**PLANNING COMMISSION REGULAR SESSION AGENDA**
**Monday, August 25, 2025 - 7:00 PM**
**City Hall, Council Chambers, 169 SW Coast Hwy, Newport, OR 97365**

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All public meetings of the City of Newport will be held in the City Council Chambers of the Newport City Hall, 169 SW Coast Highway, Newport. The meeting location is accessible to persons with disabilities. A request for an interpreter, or for other accommodations, should be made at least 48 hours in advance of the meeting to the City Recorder at 541.574.0613, or cityrecorder@newportoregon.gov.

All meetings are live-streamed at https://newportoregon.gov, and broadcast on Charter Channel 190. Anyone wishing to provide written public comment should send the comment to publiccomment@newportoregon.gov. Public comment must be received four hours prior to a scheduled meeting. For example, if a meeting is to be held at 3:00 P.M., the deadline to submit written comment is 11:00 A.M. If a meeting is scheduled to occur before noon, the written comment must be submitted by 5:00 P.M. the previous day. To provide virtual public comment during a city meeting, a request must be made to the meeting staff at least 24 hours prior to the start of the meeting. This provision applies only to public comment and presenters outside the area and/or unable to physically attend an in person meeting.

The agenda may be amended during the meeting to add or delete items, change the order of agenda items, or discuss any other business deemed necessary at the time of the meeting.

**1. Call to Order and Roll Call**
*Commission Members: Bill Branigan, Bob Berman, Jim Hanselman, Gary East, Braulio Escobar, John Updike, and Robert Bare.*

**2. Approval of Minutes**

**2.A Approval of the Planning Commission Work Session Meeting Minutes of July 28, 2025.**
Draft PC Work Session Minutes 07-28-2025
7-28-25 PC Work Session Meeting Video Link

**2.B Approval of the Planning Commission Regular Session Meeting Minutes of July 28, 2025.**
Draft PC Reg Session Minutes 07-28-2025
7-28-25 PC Regular Session Meeting Video Link

**2.C Approval of the Planning Commission Work Session Meeting Minutes of August 11, 2025.**
Draft PC Work Session Minutes 08-11-2025
8-11-25 PC Work Session Meeting Video Link

**3. Citizens/Public Comment**
*A Public Comment form is available immediately inside the Council Chambers. Anyone who would like to address the Planning Commission on any matter not on the agenda will be given the opportunity after submitting a form. Each speaker should limit comments to three minutes. The normal disposition of these items will be at the next scheduled Planning Commission meeting.*

**4. Public Hearings**

**4.A File No. 2-CP-25: Amendments to the Wastewater Section of the Comprehensive Plan.**
Memorandum
Attachment A - Draft Ordinance #2025-05 Implementing Wastewater Treatment Plan Updates
Attachment B - Wastewater Treatment Master Plan by Brown and Caldwell, dated May 2025
Attachment C - Appendices to the May 2025 Wastewater Treatment Master Plan
Attachment D - OAR 660-011-045
Attachment E - Notice of public hearing
Attachment F - Minutes from the July 14, 2025 Planning Commission meeting

**4.B File No. 3-Z-25: Draft Zoning Ordinance Housekeeping Amendments.**
Memorandum
Attachment A - Draft Copy of Ordinance No. 2025-06 (changes shown in mark-up format)
Attachment B - HB 2138 (2025)
Attachment C - Referenced ORS Chapter 1 97A Provisions
Attachment D - OAR 414-305-0920
Attachment E - Minutes from the July 14, 2025 Planning Commission Work Session
Attachment F - Public Hearing Notice

**5. Director Comments**

**6. Adjournment**

City of Newport
Draft Planning Commission Work Session Minutes
July 28, 2025

**LOCATION:** CITY COUNCIL CHAMBERS, NEWPORT CITY HALL, 169 SW COAST HIGHWAY, NEWPORT
**Time Start:** 6:00 P.M. **Time End:** 7:00 P.M.

ATTENDANCE LOG/ROLLCALL

| COMMISSIONER/ ADVISORY MEMBER | STAFF |
|---|---|
| Chair Bill Branigan (by video) | Derrick Tokos, Community Development Director |
| Commissioner Bob Berman | Sherri Marineau, Community Development Dept. |
| Commissioner Jim Hanselman | |
| Commissioner Gary East | |
| Commissioner Braulio Escobar (by video) | **PUBLIC** |
| Commissioner John Updike | Marcy McInelly, Urbsworks, Inc. |
| Commissioner Robert Bare | Jim Hencke, David Evans and Associates |
| Citizen Advisory Member Dustin Capri (absent, excused) | Ane McIntyre (by video) |
| | |

| AGENDA ITEM | ACTIONS |
|---|---|
| **WORK SESSION MEETING** | |
| **CALL TO ORDER AND ROLL CALL**<br><br>a. Roll Call | None. |
| **CITY CENTER DESIGN REVIEW DISTRICT FORM BASED CODE CONCEPTS.** | Marcy McInelly, AIA, with Urbsworks, Inc., presented final draft of a form-based code concept for the City Center area.<br><br>Hanselman joined the meeting at 6:07 p.m.<br><br>The Commission discussed how "Retail Ready" frontage standards would apply exclusively to new buildings and reviewed architectural features. The City Center Design Review District was considered, along with an evaluation of traditional downtown zone standards. Public realm street standards and cross sections were examined, followed by a discussion on appropriate residential setbacks.<br><br>The Commission discussed how SW Hurbert Street would be a parklet street with tree islands, while SW Alder and SW Lee Streets would be designation as festival or plaza streets. They requested a desire to see the width of pedestrian spaces and considered the difference between commercial and residential alleys. Development and design standards were reviewed, with emphasis placed on the need for clear and objective design standards. Base zone development standards were examined, along with |

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| | general standards. Lastly, the Commission requested that asphalt shingles and non-permeable membrane materials be added to the list of approved roof tile types. |
| **PLANNING COMMISSION WORK PROGRAM UPDATE.** | None. |

Submitted by: _____
Sherri Marineau, Executive Assistant

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**07-28-2025 - Planning Commission Work Session Meeting Video Link:**

https://thecityofnewport.granicus.com/player/clip/1469?view_id=2&redirect=true

City of Newport
Draft Planning Commission Regular Session Minutes
July 28, 2025

**LOCATION:** CITY COUNCIL CHAMBERS, NEWPORT CITY HALL 169 SW COAST HIGHWAY NEWPORT
**Time Start:** 7:00 P.M. **Time End:** 7:51 P.M.

ATTENDANCE LOG/ROLLCALL

| COMMISSIONER/ ADVISORY MEMBER | STAFF |
|---|---|
| Chair Bill Branigan (by video) | Derrick Tokos, Community Development Director |
| Commissioner Bob Berman | Sherri Marineau, Community Development Dept. |
| Commissioner Jim Hanselman | |
| Commissioner Gary East | **PUBLIC** |
| Commissioner Braulio Escobar (by video) | Gary Gamer |
| Commissioner John Updike | Ane McIntyre (by video) |
| Commissioner Robert Bare | |
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| AGENDA ITEM | ACTIONS |
|---|---|
| **REGULAR MEETING** | |
| **CALL TO ORDER AND ROLL CALL**<br><br>a. Roll Call | None. |
| **APPROVAL OF THE MINUTES**<br><br>a. Meeting minutes of Work Session Meeting on July 14, 2025.<br><br>b. Meeting minutes of Regular Session Meeting on July 14, 2025. | Motion by Bare, seconded by Updike, to approve the work session meeting minutes of July 14, 2025 as written. MOTION carried unanimously with Branigan, Berman, Hanselman, East, Escobar, Updike, and Bare all voting in favor.<br><br>Motion by Bare, seconded by Updike, to approve the regular session meeting minutes of July 14, 2025 as written. MOTION carried unanimously with Branigan, Berman, Hanselman, East, Escobar, Updike, and Bare all voting in favor. |
| **CITIZEN/PUBLIC COMMENT** | Gary Gamer addressed the Commission and read a statement requesting that his vacation rental license be modified to allow transfer upon sale, noting that this was not currently permitted. He described the rental's location near the marina, Aquarium, and Hatfield Marine Science Center, and expressed his belief that it should be transferable to a future owner. |

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| | Commissioner Berman requested that the matter be placed on a future work session agenda for further discussion. |
| ACTION ITEMS<br><br>**Initiate Legislative Process for City Center Revitalization Plan Form-Based Zoning Amendments.** | Motion was made by East, seconded by Bare, to initiate the legislative process for City Center Revitalization Plan form-based zoning amendments. MOTION carried unanimously with Branigan, Berman, Hanselman, East, Updike, and Bare all voting in favor. |
| PUBLIC HEARINGS<br><br>**3-CP-22: City Center Revitalization Comprehensive Plan Amendments.** | |
| a. PUBLIC HEARING OPEN | 7:17 p.m. |
| b. STAFF REPORT – DERRICK TOKOS | Mr. Tokos reviewed the staff report.<br><br>The Commission discussed whether Memo #9 should be tied into the Comprehensive Plan amendments at this time, which it was, and proceeded to review the proposed edits to the Comprehensive Plan.<br><br>Commissioner Berman questioned whether the East Olive district needed to be included, to which Tokos responded that staff would examine the issue to avoid potential overlap.<br><br>Commissioner Updike raised concerns about how the district was defined, noting the description “adjacent properties next to US 101 and Hwy 20” and referencing Figure 1. He suggested the language be revised to read “as more particularly described in Figure 1” for clarity regarding which lots were included in the district. Updike also questioned the reference to consolidating the memos and asked for clarification on how that would be done. Tokos explained that the final product would be a compilation of memos. While final plans are often comprehensive documents that consolidate everything, in this case it would be more of an informational pamphlet or fold-out highlighting key concepts rather than an adoptable document. |
| c. PUBLIC COMMENT | None. |
| d. PUBLIC HEARING CLOSED | 7:43 p.m. |

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| e. COMMISSION DECISION | Commissioner Hanselman acknowledged the scope of the task and appreciated the committee's contributions, expressing support for the plan. Bare noted his surprise at the absence of public attendees but supported moving forward. East and Updike also voiced support for the recommendation. Escobar echoed the sentiment, emphasizing that it was time to advance the plan and expressing appreciation for the effort involved. Branigan commented that the process had been extensive and, like Bare, was surprised at the lack of public participation. He stated would recommend approval.<br><br>Motion was made by Branigan, seconded by Escobar, to forward a favorable recommendation to the City Council for File 3-CP-22 with the clarification language requested by Commissioner Updike, and to make sure there was no overlap in the language as requested by Commissioner Berman. MOTION carried with Branigan, Berman, East, Escobar, Updike, and Bare all voting in favor. Escobar and Hanselman were a nay.<br><br>Following the vote, Berman expressed concern over the absence of public engagement and suggested efforts be made to encourage participation for the next hearing. Tokos responded that the city had conducted extensive outreach to keep residents informed. Updike wanted it emphasized that the decision pertained to the couplet. |
| DIRECTORS COMMENTS | Tokos reported the city council had approved the geologic hazard report code changes. |

Submitted by: _____

Sherri Marineau, Executive Assistant

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**07-28-2025 - Planning Commission Regular Session Meeting Video Link:**

https://thecityofnewport.granicus.com/player/clip/1470?view_id=2&redirect=true

City of Newport
Draft Planning Commission Work Session Minutes
August 11, 2025

**LOCATION:** CITY COUNCIL CHAMBERS, NEWPORT CITY HALL, 169 SW COAST HIGHWAY, NEWPORT
**Time Start:** 6:00 P.M. **Time End:** 7:46 P.M.

ATTENDANCE LOG/ROLLCALL

| COMMISSIONER/ ADVISORY MEMBER | STAFF |
|---|---|
| Chair Bill Branigan | Derrick Tokos, Community Development Director |
| Commissioner Bob Berman | Sherri Marineau, Community Development Dept. |
| Commissioner Jim Hanselman | |
| Commissioner Gary East | |
| Commissioner Braulio Escobar (absent, excused) | **PUBLIC** |
| Commissioner John Updike (by video) | Marcy McInelly, Urbsworks, Inc. (by video) |
| Commissioner Robert Bare | Jim Hencke, David Evans and Associates (by video) |
| Citizen Advisory Member Dustin Capri (by video) | |
| | |

| AGENDA ITEM | ACTIONS |
|---|---|
| **WORK SESSION MEETING** | |
| **CALL TO ORDER AND ROLL CALL**<br><br>a. Roll Call | None. |
| **CITY CENTER DESIGN REVIEW DISTRICT FORM BASED CODE CONCEPTS.** | Consultants Marcy McIlnelly (Urbsworks, Inc.) and Jim Hencke (David Evans and Associates) continued their presentation on the draft form-based code for the City Center district.<br><br>The Commission reviewed design standards and proposed updates, including roof slope guidelines, lot coverage limits, shop frontage in the downtown core, and micro retail depth adjustments. Additional topics included canopy and awning encroachments, landscaping requirements, and street cross sections for Hwy 101 and Hwy 20. Retail-ready frontage areas were refined to include Hwy 101, Alder, Lee, and the north side of 9th Street, with exclusions for the Farmer's Market parking lot. Festival street concepts were discussed for Alder Street, and added frontage requirements were proposed for Fall Street and the couplet transition.<br><br>Tokos reviewed the City Center parking district map.<br><br>The Commission discussed boundary options and agreed to align the couplet area with the Bayfront parking district. |

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| | Tokos also presented updates to the draft code.<br><br>The Commission considered screening buffers between residential and non-residential zones, revised non-residential language, discussed design review triggers and exemptions, and supported raising the building height threshold for design review to 50 feet. |
| SOUTH BEACH ISLAND ANNEXATION BOUNDARY MAP AND PROPOSED ZONING. | Tokos presented maps outlining the current Comprehensive Plan designations for properties proposed for annexation, along with the zoning that would apply once annexed.<br><br>The Commission discussed whether the annexation would help resolve irregularities in the city limit boundary in South Beach and expressed general agreement with the proposed zoning for the affected properties. Commissioners raised questions about how prior outreach to property owners had been done and the timing of public hearing notifications. They also discussed the possibility of offering rebates for property owners connecting to city services as part of the annexation process. |
| PLANNING COMMISSION WORK PROGRAM UPDATE. | None. |

Submitted by: _____
Sherri Marineau, Executive Assistant

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**08-11-2025 - Planning Commission Work Session Meeting Video Link:**

https://thecityofnewport.granicus.com/player/clip/1473?view_id=2&redirect=true

# PLANNING STAFF MEMORANDUM
## FILE No. 2-CP-25

**I. Applicant:** City of Newport. (Initiated pursuant to authorization of the Newport Planning Commission on July 14, 2025).

**II. Request:** Amend the "Wastewater Facilities" and "Goals and Policies" sections of the Public Facilities Chapter of the Newport Comprehensive Plan to update projections for wastewater system use, identify future wastewater treatment plant capital project needs, and amend policies for the provision of wastewater services, in a manner consistent with OAR 660, Division 11. The amendments build upon, and draw from, recommendations contained in a "Wastewater Treatment Master Plan," by Brown and Caldwell, dated May 2025.

**III. Planning Commission Review and Recommendation:** The Planning Commission reviews proposed amendments to the Comprehensive Plan and provides a recommendation to the City Council. At a later date, the City Council will hold an additional public hearing prior to any decision on the amendments.

**IV. Findings Required:** The Newport Comprehensive Plan Chapter entitled "Administration of the Plan" (p. 420-421) allows amendments of this nature if findings can be made that there is (a) a significant change in one or more conclusions; or (b) a public need for the change; or (c) a significant change in community attitudes or priorities; or (d) a demonstrated conflict with another plan goal or policy that has a higher priority; or (e) a change in a statute or statewide agency plan. Revisions must comply with applicable Statewide Planning Goals.

**V. Planning Staff Memorandum Attachments:**

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| Attachment "A" | Draft Ordinance #2025-05 Implementing Wastewater Treatment Plan Updates |
| Attachment "B" | Wastewater Treatment Master Plan by Brown and Caldwell, dated May 2025 |
| Attachment "C" | Appendices to the May 2025 Wastewater Treatment Master Plan |
| Attachment "D" | OAR 660-011-045 |
| Attachment "E" | Notice of public hearing |
| Attachment "F" | Minutes from the July 14, 2025 Planning Commission meeting |

**VI. Notification:** Notification for the proposed amendments included notification to the Department of Land Conservation & Development (DLCD) in accordance with the DLCD requirements on July 16, 2025. Notice of the Planning Commission hearing was also published in the Lincoln County Leader on August 13, 2025 (Attachment "E").

**VII. Comments:** No comments were received in response to the notice.

**VIII. Discussion of Request:** Statewide Planning Goal 11 addresses public facilities planning, and that goal is implemented in OAR Chapter 660, Division 11. The administrative rule calls for certain elements of public facilities plans to be adopted into a Comprehensive Plan, namely a list of the identified capital projects (OAR 660-011-0045). System Development Charge eligible capital projects should also be identified in the project list. The consulting firm, Brown and Caldwell completed a Wastewater Treatment

Master Plan for the City of Newport, effective May 2025, so it is timely for the City to update the "Wastewater Facilities" and "Goals and Policies" sections, Public Facilities Chapter, of the Newport Comprehensive Plan to include the projects and recommendations contained in the Plan.

Proposed amendments identify wastewater treatment plant capital needs to modernize the facility and increase its capacity to meet anticipated growth over the next 20-years. The revisions include future development assumptions, and the demand it will place on the facility. Each wastewater treatment plant project includes a schedule for when it should be initiated, a cost estimate, and a cross-reference to the master plan appendices where additional information is available outlining the scope and nature of the planned improvements. Since the collections and wastewater treatment plant master plans are separate documents, clarifying language has been added to identify the projects tied to each plan.

Wastewater Policy 1 of Goal 1 in the Goals and Policies section of the Public Facilities Chapter is being amended to formally adopt the "Wastewater Treatment Master Plan," by Brown and Caldwell, dated May 2025 into the public facilities plan for the City of Newport. No other policy changes are proposed.

**IX. Conclusion and Recommendation:** The Planning Commission should review the recommended amendments to the Newport Comprehensive Plan and make a recommendation to the City Council. As this is a legislative process, the Commission may recommend changes to the amendments. If the Commission provides a favorable recommendation, then an ordinance for the Comprehensive Plan amendments will be prepared identifying that there is a public need for the change, which is one of the factors that justifies a Comprehensive Plan Amendment. Such ordinance would further include the requisite goal findings for the City Council's consideration. The Council may also make changes to the proposal prior to, or concurrent with, the adoption of an implementing ordinance.

Derrick I. Tokos AICP
Community Development Director
City of Newport

August 20, 2025

# CITY OF NEWPORT

## ORDINANCE NO. 2025-05

## AN ORDINANCE AMENDING WASTEWATER SECTIONS OF THE CAPITAL FACILITIES CHAPTER OF THE CITY OF NEWPORT COMPREHENSIVE PLAN

(Newport File No. 2-CP-25)

**Summary of Findings:**

1. On July 14, 2025, the Newport Planning Commission initiated amendments to the "Wastewater Facilities" and "Goals and Policies: sections of the Public Facilities chapter of the Newport Comprehensive Plan to update projections for wastewater system use, identify future wastewater treatment plant capital project needs, and amend policies for the provision of wastewater services. The amendments build upon, and draw from, recommendations contained in a "Wastewater Treatment Master Plan," by Brown and Caldwell, dated May 2025.

2. Statewide Planning Goal 11 addresses public facilities planning, and that goal is implemented in OAR Chapter 660, Division 11. The administrative rule calls for certain elements of public facilities plans to be adopted into a Comprehensive Plan, namely a list of the identified capital projects (OAR 660-011-0045). System Development Charge eligible capital projects should also be identified in the project list.

3. The 2025 Brown and Caldwell plan focuses solely on the City's wastewater treatment plant. It is the second of two plans that the firm has prepared for the City, the first being a plan completed in 2018 that focused on the wastewater collections system. The 2018 plan was incorporated into the Newport Comprehensive Plan with Ordinance No. 2167.

4. Proposed amendments to the Wastewater Facilities section identify wastewater treatment plant capital needs to modernize the facility and increase its capacity to meet anticipated growth over the next 20-years. The revisions include future development assumptions, and the demand it will place on the facility. Each wastewater treatment plant project includes a schedule for when it should be initiated, a cost estimate, and a cross-reference to the master plan appendices where additional information is available outlining the scope and nature of the planned improvements. Since the collections and wastewater treatment plant master plans are separate documents, clarifying language has been added to identify the projects tied to each plan.

5. Wastewater Policy 1 of Goal 1 in the Goals and Policies section of the Public Facilities Chapter is being amended to formally adopt the "Wastewater Treatment Master Plan," by Brown and Caldwell, dated May 2025 into the public facilities plan for the City of Newport. No other policy changes are proposed.

6. The inventory of wastewater treatment plant assets, capital project recommendations, and the updated wastewater policy noted above are derived from detailed analysis contained in the 2025 Brown and Caldwell plan, and collectively serve as the basis for finding that (a) conditions

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have significantly changed since the Wastewater section of the Comprehensive Plan was last updated and (b) that there is a public need for these amendments, both of which are a valid basis for amending the Comprehensive Plan, as outlined in the chapter of the document titled "Administration of the Plan."

7. These amendments to the "Public Facilities" element of the Newport Comprehensive Plan are consistent with applicable Statewide Planning Goals in that the changes:

a. Have been developed and vetted with the Planning Commission consistent with Statewide Planning Goal 1, Public Involvement; and

b. Update the Newport Comprehensive Plan's technical inventory with respect to the condition of wastewater treatment capital assets, infrastructure investment priorities, and funding strategies that will facilitate fact-based land use decision making processes consistent with Statewide Planning Goal 2, Land Use Planning; and

c. Recognize that wastewater treatment infrastructure is susceptible to landslides, flooding, and related natural hazards and provide recommendations for improving system redundancy and resiliency, consistent with Statewide Planning Goal 7, which calls for local governments to plan for and mitigate against such hazards where possible; and

d. Complement economic development strategies contained in the Comprehensive Plan that recognize wastewater treatment systems as a strategic component of the City's infrastructure that must have capacity to meet current and future needs of area businesses, consistent with Statewide Planning Goal 9; and

e. Identify capital priorities and strategies for enhancing the public wastewater treatment system so that it has the capacity to meet the demand of existing residential users, and accommodate new needed housing, consistent with Statewide Planning Goal 10; and

f. Provide for the timely, orderly, and efficient arrangement of public facilities and services by ensuring the wastewater treatment infrastructure priorities are identified in conjunction with the City's other capital project needs, as encouraged by Statewide Planning Goal 11.

8. No other Statewide Planning Goals are applicable to the proposed changes to the "Public Facilities" Chapter of the Newport Comprehensive Plan.

9. The Newport Planning Commission reviewed the proposed amendments at work sessions on July 14, 2025. The Commission held a public hearing on March 9, 2020 and, after taking public testimony, voted to recommend adoption of the amendments.

10. The City Council held a public hearing on October 6, 2025 regarding the question of the proposed revisions, and voted in favor of their adoption after considering the recommendation of the Planning Commission and evidence and argument in the record.

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11. Information in the record, including affidavits of mailing and publication, demonstrate that appropriate public notification was provided for both the Planning Commission and City Council public hearings.

THE CITY OF NEWPORT ORDAINS AS FOLLOWS:

Section 1. Findings. The findings set forth above, are hereby adopted in support of the amendments to the City of Newport Comprehensive Plan Map, Zoning Map, and Title XIV of the Newport Municipal Code as set forth in Section 2 of this Ordinance.

Section 2. Newport Comprehensive Plan Amendments. The "Wastewater Facilities" and "Goals and Policies: sections of the Public Facilities chapter of the Newport Comprehensive Plan are hereby amended as outlined in Exhibit "A" to this ordinance.

Section 3. Effective Date. This ordinance shall take effect 30 days after passage.

Date adopted and read by title only: _____

Signed by the Mayor on _____, 2025

_____
Jan Kaplan, Mayor

ATTEST:

_____
Allie Anderson, City Recorder

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(Note: Recommended changes to existing comprehensive plan language is shown in red, with new language being depicted in underline and deleted language in ~~strikethrough~~.

**Exhibit A**
Ord. # 2025-05

# WASTEWATER FACILITIES

The City of Newport (City) provides wastewater collection system services for more than 10,000 people and businesses spread across an area of approximately 11.2 square miles. The City owns over 62.5 miles of gravity pipelines ranging in size from approximately 3 to 36 inches in diameter, 1,400 manholes, 9 major pump stations, 16 minor pump stations, and 12 miles of sanitary force mains. A majority of the sewer system was built after 1950 and is concrete, while much of the newer pipe is polyvinyl chloride (PVC).

Detailed information on the historical, functional, and environmental factors relevant to the City's wastewater system can be found in the documents entitled, "Final Wastewater Collections Master Plan, by Brown and Caldwell, dated February 9, 2018" (hereinafter, the "Wastewater Collections Master Plan") and "Wastewater Treatment Master Plan, by Brown and Caldwell, dated May 2025" (hereafter, the "Wastewater Treatment Master Plan).

**Existing Wastewater System:**
The primary components of the wastewater system are the Wastewater Treatment Plant (WWTP), gravity sewer mains, force mains, and pump stations. The WWTP was built by the City of Newport in 2002 at an initial cost of $42 million dollars. The plant is located in South Beach, and has the hydraulic capacity to bypass 15 million gallons of wastewater per day (untreated). The WWTP is permitted to treat up to 5 million gallons per day, and typically receives flows of 2 million gallons per day. The plant uses a biological process to treat wastes known as activated sludge. This process creates two products from wastewater. The main product is clean water, which is treated and pumped into the ocean off Nye Beach. The other product produced at the plant is Class A Biosolids. The Wastewater Collections Master Plan evaluated the condition and future needs of the wastewater distribution system (i.e. gravity lines, force mains and pump stations). A separate Wastewater Treatment Master Plan has been prepared for the WWTP.

The topography of Newport has required that pump stations be used to serve a number of areas throughout the city. Major pump stations are those that are critical to the operation of the entire collection system. Minor pump stations and individual septic tank effluent pump (STEP) systems serve targeted populations. Should minor facilities fail, the immediate population they serve would be impacted; however, the balance of the collection system would be operational. Table 1 below summarizes the design data for the City's major pump stations.

Table 1: Pump Station Summary

| Pump Station | Capacity (gpm)[a] | Number of Pumps | Force Main Size (in) | Force Main Material | Force Main Length | Year Upgraded[b] |
|---|---|---|---|---|---|---|
| Bayfront | 1,200 | 2 | 8 | PVC | 1,370 | 2001 |
| Big Creek | 2,430 | 3 | 14 | HDPE | 5,040 | 2016 |
| HMSC | 1,390 | 2 | 8 | | 35 | 2001 |
| Influent | 850 | 2 | 24 | HDPE | 3,000 | 2001 |
| | 3,500 | 4 | | | | |
| Northside | 3,000 | 3 | 20-24 | Steel / DI / HDPE | 142,000 | 2001 |
| NW 48th St[c] | 1,215 | 2 | 10 | PVC | 1,564 | 2018 |
| Nye Beach | 1,400 | 2 | 12 | PVC / AC | 2,200 | - |
| Schooner Creek[c] | 660 | 2 | 8 | PVC | 3,779 | 2018 |
| SE Running Springs Dr | 153 | 2 | 4 | PVC | 2,505 | - |

Note: gpm = gallons per minute.

a. Figures represent firm pumping capacity, and are based upon pump station operation without use of redundant pumps.
b. Year upgraded is based upon record drawings where available.
c. The NW 48th Street pump station, Schooner Creek Pump Station, and Schooner Creek force main are currently being upgraded as part of the Agate Beach Wastewater Improvement Project. Values listed represent planned improvements.

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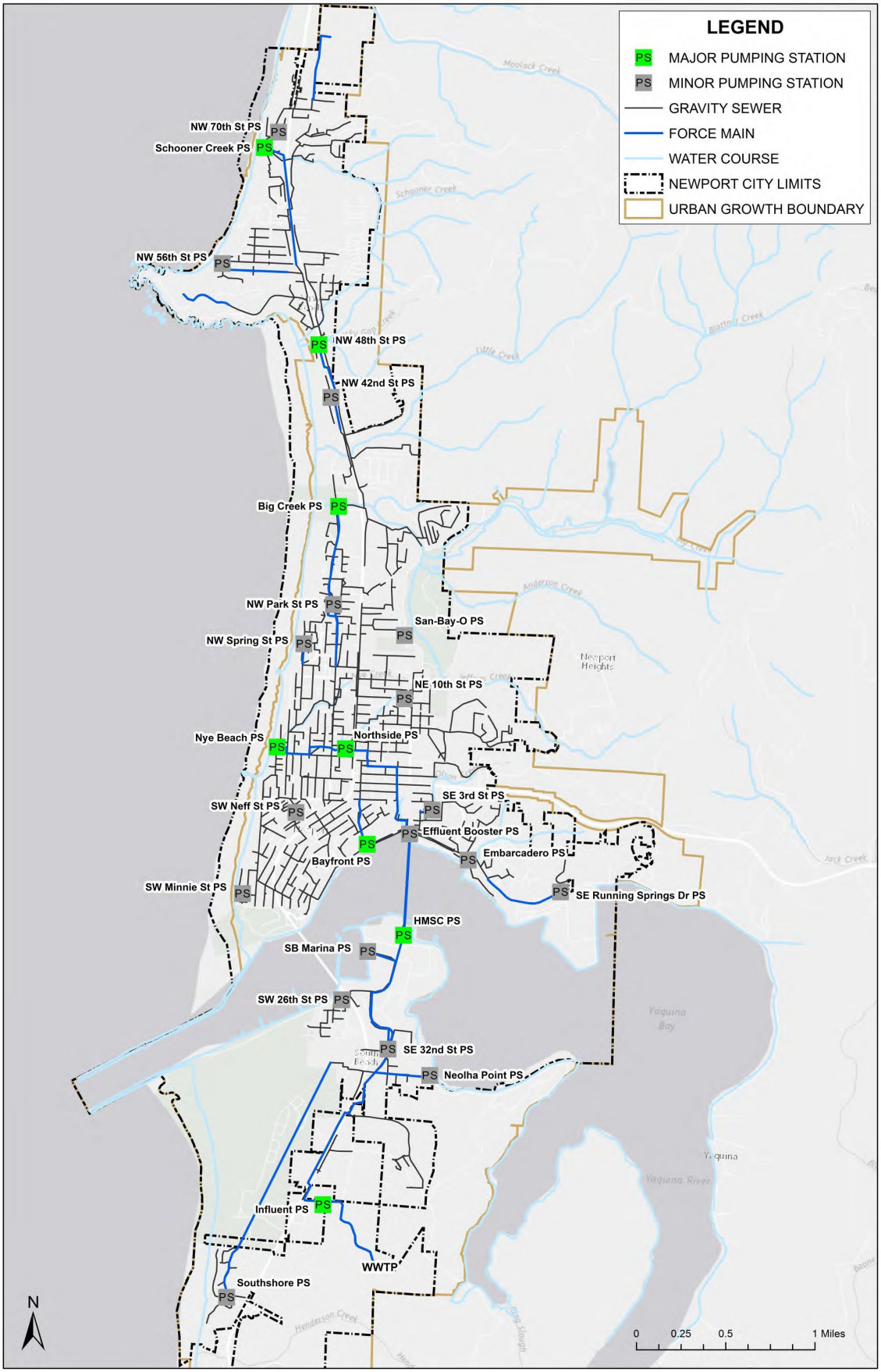
Figure 1: Existing Wastewater Distribution System



**Development Assumptions:**

Land use and zoning provide the basis for developing future unit wastewater flows and overall wastewater flow projections for buildout conditions. Understanding the nature and distribution of the various land use classifications is important for accurate identification of future wastewater flow rates and the phasing of required improvements. This section describes both the existing and proposed future land uses for the study area. Land use and zoning are largely governed by the local topography and by decisions made by the City, its citizens, and the Oregon Department of Land Conservation and Development (DLCD). Expansion of the Urban Growth Boundary (UGB) must be approved by the DLCD before such actions can be adopted.

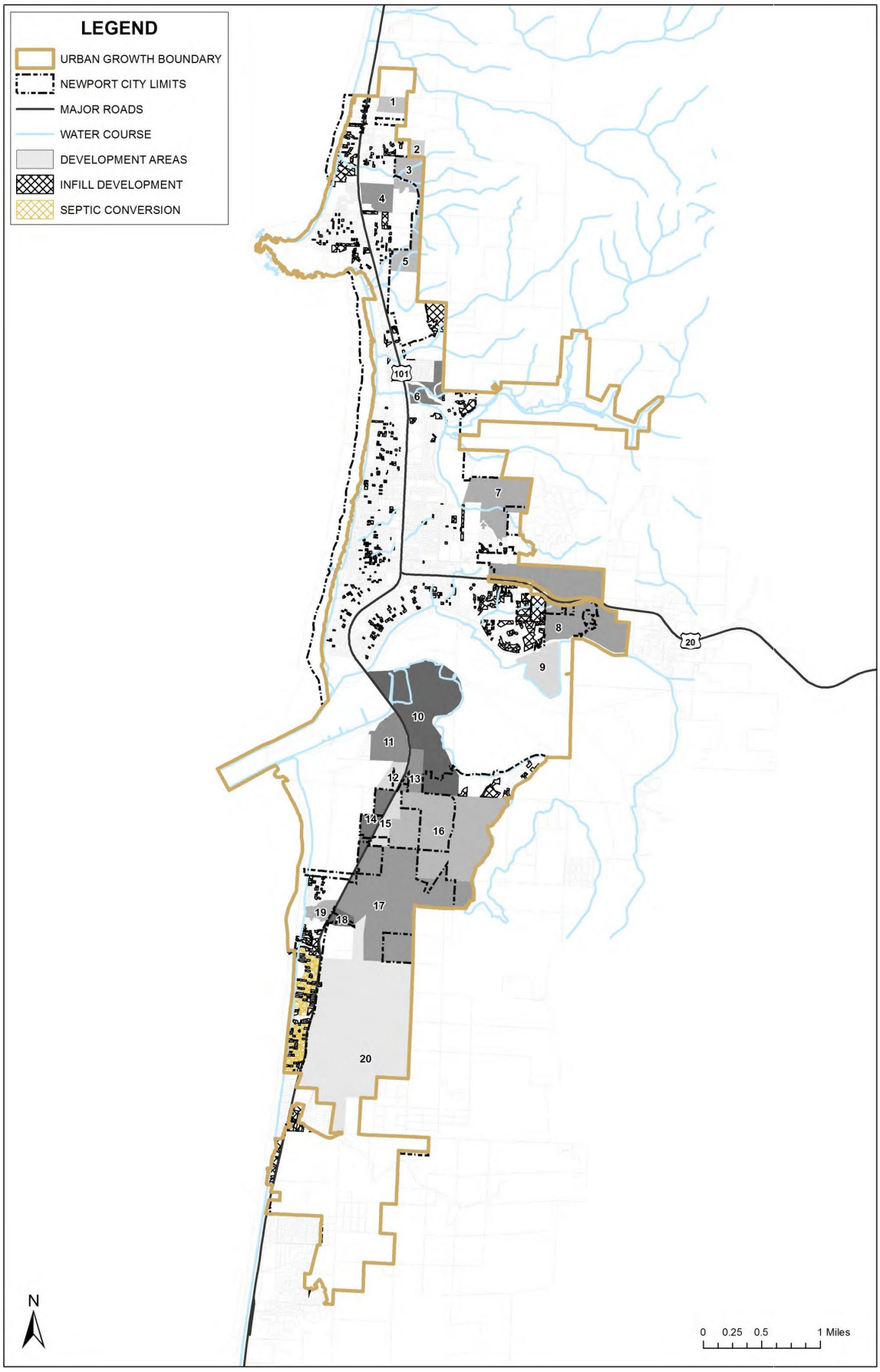
Information on current land use was obtained from GIS data provided by the City. In addition, the City maintains a buildable lands inventory (BLI). The BLI was developed in two parts. A Housing Needs and Buildable Lands Study provides land capacity estimates for low, medium and high density residential development (ECONorthwest, 2011 and 2014). An Economic Opportunities Analysis includes the same information for commercial and industrial properties, estimate land capacity in terms of dwelling unit equivalencies (ECONorthwest 2012). Buildable parcels are identified as "infill development" in Figure 2, below. The City's Community Development Department provided 20-year and buildout development conditions considering these studies. That information is listed in Table 2 below. The development identifier (ID) corresponds to the development area on Figure 2. Detailed views of the development areas are provided in Appendix B of the Wastewater Collections Master Plan.

Table 2: Development Assumptions

| Development ID | 20-year Development Conditions | Buildout Development Conditions [c] |
|---|---|---|
| 1 | 30-acre light industrial development [a] | |
| 2 | 6-acre annexation for 48-unit assisted living facility | |
| 3 | 50 Low Density Residential (LDR) units | 50 LDR units |
| 4 | 170 Medium Density Residential Units<br>120-unit assisted living facility | |
| 5 | 50 LRD units | 50 LDR units |
| 6 | 22.5 acres High Density Residential (HDR) development [a] | 12.5 acres HDR development [a] |
| 7 | 38.5 acres LDR development [a] | 38.5 acres LDR development [a] |
| 8 | 135 acres LDR development [b] | 135-acres LDR development [b] |
| 9 | 9-acre log yard, 1.1 acre light industrial, 1.2 acre water dependent industrial | 12-acre water dependent industrial |
| 10 | 1.4 acre industrial, 3.4 acre research/classroom, 0.2 acre commercial | |
| 11 | 2.3 acre commercial, OMSI 250 occupants, 60 MDR units | |
| 12 | 0.2 acres commercial, 0.2 acres light industrial | |
| 13 | 4.1 acres commercial development | |
| 14 | 1.1 acres light industrial, 1.1 acres commercial | |
| 15 | 1.0 acre commercial | |
| 16 | 9.3 acres commercial, 350 LDR units, OSU (500 students) | 3 acres commercial, 650 LDR units |
| 17 | 1.1 acres light industrial development | 2.2 acres light industrial development |
| 18 | 0.5 acres commercial, 3 LDR units | |
| 19 | 18 LDR units | |
| 20 | 0.5 acres light industrial, 5 acres airport commercial | |
| Infill Development | 215 residential parcels | 501 residential parcels |
| Septic Conversion | 184 LDR units | |

a. Assume 80% infill to account for roads and right-of-way.
b. Assume 40% infill to account for steep sloped terrain, roads, and right-of-way
c. 20-year development conditions not are not included in buildout conditions.

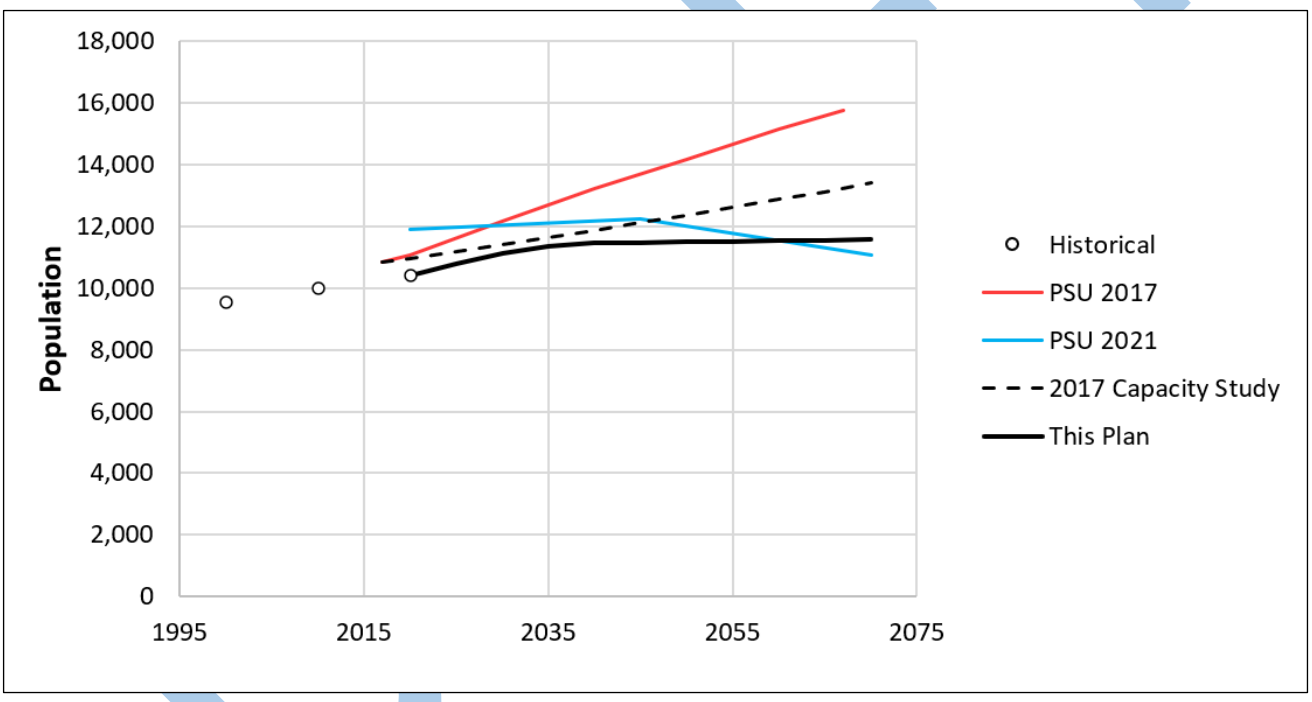
Figure 2: 20-year and Buildout Conditions



Population projections for Newport and Lincoln County are periodically developed by Portland State University (PSU). The Wastewater Collections Master Plan relied upon PSU's 2017 projection that estimated a 0.91 percent annual growth rate for the city between 2017 and 2067. From 2004 to 2017, water use within the city increased at an annual rate of approximately 0.1 percent. While some of this reflects water conservation, the water-use data suggested that PSU projections could overestimate development. As a compromise, the 2017 capacity study used a set of projections with a 0.45 percent annual growth rate.

PSU updated its population forecasts in 2021, and the new forecasts were much lower than those developed in 2017. The 2021 PSU projections forecast an overall reduction in population within the city from 2020 to 2070, and only a small incremental increase (0.2 percent annual growth) in Lincoln County as a whole. Actual population growth within the city averaged 0.96 percent between 2000 and 2020, with a 1.39 percent annual growth rate from 2010 to 2020. A new set of population projections were developed for Wastewater Treatment Master Plan to rationalize the available data. The new projections start with the 2000-2020 annual growth rate of 0.96 percent and gradually reduce to 0.03 percent, which is the annual growth rate projected for Lincoln County after 2040 in the PSU 2021 forecast. Figure 2-1 presents the new projections alongside those from the 2017 capacity report, the two PSU projections, and the historical population for Newport.

Figure 2-1: Updated Population Forecast




**Recommended Wastewater System Projects:**

Chapters 4 and 5 of the Wastewater Collections Master Plan include flow projections, system modeling and hydraulic analysis to forecast anticipated demand based upon the 20-year and buildout scenarios. The results of that future condition assessment informed the development of a list of recommended capital improvements listed in the tables and figures below. Where capital projects are recommended from other facility plans, the source documents are noted.

Wastewater Treatment Master Plan capital project recommendations were informed by Capacity and Condition Assessments in Sections 3 and 4 of the document, in conjunction with detailed recommendations regarding the WWTP Headworks (Section 5), Liquids Process (Section 6), Solids Process (section 7), and Northside Pump Station Recommendations (Section 8). Table 2-1 below lists the recommended WWTP related capital projects.

Table 2-1: Recommended WWTP Improvements

| Capital Projects (2025 dollars) | | | |
|---|---|---|---|
| Project | Estimated Cost [b] | Schedule | Reference |
| Near-Term Improvements | | | |
| NSPS Interim Improvements | $7,230,000 | 2027-2029 | Appendix H |
| NSPS Dechlorination | $3,930,000 | 2027-2029 | Appendix I |
| WWTP Disinfection Upgrades | $5,880,000 | 2027-2029 | Appendix E |
| WWTP Disinfection Upgrades | $270,000 | 2027-2029 | Appendix L |
| IPS Pipe Replacement [a] | $370,000 | 2029 | See Note a. |
| WWTP Headworks Upgrades | $4,670,000 | 2029-2031 | Appendix B |
| Liquids/Solids Process Selected Alternative and Longer-Term Improvements | | | |
| WWTP 3rd Secondary Clarifier [c] | $21,640,000 | 2029-2032 | Appendix C |
| WWTP Solids Upgrades | $34,130,000 | 2032-2035 | Appendix D |
| IPS Upgrades [a] | $1,050,000 | 2034 | See Note a. |
| WWTP 2nd Oxidation Ditch | $18,760,000 | 2035-2038 | Appendix C |
| NSPS Buildout Facility | $49,180,000 | 2039-2041 | Appenndix H |

*a. Detailed cost estimates for the Influent Pump Station (IPS) have not yet been developed. Costs shown are for reference only and based on improvements described by the City.*
*b. Additional engineering and administrative costs have been applied to projects for which this was not applied during capital cost development.*
*c. The 3rd secondary clarifier project cost was estimated assuming incorporation of pump stations and flow distribution improvements to prepare for the future 2nd oxidation ditch.*

## Gravity Main Replacement

Sections of the existing gravity sewer mains along NE Avery Street and NW Nye Street lack capacity for 20-year buildout, and must be upsized to prevent excessive surcharging that could lead to basement backups and/or flooding. Individual sewer replacements are broken out into distinct sub-projects so that they can be designed bid and constructed incrementally or collectively based upon available funding, as outlined in Table 3 and graphically depicted in Figure 3.

Table 3: Recommended Gravity Main Replacements

| Gravity Sewer Mains (2016 dollars) | | | | | | |
|---|---|---|---|---|---|---|
| Pipe ID | Length,(lf) | Existing Diameter (in) | Recommended Diameter (in) [a] | Solution | Estimated Cost [b] | Total Project Cost |
| **NE Avery Street** (Upsize gravity sewer from the Bayfront force main to the Northside pump station) | | | | | | |
| 7504 – 7045 | 258 | 14 | 18 | Open cut | $137,000 | $1,230,000 |
| 7045 – 7043 | 234 | 14 | 18 | Open cut | $124,000 | |
| 7043 – 7040 | 264 | 14 | 18 | Open cut | $140,000 | |
| 7040 – 7028 | 251 | 12 | 18 | Open cut | $133,000 | |
| 7028 – 7026 | 140 | 12 | 18 | Open cut | $74,000 | |
| 7026 – 7027 | 170 | 12 | 18 | Open cut | $90,000 | |
| 7027 – 7011 | 293 | 10 | 18 | Open cut | $155,000 | |
| 7011 – 7010 | 268 | 12 | 18 | Open cut | $142,000 | |
| 7010 – 7059 | 345 | 12 | 18 | Open cut | $183,000 | |
| 7059 – 7060 | 80 | 12 | 18 | Open cut | $42,000 | |
| 7060 - 7058 | 23 | 12 | 18 | Open cut | $12,000 | |
| **NW Nye Street** (Upsize and rehabilitate gravity sewer from the Big Creek force main to the Northside pump station) | | | | | | |
| 5023 – 5037 | 330 | 15 | 13.5 | CIPP | $109,000 | $1,140,000 |
| 5037 – 5040 | 122 | 15 | 13.5 | CIPP | $40,000 | |
| 5040 – 5043 | 204 | 15 | 13.5 | CIPP | $67,000 | |
| 5043 – 5513 | 329 | 15 | 13.5 | CIPP | $109,000 | |
| 5513 – 5520 | 340 | 15 | 18 | Pipe burst | $163,000 | |
| 5520 – 5542 | 328 | 15 | 18 | Pipe burst | $157,000 | |

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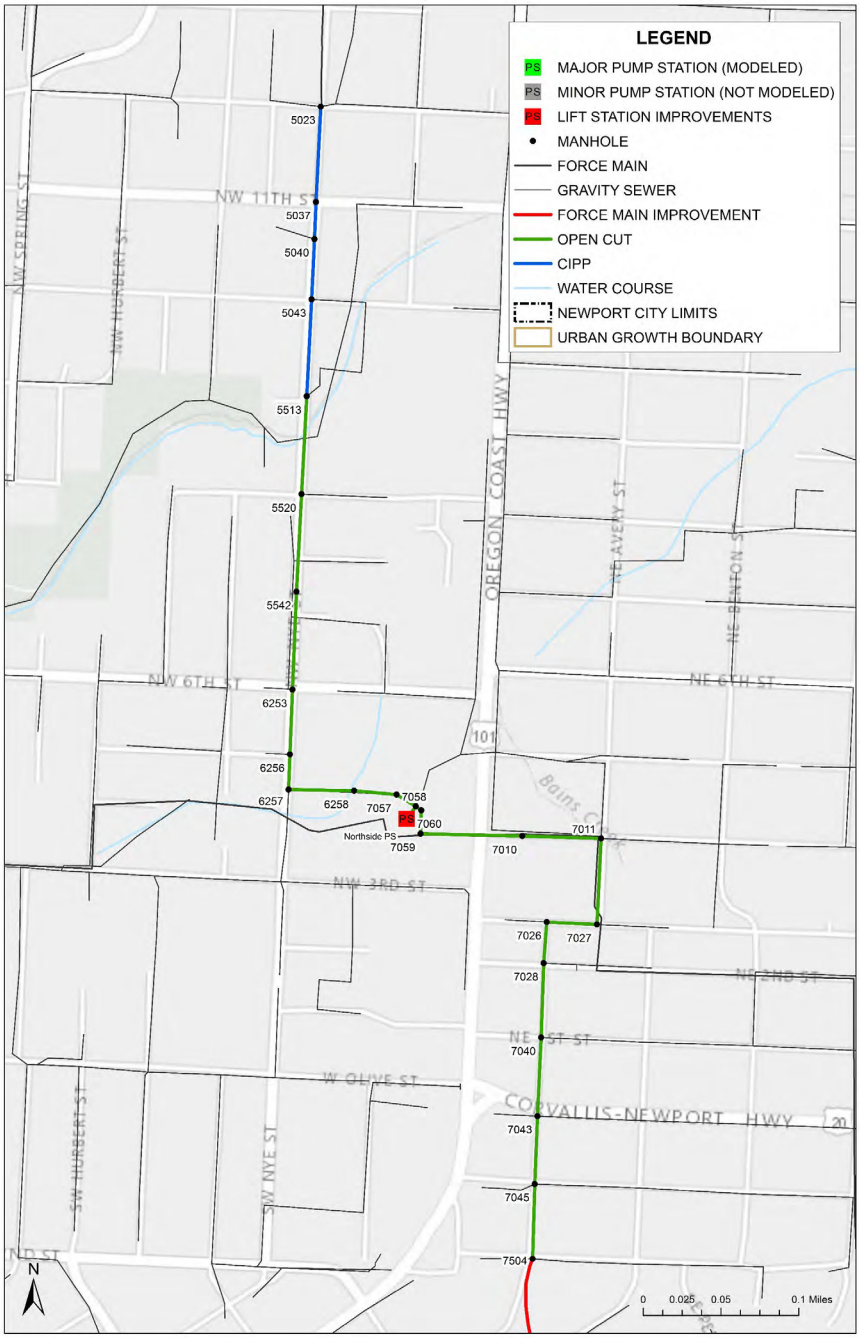
| | | | | | | |
|---|---|---|---|---|---|---|
| 5542 – 6253 | 333 | 15 | 18 | Pipe burst | $159,000 | |
| 6253 – 6256 | 225 | 15 | 18 | Pipe burst | $108,000 | |
| 6256 – 6257 | 109 | 15 | 18 | Pipe burst | $52,000 | |
| 6257 – 6258 | 80 | 16 | 18 | Pipe burst | $38,000 | |
| 6258 – 7057 | 145 | 16 | 18 | Pipe burst | $69,000 | |
| 7057 – 7058 | 76 | 16 | 18 | Pipe burst | $36,000 | |
| 7058 – Northside | 53 | 20 | 21 | Open cut | $31,000 | |

Note: CIPP = cured in place pipe.

a. Pipe diameter reduction of 10% assumed for CIPP rehabilitation

b. Estimated costs include a 30% allowance for construction contingencies and a 20% allowance for engineering design and administration. Appendix E to the Wastewater Collections Master Plan includes unit costs tables. Assumes a depth of 10-feet per cost condition and 2-feet for gravity sewers.

Figure 3: NE Avery and NW Nye Street Gravity Sewer Replacement




## Pump Station and Force Main Improvements

Four of the nine major pump stations were found to lack firm capacity for conveying the future buildout conditions peak flows: Nye Beach, Bayfront, Northside, and SE Running Springs. One pump station was identified to be at risk from unstable soil conditions.

The force main along the Bayfront will require upsizing, and replacing the force main and pump station at the same time would be beneficial from economy of scale pricing. Alternatively, the City may want to postpone installation of the new force main until later in the planning period once the buildout condition is met. Currently, the Bayfront force main is appropriately sized but nearing the upper limit of acceptable peak velocities. The HMSC force main appears to be undersized; however, flow is expected to be reduced in this area, which may mitigate concerns related to elevated force main velocities. A summary of the costs required to provide the necessary improvements is listed below.

Table 4: Recommended Pump Station and Force Main Improvements

| Pump Station | Description of Improvements | Source | Estimated Cost (2016 dollars) |
|---|---|---|---|
| Nye Beach | Upgrade pump station firm capacity to 2.74 mgd | 2018 Wastewater Collections Master Plan | $2,828,000 |
| Bayfront | Upgrade pump station firm capacity to 3.24 mgd | 2018 Wastewater Collections Master Plan | $3,224,000 |
| Bayfront | Upgrade force main capacity to 14-inches | 2018 Wastewater Collections Master Plan | $490,000 |
| Northside | Upgrade pump station firm capacity to 9.2 mgd | 2018 Wastewater Collections Master Plan | $2,780,000 |
| SE Running Springs Dr | Upgrade pump station firm capacity to 9.2 mgd | 2018 Wastewater Collections Master Plan | $1,178,000 |
| SE Running Springs Dr | Realign 4-inch force main | 2018 Wastewater Collections Master Plan | $330,000 |
| NW 56th Street | Study pump station and upgrade | 2018 Wastewater Collections Master Plan | $1,347,000 |
| SE 62nd Street | Construct new pump station | 2006 South Beach Nbhd Plan | $1,000,000 |

Note: MGD = millions of gallons per day.

## New Gravity Mains (i.e. Sewer Extensions)

Sewer extensions are required to provide service to those areas that do not have City sewer service. Areas without sewer service include homes on septic systems, areas within the current UGB to be developed, and miscellaneous properties inside the city boundary that are not located near existing sewers. Generally, sewer extensions are not funded by rates. Instead, most sewer extensions are funded by developers with potentially some of the costs being SDC-reimbursable. In partially developed areas of the city not currently connected to the sewer, Local Improvement Districts (LIDs) and special assessment districts may need to be formed to fund the projects. New gravity mains needed to serve new development areas include:

Table 5: Gravity Mains Needed to Serve New Development

| New Gravity Sewer Mains (2016 dollars) | | | | |
|---|---|---|---|---|
| Project | Length,(lf) | Recommended Diameter (in) | Source Document | Total Project Cost |
| NE Harney Street | 1,400 | 8 | 1990 Public Facilities Plan | $740,000 |
| NE 52nd Street | 4,000 | 8 | 1990 Public Facilities Plan | $259,000 |
| NE 70th Place | 1,400 | 8 | 1990 Public Facilities Plan | $371,000 |
| Yaquina Heights Dr | 5,800 | 8 | 1990 Public Facilities Plan | $1,426,000 |
| Benson Road | 4,400 | 8 | 1990 Public Facilities Plan | $1,722,600 |
| Harborton to SE 50th | 3,400 | 12 | 2006 South Beach Neighborhood Plan | $754,800 |
| SE 50th to SE 62nd | 3,000 / 2,900 | 12 / 6 | 2006 South Beach Neighborhood Plan | $1,979,500 |
| Wilder Phase 5 | 2,800 | 8 | 2006 South Beach Neighborhood Plan | $1,206,000 |

## Septic Conversion and Airport Sewer

In the southern portion of the city, the Newport Municipal Airport and the Surfland neighborhood are currently served by septic sewer systems. The City plans on extending its sewer service out to the Surfland neighborhood and the Newport Municipal Airport. The scope and extent of the improvements are listed in the table below.

Table 6: Surfland Septic Conversion – Airport Sewer Extension

| Description of Improvements | Source | Estimated Cost (2016 dollars) [a] |
|---|---|---|
| Gravity sewer distribution system | 2018 Wastewater Collections Master Plan | $4,620,000 |
| Sewer force main | 2018 Wastewater Collections Master Plan | $612,000 |
| Sewer pump station | 2018 Wastewater Collections Master Plan | $1,000,000 |

a. Estimated costs include a 30% allowance for contingency and a 20% allowance for engineering design and administration.

**Rehabilitation and Replacement Program:**

As a collection system ages, the structural and operational condition of the sewer system will decline as the number and type of defects in the piped system increase. If unattended, the severity and number of defects will increase along with an increased potential of sewer failure. Sewer failure is defined as an inability of the sewer to convey the design flow. It is manifested by hydraulic and/or structural failure modes. Hydraulic failures can result from inadequate hydraulic capacity in the sewer. Loss of hydraulic capacity can result from a reduction of pipe area because of accumulations of sediment, gravel, debris, roots, fats, oil, and grease, and structural failure. Also, a major loss of hydraulic capacity can be the result of excessive infiltration/inflow (I/I) or inappropriate planning for future growth that results in flows in excess of pipe capacity. Structural defects left unattended can lead to catastrophic failures that can have a significant negative impact on the community and the environment.

The City should implement a repair and rehabilitation (R&R) program to address its aging collection system. While the focus of many R&R programs is to restore the structural integrity of existing sewers, such activities will also help reduce the amount of infiltration that finds its way into the collection system. Elements of the collection system should be repaired or replaced based upon their structural condition with Grade 1 lines being in the best condition and Grade 5 being in the poorest condition. Factors used to determine the condition grade of the collection system are shown in the table below.

Table 7: Structural and Operational Condition Grades of Sewers

| Condition Grade | Grade Description | Defect Description | Structural Condition Grade Implication | Operational Condition Grade Implication |
|---|---|---|---|---|
| 5 | Immediate Attention | Defects have led to failure | Collapsed or collapse imminent | Unacceptable infiltration or blockages; surcharging of pipe during high flow with possible overflows |
| 4 | Poor | Severe defects that will continue to degrade with likely failure in 5-10 years | Collapse likely in 5-10 years | Pipe at or near surcharge condition during high flow; overflows still possible at high flows |
| 3 | Fair | Moderate defects that will continue to deteriorate | Collapse unlikely in near future; further deterioration likely | Surcharge or overflows unlikely but increased maintenance required |
| 2 | Good | Minor and few moderate defects | Minimal near-term risk of collapse, potential for further deterioration | Routine maintenance only |
| 1 | Excellent | No defects, condition is like new | Good structural condition | Good operational condition |

The City should budget approximately $1M per year in 2016 dollars to the R&R program, assuming that 2 percent of its system per year will be rehabilitated. The table below presents a more detailed break-down of the recommended R&R implementation strategy. The assumption that 2 percent will be re-habilitated is an approximate estimate based on information gathered from existing condition assessment information.

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Table 8: Recommended R&R Schedule

| Work Item | R&R Pipe (LF) | 2016 – 2031 R&R Activities (2016 dollars) | | | |
|---|---|---|---|---|---|
| | | 2016 - 2019 | 2020 - 2023 | 2024 - 2027 | 2028 - 2031 |
| Grade 5 (known) | 4,990 | $1,248,000 | - | - | - |
| Grade 4 (known) | 2,395 | $359,000 | - | - | - |
| Grade 5 (assumed) | 22,954 | $1,081,000 | $2,329,000 | $2,329,000 | - |
| Grade 4 (assumed) | 11,017 | $311,000 | $671,000 | $671,000 | - |
| Grade 1, 2 or 3 [a] | 288,644 | - | - | - | $3,464,000 |
| Force Mains [b] | 46,500 | $930,000 | $930,000 | $930,000 | $930,000 |
| Total Cost | | $3,929,000 | $3,930,000 | $3,930,000 | $4,394,000 |
| Annual Cost | | $982,000 | $983,000 | $983,000 | $1,099,000 |

a. Over time, pipes that are currently grade 1, 2, or 3 will escalate to being a Grade 4 pipe. It is estimated that the City will need to rehabilitate 2% of current Grade 1-3 pipes to maintain a sustainable inspection program. This is an estimated value; it is recommended that the City continues to evaluate the results of their inspection program to determine a refined R&R rate.

b. The force main R&R scope does not include the cost of replacing the Big Creek FM, NW 48th St FM, or Schooner Creek FM. These force mains were recently evaluated as part of the Agate Beach Improvement Project. In addition, the Northside, SE Running Springs Dr, and Bayfront force mains were excluded, as they are included as individual CIPs.

Years 1 through 16 should focus on the most severely deteriorated sewers, the Grade 5 sewers identified by the closed-circuit television (CCTV) inspections. The less deteriorated Grade 4 sewers should be addressed during years 5 through 16. As future inspections are conducted, additional Grade 4 and Grade 5 sewers will be identified. The LF listed in Table 6-8 for the unknown (i.e., yet to be inspected) Grade 4 and 5 sewers are estimated based on the distribution of grades for sewers inspected to date. These sewers are identified for R&R during years 1 through 16. The future inspections may find that the actual LF for each grade may vary from these projections. Also, the City should anticipate that additional R&R will be required in the future as the collection system ages. A recommended annual inspection and minor pump station repair program is outlined in the table below.

Table 9: Recommended Annual Inspection Pump Station Repair Program

| Work Item | Quantity | Assumptions | Annual Estimated Cost (2016 dollars) |
|---|---|---|---|
| CCTV Inspections | 47,000 LF per year | 7-year inspection cycle. Assumes an average of $2.50/LF | $117,000 |
| Pump Station Inspections | 25 total | Inspect pump stations (excluding SE 3rd Street PS), with smaller stations costing $10,000 and large stations costing $20,000. Assume an average of $15,000 per station. | $15,000 |
| Force Main Inspections | 9,300 LF per year | 7-year inspection cycle. Assume an average of $20/LF | $186,000 |
| Minor Pump Station Repair and Rehabilitation Program | 20 years | A schedule should be established to conduct these improvements on an annual basis. Priority pump stations include, but are not limited to Embarcadero, SW Minnie, Bayfront, and NE 10th Street. | $200,000 |
| Total | | | $518,000 |

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(Note: Recommended changes to existing comprehensive plan policies are shown in red, with new language being depicted in underline and deleted language in ~~strikethrough~~.

# GOALS AND POLICIES
# PUBLIC FACILITIES ELEMENT

## WASTEWATER

**Goal 1: To provide a wastewater collection and treatment system with sufficient capacity to meet the present and future needs of the Newport urbanizable area in compliance with State and Federal regulations.**

Policy 1: Improve and maintain the wastewater collection system as identified in the 1990 Public Facilities Plan for the City of Newport, by CH2MHILL, as amended by the following updates:

A. Wastewater Facilities Plan, by Fuller & Morris Engineering & CH2MHILL, dated May 1996
B. 2006 South Beach Neighborhood Plan (Ord. No. 1899)
C. Wastewater Collections Master Plan, by Brown and Caldwell, dated February 9, 2018
D. Wastewater Treatment Master Plan, by Brown and Caldwell, dated May 2025

Policy 2: On-site sewer systems or holding tanks shall not be allowed unless the city's sanitary sewer system is greater than 250 feet away. In any case, a subsurface permit from the Lincoln County Sanitarian must be obtained prior to any development that will rely on an on-site sewer system or holding tank.

Policy 3: Existing structures within the city limits that contain sanitary facilities shall connect to the city's sanitary sewer system at such time as a gravity main or equivalent wastewater collection system is extended to within 250 feet of the property.

Policy 4: City wastewater services may be extended to any property within the urban growth boundary. Except for the very limited circumstances allowed by state law and regulations, the city will not generally provide wastewater services outside the urban growth boundary. The city may require a consent to annexation as a condition of providing wastewater service outside the city limits and shall require a property to annex before providing wastewater service if it is contiguous to the city limits. Nothing in this policy obligates the City to provide wastewater services outside of the city limits. For property outside the city limits but within the urban growth boundary, wastewater services may be provided at the City's discretion only for:

A. residentially zoned lands as allowed by county zoning without urban services, and

B. commercial and industrial zoned lands as allowed by county zoning at the scale of development in existence on September 4, 2007.

Policy 5: When designing the wastewater collection and treatment system to ensure there is sufficient capacity to meet current and future needs of the community, the City shall consider the demands of various users under normal and predictable daily and seasonal patterns of use.

Policy 6: When undertaking capital improvement planning, priority shall be given to projects that will repair, replace or upsize wastewater infrastructure with known condition or capacity limitations in order to minimize discharges that could compromise public health and safety, damage real property, or harm the environment.

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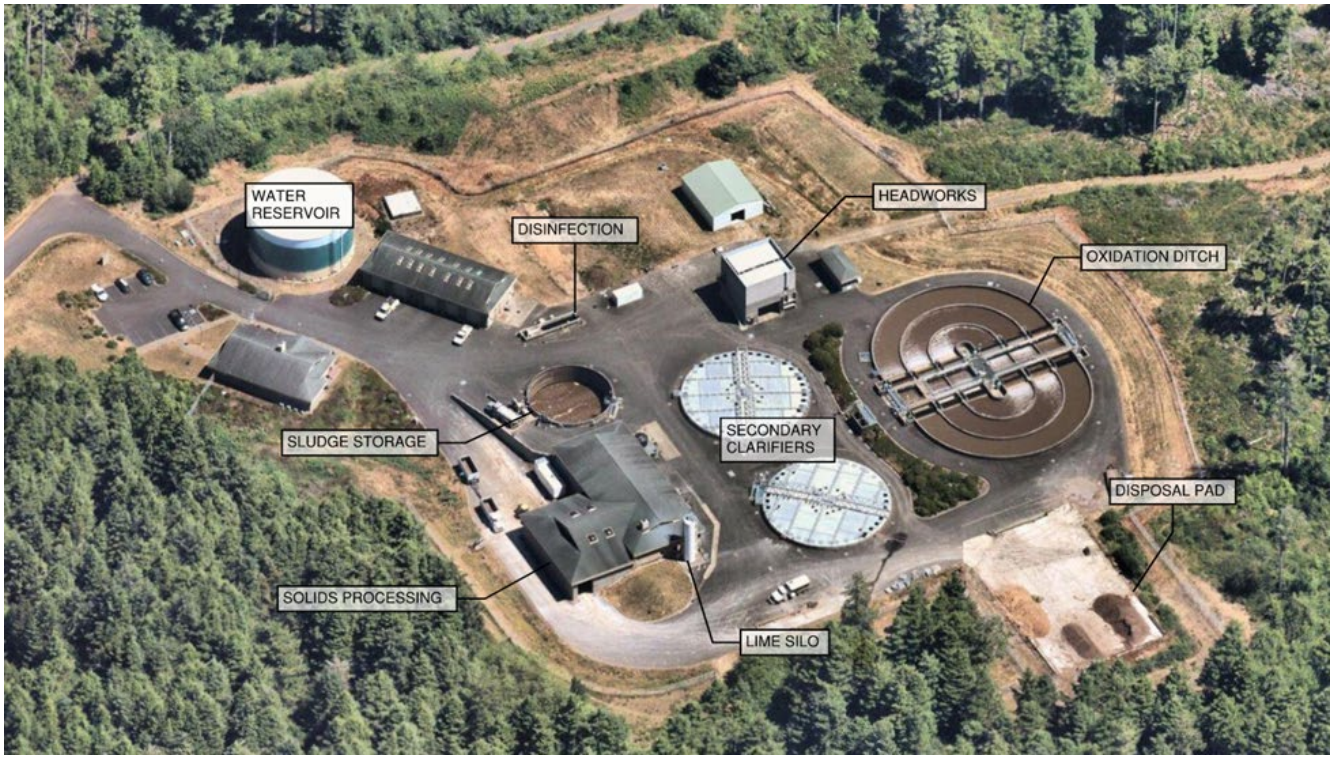
Brown AND Caldwell

**DRAFT REPORT** | Prepared for
**City of Newport, Oregon**

# Wastewater Treatment Master Plan

## Phase II: Alternatives Development and Evaluation

May 2025



# Newport Wastewater Treatment Master Plan
# Phase II: Alternatives Development and Evaluation

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# List of Abbreviations

| | |
|---|---|
| °C | degree(s) Celsius |
| °F | degree(s) Fahrenheit |
| AACE | Association (for the) Advancement of Cost Engineering |
| APLR | Annual Pollutant Loading Rate |
| As | arsenic |
| BC | Brown and Caldwell |
| BOD | biological oxygen demand |
| $BOD_5$ | 5-day biochemical oxygen demand |
| CASP | covered aerated static pile |
| CCL | Ceiling Concentration Limits |
| Cd | cadmium |
| CF | cubic feet |
| CFM | cubic feet per minute |
| CFR | Code of Federal Regulations |
| CIP | Capital Improvement Plan |
| CPLR | Cumulative Pollutant Loading Rate |
| Cu | copper |
| CY | cubic yard |
| d | day(s) |
| DEQ | (Oregon) Department of Environmental Quality |
| DO | dissolved oxygen |
| ea | each |
| EQ | Exceptional Quality |
| ERU | equivalent residential units |
| EPA | U.S. Environmental Protection Agency |
| ft | feet |
| FTE | full-time employee |
| FY | fiscal year |
| gal | gallon(s) |
| gpd | gallon(s) per day |
| $H_2S$ | hydrogen sulfide |
| Hg | mercury |
| HMSC | Hatfield Marine Science Center |
| hp | horsepower |
| IPS | influent pump station |
| kg | kilogram(s) |
| KJ | Kennedy Jenks |
| kW-hr | kilowatt hour |
| lb(s) | pound(s) |
| MCRT | mean cell residence time |
| MG | million gallons |
| mg/L | milligram(s) per liter |
| mgd | million gallon(s) per day |
| mL | milliliter(s) |
| mL/g | milliliter(s) per gram |
| MLSS | mixed liquor suspended solids |
| mm | millimeter(s) |
| MMBTU | million British Thermal Unit |
| Mo | molybdenum |
| MPN | Most Probable Number |
| NFPA | National Fire Protection Association |
| Ni | nickel |
| NMC | Newport Municipal Code |
| NOAA | National Oceanic and Atmospheric Administration |
| NPDES | National Pollutant Discharge Elimination System |
| NSPS | Northside Pump Station |
| OHA | Oregon Health Authority |
| O&M | operations and maintenance |
| OPCC | Opinion of Probable Construction Cost |
| Pb | lead |
| PCL | Pollutant Concentration Limits |
| PFAS | per- and polyfluoroalkyl substances |
| PFRP | Process Further Reduce Pathogens |
| ppm | parts per million |
| PS | pump station |
| PSRP | Process (to) Significantly Reduce Pathogens |
| PSU | Portland State University |
| RAS | return activated sludge |
| RDT | rotary drum thickener |
| SCADA | supervisory control and data acquisition |
| Se | selenium |
| SOUR | specific oxygen uptake rate |
| SRT | solids retention time |
| SVI | sludge volume index |
| TM | technical memorandum |
| TSS | total suspended solids |
| VAR | vector attraction reduction |
| VS | volatile solids |
| VSS | variable suspended solids |
| WAS | waste activated sludge |
| WWTMP | Wastewater Treatment Master Plan |
| WWTP | wastewater treatment plant |
| Zn | zinc |



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# Executive Summary

Brown and Caldwell (BC) and Kennedy Jenks (KJ) prepared this Wastewater Treatment Master Plan (WWTMP) for the City of Newport (City), focusing on near-term improvements at the Vance Avery Wastewater Treatment Plant (WWTP). This report represents Phase II–Alternative Development and Evaluation and includes updates to Phase I flow projections, capacity assessments, and criticality evaluations. Improvements for WWTP headworks, liquid stream processes, solids processes, and Northside Pump Station (NSPS) are recommended along with descriptions of key alternatives and capital improvement planning.

## Updates and Analyses

**Flow Projection Updates (Section 2)**: New population projections prepared by Portland State University suggest population growth will be much slower than was anticipated in the Phase I efforts; flow projections have been adjusted accordingly. Previous analyses suggest tourism is the main driver for flow variability; however, recent flow data revealed storm events show a higher degree of correlation than population spikes during holiday weekends. Loadings from Rogue Brewery (Rogue) have decreased by more than 50 percent following new pretreatment regulations.

**Capacity Assessment Updates (Section 3)**: Key processes continue to operate at higher than design capacity including:

- Influent screens: The influent screens continue to be a capacity limitation, with firm capacity already exceeded.
- Dewatering centrifuges: The dewatering centrifuges are operating with no redundancy, and capacity of the system is exceeded at average load conditions.
- Lime pasteurization: The lime pasteurization system continues to exceed its design throughput. While this does not affect the plant's capacity to process solids, it impairs reliability and increases risk of system failure, as the system has less downtime for maintenance and repairs. System failure would result in increased solids disposal costs, since landfill disposal or hauling to another system for treatment would be the only other options.
- Secondary treatment: The secondary treatment process consists of a single oxidation ditch and two secondary clarifiers, which provides no redundancy.
  - Due to capacity limitations, the oxidation ditch typically operates at maximum overflow levels, which is not ideal.
  - Mixed liquor suspended solids (MLSS) concentration in the oxidation ditch is maximized at 3,000 milligrams per Liter (mg/L). With current flows and loads and a solids retention time (SRT) of 8-10 days, the WWTP cannot operate at an MLSS concentration below 3,000 mg/L. Operating at a longer SRT, as is common practice with this type of ditch, would overload the secondary clarifiers.
  - Secondary clarifier capacity of the system is approximately 3.2 million gallons per day (mgd), at recommended operating conditions in the winter. The current maximum month flow is 3.3 mgd. By this measure, the plant is already operating at capacity.
  - The combination of limited capacity and inadequate redundancy will limit the future available timeframe between repairs, and increase operational risk.



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**Condition and Criticality Updates (Section 4)**: In 2021, Waterdude Solutions (Waterdude) prepared the "*Wastewater Treatment Facilities Condition Assessment Update*", which revealed further deterioration of process equipment since the "*Draft Wastewater Treatment Facilities Condition Assessment*" was prepared in 2018. Facilities most at-risk from deteriorating conditions are the NSPS, headworks, septage screening, and solids handling.

## Recommendations

Alternatives evaluations were conducted for improvements at the WWTP Headworks Facility, the liquids process, the solids process, and the Northside Pump Station (NSPS). The alternatives evaluations for the liquids process and solids process were considered together and included non-cost criteria due to their complexity and connectivity to each other. The alternatives for WWTP Headworks and NSPS were evaluated independently based on asset condition and capacity limitations. Recommendations for each process are summarized below.

**WWTP Headworks Recommendations (Section 5)**: Multi-rake bar screens are recommended to replace the two existing rotary screens, which are at the end of their design life. A third screen is recommended to be installed in one of the unoccupied screening channels to increase process capacity and redundancy. Hydrogen sulfide ($H_2S$) concentrations are also very high and pose a safety risk to personnel working in this facility. Accordingly, odor control and building ventilation upgrades are recommended.

**Liquids Process Recommendations (Section 6)**: A second oxidation ditch is recommended to provide additional capacity and redundancy for the existing, aging oxidation ditch. A third secondary clarifier will be sufficient to address downstream capacity issues. Disinfection storage tank and pump replacements are needed.

**Solids Process Recommendations (Section 7)**: Aerobic digestion should be incorporated to stabilize sludge prior to dewatering and disposal. Other recommended processes are a packaged hauled waste receiving station, continued use of waste activated sludge (WAS) storage tank, mechanical thickening, centrifuge dewatering, and a Class A compost facility.

Specific to the recommendation of a Class A compost facility, solids drying and solids composting were two alternatives compared during development of this WWTMP. The Class A compost facility is projected to have significantly lower capital and annual operation and maintenance (O&M) costs compared to the Class A dryer–more than $10 million lower in total net present worth. The differences in capital costs are largely due to the dryer equipment costs, costs for constructing the new dryer Building, and the need to install a new natural gas pipeline to the plant for firing the dryer furnace. The dryer also has higher annual O&M costs than composting, mainly due to the high energy use associated with drying biosolids. For these reasons, and because there is available land at the WWTP, the Class A compost facility is recommended.

**Northside Pump Station (NSPS) Recommendations (Section 8)**: Immediate improvements are required at the existing pump station located inside a geodesic dome structure due to health and safety concerns and aging equipment. When additional funding is secured, a new buildout facility is recommended, located adjacent to the existing facility.

**Capital Improvements Plan (Section 9)**: The recommended improvements summarized above were compiled into a capital improvements plan (CIP) for the wastewater treatment facilities. Table ES-1 and Figure ES-1 show the estimated total annual funding required for applicable projects occurring during each fiscal year. Estimated costs have been adjusted to 2025 costs using a 5.0 percent cost increase based on increases in the Consumer Price Index from 2023 to 2025. Projects are set to start in FY27 due to current funding limitations, with schedules driven by the associated capacity,



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condition assessments, and balanced funding demands within the 10-year implementation timeframe. The most at-risk facilities are slated for upgrades earlier in this timeframe. The City's WWTP operations staff will need to mitigate current risks and overcome capacity limitations in the meantime.

**Table ES-1. Capital Improvement Projects**

| Project | Estimated Cost | Schedule | Reference |
|---|---|---|---|
| NSPS Interim Improvements | $7,230,000 | 2027-2029 | Appendix H |
| NSPS Dechlorination | $3,930,000 | 2027-2029 | Appendix I |
| WWTP Centrifuge Upgrades | $5,880,000 | 2027-2029 | Appendix E |
| WWTP Disinfection Upgrades | $270,000 | 2027-2029 | Appendix L |
| IPS Pipe Replacement[a] | $370,000 | 2029 | See Note a. |
| WWTP Headworks Upgrades | $4,670,000 | 2029-2031 | Appendix B |
| WWTP 3rd Secondary Clarifier[c] | $21,640,000 | 2029-2032 | Appendix C |
| WWTP Solids Upgrades | $34,130,000 | 2032-2035 | Appendix D |
| IPS Upgrades | $1,050,000 | 2034 | See Note a. |
| WWTP 2nd Oxidation Ditch | $18,760,000 | 2035-2038 | Appendix C |
| NSPS Buildout Facility | $49,180,000 | 2039-2041 | Appendix H |

*a. Detailed cost estimates for the Influent Pump Station (IPS) have not yet been developed. Costs shown are for reference only and based on improvements described by the City.*

*b. Additional engineering and administrative costs have been applied to projects for which this was not applied during capital cost development.*

*c. The 3rd secondary clarifier project cost was estimated assuming incorporation of pump stations and flow distribution improvements to prepare for the future 2nd oxidation ditch.*

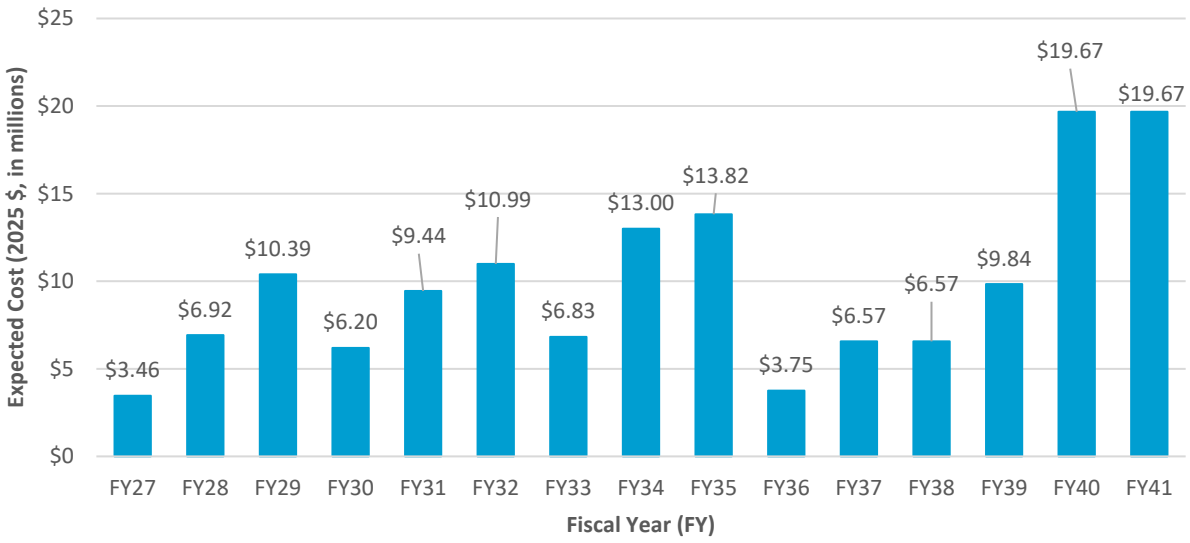


**Figure ES-1. Capital cost distribution by year**



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Section 1

# Introduction

The City of Newport (City) contracted with Brown and Caldwell (BC) to complete Phase II of their Wastewater Treatment Master Plan (WWTMP). The goal of the WWTMP is to evaluate existing infrastructure, operational procedures, equipment performance, projected population growth, future flows and loads, anticipated future regulations, and financial planning to develop a Capital Improvements Plan (CIP) to address both current needs and future needs for the next 20 years.

In 2018, Phase I of the WWTMP was completed, which included an assessment of existing operating conditions, an equipment condition assessment, flow and load forecasts, and a plant capacity assessment. A key finding of Phase I was that industrial users contribute a significant portion of headworks loads. Based in part on this finding, the City elected to pause Phase II of the WWTMP to voluntarily implement a pretreatment program. Once the program was established, Phase II of the WWTMP was initiated.

The focus of Phase II of the WWTMP is the Vance Avery Wastewater Treatment Plant (WWTP) but is informed by the previous planning conducted for the collection system. This WWTMP includes an alternatives evaluation for upgrades to the WWTP and presents a capital improvements plan (CIP) for the proposed improvements. The CIP will inform future efforts including a Facility Planning and Rate Structure analysis.

## 1.1 Background

Newport is in Lincoln County on the central Oregon coast about 55 miles west of Corvallis. The population of the city is just over 10,000 but can draw nearly 30,000 to 40,000 visitors during the tourist season. The City indicated a significant contribution of wastewater is attributable to residents from outside the city commuting into the city for work.

Newport is home to industries and businesses (e.g., breweries, fisheries, restaurants, and hotels, etc.) including the Oregon Brewing Company's Rogue Brewery. The National Oceanic and Atmospheric Administration (NOAA) bases four research vessels in Yaquina Bay and the Hatfield Marine Science Center (HMSC) is located on the south side of the bay.

Surface water is the city's primary water supply via the Big Creek Reservoirs but is supplemented in the summer with water pumped from the Siletz River. Drinking water is treated via membrane filtration at the 7 million gallons per day water treatment plant (WTP) located at the base of the lower dam. Residual waste produced by the WTP is discharged to the sewer system and eventually makes its way to the WWTP. The WTP generates an average of 5 million gallons of residual waste per month and pumps into the sewer system, when operating, at a rate of 600 gallons per minute.

Wastewater is conveyed to the Vance Avery WWTP for treatment before being discharged to the Pacific Ocean off Nye Beach. The City owns and operates the Vance Avery WWTP located on the south side of Yaquina Bay at 5525 SE 50th Place in Newport. The WWTP and influent pump station (IPS), commissioned in 2003, replaced the old WWTP located at the current NSPS at NW Nye Street and NW 3rd Street, approximately 3 miles north.



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## 1.2 Objectives

The objectives of this Phase II WWTMP include the following:

1. Update key findings from the Phase I WWTMP, including flow and load projections, capacity assessments, and criticality evaluations.
2. Develop improvement alternatives for each major facility at the WWTP and Northside Pump Station, and summarize prioritization criteria and scoring.
3. Estimate high-level costs for each alternative.
4. Present alternatives in the form of updated site layouts at the WWTP.
5. Recommend a single alternative for implementation at the WWTP, guided by discussions with the City.
6. Discuss alternative development for NSPS and recommend path forward.
7. Present a CIP for 20-year improvements.

## 1.3 Wastewater System Policies

This chapter presents policies and standards that guide the operation and development of the City's wastewater treatment system. The policies and standards are derived from the City's Comprehensive Plan, City resolutions, and Newport Municipal Code (NMC).

### 1.3.1 Comprehensive Plan

The City revised its Comprehensive Plan in 2023 and it can be accessed in its entirety through the City's website. Table 1-1 presents the Comprehensive Plan goals and policies related to the WWTP:

**Table 1-1. Comprehensive Plan Goals and Policies**

| Item | Policy, standard, or guideline statement |
|---|---|
| **General Goals and Policies** | |
| Goal | To assure adequate planning for public facilities to meet the changing needs of the City of Newport urbanizable area. |
| Policy 1 | The city shall develop and maintain public facilities master plans (by reference incorporated herein). These facility plans should include generalized descriptions of existing facilities operation and maintenance needs, future facilities needed to serve the urbanizable area, and rough estimates of projected costs, timing, and probable funding mechanisms. Public facilities should be designed and developed consistent with the various master plans. |
| Policy 2 | In order to assure the orderly and cost efficient extension of public facilities, the city shall use the public facilities master plans in the capital improvement planning. |
| Policy 3 | The city shall work with other providers of public facilities to facilitate coordinated development. |
| Policy 4 | Essential public services should be available to a site or can be provided to a site with sufficient capacity to serve the property before it can receive development approval from the city. For purposes of this policy, essential services shall mean water, sanitary sewer (i.e. wastewater), storm drainage and streets.<br>Development may be permitted for parcels without the essential services if:<br>a. The proposed development is consistent with the Comprehensive Plan; and<br>b. The property owner enters into an agreement, that runs with the land and is therefore binding upon future owners, that the property will connect to the essential service when it is reasonably available; and<br>c. The property owner signs an irrevocable consent to annex if outside the city limits and/or agrees to participate in a local improvement district for the essential service, except that annexation shall be required before property that is contiguous to the city limits can receive sanitary sewer service. |
| Policy 5 | Upon the annexation of territory to the City of Newport, the city will be the provider of water and sewer service except as specified to the contrary in an urban service agreement or other intergovernmental agreement. |



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**Table 1-1. Comprehensive Plan Goals and Policies**

| Item | Policy, standard, or guideline statement |
|---|---|
| Policy 6 | Local Improvement Districts (LIDs) should be evaluated as a means of funding public facilities where the construction of such facilities is expected to enhance the value of properties that are adjacent or proximate to the planned improvements.<br>For LIDs in developed residential areas, the aggregate assessment amount within a prospective LID should be no more than 10% of the assessed value of properties within the boundaries of the proposed district. The aggregate assessed value may be higher for other types of LIDs, such as developer initiated districts; however, in no case should it exceed 50% of the assessed value of the affected property.<br>When considering a new LID, the City should proceed with preparing an engineer's report that sets out the likely cost of constructing the improvement.<br>Consideration should be given to bundling LID projects with other capital projects that the City secures bond funds to construct. For an LID to proceed, it must have a reasonable chance of being self-financing, with adequate reserves to ensure that payments are made on bonds/loans regardless of the property-owners' repayment.<br>If an LID project is considered by the City Engineer to be a partial improvement (less than ultimate planned design), the City should require that interim improvements conform to current City standards in a manner which will allow for completion of the total facility at such time that resources are available.<br>New LIDs may be initiated by petition or resolution of the City Council.<br><u>Formation of an LID by Petition</u><br>The City Council shall evaluate new LIDs proposed by petition to determine if City resources should be expended to formulate an engineer's report. Only those projects with substantial public support should proceed. An LID petition that includes non-remonstrance agreements and/or petitions of support from property owners representing 75% of the benefited area shall be presumed to have substantial public support.<br>If an LID petition seeks to leverage other funding to achieve 100% of the project costs then the City Council should consider the likelihood of whether or not those funds will be available within the timeframe that they would need to be committed for construction.<br>When the City receives petitions for multiple LIDs, priority should be given to prospective LIDs with the highest level of documented support, as measured by recorded non-remonstrance agreements and/or petitions in the benefit area in question.<br>The cost of completing the engineer's report should be included in the total LID assessment. The City should update its fee schedule to include a nonrefundable LID Application Fee to be paid by LID petitioner(s) for petition-initiated LIDs.<br><u>City Council Initiated LIDs</u><br>The City Council on its own motion or upon recommendation by the City Manager may initiate an LID without a petition. In doing so the City Council shall consider the following factors:<br>• Project purpose and need, including whether or not the improvement addresses an immediate health and safety risk or if it has been identified as a priority improvement in an adopted public facility plan.<br>• Whether the improvement will address existing deficient infrastructure that is chronically failing.<br>• Capital cost of the improvement.<br>• Project cost contingencies and related construction risk factors, such as the need to acquire new public right-of-way, unique construction challenges, or environmental issues.<br>• Nature of the area benefited, including its existing condition.<br>• The amount of potential non-LID funding that is expected to be leveraged by the LID, if any. This may include, but is not limited to, federal or state grants, sewer or other types of service charges, urban renewal funds, revenue or general obligation bonds, and reimbursement districts.<br>• Percentage of properties within the benefit area that have prerecorded non-remonstrance agreements or have owners that favor formation of an LID.<br>When considering multiple City-initiated LIDs, priority should be given to the LID that addresses the greatest number of factors identified above. |
| Policy 7 | The City may use various means to finance, in whole or in part, improvements to public services in order to maintain public facility service levels and to carryout improvements identified in public facility plans, and adopted city goals and policies. This includes but is not limited to consideration of federal or state grants; water, sewer, storm drainage and other types of service charges; urban renewal funds, revenue or general obligation bonds, local improvement districts, and reimbursement districts. |



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| Table 1-1. Comprehensive Plan Goals and Policies | |
|---|---|
| **Item** | **Policy, standard, or guideline statement** |
| **Wastewater Goals and Policies** | |
| Goal | To provide a wastewater collection and treatment system with sufficient capacity to meet the present and future needs of the Newport urbanizable area in compliance with State and Federal regulations. |
| Policy 1 | Improve and maintain the wastewater collection system as identified in the 1990 Public Facilities Plan for the City of Newport, by CH2MHILL, as amended by the following updates:<br>• Wastewater Facilities Plan, by Fuller & Morris Engineering & CH2MHILL, dated May 1996<br>• 2006 South Beach Neighborhood Plan (Ord. No. 1899)<br>• Sanitary Sewer Master Plan, by Brown and Caldwell, dated February 9, 2018 |
| Policy 2 | On-site sewer systems or holding tanks shall not be allowed unless the city's sanitary sewer system is greater than 250 feet away. In any case, a subsurface permit from the Lincoln County Sanitarian must be obtained prior to any development that will rely on an on-site sewer system or holding tank. |
| Policy 3 | Existing structures within the city limits that contain sanitary facilities shall connect to the city's sanitary sewer system at such time as a gravity main or equivalent wastewater collection system is extended to within 250 feet of the property. |
| Policy 4 | City wastewater services may be extended to any property within the urban growth boundary. Except for the very limited circumstances allowed by state law and regulations, the city will not generally provide wastewater services outside the urban growth boundary. The city may require a consent to annexation as a condition of providing wastewater service outside the city limits and shall require a property to annex before providing wastewater service if it is contiguous to the city limits. Nothing in this policy obligates the City to provide wastewater services outside of the city limits. For property outside the city limits but within the urban growth boundary, wastewater services may be provided at the City's discretion only for:<br>• Residentially zoned lands as allowed by county zoning without urban services, and<br>• Commercial and industrial zoned lands as allowed by county zoning at the scale of development in existence on September 4, 2007. |
| Policy 5 | When designing the wastewater collection and treatment system to ensure there is sufficient capacity to meet current and future needs of the community, the City shall consider the demands of various users under normal and predictable daily and seasonal patterns of use. |
| Policy 6 | When undertaking capital improvement planning, priority shall be given to projects that will repair, replace or upsize wastewater infrastructure with known condition or capacity limitations in order to minimize discharges that could compromise public health and safety, damage real property, or harm the environment. |

### 1.3.2 City Resolutions

A resolution is a policy that has been adopted by the City Council. The following sections summarize resolutions that address wastewater policies. The entirety of the resolutions below can be accessed through the City's website.

#### 1.3.2.1 Amending the List of Capital Improvement Projects Eligible to be Funded with System Development Charge Revenues: Resolution No. 3886

The City's *Resolution No. 3886* was adopted on May 18, 2020. This resolution amends the list of capital improvement projects eligible for funding with System Development Charge (SDC) revenues. The resolution lists various eligible projects across water, wastewater, storm drainage, transportation, and parks categories. Some of the key wastewater projects include upsizing the gravity sewer from the Bayfront force main to the Northside pump station, upgrading the capacity of the Northside pump station to 9.2 mgd, and upgrading the Nye Beach pump station to 2.74 mgd. These projects aim to enhance the city's wastewater infrastructure to meet future demands. Proposed upgrades to the Northside Pump Station are discussed later in this report.



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#### 1.3.2.2 Low-Income Utility Assistance Program and Funding: Resolution No. 3847

The City's *Resolution No. 3847* was adopted retroactively to February 1, 2019. This resolution establishes a Low-Income Utility Assistance Program funded by a one percent payment from the Water and Sewer Funds to the General Fund. The program aims to help low-income residents with utility payments and requires applicants to meet specific eligibility criteria, including having an income at or below 60 percent of the 2018 Lincoln County median income. Applications are processed through the Community Services Consortium (CSC) and must be completed annually.

#### 1.3.2.3 Water, Wastewater and Stormwater Utility Rates: Resolution No. 3803

The City's *Resolution No. 3803: Setting Water, Wastewater and Stormwater Utility Rates* was adopted on October 15, 2018. The resolution went into effect December 1, 2018. This resolution sets charges, fees, deposits, and penalties for water, wastewater, and stormwater services within the city and its urban growth area. The wastewater related fees are broken down into the following categories:

- Metered rates: Defines established wastewater charges based on meter size and property type, within and outside of the city limits, and sets a rate for low income qualified residences within city limits. This resolution also includes an "extra strength charge" based on biochemical oxygen demand (BOD) for commercial properties, a monitoring sewage discharge rate, and a charge for fish plants
- Individually determined rate: Commercial customers shall have a sewer use charge established based on the impact of the property on the sewer system, as determined by the City Manager
- Septage: Defines a disposal rate for septage at the City's WWTP
- Class A sludge sales: Establishes the price per cubic yard of Class A sludge
- Utility Infrastructure Fee: Establishes a monthly charge imposed on properties with metered city water service to support utility infrastructure maintenance and improvements. This fee will be phased out over a three-year period.

Like wastewater, the utility rates for water services are based on the size of the water meter and the type of property, including single-family residences, multi-family residential buildings, and commercial properties. Water services also consider temporary service through a fire hydrant and water purchased and privately transported.

This resolution establishes rates for stormwater services to cover the costs of managing and treating stormwater runoff, including infrastructure maintenance and regulatory compliance. These rates are categorized by property types, with specific rates based on the size and impact of each property on the stormwater system.

The City's wastewater rates should be evaluated according to the financial obligation required to complete the projects established in this WWTMP.

#### 1.3.2.4 System Development Charge Methodology: Resolution No. 3786

The City's *Resolution No. 3786* is an update to the 2007 System Development Charge (SDC) methodology and was adopted on August 7, 2017, effective September 6, 2017. This resolution outlines a comprehensive approach to updating and managing the SDCs in Newport, ensuring that the fees collected are fair, proportional, and aligned with the city's growth and development needs for growth-related projects likely needed within the next 20 years. This methodology includes a capital improvement plan, growth projections, evidence of system capacity needs, projected costs of improvements, and the portion of those costs attributed to future demand. SDCs are calculated by combining a reimbursement fee, which is based on the cost of available capacity per unit of growth,



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and an improvement fee, which is based on the cost of planned capacity-increasing capital projects. SDC rates are adjusted annually based on the Construction Cost Index.

This resolution includes a wastewater SDCs section which outlines the methodology for calculating SDCs for wastewater services in Newport. Growth is measured in Equivalent Dwelling Units (EDUs), with current customers, at the time of adoption, equating to 14,131 EDUs and projected to increase to 17,322 by 2037. The improvement fee cost basis is $12,064,320, adjusted to $11,750,461 after deducting the existing SDC fund balance, resulting in an SDC of $3,843 per EDU.

The City's list of eligible wastewater projects should be evaluated according to the financial obligation required to complete the projects established in this WWTMP eligible for SDC funding.

### 1.3.3 Newport Municipal Code

The NMC is a collection of the regulatory and penal ordinances and certain administrative ordinances of the City with the latest version having been codified in 2024. Chapter 5.15 of the NMC, "Sewer System and Charges," contains the ordinances most relevant to how the utility operates but several other sections contain pertinent wastewater related ordinances. The NMC in its entirety can be accessed on the City's website.

#### 1.3.3.1 Existing Municipal Code

Table 1-2 below summarizes the information pertaining to the wastewater system in the NMC. The information is organized by the following categories:

- Service area
- Planning considerations
- Design standards
- Protection and improvement of the environment and public health
- Utility financing
- Wastewater quality
- Pretreatment
- Operations and maintenance



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**Table 1-2. Municipal Code Policies**

| NMC | Policy, standard, or guideline statement |
|---|---|
| **Service Area** | |
| 5.15.020 | Connection Required<br>A. All structures containing sanitary facilities that are located within 250 feet of a collection sewer or intercepting sewer other than a force main must be connected to the sewer system. Connection to the public sewer system for new buildings or structures is required prior to the issuance of a certificate of occupancy. Any building served by a private sewage disposal system shall be connected to the city sewer system within 60 days of the date that a city sewer line is extended to within 250 feet of the property and is available for connection. At the request of the property owner of an existing structure, the City Council may allow deferral of the connection if connection would impose an undue hardship on the property owner. In determining what constitutes an undue hardship, the Council may consider the following factors:<br>1. Whether the property owner is contributing to the cost of extending the main.<br>2. The cost of connection.<br>3. The condition and capacity of the private sewage disposal system.<br>Deferral shall be allowed only if the existing structure is served by a private sewage disposal system in good condition and adequate to serve the sanitary facilities on the property. Council may require proof that the disposal system is properly and regularly maintained and pumped, and routinely inspected by the county. The Council's decision shall be by written order with findings. Any deferral allowed by the Council may be revoked by the Council at any time.<br>If sewer connection is deferred, the deferral is automatically revoked and sewer connection must occur within 30 days of:<br>1. Failure of the private sewage disposal system;<br>2. Failure of the private sewage disposal system to comply with all applicable state and county standards and requirements;<br>3. Sale of the property; or<br>4. Any determination by the state or county that the private sewage disposal system presents a health or environmental risk.<br>B. All private sewage disposal systems allowed by subsection A shall comply with all applicable state and county standards and requirements.<br>C. No person shall discharge any sewage into any storm drain or natural drainage outlet. |
| 14.06.050 | Recreational Vehicles: General Provisions<br>D. It shall be unlawful for any person occupying or using any recreational vehicle within the City of Newport to discharge wastewater unless connected to a public sewer or an approved septic tank in accordance with the ordinances of the City of Newport relating thereof. All recreational vehicle parks within the City of Newport shall comply with the sanitary requirements of the City of Newport and the State of Oregon. |
| 14.09.030 | Temporary Living Quarters.<br>A. Notwithstanding any other restrictions and prohibitions in this code, a recreational vehicle may be used as a temporary living quarters subject to the following conditions:<br>4. The recreational vehicle used as the temporary living quarters is self-contained for sanitary sewer; |
| **Planning Considerations** | |
| 5.15.030 | Permit and Construction Requirements<br>A. No person, firm, or corporation shall construct or reconstruct any sanitary or storm drains within the city on private property or in public ways without a city permit.<br>B. Applications for permits to construct or reconstruct sanitary sewers or storm drains shall be made in writing on a city form and include the location of the property, the name of the owner, the name of the person or firm engaged to construct or reconstruct the proposed sanitary sewer or storm drain and such other information and plans as may be required by the city.<br>C. The applicant upon approval of permit shall pay all applicable fees established by Council resolution. If excavation work in the public right-of-way is required, the applicant shall deposit a cash bond in the amount determined by the city.<br>D. All costs and expenses incidental to the installation of the building sewer connection shall be borne by the applicant.<br>E. A separate building sewer connection shall be provided for every building, unless otherwise authorized in writing by the city.<br>F. Existing building sewers may be used in connection with new buildings only when they are found, on examination and tests, to meet all requirements.<br>G. All design, construction and materials and repairs shall conform to the city's design and construction standards.<br>H. Emergency repairs may be made without first obtaining a permit providing that the owner or his representative shall obtain a permit at the earliest possible time, by the end of the next normal business day.<br>I. Sewer system users are responsible for all costs of service laterals and building sewers. |
| 12.15.090 | Prohibited Connection<br>No person may connect to the water or sewer system of the city or obtain a building permit unless the appropriate SDCs have been paid, or the installment payment method has been applied for and approved. |



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| Table 1-2. Municipal Code Policies | |
|---|---|
| **NMC** | **Policy, standard, or guideline statement** |
| 14.33.050 | Criteria for Approval of an Adjustment<br>The approval authority may grant an Adjustment using a Type I or Type III decision-making process when it finds that the application complies with the following criteria:<br>C. The Adjustment will not interfere with the provision of or access to appropriate utilities, including sewer, water, storm drainage, streets, electricity, natural gas, telephone, or cable services, nor will it hinder fire access; |
| 14.33.060 | Criteria for Approval of a Variance<br>The approval authority may grant a Variance using a Type III decision-making process when it finds that the application complies with the following criteria:<br>E. The Variance will not interfere with the provision of or access to appropriate utilities, including sewer, water, storm drainage, streets, electricity, natural gas, telephone, or cable services, nor will it hinder fire access. |
| 14.40.100 | Procedure for Preliminary Development Plan (PDP) Application<br>A PDP shall be provided for each development phase of the destination resort. Completion of construction of a phase shall not be a prerequisite to approval of subsequent PDP's.<br>A. The PDP application shall include:<br>2. Text or graphics explaining and illustrating:<br>d. Preliminary location of all sewer, water, storm drainage, and other utility facilities, and the materials, specifications and construction methods for the water and waste water systems |
| **Design Standards** | |
| 11.05.130 | Demolition<br>A. The demolition of any building that contains asbestos or other hazardous materials shall be conducted in accordance with all applicable state laws and regulations, including regulations relating to removal, transportation and disposal of asbestos or other hazardous materials.<br>B. The Building Official may require any or all of the following as conditions of issuing demolition permits:<br>4. Compliance with all applicable local, state and federal laws and regulations, including regulations relating to asbestos and hazardous materials and regulations relating to the protection of water and sewer systems. |
| 14.04.180 | Outfalls.<br>By definition, an "outfall" is an outlet through which materials are discharged into the estuary. Outfalls include sanitary (sewer) discharges, storm drainage facilities, waste seawater discharges, and industrial waste discharges.<br>A. As applicable, the standards for dredging, shoreline stabilization, and placement of structures as set forth in this ordinance must be complied within the installation of outfalls.<br>B. Sanitary outfalls shall not be allowed in poorly flushed areas of the estuary. |
| 14.04.190 | Submerged Crossings.<br>By definition, "submerged crossings" are power, telephone, water, sewer, gas, or other transmission lines that are constructed across the estuary, usually by embedding into the bottom of the estuary.<br>A. Trenching or other bottom disturbance undertaken in conjunction with installation of a submerged crossing shall conform to the standards for dredging as set forth in this ordinance.<br>B. Submerged crossings shall be designed and located so as to eliminate interference with present or future navigational activities.<br>C. Submerged crossings shall be designed and located so as to ensure sufficient burial or water depth to avoid damage to the crossing. |
| 14.32.070 | Alteration, Expansion, or Replacement of Nonconforming Uses or Structures<br>A. After verification of the status of a nonconforming use pursuant to Section 14.32.060, the approval authority may authorize alteration, expansion, or replacement of any nonconforming use or structure when it is found that such alteration, expansion, or replacement will not result in a greater adverse impact on the neighborhood. In making this finding, the approval authority shall consider the factors listed below. Adverse impacts to one of the factors may, but shall not automatically, constitute greater adverse impact on the neighborhood.<br>3. Adequacy of infrastructure to accommodate the use. For the purpose of this subsection, infrastructure includes sewer, water, and streets; |


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| Table 1-2. Municipal Code Policies | |
|---|---|
| **NMC** | **Policy, standard, or guideline statement** |
| **Protection and Improvement of the Environment and Public Health** | |
| 5.15.020 | Connection Required<br>C. No person shall discharge any sewage into any storm drain or natural drainage outlet. |
| 5.15.060 | Discharge Regulations<br>F. No unauthorized person shall maliciously, willfully or negligently break, damage, destroy, uncover, deface or tamper with any part of the sewer system.<br>G. The public works director may adopt specifications and additional regulations consistent with city ordinances to carry out the purpose of this chapter. A copy of such additional material shall be maintained in the public works department. |
| 5.15.080 | Violation – Penalty<br>A. A violation of any provision of this chapter is a civil infraction subject to a civil penalty not to exceed $500.00. Each day on which a violation occurs or continues is a separate violation.<br>B. Violations that constitute a health hazard are nuisances and may be abated as nuisance or by any other legal means of eliminating the hazard. |
| 14.21.090 | Erosion Control Measures<br>A certified engineering geologist, geotechnical engineer, or qualified civil engineer shall address the following standards.<br>K. Such non-erosion pollution associated with construction such as pesticides, fertilizers, petrochemicals, solid wastes, construction chemicals, or wastewaters shall be prevented from leaving the construction site through proper handling, disposal, site monitoring and clean-up activities. |
| **Utility Financing** | |
| 5.15.070 | Sewer Service Charges<br>A. Users of sanitary sewer service shall be charged fees established by resolution of the City Council. The amounts may be based in whole or in part on the amount of water consumed at the property. The Council may establish fees for any service or impact on the system, including, but not limited to:<br>1. Application fees.<br>2. Connection fees.<br>3. Usage fees.<br>4. Inspection fees.<br>5. Fees for improper connection.<br>6. Fees for misuse of the system.<br>7. Disconnection fees.<br>C. Sewer users are responsible for payment for sewer services as follows:<br>1. The city shall prepare and mail billings for sanitary sewer services monthly. Billing shall be in the same manner as billings for water services, and shall be combined with the water and stormwater bill, if applicable. Deadlines for payment shall be the same as for water bills. |
| 12.05.005 | Initiation of Local Improvement Districts<br>A. The council by motion or on petition of the owners of 75 percent of the property benefited by the proposed public improvement may direct that a preliminary engineering report be prepared to assist the council in determining whether a local improvement district should be formed to pay all or part of proposed street, sewer, sidewalk, drainage and/or other public improvements. |
| 12.10.020 | Application for a Reimbursement District<br>A. Any person who is required to or chooses to pay for some or all of the cost of a street, water, sewer or other improvement in excess of what is needed to provide services to the person's property may, by written application filed with the city engineer, request that the city establish a reimbursement district. The street, water and sewer improvements must include improvements in addition to those that are required in connection with an application for permit approval and must be available to provide service to property other than property owned by the applicant. Examples include but are not limited to full street improvements instead of half street improvements, off-site sidewalks, connection of street sections for continuity, and extension or over-sizing of water or sewer lines. The city may be an applicant. The application shall be accompanied by a fee or deposit in an amount set by Council resolution sufficient to cover the city's administrative costs. If the Council establishes a deposit system, the applicant shall be responsible for supplementing the deposit on demand by the city in an amount sufficient to cover all anticipated costs by the city, including the costs of engineer's reports. |


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**Table 1-2. Municipal Code Policies**

| NMC | Policy, standard, or guideline statement |
|---|---|
| 12.10.070 | City Council Action<br>D. The City Council resolution and reimbursement agreement shall determine the boundaries of the reimbursement district and shall determine the methodology for imposing a fee which considers the cost of reimbursing the applicant for financing the construction of a street, water or sewer improvement within the reimbursement district. |
| 12.10.110 | Obligation to Pay Reimbursement Fee<br>A. The applicant for a permit related to property within any reimbursement district shall pay the, in addition to any other applicable fees and charges, the reimbursement fee established by the Council, if within the time specified in the resolution establishing the district, the person applies for and receives approval from the city for any of the following activities:<br>5. Connection to or new use of a sewer improvement, if the reimbursement district is based on the sewer improvement; |
| 12.15.020 | System Development Charged Imposed; Method for Establishment<br>B. Unless otherwise exempted, SDCs for water, wastewater, storm water, transportation and parks are imposed on all development within the city, on all development outside the city that connects to the water and/or sewer facilities of the city, and on all other development which increases the usage of the water and/or sewer system or that contributes to the need for additional or enlarged capital improvements. This shall include new construction and the alteration, expansion or replacement of a building or development if such alteration, expansion or replacement results in a change in any of the components of the formula for determining the amount of SDCs to be paid. For redevelopment, the amount of the SDC to be paid shall be the difference between the rate for the proposed redevelopment and the rate that would be applicable to the existing development. |
| 12.15.050 | Collection of Charge<br>A. The SDC is payable on:<br>2. Issuance of a development permit or approval for development not requiring the issuance of a building permit. A permit or approval to connect to the water and/or sewer system;<br>4. Issuance of a permit to connect to the sewer system or actual connection to the sewer system if a permit is not obtained.<br>B. SDCs are payable only for those types of improvements affected by the development, permit or connection. For example, a permit to connect an existing structure to the sewer system does not necessarily trigger an obligation to pay Parks, Transportation, Water or Stormwater SDCs.<br>C. The amount of SDC payable shall be established by resolution relying on an approved methodology and SDC project plan. The SDC project plan, methodology and amount of charge may be adopted in a single resolution, and more than one type of SDC (water, sewer, storm, transportation and park) can be included in a single resolution. |
| 12.15.065 | Credits<br>B. A credit of the improvement fee portion of the SDC only shall be given to the permittee against the cost of the SDC charged, for the cost of a qualified public improvement incurred by the permittee, upon acceptance by the city of the public improvement. The credit shall not exceed the amount of the improvement fee even if the cost of the capital improvement exceeds the improvement fee.<br>1. If a qualified public improvement is located in whole or in part on or contiguous to the property that is the subject of the development approval and is required to be built larger or with greater capacity than is necessary for the particular development project, a credit shall be given for the cost of the portion of the improvement that exceeds the city's minimum standard facility size or capacity needed to serve the particular development project or property. The applicant shall have the burden of demonstrating that a particular improvement qualifies for credit under this subsection. The request shall be filed in writing no later than 60 days after acceptance of the improvement by the city. The city may deny the credit provided for in this section if the city demonstrates that the application does not meet the requirements of this section or if the improvement for which credit is sought is not included in the SDC Project List.<br>2. When construction of a qualified public improvement located in whole or in part or contiguous to the property that is the subject of development approval gives rise to a credit amount greater than the improvement fee that would otherwise be levied against the project, the credit in excess of the improvement fee for the original development project may be applied against improvement fees that accrue in subsequent phases of the original development project or otherwise imposed on the same property.<br>2. Credits for qualified public improvements may be used for future phases of development, redevelopment, a change in use of the property, or transferred to another property as provided in NMC 12.15.065(D)(6).*<br>3. Credit for qualified public improvements shall not be transferable from one type of capital improvement to another.<br>4. Credits for qualified public improvements shall be used within 10 years from the date the credit was given.<br>5. Credits for qualified public improvements may be transferred from one property to another within the 10-year period the credits are valid if (a) the receiving property is being developed with a residential use and (b) the amount of credit transferred is less than or equal to 50% of the total SDC assessment that would otherwise be payable.* |



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**Table 1-2. Municipal Code Policies**

| NMC | Policy, standard, or guideline statement |
|---|---|
| | 6. If the public improvement for which a credit is sought is not on the SDC Project List, the applicant may submit an application for both the credit and for the placement of the improvement on the SDC project list. If the city manager determines that the project is of a type and location that is appropriate for inclusion, the project shall be added to the SDC Project List and a credit may be given, but the additional of the project shall not change the SDC amount payable by others.<br>7. The City Council shall conduct a public hearing no later than August 21, 2023, to evaluate the impact of transferred SDC credits on the City's ability to fund qualified public improvements and determine if changes should be made to provisions of this section related to the transfer of SDC credits.* |
| 12.15.020 | Method of Assessment<br>C. In establishing a fair and reasonable method for apportioning actual or estimated costs of local improvements among benefited properties, the Council may, but in no way is required to, rely upon the following guidelines (as summarized in Exhibit 12.05.050-1) and described below:<br>4. Improvement Costs of Water and Sewer Lines.<br>a. The properties specially benefited by a sewer main or water pipe shall bear the cost of the system up to and including 8 inch-diameter pipes. These costs shall be apportioned to each parcel on the basis of a cost per square foot of service area, determined by dividing the total system cost by the total service area.<br>b. In addition to main or pipe costs, each property benefited by a sewer main or water pipe shall be considered to have at least one service line connection point. If more than one service line connection point is provided for a benefited parcel, it shall be assessed for the actual number of service line connection points. All costs related to the service lines, including overhead costs, shall be divided by the total number of service line connection points, to determine the cost per service line connection point. |
| 12.05.055 | Alternative Methods of Financing<br>B. The council may use other means to finance, in whole or in part, the improvements, including but not limited to: federal or state grants-in-aid, sewer or other types of utility charges, urban renewal funds, revenue or general obligation bonds. |
| **Wastewater Quality** | |
| 5.15.060 | Discharge Regulations<br>A. No person shall discharge or cause to be discharged any stormwater, surface water, groundwater, roof runoff, cooling water or unpolluted industrial process waters to any sanitary sewer. In the event the sewer system user fails to comply with any order requiring disconnection or it is impractical to require the disconnection of any storm drain from the sewer system, the sewer system user shall be required to pay a surcharge for the use of the system as established by Council resolution.<br>B. Storm water and all other unpolluted drainage shall be discharged to storm drains, ditches, or natural storm drainage facilities or into drywells as approved by the city.<br>C. Except as provided in this section, no person shall discharge or cause to be discharged any of the following waters or wastes to any public sewer:<br>1. Any liquid or vapor having a temperature higher than 150° Fahrenheit;<br>2. Any water or waste which may contain more than one hundred parts per million, by weight, of fat, oil, or grease;<br>3. Any gasoline, benzene, naphtha, fuel oil, or other flammable or explosive liquid, solid or gas;<br>4. Any garbage except organic wastes from a commercial source that have been shredded by a disposal system with a maximum 1.5 horsepower;<br>5. Any ashes, cinders, sand, mud, straw, shavings, metal, glass, rags, feathers, tar, plastics, wood, paunch manure, or any other solid or viscous substance capable of causing obstruction to the flow in sewers or other interference with the proper operation of the sewer system;<br>6. Any waters or wastes having pH lower than 5.5 or higher than 9.0 or having any other corrosive property capable of causing damage or hazard to structures, equipment and personnel of the sewage works;<br>7. Any waters or wastes containing a toxic or poisonous substance in sufficient quantity to injure or interfere with any sewage treatment process or constitute a hazard in the receiving waters of the sewage treatment plant;<br>8. Any waters or wastes containing suspended solids of such character and quantity that unusual attention or expense is required to handle such materials at the sewage treatment plant;<br>9. Any noxious or malodorous gas or substance capable of creating a public nuisance;<br>10. Any material from septic tanks or recreational vehicle holding tanks except at dump stations for that purpose operated or authorized by the city.<br>D. Grease, oil, and sand interceptors shall be provided when necessary for the handling of those wastes; except that interceptors shall not be required for private living quarters. All interceptors shall be of a type and capacity approved by the city and shall be located so as to be easily cleaned and inspected. Where installed, all grease, oil and sand interceptors shall be maintained by the sewer system users, at their expense, in continuously efficient operation. The city may inspect facilities at any time for proper operation and maintenance. |



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| Table 1-2. Municipal Code Policies | |
|---|---|
| **NMC** | **Policy, standard, or guideline statement** |
| **Pretreatment** | |
| 5.15.070 | Sewer Service Charges<br>B. When an industrial or commercial sewer system user will discharge sewage of unusual strength or character, the city reserves the right to reject the application for service, to require pretreatment of such waste, and/or require the sewer system user to pay additional charges as provided in this chapter. |
| 5.15.060 | Discharge Regulations<br>E. The admission into the sewer system of waters or wastes having:<br>1. A 5-day Biochemical Oxygen Demand greater than 300 parts per million by weight, or<br>2. Containing more than 350 parts per million by weight of suspended solids, or<br>3. Containing any quantity of the substances described in Subsection C., or<br>4. Having an average daily flow greater than two percent of the average daily sewer flow of the city shall be subject to the review and approval of the city manager. The city may require pretreatment at the owner's expense and may establish a fee for acceptance of the wastes |
| 5.15.065 | Industrial Pretreatment<br>All non-domestic users of the city sewer system shall comply with industrial pretreatment standards of 40 CFR Chapter 1 Part 403. |
| **Operations and Maintenance** | |
| 5.15.040 | Power and Authority of Inspectors<br>A. Duly authorized city employees shall be permitted to enter upon all properties for the purposes of inspection, observation, measurement, samplings and testing.<br>B. It shall be the permittee or permittee's representative responsibility to request inspection of the work and to allow reasonable time for the city to schedule the inspection. Inspections shall be requested for and made during the normal business hours of the city. Should inspections be required during non-business hours, the permittee shall reimburse the city for all overtime costs incurred. |



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Section 2

# Flow Projection Updates

For the 2018 Phase I WWTMP, a capacity study provided a set of flow and load projections that were derived from a combination of Portland State University (PSU) population forecasts and water use data from 2004 through 2017. The evaluation presented in this section provides an update to those projections with more recent data. The updated flow and load projections were used to evaluate the capacity of the existing WWTP processes.

## 2.1 Population Projection Updates

Population projections for Newport and Lincoln County are periodically developed by PSU. PSU's 2017 projection estimated a 0.91 percent annual growth rate for the city between 2017 and 2067. From 2004 to 2017, water use within the city increased at an annual rate of approximately 0.1 percent. While some of this reflects water conservation, the water-use data suggested that PSU projections could overestimate development. As a compromise, the 2017 capacity study used a set of projections with a 0.45 percent annual growth rate.

PSU updated its population forecasts in 2021, and the new forecasts were much lower than those developed in 2017. The 2021 PSU projections forecast an overall reduction in population within the city from 2020 to 2070, and only a small incremental increase (0.2 percent annual growth) in Lincoln County as a whole. Actual population growth within the city averaged 0.96 percent between 2000 and 2020, with a 1.39 percent annual growth rate from 2010 to 2020.

A new set of population projections were developed for this study to rationalize the available data. The new projections start with the 2000-2020 annual growth rate of 0.96 percent and gradually reduce to 0.03 percent, which is the annual growth rate projected for Lincoln County after 2040 in the PSU 2021 forecast. Figure 2-1 presents the new projections alongside those from the 2017 capacity report, the two PSU projections, and the historical population for Newport.

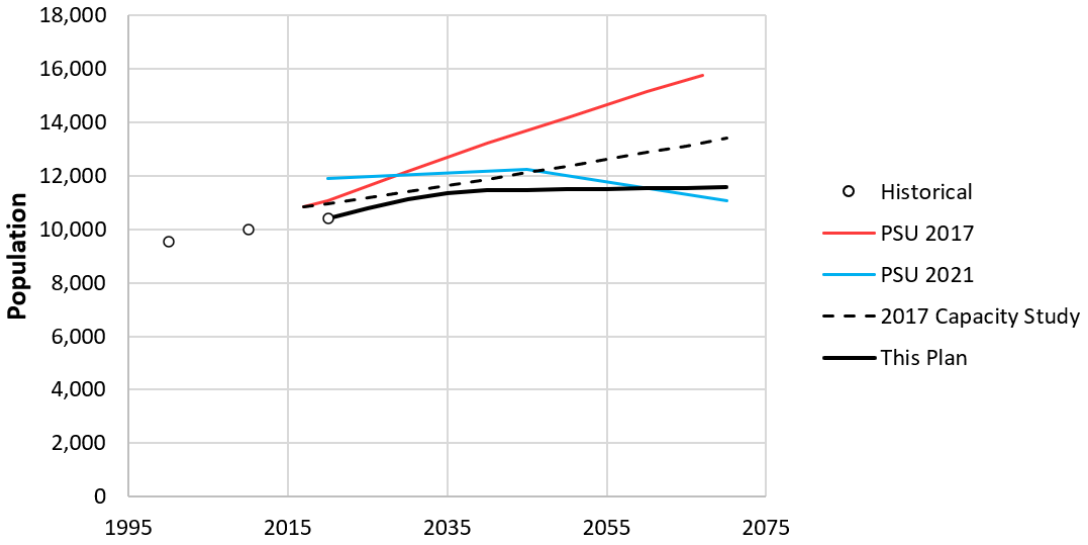


**Figure 2-1. Population projections for Newport**




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The new projections are somewhat lower than those used in the 2017 capacity report. In total, the city population is projected to increase by 1,168 (11 percent) between 2020 and 2070.

## 2.2 Current Flows

Wastewater flow at the City's WWTP follows a seasonal trend due to wet weather impacts, with high flows in the rainy winter months and low flows during the summer. Figure 2-2 presents the daily flow record for the past 15 years.

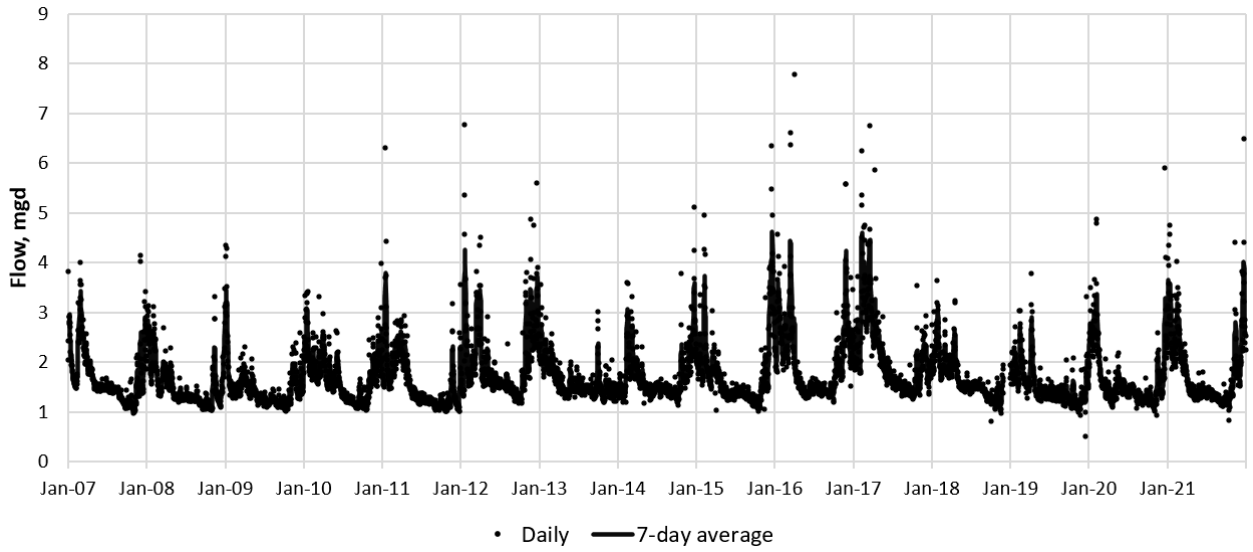


**Figure 2-2. Daily flow at the Vance Avery WWTP**

The base sanitary flow is defined as the 7-day minimum flow recorded each year, which approximates sanitary flow without impacts from inflow and infiltration. The base sanitary flow typically occurs near the end of the summer. Figure 2-3 presents the annual base sanitary flow from 2007-2021.

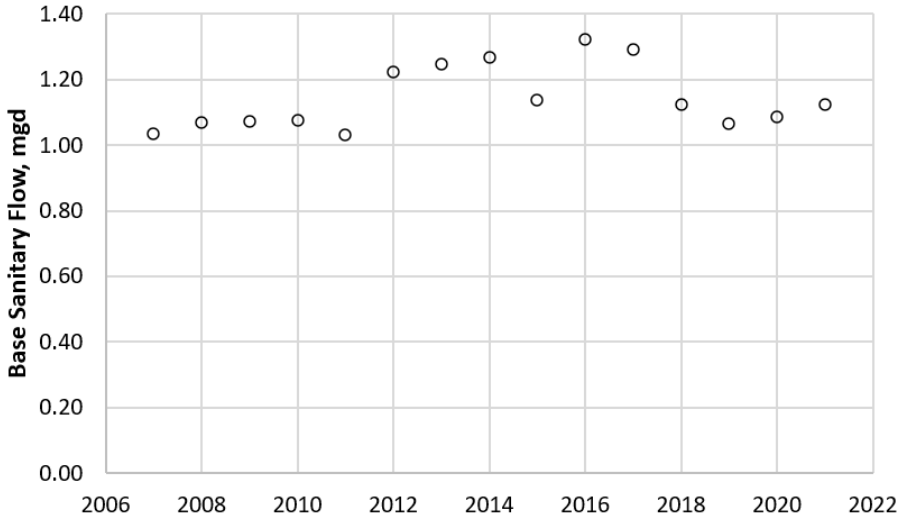


**Figure 2-3. Annual base sanitary flow at the Vance Avery WWTP**


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Although some annual variation exists, the base flow has increased steadily between 2006 to 2021, and currently averages approximately 1.1 million gallons per day (mgd). Figure 2-4 presents average flows by the day of the year, from 2017 to 2021.

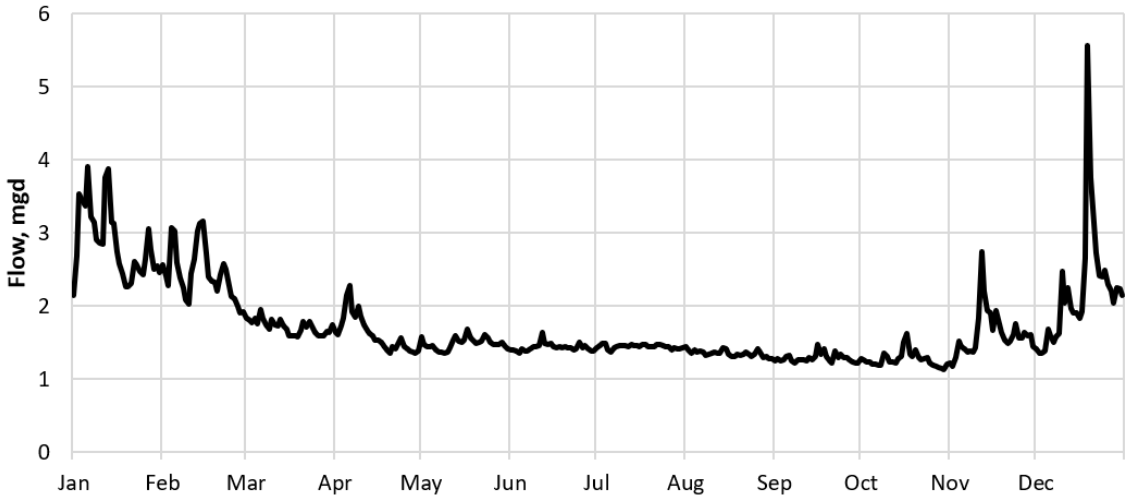


**Figure 2-4. Average flow by day of the year, 2017-2021**

The City is a tourist destination, particularly during the summer. However, the wastewater flow record exhibits only a marginal tourism component. Flow impacts during the summer months and from major holidays such as Independence Day, Labor Day, and Memorial Day are negligible according to the data. Instead, seasonal inflow and infiltration result in winter flows averaging 1 to 2 mgd higher than summer flows. The spikes on Figure 2-4 represent days on which major storm events occurred. The very large spike on December 20 reflects the coincidental arrival of major rainstorms on the same day in both 2020 and 2021.

A statistical analysis of the flow data from 2017 to 2021 is summarized in Table 2-1. The table presents current flows and peaking factors, which will be used as the basis for flow projections.

**Table 2-1. Current Flows and Peaking Factors**

| Parameter | Flow (mgd) | Peaking (flow/base sanitary) |
|---|---|---|
| Base sanitary | 1.10 | 1.00 |
| Minimum month | 1.15 | 1.05 |
| Average | 1.75 | 1.59 |
| Maximum month | 3.30 | 3.00 |
| Maximum 14-days | 3.75 | 3.41 |
| Maximum day | 6.50 | 5.91 |
| Peak hour[a] | 13.9 | 12.68 |
| Summer average | 1.40 | 1.27 |
| Winter average | 2.10 | 1.91 |

*a. Peak hour flows are not tracked. The data in Table 2-1 were applied to the Oregon Department of Environmental Quality (DEQ) method of determining wet weather and peak flow projections to estimate an average peak hourly flow. Plant operators have reported that flows up to 15 mgd have been observed, although such flows are infrequent.*



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## 2.3 Current Loading and Industrial Contributions

Influent loadings are presented on Figure 2-5. The figure shows the daily and 30-day average loadings for biological oxygen demand (BOD) and total suspended solids (TSS).

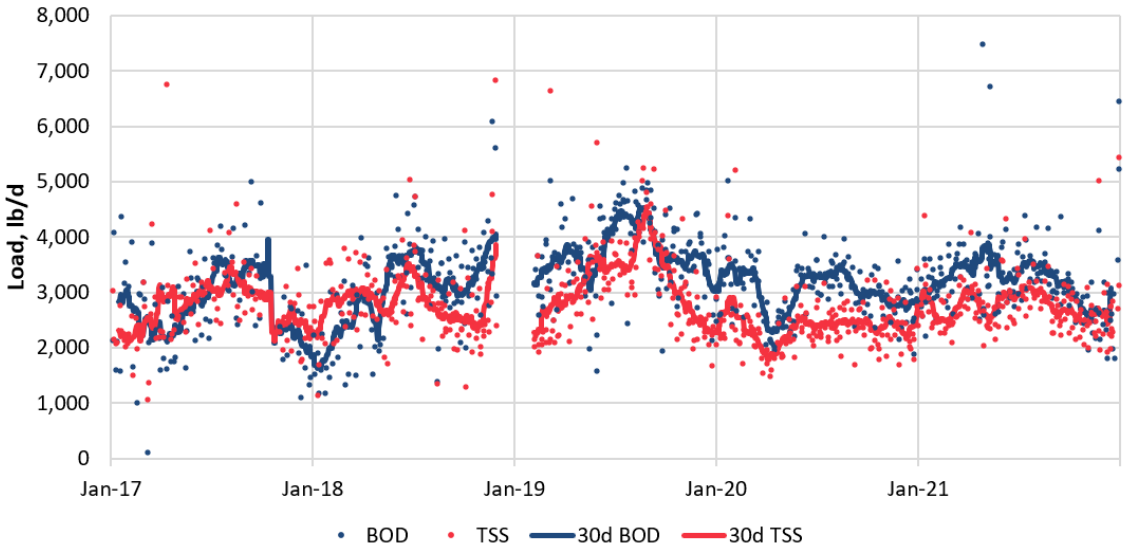


**Figure 2-5. Daily and 30-day average influent BOD and TSS loadings**

Although it is hard to visualize due to the scatter, the loadings demonstrate seasonal variation. Loadings are typically 10 to 15 percent higher in the summer, peaking in July. As was the case with flows, it is difficult to determine a tourism-related load impact. Figure 2-6 presents average BOD loadings by calendar date, using data from 2008 through 2021. While the summer increase is clear, specific holiday-related peaking is not conclusively observed.

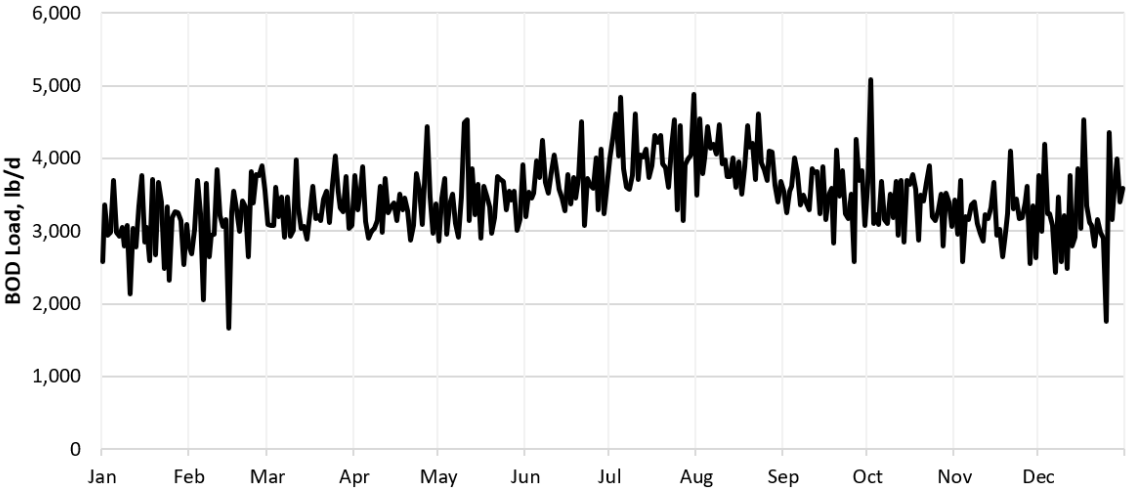


**Figure 2-6. Average daily BOD loading by calendar date,(2008-2021)**

A key component of the influent loading is the Rogue Brewery (Rogue). Rogue currently contributes approximately 26,100 gallons per day (gpd) of flow, with a high BOD content (2,160 pounds [lb]/day[d]). Table 2-2 summarizes Rogue flows and loads since 2020, when the latest pretreatment regulations went into effect.


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| Table 2-2. Rogue contribution to Newport, 2020-2021 | | | |
|---|---|---|---|
| Parameter | Rogue | Total | Rogue % of total |
| Flow, mgd | | | |
| Average | 0.026 | 1.75 | 1.5% |
| Maximum month | 0.031 | 3.30 | 0.9% |
| Maximum day | 0.060 | 6.50 | 0.9% |
| BOD, lb/d | | | |
| Average | 475 | 3,200 | 14.8% |
| Maximum month | 700 | 4,250 | 16.5% |
| Maximum day | 1,900 | 6,500 | 29.2% |
| TSS, lb/d | | | |
| Average | 50 | 2,775 | 1.8% |
| Maximum month | 120 | 4,000 | 3.0% |
| Maximum day | 550 | 6,800 | 8.1% |

Table 2-3 summarizes the current overall loadings, with peaking factors. BOD loadings have been adjusted to exclude the average Rogue loading of 475 lb/d. TSS loadings are unadjusted, as Rogue contributions are insignificant (less than 2 percent of the total at average load conditions). Adjusting the BOD loadings for Rogue ensures that per capita load generation rates and peaking factors are independent of Rogue, and Rogue loadings can be projected separately.

| Table 2-3. Influent Loads and Peaking Factors | | |
|---|---|---|
| Parameter (excludes Rogue) | Loading | Peaking (compared to average load) |
| BOD, lb/d | | |
| Minimum month | 1,925 | 0.71 |
| Average | 2,725 | 1.00 |
| Maximum month | 3,775 | 1.39 |
| Maximum 14-day | 4,125 | 1.51 |
| Maximum day | 6,500 | 2.39 |
| TSS, lb/d | | |
| Minimum month | 1,900 | 0.68 |
| Average | 2,775 | 1.00 |
| Maximum month | 4,000 | 1.44 |
| Maximum 14-day | 4,600 | 1.66 |
| Maximum day | 6,800 | 2.45 |

## 2.4 Equivalent Residential Units

Equivalent residential units (ERUs) may be defined based on flow or load and are used to compare trends in flow or load in units roughly equivalent to a single household. This approach can make it easier to correlate flow and load impacts and future projections to population trends.

To define based on flow, the current base flow of 1.1 mgd is divided by the 2021 residential population of 10,591 to estimate an average per capital wastewater generation rate of 103.9 gallons/capita/day. Multiplying this by the average household size of 2.29 gives a flow-based generation rate of 238 gpd/ERU. By this measure, there are 4,625 ERUs in the City system.



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To define ERUs based on load, during the winter, the average BOD load is 2,625 lb/d, which excludes contributions from Rogue. Dividing this by the population of 11,882 gives a per capita loading of 0.25 lb/capita/d. Multiplying this by the average household size gives a load-based generation rate of 0.57 lb/d/ERU. The load basis may be used to project the number of additional ERUs observed during the summer and ERUs associated with Rogue:

- Current ERUs: 4,625
- ERUs added during the summer: 661
- ERUs associated with Rogue: 837

On average, the City has approximately 4,625 households in the wastewater system and adds approximately 661 households' worth of BOD load (a 14 percent increase) each summer. The BOD load from Rogue is equivalent to 837 households (an 18 percent increase) added to the collection system when the brewery is discharging.

## 2.5 Flow and Load Projections

Flow and load projections were derived by extrapolating current base flow and average loads into the future based on population forecasts (Figure 2-1). Peaking was derived from the peaking factors presented in Tables 2-1 and 2-3. Rogue flows and loads were assumed to remain constant, with the average BOD loading of 475 lb/d applied to all future projections. Table 2-4 summarizes the flow and load projections.

**Table 2-4. Influent Flow and Load Projections**

| | 2021 | 2030 | 2040 | 2050 | 2060 | 2070 |
|---|---|---|---|---|---|---|
| Flow, mgd | | | | | | |
| Base sanitary | 1.10 | 1.19 | 1.25 | 1.26 | 1.26 | 1.27 |
| Minimum month | 1.15 | 1.24 | 1.30 | 1.32 | 1.32 | 1.33 |
| Average | 1.75 | 1.89 | 1.98 | 2.01 | 2.01 | 2.02 |
| Maximum month | 3.30 | 3.56 | 3.74 | 3.78 | 3.79 | 3.81 |
| Maximum day | 6.50 | 7.01 | 7.36 | 7.45 | 7.47 | 7.50 |
| Maximum hour | 13.9 | 15.0 | 15.8 | 16.0 | 16.0 | 16.1 |
| Summer | 1.40 | 1.51 | 1.59 | 1.60 | 1.61 | 1.61 |
| Winter | 2.10 | 2.26 | 2.38 | 2.41 | 2.41 | 2.42 |
| BOD load, lb/d | | | | | | |
| Minimum month | 2,400 | 2,550 | 2,650 | 2,680 | 2,690 | 2,690 |
| Average | 3,200 | 3,410 | 3,560 | 3,600 | 3,610 | 3,620 |
| Maximum month | 4,250 | 4,550 | 4,750 | 4,800 | 4,820 | 4,830 |
| Maximum 14-day | 4,600 | 4,920 | 5,150 | 5,200 | 5,220 | 5,230 |
| Maximum day | 6,500 | 7,010 | 7,360 | 7,450 | 7,470 | 7,500 |
| TSS load, lb/d | | | | | | |
| Minimum month | 1,900 | 2,050 | 2,150 | 2,180 | 2,180 | 2,190 |
| Average | 2,780 | 2,990 | 3,140 | 3,180 | 3,190 | 3,200 |
| Maximum month | 4,000 | 4,310 | 4,520 | 4,580 | 4,590 | 4,610 |
| Maximum 14-day | 4,600 | 4,970 | 5,220 | 5,280 | 5,300 | 5,310 |
| Maximum day | 6,800 | 7,330 | 7,700 | 7,790 | 7,820 | 7,840 |

*a. Includes contributions from Rogue.*



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In summary, the flow and load projections are expected to mirror the population projection, with only a small increase (13 to 15 percent) over the next 50 years.

## 2.6 Permit Requirements

The WWTP is permitted to discharge under National Pollutant Discharge Elimination System (NPDES) Permit 102497, issued on May 3, 2002. The permitted discharge limits are summarized in Table 2-5. The current permit, which expired on April 30, 2007, remains in effect until a new permit is issued. These limits were used to evaluate the WWTP processes' ability to handle the projected increases in flows and loads without risk of permit violations.

**Table 2-5. NPDES Permit Regulations**

| BOD and TSS Limits | | | | | | |
|---|---|---|---|---|---|---|
| | Concentration-based Limits (mg/L) | | Mass-based Limits (lb/d) | | | Removal Efficiency |
| | Monthly | Weekly | Monthly | Weekly | Daily Maximum[a] | |
| Summer (May 1–Oct 31) | | | | | | |
| BOD | 30 | 45 | 770 | 1,100 | 1,500 | 85% |
| TSS | 30 | 45 | 770 | 1,100 | 1,500 | 85% |
| Winter (Nov 1–Apr 30) | | | | | | |
| BOD | 30 | 45 | 960 | 1,700 | 2,300 | 85% |
| TSS | 30 | 45 | 960 | 1,700 | 2,300 | 85% |
| **Other Limits** | | | | | | |
| Fecal coliform bacteria | 126 per 100 mL (monthly geometric mean) with no sample exceeding 406 per 100 mL | | | | | |
| pH | 6–9 | | | | | |
| Total residual chlorine | 0.47 mg/L | | | | | |

*Abbreviations: lb/d = pound(s) per day, mg/L = milligram(s) per liter, mL = milliliter(s)*

*a. Daily maximum limits suspended when flow exceeds 6.4 mgd.*



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## 2.7 Effluent Performance

Effluent concentrations from the WWTP for BOD and TSS have generally remained well below permit limits. Figures 2-7 and 2-8 present monthly average effluent concentrations and loadings, respectively, compared to permit limits. The WWTP currently is able to meet permit limits, and performance became notably more stable in 2020 and 2021.

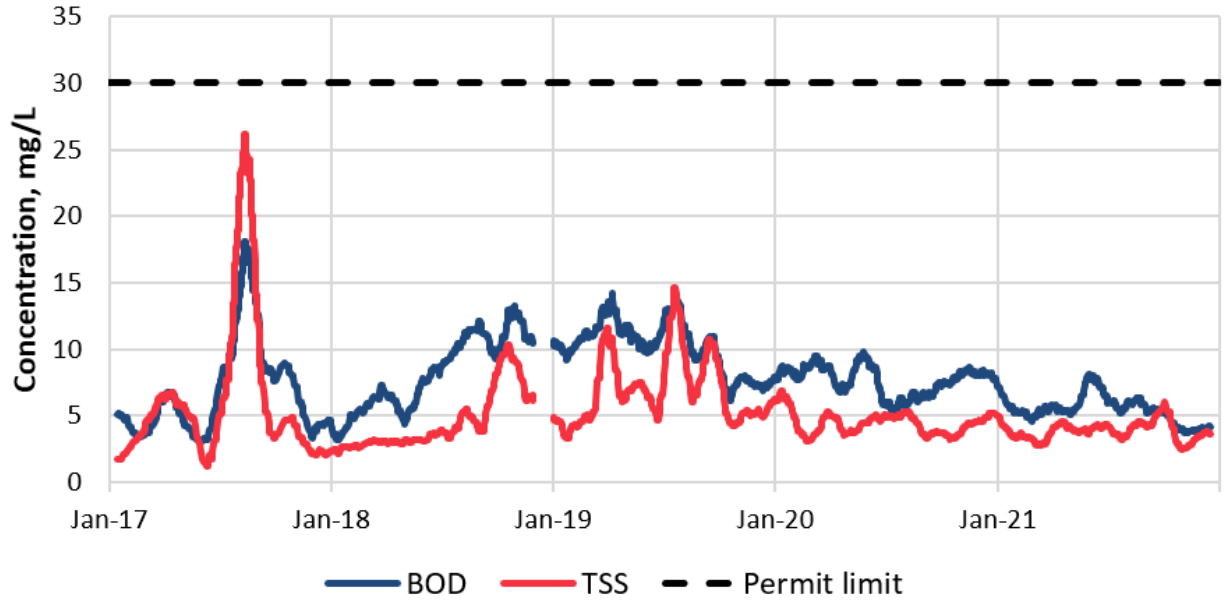


**Figure 2-7. Effluent BOD and TSS concentration, 30-day average**

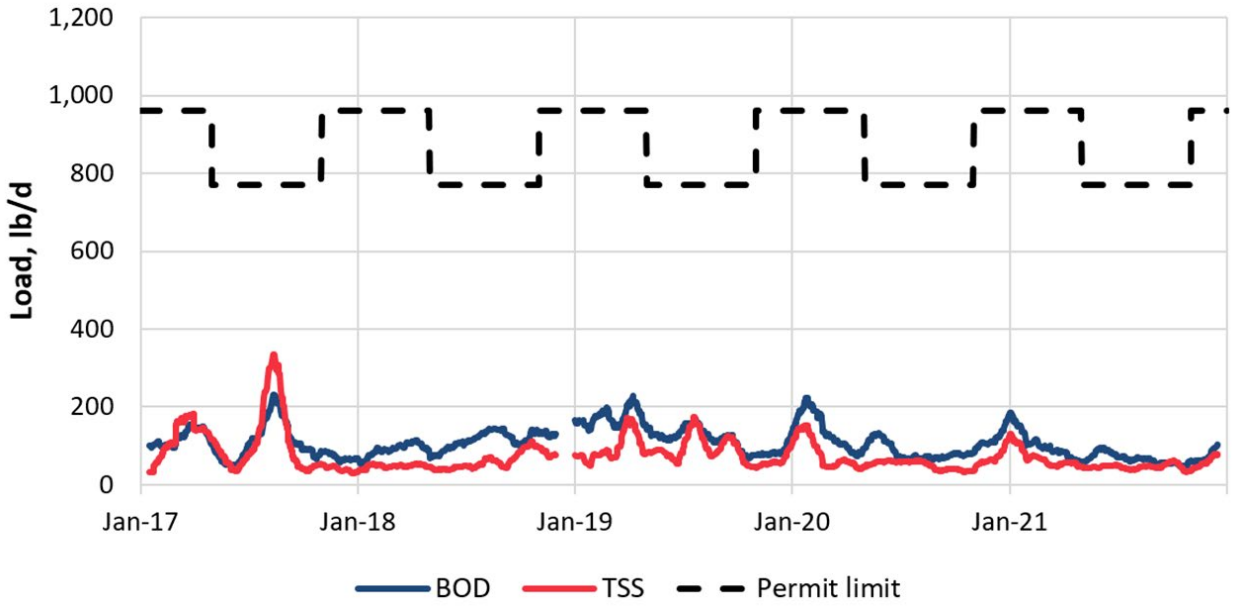


**Figure 2-8. Effluent BOD and TSS loading, 30-day average**



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Section 3

# Updated Condition and Criticality Evaluation

This section describes the processes and recommendations for near-term improvements for the Vance Avery Wastewater Treatment Plant (WWTP). This section reflects an update to BC's 2019 Existing Conditions Technical Memorandum (TM), stemming from the updated (2021) "*Wastewater Treatment Facilities Condition Assessment Update*" performed by Waterdude and included in Appendix A. Waterdude previously performed a condition assessment in 2018 which informed the 2019 BC TM. Unless otherwise noted, condition status per Waterdude have been paraphrased for brevity.

## 3.1 Condition Summary

The locations of major facilities at WWTP are shown on Figure 3-1.

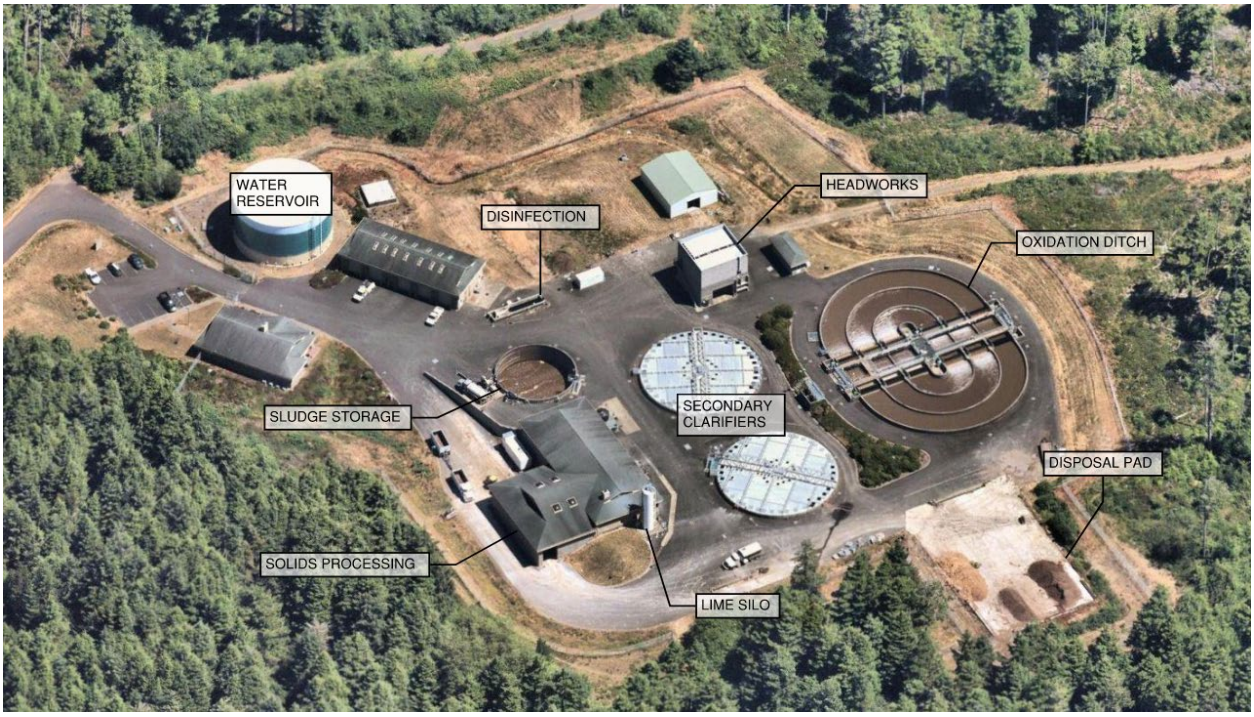


**Figure 3-1. WWTP aerial layout**

Table 3-1 summarizes applicable 2018 and 2021 criticality ratings. Ancillary processes that have been identified as critical are Northside Pump Station (NSPS) (discussed in Appendix H) and septage screening (discussed in Section 7). The status of each major unit process is summarized next.



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| Table 3-1. Major Unit Process Condition Rating Changes | | | |
|---|---|---|---|
| Description | 2018 Rating | 2021 Rating | Rating Change |
| Headworks Screenings | 3.0 | 3.7 | -0.7 |
| Oxidation Ditch | 2.9 | 2.7 | +0.2 |
| Secondary Clarification | 2.0 | 2.3 | -0.3 |
| Disinfection System | 2.5 | 3.3 | -0.8 |
| Lime Storage and Feed | 2.8 | 3.4 | -0.6 |
| Biosolids System | 2.6 | 3.4 | -0.8 |

*a. A rating of 1 reflects "very good" condition and 5 reflects "very poor" condition.*

## 3.2 Headworks

The headworks contains the influent screening process, which removes rags, plastics, and medium to large debris from the influent flow stream, preventing their passage to downstream processes. Removing this debris protects downstream pumps and equipment and reduces maintenance requirements for downstream facilities.

Cylindrical screens and shaftless cleaning and conveying screws are housed in two of the four existing screening channels. The remaining two channels were constructed to facilitate future expansion and are currently blocked and unused. Screenings material is washed and compacted during its transport to a dumpster for offsite disposal. The City has noted "ragging" of the existing rotary screens results in buildup that impact screen performance and require regular clearing. Note that while grit removal was initially planned to be incorporated into the process, the City has indicated there are no current concerns with excess grit.

Corrosion is prevalent throughout the headworks building, and the odor control system is currently out of service. Corrosion could be a result of the proximity of the plant to the ocean and the fact that the upper level of the building is open to marine air. However, hydrogen sulfide ($H_2S$) concentrations are also very high and pose a safety risk to personnel working in this facility. $H_2S$ also contributes to concrete erosion throughout the building in areas of high moisture. Corroding facilities such as the roof access ladder and stair gratings are safety concerns.

From 2018 to 2021, the condition of the existing screening system has worsened, partially due to increased corrosion over time. The screens have further degraded since 2021 and are due for replacement. As discussed in the 2018 condition assessment, there is insufficient screening redundancy or passive bypass; bypassing the screening process would only be possible by removing a screen entirely, for a certain period.

## 3.3 Oxidation Ditch

An Orbal oxidation ditch manufactured by Evoqua Water Technologies uses surface aerators to mix and aerate the wastewater. The basin is fitted with adjustable effluent gates that allow the water surface to be controlled to provide optimal mixing and aeration. The aeration process promotes growth of naturally occurring bacteria that consume biochemical waste material in the wastewater. This process removes 5-day biochemical oxygen demand ($BOD_5$), solids, and nutrients from the wastewater.

The aeration basin consists of three concentric, oval-shaped channels with four banks of surface aerators. Screened raw sewage and return activated sludge (RAS) typically enter the outer channel but can also be fed directly to the middle channel or both channels. The outer channel is operated at



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a near zero dissolved oxygen (DO) condition while the middle channel is operated at a DO of approximately 2 milligrams per liter (mg/L), and the inner channel is operated at a DO around 5 mg/L. Mixed liquor from the aeration basin is conveyed to the two secondary clarifiers via the mixed liquor splitter box.

The WWTP experienced increased TSS in the effluent from 2017-2019 and contracted with an operations specialist to evaluate and make operational recommendations to improve performance and optimize treatment processes. While the evaluation considered the whole WWTP, emphasis was placed on operational improvements to the aeration basins. The improvements aim to maintain set DO levels within each channel and set operational protocols for both the aeration basin and secondary clarifiers. Solids retention time (SRT) was recently reduced from 10 to 15 days, down to 9 days. Mixed liquor suspended solids (MLSS) has also been reduced recently from 3,200 mg/L to 2,400 mg/L, and process adjustments continue.

Due to capacity limitations, the ditch is typically operated at maximum overflow level. This is not ideal as it places the aerator shafts and bearings in contact with the activated sludge, leading to accelerated corrosion of these components. Furthermore, Phase I capacity analyses indicated the aeration system was not able to provide the target transfer efficiency to support the process.

Since 2018, the aerators underwent refurbishment and repairs, including new drives, bearings, and lubrication. In addition, the rotating speed was increased to provide more oxygen overall. These improvements are reflected in the 2021 criticality rating for the oxidation ditch. However, the capacity challenges will limit the timeframe between subsequent repairs moving forward if additional capacity is not incorporated to support the process.

## 3.4 Secondary Clarifiers

The secondary clarifiers take mixed liquor from the oxidation ditch and allow particles to settle out of the mixture forming sludge on the bottom of the clarifier. This sludge is drawn off the bottom of the clarifier and pumped to the aeration basin as RAS to improve process efficiency, or it is pumped as waste activated sludge (WAS) to the sludge storage tank. Pumps for the RAS and WAS processes are in the solids building. Scum floating on the clarifier surface is collected by skimmers, directed to the scum box, and pumped to the sludge storage tank.

Physically, the clarifiers are in decent condition with a few notable issues, as summarized below:

- The original scum removal sprayers have been removed due to plugging, and the current spray system is ineffective.
- In 2021, the drives and submerged portions of the blade-type mechanisms showed signs of corrosion. Deterioration of these components are reflected in the downgraded criticality rating between 2018 and 2021. However, the drive for Clarifier No. 2 was recently replaced, and the mechanism was recently recoated to mitigate corrosion.
- According to the City, the clarifier covers require regular cleaning and present an operational challenge due to the obstruction of the equipment below. The City has noted a preference to have the covers removed, if possible, but they were included in the original design due to proximity to the regional airport and a stated criterion of minimizing attractions for birds. Reconsideration of this requirement may be warranted, including coordination with the Federal Aviation Administration to confirm that covers are required by law.



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## 3.5 Disinfection

The disinfection system inactivates pathogens and other microorganisms before the effluent is discharged to the Pacific Ocean. Sodium hypochlorite solution (12.5 percent) is stored in a 3,650-gallon storage tank and pumped to the chlorine contact basin, where it is mixed with secondary effluent. The sodium hypochlorite solution can also be used at various other locations on the site. Disinfected effluent from the contact basins is measured with a Parshall flume before flowing by gravity through a 30-inch-diameter gravity effluent line under Yaquina Bay to the effluent booster pump station, where it is pumped to the ocean outfall near Nye Beach.

No capacity limitations were noted with the existing sodium hypochlorite disinfection system. However, the eyewash station present at the chlorine injection point is reaching the end of its useful life. In the past, eyewash stations have not received the required monthly inspections to ensure safety systems are fully operational. Furthermore, in 2023, a failure involving the existing diaphragm pumps resulted in an unplanned discharge of unchlorinated effluent. Pump replacement strategy and costs are presented later in this report. Finally, the disinfection tank outlet was drilled into the tank side and attached after fabrication rather than cast into the tank structure, and there have been issues with tank leaks. A new disinfection tank (of the same size) is recommended.

In 2019, the chlorine delivery system was upgraded from manual control to automatic delivery. The chlorine set point is currently based on a control loop, which continuously analyzes effluent conditions and adjusts the dosage accordingly. This system has been reported to be effective.

## 3.6 Solids Treatment

The solids stream receives waste activated sludge (WAS) and septage via the Hauled Waste Receiving Station. The WAS is conveyed from the RAS piping to the aerated WAS Storage Tank by WAS pumps located in the Solids Handling Building gallery. Septage from the Hauled Waste Receiving Station is also conveyed to the WAS Storage Tank.

Centrifuge Feed Pumps located in the Solids Handling Building gallery pump stored WAS and septage at a concentration of approximately 0.55 percent to centrifuges located on the ground level in the Solids Handling Building. Centrifuges and a liquid emulsion polymer system dewater WAS to approximately 20-percent solids concentration. Centrate decanted from the centrifuge is then returned to the plant headworks.

Conveyors transport dewatered cake to the Lime Stabilization equipment, located in the lime processing room adjacent to the centrifuges on the ground level of the Solids Handling Building. Cake is conveyed to a thermoblender where it is mixed with quicklime and heated. From the thermoblender, the heated sludge/lime mixture drops into a pasteurization vessel where it is held and heated for 30 minutes to produce Class A biosolids. The lime-stabilized, Class A biosolids finished product is conveyed to the solids storage bay on the west side of the Solids Handling Building where it is truck loaded and hauled to a biosolids end user or stored at Crestmont Farms, near Wren, Oregon. At the time of this evaluation, the plant had approximately 3 weeks of biosolids storage available onsite. A schematic of the existing solids stream is shown on Figure 3-2. Photos of the existing WAS Storage Tank, Centrifuge Feed Pumps, Centrifuges and RDP system are shown on Figures 3-3 through 3-6.



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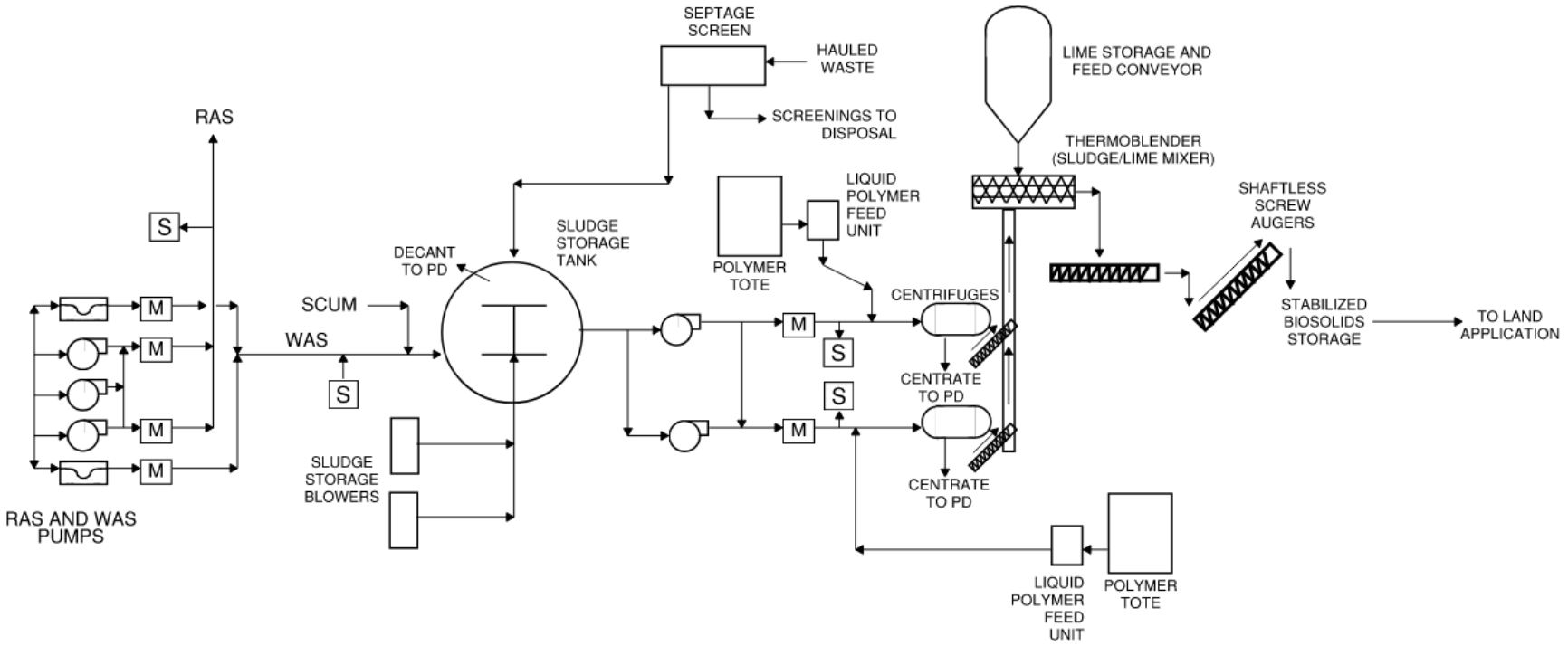


**Figure 3-2. Solids stream schematic**



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Figure 3-3. WAS storage tank

Figure 3-4. Centrifuge feed pumps



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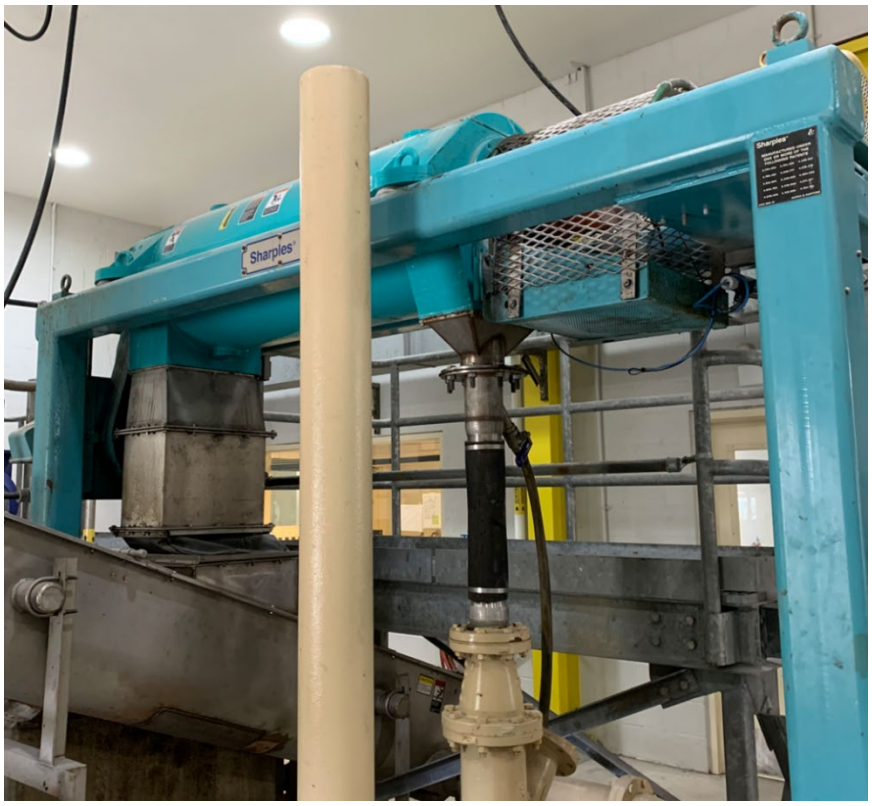


Figure 3-5. Centrifuges

Figure 3-6. RDP lime stabilization equipment


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The solids process has experienced capacity issues for several years and a Biosolids Capacity Evaluation in 2012 made several recommendations to further evaluate and resolve the issues (BC, 2012). A rebuild of the centrifuges was completed in 2018 along with the installation of new control panels and a new polymer delivery system. The dewatering centrifuge capacity issues are also documented by BC in a 2018 capacity assessment, and by Kennedy Jenks in a Centrifuge Replacement TM (Appendix E).

The plant is currently looking to implement an emergency centrifuge replacement project, as the existing centrifuges are undersized and have reached the end of their useful life. Additional existing conditions information relating to dewatering is provided in the Centrifuge Replacement TM. Existing conditions of solids processes are also described in the Solids Basis of Design TM, included as Appendix J.

The existing RDP Lime Stabilization process is also reaching the end of its useful life, and product support and parts are becoming increasingly difficult to obtain for the existing system. The finished biosolids product is poor quality (e.g., consistency) and odiferous, making it more difficult to partner with agricultural land application sites and other end users.

Labor challenges with respect to biosolids hauling has resulted in backups at the plant. The plant pays to store biosolids at Crestmont Farms from November through April, as it is difficult to access the Class A Biosolids site during these months due to wet weather. DEQ has also notified the City that land application of biosolids is no longer permitted during the wet season (October through February), due to low nutrient update during winter months and difficulty with applying biosolids at the land application site. Large quantities of rainfall in the area do not allow the plants to absorb the nutrients in biosolids. The City has contracted storage of Class A biosolids with Crestmont Farms over the next 5 years. The farm will allow the City to haul and store a maximum of 4,500 wet tons of Class A biosolids annually, until they can be land-applied during the dry season. There are several sites available to the City for land application of Class A biosolids in the Siletz valley, mostly pasture lands; however, odors can be an issue on smaller sites. The DEQ is allowing the City to blend RDP Class A biosolids product with wood chips to improve quality and odor issues at certain sites. This is considered a “blended” product and allowed by the City’s existing Biosolids Management Plan. Wood chips are provided by Central Lincoln P.U.D. and are free to the City.



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Section 4

# Capacity Assessment Update

A capacity assessment was developed as part of the 2018 Phase I Wastewater Treatment Master Plan (WWTMP). The capacity assessment was based on a combination of equipment data, historical operation and observations, and biological process modeling. That assessment has been updated as part of this plan using the same biological process model, with updates as described below.

## 4.1 Plant Operation

Figure 4-1 presents a process flow schematic representation of the plant.

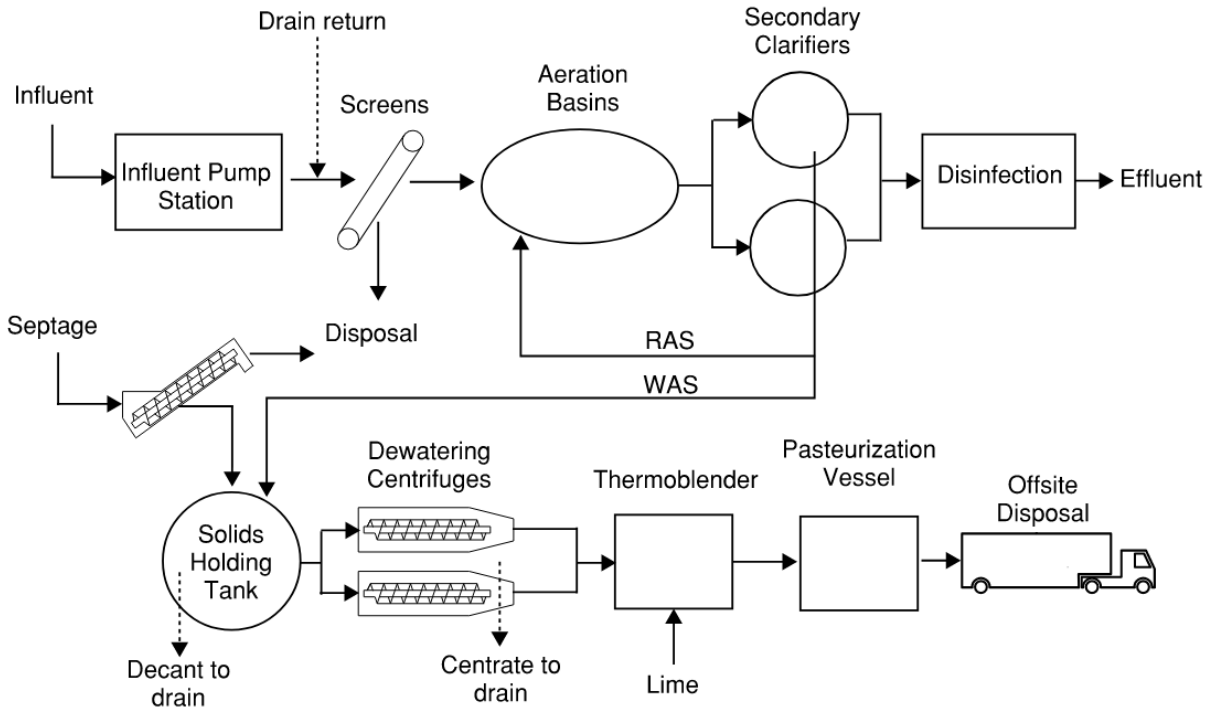


**Figure 4-1. Plant process flow schematic**

Influent is pumped up to the headworks, which houses a pair of in-channel rotary screens. Each screen has 0.25-inch openings and is rated for a capacity of 8 million gallons per day (mgd). Screened influent is conveyed to a 1.5-million-gallon Orbal oxidation ditch, which operates at a liquid depth of 11.5 feet. The Orbal system consists of three loops, each of which operates at a different DO concentration (Figure 4-2).



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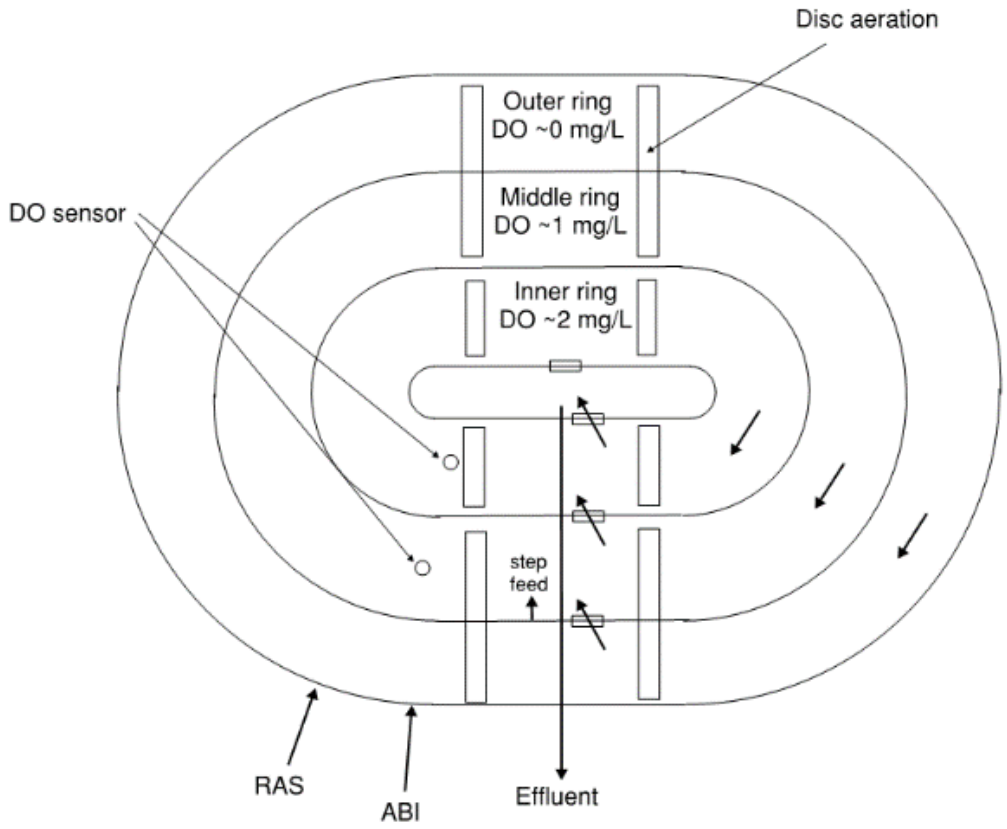


**Figure 4-2. Schematic of Orbal oxidation ditch**

The oxidation ditch is currently operated at an solids retention time (SRT) of 8 to 10 days. The mixed liquor suspended solids (MLSS) concentration is maintained at an average of 2,560 mg/L, with a typical monthly average range from 2,250 to 2,980 mg/L.

Mixed liquor from the ditch is sent to a pair of 90-foot-diameter secondary clarifiers for solids separation. Activated sludge bacteria are sent back to the ditch as RAS, and effluent is sent to a 13,600-gallon disinfection channel. The disinfection channel is primary used for mixing, with contact time achieved in the outfall pipeline, which has an estimated volume of 580,000 gallons.

WAS from the secondary clarifiers is sent to a holding tank where it is mixed with septage. The combined sludge is dewatered with a pair of centrifuges and stabilized via a lime pasteurization process.

## 4.2 2018 Capacity Assessment

The 2018 capacity assessment identified several capacity limitations:

1. The influent screens were operating with no redundancy, and firm capacity of the system was exceeded at peak flows.
2. The dewatering centrifuges were operating with no redundancy, and firm capacity of the system was exceeded at average load conditions.
3. The lime pasteurization system was operating above its design throughput of 24 hours/week.


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4. The secondary process appeared to be operating near its capacity. The rated capacity, based on the ditch's design SRT of 5.5 days, was estimated to be 4.1 mgd (maximum month flow basis). However, it was recommended, due to a nutrient imbalance, to keep the SRT at a minimum of 8 days to improve mixed liquor settleability. Operation at the recommended minimum SRT of 8 to 10 days would reduce the rated capacity to 3.7 mgd, which was the flow rate projected to be observed shortly after 2030.
5. Oxidation ditch aeration capacity appeared to be limited, based on operator observation of DO depression during peak loadings. This was assumed to be caused by a combination of the oxidation ditch disc aerators performing below specification with respect to oxygen transfer, and to a transfer efficiency depression which may have been related to peak loadings from Rogue.
6. The influent pumps and plant design hydraulics, both rated to 15 mgd (maximum hour), were projected to become capacity-limited in the early 2040s.

## 4.3 Capacity Assessment Update

The capacity assessment performed as part of the 2018 Phase I WWTMP has been updated as part of this planning effort. Updates include:

1. Incorporating the new flow and load projections (see Section 2).
2. Reducing the Rogue BOD loadings from approximately 1,100 pounds per day (lb/d) to the current average of 475 lb/d. Since the 2017 assessment, pretreatment regulations have reduced Rogue loadings by more than 50 percent. This, combined with mechanical improvements to increase the motor power delivered by the oxidation ditch disc aerators, has eliminated the aeration limitations observed in the 2017 assessment.
3. Updating the secondary process capacity assessment based on more stable operation in recent years, specifically improved mixed liquor settleability. The modeled sludge volume index (SVI) was decreased from 361 milliliters per gram (mL/g) to 325 mL/g, to reflect this operational improvement.

Major findings from the capacity update include:

1. The influent screens continue to be a capacity limitation, with firm capacity already exceeded.
2. The dewatering centrifuges continue to be a capacity limitation.
3. The lime pasteurization system continues to exceed its design throughput. While this does not affect the plant's capacity to process solids, it impairs reliability and increases risk, as the system has less down-time for maintenance and repairs.
4. The influent pumps and plant design hydraulic limitations are expected to be exceeded a few years earlier (the late 2030s instead of the early 2040s), based on the updated flow projections.
5. Secondary process remains near capacity. The secondary process evaluation considered two factors:
   - **MLSS concentration in the oxidation ditch**: A common operating MLSS for oxidation ditches is 3,000 mg/L, and that is the maximum concentration currently being observed. With current flows and loads and an SRT of 8 to 10 days, the WWTP cannot operate at an MLSS concentration below 3,000 milligram per Liter (mg/L). Operating at a longer SRT, as is common practice with this type of ditch, would drive the MLSS concentration well above 3,000 mg/L and overload the secondary clarifiers.
   - **Secondary clarifier capacity**: At a 10-day SRT and the current SVI of 325 mL/g, which would be a recommended operating condition in the winter, capacity of the system is



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approximately 3.2 mgd. The current maximum month flow is 3.3 mgd. By this measure, the plant is at capacity.

- The secondary process is also limited with respect to redundancy. The above analysis assumes both secondary clarifiers are in service. With one clarifier out of service, which could happen at any time for required repairs or maintenance, capacity would be cut in half, and the plant would be severely restricted. Based on Oregon State guidelines, the clarifiers should have capacity to treat the maximum day with flow both units in service, and the maximum month dry weather flow with one unit out of service. The winter maximum day requirement is typically more limiting.

Figure 4-3 compares the capacity findings to current and future flows in terms of equivalent residential units (ERUs). The capacities of each unit process and future projected flows were converted to ERUs as discussed in Section 2.4. Various operating conditions for each process are presented to demonstrate how the WWTP operations staff can consider capital improvements or operational approaches to maintain or improve capacity. Where the capacity columns in the chart fall below the ERUs line, that indicates a condition in which that process would be over capacity. For example, the current secondary clarifier total capacity (with SVIs at 325 mL/g, not 250 mL/g), is approximately 4,500 ERUs; since the wastewater system currently has 4,625 ERUs, the clarifiers are over capacity.



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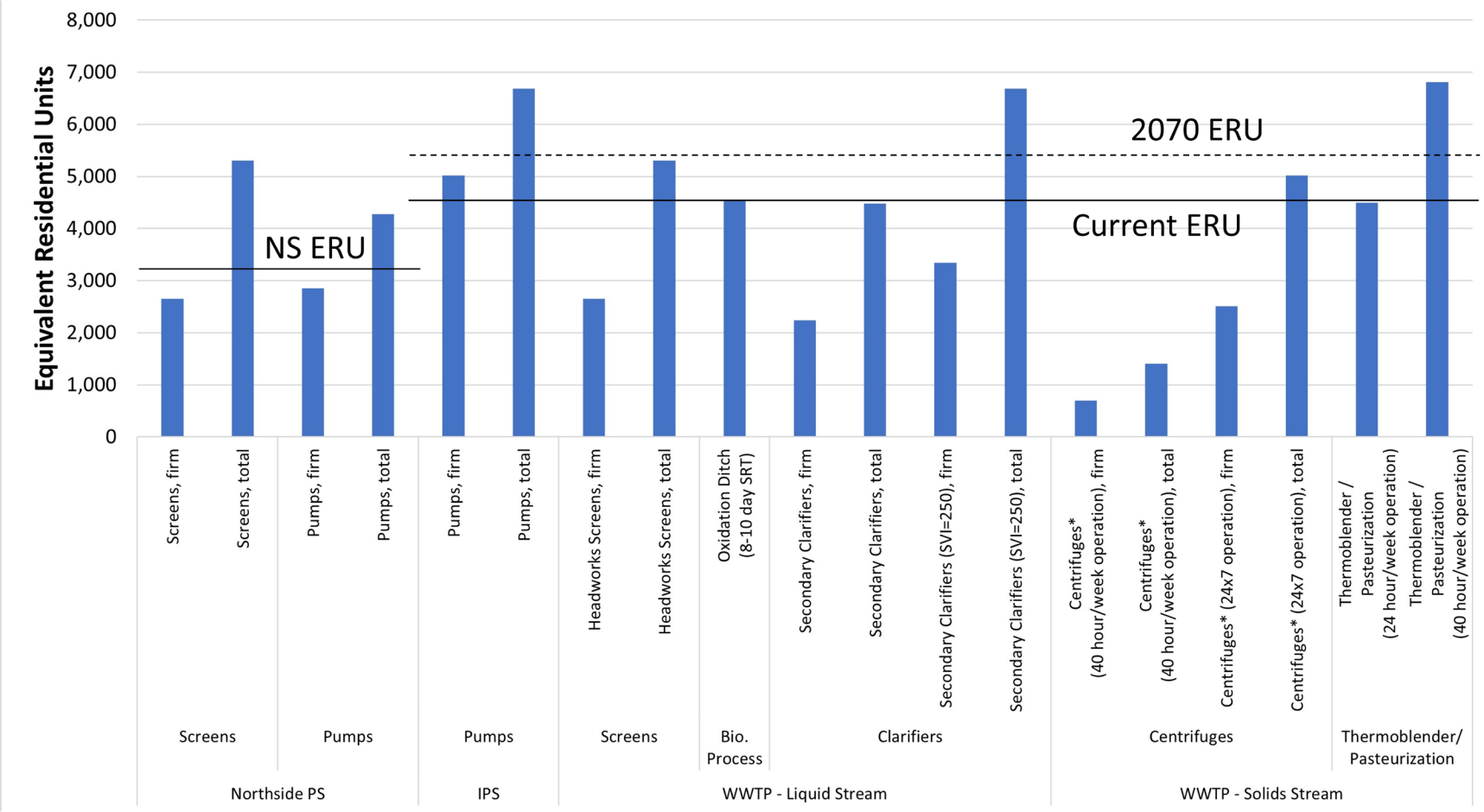


**Figure 4-3. Capacity summary**

*NOTE: Capacity columns falling below the ERUs line indicates a condition in which that process would have insufficient capacity.*

## 4.4 Capacity Implications

Most of the capacity limitations can be addressed by replacing equipment with larger units or adding infrastructure. The alternatives assessment evaluates upsizing or adding units specific for screens, dewatering, and biosolids management, and such alternatives are presented in Sections 5, 6, and 7.

Secondary process capacity limitations are somewhat more complicated. The plant was designed with a single Orbal ditch and two secondary clarifiers. Design criteria reflected an extremely aggressive approach to operation, with a 5.5-day SRT in the ditch, and no redundancy in either the ditch or the clarifiers. Site layouts included plans for a second oxidation ditch and two more secondary clarifiers. Options for expanding capacity of the secondary process include the following:

1. **Reduce loadings from Rogue.** This option has already been implemented by imposing pretreatment regulations on Rogue. The implementation of pretreatment regulations has resulted in greater than 50 percent reduction in Rogue loadings. While this has certainly reduced capacity risk, it has not eliminated capacity limitations.
2. **Reduce loadings by applying pretreatment at the plant.** The most common form of pretreatment is primary clarifiers, which could reduce solids loading by 60 to 70 percent and reduce BOD loadings by 25 to 40 percent. Additional primary clarifiers would extend capacity of the secondary process for all projected flows and loads. However, additional primary sludge would impact biosolids decisions. The best way to stabilize a combined sludge from primary and secondary treatment (i.e., WAS) would be to implement a form of solids digestion at the plant.
3. **Expand capacity by building a second oxidation ditch and more secondary clarifiers.** The recommendation to address capacity limitations at the WWTP would be to build the second ditch plus one additional secondary clarifier, which would resolve both capacity and redundancy limitations. A second ditch would provide capacity not only for projected loadings, but could also accommodate brewery or other industrial expansion, if desired.

Option 3 will be discussed in more detail in Section 6 of this plan.



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Section 5

# Headworks Alternatives Development

The status of the existing headworks building and associated equipment was discussed in Section 3.2 and 4.3. This section presents improvement alternatives and recommendations.

## 5.1 Alternative Descriptions and Evaluation

Two alternatives were developed for the existing headworks building as follows.

- **Alternative 1: Minimum Investment**–Replace equipment and proceed with improvements that have been identified as critical.
- **Alternative 2: Minimum Investments + Upgraded Functionality**–Proceed with critical improvements and additional improvements to decrease labor requirements and add operational flexibility.

### 5.1.1 Alternative 1 - Minimum Investments

Minimum improvements were identified based on critical needs per the updated capacity assessment and 2021 condition assessment discussed previously. Most notably, the existing rotary screens are due for replacement. Recommended screen replacements are discussed in Section 5.1.3. Additional minimum improvements recommended to combat odor issues, mitigate the impacts of corrosion, and improve personnel safety include the following:

- The existing screening channels should be enclosed and connected to an odor control unit to treat odorous air within the channels.
- The upper level should be enclosed to provide separation from the outside marine air, which in the past has contributed to corrosion issues throughout building.
- Access equipment that is currently corroded should be replaced, such as the roof access ladder and discharge channel maintenance hole covers.
- Fall protection measures are needed at the existing screening chute.
- Electrical work is required to repair inoperable lighting and switches.
- Roof replacement or rehabilitation is recommended due to significant rust on the interior face.

### 5.1.2 Alternative 2–Minimum Investments plus Upgraded Functionality

Additional improvements included as part of Alternative 2 could increase the functionality of existing headworks operations. Mainly, screening capacity and flexibility can be significantly increased with the addition of a third screen (see Section 5.1.3 for screen equipment options) in one of the two available screening channels north and south of the channels that are currently occupied. The south channel is highly preferred due to the proximity of the north channel to the building wall and associated space restrictions. The additional redundancy would be helpful in facilitating screen maintenance and repairs, when required. To facilitate third screen operation, slide gates would be required upstream and downstream of the screen location, similar to the existing screen channels.



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The City has also noted a preference to minimize labor requirements and add automation to the existing process. Electric actuators could be added to the existing gates and new gates to increase the ease with which flows are directed between the three channels. The actuator controls could be connected to the existing supervisory control and data acquisition (SCADA) system to streamline operations with the rest of the plant.

### 5.1.3 Screen Replacement Options

Associated with Alternatives 1 and 2, the existing rotary screens are recommended to be replaced with multi-rake bar screens or flexible multi-rake bar screens. These two screen types were recommended for several reasons:

1. No flushing water is required for cleaning
2. Use of multiple rakes allows for higher loading rates
3. Relatively low headloss
4. Simple design requires relatively little maintenance
5. Reasonable cost
6. Steep installation angle reduces lay length within existing screening channels
7. City preference against screens with rotating augers due to consistent ragging issues

The recommended screen types are commonly used in the industry and BC has specified them in the past. Note that for the basis of this evaluation, the Huber RakeMax and Duperon FlexRake were considered, but other alternatives are available from competing manufacturers. The two screens are similar, but have a few notable differences:

- The flexible multi-rake bar screen is designed to stay in operation when larger debris causes an obstruction of the cleaning rakes. The lack of a bottom chain connection allows the rakes to move freely away from the screen when debris are obstructing the screen's face at the bottom of the channel. This arrangement is possible due to the chain used in the screen's design and eliminates the need to enter the channel to maintain connection points (although that is uncommon for screens with sprockets).
- The lack of a bottom connection point can also allow large debris to remain in the channel and obstruct the flow pathway without detection from operations personnel. There have also been reports of the rakes getting misaligned on flexible multi-rake screens, causing the rake teeth to not engage between the screen bars and properly clean the screen.
- Large debris are not commonly observed at the WWTP Headworks due to pre-screening at the upstream NSPS. However, having the ability to handle unscreened waste at the WWTP could add process flexibility if upstream screening is unavailable. Additionally, a smaller drive motor is included with flexible multi-rake screens, which is possible because the rakes are spaced closer together with more overall rakes.
- Key benefits of a conventional bar screen include technology maturity, simplicity, size, and cost. The Huber RakeMax, specifically, has been installed at several WWTPs in Oregon and is a much more proven technology when compared to flexible multi-rake screens, of which there are fewer installations in the immediate area. The relatively fewer rakes on the conventional bar screens mean that periodic maintenance is simpler. Also, the drive chains can be re-tensioned in place and remain in alignment due to the bottom connection point in the channel. Finally, conventional screens are slightly shorter and less expensive than the catenary type-screens, though the existing hatch opening and bridge crane in the headworks building can facilitate the installation of either screen.



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## 5.2 Recommended Layout

Alternative 2 includes the installation of a third screen that would be placed in the unused south channel. The south channel is recommended to facilitate access around the screen; access around a screen at the north channel would be impeded by the building wall on the north side.

The proposed arrangement is shown on Figure 5-1. Note the additional screen is recommended to be staggered upstream of the two replaced screens in the center channels to create space for discharge piping to a new discharge chute. If preferred, the arrangement could be flipped so that the screens in the center channels are installed upstream of the screen in the outside channel.

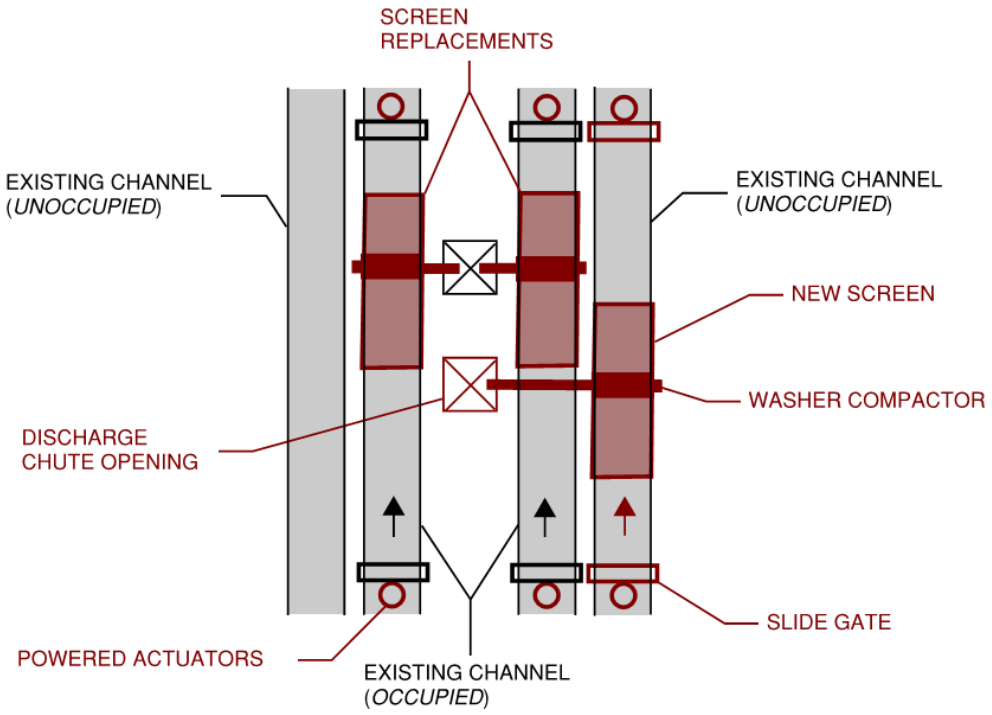


**Figure 5-1. Headworks screening proposed plan**

This staggered arrangement is possible because the proposed screens will be installed at a steeper installation angle than the existing rotary screens. The steeper angle decreases the lay length in the existing screening channels; however, note additional length upstream and downstream of the screens should be provided per manufacturer recommendations.

As shown on Figure 5-2, screened solids will be deposited into associated washer compactors and directed to the screening discharge chutes. To accommodate dual chute openings, a modification of the existing chute will be required, with one potential option shown on the figure. Separated discharge chutes may be desired to accommodate the additional screenings and facilitate distribution to the dumpster on the lower level.



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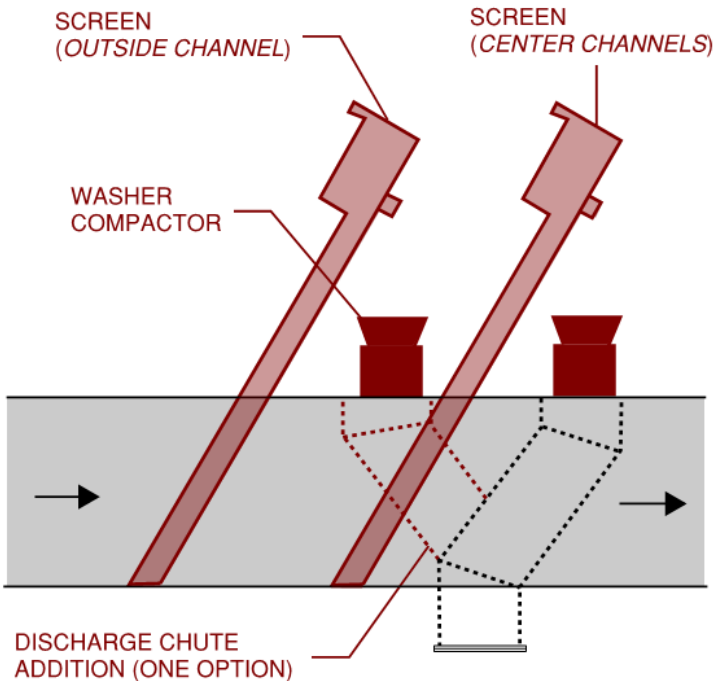


**Figure 5-2. Headworks screening proposed profile**

## 5.3 Costs

A construction cost summary for each alternative is listed in Table 5-1. Note that these costs are "construction only" and do not include additional fees necessary for engineering and administration. Duperon FlexRake screens were assumed for both Alternative 1 and Alternative 2 in Table 5-1. The costs in Table 5-1 have been adjusted to reflect 2025 costs using an average 5.0 percent cost increase. More detailed cost estimates are included in Appendix B and reflect the costs in 2023.

As shown, the expected cost increase to incorporate the non-critical upgrades is approximately $900K. These upgrades could be postponed to a time when additional funding is available; however, activities such as re-mobilization and additional planning would likely increase the total cost of the improvements listed for Alternative 2.

**Table 5-1. Headworks Construction Costs**

| Project Element | Alternative 1–Minimum Investments | Alternative 2–Minimum Investments plus Upgraded Functionality |
|---|---|---|
| Replace Screens | $1,370,000 | $1,370,000 |
| Add Odor Control | $660,000 | $660,000 |
| Enclose Upper Level | $40,000 | $40,000 |
| Replace Corroded Elements | $50,000 | $50,000 |
| Electrical Allowance | $350,000 | $530,000 |
| Add New Screen | – | $670,000 |
| Add Gates and Automation | – | $50,000 |
| **Total** | $2,470,000 | $3,370,000 |



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Summarized life-cycle costs are presented in Table 5-2. Note that while an additional screen is proposed for Alternative 2, yearly labor costs will be similar between Alternative 1 and Alternative 2 since flow through each screen under Alternative 2 will be lower.

**Table 5-2. Headworks Life-cycle Costs**

| Life Cycle Cost | Alternative 1 | Alternative 2 |
|---|---|---|
| Labor | $45,000 | $45,000 |
| Electricity | $3,439 | $4,203 |
| **Yearly Totals:** | **$48,439** | **$49,203** |

*a. Life-cycle cost analysis base assumptions:*

*- Electrical costs: $0.0464 per kWH (September-March), $0.0413 per kWH (April-August), $10.38 per KW peak demand,*

*- Labor costs: $45,000 per FTE; 0.05 FTE for maintenance, 0.25 FTE for operation of Headworks Facility*

*- Life-cycle costs cover a 20-year period with an escalation rate of 3.55% and a discount rate of 2.50%. Analysis was performed in 2023.*

*b. Conventional multi-rake bar screens were assumed for life-cycle analysis. Flexible multi-rake bar screens are expected to reduce yearly electrical costs by approximately $200 per year per screen.*

*c. Life-cycle cost comparisons were performed in 2023 and have not been updated to 2025 pricing.*

## 5.4 Recommendations

Alternative 2 is recommended. The addition of a third screen increases process flexibility, redundancy, and capacity. Automated channel gates are recommended to decrease labor requirements and streamline operations moving forward. Combining these non-critical upgrades with the critical upgrades in Alternative 1 during construction is also recommended to reduce total project costs compared to implementing separately.

Further analysis is required to determine the ideal screen replacement type. A hydraulic evaluation is recommended to determine the anticipated water levels upstream and downstream of the proposed screens and rule out the need for any channel modifications. Comparative visits to nearby installations and discussions with manufacturers would also help inform key benefits and drawbacks of each type. As an additional option and if no strong preference is developed during design, these two screens have historically been bid head-to-head, with contract documents allowing both options for the contractor's consideration.



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Section 6

# Liquids Stream Alternatives Evaluation

Guided by findings from capacity and condition assessments as well as discussions with WWTP staff, recommended improvements to the existing liquid stream processes are described and evaluated in this section.

## 6.1 Alternative Descriptions and Evaluation

While the existing secondary treatment process was not deemed to be in critical condition, limitations to capacity and redundancy are anticipated to compound with population growth, as described in Section 4.3. Two alternatives are presented in this section for consideration, and both include a third secondary clarifier to address the current capacity limitation.

### 6.1.1 Primary Clarification + Third Secondary Clarifier

One alternative to reduce the biological oxygen demand (BOD) load to secondary treatment would be to add primary clarification upstream of the existing oxidation ditch. While clarifiers implement a different treatment mechanism than activated sludge treatment, they are sometimes capable of removing a similar percentage of BOD from the waste stream as biological treatment–reducing the capacity requirements for the downstream process. When compared to biological treatment, additional benefits include increased solids removal, lower energy costs, and smaller footprint within the site. The City also suggested primary clarifiers could act as a stabilization tank upstream of the existing oxidation ditch, helping to resolve issues with variable BOD loading described in Section 2.3.

The main drawback with incorporating primary clarifiers is that they limit the space on site for a future biological process expansion for secondary treatment redundancy. The existing oxidation ditch is currently limited in terms of capacity and has been in service for over 20 years. Also, as the equipment associated with the primary clarification ages, increasing amounts of maintenance will be required. Finally, tank covers and a dedicated odor control system may also be needed for the primary clarifiers.

### 6.1.2 Additional Oxidation Ditch + Third Secondary Clarifier

Biological treatment redundancy is recommended for all publicly owned wastewater treatment facilities, to allow for a tank to be taken out of service if maintenance is needed. Currently, with only one oxidation ditch, the City has no ability to empty the tank for maintenance or even inspection of the structure. If there were a catastrophic failure of the tank structure or any other major component of the oxidation ditch treatment system, the City would be in violation of their NPDES permit until the situation is remedied.

To provide this system redundancy, the other alternative is the installation of a second oxidation ditch. Drawbacks of this approach are that it would take more energy than primary clarification, and it has a larger site footprint than two primary clarifiers, resulting in higher life-cycle costs. In addition, there would be times when the influent loading to the WWTP would be more than one tank could handle but lower than two tanks might need for stable operation. To mitigate these potential issues



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with variable loading, the City could consider incorporating other equalization measures, such as a contact stabilization operating strategy, or selector zones upstream. Expanded oxidation would also produce less odors than primary clarification.

### 6.1.3 Downstream Impacts

Digestion will be incorporated downstream of the secondary process and is discussed in Section 7. While this process is separate from primary and secondary treatment, it is impacted by the type of technology incorporated upstream. Primary clarification would produce primary sludge, which is beneficial for anaerobic digestion and production of biogas. Conversely, WAS from secondary treatment has minimal biogas production potential in anaerobic digestion. If there are no primary clarifiers, anaerobic digestion is typically nonviable. Accordingly, the additional oxidation ditch alternative is associated with aerobic digestion rather than anaerobic digestion.

## 6.2 Site Planning

Preliminary locations for equipment and associated piping associated with the two alternatives are shown in Appendix F for consideration. The additional facilities associated with Alternative 1 and Alternative 2 could be installed north of the existing facilities within a defined setback area from the property line. The area to the east of the existing ditch was also explored for expansion potential, however the steep slopes present in this direction would require significant earthwork to accommodate the required elevations for the proposed equipment.

For costing and consideration of the Primary Clarification + Third Secondary Clarifier alternative, two rectangular clarifiers would be located east of the headworks building and north of the existing oxidation ditch–each tank 16 feet wide by 80 feet long. The primary clarifier footprint would be significantly less than a second oxidation ditch. For the Additional Oxidation Ditch + Third Secondary Clarifier alternative, the additional oxidation ditch was assumed to be located in the same location as the primary clarifiers and the same size as the existing oxidation ditch.

The third secondary clarifier is proposed to be located directly south of the two existing clarifiers–south of the fence line–to minimize lengths of site piping and streamline pumping between the existing and future clarifiers.

Figure 6-1 shows the Additional Oxidation Ditch plus Third Secondary Clarifier alternative for reference.



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**Figure 6-1. Updated proposed oxidation ditch and clarifier locations**

## 6.3 Costs

The anticipated construction costs for liquid stream alternatives are included in Appendix C and summarized in Table 6-1.



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| Table 6-1. Liquids Alternatives Construction Costs | | |
|---|---|---|
| Project Element | Alternative 1: Primary Clarifiers + Third Secondary Clarifier | Alternative 2: Second Oxidation Ditch + Third Secondary Clarifier |
| Primary Clarifiers/Oxidation Ditch | $8,100,000 | $9,100,000 |
| Secondary Clarifier | $6,300,000 | $6,300,000 |
| PS or RAS/WAS Pumping Station | $1,200,000 | $1,200,000 |
| PE Distribution Box or RAS Mixing Box | $200,000 | $200,000 |
| ML Splitter Box | $400,000 | $400,000 |
| Site Upgrades | $800,000 | $800,000 |
| Site Piping | $3,400,000 | $3,700,000 |
| Electrical | $5,300,000 | $5,500,000 |
| **Total** | $25,600,000 | $ 27,200,000 |

Summarized life-cycle costs are presented in Table 6-2.

| Table 6-2. Liquids Process Life-cycle Costs | | |
|---|---|---|
| Life-cycle Cost | Alternative 1: Primary Clarifiers + Third Secondary Clarifier | Alternative 2: Second Oxidation Ditch + Third Secondary Clarifier |
| Labor | $1,080,000 | $1,200,000 |
| Electricity | $650,000 | $2,300,000 |
| **Yearly Totals:** | **$1,730,000** | **$3,500,000** |

*a. Life-cycle cost analysis base assumptions:*

*- Electrical costs: $0.0464 per kWH (September-March), $0.0413 per kWH (April-August), $10.38 per KW peak demand.*

*- Labor costs: $45,000 per FTE.*

*- Life-cycle costs cover a 20-year period with an escalation rate of 3.55% and a discount rate of 2.50%. Analysis was performed in 2023.*

*b. Life-cycle cost comparisons were performed in 2023 and have not been updated to 2025 pricing.*

## 6.4 Recommended Improvements

The alternatives evaluations for the liquids process and solids process were considered together and included non-cost criteria due to their complexity and connectivity to each other. For additional details on this evaluation, see Section 9.2.

Alternative 2, reflecting expansion of biological treatment by incorporating a second oxidation ditch and the addition of a third secondary clarifier is recommended for implementation due to recommended reliability and redundancy guidelines for secondary treatment. Despite the higher cost, this alternative will provide improved operational flexibility and industry standard reliability.

Capacity analyses suggest one additional oxidation ditch and one additional secondary clarifier will be sufficient to serve projected increased flows. These expansions will require additional RAS/WAS pumping and site piping to facilitate process flows between the additional equipment. An expanded process flow diagram is shown on Figure 6-2; red linework shows proposed additions to the existing network shown in black.



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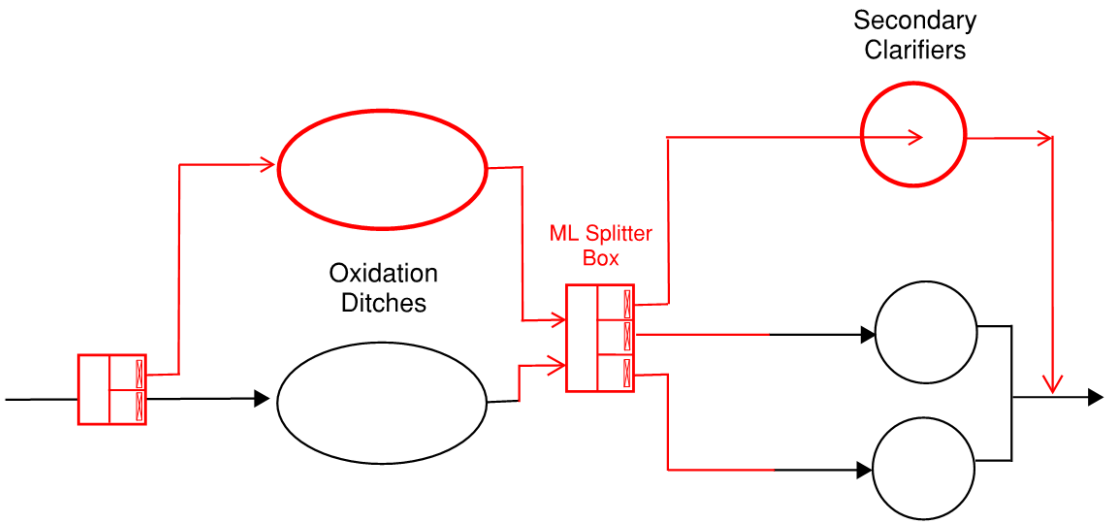


**Figure 6-2. Proposed secondary treatment process flow diagram**

Flows would be distributed between the two oxidation ditches and three clarifiers using a mixed liquor splitter box. For the purposes of this analysis, the existing mixed liquor splitter box was assumed to be abandoned or demolished after construction of an entirely new splitter box. While process capacity is expanded overall, the ability to distribute flows also provides additional redundancy in case process equipment is taken out of service for maintenance or other unexpected shutdowns. Downstream of the clarifiers, a RAS flow mixing box (not shown) is also recommended to distribute RAS back to the oxidation ditches and WAS to the downstream solids process.



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Section 7

# Solids Stream Alternatives Evaluation

This section presents key alternatives for solids facility improvements and recommends additional processes to be incorporated into the Vance Avery wastewater treatment plant (WWTP).

## 7.1 Biosolids Regulations

Biosolids are the nutrient-rich organic material resulting from the treatment of sewage at domestic WWTPs. Through biosolids management, solid residue from the wastewater treatment process is treated to reduce or eliminate pathogens and minimize odors, forming a safe, beneficial product for land application or disposal.

Biosolids are regulated by both the U.S. Environmental Protection Agency (EPA) and Oregon Department of Environmental Quality (DEQ) to ensure quality standards are met. EPA's regulations can be found in 40 Code of Federal Regulations (CFR) Part 503 (Part 503) and DEQ's Chapter 340 Division 50 of the Oregon Administrative Rules (OARs) (Division 50). Regulations address pollutant concentrations, pathogen content, odor potential, and basic operational practices. Beneficial reuse of biosolids has long been preferred over historical disposal practices such as incineration or landfilling.

Land application practices and marketable biosolids products are encouraged, as an alternative to disposal, by state and federal regulatory authorities. Numerous publications from EPA and regional academic institutions such as Oregon State University, Washington State University, and University of Washington provide valuable information regarding biosolids management practices. DEQ's December 2005 biosolids guidance titled, "Implementing Oregon's Biosolids Program Internal Management Directive" (Biosolids IMD) provides very useful information for permit writers and the public regarding how Oregon administers state and federal biosolids regulations.

Currently, approximately 95 percent of biosolids in Oregon are beneficially used as Class B biosolids via agricultural land application or as Class A Exceptional Quality (EQ) biosolids as a marketable product (e.g., compost). Overall, there tends to be a slight reduction in biosolids beneficial use primarily because of the loss of farmland to development and decrease in public acceptance of Class B biosolids land application. There is an increasing trend, however, in the implementation of Class A EQ biosolids programs due to the decrease in available Class B biosolids land application sites. Overall, the regulatory outlook for biosolids management in Oregon remains supportive but there is a trend toward use of Class A EQ biosolids, and the additional flexibility presented to municipalities in markets for the end product.

### 7.1.1 Federal Regulations

Biosolids treatment for disposal and beneficial use is regulated at the federal level by the EPA to ensure quality standards are met. Promulgated in 1993, the Part 503 regulations set forth quality standards so that biosolids are protective of human health and the environment. Under these regulations, biosolids must meet risk-based pollutant limits and controls for pathogen reduction and



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vector attraction reduction (VAR). The rules also describe the requirements for land application, monitoring, testing, and reporting.

The federal regulations define two classes of biosolids based on pathogen reduction (i.e., Class B and Class A). Class B biosolids are treated but still contain detectable levels of pathogens. When utilizing Class B biosolids for land application, the site must be permitted. Agronomic application rates are specified and buffer requirements, public access restrictions, and crop harvesting restrictions must be met. This allows time for any pathogens that are present to be destroyed by environmental exposures to temperature changes, sunlight, drying, and competing soil microorganisms. Class A biosolids receive additional treatment and contain insignificant levels of pathogens. Class A biosolids that meet EQ standards have fewer restrictions on their use or sale to the public. Class A EQ biosolids meet the most stringent requirement for pathogens (Class A), vector control, pollutant concentrations, and are safe for unregulated use. In most cases, when a facility refers to producing a "Class A biosolids product" they meet the EQ designation as well. A review of Newport's biosolids quality testing data indicates the plant will likely meet the EQ standards in the future.

The following sections describe requirements for treating biosolids to reduce pathogens, VAR, pollutant concentrations (e.g., metals) as well as requirements for sampling and monitoring.

### 7.1.2 Class A Pathogen Reduction Requirements

Pathogen reduction can be achieved by treating solids prior to beneficial use or disposal and through environmental attenuation. Treatment processes are available that use a variety of approaches to reduce pathogens in solids making it a less effective medium for microbial growth (EPA, 2003). The 40 CFR Part 503 lists treatment technologies that are judged to produce biosolids with pathogens sufficiently reduced to protect public health and the environment. The regulation also allows the use of any other technologies that produce biosolids with adequately reduced pathogens as demonstrated through microbiological monitoring.

There are six alternative methods for demonstrating Class A pathogen reduction. The objective of these requirements is to reduce pathogen densities to below detectable limits. In addition to undergoing a treatment process, Class A biosolids must also be tested for bacteria. Class A biosolids must meet one of the following bacteria limits and one of the process treatment alternatives:

Biosolids must comply with one of the following bacteria limits:

- Fecal coliform is less than 1,000 Most Probable Number (MPN) per gram of total solids (dry weight).
- *Salmonella sp*. Bacteria density is less than 3 MPN per 4 grams total solids (dry weight).

Biosolids must meet one of the following treatment alternatives:

- Maintain the sludge at the time, temperature, and percent solids determined by using the formula in EPA Class A Alternative 1, per 503.32(a)(3).
- Maintain the temperature of the sludge above 52 degrees Celsius (°C) (126 degrees Fahrenheit [°F]) for 72 hours. The sludge must be above pH 12. Air dry the sludge to 50 percent solids or higher, EPA Class A Alternative 2, per 503.32(a)(4).
- Use a Process to Further Reduce Pathogens (PFRP) or equivalent treatment process approved by the permitting authority, EPA Class A Alternative 5 or 6, per 503.32(a)(7) and (8), and as listed in Table 7-1.



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| Table 7-1. Process to Further Reduce Pathogens | |
|---|---|
| **Process** | **Requirements** |
| Composting | Using either the within-vessel composting method or the static aerated pile composting method, the temperature of sewage sludge is maintained at 55 °C (131 °F) or higher for 3 consecutive days. Using the windrow composting method, the temperature of the sewage sludge is maintained at 55 °C (131 °F) or higher for 15 consecutive days or longer. During the period when the compost is maintained at 55 °C (131 °F) or higher, there shall be a minimum of five turnings of the windrow. |
| Heat Drying | Sewage sludge is dried by direct or indirect contact with hot gases to reduce the moisture content of the sewage sludge to 10 percent or lower. Either the temperature of the sewage sludge particles exceeds 80 °C (176 °F) or the wet bulb temperature of the gas in contact with the sewage sludge as the sewage sludge leaves the dryer exceeds 80 °C (176 °F). |
| Heat Treatment | Liquid sewage sludge is heated to a temperature of 180 °C (356 °F) or higher for 30 minutes. |
| Thermophilic Aerobic Digestion | Liquid sewage sludge is agitated with air or oxygen to maintain aerobic conditions and the mean cell residence time (MCRT) (i.e., the solids retention time) of the sewage sludge is 10 days at 55 °C (131 °F) to 60 °C (140 °F). |
| Beta Ray Irradiation | Sewage sludge is irradiated with beta rays from an electron accelerator at dosages of at least 1.0 megarad at room temperature (ca. 20 °C [68 °F]). |
| Gamma Ray Irradiation | Sewage sludge is irradiated with gamma rays from certain isotopes, such as Cobalt 60 and Cesium 137, at dosages of at least 1.0 megarad at room temperature (ca. 20 °C [68 °F]). |
| Pasteurization | The temperature of the sewage sludge is maintained at 70 °C (158 °F) or higher for 30 minutes or longer. |

### 7.1.3 Class B Pathogen Reduction Requirements

The alternatives for Class B biosolids consist of either a treatment process, such as a Process to Significantly Reduce Pathogens (PSRP) or a fecal coliform bacteria limit. Biosolids must comply with the following bacteria limit:

- The geometric mean of the density of fecal coliform must be less than 2,000,000 MPN, per gram of total solids (dry weight).

Solids must undergo one of the PSRPs listed in Appendix B of 40 CFR Part 503 or an equivalent treatment method approved by the permitting authority (Table 7-2).

| Table 7-2. Process to Significantly Reduce Pathogens | |
|---|---|
| **Process** | **Requirements** |
| Aerobic Digestion[a] | Sewage sludge is agitated with air or oxygen to maintain aerobic conditions for a specific MCRT (i.e., solids retention time) at a specific temperature. Values for the MCRT and temperature shall be between 40 days at 20 °C (68 °F) and 60 days at 15 °C (59 °F). |
| Air Drying | Sewage sludge is dried on sand beds or on paved or unpaved basins. The sewage sludge dries for a minimum of three months. During two of the three months, the ambient average daily temperature is above 0 °C (23 °F). |
| Anaerobic Digestion | Sewage sludge is treated in the absence of air for a specific MCRT (i.e., solids retention time) at a specific temperature. Values for the MCRT and temperature shall be between 15 days at 35 °C to 55 °C (131 °F) and 60 days at 20 °C (68 °F). |
| Composting | Using either the within-vessel, static aerated pile, or windrow composting methods, the temperature of the sewage sludge is raised to 40 °C (104 °F) or higher and remains at 40 °C (104 °F) or higher for 5 days. For 4 hours during the 5-day period, the temperature in the compost pile exceeds 55 °C (131 °F). |
| Lime Stabilization | Sufficient lime is added to the sewage sludge to raise the pH of the sewage sludge to 12 for ≥2 hours of contact. |

*a. The recommended aerobic digester will be sized for a MCRT of 25 days at a minimum operating temperature of 20 °C at design year conditions. This does not meet the requirements for a PSRP to achieve Class B biosolids but does provide some stabilization ahead of the Class A systems discussed in this section while maintaining good dewatering characteristics.*



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### 7.1.4 Vector Attraction Reduction Requirements

The pathogens in biosolids may pose a disease risk only if there are routes by which the pathogens are brought into contact with humans or animals (EPA, 2003). A primary route for transport of pathogens is vector transmission. Vectors are any living organism capable of transmitting a pathogen from one organism to another either mechanically or biologically by playing a specific role in the life cycle of the pathogen. Vectors for pathogens would most likely include insects, rodents, and birds. The VAR is accomplished by implementing one of the following:

- Biological processes which breakdown volatile solids, reducing the available nutrients for microbial activities and odor producing potential.
- Chemical or physical conditions which stop microbial activity.
- Physical barriers between vectors and volatile solids in the solids.

The term "stability" is often used to describe sewage sludge or biosolids. Although it is associated with VAR, stability is not regulated by 40 CFR Part 503. Stability is generally defined as the point at which food for microbial activity is no longer available (EPA, 2003). Solids which are stable will generally meet VAR but there are exceptions. Because stability is also related to odor generation and the continued degradation of solids, it is often considered an important parameter when producing Class A EQ biosolids for sale or distribution. Solids must undergo one of the VAR options set forth in 40 CFR Part 503, listed in Table 7-3.

**Table 7-3. Vector Attraction Reduction Options**

| VAR Option | Requirements | Most Appropriate for the Following |
|---|---|---|
| #1-503.33(b)(1) | At least 38% reduction in volatile solids during sewage sludge treatment. | Sewage sludge processed by anaerobic or aerobic biological treatment. |
| #2-503.33(b)(2) | Less than 17% additional volatile solids loss during bench-scale anaerobic batch digestion of the sewage sludge for 40 additional days at 30 °C to 37 °C (86 °F to 99 °F). | Only for anaerobically digested sewage sludge that cannot meet the requirements of Option 1. |
| #3-503.33(b)(3) | Less than 15% additional volatile solids reduction during bench-scale aerobic batch digestion for 30 additional days at 20 °C (68 °F). | Only for aerobically digested liquid sewage sludge with 2% or less solids that cannot meet the requirements of Option 1 (e.g., sewage sludges treated in extended aeration plants). Sludges with 2% or greater solids must be diluted. |
| #4-503.33(b)(4) | Specific oxygen uptake rate (SOUR) at 20 °C (68 °F) is ≤ 1.5 mg oxygen/hr/g total sewage sludge solids. | Liquid sewage sludges (2% or less solids) from aerobic processes run at temperatures between 10 to 30 °C (50 to 86 °F) (should not be used for composted sewage sludges). |
| #5-503.33(b)(5) | Aerobic treatment of the sewage sludge for at least 14 days at over 40 °C (104 °F) with an average temperature of over 45 °C (113 °F). | Composted sewage sludge (For sewage sludges from other aerobic processes, it will likely be easier to meet Option 3 or 4.) |
| #6-503.33(b)(6) | Addition of sufficient alkali to raise the pH to at least 12 at 25 °C (77 °F) and maintain a pH ≥ 12 for 2 hours and a pH ≥ 11.5 for 22 more hours. | Alkali-treated sewage sludge (alkaline materials include lime, fly ash, kiln dust, and wood ash). |
| #7-503.33(b)(7) | % solids ≥ 75% prior to mixing with other materials. | Sewage sludges treated by an aerobic or anaerobic process (i.e., sewage sludges that do not contain unstabilized solids generated in primary wastewater treatment). |
| #8-503.33(b)(8) | % solids ≥ 90% prior to mixing with other materials. | Sewage sludges that contain unstabilized solids generated in primary wastewater treatment (e.g., heat-dried sewage sludges). |



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| Table 7-3. Vector Attraction Reduction Options | | |
|---|---|---|
| VAR Option | Requirements | Most Appropriate for the Following |
| #9-503.33(b)(9) | Sewage sludge is injected into soil so that no significant amount of sewage sludge is present on the land surface 1 hour after injection, except Class A biosolids which must be injected within 8 hours after the pathogen reduction process. | Sewage sludge applied to the land or placed on a surface disposal site. Domestic septage applied to agricultural land, a forest, or a reclamation site, or placed on a surface disposal site. |
| #10-503.33(b)(10) | Sewage sludge is incorporated into the soil within 6 hours after application to land or placement on a surface disposal site, except Class A biosolids which must be applied to or placed on the land surface within 8 hours after the pathogen reduction process. | Sewage sludge applied to the land or placed on a surface disposal site. Domestic septage applied to agricultural land, forest, or a reclamation site, or placed on a surface disposal site. |

### 7.1.5 Pollutant Concentration Requirements

Biosolids for beneficial use must meet risk-based pollutant limits to protect public health and the environment. The 40 CFR Part 503 rules (Section 503.13) set regulatory limits for certain pollutants (metals) and requires biosolids be used in accordance with approved management practices including operational standards, monitoring, recordkeeping, and reporting.

The nine pollutants regulated are arsenic (As), cadmium (Cd), copper (Cu), lead (Pb), mercury (Hg), molybdenum (Mo), nickel (Ni), selenium (Se), and zinc (Zn). These limits determine how Oregon regulates land application under a permit. The regulatory limits are included in the sections to follow.

#### 7.1.5.1 Ceiling Concentration Limits

This is the maximum concentration of each pollutant allowed in biosolids for beneficial use. According to 40 CFR Part 503, biosolids containing any pollutant that exceeds the Ceiling Concentration Limits (CCLs) cannot be beneficially used. This is also known as EPA Table 1, which is shown in the second column of Table 7-4 below.

#### 7.1.5.2 Cumulative Pollutant Loading Rate

The Cumulative Pollutant Loading Rate (CPLR) is the maximum amount of a pollutant that can be applied to a site over its lifetime by all biosolids applications meeting ceiling concentration limits. Biosolids applications must be discontinued when any one of the pollutants reaches its maximum CPLR. This is also known as EPA Table 2, which is shown in the third column of Table 7-4 below.

#### 7.1.5.3 Pollutant Concentration Limits

The Pollutant Concentration Limits (PCLs) are used along with the pathogen reduction and VAR requirements as quality standards for EQ biosolids. Biosolids with pollutant concentrations below the PCLs can be sold or given away without a permit from EPA or DEQ. However, these Class A EQ biosolids must still be land-applied at agronomic rates. Biosolids with pollutant concentrations above the PCL require a permit, applied at an agronomic rate, and the cumulative amounts of pollutants must be tracked. This is also known as EPA Table 3, which is shown in the fourth column of Table 7-4 below.

#### 7.1.5.4 Annual Pollutant Loading Rate

The Annual Pollutant Loading Rate (APLR) sets the maximum amount of a pollutant that can be applied during a 365-day period. These rates apply to non-EQ biosolids. This is also known as EPA Table 4, which is shown in the fifth column Table 7-4 below.



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| Table 7-4. Pollutant Limits and Loading rates for Biosolids | | | | |
|---|---|---|---|---|
| Pollutant[a] | Ceiling Concentration Limits, EPA Table 1 (mg/kg)[b] | Cumulative Pollutant Loading Rate Limits, EPA Table 2 (mg/kg)[b] | Pollutant Concentration Limits, EPA Table 3 (mg/kg)[b] | Annual Pollutant Loading Rate Limits, EPA Table 4 (mg/kg/365-d-period)[b] |
| Arsenic | 75 | 41 | 41 | 2.0 |
| Cadmium | 85 | 39 | 39 | 1.9 |
| Copper | 4,300 | 1,500 | 1,500 | 75 |
| Lead | 840 | 300 | 300 | 15 |
| Mercury | 57 | 17 | 17 | 0.85 |
| Molybdenum | 75 | —c | —c | —c |
| Nickel | 420 | 420 | 420 | 21 |
| Selenium | 100 | 100 | 100 | 5.0 |
| Zinc | 7,500 | 2,800 | 2,800 | 140 |

*a. Source: EPA 40 CFR Part 503; University of Georgia Extension (March 2017).*

*b. Dry-weight basis: mg/kg (milligrams per kilogram); kg/ha (kilograms per hectare).*

*c. February 25, 1994, 40 CFR Part 503 Rule Amendment deleted the molybdenum limits but retained the molybdenum CCL.*

### 7.1.6 Oregon State Regulations

In addition to federal requirements, DEQ also implements regulations overseeing biosolids management in Oregon. OAR 340-050 incorporates all the legal requirements in 40 CFR Part 503 but goes further to require specific plans for land application, best management practices (e.g., setbacks), and additional public notice requirements.

In Oregon, biosolids are regulated under DEQ's water quality program through a water quality permit (NPDES or Water Pollution Control Facility permit), a biosolids management plan, and land application site authorization letters. The permit, management plan, and site authorization letters are specific to a facility and include conditions relevant to both state and federal regulations. The conditions in the management plan and site authorization letters are considered an integral part of the permit and thus are enforceable. Oregon's biosolids regulations are more restrictive than federal regulations.

Each permit is open for public comment when the facility's permit is renewed. The facility's biosolids management plan is also open for public comment when the facility's permit is renewed and anytime there are significant changes to the management plan. The public comment period is at least 30 or 35 days depending on the type of permit.

### 7.1.7 Future Biosolids Regulations

As part of this project, Kennedy Jenks (KJ) contacted DEQ's biosolids program staff to discuss their opinion regarding current and future trends in biosolids management. The staff at DEQ mentioned there is a general trend of moving from Class B to Class A EQ programs in Oregon. The trend allows more flexibility in biosolids product use, protects against any unforeseen regulatory changes, and addresses common public perception issues encountered with Class B land application. Also, there is continued public perception challenges on the Oregon Coast. Concerns are focused on odor, emerging contaminants, and lack of regulatory oversight.



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When discussing potential future regulatory requirements, DEQ staff stated they did not foresee any immediate changes to OAR 340-050. However, they are intending on issuing a general permit for biosolids land application to allow facilities an additional option for permitting beneficial use.

The DEQ believes that much of the challenge associated with managing biosolids is the result of increased growth in rural areas. The urbanization of the Willamette Valley will continue to result in less local Class B land application sites and thus, more reliance on distant land application or Class A options for municipalities. On a federal level, new requirements will be implemented requiring utilities to test for per- and polyfluoroalkyl substances (PFAS).

The DEQ has designated PFAS as one of 60 priority chemicals or chemical classes for its Toxics Reduction Strategy. In addition, DEQ is working with the Oregon Health Authority (OHA) and other federal, state, and local agencies to address growing public health and environmental concerns. DEQ and OHA are evaluating appropriate policy responses to protect public health and the environment from PFAS contamination.

DEQ air, land, and water programs are taking the following steps to address PFAS:

- Identifying sites that may use PFAS in their operations.
- Overseeing site testing and assessment of impacts. This may include biosolids land application sites.
- Using newly developed analytical methods for testing for PFAS in water and working with the EPA and other agencies to develop testing methods for soil and biosolids.
- Using Cleaner Air Oregon's data on requested toxic pollutant emissions reports from industries that included PFAS.

## 7.2 Solids Alternative Descriptions

This section presents process descriptions for Hauled Waste Receiving, Thickening, Stabilization, Dewatering, and Class A Biosolids Treatment. Sizing and design criteria for the solids processes described this this section are included in the August 2022 Solids Stream Basis of Design and September 2022 Centrifuge Replacement Evaluation TMs prepared by KJ, included as Appendix J and Appendix E, respectively.

### 7.2.1 Hauled Waste

A new, packaged hauled waste system to receive septage trucked to the WWTP is included with each solids stream alternative evaluated in this report. The packaged system includes a truck unloading station, with an optional ticketing system for tracking loads. The proposed system is based on a Huber RoFas packaged receiving system which includes a 10-millimeter (mm) rotary drum screen, washer compactor, and grit and grease removal equipment. An optional rock trap can also be provided. An example installation of the Huber RoFas system is shown on Figure 7-1.



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**Figure 7-1. Huber RoFas packaged hauled waste system**

*(Source: Huber)*

### 7.2.2 Stabilization

As discussed in Section 3.6, the current RDP Lime Stabilization system is reaching the end of its useful life, parts and support are increasingly difficult to obtain, and the system is not adequately sized for future biosolids production rates. The solids master planning effort has evaluated the following alternatives regarding stabilization:

1. **Lime Stabilization (base case scenario)**–Dewatered WAS would continue to be lime stabilized.
2. **No Stabilization**–Dewatered WAS would be discharged to an alternate Class A biosolids process, such as composting or indirect, belt dryer.
3. **Aerobic Digestion**–Thickened WAS would be discharged to an aerobic digester, capable of producing either Class A or B biosolids. The evaluation is based on conventional aerobic digestion. Alternatives such as Autothermal Thermophilic Aerobic Digestion are not evaluated due to high energy demands and odor potential associated with these processes.
4. **Anaerobic Digestion**–Thickened WAS would be discharged to an anerobic, mesophilic digester capable of producing Class A or B biosolids. Alternatives such as Thermophilic digestion and Thermal Hydrolysis pre-treatment were not evaluated.

Due to the issues with the existing RDP system discussed in Section 3.6, continued lime stabilization was eliminated from further consideration as its continued use is not feasible in the long term due to poor biosolids quality and difficulty obtaining support to maintain the equipment.

The production of Class A biosolids can be achieved without stabilization by either sufficiently drying the dewatered WAS or achieving volatile solids reduction through amending with a substrate and aerating. Belt dryers that heat solids indirectly and composting are evaluated in this report as Class A treatment alternatives. The lack of a stabilization step does not negatively impact the quality of the finished compost product; however, dried solids that have not been stabilized can be odiferous when re-wetted. The lack of a stabilization step also results in more solids that needs to be handled. For these reasons, solids alternatives that do not include stabilization were eliminated from further consideration.



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#### 7.2.2.1 Aerobic Digestion

In addition to improving odor characteristics and reducing the volume of handled materials, digestion provides additional treatment which improves the consistency of the finished product as well as the performance of downstream processes, such as dewatering and Class A drying.

Aerobic digestion is defined as the biological conversion of organic matter in the presence of air or oxygen. During aerobic digestion, bacteria convert organic matter to carbon dioxide, water, ammonia, new cellular biomass, and energy through oxidation. In the presence of adequate oxygen and declining food supply, the microorganisms convert their own protoplasm to energy that is used for cell maintenance purposes also known as endogenous metabolism. It is typically used at plants that have flow rates less than 5 mgd, but it has been installed at larger plants. The process requires higher energy to operate aeration equipment compared with anaerobic digestion. The space requirement is also slightly higher than anaerobic digestion, but the process is considered more stable under variable feed conditions and less labor intensive to operate.

Figure 7-2 shows an example of a rectangular aerobic digester.

**Figure 7-2. Aerobic Digester**

*(Source: Ovivo)*

Aerobic digestion can be used as a part of biosolids processing system to produce Class A and Class B biosolids, and is specifically discussed in EPA's biosolids regulations:

- **40 CFR 503.32(b)(3)**–Aerobic digestion is allowed as a PSRP to satisfy the pathogen reduction requirements for Class B biosolids. MCRT and temperature must be between 40 days at 20 °C (68 °F) and 60 days at 15 °C (59 °F).
- **40 CFR 503.33(b)(1)**–When aerobic digestion achieves a minimum volatile solids destruction of 38 percent, it may be used to satisfy the VAR requirements of this regulation.
- **40 CFR 503.33(b)(3)**–When aerobic digestion does not achieve a minimum volatile solids destruction of 38 percent, additional bench testing may be used to satisfy VAR requirements of this regulation.



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**Aerobic Digestion Process Considerations.** Conventional aerobic digestion uses air to transfer oxygen to the sludge to facilitate the cell reproductive process. Oxygen requirements are typically based on volatile solids destruction requirements. Oxygen transfer is typically achieved through diffused air but can also be supplied by submersible jet aeration. Target (DO concentrations are between 0.4 and 1.0 parts per million (ppm) and 1.4 pounds of oxygen per pound of volatile suspended solids (VSS) destroyed. Ammonia is oxidized to nitrate in the aerobic process, causing reduced alkalinity and pH. Typically, the air is cycled off to promote denitrification and lower the nitrate concentrations in the return stream, which also stabilizes the alkalinity and raises the pH by producing carbon dioxide.

Mixing of the aerobic digester can lead to higher levels of air diffusion depending on the configuration of the digester and is typically required to keep solids from settling out of suspension. Mixing of the digester can be achieved by mechanical devices such as surface mounted or submersible mixers, jet (pump) mixing, or draft tubes. Jet mixing can be accomplished with submersible pumps or using pumps external to the tank and connected to an eductor mixing system.

Odors from new aerobic digesters will be less than the existing reactor because the digester will be designed to handle the plant's solids quantities and typically would remain uncovered. However, covering the aerobic digesters can provide benefits:

- Temperatures can be maintained slightly higher in winter to achieve the desired volatile solids destruction in less time.
- Improved operations and maintenance (O&M) access to any location at the tank top over a standard open top tank configuration with perimeter walkways.

Biological activity in the digester leads to the breakdown of cellular material and soluble BOD remaining in the WAS and hauled waste. Byproducts of the reaction are nitrate (conversion from ammonia by nitrification), water and hydrogen ions. The reaction kinetics follow a first order decay rate, which varies based on temperature. The optimal temperature for aerobic digestion ranges between 20 °C (68 °F) and 35 °C (95 °F). At temperatures below 10 °C (50 °F) biological activity is severely reduced, and nitrification is inhibited.

Class B biosolids requirements to provide a 40-day MCRT during the maximum loading condition projected for year 2040 indicate a tank volume of 0.28 million gallons (MG) would be required based on the projected solids and hauled waste loads. A covered digester is assumed to better maintain a temperature of at least 20 °C (68 °F). The tank may also be partitioned and run with a 25-day MCRT ahead of a Class A process to maintain optimum dewaterability. By constructing sufficient volume to provide a 40-day MCRT, the plant would be able to produce Class B biosolids if the Class A treatment system was offline for an extended period.

Often municipalities may operate at shorter residence times of 20 to 30 days and still meet Class B based on SOUR or bench testing. The SOUR test is based on the biosolids consuming very little oxygen, which indicates their value as a food source to microorganisms is very low and therefore active microbes are unlikely to be attracted to them. This test is only applicable to liquid aerobic biosolids sampled from an aerobic process.

Research conducted on similar plants running aerobic digesters in Washington State with conventional secondary treatment found an average SRT of 30 days or less is required to achieve Class B VAR requirements based on SOUR testing results. The cities of Shelton (28-29 days SRT), and Gig Harbor, Washington (20-25 days SRT), operate aerobic digesters at an average SRT of less than 30 days. Given the City intends to meet Class A requirements, the need to make Class B biosolids will only be for times when the Class A treatment system is down for extended maintenance.



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Extended residence time in the digester to achieve Class B can also create issues with dispersed floc, due in part to the release of soluble proteins and polysaccharides from the breakdown of cellular material, making subsequent dewatering of the biosolids more difficult. Studies have shown that addition of positively charged ions such as calcium or magnesium can improve floc formation and dewaterability in aerobic digesters (Murthy and Novak, 1999) and (Novak, et al, 1998). The addition of calcium or magnesium is not likely to be required given the ability to control cell residence time in the digester and operate on a shorter MCRT of 25 days. If calcium or magnesium were required to improve dewaterability, these chemicals would be added periodically using bulk bags and are not assumed to be liquid metering systems.

**Advantages and Disadvantages of Aerobic Digestion**. The advantages and disadvantages of aerobic digestion are summarized in Table 7-5.

**Table 7-5. Aerobic Digestion–Advantages and Disadvantages**

| Advantages | Disadvantages |
|---|---|
| • Ability to meet Class B biosolids at ambient temperatures, likely without chemical addition<br>• Relatively simple operational control, amenable to variations in sewage sludge feed composition<br>• It is a common treatment technology for small to medium sized wastewater treatment facilities, and thus excellent operational knowledge exists in the industry<br>• Volatile solids destruction exceeding 38%<br>• or demonstrating required stabilization by alternative testing methods<br>• Relatively low strength recycle stream as compared with anaerobic digestion<br>• Improved safety without the generation of methane (as compared with anaerobic digestion)<br>• Limited equipment to maintain | • High energy and capital cost requirements for aeration<br>• Extended retention times to meet PSRP requirements<br>• Dispersed floc can sometimes be difficult to dewater at higher SRT<br>• Stabilization is reduced at colder water temperatures (i.e., winters in the Pacific Northwest) resulting in the need for longer detention times or addition of covers to help maintain temperature<br>• Larger volume required compared to anaerobic digestion<br>• No ability to harvest or reuse biogas |

### 7.2.2.2 Anaerobic Digestion

Anaerobic digestion is a biological process in which anaerobic bacteria convert organic matter into methane and carbon dioxide (sometimes called biogas) in the absence of air. The process stabilizes the organic matter in wastewater solids, reduces pathogens and odors, and reduces the total solids quantity. Solids are reduced by converting the volatile solids fraction of the wastewater into biogas. Digesters run at mesophilic temperature ranging between 30 to 38 °C (85 to 100 °F) or thermophilic temperature ranging between 49 to 60 °C (120 to 140 °F) which result in solids destruction. Thermophilic digestion can produce Class A biosolids and has higher biogas outputs than conventional mesophilic digestion. Figure 7-3 shows an example of an anerobic digester.


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**Figure 7-3. Anaerobic digester**

Anaerobic digestion generally requires less tank volume than aerobic digestion and produces biogas as a byproduct of the anaerobic decomposition process. However, the mesophilic anaerobic process evaluated requires a biogas or natural gas-fired sludge heating system to maintain sludge temperatures at 30 to 38 °C (86 to 100 °F) increasing the rate of digestion. When biogas is used to offset natural gas or electricity needs, the benefit can be significant and may offset some or all treatment facility energy costs.

Anaerobic digestion can be used as part of a biosolids processing system to produce Class A and Class B biosolids, and is specifically discussed in EPA's biosolids regulations:

- **40 CFR 503.32(b)(3)**–Anaerobic digestion is allowed as a PSRP to satisfy the pathogen reduction requirements for Class B biosolids. MCRT and temperature must be between 15 days at 35 to 55 °C (95 to 131 °F) and 60 days at 20 °C (68 °F).
- **40 CFR 503.33(b)(1)**–When anaerobic digestion achieves a minimum volatile solids destruction of 38 percent, it may be used to satisfy the VAR requirements of this regulation.
- **40 CFR 503.33(b)(2)**–When anaerobic digestion does not achieve a minimum volatile solids destruction of 38 percent, additional bench testing may be used to satisfy VAR requirements of this regulation.

**Anaerobic Digestion Process Considerations.** As stated, anaerobic digestion reduces the total solids quantity by converting part of the volatile solids fraction to biogas. Biogas, which is about 60-percent methane and 40-percent carbon dioxide, has historically been either used to power boilers, to heat digesters, used to run reciprocating engines to generate power, or flared. This process operates best under a constant homogeneous feed.

**Advantages and Disadvantages of Anaerobic Digestion.** The advantages and disadvantages of anaerobic digestion are summarized in Table 7-6.



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| Table 7-6. Anaerobic Digestion–Advantages and Disadvantages | |
|---|---|
| **Advantages** | **Disadvantages** |
| • Ability to meet Class B biosolids requirements at lower electrical cost and residence time.<br>• Generates biogas, which can be used for heating or renewable energy.<br>• Lower capital cost due to smaller tank volume required.<br>• Suitable for cold environments.<br>• Potential volatile solids destruction exceeding 55 percent.<br>• Could potentially allow acceptance of outside feedstocks for co-digestion (e.g., FOG and Food Waste) that would provide additional tipping fees and increase gas production. | • High operation and maintenance costs for sewage sludge heating and mixing equipment.<br>• Proper operation requires primary wasting, which is not currently available at the WWTP.<br>• Greater operational complexity; potential for upset and slow startup/recovery period following upsets.<br>• Safety risk due to handling of potentially explosive digester gas.<br>• Typically, most cost effective with primary or raw sewage sludge, where more "food" is available as opposed to more stabilized septage and hauled sewage sludge.<br>• Requires consistent and continuous solids feed for stability (not amenable to wide variability associated with hauled waste receiving).<br>• Greater potential for odor generation. |

## 7.2.3 Class A Treatment

Two key options are available for treatment of solids to a Class A product.

### 7.2.3.1 Compost

Composting is a treatment process that uses time and temperature to produce a final product that meets Class A pathogen reduction criteria and is highly marketable.

There are four general methods of composting including aerated static pile, covered aerated static pile (CASP), windrow, and in-vessel systems. Each method involves mixing dewatered biosolids with a "bulking material" to provide carbon and increase porosity. The resulting mixture is placed in a vessel or pile where microbial activity causes the temperature of the mixture to rise during the "active composting" period. The specific temperatures that must be achieved and maintained for successful composting vary based on the method and use of the biosolids end-product. After active composting, the material is screened, cured, and distributed for public use.

#### 7.2.3.1.1 Compost Bulking Materials and Ratios

A carbon source is a necessary component of a composting system because it provides the energy and predominant cellular mass for compost, along with the "nitrogen" derived from the biosolids that is consumed during the active composting process. In addition to the carbon and nitrogen materials, a "bulking agent" is added which allows air to flow through the compost mixture. Typically, the carbon source and bulking agent together are referred to as the "bulking material."

Ground wood waste, hog fuel, green waste, or yard debris are regularly used as carbon sources in composting operations. Primary compost feed stocks typically consist of an easily degradable carbon source. As a carbon source, the primary purpose of the wood waste material is to break down during the composting process and, thus, a finer grade of material is desirable. The use of yard debris as a primary carbon source is desirable when material is relatively free of grass clippings, plastics, metals, and other contaminants. Yard debris is typically ground to a finer degree prior to being added to a composting process.

The use of wood chips for a bulking agent requires a coarser grade of material that will be screened-out after composting and reused. In this case, the size and other characteristics of the wood chips must be tailored to the aeration system and other operational parameters.



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**Covered Aerated Static Pile Technology Summary (CASP).** For the purposes of this report, the CASP composting technology was considered. This technology was considered because it is a commonly used composting system proven to meet Class A regulatory requirements, and the final biosolids end-product is marketable for distribution to the public.

The CASP composting is a forced aeration composting system for treating blended piles of organic residuals. The CASP process utilizes the process of aerobic biological degradation to reduce pathogens and organic solids. Process airflow pushed through the piles provides adequate oxygen to support the microbial community while controlling the pile temperature. The CASP composting utilizes a cover (e.g., porous membrane or finished compost product) over the pile to control moisture levels, odor emissions, and reduce temperature variability. In addition, the capital costs for CASP are lower than aerated static piles (without covers) with fewer permanent structures required. The covered piles are aerated under positive and negative pressure using blowers with low energy requirements.

The CASP composting process takes place by means of controlled pressurized aeration in encapsulated windrow covers. A resultant insulating layer of air guarantees an even distribution of temperature in the body of the heap. The cover also works as a physical barrier against odors and other gaseous substances escaping from the composting material.

The aeration piping and leachate collection system are combined in an “in-floor” system with permanent aeration trenches. The aeration trenches have perforated metal lids and also serve as a leachate collection system. The biosolids composting process can take 6 to 8 weeks and occurs in three phases. The City of Albany’s CASP composting facility is shown on Figure 7-4.

**Figure 7-4. Compost facility**



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**Advantages and Disadvantages of Composting.** The advantages and disadvantages of composting are summarized in Table 7-7.

**Table 7-7. Composting–Advantages and Disadvantages**

| Advantages | Disadvantages |
|---|---|
| • Composting is a relatively simple, reliable technology.<br>• Composting is the most used technology for achieving Class A biosolids standards according to the EPA.<br>• Composting produces a highly marketable biosolids end-product that is typically well accepted by the public.<br>• Composting can be gradually phased in with additional compost piles added over time.<br>• There is sufficient space at the WWTP for a composting facility.<br>• The City may be able to secure the bulking agent at little to no cost. | • Total volume of Class A biosolids will be greater than other alternatives because of the addition of bulking material (e.g., wood chips and yard debris) needed for the composting process.<br>• The time required for the process to achieve Class A is the highest of the alternatives considered. |

### 7.2.3.2 Dryer

Thermal drying technology removes water via evaporation from dewatered biosolids, reducing the volume and weight. The high temperatures utilized by a dryer ensure that the EPA time and temperature requirements for Class A biosolids are met. Thermal drying typically results in a material with a solids content greater than 90 percent dry weight.

A thermally dried Class A EQ biosolids product has universal applications. The dried biosolids can supplement fuel in the drying process, can be land-applied for reclamation and other soil improvement projects, or blended with other materials to create fertilizer.

Thermal drying can be accomplished by one of two main drying technologies: indirect convection or indirect conduction dryers. Direct dryers expose the biosolids to open flame and are not considered further in this evaluation. Figure 7-5 shows an image of an indirect belt dryer.

**Figure 7-5. Indirect belt dryer**

*(Source: Centrisys)*



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**Advantages and Disadvantages of Drying.** The advantages and disadvantages of drying are summarized in Table 7-8.

**Table 7-8. Drying–Advantages and Disadvantages**

| Advantages | Disadvantages |
|---|---|
| • Thermal drying generates the least volume of biosolids because of the high solids concentration (>90 percent) and the absence of bulking agents such as lime or yard debris. This greatly reduces the amount of storage needed.<br>• The cost of transport is reduced due to the volume reduction of the product compared to other treatment methods. To haul the same quantity of biosolids, three to four times as many truckloads are required to transport dewatered biosolids compared to a dried product.<br>• Dryer facilities would be located at the WWTP site and do not require offsite land acquisition or lease agreements as is the case with composting.<br>• Biosolids end-product is highly stable and less voluminous when compared to lime pasteurized products.<br>• Biosolids end-product can be easily blended with landscape products (e.g., soil and compost mixes) to generate further markets of beneficial use.<br>• Dryers are a popular technology for achieving Class A biosolids throughout the globe.<br>• Several vendors that offer this technology. | • Adequate digestion is required to mitigate or eliminate the odor that can occur when a dried biosolids product is wetted in the environment.<br>• Drying is an energy intensive process and is thus very sensitive to changes in fuel costs and increased moisture due to poor dewatering. Drying will require a new natural gas service be constructed into the WWTP site. The high end of the range of gas consumption was used in the alternatives analysis presented in Section 7.4.<br>• The dryer can be operated intermittently, 16 hours per day, 4 days per week, which is preferred by the City based on current WWTP staffing. However, the dryer will operate with decreased energy efficiency due to daily heat up and cool down cycles, during which time the dryer will not be treating solids.<br>• Due to their high organic content, both the heat-drying end-product and the dust generated during production of the end-product are flammable, and precautions must be taken to design the heat-drying process, equipment, and storage to minimize the potential for explosion or fire. The dryer will be outfitted with classified electrical equipment that meets the hazard classification based on the National Fire Protection Association (NFPA) Publication 820, latest edition. |

## 7.2.4 Ancillary Processes

Sludge thickening and biosolids dewatering are recommended to be incorporated into the solids stream process, regardless of alternative selected.

### 7.2.4.1 Thickening

Sludge thickening is a physical process and is normally the first unit process in a plant's solids stream. The purpose of this unit process is to reduce the water content (increase solids concentration) of the WAS captured during the secondary clarification process. Thickening before sludge stabilization processes can aid in reducing the volume of tankage needed for downstream activities. For this report, thickening is included in the treatment alternatives with solids stabilization processes.

Solids thickening is achieved through physical separation of solid particles from liquid. The mechanism used for separation is often one of the following: centrifugal force, filtration, screening, sedimentation, or flotation. The effectiveness of the separation mechanism can depend upon hydraulic flow rate, solids loading rate, and the quantity of chemicals used for increasing particle size (e.g., polymer flocculation).

**Rotary Drum Thickener.** The use of rotary drum thickeners (RDTs) was assumed for this analysis. While there are other thickening technologies available, RDTs are more commonly used for new installations and are representative of the costs associated with thickening, as a whole. In addition, the relative cost difference in thickening operations between treatment train alternatives was expected to be the same regardless of thickening technology assumed. If thickening is needed for the selected treatment train alternative, other thickening processes will be considered during


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preliminary design and the advantages and disadvantages of each will be considered in more detail for the best fit for the WWTP.

RDTs are often used due to their mechanical simplicity, small footprint, low power requirements, and moderate capital cost. Sludge is conditioned with polymer before being introduced into a rotating drum screen. Free water drains through the screen openings and collects in a trough underdrain. Thickened sludge is conveyed through the rotating drum and out the discharge end via a continuous internal screw or angled flights. The drum is sometimes inclined to aid in dewatering.

A thickened solids content of 3 to 5 percent is typically obtained with RDTs, depending upon the solids concentration in the feed sludge. Polymer addition in the range of 8 to 12 lbs per dry ton is required for optimum thickening and represents most of the operational costs. Between 93 to 99 percent of solids are retained with this process. The unit is typically monitored whenever it operates to ensure proper function and accommodate fluctuating sludge characteristics by adjusting polymer dosage, feed rate, and drum speed. A typical RDT is shown on Figure 7-6.

**Figure 7-6. Rotary drum thickener**

*(Source: FKC)*

**Thickener Considerations.** Thickening facilities were assumed to include the following:

- Installation in the existing lime processing room
- Two equal capacity rotary drum thickeners sized for continuous, parallel operation.
- Odor control
- Polymer feed system
- New Thickening Feed Pumps installed in the Solids Handling Building gallery.
- Controls and electrical equipment
- Continued use of the existing WAS Storage Tank
- RDT operation allows for continuous, unattended operation, providing 24/7 wasting and Thickened WAS feed to the stabilization process.

#### 7.2.4.2 Dewatering

Dewatering is the removal of water from biosolids to reduce the weight and volume of solids that require hauling and application. There are several dewatering technologies available such as a belt filter press, fan press, or screw press; however, as the City is soon moving forward with an emergency centrifuge replacement project, this evaluation will be based on centrifuge dewatering.



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**Centrifuge Dewatering.** In a centrifuge, the applied centrifugal force causes suspended solids to migrate through the liquid away from the axis of rotation due to the difference in densities between the solids and liquids. The solids are then conveyed via auger, also called a scroll, to one end of the machine for discharge. The liquid filtrate overflows a weir and is discharged from the opposite end of the machine. The bowl and the scroll are controlled by separate drives, rotate at different speeds, and have relatively high electrical energy demands. High speed centrifuges can produce cake with solids concentrations higher than those produced using lower energy technologies. When using polymer, centrifuges can typically produce dewatered cake with 20 to 25 percent solids content and usually capture more than 95 percent of the solids. Conditioning with polymers is required to prevent floc shear and to improve centrate quality and solids capture.

Centrifuge dewatering is a closed process, which makes for easy containment of odors. The liquids and solids discharge from the bottom of the machine by gravity. The controlled discharge and containment of the dewatering mechanism allow for localized odor control at the liquids and solids discharge ports. Dewatered cake from a centrifuge is generally more odorous and odor control is required on the cake and centrate outlets. Because odor control is at point sources, smaller foul air volumes must be treated.

Centrifuges require operator attention, and therefore cannot be operated unattended. For this reason, the dewatering process as well as downstream processes are recommended to run 16 hours per day, 4 days per week to align with the WWTP's staffing availability.

As discussed in Section 3.6 and referenced in Appendix E, the existing centrifuges are undersized and have reached the end of their useful life and will be replaced. A photo of the existing centrifuges is shown on Figure 7-7. The existing odor control equipment serving the existing centrifuges will need to be evaluated in terms of size and condition for continued service following centrifuge replacement.

**Figure 7-7. Existing dewatering centrifuges**


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## 7.3 Solids Alternative Site Plans

A preliminary overall site plan depicting proposed solids improvements is shown on Figure 7-8.

### 7.3.1 Hauled Waste Receiving

The proposed packaged Hauled Waste facility would be installed adjacent to the existing station to allow for the continued receipt of septage during construction. Consideration was made to relocate hauled waste receiving to the NSPS; however, that concept was abandoned early in the master planning process. Septage receiving and construction traffic/access would be coordinated during design. As there are no other nearby septage disposal locations, and waste from facilities at nearby tourist areas are hauled to the plant, continuation of septage receiving is desired. Septage receiving also brings in approximately $80,000 to $100,000 annually in revenues to the City.

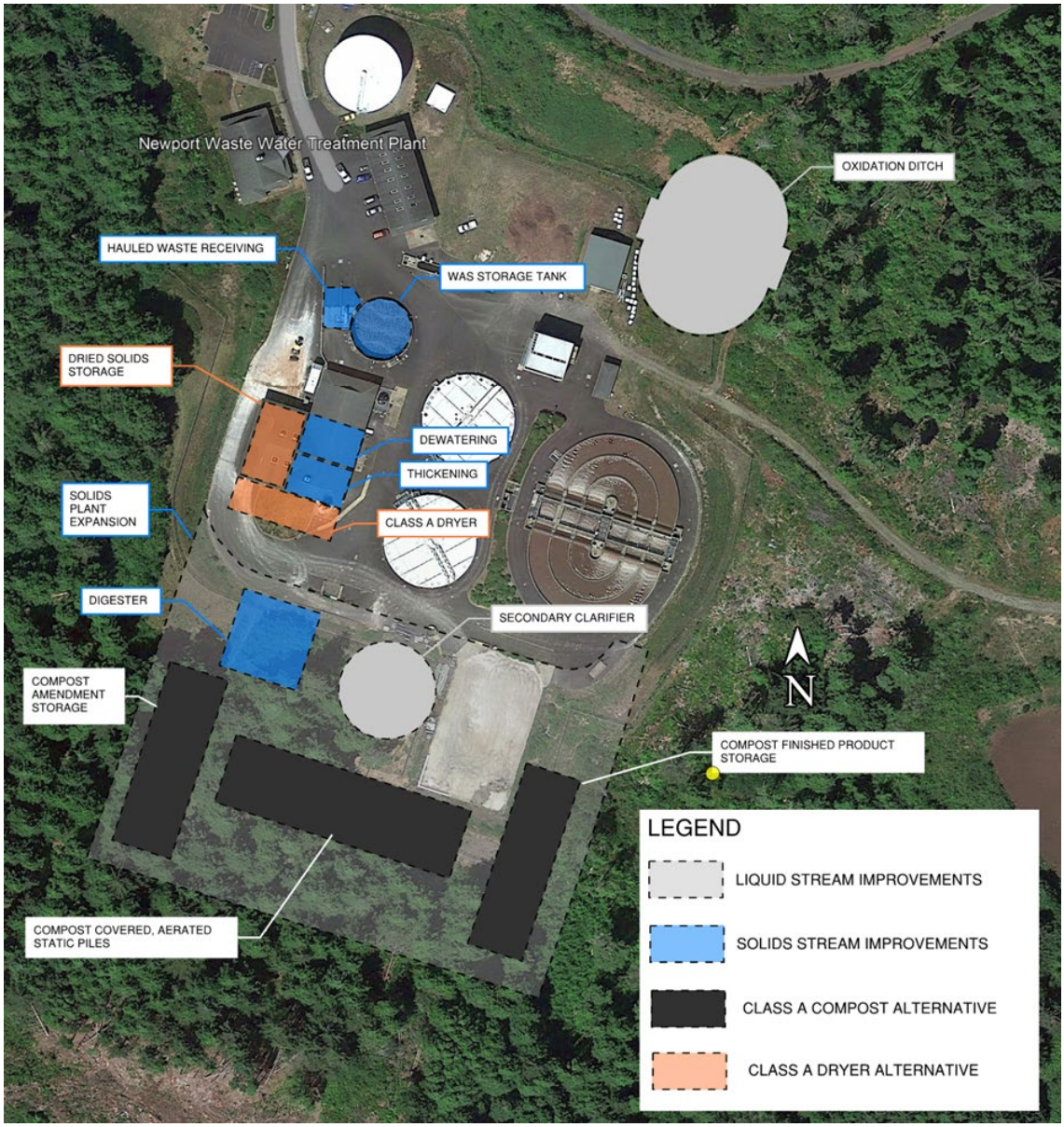


Figure 7-8. Solids stream site plan


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### 7.3.2 Thickening

Mechanical thickening with RDTs is proposed to be installed in the existing lime processing room. The WAS would be wasted continuously, and the WAS Storage Tank would continue to be used to provide process flexibility. With the removal of the Lime Stabilization equipment, RDTs would be installed at ground level, with open-throat thickened WAS pumps installed on the intermediate level below and positioned beneath RDT discharges, as shown on Figure 7-9 and Figure 7-10.

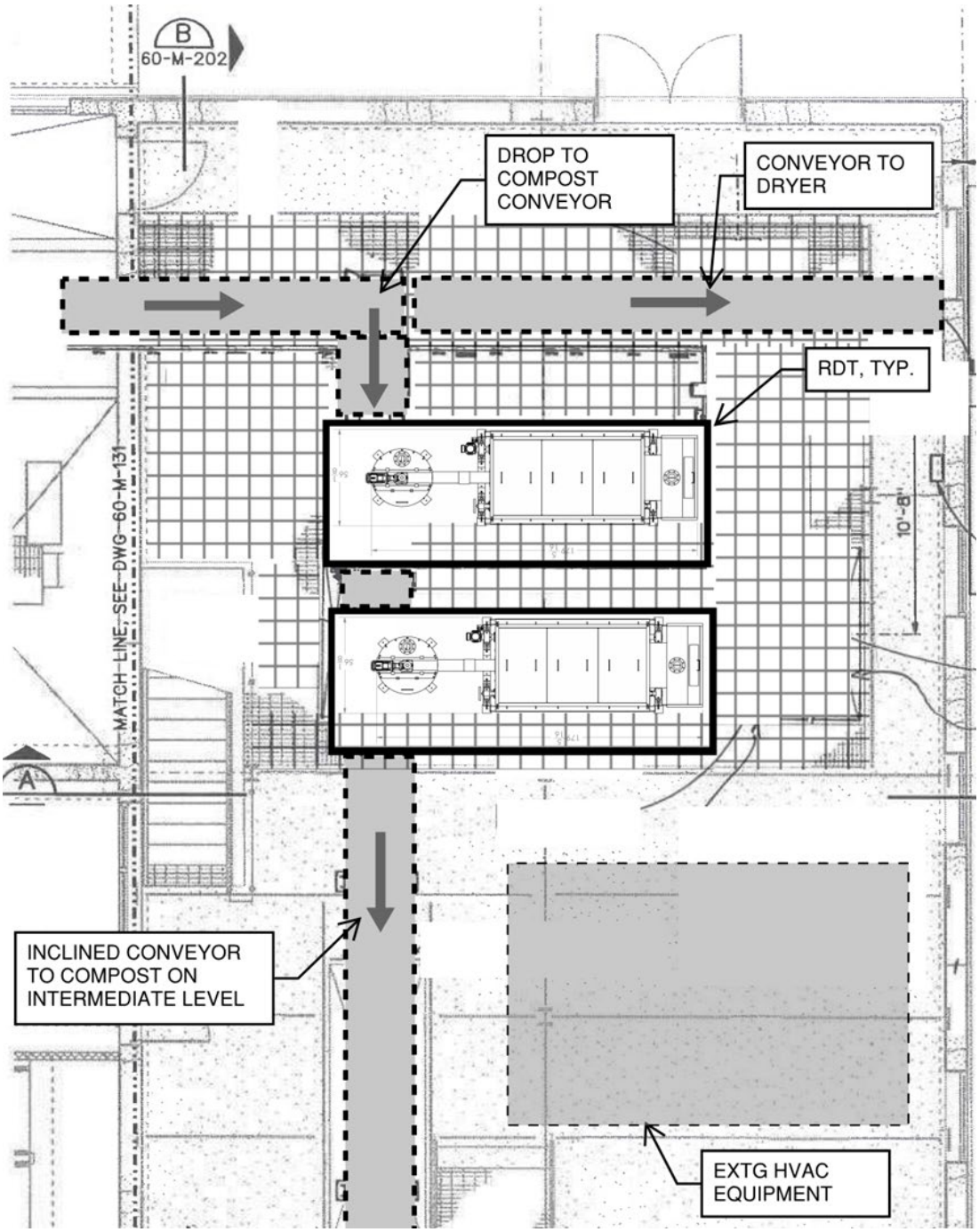


Figure 7-9. Thickening plan


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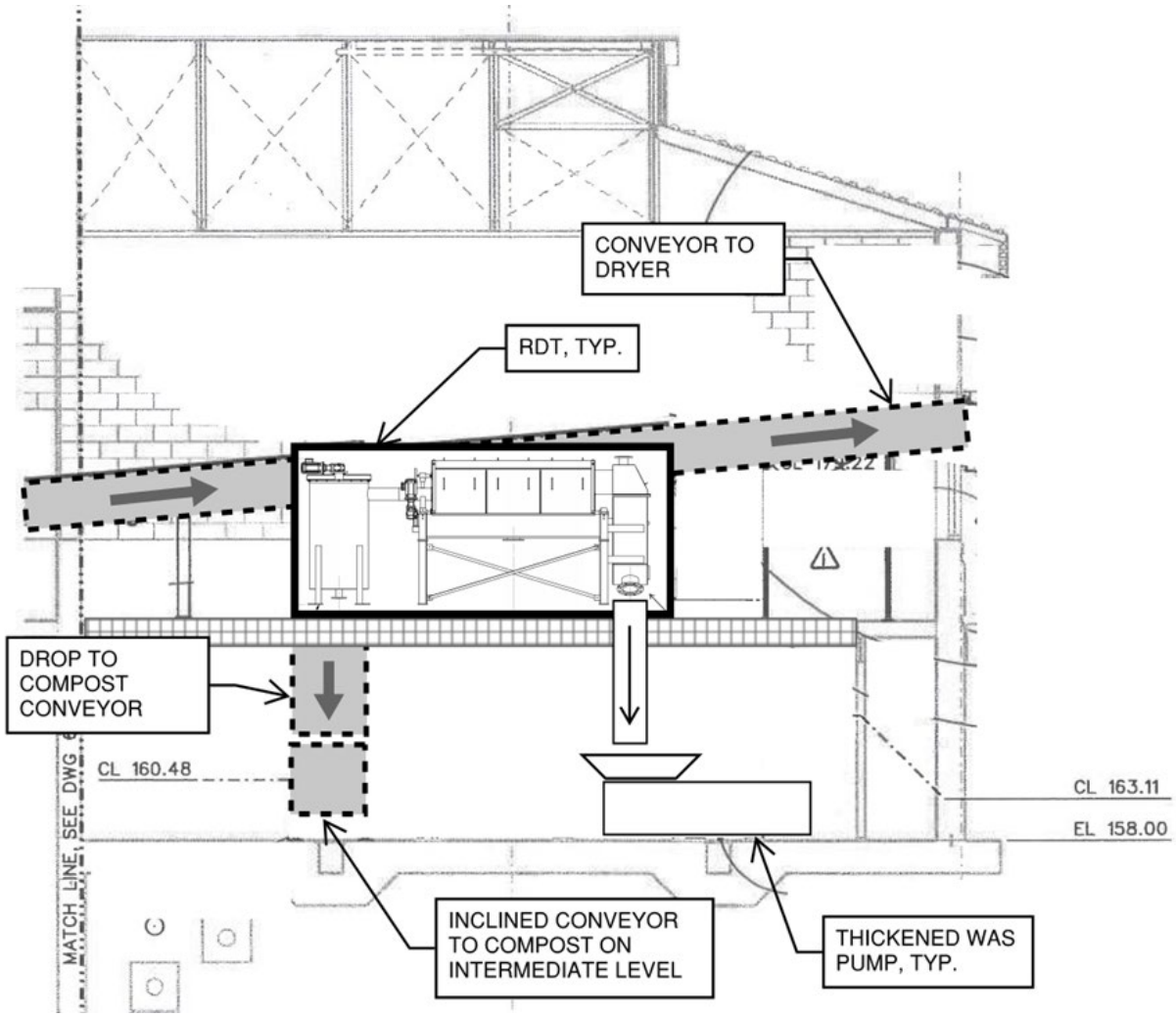


Figure 7-10. Thickening section

Alternatively, thickened WAS pumps may be installed on the same level as the RDTs. Concrete work to support equipment, along with grating and access platforms would be provided to facilitate access to RDTs while maintaining the existing stairway access to the intermediate level below. New thickening feed pumps would be installed in the Solids Handling Building gallery, replacing the existing centrifuge feed pumps.

### 7.3.3 Stabilization

The existing plant fence line is proposed to be extended south to accommodate the solids stabilization and composting facilities. Within the expanded area, the proposed stabilization process shown on Figure 7-8 is located across an existing roadway to minimize thickened WAS pumping distance. The stabilization area is roughly 75 feet by 75 feet and includes an adjoining support building.

Table 7-9 summarizes the sizing and facility descriptions for Aerobic and Anaerobic Digesters.


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| Table 7-9. Stabilization Sizing and Facilities | | |
|---|---|---|
| Parameter | Aerobic Digester | Anaerobic Digester |
| Footprint, feet | 50 x 50[a] | 40[b] |
| Volume, gal | 280,000[c] | 216,000[d] |
| Design Loading<br>Average, ppd<br>Maximum Month, ppd | <br>3,380<br>4,226 | <br>3,380<br>4,226 |
| Sidewater Depth, feet | 15[e] | 23[f] |
| Support Building and Facilities | • Blowers<br>• Electrical Room<br>• Digested Sludge Pumps | • Boilers<br>• Heat Exchangers<br>• Digested Sludge Pumps<br>• Electrical Room<br>• Waste Gas Burner |

*a. Covered, rectangular footprint is divided into four equally-sized cells equipped with mixers and diffusers.*

*b. Diameter of circular tank equipped with mixing system.*

*c. Design Condition–2040 Max Month: (1) Redundancy: None, (2) Thickened WAS solids concentration: 4%, (3) Digester content solids concentration: 2.67%, (4) Volatile Fraction: 0.83, (5) Solids Retention Time: 40 days.*

*d. Design Condition–2040 Max Month: (1) Redundancy: None, (2) Thickened WAS solids concentration: 4%. (3) Volatile Fraction: 0.83, (4) Volatile Solids (VS) Loading: 0.15 lbs VS/CF/day, (5) Solids Retention Time: 15 days minimum.*

*e. Minimum tank depth for efficient oxygen transfer.*

*f. Assumes 3 feet of freeboard and 6-feet dome height for a total height of 32 feet.*

### 7.3.4 Dewatering

Dewatering improvements described in the Centrifuge Replacement TM (as Appendix E) include the removal and replacement of existing centrifuges with larger centrifuges and conveyors sized to accommodate the 2040 max month loading condition. The sizing criteria in the Centrifuge Replacement TM indicates a WAS feed solids concentration to centrifuges of 0.55 percent, as no other solids improvements were considered as part of the centrifuge evaluation. The recommended replacement project includes a fully redundant centrifuge. For the master planning project, thickening and stabilization will precede dewatering. With this reduced loading, centrifuge operation will require fewer operating hours and offer increased redundancy. The proposed dewatering improvements are shown on Figure 7-11.



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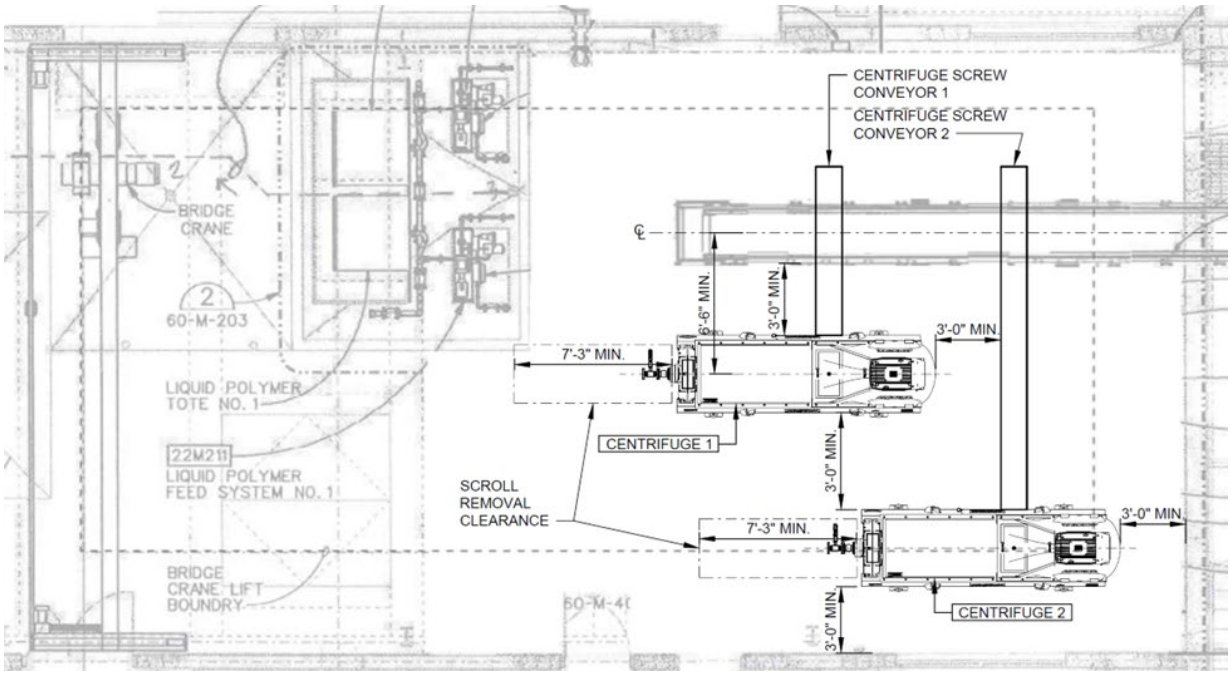


Figure 7-11. Dewatering plan

## 7.3.5 Class A Treatment

The proposed Class A Treatment alternatives would require expansion of the plant site and/or the existing Solids Handling Building. Design criteria relating to Class A treatment are discussed in the Solids Basis of Design TM, included as Appendix J.

### 7.3.5.1 Compost

The proposed Class A compost facility is located south of the existing plant fence line. This wooded area rises gradually in grade to the south and east. An extensive area would need to be cleared, grubbed, and graded to accommodate the large footprint of the compost area. A significant amount of earthwork, grading, and the installation of retaining walls would be needed to construct 20- to 30-feet wide paved roadways to facilitate the handling and transport of compost materials. Site footprint is also needed to locate amendment mixing and screening equipment for final processing of finished product.

A finished product storage area is included, which will negate the need to store solids at a third-party location (November through April) as the plant currently does. Compost facilities may be phased in over time, as the storage and processing bays are modular and can be readily expanded. Improvements would include a new system of conveyors to transport dewatered cake to the existing solids bay, as shown on Figure 7-9. A site plan of the proposed Class A compost facility is shown on Figure 7-12.


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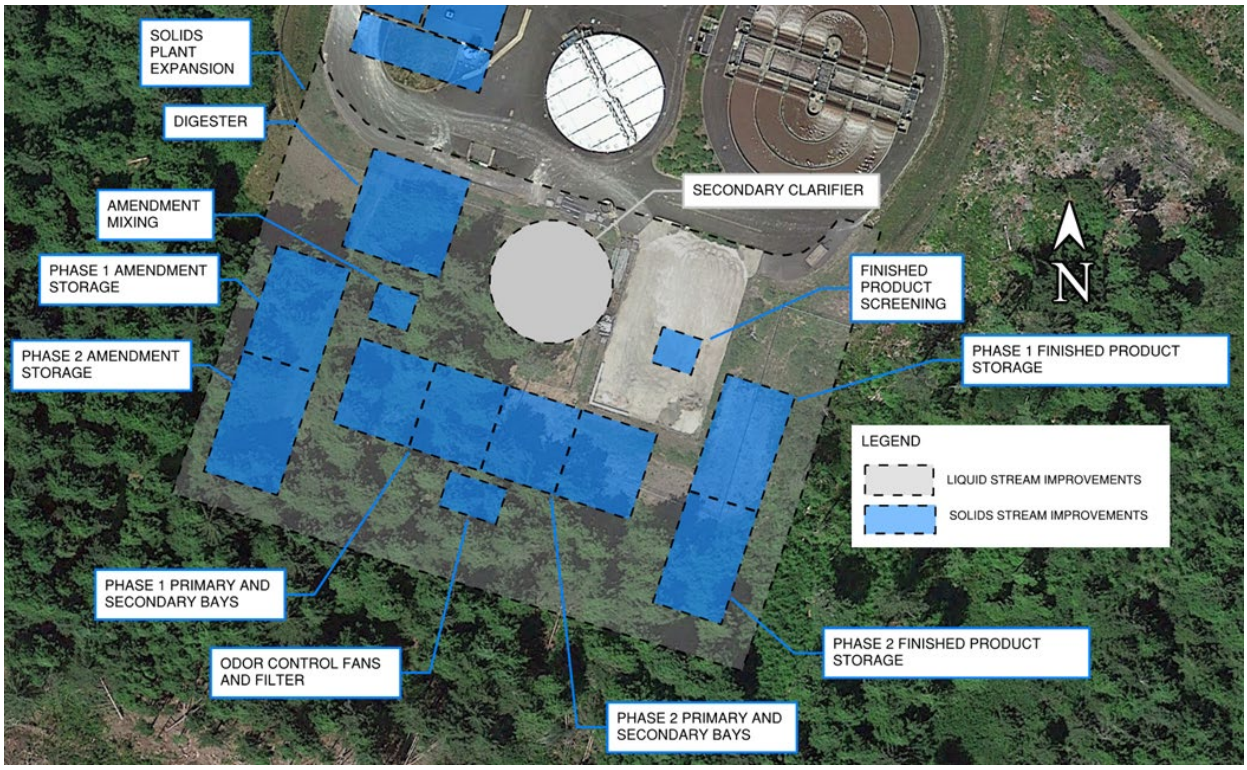


**Figure 7-12. Class A compost facility plan**

### 7.3.5.2 Dryer

The proposed Class A dryer is a large piece of equipment and may include numerous ancillary equipment depending on the manufacturer selected. The dryer itself may be 44 to 70 feet in length, 12 to 40 feet in width, and up to 26 feet in height, depending on the manufacturer.

The existing Solids Handling Building would be expanded to provide a dedicated room housing the Class A dryer, cake bin, and associated electrical and controls room. The existing Lime Silo and outdoor equipment would be demolished. Conveyors, shown on Figure 7-9, would transport dewatered cake from the dewatering area to the Dryer Room. Alternatively, a dedicated building may be constructed adjacent to the Solids Handling Building on its own foundation with minimal separation between the outside walls of new and existing structures. Dried solids would be bagged into supersacks and stored in the existing solids storage bay.

The new Dryer Room would be installed at an elevation that matches the existing intermediate level elevation in the Solids Handling Building. This would facilitate truck access to the supersack bagging system via a new roll-door on the south side of the room, transport of supersacks to the existing solids bay for storage and allow for a maximum building height close to the existing Solids Handling Building. The proposed dryer improvements are shown on Figures 7-13 and 7-14.


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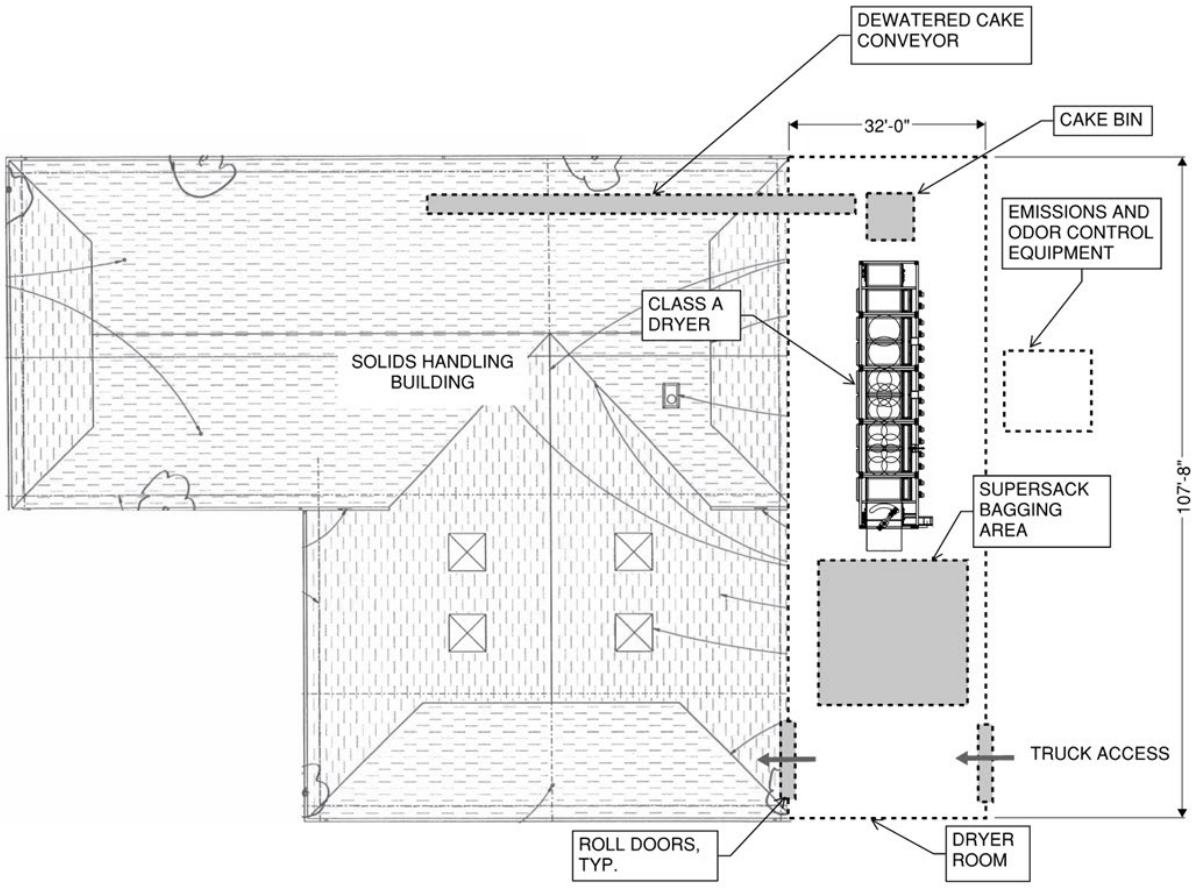


Figure 7-13. Class A dryer plan

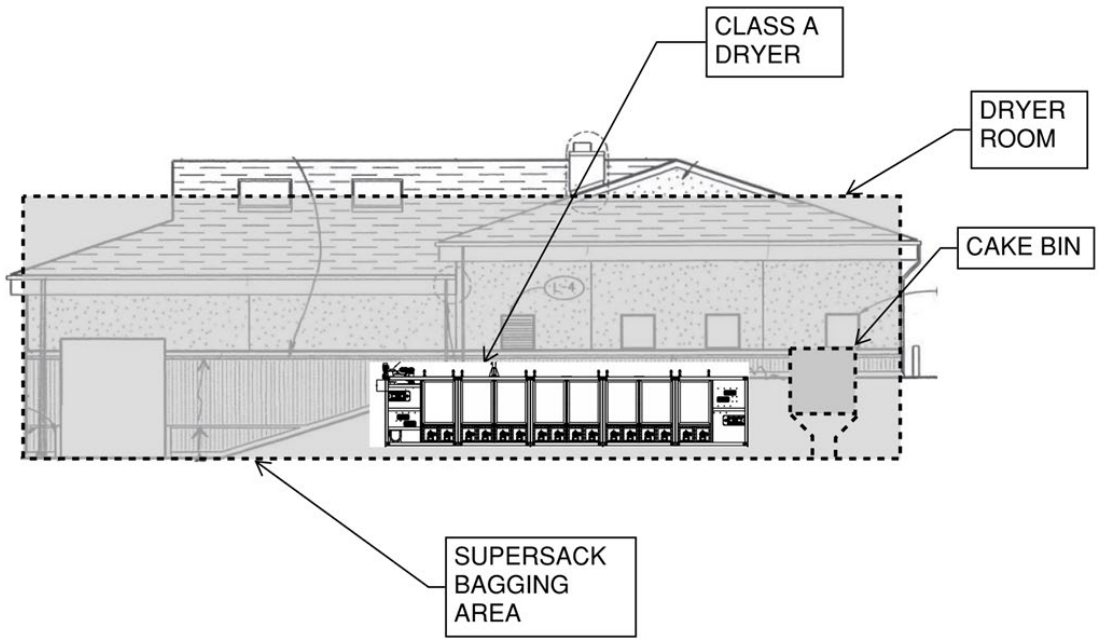


Figure 7-14. Class A dryer section


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## 7.4 Solids Alternatives Evaluation

Solids processes such as Hauled Waste Receiving, Thickening, and Dewatering are common to each of the solids alternatives considered and are presented in Section 7.1, with additional detail and design criteria included in Appendix J. The following sections focus on the stabilization and Class A treatment alternatives under consideration.

Stabilization is recommended to reduce solids quantities and improve the performance of downstream processes. The inclusion of aerobic or anaerobic digestion also allows the production of Class B Biosolids if Class A Treatment systems are offline for an extended period. There are several key differentiators and considerations to account for in the evaluation of aerobic versus anaerobic digestion, including but not limited to labor resources, energy use, construction costs, and site conditions. A list of key considerations is provided in Table 7-10.

**Table 7-10. Aerobic versus Anaerobic Digestion**

| Parameter | Aerobic Digester | Anaerobic Digester |
|---|---|---|
| Footprint | Slightly Larger Footprint | Slightly Smaller Footprint |
| Process Flexibility | Capable of Producing Class B Biosolids without downstream treatment | Capable of Producing Class B biosolids without downstream treatment |
| Odor Potential | Increased Potential for Odors | Less Odor Potential |
| Labor Requirements | Lower Labor Effort | Additional O&M Required |
| Capital Costs | Lower Capital Costs | Higher Capital Costs |
| Energy Costs | Increased Energy Costs for Aeration | Lower Energy Costs |
| General Sizing Criteria | Typical for Facilities < 5 mgd | Typical for Facilities > 5 mgd |

While the capital cost for the aerobic system is significantly less than the anaerobic system, ongoing energy costs are higher due to aeration demands, Ongoing labor is relatively minor for an aerobic digester. In addition, odors produced by an aerobic digester are like those produced from the activated sludge process and no additional odor control system would be required.

Anaerobic digestion requires more labor effort to maintain the heating and mixing systems, along with gas handling equipment such as waste gas burners. There is potential with anaerobic digestion to meet digester heat demands by firing boilers on digester gas. Given the relatively small size of the facility, reduced labor and generally lower capital costs, aerobic digestion was selected as the preferred stabilization process by the City, BC, and KJ in a workshop held on April 25, 2023.

Class A treatment is recommended to improve the quality of biosolids, reduce odors, and maintain flexibility with respect to disposal at various land application sites. Table 7-11 summarizes the pros and cons associated with composting versus drying in the production of Class A Biosolids.



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| Table 7-11. Composting versus Drying | | |
|---|---|---|
| Parameter | Compost | Dryer |
| Footprint | Land Intensive | Relatively Small Footprint Compared to Compost |
| Odor Potential | Potential for Odors | Indoor, Ventilated Process, Low Odor Potential when paired with adequate Odor Control equipment. |
| Labor Requirements | Labor Intensive, Labor Required to Handle Compost | Labor Intensive, Labor Required to Maintain Numerous Equipment |
| Capital Costs | Lower Capital Costs | Higher Capital Costs |
| Energy Costs | Less Energy Intensive | High Electricity and Natural Gas Use |

Although the Class A dryer has higher capital and operation and maintenance (O&M) costs than a compost facility, it results in a dried product that is greater than 90 percent solids which significantly reduces the quantity of biosolids that need to be stored, handled, and transported. Compost however requires a bulking agent or amendment such as wood chips that significantly increases the volume of the finished product. The City indicates that the nearby Georgia Pacific mill is a reliable and long-term source for amendment material. A life-cycle cost analysis of the compost and dryer Class A alternatives is therefore recommended to understand the cost differences between the two alternatives.

## 7.5 Life-cycle Cost Evaluation

The estimated capital costs, annual O&M costs, and total O&M present-worth costs for the Class A compost and dryer alternatives are summarized in Table 7-12. Costs for solids improvements common to each alternative are also included to indicate the overall total costs. Detailed cost estimates are included in Appendix D.

The following assumptions were made in the preparation of the capital costs:

- Capital costs include Opinion of Probable Construction Cost (OPCC) as well as an allowance of 38 percent for soft costs, such as engineering, administrative, permits, and legal costs.
- Estimates are Association for the Advancement of Cost Engineering (AACE) Class IV estimates with a stated range of accuracy of +40 percent to -20 percent.
- Estimates do not include hazardous materials removal or disposal. Costs assume that structural conditions are suitable and that special foundations are not required.



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**Table 7-12. Class A Life-cycle Cost Evaluation**

| Cost Element | Compost | Dryer |
|---|---|---|
| **Capital Cost**[a,b,c] | | |
| Hauled Waste | $2,400,000 | |
| Thickening | $2,400,000 | |
| Aerobic Digester | $7,100,000 | |
| Dewatering | $6,400,000 | |
| Class A Biosolids Process | $11,200,000 | $17,300,000 |
| Sitework | $3,000,000 | $4,300,000 |
| Capital Cost Subtotal | $32,500,000 | $39,900,000 |
| **Annual O&M Costs** [d,e,f,g,h,i] | | |
| Hauled Waste | ($80,000) | |
| Thickening | $70,000 | |
| Aerobic Digester | $80,000 | |
| Dewatering | $110,000 | |
| Class A Biosolids Process | $180,000 | $380,000 |
| Annual O&M Subtotal | $360,000 | $560,000 |
| Total O&M Present Worth Cost[j] | $7,500,000 | $11,700,000 |
| Total Present Worth Cost | $40,000,000 | $51,600,000 |

a. *Capital costs are rounded to the nearest $100,000.*

b. *Construction costs include a 17% adder for Electrical, Instrumentation and Controls.*

c. *Construction costs include the following markups: Contractor Indirects (12%), Overhead and Profit (15%), Contingency (25%) and Escalation (4% per year) assuming 5 years to the mid-point of construction.*

d. *O&M costs are rounded to the nearest $10,000, and include labor, maintenance, equipment replacement, utilities, chemical use, and biosolids hauling.*

e. *Electricity costs are based on a rate of $0.08 per kilowatt hour (kW-hr).*

f. *Natural Gas costs are based on a rate of $1.25 per therm.*

g. *Labor costs assume a burdened labor rate of $50 per hour.*

h. *Chemical costs are for liquid emulsion polymer, $4,20 per active lb. Assumes 8 to 10 active lbs of polymer per dry ton for thickening and 20 active lbs per dry ton for dewatering.*

i. *Maintenance costs are annualized at 2% of equipment costs.*

j. *Present worth costs are based on 20-year life-cycle costs in 2023 dollars, assuming a 3% inflation rate and 2.5 discount rate per OMB Circular A-94, Appendix C.*

The Class A compost facility is projected to have lower capital and annual O&M costs compared to the Class A dryer. The differences in capital costs are largely due to the dryer equipment costs, costs for constructing the new Dryer Building, and the need to install a new natural gas pipeline to the plant for firing the dryer furnace. The dryer also has higher annual O&M costs than composting, mainly due to the high energy use associated with drying biosolids. The dryer is anticipated to require up to 10,333 million British Thermal Unit (MMBTU) (103,330 therms) of natural gas per year, and up to 640,000 kilowatt per hour (kW-hr) per year of electricity. For this reason, and given the available land at the WWTP, the Class A compost facility is recommended.



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## 7.6 Recommended Solids Improvements

The alternatives evaluations for the liquids process and solids process were considered together and included non-cost criteria due to their complexity and connectivity to each other. For additional details on this evaluation, see Section 9.2.

The key recommended solids stream improvements include:

- Packaged Hauled Waste Receiving Station
- Continued use of WAS Storage Tank
- Mechanical Thickening
- Aerobic Digestion
- Centrifuge Dewatering
- Class A Compost Facility

Design data for the proposed solids improvements and projected solids loadings are summarized in Tables 7-13 and 7-14, respectively. Detailed design data for proposed equipment are also available in the vendor proposals included as Appendix K. Equipment and process sizing criteria are presented the Solids Basis of Design, included as Appendix J. A Site Plan and Process Flow Diagram for the recommended improvements are shown on Figures 7-15 and 7-16.

Solids improvements may be phased to prioritize critical areas and capacity bottlenecks. Dewatering improvements could be constructed in Phase 1. Phase 2 may include the Class A compost facility. Phase 3 may include Mechanical Thickening, Aerobic Digester, and Hauled Waste Receiving.

**Table 7-13. Recommended Solids Improvements Design Data**

| Process Area/Parameter | Units | Value |
|---|---|---|
| **Hauled Waste** | | |
| Type | | Packaged, Rotary Drum Screen |
| No. of Systems | | 1 |
| Operation | | Intermittent |
| Days/Week | | 7 |
| Hours/Day | | 2 |
| Drum | | |
| Perforation Size | mm | 10 |
| Motor | hp | 3 |
| Washer Compactor | | |
| Motor | hp | 7.5 |
| Grit Screws | | |
| No. | | 2 |
| Screw Motors | hp, ea | 0.75 |
| Grease Pump | | |
| Motor | hp | 3 |



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| Table 7-13. Recommended Solids Improvements Design Data | | |
|---|---|---|
| Process Area/Parameter | Units | Value |
| **Thickening** | | |
| Thickening Feed Pumps | | |
| No. | | 2 |
| Type | | Recessed Impeller |
| Motor | hp, ea | 15 |
| Thickeners | | |
| No. | | 2 |
| Type | | Rotary Drum |
| Motor | hp, ea | 1.5 |
| Thickened WAS Pumps | | |
| No. | | 2 |
| Type | | Progressing Cavity |
| Motor | hp, ea | 2 |
| **Aerobic Digester** | | |
| No. of Cells | | 4 |
| Cell Length | ft | 25 |
| Cell Width | ft | 25 |
| Sidewater Depth | ft | 15 |
| Volume | gal | 280,000 |
| Design SRT[a] | days | 40 |
| Blowers | | |
| No. | | 4 |
| Type | | Hybrid Positive Displacement and Screw Compressor |
| Motor | hp, ea | 150 |
| Mixers | | |
| No. | | 4 |
| Type | | Submersible |
| Motor | hp, ea | 10 |
| **Digested Sludge Pumps** | | |
| No. | | 2 |
| Type | | Progressing Cavity |
| Motor | hp, ea | 5 |
| **Dewatering** | | |
| Centrifuges | | |
| No. | | 2 |
| Motor | hp, ea | 95 (75 hp Main Drive, 20 hp Back Drive) |



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| Table 7-13. Recommended Solids Improvements Design Data | | |
|---|---|---|
| Process Area/Parameter | Units | Value |
| Conveyors | | |
| No. | | 3 |
| Type | | Shaftless Auger |
| Motor | hp, ea | (1) 3 hp and (2) 2 hp |
| **Compost** | | |
| Type | | CASP |
| No. of Stages | | 2, (1) Active, (1) Secondary |
| No. of Bays | | 4, (2) Active, (2) Secondary |
| Design Retention Time[b] | | |
| Active Bays | days | 20 |
| Secondary Bays | days | 20 |
| Bay Length | | |
| Active Bays | ft | 40 |
| Secondary Bays | ft | 33 |
| Bay Width | | |
| Active Bays | ft | 20 |
| Secondary Bays | ft | 20 |
| Pile Height | ft | 8 |
| Aeration | | |
| Capacity | | |
| Active Bays | CFM/CY | 6 |
| Secondary Bays | CFM/CY | 2.5 |
| Fan Power | | |
| Active Bays | hp | 22.5 |
| Secondary Bays | hp | 5 |
| Biofilter Area | $ft^2$ | 690 |

*a. Assumes covered digester with minimum operating temperature of 68 °F.*

*b. At 2040 max month condition.*





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**Table 7-14. Projected Solids Loadings**

| Parameter | Units | Design Condition | | | |
|---|---|---|---|---|---|
| | | Current-2023 | Design-2040 | | |
| | | Average | Average | Max Month | Max Week |
| WAS[a] | | | | | |
| Solids Loading | lb/d | 3,198 | 3,558 | 4,448 | 5,338 |
| Solids Flow | gpd | 69,717 | 77,575 | 96,969 | 116,363 |
| Solids Concentration | % | 0.55 | 0.55 | 0.55 | 0.55 |
| Thickened Sludge[b] | | | | | |
| Solids Concentration | % | 4.00 | | | |
| Solids Production | lb/d | 3,038 | 3,380 | 4,226 | 5,071 |
| Solids Flow | gpd | 9,107 | 10,133 | 12,667 | 15,200 |
| VSS/TSS Ratio[c] | % | 83 | | | |
| VSS Loading | lb/d | 2,522 | 2,806 | 3,507 | 4,209 |
| Thickener Supernatant | | | | | |
| Total Supernatant (daily flow) | gpd | 76,450 | 83,282 | 100,143 | 117,003 |
| Solids Concentration | mg/L | 250 | 256 | 266 | 273 |
| Aerobic Digester Feed[d] | | | | | |
| Solids Loading | lb/d | 3,038 | 3,380 | 4,226 | 5,071 |
| Solids Flow | gpd | 9,107 | 10,133 | 12,667 | 15,200 |
| Solids Concentration | % | 4.00 | 4.00 | 4.00 | 4.00 |
| Volatile Solids by Source | | | | | |
| Thick Sludge VSS Loading | lb/d | 2,522 | 2,806 | 3,507 | 4,209 |
| Thick Sludge VSS Reduction | % | 40 | | | |
| Thick Sludge VSS Reduction | lb/d | 1,009 | 1,122 | 1,403 | 1,683 |
| Total VSS Reduced | lb/d | 1,009 | 1,122 | 1,403 | 1,683 |
| Total Solids Remaining | lb/d | 2,029 | 2,258 | 2,823 | 3,387 |
| Dewatering Feed[e] | | | | | |
| Solids Loading (intermittent)[(f)] | lb/hr | 222 | 247 | 309 | 370 |
| Solids Loading (intermittent) | lb/d | 3,551 | 3,952 | 4,940 | 5,928 |
| Solids Loading (intermittent) | dry tons/day | 2 | 2 | 2 | 3 |
| Solids Flow (intermittent) | gpm | 17 | 18 | 23 | 28 |
| TSS Concentration | % | 2.67 | 2.67 | 2.67 | 2.67 |
| Dewatering Performance | | | | | |
| Cake Concentration | % | 20.0 | | | |
| Cake Production (intermittent) | lb/d | 3,374 | 3,754 | 4,693 | 5,631 |
| Cake Production (intermittent) | tons/d | 1.7 | 1.9 | 2.3 | 2.8 |


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**Table 7-14. Projected Solids Loadings**

| Parameter | Units | Design Condition | | | |
|---|---|---|---|---|---|
| | | Current-2023 | Design-2040 | | |
| | | Average | Average | Max Month | Max Week |
| Centrate | | 1156 | 1286 | 1608 | 1929 |
| Total Centrate (intermittent) | gpd | 19,549 | 21,607 | 26,687 | 31,768 |
| Centrate Solids Load | lb/d | 169 | 188 | 235 | 282 |
| Compost Feed | | | | | |
| Solids Loading (intermittent) | lb/d | 3,374 | 3,754 | 4,693 | 5,631 |
| Solids Loading (intermittent) | dry tons/day | 1.7 | 1.9 | 2.3 | 2.8 |
| Solids Concentration | % | 20.00 | 20.00 | 20.00 | 20.00 |
| Amendment[g] | wet tons/day | 10 | 11 | 14 | 17 |
| Amendment | wet tons/year | 3,694 | 4,111 | 5,139 | 6,166 |
| Compost Production | | | | | |
| Compost Production | CY/d | 32.0 | 35.0 | 44.0 | 53.0 |
| Compost Production | CY/year | 11,545 | 12,846 | 16,059 | 19,269 |
| Compost Production[h] | tons/d | 14.0 | 15.3 | 19.2 | 23.1 |
| Compost Production | tons/d | 5,039 | 5,607 | 7,010 | 8,411 |

*a. Assumes continuous wasting.*

*b. Two units, each sized for 100 gpm, 1 duty unit runs continuously with 1 standby unit. Assumes 95% capture.*

*c. RAS sampling-based on 1 week of data from December 2021. VSS/TSS ratio is provided by BC.*

*d. Continuous Digester Feed.*

*e. One duty, 1 standby unit. Assumes 95% capture.*

*f. Sixteen hrs/day, 4 days/week.*

*g. Based on 1.2 to 1.0 ratio of amendment to biosolids wet tons.*

*h. Based on nominal mix density of 873 lb/CY.*



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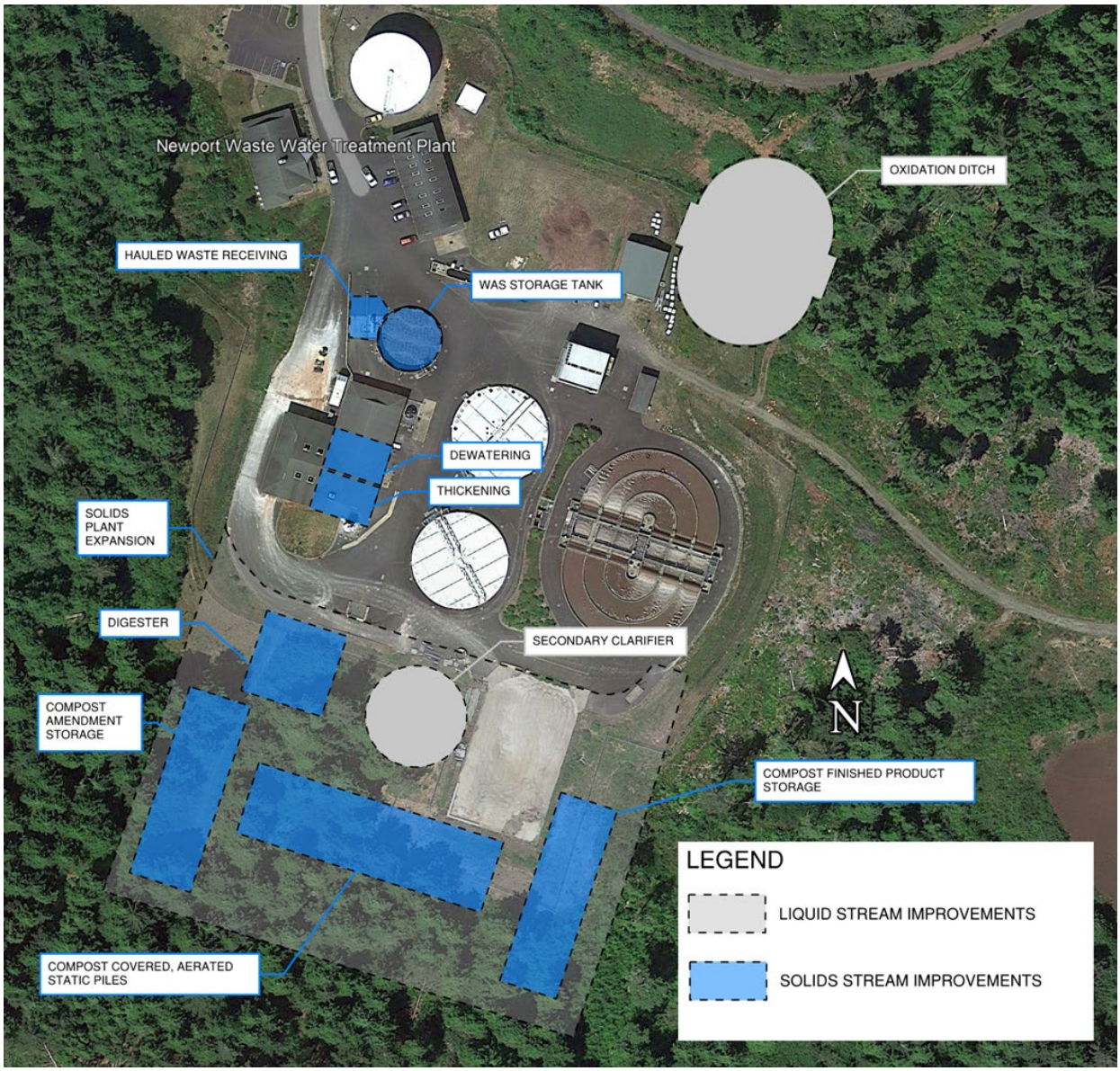


**Figure 7-15. Recommended solids stream improvements site plan**


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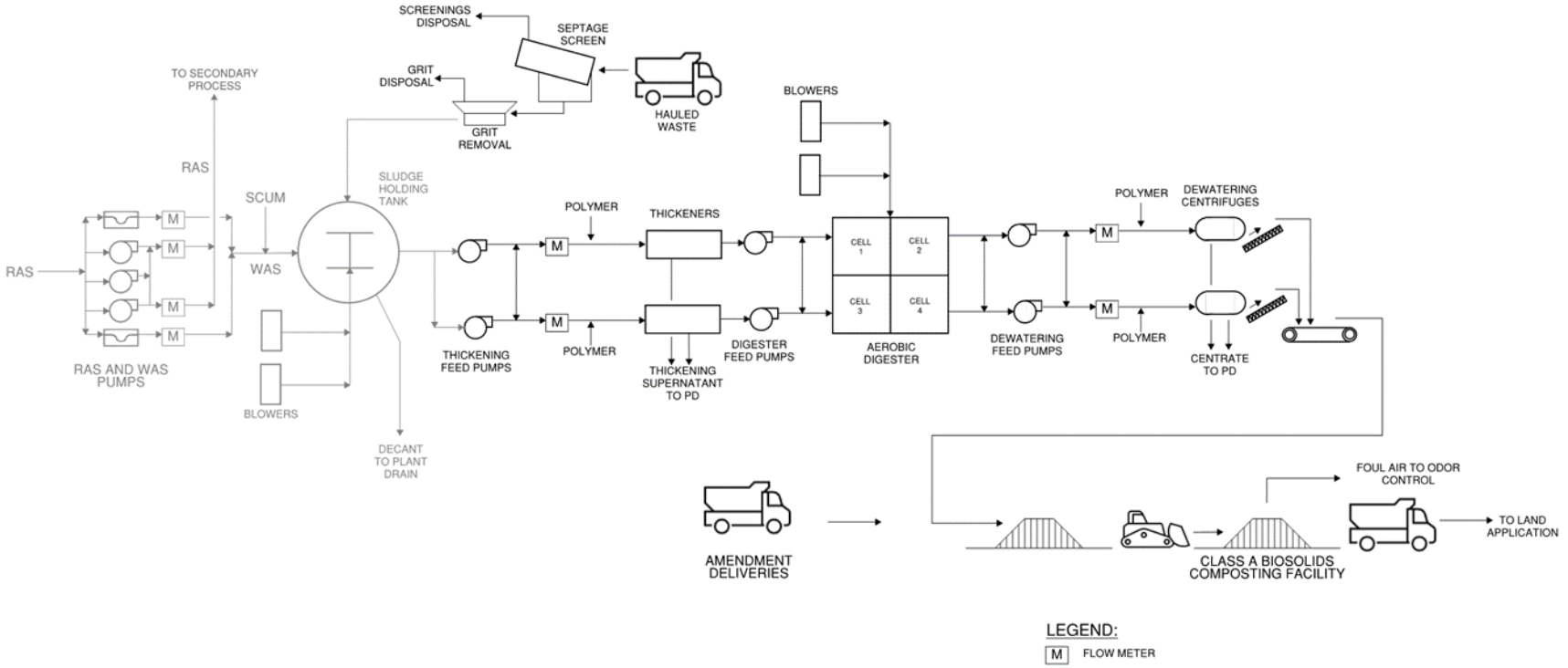


**Figure 7-16. Recommended solids stream improvements process flow diagram**

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Section 8

# Northside Pump Station

Alternatives for Northside Pump Station were developed in a standalone TM under this project scope (see Appendix H). Imminent upgrades are required to replace failing equipment and address significant safety concerns. Ideally, a new facility would replace the existing facility entirely. Due to the limited funding available, the City has elected to proceed with interim improvements to address critical concerns while additional funding is secured to proceed with the incorporation of an entirely new buildout facility.



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Section 9

# Recommendations and Conclusions

## 9.1 Near-Term Improvements

At the time of this WWTMP development, the following near-term upgrades are planned for key facilities:

1. NSPS Interim Improvements
2. NSPS Dechlorination Project
3. WWTP Centrifuge Replacements
4. WWTP Headworks Upgrades
5. WWTP Disinfection Improvements
6. Influent Pump Station Pipe Replacement

The NSPS interim improvements are summarized in Appendix H. Estimated design costs to incorporate dechlorination at this site have been developed separately and are driven by regulatory needs rather than condition or capacity reasons. Preliminary costs are included in Appendix I.

Imminent WWTP upgrades include headworks improvements, replacement of aging centrifuges, and disinfection pump replacements. Headworks upgrades are discussed in Section 3.2. Kennedy Jenks prepared a standalone TM presenting centrifuge alternatives and estimated costs, which is included as Appendix E

Detailed improvements to the disinfection system have been developed and are currently being incorporated into the existing system as time and funding allows. Key improvements are listed below. Preliminary costs are included as Appendix L.

- Two new peristaltic chemical delivery pumps to replace the existing diaphragm pumps.
- Associated pump skids to replace the existing chemical delivery system.
- Addition of a chorine analyzer assembly to ensure accurate chemical dosing.
- Submersible sewage pump to replace existing pump within the chlorine contact chamber.
- Addition of a submersible mixer within the chlorine contact chamber.
- Replacement of the existing disinfection storage tank due to recurring leaks.

The City is currently experiencing failure of pump suction and discharge piping at the influent pump station. While specific recommendations have not been developed as part of this WWTMP, replacement and rehabilitation is recommended as soon as funding can be secured. Complete pipe failures could cause flooding of raw sewage and unplanned pump shutdowns. Estimated yearly costs for all projects can be found in Section 9.2.2.



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## 9.2 Liquids and Solids Process Alternative Criteria and Scoring

To facilitate selection of the liquids and solids process alternatives, the City of Newport (City) and Brown and Caldwell/Kennedy Jenks (BC/KJ) project team identified viable combinations of alternatives for the liquids process, solids stabilization, and solids processing alternatives. The team also developed a method of scoring non-cost considerations alongside life-cycle costs. Non-cost considerations were grouped into two categories, with subcategories:

1. **Operational Benefits**: Processes that optimize flexibility and simplicity in operations without compromising compliance or health and safety.
    a. *Process and Regulatory Flexibility*–Higher scores for alternatives that mitigate future risk. For biosolids, this can mean the ability to easily switch between Class A or B to provide for more beneficial use/disposal options. For liquids, this can mean the ability to adapt to potential future regulations (e.g., nutrients, metals, etc.).
    b. *Labor Requirements*–Higher scores for reduced need for additional full-time employees (FTEs) and level of skill required to run the proposed processes. Finding/retaining O&M staff has been a challenge for the City.
    c. *Simplicity, Reliability, and Health and Safety*–Higher scores for reduced level of effort required to operate and maintain in normal and failure modes, and how consistently the process is expected to meet design criteria. Intrinsic health and safety is also considered.
2. **Community Benefits**: Processes that optimize local resources and have minimal negative impacts on the community such as odor generation.
    a. *Fenceline Odor Potential*–Higher scores for reduced risk of odor migration offsite.
    b. *Expandability and Site Efficiency*–Higher scores for increased ease with which the process could be expanded for additional future loading. Higher scores also for processes that require less space at the treatment plant site and thus would not impact the constructability of potential future expansions.
    c. *Public Outreach and Resource Recovery*–Higher scores for processes that create an opportunity for the WWTP to be a community center and resource recovery facility.

The alternatives are identified and discussed in detail in Section 6 and Section 7. The viable combinations of alternatives and scoring is summarized in Figure 9-1.

| | | Alternative | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | | 7 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Liquids Process | 2nd Oxidation Ditch | | 2nd Oxidation Ditch | | 2nd Oxidation Ditch | | 2nd Oxidation Ditch | | 2nd Oxidation Ditch | | Oxidation Ditch / Primary Clarifiers | | Oxidation Ditch / Primary Clarifiers | |
| | | Stabilization Process | No Stabilization | | No Stabilization | | No Stabilization | | Aerobic Digester | | Aerobic Digester | | Anaerobic Digester | | Anaerobic Digester | |
| | | Solids Process | Existing RDP | | Composting | | Dryer | | Composting | | Dryer | | Composting | | Dryer | |
| | Criteria | Criteria Weight | Score | Weighted Score | Score | Weighted Score | Score | Weighted Score | Score | Weighted Score | Score | Weighted Score | Score | Weighted Score | Score | Weighted Score |
| 1 | **Operational Benefits** | **50%** | | **0.5** | | **0.8** | | **1** | | **1.1** | | **1.3** | | **0.7** | | **0.95** |
| | Process and Regulatory Flexibility | 20% | 1 | 0.2 | 1 | 0.2 | 1 | 0.2 | 2.5 | 0.5 | 2 | 0.4 | 2 | 0.4 | 2.5 | 0.5 |
| | Labor Requirements | 10% | 1 | 0.1 | 2 | 0.2 | 3 | 0.3 | 2 | 0.2 | 3 | 0.3 | 1 | 0.1 | 2.5 | 0.25 |
| | Simplicity, Reliability, and Health and Safety | 20% | 1 | 0.2 | 2 | 0.4 | 2.5 | 0.5 | 2 | 0.4 | 3 | 0.6 | 1 | 0.2 | 1 | 0.2 |
| 2 | **Community Benefits** | **30%** | | **0.6** | | **0.35** | | **0.575** | | **0.7** | | **0.675** | | **0.55** | | **0.65** |
| | Fenceline Odor Potential | 15% | 3 | 0.45 | 1 | 0.15 | 2.5 | 0.375 | 2 | 0.3 | 2.5 | 0.375 | 1 | 0.15 | 2 | 0.3 |
| | Expandability and Site Efficiency | 5% | 1 | 0.05 | 2 | 0.1 | 2 | 0.1 | 2 | 0.1 | 2 | 0.1 | 2 | 0.1 | 3 | 0.15 |
| | Public Outreach and Resource Recovery | 10% | 1 | 0.1 | 1 | 0.1 | 1 | 0.1 | 3 | 0.3 | 2 | 0.2 | 3 | 0.3 | 2 | 0.2 |
| 3 | **Relative Cost (Net Present Value)** | **20%** | **3** | **0.6** | **2** | **0.4** | **2** | **0.4** | **2** | **0.4** | **2** | **0.4** | **2** | **0.4** | **2** | **0.4** |
| | **TOTAL** | **100%** | 2.3 | | 1.9 | | **2.55** | | **2.9** | | **3.05** | | 2.2 | | **2.65** | |

Each alternative assigned a score of 1 (negative / worse than average), 2 (average), or 3 (positive / better than average)

**Figure 9-1. Alternatives evaluation criteria and scoring**



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Alternatives 4 and 5 were the highest scoring alternatives. Accordingly, the City and BC/KJ project team elected a second oxidation ditch with aerobic digestion as the liquids stream alternative and solids stabilization process, respectively. Subsequently, a more detailed cost analysis on the biosolids process confirmed selection of composting as the preferred alternative, with energy consumption and safety concerns associated with the biosolids dryer equipment being the primary deciding factors. Alternative 4 as presented in Figure 9-1 was selected for capital improvement planning efforts.

## 9.3 Capital Improvements Plan (CIP)

The following sections describe the basis and assumptions used to develop cost estimates for recommended projects, and the criteria used to prioritize individual projects within the CIP.

### 9.3.1 Cost Estimating Basics and Assumptions

An engineering opinion of probable construction costs (OPCC) has been developed for each of the improvement projects identified in previous sections. Project definitions and associated costs presented in this CIP are conceptual in nature due to the limited design information that is available at this stage of project planning. The scope of work for projects and studies were approximated based on equipment and/or facility size and comparison with similar replacement projects. As each project progresses into design and construction, the associated costs may vary as project-specific requirements are identified.

All estimates provided in this section were prepared in accordance with a Class 5 OPCC as defined by the AACE. A Class 5 estimate is appropriate for projects that have been developed to a conceptual level only. The purpose of a Class 5 estimate is to provide a cost that can be used in budgetary planning. The expected range in accuracy of a Class 5 estimate is from -20 percent to -50 percent low and +30 percent to +100 percent high and is typically developed through analogy to costs from similar construction, judgment, and parametric models. These cost estimates are based on unit costs developed using a combination of data from RS Means CostWorks® and recent bids, experience with similar projects, and foreseeable regulatory requirements. Project capital costs visualized by a figure or table in this report have been adjusted to reflect 2025 costs by applying a 5.0 percent cost increase to 2023 cost estimates for each project. Cost estimates performed in 2023 included in the attached appendices have not been updated to reflect 2025 costs.

The costs for each project in the CIP include an allowance for “soft costs” and for contingency, which were not included in the construction costs listed in previous sections. The “soft costs” are the portion a project’s total cost required to plan, design, and manage each project through construction and are estimated at the planning level using a percentage markup applied to the estimated construction cost. The contingency allowance accounts for aspects of the work that are currently unknown and that cannot be reasonably identified at the conceptual phase. The contingency allowance is also estimated at the planning level using a percentage markup, which can be reduced as the project is better understood through detailed design.

Adjustments to each project estimate were made using the following markups:

- 40 percent markup of the itemized construction sub-total was added to account for construction contingency and unforeseen work items.
- 38 percent markup of the total construction cost including contingency was added to account for project development services including project administration, planning, alternatives analysis, engineering design, surveying, permitting, construction administration, inspection, materials testing, etc.



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Detailed cost estimates for each project, listed in Table 9-1, are included in the appendices. See Table 9-1 for specific reference information.

### 9.3.2 CIP Project Costs and Schedule

In addition to the wastewater treatment upgrades described in this report, key upgrades are required for aging collection system facilities, mainly NSPS and the IPS. Class 5 cost estimates are shown in Table 9-1 for the Alternative 4 system upgrades along with recommended implementation timeframes. Projects are set to start in FY27 due to current funding limitations, with schedules driven by the associated capacity, condition assessments, and balanced funding demands within the 10-year implementation timeframe. Most at-risk facilities are slated for upgrades earlier in this timeframe. The City's WWTP operations staff will need to mitigate current risks and overcome capacity limitations in the meantime.

**Table 9-1. Capital Improvement Projects**

| Project | Estimated Cost | Schedule | Reference |
|---|---|---|---|
| Near-Term Improvements | | | |
| NSPS Interim Improvements | $7,230,000 | 2027-2029 | Appendix H |
| NSPS Dechlorination | $3,930,000 | 2027-2029 | Appendix I |
| WWTP Centrifuge Upgrades | $5,880,000 | 2027-2029 | Appendix E |
| WWTP Disinfection Upgrades | $270,000 | 2027-2029 | Appendix L |
| IPS Pipe Replacement[a] | $370,000 | 2029 | See Note a. |
| WWTP Headworks Upgrades | $4,670,000 | 2029-2031 | Appendix B |
| Liquids/Solids Process Selected Alternative and Longer-term Improvements | | | |
| WWTP 3rd Secondary Clarifier[c] | $21,640,000 | 2029-2032 | Appendix C |
| WWTP Solids Upgrades | $34,130,000 | 2032-2035 | Appendix D |
| IPS Upgrades[a] | $1,050,000 | 2034 | See Note a. |
| WWTP 2nd Oxidation Ditch | $18,760,000 | 2035-2038 | Appendix C |
| NSPS Buildout Facility | $49,180,000 | 2039-2041 | Appendix H |

*a. Detailed cost estimates for the Influent Pump Station (IPS) have not yet been developed. Costs shown are for reference only and based on improvements described by the City.*

*b. Additional engineering and administrative costs have been applied to projects for which this was not applied during capital cost development.*

*c. The 3rd secondary clarifier project cost was estimated assuming incorporation of pump stations and flow distribution improvements to prepare for the future 2nd oxidation ditch.*

Required funding for each project is expected to increase over the duration of the project. Projects expected to last 3 years will require 20 percent of the total funding for the first year, then 40 percent of total estimated cost during each of the next 2 years. Four-year projects will require approximately 10 percent of the total funding for the first year, then 20 percent, 35 percent, and 35 percent for the following years. This distribution was applied to each of the multi-year projects in Table 9-1 and used to develop Figure 9-2, which shows the estimated total yearly funding required for applicable projects occurring during each fiscal year. The costs in Figure 9-2 have been adjusted in the same way performed for Table 9-1 to reflect 2025 costs.



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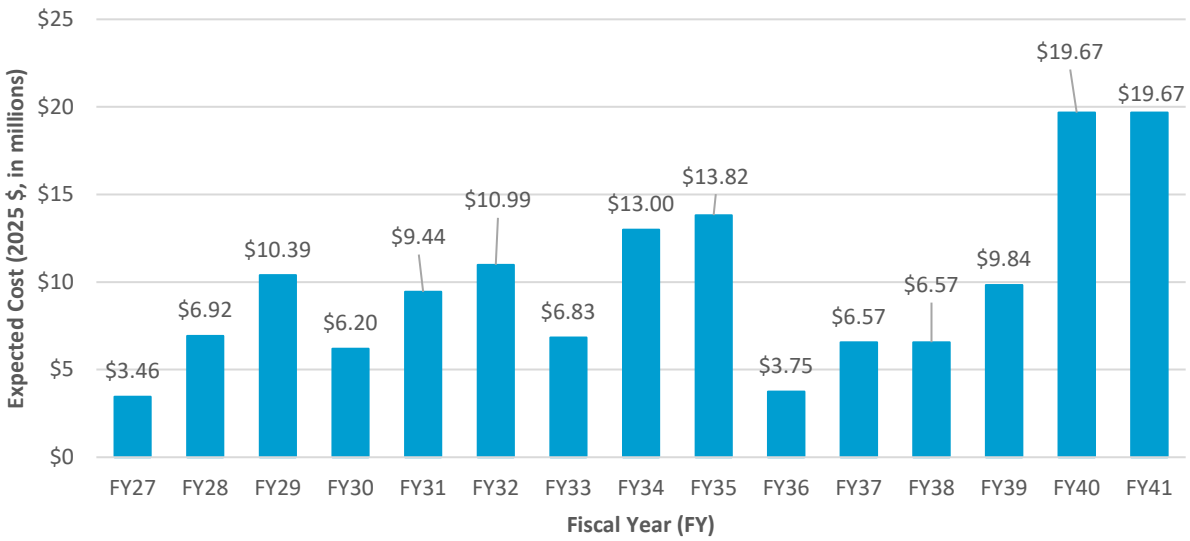


**Figure 9-2. Capital cost distribution by year**

### 9.3.3 System Development Charge (SDC) Estimates

Eligibility for System Development Charges (SDCs) can help offset the cost of the proposed improvements. To determine eligibility, the percentage of total project costs directly related to serving new customers is estimated and shown in Table 9-2. To clarify, improvements that represent a capacity expansion required by anticipated population growth are eligible for this funding. The costs shown in Table 9-2 have been updated to reflect 2025 costs by applying an average 5.0 percent cost increase from 2023 to 2025.

**Table 9-2. System Development Charge (SDC) Summary**

| Project | Estimated Total Cost | Development Percentage | Estimated SDC Eligibility |
|---|---|---|---|
| NSPS Interim Improvements | $7,230,000 | 0% | $0 |
| NSPS Dechlorination | $3,930,000 | 0% | $0 |
| WWTP Centrifuge Upgrades | $5,880,000 | 50% | $2,940,000 |
| WWTP Disinfection Upgrades | $270,000 | 0% | $0 |
| IPS Pipe Replacement | $370,000 | 0% | $0 |
| WWTP Headworks Upgrades | $4,670,000 | 25% | $1,167,500 |
| WWTP 3rd Secondary Clarifier | $21,640,000 | 80% | $17,312,000 |
| WWTP Solids Upgrades | $34,130,000 | 80% | $27,304,000 |
| IPS Upgrades | $1,050,000 | 0% | $0 |
| WWTP 2nd Oxidation Ditch | $18,760,000 | 80% | $15,008,000 |
| NSPS Buildout Facility | $49,180,000 | 0% | $0 |


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As most improvements are condition-driven rather than capacity-driven, most improvements are not eligible for SDC funding. These condition-related improvements are primarily associated with the Northside Pump Station and Influent Pump Station. The projects that are eligible are also partially condition-driven, as noted below.

1. The WWTP Centrifuge Upgrades are to address deteriorating conditions, operational and maintenance concerns, and already undersized equipment. The proposed increase in capacity to meet future conditions reflects the 50 percent SDC eligibility.
2. The WWTP Headworks Upgrades are largely driven by deteriorating conditions at the existing headworks facility, including screens which are past their service life and numerous corrosion issues. The addition of a third screen represents a capacity expansion, which is reflected in the 25 percent SDC eligibility.
3. The WWTP 3rd Secondary Clarifier and WWTP 2nd Oxidation Ditch represent capacity expansions, however, these projects are not fully SDC eligible because they introduce redundancy into the system, which is required due to the deteriorating condition of the existing clarifiers and oxidation ditch. The proposed SDC eligibility percentage for these two projects is 80 percent.
4. The WWTP Solids Upgrades, like the secondary clarifier and oxidation ditch, address aging infrastructure and condition concerns while increasing the capacity of the WWTP. Because of the associated increase in capacity, the proposed SDC eligibility percentage is 80 percent.



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## Section 10

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## Section 11

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# Appendix A Updated Criticality Assessment


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WATERDUDE SOLUTIONS

# Technical Memorandum

**Project: Wastewater Treatment Facilities Condition Assessment Update**

**Client:** City of Newport

**To:** Andrew Grant, Wastewater Treatment Supervisor

**From:** Mark Walter, Waterdude Solutions

**Date:** October 11, 2021

## 1. Introduction and Scope of Technical Memorandum

This technical memorandum (TM) provides an update to the Wastewater Treatment Facilities Condition Assessment dated January 2017. The information in this TM includes the following:

- Description of the 2021 condition assessment update.
- A summary of wastewater treatment facilities systems current condition.
- Tabulated results from the condition assessment and criticality matrix update.
- Observations based on the results of the update.

## 2. 2021 Condition Assessment Update

Workshops were conducted September 27 and 28, 2021 to update system condition ratings and the criticality matrix. The systems rating spreadsheet used for the 2017 assessment was used as a condition baseline. The system ratings spreadsheet includes nineteen systems reflecting the entire WWTP facility. Key components of each system are rated and tabulated for a system score. The condition rating scale used for the assessment is shown as Table 1. This condition assessment update is intended to support facility planning and prioritization of improvements.

The criticality matrix developed in March 2018 was reviewed and updated. The criticality matrix measures impact including health and safety, compliance, reliability, disruption, ability to return to service and financial.

The likelihood and trigger matrix further defines system characteristics by placing values on:

- Condition assessment overall
- Effective operating protocols
- Reliability
- Planned redundancy
- Capacity and utilization
- Obsolescence
- Annual maintenance cost

The two matrices are combined and tabulated to provide an overall system risk score. These tables and the final criticality risk matrix are included as Appendix A.

**Asset Condition Assessment Rating Scale**

| GRADE | CONDITION | DESCRIPTION |
|---|---|---|
| 0 | Abandoned | Asset Abandoned, not longer in use, or no longer exists |
| 1 | Very Good | Sound physical condition. Meets current needs. Operative and well maintained. Asset expected to perform adequately with routine maintenance for 10 yr. or more. No work required. |
| 2 | Good | Acceptable physical condition. Shows minor wear that has minimal impact on performance. Minimal short term failure risk. Potential for deterioration or impaired performance over next 5-10 years. Minor work (if any ) required. |
| 3 | Fair | Functionally sound but showing wear and diminished performance. Moderate short term failure risk. Potential for further deterioration and diminished performance within next 5 years. Renewal or major component replacement expected within next 5 years. Minor work required but asset is serviceable. |
| 4 | Poor | Asset functions but required high level of maintenance to remain operable. High risk of short term failure. Likely to have significant deterioration in performance within next two years. Renewal or replacement expected within next 2 years. Substantial work required, asset barely serviceable. |
| 5 | Very Poor | Asset failed or failure is imminent. Excessive maintenance required. No further service life expectancy. Significant health and safety hazer. Major work or replacement is urgent. |

*Source: Association of Metropolitan Sewerage Authorities, "Managing Public Infrastructure Assets" 2002*

**Table 1**

## 3. Systems Condition Summary

The overall average condition of all wastewater treatment systems has decreased from Good-Fair to Fair. This reduction in condition rating is primarily due to acquiring additional time in service creating component wear. As the facilities near 20 years in service, obsolescence is affecting the ability to acquire parts and service.

Numerous refurbishment and replacement projects have been completed since 2018. These projects focused on replacing failed system components and replacement of some previously abandoned systems including:

- Various pump refurbishment and replacements
- New chlorine residual analyzer at the chlorine contact basin
- Refurbishment and optimization of the aerators
- Centrifuge refurbishment
- Centrifuge controls replacement
- Repairs of the solids pasteurization system

Several projects are funded and scheduled for 2021 including:

- Replacement and optimization of the disinfection system
- Continued optimization of aerators
- Clarifier drive and mechanism refurbishment
- Solids conveyor belt replacement

While these projects help maintain the wastewater system's design level of service, obsolescence and age continue to challenge system performance and reliability.

The criticality matrix was updated to aid with this effort. Table 2 incorporates the overall condition rating, risk score and critically rank to aid with evaluation and prioritization of improvements.

| System Description | Risk Rank | Overall Condition Rating | Criticality Rank |
|---|---|---|---|
| Pasteurization System Biosolids | 1 | 3.4 | 1 |
| Septage | 2 | 3.6 | 9 |
| Centrifuge | 3 | 3.2 | 5 |
| Northside Pump Station | 4 | 3.1 | 4 |
| Headworks Screenings | 5 | 3.7 | 10 |
| Sodium Hypochlorite System | 6 | 3.3 | 2 |
| Pasteurization System Lime Storage and Feed | 7 | 3.4 | 3 |
| Aeration Basin | 8 | 2.7 | 14 |
| RAS/WAS Pumping | 9 | 2.4 | 11 |
| Influent Pump Station | 10 | 3.0 | 7 |
| Secondary Clarification | 11 | 2.3 | 12 |
| Electrical | 12 | 2.3 | 8 |
| Sludge Storage and Dewatering Feed Pumping | 13 | 2.1 | 17 |
| Generator Power | 14 | 2.0 | 6 |
| Instrumentation and Control | 15 | Not Rated | 15 |
| Plant Drain | 16 | 2.0 | 19 |
| Dewatering Polymer | 17 | 2.2 | 18 |
| Plant Effluent | 18 | 1.8 | 16 |
| Effluent Conveyance | 19 | 2.2 | 13 |
| W3 and Sump Pumping | 20 | 3.0 | 19 |
| Structures | 21 | 1.9 | 21 |
| W1 | 22 | 2.4 | 22 |

**Table 2**

The risk rank provides a means of identifying the systems that pose the highest risk to the facility. The corresponding overall condition rating provides a separate score to compare with the risk rank. The criticality rank provides an additional reference point. This information provides the city with different perspectives when developing plans for these facilities.

The systems most at risk include four main areas:

- Northside pump station
- Headworks
- Septage
- Solids handling

Key findings in each of these systems is summarized as follows.

**Northside Pump Station**

The northside pump station is a remote pump station located at the site of the original wastewater treatment facility. Failure of the station results in sewage overflow as well as potential overflow of the Nye Beach pump station. The station provides pretreatment including screening and grit removal. These systems and the structure that houses these systems are in Fair to Poor condition. During 2019 and 2020 staff engaged consultants to develop improvement options. Implementation of improvement options are pending.

The condition of the station continues to challenge ongoing operation and maintenance of the station. One example is the screening system. The system is quickly reaching the end of its service life and requires continuous maintenance to maintain operation. The package screening and conveyance unit has been repaired several times and continues to degrade. Figure 1 shows how the conveyor has begun to wear through the housing creating leakage from the unit.

**Figure 1**

The equipment in the station is exposed to weather due to the failure of the geodesic dome that serves as the roof. Numerous leaks create operational challenges and requires staff to cover equipment with plastic for protection. Figure 2 shows the screening controls that must be covered to preserve electrical control.

**Figure 2**

**Headworks**

The headworks is located at the treatment plant site and includes screening and sampling. The screening system is the same as northside pump station. In addition to having the same maintenance challenges, the headworks is exposed to high levels of hydrogen sulfide. This exposure results in severe corrosion throughout the system. The sampling and air handing equipment requires replacement on a regular basis due to this corrosion. The sampling system is currently out of service due to this condition. Staff have implemented an interim sampling solution that requires addition of ice to maintain the required temperature to preserve sample integrity.

Corrosion is damaging infrastructure throughout the conveyance system, from the northside pump station to the influent pump station and into the headworks. The septic conditions that produce hydrogen sulfide also creates an oxygen demand on the secondary treatment system which strains the aeration system at times. High levels of hydrogen sulfide gas create hazardous atmospheres that are toxic. Figure 3 shows the effect of hydrogen sulfide on concrete. This photo was taken in front of the influent pump station where air is removed from the wet well for treatment. The concrete is eroding due to sulfuric acid created by hydrogen sulfide and moisture.

**Figure 3**

**Septage Receiving**

Septage receiving is an ongoing activity at the treatment plant as septage haulers from the region arrive on a regular basis to off load septage. The package receiving system includes automated control and screening. The screening system is like the northside and headworks systems. The seepage screen is no longer performing and requires manual removal of screening. This requires the haulers or staff to intervene between loads to remove debris from the screen.

**Solids Handling**

The overall condition of the solids handling system is Fair to Poor even after several component refurbishments over the past three years. Much of the condition deterioration is due to the fact the system must operate well over 40 hours a week to process the incoming solids. This leaves little time for maintenance and results in immediate impact when a component failure occurs. The system's automation incorporates multiple systems. While many controls have been refurbished, the incomplete integration caused by failures over the years has resulted in manual control and monitoring. Operation of the system requires in excess of one full time equivalent employee resource.

### 2018 to 2021 Condition Rating Comparison and Observations

This section concludes the condition assessment update TM. Table 3 provides a summary and comparison of 2018 and 2021 ratings. Rating changes that result in negative values indicate further deterioration in asset condition. An observations column has been added to provide context to the rating change.

Observations based on the comparison of the two condition assessments:

- The system condition ratings from 2018 to 2021 have degraded by about 6% even though several refurbishment projects have been completed in that time.
- Approximately half of the systems show declining condition.
- Refurbishments of the aeration and polymer systems have resulted in an improved condition score.
- Pump failures in IPS, RAS/WAS, NS pump station contribute to a decreased rating.
- Personnel safety in the areas of the NS pump station, headworks and septage systems contribute to reduced condition rating.
- The condition of the solids handling systems combined (pasteurization system, centrifuge, lime feed and septage receiving) pose a significant risk to the city.

| System Description | 2018 Condition Rating | 2021 Condition Rating | Rating Change | Observation |
|---|---|---|---|---|
| Influent Pump Station | 3.2 | 3.0 | 0.20 | Pump improvements; Odor system in service; Wet well and equipment corrosion increasing. |
| Effluent Conveyance | 2.2 | 2.2 | 0.00 | Planned to install chlorine residual monitoring. |
| Headworks Screenings | 3.0 | 3.7 | -0.71 | Pump out of service; Screening ineffective; Screening chute safety; Corrosion. |
| Aeration Basin | 2.9 | 2.7 | 0.22 | New aerator drives, bearings, lubrication; Increased RPM to provide additional aeration. |
| Secondary Clarification | 2.0 | 2.3 | -0.33 | Drive and mechanism deterioration, refurbishment scheduled for 2022. New scum pump installed. |
| Sodium Hypochlorite System | 2.5 | 3.3 | -0.79 | Chemical metering and control not reliable. New skid mounted system design is 80% complete. |
| W3 and Sump Pumping | 2.6 | 3.0 | -0.40 | Sump pumps not accessible for maintenance, requires cutting pipe. |
| Septage | 2.9 | 3.6 | -0.67 | New access deck installed; screening removal requires manual effort; Monitoring sensors not in operation. |
| Plant Drain | 2.4 | 2.0 | 0.40 | Replaced plant drain pump. |
| Plant Effluent | 2.4 | 1.8 | 0.57 | Replaced sample pump; New chlorine analyzer; Purchased new mixer and control panel. |
| W1 | 2.1 | 2.4 | -0.28 | Pump condition decreased to fair. |
| Generator Power | 2.0 | 2.0 | 0.00 | Serviced and load tested July 2021. |
| RAS/WAS Pumping | 1.4 | 2.4 | -1.04 | One RAS pump out of service; WAS flow metering not accurate. |
| Sludge Storage and Dewatering Feed Pumping | 1.9 | 2.1 | -0.16 | Blower not operating at design pressure. |
| Dewatering Polymer | 3.4 | 2.2 | 1.20 | Replaced one of two polymer make down systems. |
| Centrifuge | 3.7 | 3.2 | 0.55 | One centrifuge out of service due to feed port; New centrifuge motors, controls; New screw conveyor for No. 1 centrifuge. Both centrifuges on line do not meet throughput needs. |
| Pasteurization System Lime Storage and Feed | 2.8 | 3.4 | -0.64 | Equipment on top of lime storage not accessible due to safety. Other equipment requires excessive maintenance. |
| Pasteurization System Biosolids | 2.6 | 3.4 | -0.80 | Control requires manual operation; Heat system not reliable; conveyor replacement scheduled for December 2021. |
| Northside Pump Station | 2.5 | 3.1 | -0.64 | One of three pumps out of service for repair; Screens are worn and not effective in removing screenings. |
| Structures | 1.9 | 1.9 | 0.03 | Perimeter fence project completed; Northside pump station cover has missing panel, broken skylights and corrosion. |
| Electrical | 2.5 | 2.3 | 0.16 | Harmonic filters not serviceable; Several adjustable frequency drives have been replaced. |
| Instrumentation and Control | Not Rated | n/a | n/a | n/a |

**Table 3**

## Appendix A

**Criticality Matrix**

| Wastewater Treatment - criticality levels by possible impact | | | | | |
|---|---|---|---|---|---|
| **Impact Category** | **Weight** | **Negligible = 1** | **Low = 4** | **Moderate = 7** | **Critical = 10** |
| 1 Health & Safety of employees and public | 1.0 | No injuries or adverse health effects | No lost-time injuries or medical attention necessary | Lost time injury or injury requires medical attention | Long term disability or death. |
| 2 Compliance with permits and regulations | 0.8 | No violations of permits or regulations. No environmental or public health impact. | Warning Letter but no enforcement action taken, No environmental or public health impact | Violation of NPDES Permit. Possible short-term environmental impact. Possible public health impact. | Violation of NPDES Permit. Enforcement action likely. Long-term environmental impact likely; public health impact likely. |
| 3 Service reliability | 0.8 | <20 services interrupted; No Process Impact | <500 services effected; Reduction in Process efficiency | 500-1000 services effected; Long term Process impacts | Service interruption >1000 services; Process failure |
| 4 Disruption to the community / Public Image | 0.7 | No social or economic impact on the businesses or the community. No disruption to the community. No media coverage. | No social or economic impact on the businesses or the community. Minor disruption to the community (e.g., traffic, dust, noise). No media coverage. | Short-term economic impact on residential customers and/or a few business. Minor disruption to the community (e.g., traffic, dust, noise). Local media coverage. | Long-term or area-wide economic impact on numerous businesses or any "high-priority" customer. Major disruption to the community (e.g., traffic, dust, noise). National media coverage. |
| 5 Ability to return asset to service | 0.7 | Less than 4 hours | Service restored 4 to 12 hours | Service restored 12 to 24 hours | Not able to restore service for >24 hrs |
| 6 Financial impact on utility | 0.6 | <$5,000 | $5,000 to $25,000 | $25,000 to $150,000 | >$150,000 |

## Appendix A

### Likelihood-Trigger Matrix

| Likelihood - Trigger Matrix | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Objective | Weight | Negligible = 1 | Minor = 2 | Moderate = 4 | Major = 7 | Critical = 10 |
| Likelihood | Condition Assessment Overall | 0.75 | Only planned maintenance required (Condition Grade 1) | 5% needs corrective maintenance or renewal (Condition Grade 2) | 10 to 20% needs corrective maintenance or renewal (Condition Grade 3) | 20 to 40% needs corrective maintenance or renewal (Condition Grade 4) | >50% requires corrective maintenance or renewal (Condition Grade 5) |
| Likelihood | Effective Operating Protocols[1] | 0.10 | Optimal | Satisfactory | Known improvements needed | No protocols currently exist | |
| Likelihood | Reliability | 0.10 | No Corrective work order Events within 12 months | <2 corrective work order events within 12 months | 2-5 corrective work order events within 12 months | >6-8 corrective work order events within 12 months | >8 corrective work order events within 12 months |
| Likelihood | Planned Redundancy[2] | 0.05 | 200% - additional spare parts in stock - action plan in place and practiced | 100% - spare parts in stock - action plan developed and implemented | Spare parts are available within 4 hours - action plan developed and implemented | Spare parts are available within 24 hours - action plan developed and implemented | 0% - no parts - no plan |
| Trigger | Capacity and Utilization[3] | 0.5 | Sized correctly for meeting conditions | Under utilized (Time) | Over capacity (Volume) | Over utilized (Time) | Unable to meet capacity |
| Trigger | Obsolescence | 0.2 | New - optimal technology | Technology change | No manufactured parts available | Parts probably available from other sources | Parts are not available |
| Trigger | Annual Maintenance Cost[4] | 0.3 | <10% of replacement cost | 10-20% of replacement cost | 20-30% of replacement cost | 30-50% of replacement cost | >50% of replacement cost |

[1] Includes standard operating procedures, O&M manuals, maintenance checklists, etc.

[2] Includes availability of parts and written plan to find in-stock parts, and obtain parts from others.

[3] Capacity relates to volume, quantity or flow; utilization relates to the amount of time asset is in-use.

[4] Includes all maintenance costs, both planned and unplanned.

## Appendix A

**System Criticality and Risk Scoring**

| Wastewater Systems | | Influent Pump Station | Effluent Conveyance | Headworks Screening | Aeration Basin | Secondary Clarification | Sodium Hypochlorite System | W3 and Sump Pumping | Septage | Plant Drain | Plant Effluent | W1 | Generator Power | RAS/WAS Pumping | Sludge Storage and Dewatering Feed Pumping | Dewatering Polymer | Centrifuge | Pasteurization System Lime Storage and Feed | Pasteurization System Biosolids | Northside Pump Station | Structures | Electrical | Instrumentation and Control |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Criticality** | **Weight** | | | | | | | | | | | | | | | | | | | | | | |
| Health & Safety of employees and public | 1.0 | 4 | 1 | 7 | 1 | 1 | 7 | 4 | 4 | 4 | 4 | 1 | 1 | 4 | 4 | 1 | 1 | 7 | 7 | 4 | 1 | 4 | 1 |
| Compliance with permits and regulations | 0.8 | 7 | 7 | 1 | 1 | 1 | 10 | 1 | 1 | 1 | 1 | 1 | 10 | 4 | 1 | 1 | 4 | 7 | 10 | 7 | 1 | 7 | 4 |
| Service reliability | 0.8 | 7 | 4 | 4 | 10 | 4 | 10 | 4 | 10 | 4 | 7 | 1 | 7 | 4 | 4 | 4 | 10 | 10 | 10 | 7 | 1 | 4 | 7 |
| Disruption to the community / Public Image | 0.7 | 7 | 7 | 4 | 4 | 4 | 10 | 1 | 7 | 1 | 4 | 1 | 7 | 4 | 4 | 4 | 7 | 10 | 10 | 10 | 1 | 4 | 4 |
| Ability to return asset to service | 0.7 | 4 | 4 | 7 | 4 | 10 | 7 | 4 | 4 | 4 | 1 | 1 | 10 | 10 | 4 | 4 | 10 | 10 | 10 | 10 | 4 | 10 | 4 |
| Financial impact on utility | 0.6 | 7 | 4 | 7 | 7 | 10 | 7 | 1 | 7 | 1 | 1 | 1 | 4 | 4 | 1 | 4 | 10 | 7 | 10 | 10 | 7 | 7 | 4 |
| **Criticality Score** | | **27.1** | **19.9** | **22.9** | **19.6** | **20.8** | **39.1** | **12.1** | **24.7** | **12.1** | **14.5** | **4.6** | **28.9** | **22.6** | **14.2** | **13.0** | **30.1** | **38.8** | **43.0** | **35.2** | **10.3** | **26.8** | **17.8** |
| **Criticality Rank** | | **7** | **13** | **10** | **14** | **12** | **2** | **19** | **9** | **19** | **16** | **22** | **6** | **11** | **17** | **18** | **5** | **3** | **1** | **4** | **21** | **8** | **15** |
| | | | | | | | | | | | | | | | | | | | | | | | |
| **Likelihood** | **Weight** | | | | | | | | | | | | | | | | | | | | | | |
| Condition Assessment Overall | 0.75 | 4 | 1 | 7 | 7 | 4 | 10 | 2 | 10 | 2 | 2 | 1 | 1 | 4 | 1 | 2 | 7 | 7 | 10 | 7 | 2 | 2 | 2 |
| Effective Operating Protocols1 | 0.10 | 2 | 2 | 2 | 2 | 2 | 4 | 1 | 4 | 2 | 2 | 1 | 2 | 1 | 2 | 2 | 4 | 2 | 4 | 4 | 2 | 2 | 2 |
| Reliability | 0.10 | 10 | 2 | 2 | 10 | 4 | 10 | 1 | 10 | 4 | 1 | 1 | 4 | 7 | 2 | 2 | 10 | 7 | 10 | 10 | 2 | 2 | 4 |
| Planned Redundancy2 | 0.05 | 4 | 2 | 2 | 7 | 4 | 7 | 2 | 7 | 4 | 2 | 2 | 4 | 4 | 4 | 2 | 10 | 7 | 7 | 7 | 2 | 4 | 2 |
| **Likelihood Score** | | **4.4** | **1.25** | **5.75** | **6.8** | **3.8** | **9.25** | **1.8** | **9.25** | **2.3** | **1.9** | **1.05** | **1.55** | **4** | **1.35** | **2** | **7.15** | **6.5** | **9.25** | **7** | **2** | **2.1** | **2.2** |
| **Likelihood Rank** | | **9** | **21** | **8** | **6** | **11** | **1** | **18** | **1** | **12** | **17** | **22** | **19** | **10** | **20** | **15** | **4** | **7** | **1** | **5** | **15** | **14** | **13** |
| | | | | | | | | | | | | | | | | | | | | | | | |
| **Trigger** | **Weight** | | | | | | | | | | | | | | | | | | | | | | |
| Capacity and Utilization3 | 0.50 | 2 | 1 | 10 | 4 | 1 | 1 | 1 | 10 | 1 | 1 | 1 | 1 | 4 | 4 | 1 | 10 | 1 | 7 | 4 | 1 | 1 | 1 |
| Obsolescence | 0.20 | 2 | 1 | 2 | 1 | 1 | 2 | 1 | 2 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 7 | 7 | 2 | 1 | 1 | 1 |
| Annual Maintenance Cost4 | 0.30 | 2 | 1 | 4 | 7 | 2 | 4 | 1 | 2 | 2 | 1 | 1 | 1 | 2 | 1 | 1 | 2 | 2 | 7 | 4 | 1 | 1 | 1 |
| **Trigger Score** | | **2** | **1** | **6.6** | **4.3** | **1.3** | **2.1** | **1** | **6** | **1.3** | **1** | **1** | **1** | **3** | **2.7** | **1.2** | **6** | **2.5** | **7** | **3.6** | **1** | **1** | **1** |
| **Trigger Rank** | | **11** | **15** | **2** | **5** | **12** | **10** | **15** | **3** | **12** | **15** | **15** | **15** | **7** | **8** | **14** | **3** | **9** | **1** | **6** | **15** | **15** | **15** |
| | | | | | | | | | | | | | | | | | | | | | | | |
| **Risk** | | | | | | | | | | | | | | | | | | | | | | | |
| **Risk Score** | | **238** | **25** | **869** | **573** | **103** | **760** | **22** | **1371** | **36** | **28** | **5** | **45** | **271** | **52** | **31** | **1291** | **631** | **2784** | **887** | **21** | **56** | **39** |
| **Risk Rank** | | **10** | **19** | **5** | **8** | **11** | **6** | **20** | **2** | **16** | **18** | **22** | **14** | **9** | **13** | **17** | **3** | **7** | **1** | **4** | **21** | **12** | **15** |

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# Appendix B Headworks Alternatives Cost Estimate



Use of contents on this sheet is subject to the limitations specified at the end of this document.

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Alternative: | | Headworks Improvements | | | | | | | |
| Last Updated: | | 1/16/2023 | | | | | | | |
| QC/QC Date: | | 1/11/2023 | | | | | | | |
| | | | | | | | | | |
| **Detail Capital Costs** | | | | | | | | | |
| | | | | | | | | | |
| Component/Item | | | | | Quantity | Units | Unit Cost | Bare Cost | Capital Cost |
| Headworks | | | | | | | | | |
| | Demo existing screens | | | | 2 | ea | 10,000 | $20,000 | $44,296 |
| | New screen, with washer/compactor | | | | 3 | ea | 250,000 | $750,000 | $1,661,101 |
| | New screen installation | | | | 3 | ea | 37,500 | $112,500 | $249,165 |
| | New gates, 36" x 60", motor operated | | | | 2 | ea | 7,500 | $15,000 | $33,222 |
| | Operator for existing gates | | | | 4 | ea | 2,000 | $8,000 | $17,718 |
| | Replace manhole covers, 24" | | | | 2 | ea | 250 | $500 | $1,107 |
| | Replace grating, 4' x 8', aluminum | | | | 32 | sqft | 65 | $2,080 | $4,607 |
| | Channel covers, aluminum | | | | 300 | sqft | 75 | $22,500 | $49,833 |
| | Enclose exterior wall openings, CIP stem wall | | | | 175 | sqft | 45 | $7,875 | $17,442 |
| | Enclose exterior wall openings, CMU | | | | 333 | sqft | 30 | $9,990 | $22,126 |
| | Odor Control System | | | | 1 | ls | 140,000 | $140,000 | $310,072 |
| | Odor Control System installation | | | | 1 | ls | 21,000 | $21,000 | $46,511 |
| | Odorous air ductwork | | | | 1 | ls | 100,000 | $100,000 | $221,480 |
| | Misc repairs | | | | 1 | ls | 20,000 | $20,000 | $44,296 |
| | Electrical Allowance | | | | 1 | ls | 226,000 | $226,000 | $500,545 |
| | | | | | | | | | |
| Assumes project will be D/B/B | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | $1,455,445 | |
| | | | | | | | | | |
| Construction Markups | | | | | | | | | |
| | Contractor Overhead and Profit | | | | 15 | % | | $218,317 | |
| | | Subtotal | | | | | | $1,673,762 | |
| | Contractor General Conditions | | | | 12 | % | | $200,851 | |
| | | Subtotal | | | | | | $1,874,613 | |
| | Undesigned/Undeveloped Detail Contingency | | | | 40 | % | | $749,845 | |
| | | Subtotal | | | | | | $2,624,458 | |
| | Bonds and Insurance | | | | 3.5 | % | | $91,856 | |
| | | Subtotal | | | | | | $2,716,314 | |
| | Oregon Corporate Activity Tax | | | | 0.57 | % | | $15,483 | |
| | | Subtotal | | | | | | $2,731,797 | |
| | Escalation to Midpoint (March 2027) | | | | 18 | % | | $491,724 | |
| | | **SUBTOTAL CONSTRUCTION COST** | | | | | | **$3,223,521** | |
| | | | | | | | | | |
| Other Markups | | | | | | | | | |
| | Risk Based Contingency | | | | 0 | % | | $0 | |
| | | Subtotal | | | | | | $3,223,521 | |
| | Soft Costs | | | | 0 | % | | $0 | |
| | | | | | | | | | |
| **TOTAL CAPITAL COST** | | | | | | | | **$3,223,521** | **$3,223,521** |

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# Appendix C Liquids Stream Alternatives Cost Estimate



Use of contents on this sheet is subject to the limitations specified at the end of this document.

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Alternative: | | 2nd Oxidation Ditch + 3rd Secondary Clarifier | | | | | | | |
| Last Updated: | | 1/16/2023 | | | | | | | |
| QC/QC Date: | | 1/11/2023 | | | | | | | |
| | | | | | | | | | |
| **Detail Capital Costs** | | | | | | | | | |
| | | | | | | | | | |
| Component/Item | | | | | Quantity | Units | Unit Cost | Bare Cost | Capital Cost |
| Oxidation Ditch, 1.44 MG, 180 ft long x 130 ft wide | | | | | | | | | |
| | Ground Improvements Allowance | | | | 20000 | sqft | 20 | $400,000 | $885,920 |
| | Structural and Earthwork | | | | 1 | ls | 2,883,000 | $2,883,000 | $6,385,271 |
| | Equipment | | | | 1 | ls | 788,000 | $788,000 | $1,745,263 |
| | Process Piping | | | | 1 | ls | 47,000 | $47,000 | $104,096 |
| Secondary Clarifier, 90 ft dia x 16 ft deep, fully buried | | | | | | | | | |
| | Ground Improvements Allowance | | | | 7100 | sqft | 20 | $142,000 | $314,502 |
| | Structural and Earthwork | | | | 1 | ls | 1,922,000 | $1,922,000 | $4,256,847 |
| | Equipment | | | | 1 | ls | 686,000 | $686,000 | $1,519,353 |
| | Process Piping | | | | 1 | ls | 93,000 | $93,000 | $205,976 |
| RAS/WAS Pumping Station | | | | | | | | | |
| | Structural and Earthwork | | | | 1 | ls | 275,000 | $275,000 | $609,070 |
| | Equipment | | | | 1 | ls | 157,000 | $157,000 | $347,724 |
| | Process Piping | | | | 1 | ls | 116,000 | $116,000 | $256,917 |
| RAS Mixing Box, 24 ft x 6 ft x 16 ft deep, with gates | | | | | | | | | |
| | Structural and Earthwork | | | | 1 | ls | 52,000 | $52,000 | $115,170 |
| | Equipment | | | | 1 | ls | 42,000 | $42,000 | $93,022 |
| ML Splitter Box, 18 ft x 19 ft x 15 ft deep, 3 channels with cutthroat flumes and gates | | | | | | | | | |
| | Structural and Earthwork | | | | 1 | ls | 123,000 | $123,000 | $272,421 |
| | Equipment | | | | 1 | ls | 45,000 | $45,000 | $99,666 |
| Site Work | | | | | | | | | |
| | Site Grading | | | | 1 | ls | 200,000 | $200,000 | $442,960 |
| | Demo Pole Building, 50' x 40' | | | | 2000 | sqft | 12 | $24,000 | $53,155 |
| | Asphalt Roadway | | | | 24080 | sqft | 6 | $144,480 | $319,994 |
| | 36" ML (DI) Piping, buried | | | | 600 | lf | 1,000 | $600,000 | $1,328,881 |
| | 30" RS (DI) Piping, buried | | | | 165 | lf | 850 | $140,250 | $310,626 |
| | 24" SE (DI) piping, buried | | | | 380 | lf | 780 | $296,400 | $656,467 |
| | 16" RAS (DI) piping, buried | | | | 620 | lf | 450 | $279,000 | $617,929 |
| | 6" WAS, TD, DS (DI) Piping, buried | | | | 1050 | lf | 255 | $267,750 | $593,013 |
| | 6" Scum (DI glass lined) Piping, buried | | | | 325 | lf | 280 | $91,000 | $201,547 |
| | 4" TWAS (DI) Piping, buried | | | | 0 | ls | 225 | $0 | $0 |
| | Site Utility Piping Allowance | | | | 1 | ls | 10,000 | $10,000 | $22,148 |
| Electrical Allowance | | | | | 1 | ls | 2,456,000 | $2,456,000 | $5,439,551 |
| | | | | | | | | | |
| Assumes project will be D/B/B | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | $12,279,880 | |
| | | | | | | | | | |
| Construction Markups | | | | | | | | | |
| | Contractor Overhead and Profit | | | | 15 | % | | $1,841,982 | |
| | | Subtotal | | | | | | $14,121,862 | |
| | Contractor General Conditions | | | | 12 | % | | $1,694,623 | |
| | | Subtotal | | | | | | $15,816,485 | |
| | Undesigned/Undeveloped Detail Contingency | | | | 40 | % | | $6,326,594 | |
| | | Subtotal | | | | | | $22,143,080 | |
| | Bonds and Insurance | | | | 3.5 | % | | $775,008 | |
| | | Subtotal | | | | | | $22,918,087 | |
| | Oregon Corporate Activity Tax | | | | 0.57 | % | | $130,633 | |
| | | Subtotal | | | | | | $23,048,721 | |
| | Escalation to Midpoint (March 2027) | | | | 18 | % | | $4,148,770 | |
| | | **SUBTOTAL CONSTRUCTION COST** | | | | | | **$27,197,490** | |
| | | | | | | | | | |
| Other Markups | | | | | | | | | |
| | Risk Based Contingency | | | | 0 | % | | $0 | |
| | | Subtotal | | | | | | $27,197,490 | |
| | Soft Costs | | | | 0 | % | | $0 | |
| | | | | | | | | | |
| **TOTAL CAPITAL COST** | | | | | | | | **$27,197,490** | **$27,197,490** |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Alternative: | | Primary Clarifiers + 3rd Secondary Clarifier | | | | | | | |
| Last Updated: | | 1/16/2023 | | | | | | | |
| QC/QC Date: | | 1/11/2023 | | | | | | | |
| | | | | | | | | | |
| **Detail Capital Costs** | | | | | | | | | |
| | | | | | | | | | |
| Component/Item | | | | | Quantity | Units | Unit Cost | Bare Cost | Capital Cost |
| Primary Clarifiers, 80 ft long x 16 ft wide x 14' deep, typ of 2, buried half way | | | | | | | | | |
| | Ground Improvements Allowance | | | | 2500 | sqft | 20 | $50,000 | $110,740 |
| | Structural and Earthwork | | | | 1 | ls | 1,244,000 | $1,244,000 | $2,755,212 |
| | Equipment | | | | 1 | ls | 1,047,000 | $1,047,000 | $2,318,897 |
| | Process Piping | | | | 1 | ls | 523,500 | $523,500 | $1,159,448 |
| Secondary Clarifier, 90 ft dia x 16 ft deep, fully buried | | | | | | | | | |
| | Ground Improvements Allowance | | | | 7100 | sqft | 20 | $142,000 | $314,502 |
| | Structural and Earthwork | | | | 1 | ls | 1,922,000 | $1,922,000 | $4,256,847 |
| | Equipment | | | | 1 | ls | 686,000 | $686,000 | $1,519,353 |
| | Process Piping | | | | 1 | ls | 93,000 | $93,000 | $205,976 |
| RAS/WAS Pumping Station | | | | | | | | | |
| | Structural and Earthwork | | | | 1 | ls | 275,000 | $275,000 | $609,070 |
| | Equipment | | | | 1 | ls | 157,000 | $157,000 | $347,724 |
| | Process Piping | | | | 1 | ls | 116,000 | $116,000 | $256,917 |
| RAS Mixing Box, 24 ft x 6 ft x 16 ft deep, with gates | | | | | | | | | |
| | Structural and Earthwork | | | | 1 | ls | 52,000 | $52,000 | $115,170 |
| | Equipment | | | | 1 | ls | 42,000 | $42,000 | $93,022 |
| ML Splitter Box, 18 ft x 19 ft x 15 ft deep, 3 channels with cutthroat flumes and gates | | | | | | | | | |
| | Structural and Earthwork | | | | 1 | ls | 123,000 | $123,000 | $272,421 |
| | Equipment | | | | 1 | ls | 45,000 | $45,000 | $99,666 |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Site Work | | | | | | | | | |
| | Site Grading | | | | 1 | ls | 250,000 | $250,000 | $553,700 |
| | Asphalt Roadway | | | | 15080 | sqft | 6 | $90,480 | $200,395 |
| | 36" ML (DI) Piping, buried | | | | 20 | lf | 1,000 | $20,000 | $44,296 |
| | 30" RS, PE (DI) Piping, buried | | | | 260 | lf | 850 | $221,000 | $489,471 |
| | 24" ML, SE (DI) piping, buried | | | | 615 | lf | 780 | $479,700 | $1,062,440 |
| | 16" RAS (DI) piping, buried | | | | 240 | lf | 450 | $108,000 | $239,199 |
| | 6" WAS, DS, Drain (DI) Piping, buried | | | | 1780 | lf | 255 | $453,900 | $1,005,298 |
| | 6" Scum (DI glass lined) Piping, buried | | | | 600 | lf | 280 | $168,000 | $372,087 |
| | 4" TWAS, DS (DI) Piping, buried | | | | 495 | ls | 225 | $111,375 | $246,673 |
| | Site Utility Piping Allowance | | | | 1 | ls | 10,000 | $10,000 | $22,148 |
| Electrical Allowance | | | | | 1 | ls | 2,107,000 | $2,107,000 | $4,666,586 |
| | | | | | | | | | |
| Assumes project will be D/B/B | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | $10,536,955 | |
| | | | | | | | | | |
| Construction Markups | | | | | | | | | |
| | Contractor Overhead and Profit | | | | 15 | % | | $1,580,543 | |
| | | Subtotal | | | | | | $12,117,498 | |
| | Contractor General Conditions | | | | 12 | % | | $1,454,100 | |
| | | Subtotal | | | | | | $13,571,598 | |
| | Undesigned/Undeveloped Detail Contingency | | | | 40 | % | | $5,428,639 | |
| | | Subtotal | | | | | | $19,000,237 | |
| | Bonds and Insurance | | | | 3.5 | % | | $665,008 | |
| | | Subtotal | | | | | | $19,665,246 | |
| | Oregon Corporate Activity Tax | | | | 0.57 | % | | $112,092 | |
| | | Subtotal | | | | | | $19,777,337 | |
| | Escalation to Midpoint (March 2027) | | | | 18 | % | | $3,559,921 | |
| | | **SUBTOTAL CONSTRUCTION COST** | | | | | | **$23,337,258** | |
| | | | | | | | | | |
| Other Markups | | | | | | | | | |
| | Risk Based Contingency | | | | 0 | % | | $0 | |
| | | Subtotal | | | | | | $23,337,258 | |
| | Soft Costs | | | | 0 | % | | $0 | |
| | | | | | | | | | |
| **TOTAL CAPITAL COST** | | | | | | | | **$23,337,258** | **$23,337,258** |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

# Appendix D Solids Alternatives Cost Estimate



Use of contents on this sheet is subject to the limitations specified at the end of this document.

**OPINION OF PROBABLE CONSTRUCTION COST** **KENNEDY/JENKS CONSULTANTS**

**Project:** BC - Newport Solids Master Planning

**Building:** Class A Compost Alternative

**Prepared By:** BIB
**Date Prepared:** 05.23.2023
**K/J Proj. No.:** 2276008*00

**Estimate Type:**
- ■ **Conceptual**
- ☐ **Preliminary (w/o plans)**
- ☐ **Design Development @**
- ☐ **Construction**
- ☐ **Change Order**

**Current at ENR** 13,288.00
**Escalated to ENR**
**Mos. to Midpoint** 60

**SUMMARY BY DIVISION**

| Item No. | ITEM DESCRIPTION | | MATERIALS | INSTALLATION | SUB-CONTRACTOR (E&I/C) | TOTAL |
|---|---|---|---|---|---|---|
| | Hauled Waste Receiving | | $530,050 | $165,398 | $200,522 | $895,970 |
| | Thickening | | $537,300 | $185,690 | $175,022 | $898,012 |
| | Aerobic Digester | | $1,414,162 | $533,442 | $676,464 | $2,624,068 |
| | Dewatering Centrifuge | | $1,481,153 | $391,372 | $501,868 | $2,374,393 |
| | Compost | | $2,097,068 | $1,103,161 | $929,226 | $4,129,456 |
| | Sitework | | $546,095 | $546,095 | $0 | $1,092,190 |
| | Subtotals | | $6,605,828 | $2,925,158 | $2,483,103 | $12,014,089 |
| | Contractor Indirects | 12% | $792,699 | $351,019 | $297,972 | $1,441,691 |
| | Subtotals | | $7,398,528 | $3,276,177 | $2,781,075 | $13,455,779 |
| | Contractor OH&P @ | 15% | $1,109,779 | $491,426 | $417,161 | $2,018,367 |
| | Subtotals | | $8,508,307 | $3,767,603 | $3,198,236 | $15,474,146 |
| | Estimate Contingency @ | 25% | | | | $3,868,537 |
| | Subtotal | | | | | $19,342,683 |
| | Escalation to Mid-Pt of Construction | 4% | | | | $4,190,648 |
| | Subtotal | | | | | $23,533,331 |
| | Engineering, Administrative, Permits, Legal | 38% | | | | $8,942,666 |
| | Total Estimate | | | | | $32,500,000 |
| | | | | | | |

| Estimate Accuracy | |
|---|---|
| +40% | -20% |

| Estimated Range of Probable Cost | | |
|---|---|---|
| +40% | Total Est. | -20% |
| **$45,500,000** | **$32,500,000** | **$26,000,000** |

**OPINION OF PROBABLE CONSTRUCTION COST**

**KENNEDY/JENKS CONSULTANTS, INC.**

**Project:** BC - Newport Solids Master Planning

**Building, Area:** Packaged Hauled Waste System - Huber RoFas

**Prepared By:** BB
**Date Prepared:** 31-May-23
**KJ Proj. No.** 2276008*00

**Current at ENR** 13,288 May 2023
**Escalated to ENR**
**Months to Midpoint of Construct** 60

**Estimate Type:** ■ Conceptual ☐ Preliminary (w/o plans) ☐ Design Development @ ☐ Construction ☐ Change Order _____ % Complete

| Ref. No. | Spec. No. | Item No. | Description | Qty | Units | Materials $/Unit | Materials Total | Installation $/Unit | Installation Total | Sub-contractor $/Unit | Sub-contractor Total | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **DIVISION 02 - SITE WORK** | | | | | | | | | | | |
| | | | Demo Existing Haul Station | 1 | LS | 500.00 | 500 | 5,000.00 | 5,000 | | | 5,500 |
| 4 | | | Excavation: Small structures | 100 | BCY | | | 21.73 | 2,173 | | | 2,173 |
| 7 | | | Import fill: crushed rock and fill | 80 | LCY | 26.14 | 2,091 | 7.30 | 584 | | | 2,675 |
| 11 | | | Compact: Small structures | 240 | ECY | | | 1.74 | 418 | | | 418 |
| 12 | | | Haul (offsite disposal of excess cut) | 20 | LCY | | | 7.40 | 148 | | | 148 |
| 28 | | | Base course | 50 | SY | 5.02 | 251 | 1.10 | 55 | | | 306 |
| 29 | | | 6" stone base, 4" binder, 2" topper | 50 | SF | 4.16 | 208 | 0.50 | 25 | | | 233 |
| 44 | | | Demo bituminous pavement and curb | 50 | SY | | | 4.90 | 245 | | | 245 |
| | **SUBTOTAL - DIVISION 02** | | | | | | 2,550 | | 3,648 | | | 6,198 |
| | **DIVISION 03 - CONCRETE** | | | | | | | | | | | |
| | | | Misc concrete equip. slabs | 1 | LS | 10,000.00 | 10,000 | 5,000.00 | 5,000 | | | 15,000 |
| | **SUBTOTAL - DIVISION 03** | | | | | | 10,000 | | 5,000 | | | 15,000 |
| | **DIVISION 04 - MASONRY** | | | | | | | | | | | |
| | **SUBTOTAL - DIVISION 04** | | | | | | | | | | | |
| | **DIVISION 05 - METALS** | | | | | | | | | | | |
| | | | Misc metals | 1 | LS | 5,000.00 | 5,000 | 2,500.00 | 2,500 | | | 7,500 |
| | **SUBTOTAL - DIVISION 05** | | | | | | 5,000 | | 2,500 | | | 7,500 |
| | **DIVISION 06 - WOOD AND PLASTICS** | | | | | | | | | | | |
| | **SUBTOTAL - DIVISION 06** | | | | | | | | | | | |
| | **DIVISION 07 - THERMAL AND MOISTURE PROTECTION** | | | | | | | | | | | |
| | **SUBTOTAL - DIVISION 07** | | | | | | | | | | | |
| | **DIVISION 08 - DOORS AND WINDOWS** | | | | | | | | | | | |
| | **SUBTOTAL - DIVISION 08** | | | | | | | | | | | |
| | **DIVISION 09 - FINISHES** | | | | | | | | | | | |
| | | | Pipe coating | 1 | LS | 2,500 | 2,500 | 1,250 | 1,250 | | | 3,750 |
| | **SUBTOTAL - DIVISION 09** | | | | | | 2,500 | | 1,250 | | | 3,750 |
| | **DIVISION 10 - SPECIALTIES** | | | | | | | | | | | |
| | **SUBTOTAL - DIVISION 10** | | | | | | | | | | | |
| | **DIVISION 11 - EQUIPMENT** | | | | | | | | | | | |
| | | | Huber RoFas | 1 | EA | 495,000 | 495,000 | 148,500 | 148,500 | | | 643,500 |
| | **SUBTOTAL - DIVISION 11** | | | | | | 495,000 | | 148,500 | | | 643,500 |
| | **DIVISION 12 - FURNISHINGS** | | | | | | | | | | | |
| | **SUBTOTAL - DIVISION 12** | | | | | | | | | | | |
| | **DIVISION 13 - SPECIAL CONSTRUCTION** | | | | | | | | | | | |
| | **SUBTOTAL - DIVISION 13** | | | | | | | | | | | |
| | **DIVISION 14 - CONVEYING SYSTEMS** | | | | | | | | | | | |
| | **SUBTOTAL - DIVISION 14** | | | | | | | | | | | |
| | **DIVISION 15 - MECHANICAL** | | | | | | | | | | | |
| | | | Piping | 1 | LS | 15,000.00 | 15,000 | 4,500.00 | 4,500 | | | 19,500 |
| | **SUBTOTAL - DIVISION 15** | | | | | | 15,000 | | 4,500 | | | 19,500 |
| | **DIVISION 16 - ELECTRICAL** | | | | | | | | | | | |
| | | | 25-Percent of Div 11, 14 and 15 costs | 1 | LS | | | | | 165,750 | 165,750 | 83,454 |
| | **SUBTOTAL - DIVISION 16** | | | | | | | | | | 165,750 | 83,454 |
| | **DIVISION 17 - INSTRUMENTATION** | | | | | | | | | | | |
| | | | 5-Percent of total cost | 1 | LS | | | | | 34,772 | 34,772 | 34,772 |
| | **SUBTOTAL - DIVISION 17** | | | | | | | | | | 34,772 | 34,772 |
| | **SUBTOTAL, ALL DIVISIONS** | | | | | | 530,050 | | 165,398 | | 200,522 | 813,674 |

**OPINION OF PROBABLE CONSTRUCTION COST**

**KENNEDY/JENKS CONSULTANTS, INC.**

**Project:** BC - Newport Solids Master Planning

**Building, Area:** Mechanical Thickening - FKC RDT

**Prepared By:** BB
**Date Prepared:** 31-May-23
**KJ Proj. No.** 2276008*00

**Current at ENR** 13,288 May 2023
**Escalated to ENR**
**Months to Midpoint of Construct** 60

**Estimate Type:** ■ Conceptual ☐ Preliminary (w/o plans) ☐ Design Development @ ____ % Complete ☐ Construction ☐ Change Order

| Ref. No. | Spec. No. | Item No. | Description | Qty | Units | Materials $/Unit | Materials Total | Installation $/Unit | Installation Total | Sub-contractor $/Unit | Sub-contractor Total | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **DIVISION 02 - SITE WORK** | | | | | | | | | | | |
| | | | Demo Existing Lime Eqpt, Conc. and Grating | 1 | LS | 5,000.00 | 5,000 | 25,000.00 | 25,000 | | | 30,000 |
| | **SUBTOTAL - DIVISION 02** | | | | | | 5,000 | | 25,000 | | | 30,000 |
| | **DIVISION 03 - CONCRETE** | | | | | | | | | | | |
| | | | Misc concrete equip. slabs | 1 | LS | 20,000.00 | 20,000 | 10,000.00 | 10,000 | | | 30,000 |
| | **SUBTOTAL - DIVISION 03** | | | | | | 20,000 | | 10,000 | | | 30,000 |
| | **DIVISION 04 - MASONRY** | | | | | | | | | | | |
| | **SUBTOTAL - DIVISION 04** | | | | | | | | | | | |
| | **DIVISION 05 - METALS** | | | | | | | | | | | |
| | | | Misc metals | 1 | LS | 50,000.00 | 50,000 | 10,000.00 | 10,000 | | | 60,000 |
| | | | Access Platform(s) | 1 | LS | 25,000.00 | 25,000 | 7,500.00 | 7,500 | | | 32,500 |
| | **SUBTOTAL - DIVISION 05** | | | | | | 75,000 | | 17,500 | | | 92,500 |
| | **DIVISION 06 - WOOD AND PLASTICS** | | | | | | | | | | | |
| | **SUBTOTAL - DIVISION 06** | | | | | | | | | | | |
| | **DIVISION 07 - THERMAL AND MOISTURE PROTECTION** | | | | | | | | | | | |
| | **SUBTOTAL - DIVISION 07** | | | | | | | | | | | |
| | **DIVISION 08 - DOORS AND WINDOWS** | | | | | | | | | | | |
| | **SUBTOTAL - DIVISION 08** | | | | | | | | | | | |
| | **DIVISION 09 - FINISHES** | | | | | | | | | | | |
| | | | Pipe coating | 1 | LS | 10,000 | 10,000 | 5,000 | 5,000 | | | 15,000 |
| | **SUBTOTAL - DIVISION 09** | | | | | | 10,000 | | 5,000 | | | 15,000 |
| | **DIVISION 10 - SPECIALTIES** | | | | | | | | | | | |
| | **SUBTOTAL - DIVISION 10** | | | | | | | | | | | |
| | **DIVISION 11 - EQUIPMENT** | | | | | | | | | | | |
| | | | Thickening Feed Pumps | 2 | EA | 40,000 | 80,000 | 12,000 | 24,000 | | | 104,000 |
| | | | Rotary Drum Thickeners | 2 | EA | 121,150 | 242,300 | 36,345 | 72,690 | | | 314,990 |
| | | | TWAS Feed Pumps | 2 | EA | 20,000.00 | 40,000 | 6,000 | 12,000 | | | 52,000 |
| | **SUBTOTAL - DIVISION 11** | | | | | | 362,300 | | 108,690 | | | 470,990 |
| | **DIVISION 12 - FURNISHINGS** | | | | | | | | | | | |
| | **SUBTOTAL - DIVISION 12** | | | | | | | | | | | |
| | **DIVISION 13 - SPECIAL CONSTRUCTION** | | | | | | | | | | | |
| 85 | | | | | | | | | | | | |
| | **SUBTOTAL - DIVISION 13** | | | | | | | | | | | |
| | **DIVISION 14 - CONVEYING SYSTEMS** | | | | | | | | | | | |
| | **SUBTOTAL - DIVISION 14** | | | | | | | | | | | |
| | **DIVISION 15 - MECHANICAL** | | | | | | | | | | | |
| | | | Pipe and Fittings | 1 | LS | 35,000.00 | 35,000 | 10,500.00 | 10,500 | | | 45,500 |
| | | | Yard Piping | 1 | LS | 30,000.00 | 30,000 | 9,000.00 | 9,000 | | | 39,000 |
| | **SUBTOTAL - DIVISION 15** | | | | | | 65,000 | | 19,500 | | | 84,500 |
| | **DIVISION 16 - ELECTRICAL** | | | | | | | | | | | |
| | | | 25-Percent of Div 11, 13 and 15 costs | 1 | LS | | | | | 138,873 | 138,873 | 86,759 |
| | **SUBTOTAL - DIVISION 16** | | | | | | | | | | 138,873 | 86,759 |
| | **DIVISION 17 - INSTRUMENTATION** | | | | | | | | | | | |
| | | | 5-Percent of total cost | 1 | LS | | | | | 36,150 | 36,150 | 36,150 |
| | **SUBTOTAL - DIVISION 17** | | | | | | | | | | 36,150 | 36,150 |
| | **SUBTOTAL, ALL DIVISIONS** | | | | | | 537,300 | | 185,690 | | 175,022 | 845,898 |

**OPINION OF PROBABLE CONSTRUCTION COST**

**KENNEDY/JENKS CONSULTANTS, INC.**

**Project:** BC - Newport Solids Master Planning

**Prepared By:** wmh/BIB
**Date Prepared:** 31-May-23
**KJ Proj. No.** 2276008*00

**Building, Area:** Aerobic Digester

**Current at ENR** 13,288 May 2023
**Escalated to ENR**
**Months to Midpoint of Construct** 60

**Estimate Type:** ■ Conceptual ☐ Preliminary (w/o plans) ☐ Design Development @ ☐ Construction ☐ Change Order ☐ % Complete

| Ref. No. | Spec. No. | Item No. | Description | Qty | Units | Materials $/Unit | Materials Total | Installation $/Unit | Installation Total | Sub-contractor $/Unit | Sub-contractor Total | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **DIVISION 02 - SITE WORK** | | | | | | | | | | | |
| 1 | | **General Site Work** | Clearing/Grubbing | 0.10 | Acre | | | 5,642.60 | 587 | | | 587 |
| 3 | | **Digester** | Excavation: Large structures | 396 | BCY | | | 15.59 | 6,174 | | | 6,174 |
| 7 | | | Import fill: crushed rock and fill | 218 | LCY | 26.14 | 5,709 | 7.30 | 1,594 | | | 7,303 |
| 12 | | | Haul (offsite disposal of excess cut) | 218 | LCY | | | 7.40 | 1,616 | | | 1,616 |
| 8 | | | Fill (native) | 41 | LCY | | | 7.30 | 299 | | | 299 |
| 10 | | | Compact: Large structures | 218 | ECY | | | 6.12 | 1,337 | | | 1,337 |
| 12 | | | Haul (offsite disposal of excess cut) | 437 | LCY | | | 7.40 | 3,232 | | | 3,232 |
| 31 | | Sidewalk | Sidewalk (4" concrete over 4" gravel | 220 | LF | 20.92 | 4,602 | 15.55 | 3,421 | | | 8,023 |
| | | **Digester, additional excavation** | | | | | | | | | | |
| 3 | | Bring ground to grade | Excavation: Large structures | 470 | BCY | | | 15.59 | 7,327 | | | 7,327 |
| 12 | | | Haul (offsite disposal of excess cut) | 510 | LCY | | | 7.40 | 3,771 | | | 3,771 |
| 8 | | backfill sloping cut | Fill (native) | 101 | LCY | | | 7.30 | 740 | | | 740 |
| 3 | | Bring Digester slab down/lower TOW | Excavation: Large structures | 896 | BCY | | | 15.59 | 13,969 | | | 13,969 |
| 3 | | Sloping | Excavation: Large structures | 338 | BCY | | | 15.59 | 5,269 | | | 5,269 |
| 12 | | | Haul (offsite disposal of excess cut) | 896 | LCY | | | 7.40 | 6,630 | | | 6,630 |
| 8 | | backfill sloping cut | Fill (native) | 338 | LCY | | | 7.30 | 2,467 | | | 2,467 |
| 10 | | backfill sloping cut | Compact: Large structures | 338 | ECY | | | 6.12 | 2,069 | | | 2,069 |
| | | **Digester Control/Blower Building** | | | | | | | | | | |
| 3 | | | Excavation: Large structures | 50 | BCY | | | 15.59 | 780 | | | 780 |
| 7 | | | Import fill: crushed rock and fill | 33 | LCY | 26.14 | 850 | 7.30 | 237 | | | 1,087 |
| 12 | | | Haul (offsite disposal of excess cut) | 33 | LCY | | | 7.40 | 241 | | | 241 |
| 10 | | | Compact: Large structures | 33 | ECY | | | 6.12 | 199 | | | 199 |
| 12 | | | Haul (offsite disposal of excess cut) | 65 | LCY | | | 7.40 | 481 | | | 481 |
| 31 | | Sidewalk | Sidewalk (4" concrete over 4" gravel | 110 | LF | 20.92 | 2,293 | 15.55 | 1,704 | | | 3,997 |
| | **SUBTOTAL - DIVISION 02** | | | | | | 13,454 | | 64,144 | | | 77,598 |
| | **DIVISION 03 - CONCRETE** | | | | | | | | | | | |
| | | **Digester** | | | | | | | | | | |
| 56 | | Base Slab (24") | SOG Large structures | 187.00 | CY | 375.00 | 70,125 | 400.00 | 74,800 | | | 144,925 |
| 59 | | Walls (24") | Walls over 10' high | 252.00 | CY | 450.00 | 113,400 | 600.00 | 151,200 | | | 264,600 |
| 61 | | Stairs | Stairs | 11.00 | RSR | 30.00 | 330 | 130.00 | 1,430 | | | 1,760 |
| | | Drain Sumps | Sump addition | 4.00 | EA | | | | | | | |
| | | **Digester Control/Blower Building** | | | | | | | | | | |
| 57 | | blower pads | SOG Small structures | 3.00 | CY | 450.00 | 1,350 | 325.00 | 975 | | | 2,325 |
| 57 | | E-room Pads | SOG Small structures | 2.00 | CY | 450.00 | 900 | 325.00 | 650 | | | 1,550 |
| | **SUBTOTAL - DIVISION 03** | | | | | | 186,105 | | 229,055 | | | 415,160 |
| | **DIVISION 04 - MASONRY** | | | | | | | | | | | |
| | **SUBTOTAL - DIVISION 04** | | | | | | | | | | | |
| | **DIVISION 05 - METALS** | | | | | | | | | | | |
| 62 | | Handrails, Stairs | Railing - Aluminum | 24.00 | LF | 93.00 | 2,232 | 11.13 | 267 | | | 2,499 |
| 62 | | Railing, Digester | Railing - Aluminum | 800.00 | LF | 93.00 | 74,400 | 11.13 | 8,904 | | | 83,304 |
| 63 | | Decant Channel Grating | Grating - Aluminum | 180.00 | SF | 63.00 | 11,340 | 2.92 | 526 | | | 11,866 |
| | | | Miscellaneous Metals (incl. Pipe Sup | 1.00 | LS | 10,000.00 | 10,000 | 2,000.00 | 2,000 | | | 12,000 |
| 66 | | | Grating/Checker plate supports | 102.00 | LF | 15.00 | 1,530 | 10.00 | 1,020 | | | 2,550 |
| | **SUBTOTAL - DIVISION 05** | | | | | | 99,502 | | 12,717 | | | 112,219 |
| | **DIVISION 06 - WOOD AND PLASTICS** | | | | | | | | | | | |
| | **SUBTOTAL - DIVISION 06** | | | | | | | | | | | |
| | **DIVISION 07 - THERMAL AND MOISTURE PROTECTION** | | | | | | | | | | | |
| | **SUBTOTAL - DIVISION 07** | | | | | | | | | | | |
| | **DIVISION 08 - DOORS AND WINDOWS** | | | | | | | | | | | |
| | **SUBTOTAL - DIVISION 08** | | | | | | | | | | | |
| | **DIVISION 09 - FINISHES** | | | | | | | | | | | |
| | | | Pipe Coatings | 1.00 | LS | 7,500.00 | 7,500 | 750.00 | 750 | | | 8,250 |
| | **SUBTOTAL - DIVISION 09** | | | | | | 7,500 | | 750 | | | 8,250 |
| | **DIVISION 10 - SPECIALTIES** | | | | | | | | | | | |
| | **SUBTOTAL - DIVISION 10** | | | | | | | | | | | |
| | **DIVISION 11 - EQUIPMENT** | | | | | | | | | | | |
| | | **Digester Control/Blower Building** | | | | | | | | | | |
| | | Blowers | Blowers, 150 hp | 4.00 | Ea | $78,000 | 312,000 | $15,600 | 62,400 | | | 374,400 |
| | | **Digester** | | | | | | | | | | |
| | | Mixers | Flygt, 10 hp | 4.00 | Ea. | 62,400.00 | 249,600 | 5,460.00 | 21,840 | | | 271,440 |
| | | Davit Crane | Davit Cranes for Mixers | 4.00 | Ea. | 2,800.00 | 11,200 | 500.00 | 2,000 | | | 13,200 |
| | | Diffusers | Diffusers (304 SS branches + drop p | 1.00 | LS | 186,200.00 | 186,200 | 10,500.00 | 10,500 | | | 196,700 |
| 78 | | Feed Box Slide Gates | Steel Slide Gate, Contained, 24"x24 | 8.00 | EA | 6,700.00 | 53,600 | 1,340.00 | 10,720 | | | 64,320 |
| 76a | | Drainage gates | Steel Slide Gate, Contained, 12"x12 | 4.00 | EA | 4,650.00 | 18,600 | 930.00 | 3,720 | | | 22,320 |
| | | Digester Cover | | 1.00 | LS | 160,000.00 | 160,000 | 48,000.00 | 48,000 | | | 208,000 |
| | | Davit Cranes | | 4.00 | EA | 2,000.00 | 8,000 | 600.00 | 600 | | | 8,600 |
| | **SUBTOTAL - DIVISION 11** | | | | | | 999,200 | | 159,780 | | | 1,158,980 |
| | **DIVISION 12 - FURNISHINGS** | | | | | | | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **SUBTOTAL - DIVISION 12** | | | | | | | | | | | |
| | **DIVISION 13 - SPECIAL CONSTRUCTION** | | | | | | | | | | | |
| | | **Digester Control/Blower Building** | | | | | | | | | | |
| 84 | | Building (CMU) | 668 | SF | | | | | | 350.00 | 233,800 | 233,800 |
| | **SUBTOTAL - DIVISION 13** | | | | | | | | | | 233,800 | 233,800 |
| | **DIVISION 14 - CONVEYING SYSTEMS** | | | | | | | | | | | |
| | **SUBTOTAL - DIVISION 14** | | | | | | | | | | | |
| | **DIVISION 15 - MECHANICAL** | | | | | | | | | | | |
| | | **Digester Control/Blower Building** | | | | | | | | | | |
| | | Air Piping Allowance | 1.00 | LS | 17,000.00 | 17,000 | 24,000.00 | 24,000 | | | | 41,000 |
| | | **Digester** | | | | | | | | | | |
| 87 | feed, outlet piping, 4" DIP | 4" DI | 84.00 | LF | 72.89 | 6,123 | 7.08 | 594 | | | | 6,717 |
| | 4" DIP Fitting and Valve Allowance | | 1.00 | LS | 50,000.00 | 50,000 | 25,000.00 | 25,000 | | | | 75,000 |
| 89 | Drain Piping, 6" DIP | 6" DI | 37 | LF | 89.51 | 3,312 | 8.84 | 327 | | | | 3,639 |
| 116 | Drain Piping, 8" DIP | 8" DI | 6 | LF | 161.13 | 967 | 12.39 | 74 | | | | 1,041 |
| | | Drain Fitting Allowance | 1 | LS | 5,000.00 | 5,000 | 1,000.00 | 1,000 | | | | 6,000 |
| | Utility Water | Utiltiy Wash Stations | 4.00 | Ea | 1,500.00 | 6,000 | 1,000.00 | 4,000 | | | | 10,000 |
| | Utiltiy Water | Piping and valve allowance | 1.00 | LS | 10,000.00 | 10,000 | 2,000.00 | 2,000 | | | | 12,000 |
| | Utiltiy Water | Spray System Piping (per cell) | 4.00 | Ea | 2,500.00 | 10,000 | 2,500.00 | 10,000 | | | | 20,000 |
| | **SUBTOTAL - DIVISION 15** | | | | | 108,401 | | 66,996 | | | | 175,397 |
| | **DIVISION 16 - ELECTRICAL** | | | | | | | | | | | |
| | | 25-Percent of Div 11, 14 and 15 cos | 1 | LS | | | | | | 333,594 | 333,594 | 333,594 |
| | **SUBTOTAL - DIVISION 16** | | | | | | | | | | 333,594 | 333,594 |
| | **DIVISION 17 - INSTRUMENTATION** | | | | | | | | | | | |
| | | 5-Percent of total cost | 1 | LS | | | | | | 109,070 | 109,070 | 109,070 |
| | **SUBTOTAL - DIVISION 17** | | | | | | | | | | 109,070 | 109,070 |
| | **SUBTOTAL, ALL DIVISIONS** | | | | | 1,414,162 | | 533,442 | | | 676,464 | 2,624,068 |

**OPINION OF PROBABLE CONSTRUCTION COST**

**KENNEDY/JENKS CONSULTANTS**

**Project:** BC - Newport Solids Master Planning

**Prepared By:** BIB
**Date Prepared:** 8.22.2022
**K/J Proj. No.** 2276008*00

**Building, Area:** Dewatering Centrifuges

**Current at ENR** 13,288.00
**Escalated to ENR**
**Months to Midpoint of Construct** 60

**Estimate Type:** ■ **Conceptual** ☐ **Construction**
☐ **Preliminary (w/o plans)** ☐ **Change Order**
☐ **Design Development @** **% Complete**

| Spec. Section | Item No. | Description | Qty | Units | Materials $/Unit | Materials Total | Installation $/Unit | Installation Total | Sub-contractor $/Unit | Sub-contractor Total | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **DIVISION 1 - GENERAL REQUIREMENTS** | | | | | | | | | | | |
| | | | | | | 0 | | 0 | | 0 | 0 |
| **SUBTOTAL - DIVISION 1** | | | | | | 0 | | 0 | | 0 | 0 |
| **DIVISION 2 - SITE WORK** | | | | | | | | | | | |
| | | | | | | | | | | | |
| | **Demo** | | | | | | | | | | |
| | | Remove centrifuges, conveyors, polymer system, controls | 1 | LS | | | 20,000.00 | 20,000 | | | 20,000 |
| | | Haul | 1 | LS | | | 1,000.00 | 1,000 | | | 1,000 |
| | | Disposal | 1 | LS | | | 1,000.00 | 1,000 | | | 1,000 |
| | | | | | | | | | | | |
| | **Temporary** | | | | | | | | | | |
| | | Dewatering Skid and Temp connections | 6 | Mo. | 0.00 | 0 | 0.00 | 0 | 11,000 | 66,000 | 66,000 |
| | | | | | | | | | | | |
| **SUBTOTAL - DIVISION 2** | | | | | | 0 | | 22,000 | | 66,000 | 88,000 |
| **DIVISION 3 - CONCRETE** | | | | | | | | | | | |
| | **Equipment Bases** | | | | | | | | | | |
| | | Concrete Base Slab on Grade | 10 | CY | 300.00 | 3,000 | 300.00 | 3,000 | 0 | 0 | 6,000 |
| | | Grout at Equipment Bases | 1 | LS | 2,000.00 | 2,000 | 500.00 | 500 | 0 | 0 | 2,500 |
| | | | | | | | | | | | |
| **SUBTOTAL - DIVISION 3** | | | | | | 5,000 | | 3,500 | | 0 | 8,500 |
| **DIVISION 4 - MASONRY** | | | | | | 0 | | 0 | | 0 | 0 |
| | | | | | | | | | | | |
| **SUBTOTAL - DIVISION 4** | | | | | | 0 | | 0 | | 0 | 0 |
| **DIVISION 5 - METALS** | | | | | | 0 | | 0 | | 0 | 0 |
| | **Centrifuges** | | | | | | | | | | |
| | | Dewatering Belt Modifications | 1 | LS | 50,000.00 | 50,000 | 12,500.00 | 12,500 | 0 | 0 | 62,500 |
| | | | | | | | | | | | |
| **SUBTOTAL - DIVISION 5** | | | | | | 50,000 | | 12,500 | | 0 | 62,500 |
| **DIVISION 6 - WOOD AND PLASTICS** | | | | | | 0 | | 0 | | 0 | 0 |
| | | | | | | 0 | | 0 | | 0 | 0 |
| **SUBTOTAL - DIVISION 6** | | | | | | 0 | | 0 | | 0 | 0 |
| **DIVISION 7 - THERMAL AND MOISTURE PROTECTION** | | | | | | 0 | | 0 | | 0 | 0 |
| | | | | | | | | | | | |
| **SUBTOTAL - DIVISION 7** | | | | | | 0 | | 0 | | 0 | 0 |
| **DIVISION 8 - DOORS AND WINDOWS** | | | | | | 0 | | 0 | | 0 | 0 |
| | | | | | | 0 | | 0 | | 0 | 0 |
| **SUBTOTAL - DIVISION 8** | | | | | | 0 | | 0 | | 0 | 0 |
| **DIVISION 9 - FINISHES** | | | | | | 0 | | 0 | | 0 | 0 |
| | | Concrete Finishes | 1 | LS | 5,000.00 | 5,000 | 1,250.00 | 1,250 | 0 | 0 | 6,250 |
| | | Piping Coatings | 1 | LS | 10,000.00 | 10,000 | 2,500.00 | 2,500 | 0 | 0 | 12,500 |
| | | | | | | | | | | | |
| **SUBTOTAL - DIVISION 9** | | | | | | 15,000 | | 3,750 | | 0 | 18,750 |
| **DIVISION 10 - SPECIALTIES** | | | | | | 0 | | 0 | | 0 | 0 |
| | | Misc. signage | 1 | LS | 500.00 | 500 | 500.00 | 500 | | 0 | 1,000 |
| **SUBTOTAL - DIVISION 10** | | | | | | 500 | | 500 | | 0 | 1,000 |
| **DIVISION 11 - EQUIPMENT** | | | | | | 0 | | 0 | | 0 | 0 |
| **Centrifuge Replacement (Centrisys)** | | | | | | 0 | | 0 | | 0 | 0 |
| | | Centrifuges, includes: | 1 | LS | 985,500 | 985,500 | 246,375 | 246,375 | 0 | 0 | 1,231,875 |
| | | Power run-through option | | | | | | | | | |
| | | Remote monitoring | | | | | | | | | |
| | | Extended 15-year scroll warranty | | | | | | | | | |
| | | Hydraulic Containment Pans | | | | | | | | | |
| | | Stands | 2 | EA | 21,560 | 43,120 | 5,390 | 10,780 | 0 | 0 | 53,900 |
| | | Polymer System | 1 | EA | 21,756.00 | 21,756 | 5,439 | 5,439 | 0 | 0 | 27,195 |
| | | Centrifuge Discharge Conveyors | 1 | LS | 66,500.00 | 66,500 | 16,625 | 16,625 | 0 | 0 | 83,125 |
| | | Spare Parts | 1 | LS | 20,000.00 | 20,000 | 0 | 0 | 0 | 0 | 20,000 |
| | | | | | | | | | | | |
| **SUBTOTAL - DIVISION 11** | | | | | | 1,136,876 | | 279,219 | | 0 | 1,416,095 |
| **DIVISION 12 - FURNISHINGS** | | | | | | 0 | | 0 | | 0 | 0 |
| | | | | | | 0 | | 0 | | 0 | 0 |
| **SUBTOTAL - DIVISION 12** | | | | | | 0 | | 0 | | 0 | 0 |
| **DIVISION 13 - SPECIAL CONSTRUCTIONS** | | | | | | 0 | | 0 | | 0 | 0 |
| | | | | | | 0 | | 0 | | 0 | 0 |
| **SUBTOTAL - DIVISION 13** | | | | | | 0 | | 0 | | 0 | 0 |
| **DIVISION 14 - CONVEYING SYSTEMS** | | | | | | 0 | | 0 | | 0 | 0 |
| | | | | | | 0 | | 0 | | 0 | 0 |
| **SUBTOTAL - DIVISION 14** | | | | | | 0 | | 0 | | 0 | 0 |
| **DIVISION 15 -MECHANICAL** | | | | | | 0 | | 0 | | 0 | 0 |
| | **Process Piping** | | | | | | | | | | |
| | | Digested Sludge Piping | 1.00 | LS | 25,000.00 | 25,000 | 7,500.00 | 7,500 | | | 32,500 |
| | | Feed Piping | 1 | LS | 50,000.00 | 50,000 | 12,500.00 | 12,500 | 0 | 0 | 62,500 |
| | | 3W Piping | 1 | LS | 10,000.00 | 10,000 | 2,500.00 | 2,500 | 0 | 0 | 12,500 |
| | | Centrate Piping | 1 | LS | 100,000.00 | 100,000 | 25,000.00 | 25,000 | 0 | 0 | 125,000 |
| | | Vent Piping | 1 | LS | 50,000.00 | 50,000 | 12,500.00 | 12,500 | 0 | 0 | 62,500 |
| | | Polymer Piping | 1 | LS | 10,000.00 | 10,000 | 2,500.00 | 2,500 | 0 | 0 | 12,500 |
| | | | | | | | | | | | |
| **SUBTOTAL - DIVISION 15** | | | | | | 245,000 | | 62,500 | | 0 | 307,500 |
| **DIVISION 16 - ELECTRICAL** | | | | | | 0 | | 0 | | 0 | 0 |
| | | 25-Percent of Div 11, 14 and 15 costs | 1 | LS | $0.00 | $0 | $0.00 | $0 | $430,899 | $430,898.75 | $430,899 |
| | | | | | | | | | | | |
| **SUBTOTAL - DIVISION 16** | | | | | | 0 | | 0 | | 430,899 | 430,899 |
| **DIVISION 17 - INSTRUMENTATION** | | | | | | | | | | | |
| | **Centrifuges** | | | | | | | | | | |
| | | Flowmeters | 2 | EA | $7,056.00 | 14,112 | $1,764.00 | 3,528 | $0.00 | 0 | 17,640 |
| | | | | | | | | | | | |
| **SUBTOTAL - DIVISION 17** | | | | | | 14,112 | | 3,528 | | 0 | 17,640 |
| | | | | | | | | | | | |
| **SUBTOTAL, ALL DIVISIONS** | | | | | | 1,466,488 | | 387,497 | | 496,899 | 2,350,884 |
| | | | | | | | | | | | |
| **SUBTOTAL, ALL DIVISIONS, ESCALATED TO JUNE 2023** | | | | | | 1,481,153 | | 391,372 | | 501,868 | 2,374,393 |

**OPINION OF PROBABLE CONSTRUCTION COST**

**KENNEDY/JENKS CONSULTANTS, INC.**

**Project:** BC - Newport Solids Master Planning

**Building, Area:** Compost

**Prepared By:** BB
**Date Prepared:** 26-May-23
**KJ Proj. No.** 2176008*00

**Current at ENR** 13,288 May 2023
**Escalated to ENR**
**Months to Midpoint of Construct** 60

**Estimate Type:** ■ Conceptual ☐ Preliminary (w/o plans) ☐ Design Development @ ☐ Construction ☐ Change Order ☐ % Complete

| Ref. No. | Spec. No. | Item No. | Description | Qty | Units | Materials $/Unit | Materials Total | Installation $/Unit | Installation Total | Sub-contractor $/Unit | Sub-contractor Total | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **DIVISION 02 - SITE WORK** | | | | | | | | | | | |
| | | | **Site Prep** | | | | | | | | | |
| | | | Clearing and Grubbing | 18,000 | SY | | | 1.39 | 24,932 | | | 24,932 |
| | | | Loading (Cut) | 7,000 | CY | | | 1.19 | 8,295 | | | 8,295 |
| | | | Removal of Soil - Haul and Disposal Offsite | 7,000 | CY | | | 8.99 | 62,914 | | | 62,914 |
| | | | **Fill** | | | | | | | | | |
| | | | Compaction | 1,400 | CY | | | 1.17 | 1,637 | | | 1,637 |
| | | | **Surface Restoration** | | | | | | | | | |
| | | | Hydroseeding | 4,200 | SY | | | | | 1 | 4,788 | 4,788 |
| | | | **Paving** | | | | | | | | | |
| | | | Base Course (6-inch) | 12,300 | SY | 6.73 | 82,730 | 1.28 | 15,712 | | | 98,441 |
| | | | 5" - Site AC Pavement | 110,000 | SF | 3.02 | 332,310 | 0.72 | 79,566 | | | 411,876 |
| | | | AC Hauling | 849 | CY | | | 6.73 | 5,708 | | | 5,708 |
| | | | Headboard | 812 | LF | 4.56 | 3,703 | 4.56 | 3,703 | | | 7,405 |
| | | | **Gravel Roadway** | | | | | | | | | |
| | | | Base Course (4-inch) | 920 | SY | 4.49 | 4,127 | 1.23 | 1,133 | | | 5,261 |
| | | | **Concrete SOG Subgrade** | | | | | | | | | |
| | | | Crushed rock | 10,000 | SF | 1.73 | 17,328 | 0.46 | 4,617 | | | 21,945 |
| | | | **Yard Piping :** | | | | | | | | | |
| | | SD | Trenching SD Pipes | 670 | LF | | | 13.68 | 9,166 | | | 9,166 |
| | | SD | Bedding SD Pipes | 670 | LF | 4.56 | 3,055 | 2.28 | 1,528 | | | 4,583 |
| | | SD | 12" PVC Drain Piping | 230 | LF | 22.80 | 5,244 | 11.40 | 2,622 | | | 7,866 |
| | | SD | 10" PVC Drain Piping | 440 | LF | 15.96 | 7,022 | 9.12 | 4,013 | | | 11,035 |
| | | SD | Catchbasin | 6 | EA | 2,195 | 13,167 | 2,344.13 | 14,065 | | | 27,232 |
| | | D | Trenching Underdrain Pipes | 220 | | | | 9.12 | 2,006 | | | 2,006 |
| | | D | Bedding Pipes | 220 | LF | 2.28 | 502 | 1.14 | 251 | | | 752 |
| | | D | 4" HDPE Drain Piping | 220 | LF | 3.42 | 752 | 6.16 | 1,354 | | | 2,107 |
| | | D | 4" HDPE Drain wye | 24 | EA | 45.60 | 1,094 | 68.40 | 1,642 | | | 2,736 |
| | | D | 4" HDPE Drain Bend Fittings | 28 | EA | 34.20 | 958 | 57.00 | 1,596 | | | 2,554 |
| | | D | Precast Concrete Manholes - 48", 9' deep | 2 | EA | 3,830.40 | 7,661 | 2,850.00 | 5,700 | | | 13,361 |
| | | Drain Sum | Precast Concrete Manholes - 48", 8' deep | 2 | EA | 3,420.00 | 6,840 | 2,850.00 | 5,700 | | | 12,540 |
| | | D | Cleanout | 2 | EA | 456.00 | 912 | 342.00 | 684 | | | 1,596 |
| | | D | 12" Outside Drop Connection | 2 | EA | 2,850.00 | 5,700 | 1,140.00 | 2,280 | | | 7,980 |
| | | W | Trenching Water Pipes | 500 | LF | | | 7.98 | 3,990 | | | 3,990 |
| | | W | Bedding Pipes | 500 | LF | 2.28 | 1,140 | 1.14 | 570 | | | 1,710 |
| | | W | 3" Water Piping | 230 | LF | 2.29 | 527 | 5.36 | 1,232 | | | 1,759 |
| | | W | 2" Water Piping | 320 | LF | | | | | | | |
| | | W | 1 1/2" Water Piping | 30 | LF | 1.14 | 34 | 2.28 | 68 | | | 103 |
| | | | Bollards | 38 | EA | 399.00 | 15,162 | 456.00 | 17,328 | | | 32,490 |
| | | | Demo Lime Silo | 1 | LS | 5,000.00 | 5,000 | 20,000.00 | 20,000 | | | 25,000 |
| | | | Temporary Hauling Biosolids to Landfill | 2,774 | Wet Tons | | | 96.00 | 266,304 | | | 266,304 |
| | **SUBTOTAL - DIVISION 02** | | | | | | 514,968 | | 570,316 | | 4,788 | 1,090,073 |
| | **DIVISION 03 - CONCRETE** | | | | | | | | | | | |
| | | | **Compost Zones & Biofilter** | | | | | | | | | |
| | | | Compost Bldg - Concrete SOG (Thickness - 12") | 275 | CY | 285.00 | 78,375 | 285.00 | 78,375 | | | 156,750 |
| | | | Compost Bldg - Spread Footings | 25 | CY | 285.00 | 7,125 | 285.00 | 7,125 | | | 14,250 |
| | | | Compost Bldg - Concete Pushwall & Piers | 70 | CY | 285.00 | 19,950 | 684.00 | 47,880 | | | 67,830 |
| | | | Compost Bldg - Equipment Slabs and Walkways | 25 | CY | 285.00 | 7,125 | 285.00 | 7,125 | | | 14,250 |
| | | | Biofilter - Pipe Support Footings | 5 | CY | 285.00 | 1,425 | 285.00 | 1,425 | | | 2,850 |
| | | | Amend Strg - Footings | 45 | CY | 285.00 | 12,825 | 285.00 | 12,825 | | | 25,650 |
| | | | Amend Strg - Piers | 20 | CY | 285.00 | 5,700 | 684.00 | 13,680 | | | 19,380 |
| | | | Amend Strg - Concrete SOG | 50 | CY | 285.00 | 14,250 | 285.00 | 14,250 | | | 28,500 |
| | | | Concrete Ecology Blocks - Both Bldgs & Biofilter | 260 | EA | 142.50 | 37,050 | 57.00 | 14,820 | | | 51,870 |
| | | | Bollard Footings | 6 | CY | 285.00 | 1,583 | 342.00 | 1,900 | | | 3,483 |
| | **SUBTOTAL - DIVISION 03** | | | | | | 185,408 | | 199,405 | | | 384,813 |
| | **DIVISION 04 - MASONRY** | | | | | | | | | | | |
| | **SUBTOTAL - DIVISION 04** | | | | | | | | | | | |
| | **DIVISION 05 - METALS** | | | | | | | | | | | |
| | | | Compost Bldg - Electrical Canopy | 1 | LS | 4,446.00 | 4,446 | 9,576.00 | 9,576 | | | 14,022 |
| | **SUBTOTAL - DIVISION 05** | | | | | | 4,446 | | 9,576 | | | 14,022 |
| | **DIVISION 06 - WOOD AND PLASTICS** | | | | | | | | | | | |
| | **SUBTOTAL - DIVISION 06** | | | | | | | | | | | |
| | **DIVISION 07 - THERMAL AND MOISTURE PROTECTION** | | | | | | | | | | | |
| | **SUBTOTAL - DIVISION 07** | | | | | | | | | | | |
| | **DIVISION 08 - DOORS AND WINDOWS** | | | | | | | | | | | |
| | **SUBTOTAL - DIVISION 08** | | | | | | | | | | | |
| | **DIVISION 09 - FINISHES** | | | | | | | | | | | |
| | **SUBTOTAL - DIVISION 09** | | | | | | | | | | | |
| | **DIVISION 10 - SPECIALTIES** | | | | | | | | | | | |
| | **SUBTOTAL - DIVISION 10** | | | | | | | | | | | |
| | **DIVISION 11 - EQUIPMENT** | | | | | | | | | | | |
| | | | ECS Composting System | 1 | LS | 890,000 | 890,000 | 267,000 | 267,000 | | | 1,157,000 |
| | | | Utility Water Pump with Enclosure | 1 | LS | 4,193 | 4,193 | 807 | 807 | | | 5,000 |
| | | | Wheel Loader | | EA | 205,000.00 | | | | | | |
| | | | Wheel Loader Attachments: Sweep | | EA | 10,000.00 | | | | | | |
| | | | Trommel Screen | | EA | 230,000.00 | | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Mobile Mixer & Conveyor | 1 | EA | 217,100.00 | 217,100 | 10,855 | 10,855 | | | 227,955 |
| | **SUBTOTAL - DIVISION 11** | | | | | | 1,111,293 | | 278,662 | | | 1,389,955 |
| | **DIVISION 12 - FURNISHINGS** | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | **SUBTOTAL - DIVISION 12** | | | | | | | | | | | |
| | **DIVISION 13 - SPECIAL CONSTRUCTION** | | | | | | | | | | | |
| | | | Amendment and Compost Storage Building | 1 | LS | | | | | 182,400 | 182,400 | 182,400 |
| | | | Active Compost Area Building | 1 | LS | | | | | 136,800 | 136,800 | 136,800 |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | **SUBTOTAL - DIVISION 13** | | | | | | | | | | 319,200 | 319,200 |
| | **DIVISION 14 - CONVEYING SYSTEMS** | | | | | | | | | | | |
| | | | Conveyors to Compost | 1 | LS | 260,555.00 | 260,555 | 39,083.25 | 39,083 | | | 299,638 |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | **SUBTOTAL - DIVISION 14** | | | | | | 260,555 | | 39,083 | | | 299,638 |
| | **DIVISION 15 - MECHANICAL** | | | | | | | | | | | |
| | | | **Exposed Piping** | | | | | | | | | |
| | | | 2W Piping | | | | | | | | | |
| | | | Connection in Dewatering Building | 1.00 | LS | 570 | 570 | 171.00 | 171 | | | 741 |
| | | | 2" Irrigation solenoid valves | 9.00 | EA | 456 | 4,104 | 136.80 | 1,231 | | | 5,335 |
| | | | 2" Water Piping (Biofilter Irrigation) | 90 | LF | 15.96 | 1,436 | 4.79 | 431 | | | 1,867 |
| | | | 3" Water Piping (at Composting ) | 140 | LF | 17.10 | 2,394 | 5.13 | 718 | | | 3,112 |
| | | | 2" Water Piping (at Composting) | 330 | LF | 15.96 | 5,267 | 4.79 | 1,580 | | | 6,847 |
| | | | Irrigation Spray Headers | 24 | EA | 43.32 | 1,040 | 13.00 | 312 | | | 1,352 |
| | | | Utility Water Stations | 4 | EA | 684.00 | 2,736 | 205.20 | 821 | | | 3,557 |
| | | | Associated Pipe Fittings and Appurtenances | 1.00 | LS | 2,850 | 2,850 | 855.00 | 855 | | | 3,705 |
| | | | | | | | | | | | | |
| | **SUBTOTAL - DIVISION 15** | | | | | | 20,397 | | 6,119 | | | 26,516 |
| | **DIVISION 16 - ELECTRICAL** | | | | | | | | | | | |
| | | | 25-Percent of Div 11, 14 and 15 costs | 1 | LS | | | | | 429,027 | 429,027 | 422,906 |
| | | | | | | | | | | | | |
| | **SUBTOTAL - DIVISION 16** | | | | | | | | | | 429,027 | 422,906 |
| | **DIVISION 17 - INSTRUMENTATION** | | | | | | | | | | | |
| | | | 5-Percent of total cost | 1 | LS | | | | | 176,211 | 176,211 | 176,211 |
| | | | | | | | | | | | | |
| | **SUBTOTAL - DIVISION 17** | | | | | | | | | | 176,211 | 176,211 |
| | | | | | | | | | | | | |
| | **SUBTOTAL, ALL DIVISIONS** | | | | | | 2,097,068 | | 1,103,161 | | 929,226 | 4,123,335 |

**OPINION OF PROBABLE CONSTRUCTION COST**

**KENNEDY/JENKS CONSULTANTS, INC.**

**Project:** BC - Newport Solids Master Planning

**Building, Area:** Sitework

**Prepared By:** BB
**Date Prepared:** 31-May-23
**KJ Proj. No.** 2276008*00

**Current at ENR** 13,288 May 2023
**Escalated to ENR**
**Months to Midpoint of Construct** 60

**Estimate Type:** ■ Conceptual ☐ Preliminary (w/o plans) ☐ Design Development @ _____ % Complete ☐ Construction ☐ Change Order

| Ref. No. | Spec. No. | Item No. | Description | Qty | Units | Materials $/Unit | Materials Total | Installation $/Unit | Installation Total | Sub-contractor $/Unit | Sub-contractor Total | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **DIVISION 02 - SITE WORK** | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | **SUBTOTAL - DIVISION 02 - 10% OF CONSTRUCTION SUBTOTAL** | | | | | | | | | | | 1,092,190 |

**Class A Compost Life Cycle Costs**

| Cost Element | Annual O&M |
|---|---|
| **Operations and Maintenance Present Worth Cost** | |
| Hauled Waste | ($80,000) |
| Thickening | $70,000 |
| Aerobic Digester | $80,000 |
| Dewatering | $110,000 |
| Compost | $180,000 |
| **O&M Present Worth Cost Subtotal** | $360,000 |

**Hauled Waste**

| Item | Annual Costs[a] |
|---|---|
| Labor[b] | $9,400 |
| Electricity[c] | $400 |
| Equipment Maintenance[d] | $9,900 |
| Hauled Waste Revenue[e] | ($100,000) |
| Total Annual Costs | ($80,300) |

**Notes:**

(a) Costs are rounded to the nearest $100

(b) Costs assume burden rate of $50 per hour

(c) Costs assume $0.08 per kW-hr

(d) Costs are annualized at 2% of equipment costs.

(e) Based on 2021 and 2022 hauled waste revenues, provided by the City via email dated 13 January 2023.

## Labor

| Item | Task | Frequency Hours | | Annual Total |
|---|---|---|---|---|
| Hauled Waste | Startup | 4xweek | 1 | 52 |
| | Shutdown | 4xweek | 1 | 52 |
| | Gen. Maintenance | 4xweek | 1 | 52 |
| | Preventative Maintenance | 4xyear | 8 | 32 |
| | | | | 188 |

## Electricity

| Item | Hrs/day | | Days/weel | Operating Hp | Annual Total, kW-Hr |
|---|---|---|---|---|---|
| Drum | | 2 | 4 | 3 | 931 |
| Wash Press | | 2 | 4 | 7.5 | 2,326 |
| Grit Screws | | 2 | 4 | 1.5 | 465 |
| Grease Pump | | 2 | 4 | 3 | 931 |
| | | | | | 4,653 |

## Equipment Maintenance

| Item | Equipment Cost | Annual 2%, $ |
|---|---|---|
| Hauled Waste | 495000 | $9,900.00 |
| | | $9,900.00 |

**Thickening**

| Item | Annual Costs[a] |
|---|---|
| Labor[b] | $20,000 |
| Electricity[c] | $8,000 |
| Chemical[d] | $32,700 |
| Equipment Maintenance[e] | $7,200 |
| Total Annual Costs | $67,900 |

**Notes:**

(a) Costs are rounded to the nearest $100

(b) Costs assume burden rate of $50 per hour

(c) Costs assume $0.08 per kW-hr

(d) Costs for liquid emulsion polymer, $4.20 per active lb. Assumes 8 active lbs polymer/dry ton.

(e) Costs are annualized at 2% of equipment costs.

## Labor

| Item | Task | Frequency | Hours | Annual Total |
|---|---|---|---|---|
| RDT 1&2 | Startup | 4xweek | 2 | 104 |
| | Shutdown | 4xweek | 2 | 104 |
| RDT & Polymer | Gen. Maintenance | 4xweek | 2 | 104 |
| RDT 1 | Preventative Maintenance | 4xyear | 8 | 32 |
| RDT 2 | Preventative Maintenance | 4xyear | 8 | 32 |
| Polymer | Preventative Maintenance | 4xyear | 6 | 24 |
| | | | | 400 |

## Electricity

| Item | Hrs/day | Days/week | Operating Hp | Annual Total, kW-Hr |
|---|---|---|---|---|
| RDT 1 | 19 | 7 | 2.5 | 12,891 |
| RDT 2 | 0 | 0 | 2.5 | 0 |
| Polymer 1 | 19 | 7 | 1 | |
| Polymer 2 | 0 | 0 | 1 | 0 |
| Feed Pump 1 | 19 | 7 | 15 | 77,349 |
| Feed Pump 2 | 0 | 0 | 15 | 0 |
| TWAS Pump 1 | 19 | 7 | 2 | 10,313 |
| TWAS Pump 2 | 0 | 0 | 2 | 0 |
| | | | | 100,553 |

## Equipment Maintenance

| Item | Equipment Cost | Annual 2%, $ |
|---|---|---|
| RDTs & Polymer | 242300 | $4,846.00 |
| Feed Pumps | 80000 | $1,600.00 |
| TWAS Pumps | 40000 | $800.00 |
| | | $7,246.00 |

**Aerobic Digester**

| Item | Annual Costs[a] |
|---|---|
| Labor[b] | $10,400 |
| Electricity[c] | $53,000 |
| Equipment Maintenance[d] | $12,000 |
| Total Annual Costs | $75,400 |

**Notes:**

(a) Costs are rounded to the nearest $100

(b) Costs assume burden rate of $50 per hour

(c) Costs assume $0.08 per kW-hr

(d) Costs are annualized at 2% of equipment costs.

## Labor

| Item | Task | Frequency | Hours | Annual Total |
|---|---|---|---|---|
| Blower 1 | Preventative Maintenance | 4xyear | 8 | 32 |
| Blower 2 | Preventative Maintenance | 4xyear | 8 | 32 |
| Blower 3 | Preventative Maintenance | 4xyear | 8 | 32 |
| Blower 4 | Preventative Maintenance | 4xyear | 8 | 32 |
| Mixer 1 | Preventative Maintenance | 4xyear | 4 | 16 |
| Mixer 2 | Preventative Maintenance | 4xyear | 4 | 16 |
| Mixer 3 | Preventative Maintenance | 4xyear | 4 | 16 |
| Mixer 4 | Preventative Maintenance | 4xyear | 4 | 16 |
| DS Pump 1 | Preventative Maintenance | 4xyear | 2 | 8 |
| DS Pump 2 | Preventative Maintenance | 4xyear | 2 | 8 |
| | | | | 208 |

## Electricity

| Item | Hrs/day | Days/week | Operating Hp | Annual Total, kW-Hr |
|---|---|---|---|---|
| Blower 1 | 12 | 7 | 150 | 488,517 |
| Blower 2 | 0 | 7 | 150 | 0 |
| Blower 3 | 12 | 7 | 150 | 488,517 |
| Blower 4 | 0 | 7 | 150 | 0 |
| Mixer 1 | 12 | 7 | 10 | 32,568 |
| Mixer 2 | 0 | 7 | 10 | 0 |
| Mixer 3 | 12 | 7 | 10 | 32,568 |
| Mixer 4 | 0 | 7 | 10 | 0 |
| DS Pump 1 | 16 | 4 | 5 | 12,407 |
| DS Pump 2 | 0 | 0 | 5 | 0 |
| | | | | 1,054,577 |

## Equipment Maintenance

| Item | Equipment Cost | Annual 2%, $ |
|---|---|---|
| Blowers | 312000 | $6,240.00 |
| Mixers | 249600 | $4,992.00 |
| Digested Solids Pumps | 50000 | $1,000.00 |
| | | $12,232.00 |

**Dewatering Centrifuges**

| Item | Annual Costs[a] |
|---|---|
| Labor[b] | $31,000 |
| Electricity[c] | $9,000 |
| Chemical[d] | $52,000 |
| Equipment Maintenance[e] | $20,000 |
| Total Annual Costs | $112,000 |

**Notes:**

(a) Costs are rounded to the nearest $1,000

(b) Costs assume burden rate of $50 per hour

(c) Costs assume $0.08 per kW-hr

(d) Costs for liquid emulsion polymer, $4.20 per active lb. Assumes 20 active lbs polymer/dry ton, and an annualized average of 618 dry tons per year.

(e) Costs are annualized at 2% of equipment costs.

## Labor

| Item | Task | Frequency | Hours | Annual Total |
|---|---|---|---|---|
| Centrifuge 1 | Startup | 4xweek | 4 | 208 |
| | Shutdown | 4xweek | 4 | 208 |
| Conveyor | Gen. Maintenance | 4xweek | 1 | 52 |
| Polymer | Gen. Maintenance | 4xweek | 1 | 52 |
| Centrifuge 1 | Preventative Maintenance | 4xyear | 8 | 32 |
| Centrifuge 2 | Preventative Maintenance | 4xyear | 8 | 32 |
| Polymer | Preventative Maintenance | 4xyear | 4 | 16 |
| Conveyors | Preventative Maintenance | 4xyear | 6 | 24 |
| | | | | 624 |

## Electricity

| Item | Hrs/day | Days/week | Operating Hp | Annual Total, kW-Hr |
|---|---|---|---|---|
| Centrifuge 1 | 16 | 4 | 75 | 186,102 |
| Centrifuge 2 | 0 | 4 | 75 | 0 |
| Polymer | 16 | 1 | 1 | 620 |
| Conveyor 1 | 16 | 1 | 1 | 620 |
| Conveyor 2 | 0 | 8 | 1 | 0 |
| | | | | 187,342 |

## Equipment Maintenance

| Item | Equipment Cost | Annual 2%, $ |
|---|---|---|
| Centrifuges | 908600 | $18,172.00 |
| Polymer | 21756 | $435.12 |
| Conveyors | 81894 | $1,637.88 |
| | | $20,245.00 |

**Compost**

| Item | Annual Costs[a] |
|---|---|
| Labor[b] | $50,800 |
| Electricity[c] | $15,700 |
| Equipment Maintenance[d] | $23,000 |
| Biosolids Hauling | $94,200 |
| Total Annual Costs | $183,700 |

**Notes:**

(a) Costs are rounded to the nearest $100

(b) Costs assume burden rate of $50 per hour

(c) Costs assume $0.08 per kW-hr

(d) Costs are annualized at 2% of equipment costs.

## Labor

| Item | Task | Frequency | Hours | Annual Total |
|---|---|---|---|---|
| Transport | Dewatered Cake Transport | 4xweek | 4 | 208 |
| | Dewater Cake/Amendment Mixing | 4xweek | 6 | 312 |
| | Mixed Material Transfer | 4xweek | 4 | 208 |
| | Phase 1 to Phase 2 Transfer | 4xweek | 4 | 208 |
| | Screening | 4xweek | 6 | 24 |
| | Transfer to Storage | 4xweek | 4 | 16 |
| Aeration Fans | Preventative Maintenance | 4xyear | 6 | 24 |
| Odor Fans | Preventative Maintenance | 4xyear | 4 | 16 |
| | | | | 1016 |

## Electricity

| Item | Hrs/day | Days/week | Operating Hp | Annual Total, kW-Hr |
|---|---|---|---|---|
| Conveyors | 16 | 4 | 7 | 17,369 |
| Aeration Fans | 24 | 7 | 27.5 | 179,123 |
| | | | | 196,492 |

## Equipment Maintenance

| Item | Equipment Cost | Annual 2%, $ |
|---|---|---|
| Conveyors | 260555 | $5,211.10 |
| Compost ECS | 890000 | $17,800.00 |
| | | $23,011.10 |

## Biosolids Hauling

| Item | Annual Qty, wet tons | Unit Cost | Annual Cost |
|---|---|---|---|
| Hauling | 4879.8 | $19.30 | $94,180.14 |

**Project:** BC - Newport Solids Master Planning

**Building:** Class A Dryer Alternative

**Prepared By:** BIB
**Date Prepared:** 05.23.2023
**K/J Proj. No.:** 2276008*00

**Estimate Type:**
- ■ **Conceptual**
- ☐ **Preliminary (w/o plans)**
- ☐ **Design Development @**
- ☐ **Construction**
- ☐ **Change Order**

**Current at ENR** 13,288.00
**Escalated to ENR**
**Mos. to Midpoint** 60

**SUMMARY BY DIVISION**

| Item No. | ITEM DESCRIPTION | | MATERIALS | INSTALLATION | SUB-CONTRACTOR (E&I/C) | TOTAL |
|---|---|---|---|---|---|---|
| | Hauled Waste Receiving | | $530,050 | $165,398 | $200,522 | $895,970 |
| | Thickening | | $537,300 | $185,690 | $175,022 | $898,012 |
| | Aerobic Digester | | $1,414,162 | $535,242 | $677,004 | $2,626,408 |
| | Dewatering Centrifuge | | $1,481,153 | $391,372 | $501,868 | $2,374,393 |
| | Dryer | | $3,226,921 | $882,256 | $2,283,634 | $6,392,811 |
| | Sitework | | $659,380 | $659,380 | $0 | $1,318,759 |
| | Utilities | | $125,206 | $151,598 | $0 | $276,803 |
| | Subtotals | | 7,974,172 | 2,970,934 | 3,838,050 | 14,783,156 |
| | Contractor Indirects | 12% | 956,901 | 356,512 | 460,566 | 1,773,979 |
| | Subtotals | | 8,931,072 | 3,327,446 | 4,298,616 | 16,557,135 |
| | Contractor OH&P @ | 15% | 1,339,661 | 499,117 | 644,792 | 2,483,570 |
| | Subtotals | | 10,270,733 | 3,826,563 | 4,943,409 | 19,040,705 |
| | Estimate Contingency @ | 25% | | | | 4,760,176 |
| | Subtotal | | | | | 23,800,881 |
| | Escalation to Mid-Pt of Construction | 4% | | | | 5,156,530 |
| | Subtotal | | | | | 28,957,411 |
| | Engineering, Administrative, Permits, Legal | 38% | | | | 11,003,816 |
| | Total Estimate | | | | | 39,900,000 |

| Estimate Accuracy | |
|---|---|
| +40% | -20% |

| Estimated Range of Probable Cost | | |
|---|---|---|
| +40% | Total Est. | -20% |
| **$55,860,000** | **$39,900,000** | **$31,920,000** |

**OPINION OF PROBABLE CONSTRUCTION COST**

**KENNEDY/JENKS CONSULTANTS, INC.**

**Project:** BC - Newport Solids Master Planning

**Building, Area:** Class A Biosolids Treatment: Belt Dryer (Centrisys)

**Prepared By:** BB
**Date Prepared:** 31-May-23
**KJ Proj. No.** 2276008

**Current at ENR** 13,288 May 2023
**Escalated to ENR**
**Months to Midpoint of Construct** 60

**Estimate Type:** ■ Conceptual ☐ Preliminary (w/o plans) ☐ Design Development @ ____ % Complete
☐ Construction ☐ Change Order

| Ref. No. | Spec. No. | Item No. | Description | Qty | Units | Materials $/Unit | Materials Total | Installation $/Unit | Installation Total | Sub-contractor $/Unit | Sub-contractor Total | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **DIVISION 02 - SITE WORK** | | | | | | | | | | | |
| 3 | | | Excavation: Large structures | 1,600 | BCY | | | 15.59 | 24,944 | | | 24,944 |
| 7 | | | Import fill: crushed rock and fill | 150 | LCY | 26.14 | 3,921 | 7.30 | 1,095 | | | 5,016 |
| 10 | | | Compact: Large structures | 150 | ECY | | | 6.12 | 918 | | | 918 |
| 12 | | | Haul (offsite disposal of excess cut) | 1,600 | LCY | | | 7.40 | 11,840 | | | 11,840 |
| | | | Demo Lime Silo | 1 | LS | 5,000.00 | 5,000 | 20,000.00 | 20,000 | | | 25,000 |
| | | | Temporary Hauling Biosolids to Land | 3,414 | Wet Tons | | | 96.00 | 327,759 | | | 327,759 |
| | **SUBTOTAL - DIVISION 02** | | | | | | 8,921 | | 386,556 | | | 395,477 |
| | **DIVISION 03 - CONCRETE** | | | | | | | | | | | |
| | | | Misc concrete equip. slabs | 1 | LS | 20,000.00 | 20,000 | 10,000.00 | 10,000 | | | 30,000 |
| | **SUBTOTAL - DIVISION 03** | | | | | | 20,000 | | 10,000 | | | 30,000 |
| | **DIVISION 04 - MASONRY** | | | | | | | | | | | |
| | **SUBTOTAL - DIVISION 04** | | | | | | | | | | | |
| | **DIVISION 05 - METALS** | | | | | | | | | | | |
| | | | Misc metals | 1 | LS | 50,000.00 | 50,000 | 10,000.00 | 10,000 | | | 60,000 |
| | **SUBTOTAL - DIVISION 05** | | | | | | 50,000 | | 10,000 | | | 60,000 |
| | **DIVISION 06 - WOOD AND PLASTICS** | | | | | | | | | | | |
| | **SUBTOTAL - DIVISION 06** | | | | | | | | | | | |
| | **DIVISION 07 - THERMAL AND MOISTURE PROTECTION** | | | | | | | | | | | |
| | **SUBTOTAL - DIVISION 07** | | | | | | | | | | | |
| | **DIVISION 08 - DOORS AND WINDOWS** | | | | | | | | | | | |
| | **SUBTOTAL - DIVISION 08** | | | | | | | | | | | |
| | **DIVISION 09 - FINISHES** | | | | | | | | | | | |
| | | | Pipe coating | 1 | LS | 10,000 | 10,000 | 5,000 | 5,000 | | | 15,000 |
| | **SUBTOTAL - DIVISION 09** | | | | | | 10,000 | | 5,000 | | | 15,000 |
| | **DIVISION 10 - SPECIALTIES** | | | | | | | | | | | |
| | **SUBTOTAL - DIVISION 10** | | | | | | | | | | | |
| | **DIVISION 11 - EQUIPMENT** | | | | | | | | | | | |
| | | | Belt dryer | 1 | EA | 2,083,000 | 2,083,000 | 312,450 | 312,450 | | | 2,395,450 |
| | | | Bagger (for super sacks) | 1 | EA | 235,000 | 235,000 | 35,250 | 35,250 | | | 270,250 |
| | **SUBTOTAL - DIVISION 11** | | | | | | 2,318,000 | | 347,700 | | | 2,665,700 |
| | **DIVISION 12 - FURNISHINGS** | | | | | | | | | | | |
| | **SUBTOTAL - DIVISION 12** | | | | | | | | | | | |
| | **DIVISION 13 - SPECIAL CONSTRUCTION** | | | | | | | | | | | |
| 84 | | | Building (CMU) | 3,200 | SF | | | | | 350.00 | 1,120,000 | 1,120,000 |
| | **SUBTOTAL - DIVISION 13** | | | | | | | | | | 1,120,000 | 1,120,000 |
| | **DIVISION 14 - CONVEYING SYSTEMS** | | | | | | | | | | | |
| | | | Screw conveyor - cake to hopper | 1 | EA | 225,000.00 | 225,000 | 33,750.00 | 33,750 | | | 258,750 |
| | **SUBTOTAL - DIVISION 14** | | | | | | 225,000 | | 33,750 | | | 258,750 |
| | **DIVISION 15 - MECHANICAL** | | | | | | | | | | | |
| | | | Odor control | 1 | EA | 595,000.00 | 595,000 | 89,250.00 | 89,250 | | | 684,250 |
| | **SUBTOTAL - DIVISION 15** | | | | | | 595,000 | | 89,250 | | | 684,250 |
| | **DIVISION 16 - ELECTRICAL** | | | | | | | | | | | |
| | | | 25-Percent of Div 11, 14 and 15 costs | 1 | LS | | | | | 902,175 | 902,175 | 627,501 |
| | **SUBTOTAL - DIVISION 16** | | | | | | | | | | 902,175 | 627,501 |
| | **DIVISION 17 - INSTRUMENTATION** | | | | | | | | | | | |
| | | | 5-Percent of total cost | 1 | LS | | | | | 261,459 | 261,459 | 261,459 |
| | **SUBTOTAL - DIVISION 17** | | | | | | | | | | 261,459 | 261,459 |
| | **SUBTOTAL, ALL DIVISIONS** | | | | | | 3,226,921 | | 882,256 | | 2,283,634 | 6,118,137 |

**OPINION OF PROBABLE CONSTRUCTION COST**

**KENNEDY/JENKS CONSULTANTS, INC.**

**Project:** BC - Newport Solids Master Planning

**Building, Area:** Sitework

**Prepared By:** BB
**Date Prepared:** 31-May-23
**KJ Proj. No.** 2276008*00

**Current at ENR** 13,288 May 2023
**Escalated to ENR**
**Months to Midpoint of Construct** 60

**Estimate Type:** ■ Conceptual ☐ Preliminary (w/o plans) ☐ Design Development @ _____ % Complete ☐ Construction ☐ Change Order

| Ref. No. | Spec. No. | Item No. | Description | Qty | Units | Materials $/Unit | Materials Total | Installation $/Unit | Installation Total | Sub-contractor $/Unit | Sub-contractor Total | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **DIVISION 02 - SITE WORK** | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | **SUBTOTAL - DIVISION 02 - 10% OF CONSTRUCTION TOTAL** | | | | | | | | | | | 1,318,759 |

**OPINION OF PROBABLE CONSTRUCTION COST**

**KENNEDY/JENKS CONSULTANTS, INC.**

**Project:** BC - Newport Solids Master Planning

**Building, Area:** Utilities

**Prepared By:** BB
**Date Prepared:** 31-May-23
**KJ Proj. No.** 2276008*00

**Current at ENR** 13,288 May 2023
**Escalated to ENR**
**Months to Midpoint of Construct** 60

**Estimate Type:** ■ Conceptual ☐ Preliminary (w/o plans) ☐ Design Development @ ☐ Construction ☐ Change Order _____ % Complete

| Ref. No. | Spec. No. | Item No. | Description | Qty | Units | Materials $/Unit | Materials Total | Installation $/Unit | Installation Total | Sub-contractor $/Unit | Sub-contractor Total | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **DIVISION 02 - SITE WORK** | | | | | | | | | | | |
| | | | Traffic Control | 1.00 | LS | 2,500.00 | 2,500 | 2,500.00 | 2,500 | | | 5,000 |
| | | | Saw Cut | 15,200 | LF | 0.29 | 4,408 | 1.43 | 21,736 | | | 26,144 |
| | | | Excavation | 1,976 | CY | | | 9.38 | 18,535 | | | 18,535 |
| | | | Import Fill | 1,976 | CY | 31.92 | 63,074 | 5.15 | 10,176 | | | 73,250 |
| | | | Compaction | 1,976 | CY | | | 5.70 | 11,263 | | | 11,263 |
| | | | Hauling | 1,976 | CY | | | 11.24 | 22,210 | | | 22,210 |
| | | | Tench Patch | 1,254 | SY | 26.22 | 32,880 | 44.46 | 55,753 | | | 88,633 |
| | **SUBTOTAL - DIVISION 02** | | | | | | 102,862 | | 142,174 | | | 245,035 |
| | **DIVISION 03 - CONCRETE** | | | | | | | | | | | |
| | **SUBTOTAL - DIVISION 03** | | | | | | | | | | | |
| | **DIVISION 04 - MASONRY** | | | | | | | | | | | |
| | **SUBTOTAL - DIVISION 04** | | | | | | | | | | | |
| | **DIVISION 05 - METALS** | | | | | | | | | | | |
| | **SUBTOTAL - DIVISION 05** | | | | | | | | | | | |
| | **DIVISION 06 - WOOD AND PLASTICS** | | | | | | | | | | | |
| | **SUBTOTAL - DIVISION 06** | | | | | | | | | | | |
| | **DIVISION 07 - THERMAL AND MOISTURE PROTECTION** | | | | | | | | | | | |
| | **SUBTOTAL - DIVISION 07** | | | | | | | | | | | |
| | **DIVISION 08 - DOORS AND WINDOWS** | | | | | | | | | | | |
| | **SUBTOTAL - DIVISION 08** | | | | | | | | | | | |
| | **DIVISION 09 - FINISHES** | | | | | | | | | | | |
| | **SUBTOTAL - DIVISION 09** | | | | | | | | | | | |
| | **DIVISION 10 - SPECIALTIES** | | | | | | | | | | | |
| | **SUBTOTAL - DIVISION 10** | | | | | | | | | | | |
| | **DIVISION 11 - EQUIPMENT** | | | | | | | | | | | |
| | **SUBTOTAL - DIVISION 11** | | | | | | | | | | | |
| | **DIVISION 12 - FURNISHINGS** | | | | | | | | | | | |
| | **SUBTOTAL - DIVISION 12** | | | | | | | | | | | |
| | **DIVISION 13 - SPECIAL CONSTRUCTION** | | | | | | | | | | | |
| 85 | | | | | | | | | | | | |
| | **SUBTOTAL - DIVISION 13** | | | | | | | | | | | |
| | **DIVISION 14 - CONVEYING SYSTEMS** | | | | | | | | | | | |
| | **SUBTOTAL - DIVISION 14** | | | | | | | | | | | |
| | **DIVISION 15 - MECHANICAL** | | | | | | | | | | | |
| | | | 2" Poly Pipe - Natural Gas | 3,800 | LF | 5.88 | 22,344 | 2.48 | 9,424 | | | 31,768 |
| | **SUBTOTAL - DIVISION 15** | | | | | | 22,344 | | 9,424 | | | 31,768 |
| | **DIVISION 16 - ELECTRICAL** | | | | | | | | | | | |
| | **SUBTOTAL - DIVISION 16** | | | | | | | | | | | |
| | **DIVISION 17 - INSTRUMENTATION** | | | | | | | | | | | |
| | **SUBTOTAL - DIVISION 17** | | | | | | | | | | | |
| | **SUBTOTAL, ALL DIVISIONS** | | | | | | 125,206 | | 151,598 | | | 276,803 |

**Class A Dryer Life Cycle Costs**

| Cost Element | Annual O&M |
|---|---|
| **Operations and Maintenance Present Worth Cost** | |
| Hauled Waste | ($80,000) |
| Thickening | $70,000 |
| Aerobic Digester | $80,000 |
| Dewatering | $110,000 |
| Dryer | $380,000 |
| **O&M Present Worth Cost Subtotal** | $560,000 |

**Dryer**

| Item | Annual Costs[a] |
|---|---|
| Labor[b] | $36,000 |
| Electricity[c] | $51,600 |
| Natural Gas[d] | $129,163 |
| Equipment Maintenance[e] | $146,000 |
| Biosolids Hauling | $14,089 |
| Total Annual Costs | $376,852 |

**Notes:**

(a) Costs are rounded to the nearest $100

(b) Costs assume burden rate of $50 per hour

(c) Costs assume $0.08 per kW-hr

(d) Assumes 10,333 MMBTU/yr and $1.25 per therm.

(e) Costs are annualized at 2% of equipment costs.

## Labor

| Item | Task | Frequency | Hours | Annual Total |
|---|---|---|---|---|
| Dryer | Startup | 4xweek | 4 | 208 |
| | Shutdown | 4xweek | 4 | 208 |
| Dryer | Gen. Maintenance | 4xweek | 4 | 208 |
| Dryer | Preventative Maintenance | 4xyear | 24 | 96 |
| | | | | 720 |

## Electricity

| Item | Hrs/day | Days/week | Operating Hp | Annual Total, kW-Hr |
|---|---|---|---|---|
| Conveyors | 16 | 4 | 5 | 12,407 |
| Dryer | 16 | 4 | 255 | 632,746 |
| | | | | 645,153 |

## Equipment Maintenance

| Item | Equipment Cost | Annual 2%, $ |
|---|---|---|
| Dryer | 6263215 | $125,264.30 |
| Bagging System | 235000 | $4,700.00 |
| Conveyors | 225000 | $4,500.00 |
| Odor Control | 595000 | $11,900.00 |
| | | $146,364.30 |

## Biosolids Hauling

| Item | Annual Qty, wet tons | Unit Cost | Annual Cost |
|---|---|---|---|
| Hauling | 730 | $19.30 | $14,089.00 |

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# Appendix E Centrifuge Replacement TM



Use of contents on this sheet is subject to the limitations specified at the end of this document.

23 September 2022

# Draft Technical Memorandum

To: Josh Johnson, Brown & Caldwell

From: Ben Bosse, Kennedy Jenks
Mark Cullington, Kennedy Jenks

Reviewed By: Shawn Spargo, Kennedy Jenks

Subject: Centrifuge Replacement Evaluation
Newport WWT Master Plan – Phase II, Brown & Caldwell Project No. 158211
City of Newport
K/J Project No. 2276008*00

## Introduction

The City of Newport (City) owns and operates the Vance Avery Wastewater Treatment Plant (WWTP) constructed in 2002 and located in South Beach, Oregon. The WWTP is an activated sludge plant with a peak wet weather capacity of 15 million gallons per day (mgd) that currently receives an average annual flow of approximately 2 mgd. In 2022, the City authorized Brown & Caldwell (BC) to perform master planning for the WWTP. BC has subcontracted with Kennedy/Jenks Consultants (Kennedy Jenks) in an agreement dated 11 March 2022 to complete a Centrifuge Replacement Evaluation for replacement of the existing dewatering centrifuges. The existing centrifuges were identified in a 2018 BC capacity assessment as undersized to support current biosolids production rates and are reaching the end of their useful life.

The purpose of this Technical Memorandum (TM) is to present an evaluation for replacement of the existing dewatering centrifuges. The evaluation includes layouts of larger centrifuges to accommodate the projected solids loadings over a 20-year design period. The evaluation also includes replacement of the existing liquid emulsion polymer system, controls, conveyors, dewatering feed pumps, and electrical considerations. The evaluation makes a recommendation on new equipment sizing and presents capital, Operations and Maintenance (O&M) costs, and life-cycle costs for the recommended improvements.

## Existing Conditions

The WWTP operates two Alfa Laval/Sharples dewatering centrifuges. Centrifuge 1 was installed between 1994 and 1996, and Centrifuge 2 was installed in 2001. Both centrifuges were re-built by CentriTEK in 2018 and 2019, including replacement of damaged scroll tiles, bearings and seals, cleaning and painting, and alignment and balancing.

The centrifuges receive Waste Activated Sludge (WAS), scum, and hauled waste conveyed from the sludge storage tank by two Wemco dewatering feed pumps.

Plant staff typically operate centrifuges 8 to 10 hours per day, and currently are forced to operate centrifuges beyond capacity to maintain operations. The dewatering feed solids concentration averages approximately 0.6 % Total Solids (TS). The dilute feed concentration is a result of an undersized storage tank that inhibits an effective decant and thickening of solids upstream of dewatering. The stated design capacity of the centrifuges is 65 gallons per minute (gpm); however, plant staff routinely feed centrifuges at a rate of 90 gpm.

A summary of existing plant operating data for centrifuges is included as Table 1. Design data for the existing centrifuges are summarized in Table 2. Centrifuge 1 is shown on Figure 1.

**Table 1: Existing Dewatering Operating Data**

| Parameter | Value[(a)] |
|---|---|
| Average Feed Flow, Each, gpm[(b)] | 90 |
| Average Feed Solids Concentration, % | 0.59 |
| Average Feed, Each, pph[(c)] dry solids | 266 |
| Average Centrate Solids Concentration, % | 0.013 |
| Average Capture Rate, % | 97 |
| Cake Solids, % | 26 |
| Polymer Use, active lbs per dry ton | 11 |

**Notes:**
(a) August 2022 operating data as provided by the City via email on 18 August 2022 and 12 September 2022.
(b) gpm = gallons per minute.
(c) pph = pounds per hour.

**Table 2: Existing Centrifuge Design Data**

| Parameter | Value |
|---|---|
| Manufacturer | Alfa Laval/Sharples |
| Model No., Centrifuge 1 | PM 38000 |
| Model No., Centrifuge 2 | ALDEC 406 |
| Bowl Diameter, inches | 13.8 |
| Main Drive | |
| Hp | 40 |
| Drive Type | VFD |
| Drive Configuration | V-Belt |
| Back Drive | |
| Hp | 10 |
| Drive Type | Eddy Current Brake |
| Capacity, Each, gpm | 65 |

**Figure 1: Centrifuge 1**

## Projected Solids Loadings

The 20-year solids loading projections to dewatering were provided to centrifuge manufacturers for sizing and selection of new centrifuge equipment. Projected solids loadings were presented in the draft Basis of Design TM dated 1 July 2022, and are included in Table 3 for reference. Sizing of dewatering equipment is based on the 2040 maximum week loadings, as described in the draft Solids Basis of Design TM prepared by Kennedy Jenks on 1 July 2022. Maximum day loadings are not evaluated due to the storage provided by the upstream storage tank.

**Table 3: Projected Dewatering Loadings**

| Parameter | Condition | | | |
|---|---|---|---|---|
| | 2022 Average | 2040 Average | 2040 Maximum Month | 2040 Maximum Week[a] |
| **Waste Activated Sludge[b]** | | | | |
| Solids, ppd | 3,200 | 3,561 | 4,451 | 5,341 |
| Flow, gpd[c,d] | 69,720 | 77,580 | 96,970 | 116,438 |
| **Hauled Waste[e]** | | | | |
| Solids, ppd | 137 | 152 | 191 | 229 |
| Flow, gpd | 913 | 1,015 | 1,269 | 1,523 |
| **Combined Solids to Storage** | | | | |
| Solids, ppd | 3,337 | 3,713 | 4,641 | 5,570 |
| Flow, gpd | 70,633 | 78,595 | 98,239 | 117,961 |
| **Decant[f]** | | | | |
| Solids, ppd | 130 | 144 | 180 | 216 |
| Flow, gpd[g] | 14,135 | 15,733 | 19,665 | 23,598 |
| **Dewatering Feed[h]** | | | | |
| Solids, ppd | 3,207 | 3,569 | 4,461 | 5,354 |
| Flow, gpd | 56,498 | 62,862 | 78,574 | 94,363 |

**Notes:**
(a) Based on maximum week WAS solids loading peaking factor of 1.5, per BC.
(b) Flows and loads values were developed by BC and provided via email dated 10 May 2022.
(c) gpd = gallons per day.
(d) Based on an average solids concentration of 0.55% per BC.
(e) 2022 average hauled waste flows and loads are based on WWTP annual biosolids reports (2018 through 2021) and an average solids concentration of 1.8%. Year 2040 hauled waste flows and loads are based on WAS peaking factors.
(f) Assumes a decant rate of 20% of influent to storage tank.
(g) Assumes a decant solids concentration of 0.11%, based on plant operating data for December 2021.
(h) Based on continuous feed to dewatering.

## Manufacturer Proposals

Proposals for centrifuge replacement were obtained from two manufacturers: Andritz and Centrisys. Proposals were obtained from multiple manufacturers to understand the size, configuration, layout, and maintenance clearances required for equipment replacement. Additional manufacturers and proposals may be considered as the project moves into the

design phase. Projected operating data and initial manufacturer equipment selections are summarized in Table 4.

**Table 4: Dewatering Operating Characteristics**

| | Values | | |
|---|---|---|---|
| **Parameters** | Scenario 1 | Scenario 2 | Scenario 3 |
| Dewatering Feed | | | |
| Flow, gpd[(a)] | | 94,363 | |
| Solids Concentration, %[(b)] | | 0.68 | |
| Solids Loading, pph dry solids[(c)] | | 223 | |
| Centrifuge Performance | | | |
| Solids Capture, %[(d)] | | 95 | |
| Cake Solids, %[(d)] | | 0.16 | |
| Operation | | | |
| Days/week[(e)] | 4 | 4 | 4 |
| Hour/day | 16 | 16 | 8 |
| No. of Centrifuges | | | |
| Duty | 2 | 1 | 1 |
| Total | 2 | 2 | 1 |
| Level of Redundancy[(f)] | 50% | 100% | 0% |
| Flow, gpm, each | 86 | 172 | 344 |
| Solids Loading, dry pph, each | 293 | 586 | 1,171 |
| Andritz Selection | D4L | D5L | D6LX |
| Centrisys Selection | CS18-4 | CS21-4HC | CS26-4 |

**Notes:**
(a) 2040 maximum week solids loading to dewatering, as presented in the Draft Basis of Design TM dated 1 July 2022.
(b) Based on a Storage Tank decant rate of 20% of influent flows.
(c) Based on continuous operation, 24 hours per day 7 days per week.
(d) Based on Andritz laboratory test results dated 26 May 2022, included in Attachment A.
(e) City's stated maximum operating days per week based on staffing availability.
(f) Redundancy expressed as a percentage of operating hours per 24-hour period. 100% represents full n+1 redundancy.

Three operating scenarios were provided to the manufacturers to select equipment of various sizes. The number of duty centrifuges and operating hours were varied to determine the largest process capacity centrifuge(s) that would fit within the existing centrifuge process area. A review of the general arrangement drawings for Scenario 3, Andritz D6LX and Centrisys CS26-4, indicated that the equipment footprints for both manufacturers were too large to fit within the existing centrifuge process area. As a result, Scenario 3 was eliminated from consideration. Scenario 2 selections from each manufacturer, Andritz D5L and Centrisys CS21-4HC, were

found to each fit within the existing centrifuges replacement area. Based on preliminary discussions with the City, preference is to provide larger units with additional redundancy. As a result, the Scenario 1 selections from each manufacturer, Andritz D4L and Centrisys CS18-4, are not considered. A discussion of the physical constraints and considerations for each manufacturer selection is presented later in this TM. Proposal data for the Andritz and Centrisys selections are summarized in Tables 5 and 6, respectively.

**Table 5: Andritz D5L Proposal Data**

| Parameter | Value |
|---|---|
| Manufacturer | Andritz |
| Model No. | D5L |
| Bowl Diameter, inches | 20.5 |
| Capacity[a] | |
| Flow, gpm | 176 |
| Solids, pph | 600 |
| Main Drive | |
| Hp | 75 |
| Type | VFD |
| Back Drive | |
| Hp | 20 |
| Type | VFD |
| Process Connections | |
| Feed | |
| Size, inches | 2 |
| Pressure, PSI[b] | 7.5 |
| Solids Discharge[c] | |
| Size, inches | 12 x 25 |
| Centrate[c] | |
| Size, inches | 7 x 17 |
| Wash Water[d] | |
| Size, inches | 1 |
| Flow, gpm | 44 to 88 |
| Pressure, PSI | 45 to 60 |
| Vent | |
| Size, inches | 4.5 |
| Air Flow, SCFM[e] | 207 |
| Polymer | |
| Size, inches | 1 |
| Usage, active lbs/dry ton[f] | 16 to 20 |

**Notes:**
(a) Assumes feed solids concentration of 0.68%.
(b) Inlet pressure requirement at the feed connection flange.
(c) Rectangular, flanged connection.
(d) Plant 3W is applied for 15 minutes during shutdown and 10 minutes during a clean in place cycle.
(e) Minimum air flow requirement from centrate casing.
(f) Based on manufacturer testing performed by Andritz, dated 26 May 2022, included in Attachment A.

**Table 6: Centrisys CS21-4HC Proposal Data**

| Parameter | Value |
|---|---|
| Manufacturer | Centrisys |
| Model No. | CS21-4HC |
| Bowl Diameter, inches | 21.5 |
| Capacity[a] | |
| Flow, gpm | 200 |
| Solids, pph | 680 |
| Main Drive | |
| Hp | 75 |
| Type | VFD |
| Back Drive | |
| Hp | 15 |
| Type | Hydraulic |
| Process Connections | |
| Feed | |
| Size, inches | 2 |
| Pressure, PSI[b] | 10 |
| Solids Discharge[c] | |
| Size, inches | 18 x 37 |
| Centrate[c] | |
| Size, inches | 18 x 37 |
| Wash Water[d] | |
| Size, inches | 1-1/4 |
| Flow, gpm | 100 to 110 |
| Pressure, PSI | 40 to 80 |
| Vent | |
| Size, inches | 4 |
| Air Flow, SCFM[e] | NA |
| Polymer | |
| Size, inches | 3/4 |
| Usage, active lbs/dry ton[f] | TBD |
| Air[g] | |
| Flow, SCFM | 6 |
| Pressure, PSI | 80 |

**Notes:**
(a) Assumes feed solids concentration of 0.68%.
(b) Inlet pressure requirement at the feed connection flange.
(c) Rectangular, flanged connection.
(d) Plant 3W is applied for 15 to 20 minutes during shutdown and clean in place cycle.
(e) Minimum air flow requirement from centrate casing.
(f) Information to be provided by Centrisys.
(g) Required for air-oil lubrication system. Instrumentation air quality.

## Andritz – Scenario 2

The Andritz D5L centrifuges include 2304 duplex stainless steel solids bowls, 316 stainless steel scroll with tungsten carbide tiles over the full length, 316 stainless steel wetted parts, carbon steel frame with epoxy coating, and FRP casing covers and drive guards. Flexible connectors are provided to convey solids discharge to inclined screw conveyors positioned below the centrifuges. Included with the Andritz proposal are two incline screw conveyors to transport dewatered solids from the solids discharge flange to the existing dewatering belt conveyor.

The Andritz proposal includes galvanized steel centrifuge stands positioning centrifuges approximately 3'-6" above the floor. At this height, maintenance platforms are not anticipated to be required. Flexible connectors to transition from the rectangular centrate discharge flange to an 8-inch-diameter centrate discharge pipe are also included.

Andritz also provides a 316 stainless steel pipe manifold on each unit for the connection of feed sludge, polymer, and wash water process connections fitted with flexible connectors. The Andritz centrifuges have manually greased bearings with an L-10 life of 100,000 hours. Centrate piping would require venting to prevent air lock. Total connected horsepower for the D5L is 190 hp for two centrifuges.

Lead time for the Andritz D5L is 6 weeks for shop drawings and 40 weeks from approved drawings. A figure of the Andritz D5L is shown on Figure 2. The Andritz D5L proposal is included with this TM as Attachment A, including drawings, equipment data, and installation list. Andritz performed sludge testing in May 2022, and the results are also included in Attachment A.

**Figure 2: Andritz D5L**

## Centrisys – Scenario 2

The Centrisys CS214HC centrifuges include duplex stainless steel solids bowls, duplex stainless steel scroll shaft and 304 stainless steel flights, and 304 stainless steel wetted parts and powder coated carbon steel frame. Flexible connectors are provided to convey solids discharge to inclined screw conveyors positioned below the centrifuges. Included with the

Centrisys proposal are two incline screw conveyors to transport dewatered solids from the solids discharge flange to the existing dewatering belt conveyor.

The Centrisys proposal includes powder coated carbon steel stands positioning centrifuges approximately 3'-6" above the floor. Maintenance platforms are not anticipated to be required. Centrisys centrifuges include an automatic grease lubrication system incorporating low grease level sensors.

The Centrisys centrifuges also incorporate a standalone hydraulic back drive that powers the scroll. The hydraulic drive is a distinguishing component of the Centrisys proposal. Centrisys states that the hydraulic drive is more efficient and contains fewer moving parts than a gearbox. Total connected horsepower for the CS21-4HC is 180 hp for two centrifuges. The Centrisys proposal also includes an extended 15-year scroll warranty, and a power run-through option that allows the centrifuge to continue to drive the scroll for a limited time in the event of a power outage. This feature allows the centrifuge to discharge its contents before completely shutting down; however, additional investigation would be needed to verify whether this option can be implemented, including determining if solids conveyors and the RDP lime pasteurization process are currently on standby power or have the physical capacity to accept the volume of solids discharged during an outage.

Lead time for the Centrisys CS21-4HC is 6 weeks for shop drawings and 50 weeks from approved drawings. A figure of the Centrisys CS21-4HC is shown on Figure 3. The Centrisys CS21-4HC proposal is included with this TM as Attachment B, including drawings, equipment data, and installation list.

**Figure 3: Centrisys CS21-4HC**

## Equipment Layouts

General arrangement drawings were provided by the centrifuge manufacturers and preliminary layouts were developed for each model to understand how centrifuges could be installed in the existing dewatering process area. Equipment layouts for Andritz and Centrisys for Scenario 2 are shown on Figures 4 and 5, respectively.

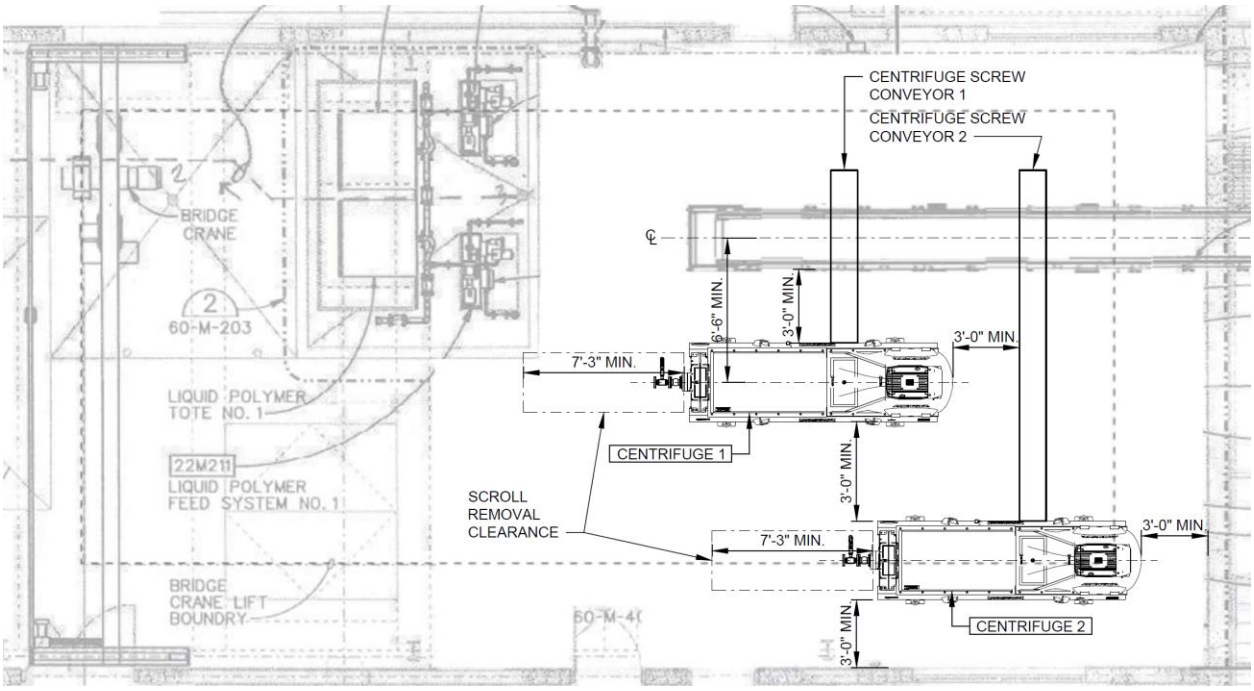


**Figure 4: Scenario 2 Andritz D5L Equipment Plan**

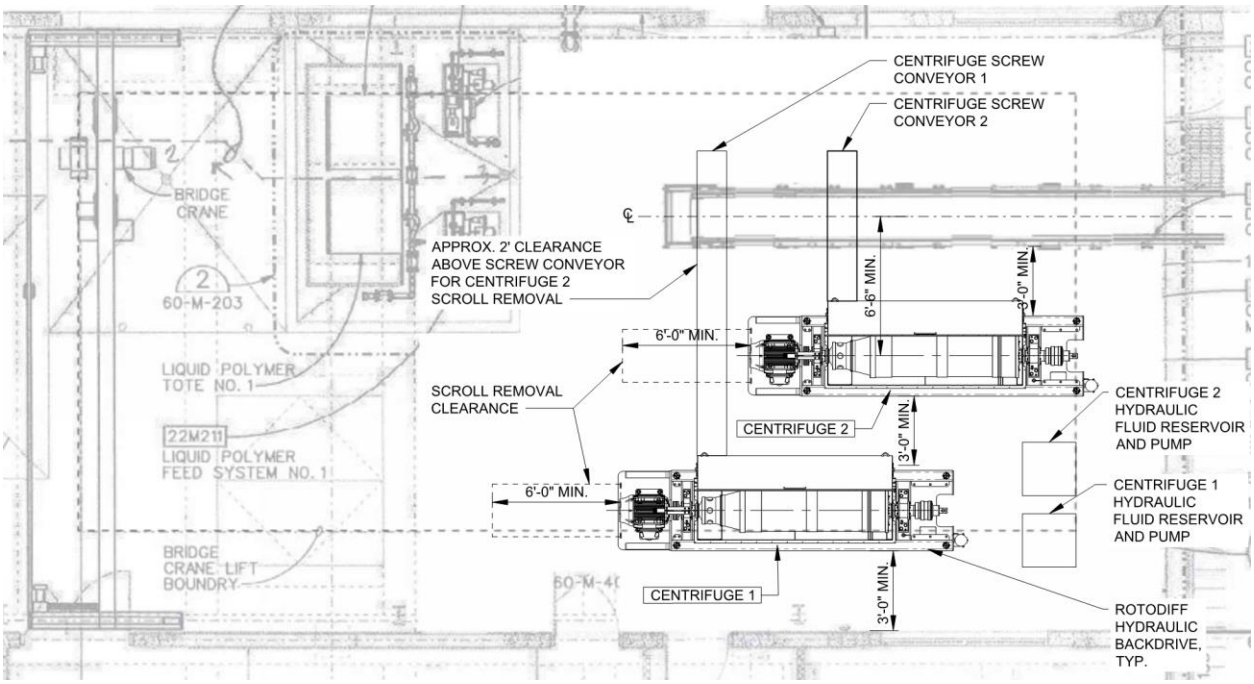


**Figure 5: Scenario 2 Centrisys CS21-4HC Equipment Plan**

## Physical Considerations

An existing 2-ton bridge crane is located in the dewatering process area. Field measurements provided by the City indicate a maximum hook height of approximately 12 feet for removing components from the centrifuge frame when performing maintenance. A single roll-door to the dewatering area is located on the east side of the Solids Handling Building for egress of equipment. An equipment laydown area immediately west of the dewatering polymer area is provided for transport of centrifuge components. This area also contains a hatch to the lower pump gallery for the removal of equipment from the basement level and must remain clear.

The centrifuge replacement project anticipates that the existing dewatering belt conveyor which conveys dewatered solids to the RDP lime pasteurization process remains; however, modifications to the height of the belt conveyor may be required based on the geometry of the inclined screw conveyors and position of the centrifuges within the room. Initial City field measurements indicate that the existing stainless steel supports beneath the dewatering belt conveyor may be able to be cut down to lower the belt conveyor up to 12 inches if needed. If lowered, additional investigation would be required to coordinate the modified belt conveyor with the existing RDP conveyors. Discharge chutes would be provided at the incline screw conveyor discharge to guide solids to the belt surface.

Additionally, centrifuges and supporting equipment will need to be located within the lift boundary of the existing bridge crane, as shown on Figures 4 and 5. Housekeeping equipment pads would be provided under each centrifuge to facilitate room washdown.

### Andritz

Physical data for the Andritz D5L centrifuges, along with maintenance clearances, lifting heights, and component weights, are summarized in Table 7.

In addition to placing centrifuge equipment within the bridge lift boundary and observing manufacturer recommendations for maintenance clearances around the units, the height of the existing dewatering belt conveyor is a controlling factor in determining the position of centrifuges within the process area. The recommended maximum incline of the screw conveyors is between 25 and 30 degrees. To position the screw conveyor discharges sufficiently above the dewatering belt conveyor will require a minimum horizontal distance of 6’-6” from centerline of the centrifuge to the centerline of the belt conveyor. This layout assumes that centrifuges are installed on stands anchored to the concrete floor, with a stand height of 3’-6”. An example section drawing of this configuration from another project is shown on Figure 6.

Process connections, such as feed and wash water, would be routed through the floor slab from the basement level below where piping is suspended from the ceiling/floor slab. Additionally, vent piping would need to be routed from the centrifuges to an air handling facility to dispose of foul air and to meet the electrical classification requirements of NFPA 820 for solids processing rooms.

**Table 7: Andritz D5L Physical Data**

| Parameter | Value |
|---|---|
| Length, inches | 147 |
| Width, inches | 48 |
| Height, inches | 70 |
| Maintenance Clearance | |
| Length, inches | 36 |
| Location | All Sides |
| Scroll Removal Clearance | |
| Length, inches | 87 |
| Location | Main Drive End |
| Rotating Assembly | |
| Weight, lbs[(a)] | 4,083 |
| Minimum Hook Height, inches | 132 |
| Scroll | |
| Weight, lbs | 1,034 |
| Minimum Hook Height, inches | 132 |
| Main Drive | |
| Weight, lbs | 1,248 |
| Minimum Hook Height, inches | 134 |

**Notes:**

(a) Weight when empty. The scroll would need to be removed separately before removing the centrifuge bowl.

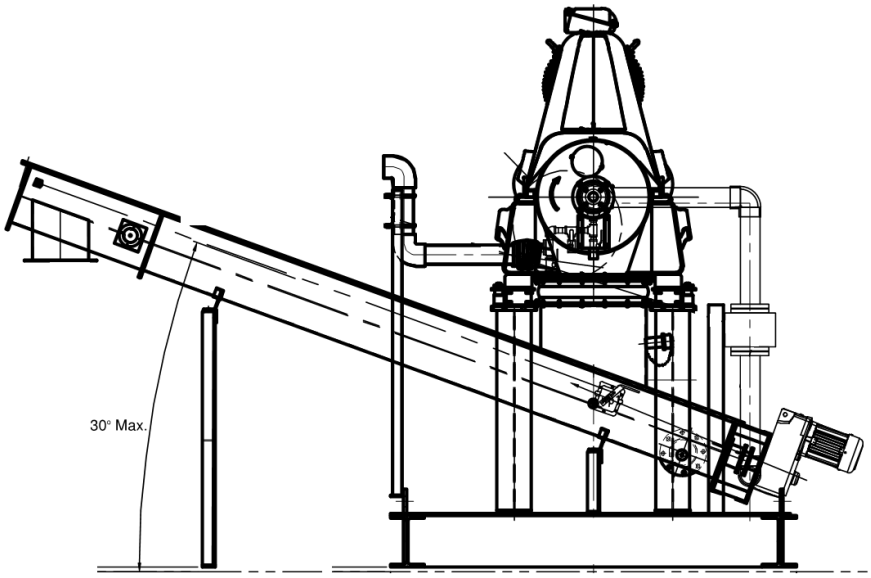


**Figure 6: Example Centrifuge and Conveyor Section**

### Centrisys

Physical data for the Centrisys CS21-4HC centrifuges, along with maintenance clearances, lifting heights, and component weights, are summarized in Table 8.

**Table 8: Centrisys CS21-4HC Physical Data**

| Parameter | Value |
|---|---|
| Length, inches | 188 |
| Width, inches | 45 |
| Height, inches | 53 |
| Maintenance Clearance | |
| Length, inches | 36/24 |
| Location | Motor Ends/Sides |
| Scroll Removal Clearance | |
| Length, inches | 72 |
| Location | Main Drive End |
| Rotating Assembly | |
| Weight, lbs[(a)] | 3,700 |
| Minimum Hook Height, inches | 102 |
| Main Drive | |
| Weight, lbs[(b)] | 847 |

**Notes:**
(a) Weight when empty. The scroll cannot be removed independently from the rotating assembly.
(b) To be determined by Centrisys.

Similar to the Andritz discussion, Centrisys centrifuges will need to fit within the existing constraints of the dewatering process area. The layout shown on Figure 5 includes an overlap of the scroll removal clearance for Centrifuge 2 and the inclined screw conveyor for Centrifuge 1. A preliminary review of the inclined screw conveyor elevation at this point indicates approximately 24 inch clearance between the top of the inclined screw conveyor and bottom of the scroll of Centrifuge 2 when removed.

## Electrical Considerations

The existing centrifuges are powered from 60MCC1 and 60MCC2, located in the electrical room on the ground level of the Solids Handling Building, immediately west of the dewatering process area. Centrifuge 1 is powered from 60MCC1, and Centrifuge 2 is powered from 60MCC2. 150A circuit breakers control power fed to control panels located in the control room that house 40 hp (main drive) and 10 hp (back drive) variable frequency drives (VFDs). A partial single line diagram for 60MCC1 is shown on Figure 7, depicting both the existing conditions and proposed

load increases associated with the Andritz and Centrisys selections. Modifications to the 60MCC2 single line diagram are similar.

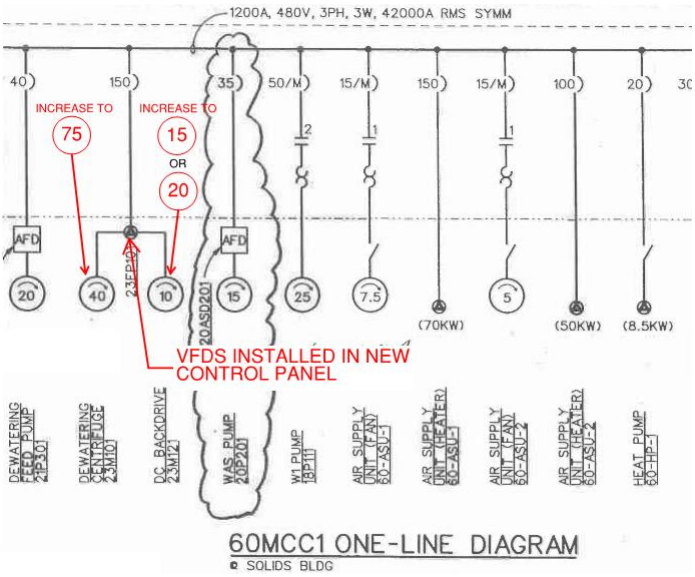


**Figure 7: Partial 60MCC1 Single Line**

A preliminary load evaluation of the motor control centers (MCCs) indicates that the existing equipment and feed breakers are sufficiently sized to accommodate the increased loads shown on Figure 7. A preliminary review of record drawings for 60SWGR1 indicate that the existing switchgear may be overloaded as it is. Additional investigation is recommended to determine if the Centrifuge Replacement Evaluation may trigger electrical improvements to 60SWGR1.

MCCs 60MCC1 and 60MCC2 are likely reaching the end of their service life, and replacement parts may become increasingly difficult to procure. We recommend the City consider MCC replacement with the Centrifuge Replacement Evaluation. If the City has not experienced maintenance issues with the existing MCCs their replacement could be deferred. The City may be considering a plant-wide electrical conditions assessment in the near future that will help to address these questions.

It is assumed that the Solids Handling Building is ventilated at a rate greater than 6 air changes per hour; however, this is unknown and will need to be verified. Per NFPA 820, the dewatering process area is then considered to be unclassified. Explosion proof motors, enclosures, and electrical connections have not been included with the manufacturers proposals.

## Controls

The existing centrifuge control panels, shown on Figure 8, are located in the Control Room west of the dewatering process area. The control panels house VFDs, programmable logic controller (PLCs) and human machine interfaces (HMIs) for the operation of centrifuges, and include hardwire I/O. Existing PLCs are Allen-Bradley with SLC 500 processors. The City made programming improvements in 2017 to address issues with the automatic operation of centrifuges; however, it was determined that further control upgrades were recommended to provide integration with the plant's SCADA system and interlocks with support equipment such as dewatering feed pumps, polymer system, conveyors, and the RDP lime pasteurization process. Plant staff have indicated a preference for centrifuge manufacturers to provide new control panels with ethernet I/O that will support integration with the various support equipment and provide unit responsibility over these systems.

### Andritz

Andritz provides a NEMA 4X junction box mounted to each centrifuge frame, along with bearing temperature sensors, vibration sensors, bowl speed sensors, and wash water solenoid valves. Two NEMA 12 starter panels equipped with fans and filters would be provided and are anticipated to be installed in the existing dewatering control room. Starter panels include Allen-Bradley PowerFlex 755 VFDs for the main and back drives. Two stainless steel NEMA 4X centrifuge control panels are provided, equipped with air conditioners. Control panels include Allen-Bradley CompactLogix PLCs with ethernet capability, 10-inch PanelView Plus HMI screens, and E-stops.

### Centrisys

Centrisys provides air conditioned, 304 stainless steel NEMA 4X control panels for each centrifuge that houses the main circuit breaker, VFD for the main drive, Allen-Bradley CompactLogix PLC, and motor starter for the hydraulic back drive. Control panels are ethernet capable and include 10-inch PanelView Plus HMI screens. Control panels would be installed in the existing control room. Centrisys also provides vibration sensors, bearing temperature sensors, bowl speed sensors for the centrifuges and hydraulic oil level, temperature and pressure sensors for the hydraulic back drives.

**Figure 8: Existing Centrifuge Control Panels**

## Dewatering Feed Pumps

The existing dewatering feed pumps are located in the pump gallery on the basement level of the Solids Handling Building, as shown on Figure 9. The existing pumps are Wemco recessed impeller pumps with slurry seal at mechanical seals, with a stated capacity of 50 to 100 gpm on plant record drawings; however, plant staff report the pumps likely have greater capacity and are capable of flowing 95 gpm at 30% speed. A pump curve for the Wemco pumps is included as Attachment E. The capacity of the existing pumps will need to be verified to confirm they can provide the required 172 gpm to each centrifuge under Scenario 2.

Plant staff also indicated a flow restriction on the pump discharge piping at the flow meters. The discharge piping necks down to 2 inches and has presented clogging issues in the past. It is recommended that an evaluation be performed for increasing meter size to 4 inches, or installing grinders upstream of the restriction.

**Figure 9: Dewatering Feed Pumps**

## Polymer System

The existing liquid emulsion dewatering polymer system is located immediately north of the dewatering process area in the Solids Handling Building, as shown on Figure 10. The polymer system is a PolyBlend system manufactured by USFilter. Plant staff have experienced issues with the operation and control of the polymer system stemming from the lack of integration of the PolyBlend equipment with the Alfa-Laval/Sharples centrifuge control panels. Additionally, plant staff have experienced issues with monitoring polymer addition to the centrifuges, inhibiting the plant's ability to optimize the process. Plant staff have indicated a preference to replace the existing polymer system with new equipment supplied by the centrifuge manufacturer to eliminate the integration issues and provide unit responsibility over polymer addition.

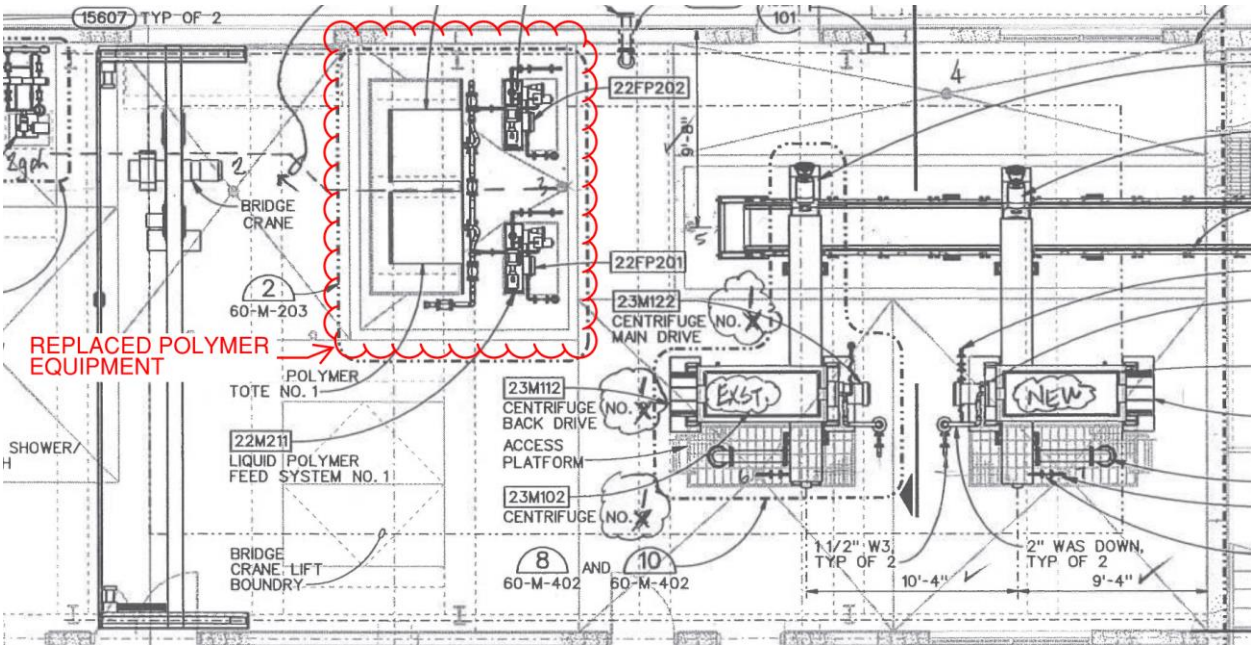


**Figure 10: Existing Polymer Area**

Additionally, plant staff have indicated that the curb containment surrounding the existing polymer system, shown on Figure 11, makes access into the polymer area for maintenance difficult and has potential for injury. Plant staff have indicated a preference to have the polymer area re-designed, eliminating the containment curbs and providing secondary containment of piping and polymer totes while improving maintenance access and the ability to washdown the polymer area.

**Figure 11: Existing Dewatering Polymer System**

Manufacturer proposals include a new liquid emulsion polymer system with feed controls integrated with the new centrifuge control panels. Additional considerations for tote storage and automated switching between polymer pumps may be considered during design. An example polymer system by Velodyne is included as Attachment C. Preliminary design data for the polymer system are summarized in Table 9. Additional discussion with plant staff is recommended to identify whether existing tote storage within the Solids Handling Building is adequate.

**Table 9: Preliminary Polymer System Design Data**

| Parameter | Value |
|---|---|
| Polymer Flow Rate, gph | 0.25 to 5 |
| Dilution Water Flow, gph | 120 to 1,200 |
| Mixing Chamber | |
| Model | VeloBlend VM |
| Type | Staged Hydro-Mechanical |
| Mixer | |
| Hp | 0.5 |
| Materials of Construction | Stainless Steel |
| Polymer Metering Pump | |
| Type | Progressing Cavity |
| Hp | 0.5 |
| Control Panel | |
| Type | NEMA 4X |
| Voltage, V | 120 |

## Recommended Improvements

Based on the equipment layouts shown on Figures 4 and 5, both the Andritz D5L and Centrisys CS21-4HC selections appear to fit within the existing dewatering process area. Additional investigation is recommended to determine the exact locations, equipment stand heights and conveyor configurations, including angle of incline, for moving the project into detailed design.

## Cost Estimate

An Engineer's Opinion of Probable Construction Cost was prepared for the Centrifuge Replacement Evaluation. The following markups were assumed for each alternative in preparation of the opinion of probable construction cost:

- Electrical, Instrumentation, and Controls Cost: 30% of electro-mechanical process areas. Costs do not include replacement of 60MCC1 or 60MCC2.
- Contractor Indirects: 12% of total construction cost (including electrical) to cover mobilization, bonds, insurance.
- Contractor Overhead and Profit (OH&P): 15% of above costs.
- Estimate Contingency: 25% of all costs listed above.
- Construction Cost Escalation: 6.5% per year, assuming 18 months to the mid-point of construction.
- Market Volatility: 10% of all above costs

Following preparation of construction costs, an additional 38% is added to account for soft costs such as engineering, legal, permitting, and administrative costs associated with design and construction. Detailed cost estimates are provided in Attachment D.

The opinions of probable cost presented in this section are Association for the Advancement of Cost Engineering (AACE) International Class 4 estimates, for which the stated range of accuracy is +40% to -20%. Estimates do not include hazardous materials removal or disposal. Costs assume that structural conditions are suitable and that special foundations are not required. Costs associated with replacement of dewatering feed pumps, installation of grinders, or re-configuration of discharge piping are also not included at this time. Costs for dewatering feed pump improvements may be determined following further investigation of pump capacities during the design stage.

The estimated capital costs for Scenarios 1 and 2 are presented in Table 10. Andritz and Centrisys costs are presented for comparison. Andritz equipment costs are lower in both scenarios, and generally Scenario 1 costs are lower than Scenario 2 due to smaller equipment. The shorter hook lifting heights associated with the smaller Scenario 1 centrifuges also eliminates the need to modify the existing dewatering belt conveyor. The level of redundancy is reduced however under Scenario 1, which requires two centrifuges to operate 16 hours per day at the 2040 maximum week solids loading. Total costs are rounded to the nearest $100,000, or $10,000 for areas with costs below $100,000. Costs presented are inclusive of all markups described above.

**Table 10: Capital Costs**

| | Scenario 1 | | Scenario 2 | |
|---|---|---|---|---|
| **Area** | **Andritz** | **Centrisys** | **Andritz** | **Centrisys** |
| Demo | $59,000 | $59,000 | $60,000 | $60,000 |
| Temporary Dewatering Skid | $230,000 | $230,000 | $230,000 | $230,000 |
| Concrete | $23,000 | $23,000 | $23,000 | $23,000 |
| Metals | $0 | $0 | $170,000 | $170,000 |
| High Performance Coatings | $50,000 | $50,000 | $51,000 | $51,000 |
| Signage | $3,000 | $3,000 | $3,000 | $3,000 |
| Centrifuges, Polymer, Conveyors | $3,180,000 | $3,680,000 | $4,190,000 | $4,890,000 |
| Spare Parts | $54,000 | $54,000 | $55,000 | $54,000 |
| Piping | $740,000 | $740,000 | $750,000 | $750,000 |
| Flow Meters | $62,000 | $62,000 | $63,000 | $62,000 |
| **Total Capital Costs[a,b]** | **$4,400,000** | **$4,900,000** | **$5,600,000** | **$6,300,000** |

**Notes:**

(a) Capital costs are inclusive of the following markups:
1. Electrical, Instrumentation and Controls = 30% of electro-mechanical areas
2. Contractor Indirects = 12%
3. Contractor OH&P = 15%
4. Contingency = 25%
5. Escalation = 6.5% per year, assuming 18 months to mid-point of construction
6. Market volatility = 10%
7. Soft costs, including engineering, construction management, permits, legal, administrative = 38%.

(b) Capital costs do not include replacement of MCCs or sludge dewatering feed pumps. Additional investigation is recommended to better define potential improvements for MCCs and sludge dewatering feed pumps.

O&M costs are inclusive of operator labor, preventative maintenance, repair and replacement, electricity, and chemical usage. Labor costs assume 0.3 full-time employee (FTE) to perform maintenance duties at a burdened rate of $50 per hour. Electricity costs are based on a rate of $0.08 per kilowatt hour (kW-hr). The estimated annual O&M costs for Scenarios 1 and 2 are presented in Table 11. Total costs are rounded to the nearest $1,000.

**Table 11: Annual O&M Costs**

| Item | Scenario 1[(a)] | Scenario 2[(a)] |
|---|---|---|
| Labor[(b)] | $31,000 | $31,000 |
| Electricity[(c)] | $10,000 | $9,000 |
| Chemical[(d)] | $52,000 | $52,000 |
| Equipment Maintenance[(e)] | $14,000 | $20,000 |
| **Total Annual O&M Costs** | **$107,000** | **$112,000** |

**Notes:**
(a) Costs are rounded to the nearest $1,000.
(b) Costs assume burden rate of $50 per hour.
(c) Costs assume $0.08 per kW-hr.
(d) Costs for liquid emulsion polymer, $4.20 per active lb. Assumes 20 active lbs polymer/dry ton, and an annualized average of 618 dry tons per year.
(e) Costs are annualized at 2% of equipment costs.

Table 12 presents a planning level opinion of 20-year life-cycle costs, including annual O&M costs and capital costs for Scenarios 1 and 2. The Net Present Value (NPV) represents costs over 20 years in terms of 2022 dollars.

**Table 12: Life-Cycle Costs**

| | Scenario 1 | | Scenario 2 | |
|---|---|---|---|---|
| **Item** | **Andritz** | **Centrisys** | **Andritz** | **Centrisys** |
| Capital Costs | $4,400,000 | $4,900,000 | $5,600,000 | $6,300,000 |
| 20-year O&M Costs NPV[(a)] | $2,200,000 | $2,200,000 | $2,300,000 | $2,300,000 |
| **Total Life-Cycle Costs** | **$6,600,000** | **$7,100,000** | **$7,900,000** | **$8,600,000** |

**Notes:**
(a) NPV = Net Present Value includes 3% inflation rate. Discount rate is 2.5%, per OMB Circular A-94, Appendix C.

## Next Steps

Next steps include a confirmation of equipment sizing and selection by the City, and a follow-up discussion with manufacturers related to ancillary equipment and various options available from the manufacturers, including extended warranties, to refine equipment scope of supply and pricing. Next steps may also include contacting manufacturer references and arranging site visits with reference installations to examine the equipment and speak with plant operators.

# Attachment A: Andritz Proposal

# City of Newport WWTP – Dewatering Upgrade
# Option 1 - 2 x ANDRITZ D4L Centrifuges

For: Kennedy Jenks
To: Ben Bossé
Benjamnin.Bosse@KennedyJenks.com

Date: 16-Aug-2022
Ref: 3827073-1-Rev-A

## Design Criteria

| | |
|---|---|
| Sludge description: | Aerobically Digested |
| Feed Solids Concentration: | 1.0-2.0% TS |
| Design Hydraulic Load: | 40-60 gpm |
| Maximum Solids Load: | 600 lb/hr dry solids |

## Equipment Selection and Expected Performance

| | |
|---|---|
| Recommended Model: | ANDRITZ D4L Centrifuge |
| Dewatered Solids Concentration: | 16-20% TS |
| Solids Capture Efficiency: | 95% TSS |
| Estimated Polymer Dosage: | 16-20 active lbs per ton dry solids |

*Note: Refer to ANDRITZ Lab Test L-14805*

## Scope of Supply

1. Two ANDRITZ D4L Centrifuges c/w:
    - 2304 duplex stainless steel solid bowl
    - SS316 scroll with tungsten carbide tiles over full length
    - SS316 wetted parts
    - Carbon steel frame with epoxy coating
    - FRP casing cover and drive guards
    - 40 HP Main drive / 10 HP Scroll Drive
    - Cyclo gearbox
    - Grease lubricated bearings, L-10 for 100,000 hours
    - Vibration Isolators

    Solids Discharge Connection:
    - Flexible connector to SS316 solids chute on conveyor (conveyor by others)

    Centrate Discharge Connection:
    - Centrate de-aerator supplied with top vent connection, bottom centrate discharge connection and sample port with flex connector between de-aerator and centrifuge

    Feed Connection:
    - SS316 pipe manifold connection for sludge, polymer and wash water c/w a flexible connector

    Centrifuge Machine Wiring and Instruments:
    - NEMA 4X SS terminal box mounted on centrifuge, with PVC Coated Conduit
    - Two Bearing Temperature Sensors
    - Two Vibration Sensors
    - One (1) Bowl Speed Sensor
    - Solenoid valve for centrifuge wash water, brass

**ANDRITZ SEPARATION TECHNOLOGIES INC.**
1010 Commercial Blvd. S.
Arlington, Texas 76001
Tel. (817) 465-5611
Fax (817) 468-3961
www.andritz.cc

2. Two (2) Centrifuge Starter Panels:
    - NEMA 12 with fans and filters
    - Allen-Bradley PowerFlex 755 VFDs for main drive and back drive
3. Two (2) Centrifuge Control Panels:
    - NEMA 4X stainless steel panel with air conditioner
    - Allen-Bradley CompactLogix PLC with ethernet
    - Allne-Bradley Panelview Plus7 10” OIT
    - E-stop
4. Two (2) galvanized steel support stands to support centrifuge over inclined conveyor (no access platform)
5. Two (2) Emulsion Polymer Systems – Velodyne VM-3P-600-D-0-A-1
6. One Set of Special Tools Including Lubricants for First Year of Operation
7. Engineering and Documentation
8. Startup and Training Services – 2 trip x 5 days on site per trip
9. Freight to Jobsite (2 flatbed loads from ANDRITZ shop, Pittsburg, TX)

Not included: Sludge feed pump and flowmeter, inclined discharge conveyor, spare parts

**Budget Pricing**

Budget Price for Two (2) ANDRITZ D4L Centrifuge Packages: $640,000.00
Pricing in US Dollars, DDP Jobsite, Taxes Not Included.

Prepared By:
ANDRITZ Separation
Denis Piché
Tel: 403-650-4131
denis.piche@andritz.com

Local Representative:
APSCO
Shawn Clark
Tel: 541-602-3016
sclark@apsco-llc.com

# DECANTER D4L

## TECHNICAL DESCRIPTION

### CHARACTERISTICS

| | |
|---|---|
| Size (L x W x H) | 3040 x 1100 x 1460 mm (120 x 43 x 58 in) |
| Empty weight with driving system | 2284 kg (5,035 lb) |
| Full weight with water | 2688 kg (6,042 lb) |
| Sludge inlet | 2” 150# RF Flange |
| Solids outlet | Flange : 495 x 318 mm (19.5 x 12.5 in) |

### MATERIAL OF CONSTRUCTION

| | |
|---|---|
| Bowl (Centrifugally Cast) : | 2304 Duplex SS (1.4362) |
| Scroll and other wetted parts : | SS 316L |
| Frame | Epoxy coated carbon steel |
| Bowl Cover | FRP |
| Motor Cover | FRP |

### BOWL

| | |
|---|---|
| Inner diameter | 430 mm (16.9 in) |
| Total length | 1591 mm (62.6 in) |
| L/D ratio | 3.7 |
| Maximum speed | 3600 rpm |
| G-value at maximum speed | 3115 |

### POND DEPTH ADJUSTMENT

| | |
|---|---|
| Type | Adjustable weir plates<br>TurboJet nozzles optional |

**SCROLL**

| | |
|---|---|
| Type | Counter-current design, High Performance |
| Total length scroll with lifting beam for removal | 2120 mm (83.5 in) |
| Total weight scroll with lifting beam for removal | 384 kg (767 lb) |

**WEAR PROTECTION**

| | |
|---|---|
| Inner bowl surface | Integral machined grooves |
| Scroll edges | Field-Replaceable tungsten carbide tiles full length |
| Scroll feed chamber (distributor) | Tungsten carbide |
| Conveyor feed ports | Field-Replaceable tungsten carbide nozzles |
| Solids Discharge Ports | Field-Replaceable tungsten carbide nozzles |
| Bowl discharge (diffuser) | SS 316L |

**PAINT**

| | |
|---|---|
| Frame and parts in cast iron or steel | Epoxy coating (RAL 5015),<br>Primary (60µ) – Finish (60µ) |

**SEALS AND LUBRICATION**

| | |
|---|---|
| Seals | BUNA N (Nitrile), maximum temperature 80°C |
| Lubrication | Main bearings are grease lubricated<br>The scroll bearings are grease lubricated |

**DRIVE SYSTEM**

| | |
|---|---|
| Bowl speed + scroll speed adjustment | VFD |
| Main motor + frequency inverter | 30 kW (40 HP) |
| Secondary motor + frequency inverter | 7.5 kW (10 HP) |
| Connected load | 30 kW (40 HP) |
| Cyclo reducer (gearbox), nominal torque | 5000 N-m |

**MOTORS**

| | |
|---|---|
| Brand | BALDOR or similar |
| Voltage | 460V / 3 ph / 60Hz (575V for Canada) |
| Speed | 1800 rpm |
| Frame | Cast iron |
| Rating | NEMA MG-1 |
| Service Factor | 1.15 |
| Insulation | Class F |

**CONTROLS**

| | |
|---|---|
| Control/Starter Panel (CCP) | NEMA 4X SS304 Panel, CSA/UL508 Listed |
| PLC | Allen-Bradley Compact Logix |
| OIT | Allen-Bradley PanelView Plus OIT |
| VFD | Allen-Bradley 755 Series |
| Communication | Ethernet |
| Area Classification for Centrifuge and Panel | General/Non-Hazardous |

**SCROLL SPEED ADJUSTMENT**

| | |
|---|---|
| Type | Frequency inverter with secondary motor |
| Differential Speed Range | 0 - 15 rpm |
| Control Modes | Automatic torque control |

**FACTORY ACCEPTANCE TEST VALUES**

| | |
|---|---|
| Noise Level | <85 dB(A) sound pressure in free field, measured at operational speed from 1 meter while empty (according to specific data sheet, 20µPa). |
| Vibration Level | <4.5 mm/s max. (registered on test bench at operational speed according ISO 10816-1) |

**UTILITIES**

| | |
|---|---|
| Sludge feed pressure | 0.5 bar (7.5 psi) at sludge feed connection |
| Wash water flow rate | 8 - 16 m3/hr (35-70 gpm) |
| Wash water quality and pressure | industrial water supply / 3-4 bars (40-50 psi) |
| Wash time for clean-in-place and shutdown | 10 minutes for cip / 15 minutes for shut-down |
| Air evacuation (de-aerator supplied) | 200 m3/hr (120 cfm) |
| Average calorific emission | 3010 Kcal/hr |

**MAINTENANCE EQUIPMENT**

| | |
|---|---|
| Special Tools Supplied with Equipment | 1 Scroll lifting beam<br>1 Scroll thrust bearing extractor<br>1 Pin extractor<br>1 Greasing set<br>1 set of wrenches<br>1 set of threaded rods<br>1 grease pump<br>1 tool box |

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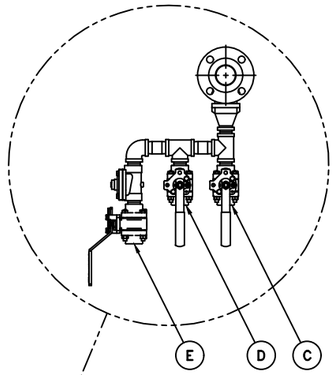
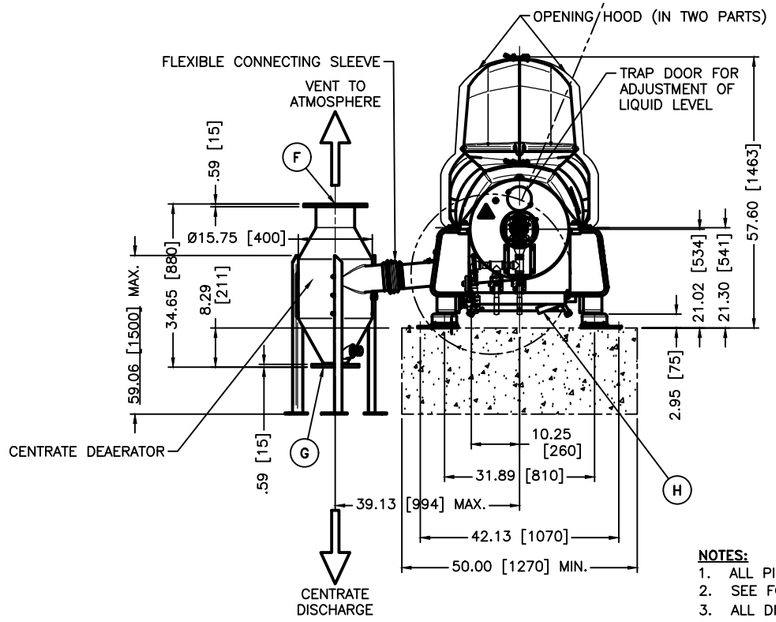
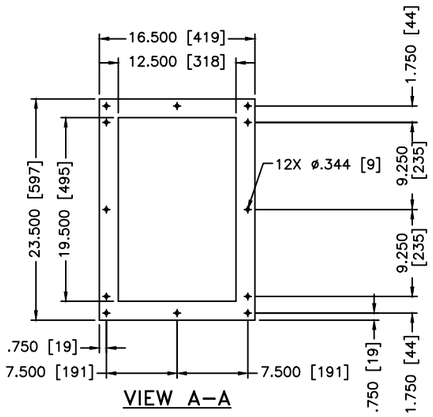
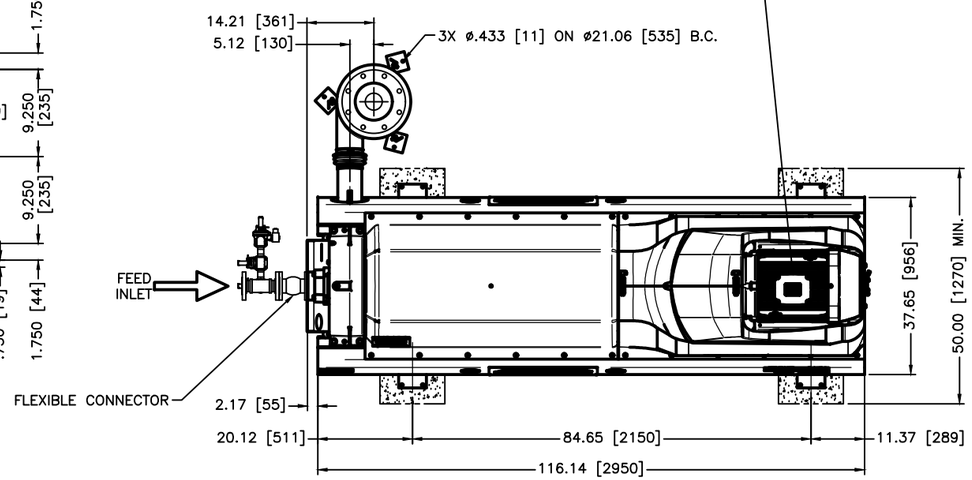
| PIPING CONNECTIONS | | |
|---|---|---|
| PORT | SIZE | DESCRIPTION |
| A | 2" CLASS 150 ANSI RF FLANGE | FEED INLET |
| B | RECTANGULAR 12–1/2" x 19–1/2" | SOLIDS DISCHARGE |
| C | 1" FNPT | SLUDGE SAMPLE |
| D | 1" FNPT | POLYMER CONNECTION |
| E | 1" FNPT | WASHWATER CONNECTION |
| F | 8" CLASS 150 ANSI FF FLANGE | VENT |
| G | 5" CLASS 150 ANSI FF FLANGE | CENTRATE DISCHARGE |
| H | ø1.181" | FRAME DRAIN |

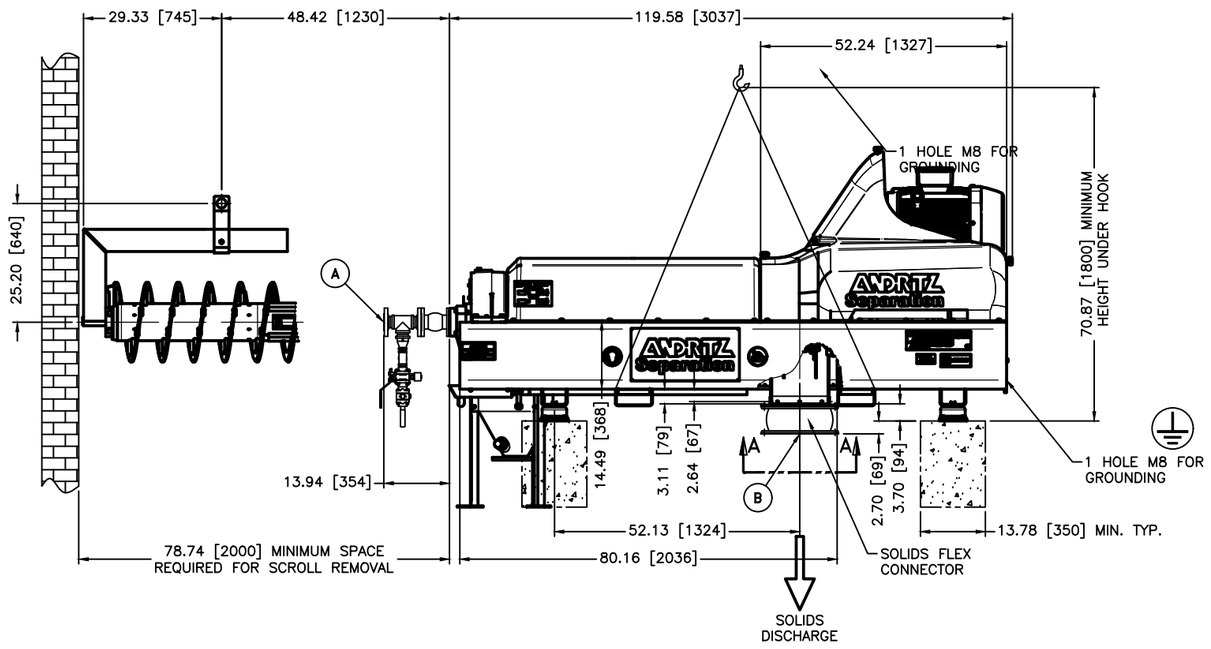



NOTE: KEEP MOTOR CONDUITS AWAY FROM FRONT OF FIBERGLASS GUARDS. RUN MOTOR CONDUITS TOWARD REAR OF MACHINE TO ALLOW FOR COVER AND REMOVAL.




**NOTES:**

1. ALL PIPING TO AND FROM MACHINE TO BE COMPLETED WITH FLEXIBLE CONNECTIONS.
2. SEE FOUNDATION DETAILS FOR DESIGN LOADS AND CONNECTION DETAILS.
3. ALL DIMENSIONS ARE IN INCHES WITH mm IN [ ].
4. DRY WEIGHT OF MACHINE: 5,035 LBS [2,284 KG] 1
5. SCROLL+LIFTING BEAM: 767 LBS [348 KG]
6. NOISE LEVEL AT OPERATION SPEED: 82 dBA.
7. PROCESS REQUIREMENTS:
   WASHWATER: 35.2–70.4 GPM @ 43.5–58 PSI
   SHUTDOWN: 15 MIN
   CIP: 10 MIN
   AIR FLOW: 118 CFM
   MINIMUM SLUDGE INLET PRESSURE: 7.5 PSI AT CENTRIFUGE FEED FLANGE.
8. ALL CHUTES TO BE SUPPORTED BY OTHERS UNLESS NOTED OTHERWISE.
9. FRAME DRAIN TO BE CONNECTED TO CENTRATE PIPING WITH FLEXIBLE TUBUNG (SUPPLIED BY OTHERS). 1

FOR INFORMATION ONLY
NOT FOR CONSTRUCTION PURPOSES

| REV | EIR | REVISION | BY | APVD | DATE |
|---|---|---|---|---|---|
| 1 | NONE | REVISED MACHINE WEIGHTS & PIPING CONNECTIONS | QG | MW | 08/27/18 |

AST No.–

| | | |
|---|---|---|
| ESTIMATED WEIGHT IN LBS: – | DRAWN BY: QG | DATE 02/28/18 |
| UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES | CHECKED BY: | DATE |
| FABRICATION TOLERANCES .XXX±.040 ANG±1° HOLE±.020 | APPROVED BY: MW | DATE 03/08/18 |
| MACHINING TOLERANCES .XXX±.005 ANG±.5° HOLE±.020 | THIRD ANGLE PROJECTION | |
| MILL FINISH ALL OVER | | |

ANDRITZ SEPARATION, INC.
1010 COMMERCIAL BLVD. SOUTH
ARLINGTON, TEXAS 76001
PHONE: (817) 465–5611

TITLE: D4L CENTRIFUGE
D4L CENTRIFUGE GENERAL ARRANGEMENT

| SIZE | DRAWING NUMBER | REV |
|---|---|---|
| D | DMA2764 | 1 |
| SCALE 1/16 | FILE DMA2764 | SHEET 1 OF 1 |

SIMILAR TO DMA1643

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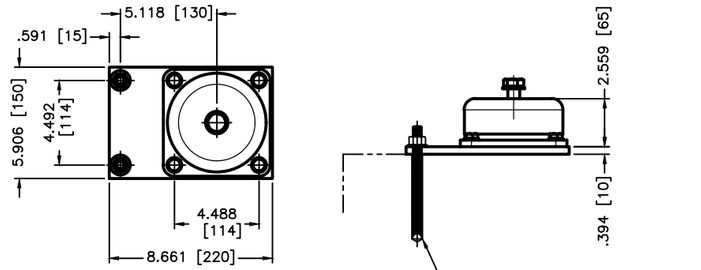
| THEORETICAL TOTAL LOAD TO DISTRIBUTE AMONG THE 4 ISOLATORS (IN NORMAL OPERATION) | | | | | | |
|---|---|---|---|---|---|---|
| STATIC LOAD | | VERTICAL DYNAMIC LOAD IN LBS [N]. CYCLING FORCE EQUIVALENT TO UNBALANCE PERPENDICULAR TO THE ROTOR AXIS AND APPLIED TO THE CENTER OF GRAVITY. | | | | |
| WEIGHT OF EMPTY MACHINE | 5,035 LBS [22,397 N] | | MACHINE SPEED | EQUI. FREQ. | BEFORE ISOLATOR | AFTER ISOLATOR |
| X 1.2 (WITH PRODUCT) = | 6,042 LBS [26,876 N] | IN NORMAL OPERATION | 2,500 RPM | 41.7 HZ | +/− 635LBS +/− [2,825 N] | +/− 12.9 LBS +/− [57 N] |
| | | | 3,000 RPM | 50.0 HZ | +/− 783 LBS +/− [3,483 N] | +/− 15 LBS +/− [67 N] |
| | | | 3,500 RPM | 58.3 HZ | +/− 882 LBS +/− [3,923 N] | +/− 19.3 LBS +/− [86 N] |
| | | AT ISOLATORS RESONANCE | 400 RPM | 6.7 HZ | +/− 72 LBS +/− [320 N] | +/− 503 LBS +/− [2,237 N] |

| TOTAL PRACTICAL LOAD TO CONSIDER FOR CALCULATION OF THE FOUNDATION (TO DISTRIBUTE AMONG THE 4 ISOLATORS) | | | | |
|---|---|---|---|---|
| VERTICAL | STATIC = | 5,035 LBS [22,397 N] | X 1.2 = | 6,042 LBS [26,876 N] |
| | + DYNAMIC* = | 6,042 LBS [26,876 N] | X 10% = | 604 LBS [2,687 N] |
| | TOTAL = | | | 6,646 LBS [29,563 N] |
| HORIZONTAL | DYNAMIC = | 6,042 LBS [26,876 N] | X 10% = | 604 LBS [2,687 N] |

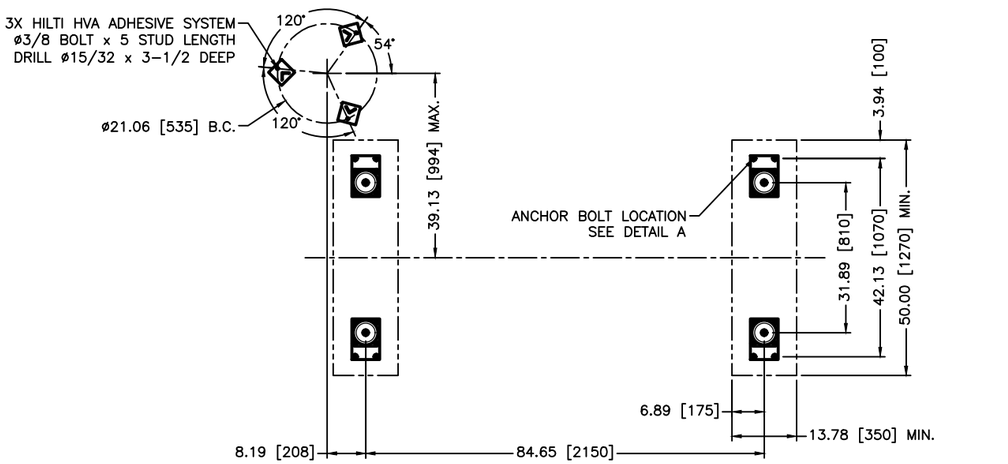
(*) WHILE SHUT DOWN OF MACHINE, AND IN CASE OF ABNORMAL OR ACCIDENTAL UNBALANCE

**ISOLATOR NOTE!**

APPLY LOCTITE TO ALL VIBRATION ISOLATOR HARDWARE DURING INSTALLATION.




DETAIL A
SCALE: 1/4



**GENERAL NOTES :**

1. ALL DIMENSIONS ARE IN INCHES WITH mm IN [ ].
2. THE FOUNDATION DESIGN SHOWN INDICATES MINIMUM REQUIREMENTS FOR CLEARANCE AND DRAINAGE. ACTUAL FOUNDATION DESIGN, CONSTRUCTION AND BUILDING HARMONICS CALCULATIONS BY OTHER THAN ANDRITZ.
3. ALL CONNECTING PIPING MUST BE SELF SUPPORTING.
4. ALL FEED AND OUTLET CONNECTIONS TO THE D4L TO BE FLEXIBLE.
5. ALL VIBRATION ISOLATION PADS TO BE LEVEL TO WITHIN 1/32 INCH.
6. CLEARANCE REQUIRED AROUND D4L CENTRIFUGE FOR MAINTENANCE: 36 INCH PER SIDE UNLESS OTHERWISE SPECIFIED.
7. USE SPREADER BARS FOR LIFTING (OR MOVING) THE SKID.
8. APPROXIMATE WEIGHT:
   TOTAL MACHINE EMPTY : 5,035 LBS [2,284 KG]
   TOTAL MACHINE FULL (WATER): 6,042 LBS [2,741 KG]
   SCROLL+LIFTING BEAM : 767 LBS [348 KG]

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SIMILAR TO DMF1298

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| REV | EIR | REVISION | BY | APVD | DATE |
|---|---|---|---|---|---|
| 1 | NONE | REVISED MACHINE WEIGHTS | QG | [illegible] | 08/27/18 |

AST No.–

| | | |
|---|---|---|
| ESTIMATED WEIGHT IN LBS: – | DRAWN BY: QG | DATE 03/02/18 |
| UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES | CHECKED BY: | DATE |
| FABRICATION TOLERANCES .XXX±.040 ANG±1° HOLE±.020 | APPROVED BY: [illegible] | DATE 03/08/18 |
| MACHINING TOLERANCES .XXX±.005 ANG±.5° HOLE±.020 | THIRD ANGLE PROJECTION | |
| MILL FINISH ALL OVER | | |

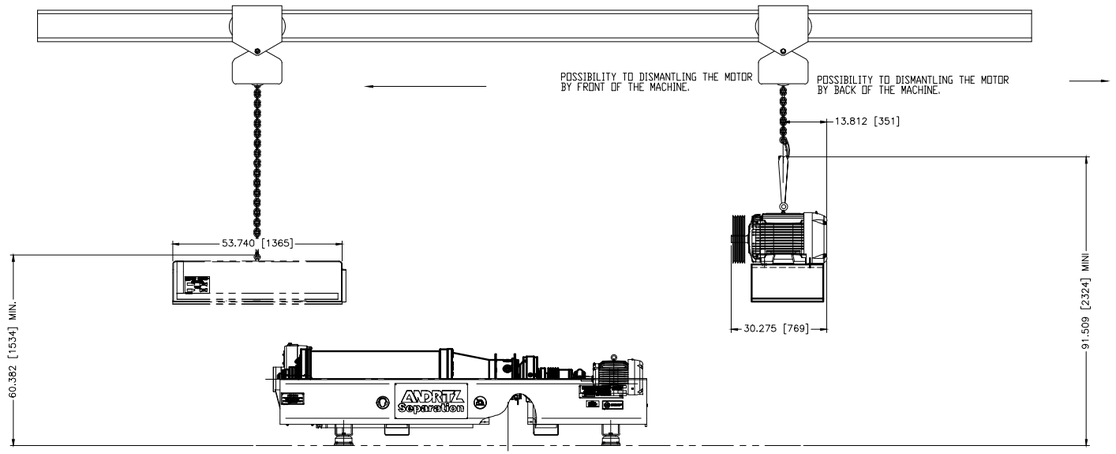
ANDRITZ

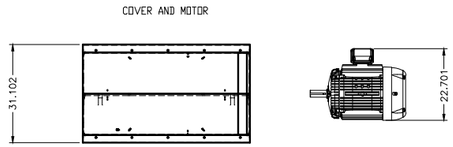
ANDRITZ SEPARATION, INC.
1010 COMMERCIAL BLVD. SOUTH
ARLINGTON, TEXAS 76001
PHONE: (817) 465−5611

TITLE: D4L CENTRIFUGE
D4L CENTRIFUGE FOUNDATION DETAILS

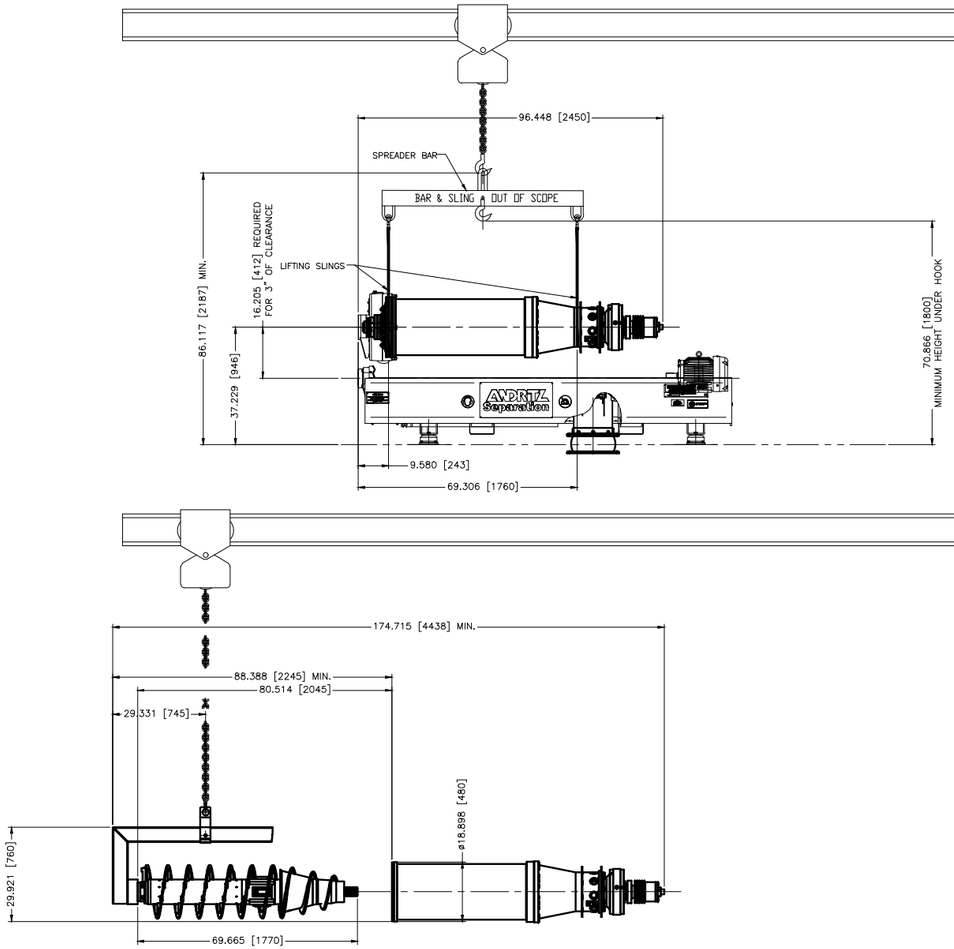
| SIZE | DRAWING NUMBER | REV |
|---|---|---|
| D | DMF1504 | 1 |

SCALE 1/16 | FILE DMF1504 | SHEET 1 OF 1




TOP VIEW




| WEIGHTS FOR MAJOR COMPONENTS | | | | | |
|---|---|---|---|---|---|
| | MAJOR COMPONENT | EMPTY UNITS | | FULL UNITS | |
| | | lbs | kg | lbs | kg |
| 1. | Main drive motor plus pulley and motor support (40HP) | 818 | 371 | N/A | N/A |
| 2. | Scroll drive motor (10HP) | 105 | 231 | N/A | N/A |
| 3. | Scroll plus standard Andritz supplied lifting beam | 767 | 316 | N/A | N/A |
| 4. | Rotating assembly, including bowl, scroll, pillow blocks and gearbox | 2075 | 941 | 2487 | 1128 |
| 5. | Slings and lifting bar for rotating assembly (if supplied by ANDRITZ) | 161 | 73 | N/A | N/A |
| 6. | Frame | 1907 | 865 | N/A | N/A |
| 7. | Motor and bowl cover | 141 | 64 | N/A | N/A |
| 8. | Complete machine (empty) | 5035 | 2284 | N/A | N/A |

Notes:
1. Millwright to determine required rating for all lifting devices used.

FOR INFORMATION ONLY
NOT FOR CONSTRUCTION PURPOSES

ASAP DOCUMENT No.–

| | | |
|---|---|---|
| ESTIMATED WEIGHT IN LBS: | DRAWN BY: QG | DATE 1/23/19 |
| UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES | CHECKED BY: | DATE |
| FABRICATION TOLERANCES .XXX±.040 ANG±1° HOLE±.020 | APPROVED BY: MW | DATE 1/25/19 |
| MACHINING TOLERANCES .XXX±.005 ANG±.5° HOLE±.020 | THIRD ANGLE PROJECTION | |
| MILL FINISH ALL OVER | | |

ANDRITZ

ANDRITZ SEPARATION, INC.
1010 COMMERCIAL BLVD. SOUTH
ARLINGTON, TEXAS 76001
PHONE: (817) 465-5611

TITLE
D4L R17 CENTRIFUGE
D4L R17 CENTRIFUGE LIFTING ARRANGEMENT

| SIZE | DRAWING NUMBER | REV |
|---|---|---|
| D | DMA2789 | 0 |

| SCALE | FILE | SHEET |
|---|---|---|
| 1/24 | DMA2789 | 1 OF 1 |

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# City of Newport WWTP – Dewatering Upgrade
# Option 2 - 2 x ANDRITZ D5L Centrifuges

For: Kennedy Jenks
To: Ben Bossé
Benjamnin.Bosse@KennedyJenks.com

Date: 22-Aug-2022
Ref: 3827073-2-Rev-B

## Design Criteria

| | |
|---|---|
| Sludge description: | Aerobically Digested |
| Feed Solids Concentration: | 1.0-2.0% TS |
| Design Hydraulic Load: | 60-100 gpm |
| Maximum Solids Load: | 1000 lb/hr dry solids |

## Equipment Selection and Expected Performance

| | |
|---|---|
| Recommended Model: | ANDRITZ D5L Centrifuge |
| Dewatered Solids Concentration: | 16-20% TS |
| Solids Capture Efficiency: | 95% TSS |
| Estimated Polymer Dosage: | 16-20 active lbs per ton dry solids |

*Note: Refer to ANDRITZ Lab Test L-14805*

## Scope of Supply

1. Two ANDRITZ D5L Centrifuges c/w:
    - 2304 duplex stainless steel solid bowl
    - SS316 scroll with tungsten carbide tiles over full length
    - SS316 wetted parts
    - Carbon steel frame with epoxy coating
    - FRP casing cover and drive guards
    - 75 HP Main drive / 20 HP Scroll Drive
    - Cyclo gearbox
    - Grease lubricated bearings, L-10 for 100,000 hours
    - Vibration Isolators

    Solids Discharge Connection:
    - Flexible connector to SS316 solids chute on conveyor (conveyor by others)

    Centrate Discharge Connection:
    - SS316 centrate discharge chute to 8-in. dia. discharge flange, c/w flex connector

    Feed Connection:
    - SS316 pipe manifold connection for sludge, polymer and wash water c/w a flexible connector

    Centrifuge Machine Wiring and Instruments:
    - NEMA 4X SS terminal box mounted on centrifuge, with PVC Coated Conduit
    - Two Bearing Temperature Sensors
    - Two Vibration Sensors
    - One (1) Bowl Speed Sensor
    - Solenoid valve for centrifuge wash water, brass

**ANDRITZ SEPARATION TECHNOLOGIES INC.**
1010 Commercial Blvd. S.
Arlington, Texas 76001
Tel. (817) 465-5611
Fax (817) 468-3961
www.andritz.cc

2. Two (2) Centrifuge Starter Panels:
    - NEMA 12 with fans and filters
    - Allen-Bradley PowerFlex 755 VFDs for main drive and back drive
3. Two (2) Centrifuge Control Panels:
    - NEMA 4X stainless steel panel with air conditioner
    - Allen-Bradley CompactLogix PLC with ethernet
    - Allne-Bradley PanelView Plus7 10” OIT
    - E-stop
4. Two (2) galvanized steel support stands to support centrifuge over inclined conveyor (no access platform)
5. Two (2) Emulsion Polymer Systems – Velodyne VM-5P-1200-D-0-A-1
6. One (1) 12” dia. x approx. 12’ long run at 27 degree incline shaftless screw conveyor:
    - 12” dia x 3/16” formed U-trough, SS304
    - 12” dia. X 12” pitch shaftless double screw, 8620 high strength carbon steel
    - 12 ga. covers, SS304
    - 5HP @ 20 rpm Nord Drive
    - Flanged drain and wash water nozzle
7. One (1) 12” dia. x approx. 22’ long run at 27 degree incline shaftless screw conveyor:
    - 12” dia x 3/16” formed U-trough, SS304
    - 12” dia. X 12” pitch shaftless double screw, 8620 high strength carbon steel
    - 12 ga. covers, SS304
    - 5HP @ 20 rpm Nord Drive
    - Flanged drain and wash water nozzle
8. One Set of Special Tools Including Lubricants for First Year of Operation
9. Engineering and Documentation
10. Startup and Training Services – 2 trip x 5 days on site per trip
11. Freight to Jobsite (2 flatbed loads from ANDRITZ shop, Pittsburg, TX)

Not included: Sludge feed pump and flowmeter, inclined discharge conveyor, spare parts

**Budget Pricing**

Budget Price for Two (2) ANDRITZ D5L Centrifuge Packages: $946,400.00
Pricing in US Dollars, DDP Jobsite, Taxes Not Included.

Prepared By:
ANDRITZ Separation
Denis Piché
Tel: 403-650-4131
denis.piche@andritz.com

Local Representative:
APSCO
Shawn Clark
Tel: 541-602-3016
sclark@apsco-llc.com

# DECANTER D5L

## TECHNICAL DESCRIPTION

### CHARACTERISTICS

| | |
|---|---|
| Size (L x W x H) | 3732 x 1228 x 1784 mm (147 x 48 x 70 in) |
| Empty weight with driving system | 4,241 Kg (9,350 lb) |
| Full weight with water | 5,090 kg (11,220 lb) |
| Product inlet | DN50 (2 in) |

### MATERIAL OF CONSTRUCTION

| | |
|---|---|
| Bowl | 2304 Duplex SS |
| Scroll and other wetted parts | SS 316L |
| Frame | Painted carbon steel |
| Cover | FRP |

### BOWL

| | |
|---|---|
| Inner diameter | 520 mm (20.5 in) |
| Total length | 1924 mm (75.7 in) |
| L/D ratio | 3.7 |
| Nominal speed | 2800 rpm |
| Maximum speed | 3300 rpm |
| G-value at maximum speed | 3165 |

### POND DEPTH ADJUSTMENT

| | |
|---|---|
| Type | Adjustable weir plates<br>TurboJet nozzles optional |

**SCROLL**

| | |
|---|---|
| Type | Counter-current design, High Performance HHP |
| Total length scroll with lifting beam for removal | 2200 mm (86 in) |
| Total weight scroll with lifting beam for removal | 470 kg (1034 lb) |

**WEAR PROTECTION**

| | |
|---|---|
| Inner bowl surface | Integral machined grooves |
| Scroll edges | Field-replaceable tungsten carbide tiles full length |
| Vickers hardness of tiles | 2500 to 4000 |
| Scroll feed chamber (distributor) | Tungsten carbide |
| Conveyor feed ports | Field-Replaceable tungsten carbide nozzles |
| Solids Discharge Ports | Field-Replaceable tungsten carbide nozzles |
| Bowl discharge (diffuser) | SS 316L |

**PAINT**

| | |
|---|---|
| Frame and parts in cast iron or steel | Epoxy coating (RAL 5015),<br>Primary (60µ) – Finish (60µ) |

**SEALS AND LUBRICATION**

| | |
|---|---|
| Seals | BUNA N (Nitrile), maximum temperature 80°C |
| Lubrication | All bearing blocks are lubricated with grease<br>The reducer is lubricated with grease |

**DRIVE SYSTEM**

| | |
|---|---|
| Bowl speed + scroll speed adjustment | VFD |
| Main motor + frequency inverter | 55 Kw (75HP) |
| Secondary motor + frequency inverter | 15 kW (20 HP) |
| Connected load with regenerative drive | 55 kW (75 HP) |
| Cyclo reducer (gearbox), nominal torque | 7960 N-m |

**MOTORS**

| | |
|---|---|
| Brand | BALDOR or similar |
| Voltage | 460V / 3 ph / 60Hz (600V for Canada) |
| Speed | 1800 rpm |
| Frame | Cast iron |
| Rating | NEMA MG-1 |
| Insulation | Class F |

**CONTROLS**

| | |
|---|---|
| Control/Starter Panel (CCP) | NEMA 4X SS304 Panel, CSA/UL508 Listed |
| PLC | Allen-Bradley Compact Logix |
| OIT | Allen-Bradley PanelView Plus 10” OIT |
| VFD | Allen-Bradley PF755 Series |
| Communication | Ethernet |
| Area Classification Centrifuge and Panel | General/Non-Classified |

**SCROLL SPEED ADJUSTMENT**

| | |
|---|---|
| Type | Frequency inverter with secondary motor |
| Differential Speed Range | 1 - 15 rpm |
| Control Modes | Automatic torque control |

**FACTORY ACCEPTANCE TEST VALUES**

| | |
|---|---|
| Noise Level | <85 dB(A) sound pressure in free field, measured at operational speed from 1 meter while empty (according to specific data sheet, 20µPa). |
| Vibration Level | <4.5 mm/s max. (registered on test bench at operational speed according ISO 10816-1) |

**UTILITIES**

| | |
|---|---|
| Sludge feed pressure | 0.5 bar (7.5 psi) at sludge feed connection |
| Wash water flow rate | 12-24 m3/hr (50-100 gpm) |
| Wash time required for shutdown / clean-in-place | 15 minutes for shutdown / 10 minutes for cip |
| Wash water quality | Industrial water supply / 3 to 4 bars (40-50 psi) |
| Air vent (de-aerator supplied) | 200 m3/hr (120 cfm) |
| Average calorific emission | 5000 Kcal/hr |

**MAINTENANCE EQUIPMENT**

| | |
|---|---|
| Special Tools Supplied with Equipment | 1 Scroll lifting beam<br>1 Scroll thrust bearing extractor<br>1 Pin extractor<br>1 Greasing set<br>1 set of wrenches<br>1 set of threaded rods<br>1 grease pump<br>1 tool box |

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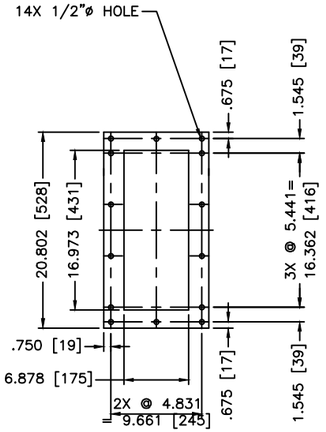
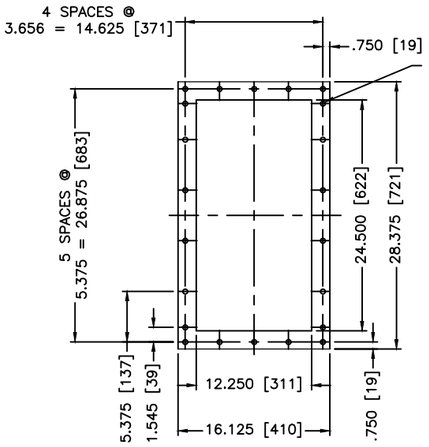
| PIPING CONNECTIONS | | |
|---|---|---|
| PORT | SIZE | DESCRIPTION |
| A | 2"– CLASS 150 ANSI RF FLANGE | FEED INLET |
| B | RECTANGULAR 12.25 x 24.50 | SOLIDS DISCHARGE |
| C | 1" FNPT | SLUDGE SAMPLE |
| D | 1" FNPT | POLYMER CONNECTION |
| E | 1" FNPT | WASHWATER CONNECTION |
| F | RECTANGULAR 6.878" X 16.973" | CENTRATE DISCHARGE |
| G | 4–1/2" OD TUBE | VENT |
| H | 1–3/8" OD TUBE | CENTRATE CASING DRAIN |




VIEW B–B

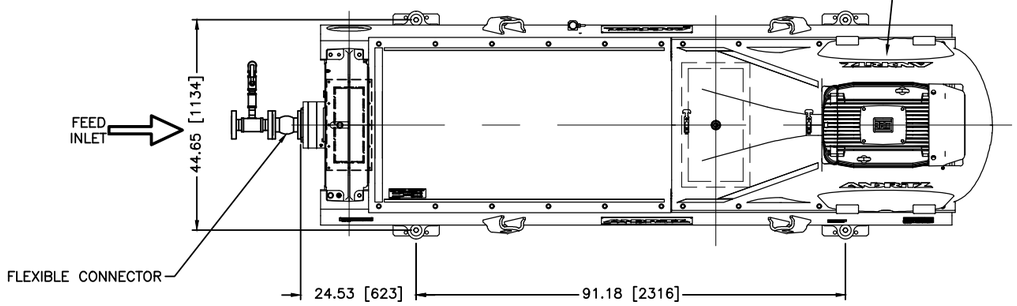
CENTRATE OUTLET FLANGE PATTERN

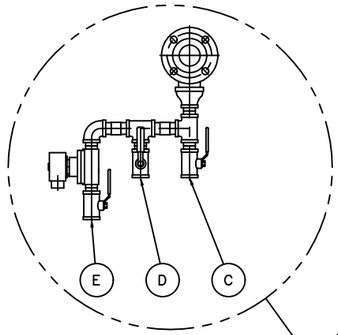


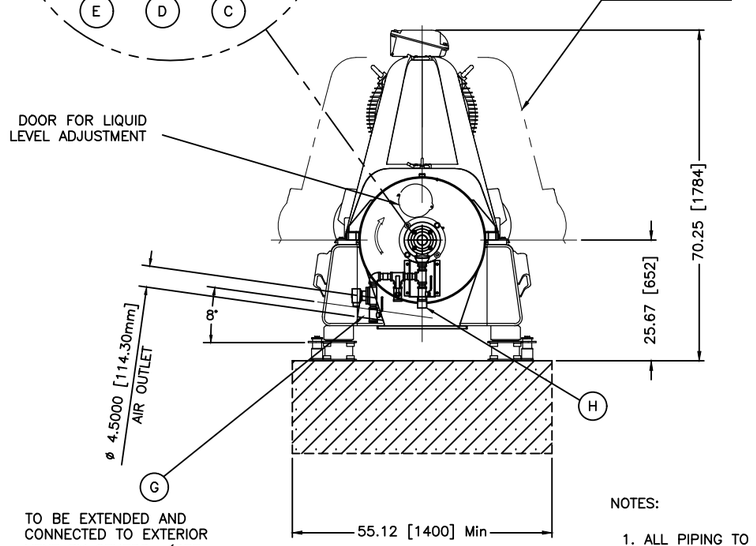

VIEW A–A

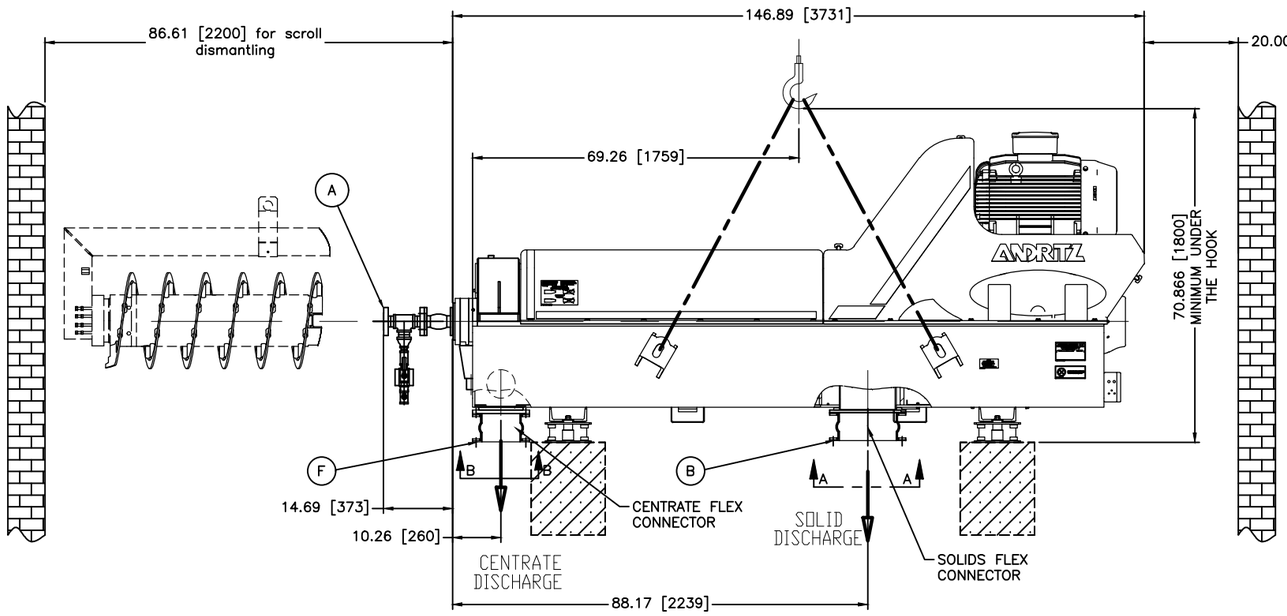
SOLIDS DISCHARGE FLANGE PATTERN

NOTE: KEEP MOTOR CONDUITS AWAY FROM FRONT OF FIBERGLASS GUARDS. RUN MOTOR CONDUITS TOWARD REAR OF MACHINE TO ALLOW FOR COVER AND REMOVAL.




NOTES:

1. ALL PIPING TO AND FROM THE MACHINE TO BE COMPLETED WITH FLEXIBLE CONNECTIONS.
2. SEE FOUNDATION DRAWING FOR DESIGN LOADS AND CONNECTION DETAILS.
3. ALL DIMENSIONS ARE IN INCHES WITH MILLIMETERS IN [].
1. 4. DRY WEIGHT OF MACHINE 9,350 lbs [4,241 kg]
5. SCROLL+LIFTING BEAM 1,034 lbs [469 kg]
6. PROCESS REQUIREMENTS:
   WASH WATER: 44–88gpm @ 45–60psi
   DURATION: SHUT DOWN: 15min.
   C.I.P.: 10min.
   AIR FLOW FROM CENTRATE CASING: 207cfm
   MINIMUM SLUDGE FEED PRESSURE SHALL BE 7.5psi AT THE CENRIFUGE FEED FLANGE.
7. ALL CHUTES TO BE SUPPORTED BY OTHERS THAN ANDRITZ.
1. 8. CENTRATE CASING DRAIN TO BE CONNECTED TO CENTRATE PIPING WITH FLEXIBLE TUBING (SUPPLIED BY OTHERS).

FOR INFORMATION ONLY
NOT FOR CONSTRUCTION PURPOSES

| REV | EIR | REVISION | BY | APVD | DATE |
|---|---|---|---|---|---|
| 1 | NONE | REVISED MACHINE WEIGHTS IN NOTES AND ADDED NOTE | QG | [illegible] | 06/12/18 |

ASAP DOCUMENT No.–

| | | |
|---|---|---|
| ESTIMATED WEIGHT IN LBS: | DRAWN BY: JJA | DATE 5/19/16 |
| UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES | CHECKED BY: [illegible] | DATE 5/19/16 |
| FABRICATION TOLERANCES .XXX±.040 ANG±1° HOLE±.020 | APPROVED BY: [illegible] | DATE 5/19/16 |
| MACHINING TOLERANCES .XXX±.005 ANG±.5° HOLE±.020 | THIRD ANGLE PROJECTION | |
| MILL FINISH ALL OVER | | |

ANDRITZ

ANDRITZ SEPARATION, INC.
1010 COMMERCIAL BLVD. SOUTH
ARLINGTON, TEXAS 76001
PHONE: (817) 465–5611

TITLE: D5L E2 CENTRIFUGE
D5L E2 CENTRIFUGE
GENERAL ARRANGEMENT

| SIZE | DRAWING NUMBER | REV |
|---|---|---|
| D | DMA2720 | 1 |

SCALE 1/16 | FILE DMA2720 | SHEET 1 OF 1

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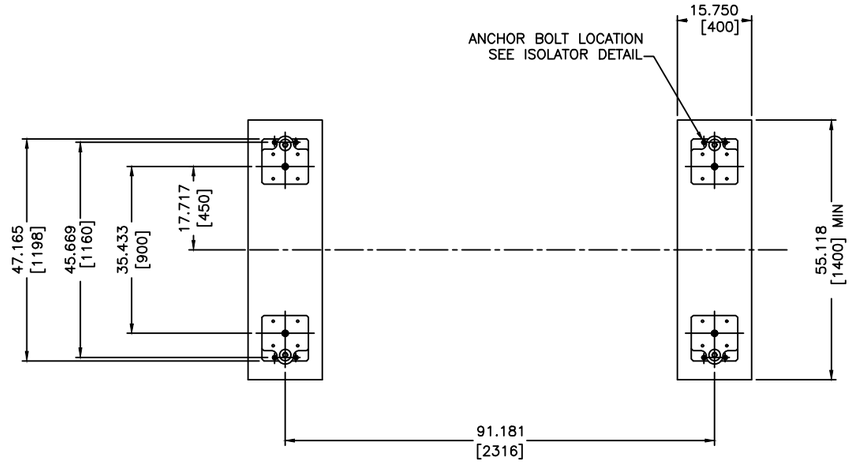
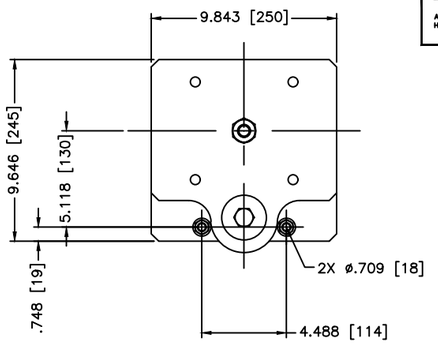



**FOUNDATION PLAN**

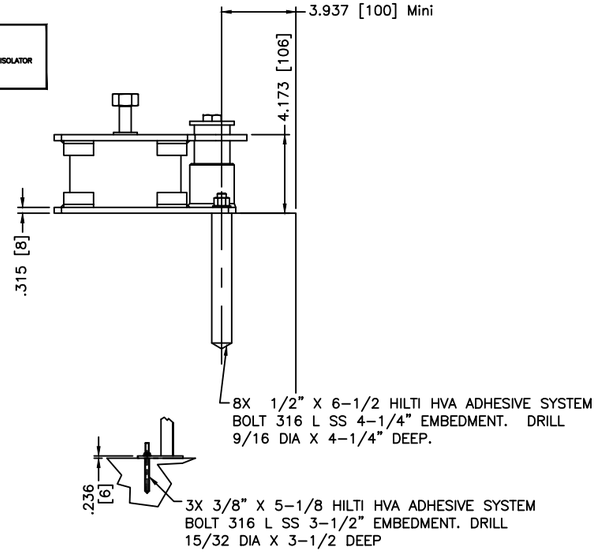
NOTES:

1. ALL DIMENSIONS ARE IN INCHES WITH mm IN [ ].
2. THE FOUNDATION DESIGN SHOWN INDICATES MINIMUM REQUIREMENTS FOR CLEARANCE AND DRAINAGE. ACTUAL FOUNDATION DESIGN AND CONSTRUCTION TO BE FURNISHED BY OTHERS.
3. ALL PIPING TO AND FROM THE MACHINE TO BE COMPLETED WITH FLEXIBLE CONNECTIONS.
4. ALL VIBRATION ISOLATION PADS TO BE LEVEL TO WITHIN 1/32".
5. APPROXIMATE WEIGHT:
   TOTAL MACHINE EMPTY: 9,350 lbs [4,241 kg]
   SCROLL+LIFTING BEAM: 1,034 lbs [469 kg]




**ISOLATOR DETAIL**
SCALE: 1/4

**ISOLATOR NOTE!**
APPLY LOCTITE TO ALL VIBRATION ISOLATOR HARDWARE DURING INSTALLATION.




**DEAERATOR PAD DETAIL**
SCALE: 1/4

| THEORETICAL TOTAL LOAD TO DISTRIBUTE AMONG THE 4 ISOLATORS (IN NORMAL OPERATION) | | | | | | |
|---|---|---|---|---|---|---|
| STATIC LOAD | | VERTICAL DYNAMIC LOAD IN LBS [N]. CYCLING FORCE EQUIVALENT TO UNBALANCE PERPENDICULAR TO THE ROTOR AXIS AND APPLIED TO THE CENTER OF GRAVITY. | | | | |
| WEIGHT OF EMPTY MACHINE | 9,350 LBS [41,590 N] | | MACHINE SPEED | EQUI. FREQ. | BEFORE ISOLATOR | AFTER ISOLATOR |
| X 1.2 (WITH PRODUCT) = | 11,220 LBS [49,909 N] | IN NORMAL OPERATION | 2,750 RPM | 45.8 HZ | +/- 5,735 LBS +/- [25,510 N] | +/- 115 LBS +/- [512 N] |
| | | | 3,000 RPM | 50.0 HZ | +/- 6,255 LBS +/- [27,822 N] | +/- 125 LBS +/- [556 N] |
| | | | 3,300 RPM | 55.0 HZ | +/- 6,882 LBS +/- [30,611 N] | +/- 138 LBS +/- [614 N] |
| | | AT ISOLATORS RESONANCE | 350-500RPM | 8.5-8.3 HZ | +/- 160 LBS +/- [712 N] | +/- 1,122 LBS +/- [4,491 N] |

| TOTAL PRACTICAL LOAD TO CONSIDER FOR CALCULATION OF THE FOUNDATION (TO DISTRIBUTE AMONG THE 4 ISOLATORS) | | | | |
|---|---|---|---|---|
| VERTICAL | STATIC = | 9,350 LBS [41,590 N] | X 1.2 = | 11,220 LBS [49,909 N] |
| | DYNAMIC* = | 11,220 LBS [49,909 N] | X 10% = | 1,122 LBS [4,991 N] |
| | TOTAL = | | | 12,342 LBS [54,900 N] |
| HORIZONTAL | DYNAMIC = | 11,220 LBS [49,909 N] | X 5% = | 561 LBS [2,495 N] |
| (*) WHILE SHUT DOWN OF MACHINE, AND IN CASE OF ABNORMAL OR ACCIDENTAL UNBALANCE | | | | |

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|---|---|---|---|---|---|
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ASAP DOCUMENT No.-

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|---|---|---|
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| MACHINING TOLERANCES .XXX±.005 ANG±.5° HOLE±.020 | THIRD ANGLE PROJECTION | |
| MILL FINISH ALL OVER | | |

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1010 COMMERCIAL BLVD. SOUTH
ARLINGTON, TEXAS 76001
PHONE: (817) 465-5611

TITLE: D5L E2 CENTRIFUGE
**D5L E2 CENTRIFUGE FOUNDATION DETAILS**

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| D | DMF1493 | 1 |

SCALE 1/16 | FILE DMF1493 | SHEET 1 OF 1

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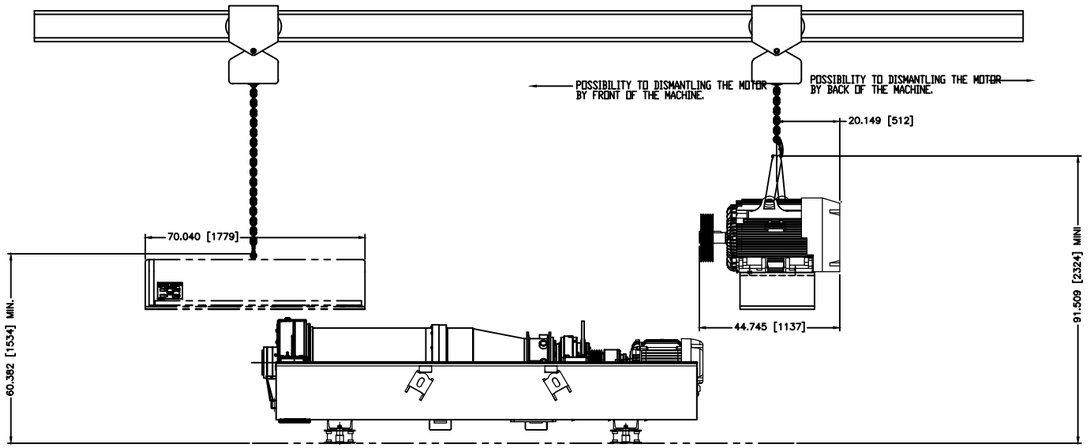


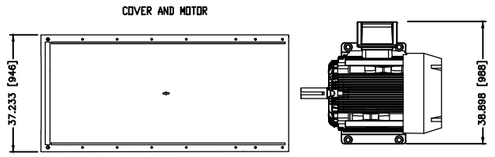


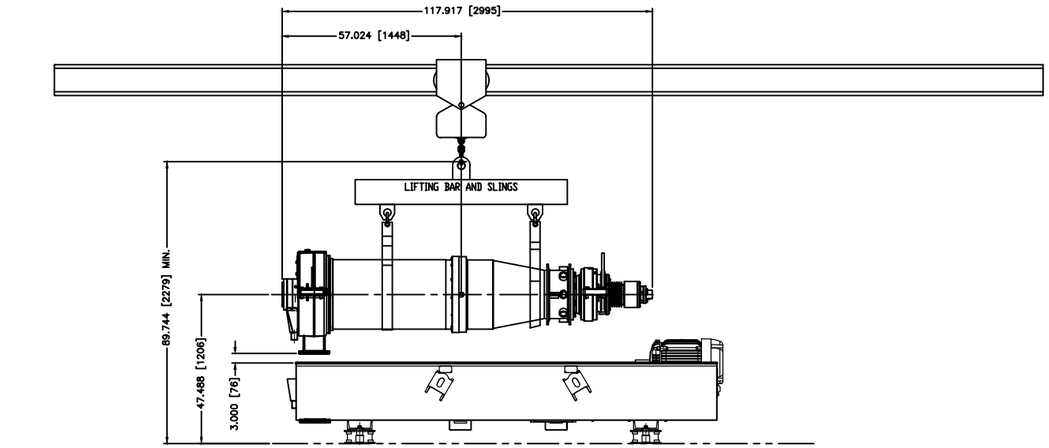


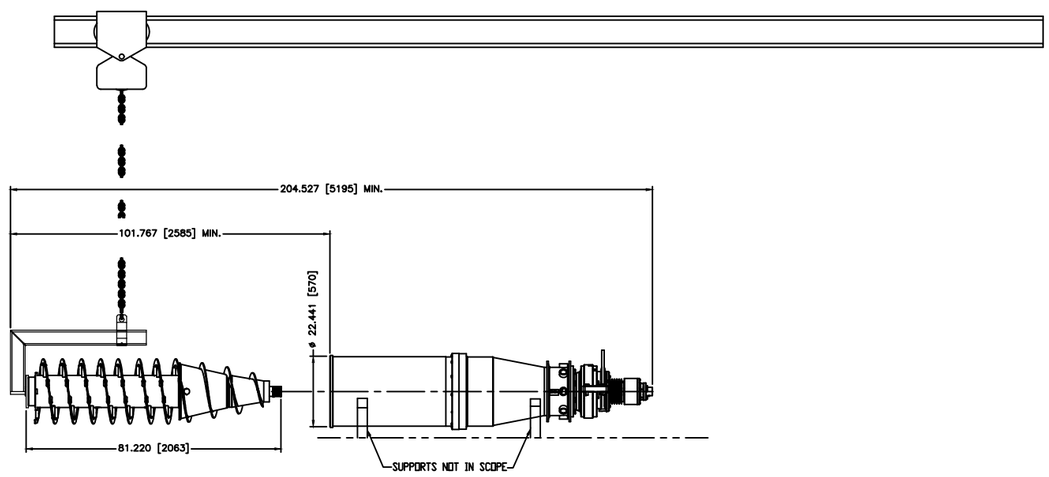


1

| WEIGHTS FOR MAJOR COMPONENTS | | | | | |
|---|---|---|---|---|---|
| | MAJOR COMPONENT | EMPTY UNITS | | FULL UNITS | |
| | | lbs | kg | lbs | kg |
| 1. | Main drive motor plus pulley and motor support (75HP) | 1248 | 566 | N/A | N/A |
| 2. | Scroll drive motor (20HP) | 358 | 162 | N/A | N/A |
| 3. | Scroll plus standard Andritz supplied lifting beam | 1034 | 469 | N/A | N/A |
| 4. | Rotating assembly, including bowl, scroll, pillow blocks and gearbox | 4083 | 1852 | 4440 | 2214 |
| 1 5. | Slings and lifting bar for rotating assembly (if supplied by ANDRITZ) | 348 | 158 | N/A | N/A |
| 6. | Frame | 3667 | 1663 | N/A | N/A |
| 7. | Motor and bowl cover | 144 | 65 | N/A | N/A |
| 8. | Complete machine (empty) | 9350 | 4241 | N/A | N/A |

Notes:
1. Millwright to determine required rating for all lifting devices used.

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| MILL FINISH ALL OVER | | |

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PHONE: (817) 465-5611

TITLE: D5L E2 CENTRIFUGE
D5L E2 CENTRIFUGE
LIFTING ARRANGEMENT

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SCALE 1/24 | FILE DMA2766 | SHEET 1 OF 1

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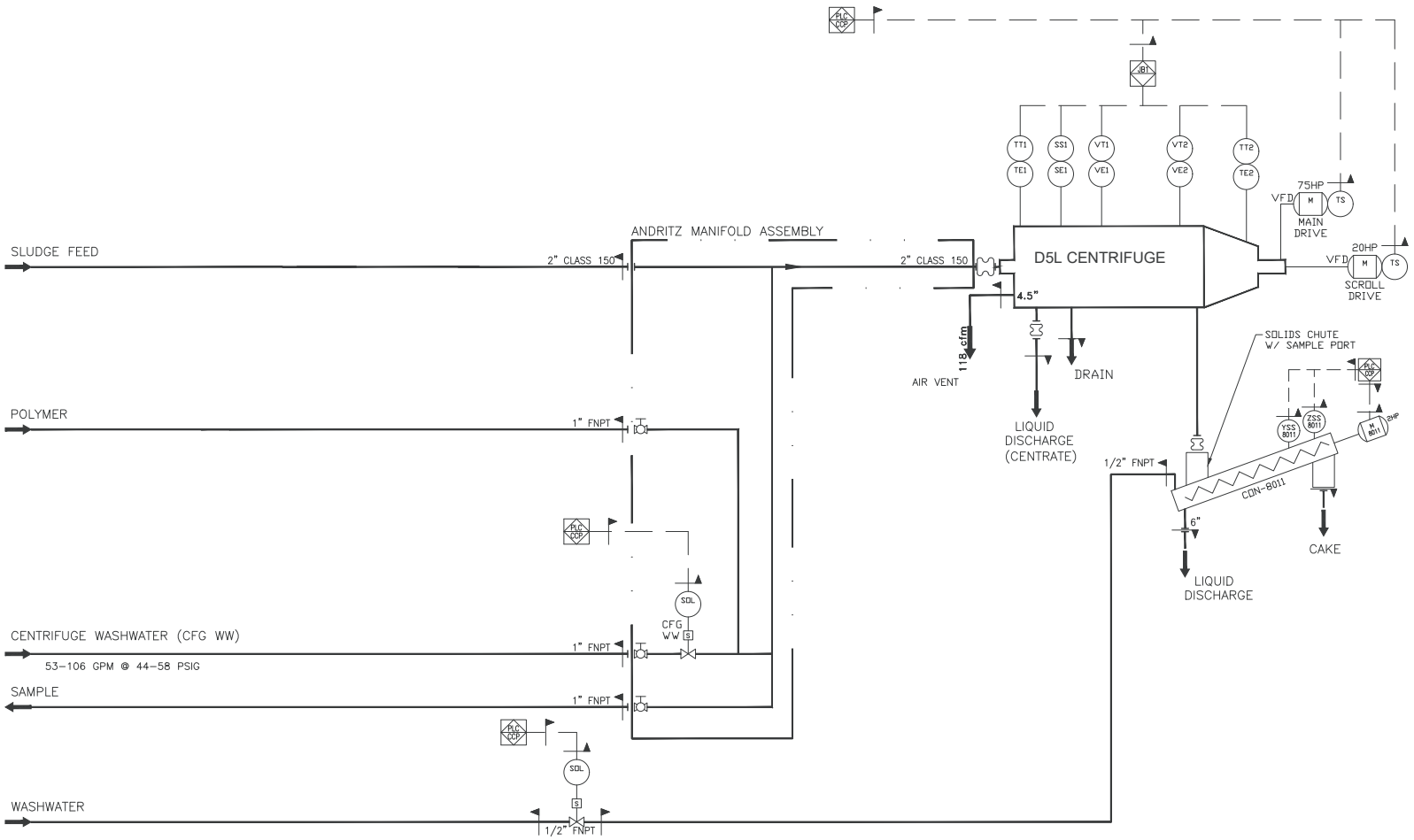


REFER TO ANDRITZ PROPOSAL FOR SCOPE OF SUPPLY

| | | | | |
|---|---|---|---|---|
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| FABRICATION TOLERANCES .XXX±.040 ANG±1° HOLE±.020 | APPROVED BY: MW | DATE 6/12/20 | | SCALE 1/1 FILE 839750-PID SHEET 1 OF 1 |
| MACHINING TOLERANCES .XXX±.005 ANG±.5° HOLE±.020 | THIRD ANGLE PROJECTION | | | |
| MILL FINISH ALL OVER | | | | |

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# Laboratory Report

## CITY OF NEWPORT WASTEWATER TREATMENT PLANT

Report No.: L-14805
Application: 2997-0017
Product Home/Group: 502, 546, 532
Division: 41

Date Report Issued: May 25, 2022
Date Sample Received: May 11, 2022
Author: Katie Murphy
Copy: Hurst, Piche

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# ANDRITZ LABORATORY REPORT

COMPANY : City of Newport

PLANT : City of Newport Wastewater Treatment Plant, Newport, OR

SAMPLE TYPE : Aerobically Digested Sludge, Centrate, Cake, Polymer

DATE : May 25, 2022

## 1. Introduction:

A five (5) gallon Aerobically Digested Sludge Sample, one (1) liter Centrate Sample, a Cake Sample and a Polymer Sample were received in the ANDRITZ laboratory on May 11, 2022, from City of Newport Wastewater Treatment Plant (WWTP) in Newport, OR. The sludge sample was sent in for Centrifuge, Screw Press (SP) and Belt Filter Press (BFP) dewatering evaluation.

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City of Newport WWTP has a design flow rate of 15 mg/d with an average flow rate of 2.05 mg/d. The existing centrifuge has a flow rate of 180 gallons per minute (3 dry tons/day) with a reported discharge solids of about 20 % Total Solids (TS). They are using an emulsion polymer. After ¼" fine screens and removing grit in the headworks, the sludge is treated with nitrification in an oxidation ditch with mechanical aeration. The sludge is aerobically digested for 9 days.

The current plan is to keep the existing Centrifuge 2, and to replace Centrifuge 1 with a larger unit based on the following design criteria.

| | |
|---|---|
| Feed Solids Concentration: | 1.0 – 1.2 % TS |
| Maximum Solids Load: | 1,000 lb/hr dry solids |
| Design Hydraulic Load: | 200 gpm |

## 2. Objectives:

The specific objectives of these laboratory tests were to:

**2.1** Analyze the physical properties of the sludge sample received.
**2.2** Conduct polymer evaluation with the sludge sample received.
**2.3** Conduct Belt Filter Press (BFP) testing with the sludge sample received.
**2.4** Conduct Centrifuge spin-down testing with the sludge sample received.
**2.5** Conduct Screw Press (SP) simulation testing with the sludge sample received.

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## 3. Sample Analysis Test Results and Observations:

### 3.1 Sample Analysis

The aerobically digested sludge sample received contained 0.66 % Total Solids (TS) and Total Suspended Solids (TSS). The sludge appeared brown and murky with a musky odor. Volatile Solids content of the sludge was 85.5 % of TS. Capillary Suction Time (CTS) was 15.7 seconds, and the conductivity of the sludge was measured at 0.61 mS/cm. When spun at 1,000 – 4,000 Gs for 5 minutes, the spin-down volume ranged from 8.5 – 15.5 % and the plug solids contained 3.4 – 6.0 % TS.

**Photo 1 – Sludge as Received**

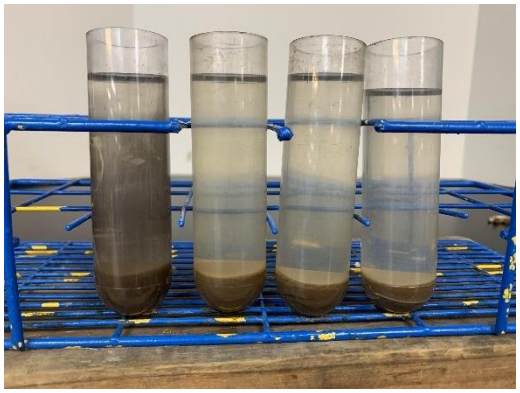

**Photo 2 – Spin-Down as Received**

The cake sample received had 18.3 % TS.

**Photo 3 – Cake as Received**

The centrate had visible floating floc that settled quickly causing a high 0.22 % TSS.

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**Photo 4 – Centrate as Received**

**Photo 5 – Centrate Settled**

**Photo 6 – Floating Floc in Centrate**

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## 3.2 Sample Analysis

| | | |
|---|---|---|
| Total Solids* (%TS @ 105°C) | 0.66 | |
| Suspended Solids** (%SS @ 105°C) | 0.66 | |
| Plug Solids (%TS, @ 1000 G's and 5 min) | 3.4 | |
| Plug Solids (%TS, @ 2000 G's and 5 min) | 4.5 | |
| Plug Solids (%TS, @ 3000 G's and 5 min) | 5.2 | |
| Plug Solids (%TS, @ 4000 G's and 5 min) | 6.0 | |
| Spin-Down Volume (%, 1000 G's, 5 min) | 15.5 | |
| Spin-Down Volume (%, 2000 G's, 5 min) | 14.1 | |
| Spin-Down Volume (%, 3000 G's, 5 min) | 10.1 | |
| Spin-Down Volume (%, 4000 G's, 5 min) | 8.5 | |
| pH @ 20°C | 6.2 | |
| Conductivity (mS/cm) | 0.610 | |
| Specific Gravity | 0.985 | |
| Solids Specific Gravity (Calculated) | 0.3 | |
| Ash Content of Total Solids* (% of TS) | 14.5 | |
| Volatile Solids Content* (% of TS) | 85.5 | |
| Capillary Suction Time (sec) | 15.7 | |
| Screened Solids: | | Description |
| +30 Mesh Fraction (% of SS) | 2.3 | Debris |
| 30 x 50 Mesh Fraction (% of SS) | 0.6 | Debris/Fibers |
| 50 x100 Mesh Fraction (% of SS) | < 0.1 | Grit |
| 100 x 140 Mesh Fraction (% of SS) | 5.7 | Fines |
| 140 x 230 Mesh Fraction (% of SS) | 28.3 | Biomass |
| 230 x 325 Mesh Fraction (% of SS) | 12.8 | Biomass |
| -325 Mesh Fraction (% of SS) | 50.4 | |
| Sludge Volume Index (SVI ml/g) | 151 | |
| Settled Solids (1000 ml @ 30 min) | 990 | |
| Color | Brown, Murky | |
| Odor | Musky | |

**Table 1 Sludge Sample Analysis as Received**

**EPA Methods: *1684, **160.2**

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## 3.3 Sample Compressibility – Centrifuge Volume Index

The sludge sample was compressible and increased in plug strength at high end G-forces.

## 3.4 Sample Compressibility – Centrifuge Volume Index

| Spin Time | G-Force | Settled Solids Volume (%) | Plug Solids (%TS) | Volume (%) / Plug Solids (%TS) | Plug Solids (%TS) / Feed Solids (%TSS) |
|---|---|---|---|---|---|
| 5 | 1000 | 15.5 | 3.4 | 4.52 | 5.23 |
| 5 | 2000 | 14.1 | 4.5 | 3.14 | 6.85 |
| 5 | 3000 | 10.1 | 5.2 | 1.96 | 7.87 |
| 5 | 4000 | 8.5 | 6.0 | 1.43 | 9.08 |

**Table 2 Sludge Spin-Down Compressibility as Received**

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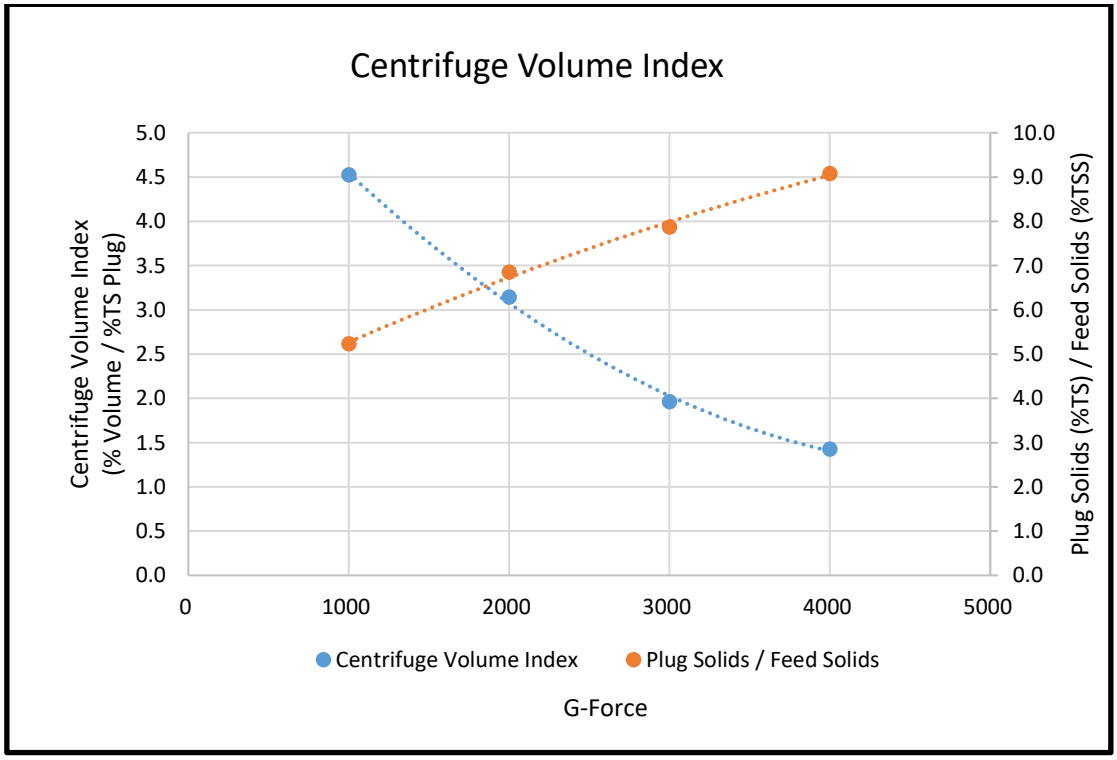
## 3.5 Sample Compressibility – Centrifuge Volume Index




**Graph 1 Sludge Centrifuge Volume Index as Received**

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## 4. Polymer Evaluation Test Results and Observations:

### 4.1 Polymer Evaluation

Six (6) polymers, including the plant provided polymer, were evaluated with the sludge sample. Solenis 8848FS and Polydyne C-6266 and plant provided polymer (L-14805) were the most effective in flocculating the sludge sample.

**Photo 7 - Plant L-14805**
**15.2 active lb/ton TSS**

**Photo 8 - Plant L-14805**
**15.2 active lb/ton TSS Sheared**

**Photo 9 – Polydyne C-6266**
**15.6 active lb/ton TSS**

**Photo 10 – Polydyne C-6266**
**15.6 active lb/ton TSS Sheared**

### 4.2 Polymers Evaluated

| | |
|---|---|
| Plant Provided | L-14805 |
| Polydyne | C-9530, C-6266, C-6288 |
| Solenis | 8848FS, K144L |

**Table 3 Polymers Evaluated with Sludge Sample**

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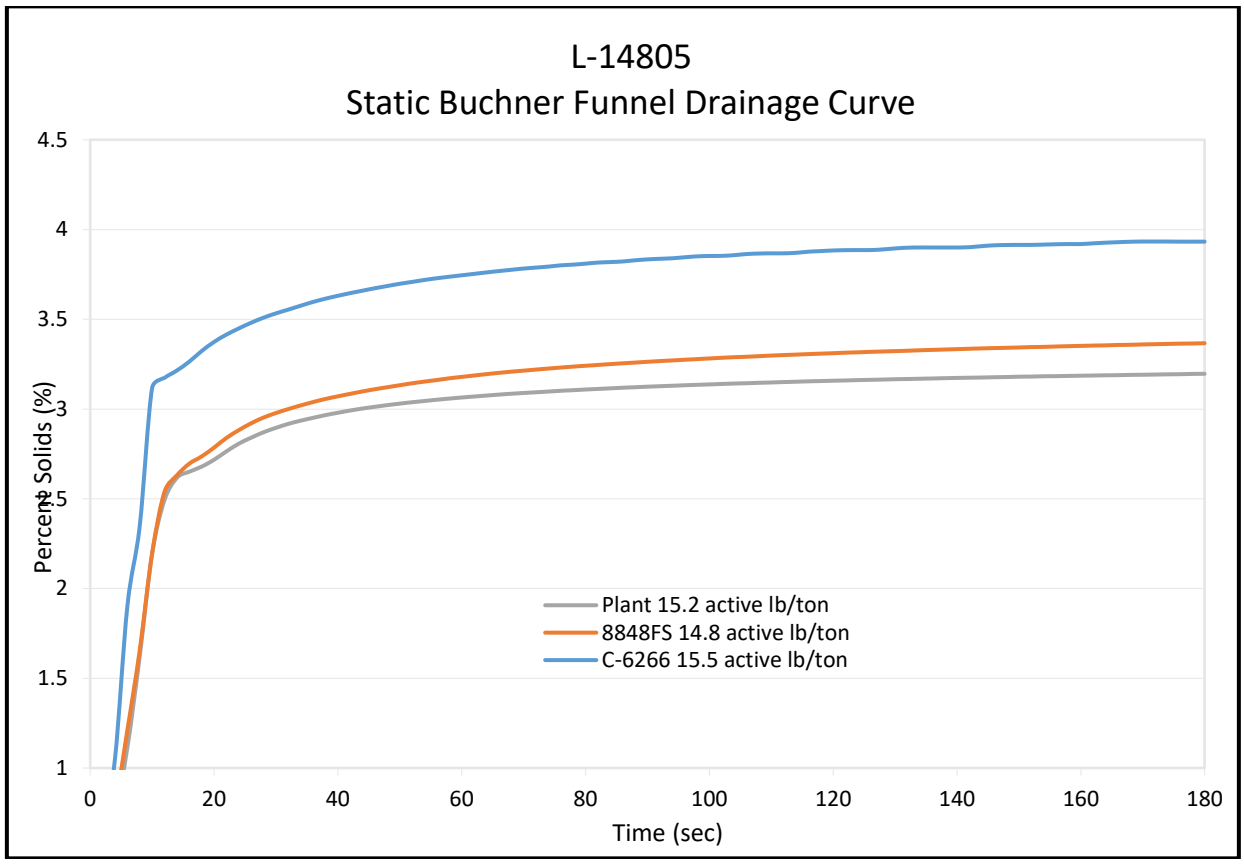
## 4.3 Polymer Evaluation – Drainage Curves




**Graph 2 Drainage Curves of Flocculated Sludge**

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## 5. Laboratory Belt Filter Press (BFP) Test Results and Observations:

### 5.1 Laboratory BFP Test

A Belt Filter Press (BFP) test was conducted with the sludge sample. Simulating the ANDRITZ 2m SMX®-S8 Quanum BFP at a throughput 148 gallons per minute (gpm) (478 dry lbs/hr), a cake dryness of 14,.8 % TS was achieved in the laboratory.

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## 5.2 Laboratory BFP Test Results

| BFP Type | SMX®-S8 Quantum 2m |
|---|---|
| Polymer Utilized | C-6266 |
| Makeup Polymer Dilution (%) | 0.5 |
| Neat Polymer Dosage (lbs/ton TSS) | 38.1 |
| Active Polymer Dosage (lbs/ton TSS) | 15.6 |
| Recommended Belt Type | GSM 6093 |
| Throughput (lb TSS/hr) | 478 |
| Throughput (GPM) | 148 |
| Belt Speed (FPM) | 5 |
| Cake Thickness (mm) | 8 |
| Cake Solids (%TS) | 14.8 |
| Anticipated Capture Rate (%) | ≥ 95 |

**Table 4 Belt Filter Press Evaluation on Flocculated Sludge**

## 6. Laboratory Centrifuge Test Results and Observations:

## 6.1 Laboratory Centrifuge Test

Centrifuge spin-down testing was conducted with the sludge sample. With the plant polymer L-14805 at 15.5 active lb / ton TSS and Polydyne C-6266 at 15.6 active lb per ton TSS, the cake dryness ranged from 15 – 17 % TS in the laboratory.

**Photo 11 – Polydyne C-6266 15.6 active lb / ton TSS Centrifuge Cake 15 min 3000Gs**

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## 6.2 Laboratory Centrifuge Test Results

| Spin Time (Minutes) | G-Force | Type of Test | Polymer Type | Polymer Dosage Rate (active lbs/ton) | Plug Solids (%TS) | Anticipated Cake Solids (%TS) | Anticipated Capture Rate (%) |
|---|---|---|---|---|---|---|---|
| 5 | 3000 | Glass Tube | None | None | 4.2 | | |
| 5 | 3000 | Glass Tube | L-14805 | 15.3 | 5.1 | 15 -17 | ≥ 95 |
| 10 | 3000 | Screen | | | 15.3 | | |
| 15 | 3000 | Screen | | | 16.8 | | |
| 20 | 3000 | Screen | | | 16.9 | | |
| 5 | 3000 | Glass Tube | None | None | 4.6 | | |
| 5 | 3000 | Glass Tube | C-6266 | 15.6 | 4.6 | 15 - 17 | ≥ 95 |
| 10 | 3000 | Screen | | | 15.4 | | |
| 15 | 3000 | Screen | | | 15.8 | | |
| 20 | 3000 | Screen | | | 17.3 | | |

**Table 5 Centrifuge Spin-Down on Flocculated Sludge Sample**

## 7. Laboratory Screw Press (SP) Test Results and Observations:

## 7.1 Laboratory SP Test

Screw Press (SP) testing was conducted with the sludge sample by applying gradual pressure to the flocculated sludge sample. At polymer dosage rate of 15.6 active lb / ton TSS, a cake dryness of 12 – 14 % TS was achieved. High amounts of extrusions were observed at the high and low pressure stages in the laboratory indicating a lower capture rate. A cake with 8 – 10 mm thickness was stabilized.

**Photo 12 – Extrusions at High Pressure Stage**

**Photo 13– Filtrate at High Pressure Stage**

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**Photo 14– Screw Press Dewatering Cake 10 minute**

## 7.2 Laboratory SP Test Results

| Test # | 1 | 2 |
|---|---|---|
| Polymer Utilized | C-6266 | |
| Makeup Polymer Concentration (%) | 0.5 | |
| Polymer Dosage (Neat lbs/ton TSS) | 38.1 | |
| Polymer Dosage (Active lbs/ton TSS) | 15.6 | |
| Maximum Pressure Applied (psia) | 15 | 15 |
| Retention Time (min) | 20 | 10 |
| Cake Thickness (mm) | 10 | 8 |
| Cake Solids (%TS) | 14.3 | 12.4 |
| Anticipated Capture Rate (%) | ≤ 85 | |

**Table 6 Screw Press Evaluation on Flocculated Sample**

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## 8. Conclusions:

The sludge sample at 0.66 % Total Suspended Solids (TSS) was dewatered with the Belt Filter Press (BFP), Centrifuge, and Screw Press (SP) evaluation. The BFP achieved a cake dryness of 15 % in the laboratory with the Polydyne C-6266. The Centrifuge achieved a cake dryness of 15 – 18 % TS with the plant polymer and Polydyne C-6266. The SP Simulation had a significant amount of capture loss due to extrusions and achieved a cake dryness of 12- 14 % TS with Polydyne C-6266.

| | Centrifuge | | Screw Press | Belt Filter Press |
|---|---|---|---|---|
| Polymer | Plant | C-6266 | C-6266 | C-6266 |
| Polymer Demand (active lb / ton TSS) | 15.3 | 15.6 | 15.6 | 15.6 |
| Cake Dryness (% TS) | 15 – 17 | 15 – 17 | 12 - 14 | 15 |
| Anticipated Capture Rate (%) | ≥ 95 | | ≤ 85 | ≥ 95 |

**Table 7 Summary of Results for Dewatering Evaluation**

Attached are photographs of the screen analysis, lab sample data sheets for reference and comparison.

## 9. Sample Disposition:

The remaining untested sludge will be disposed in accordance with local regulations.

Report Prepared by : Katie Murphy
Title : Process Engineer

KAM/sl

Copies of this report have been distributed to the following:

Original +1cc/ Lab
1 cc/ Sales
Shaun Hurst

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## Attachments:
## A. Photographs

**Photo #1: +30 Mesh Fraction**

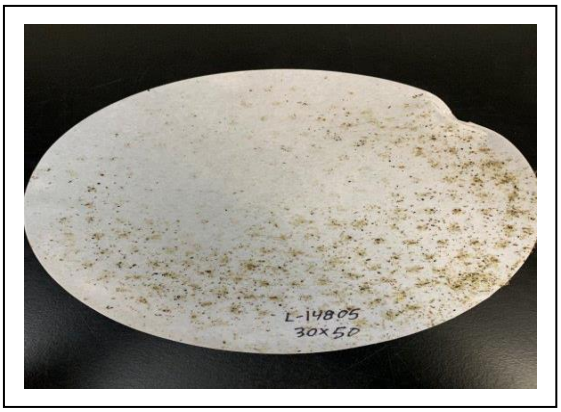


**Photo #2: 30X50 Mesh Fraction**

**Photo #3: 50X100 Mesh Fraction**

**Photo #4: 100X140 Mesh Fraction**

**Photo #5: 140X230 Mesh Fraction**

**Photo #6: 230X325 Mesh Fraction**

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## B. Lab Sample Data Sheets



### 4. ANDRITZ LABORATORY MUNICIPAL WASTEWATER SAMPLE DATA SHEET

**DATE:** 5-9-2022 **OPPORTUNITY #:**

ANDRITZ Representative and/or Salesman:
Shawn Clark APSCO

**CLIENT:**

Company: City of Newport WWTP Contact:
Plant/Mill Address: 5523 SE South Pl
City: Newport State: OR Zip: 97366
Phone: 541-574-3371 Email/Fax: A.frantz@newportoregon.gov

**Sample Characteristics:** (This information is to be supplied by Customer to determine whether sample is typical of normal operation).

Date Collected: 5-9-22
Sludge or Slurry Consistency (% Total Solids): 0.06 ave 0.20 avg 11 (% Suspended Solids):
Circle One: Ash or Volatile Solids Content (% of Total Solids):
pH @ Temperature (___ °F or ___ °C): Specific Gravity:
Capillary Suction Time (sec)

****Please include a process flow sheet of the facility with this data sheet.**

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s/process/Lab/Lab Sample Documents/Lab Sample Informaiton Municilpal WWTP Testing Services Revised 7-2018

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## PLEASE CHECK ALL BOXES THAT APPLY

**1) Plant Influent**
- ☐ Design Flow (mgd) 15
- ☐ Average Flow (MGD) ~~1.6~~ 2.05
- ☐ Industrial Influent Type Brewery
- ☐ Industrial Influent Percentage Flow 3% load 20%

**2) Headworks**
- ☐ Coarse ☑ Fine
- Screen Opening Size 1/4"
- ☑ Grit Removal ☐ None

**3) Primary Treatment**
- ☐ Gravity Settled
- ☐ Dissolved Air Flotation
- ☐ Lagoon
- ☐ Other
- ☑ None
- ☐ Chemical Aid
- ☐ Type
- ☐ Dosage

**4) Secondary Treatment**

Type of Treatment
- ☐ Nitrification/Denitrification ☑ Nitrification Only
- ☐ Chemical Phosphorous Removal Chem. Type
- ☐ Biological Phosphorous Removal

Type of Equipment
- ☐ Aerated Basin ☑ Oxidation Ditch
- ☐ Rotating Biological Contactor ☐ Trickling Filter
- ☐ Sequence Batch Reactor ☐ MBR
- ☐ Other

Type of Aeration
- ☐ Diffused Air ☐ Pure Oxygen ☑ Mechanical

**5) Sludge Description**
- ☐ 100% Primary
- ☑ 100% Secondary
- ☐ Blend ☐ by weight ☐ by volume
- ☐ _____% Primary
- ☐ _____% Secondary
- ☐ Co-settled Primary/ Secondary
- ☐ Other

**6) Sludge Treatment**
- ☐ Anaerobic Digestion ☐ Mesophilic ☐ Hermophilic
- ☑ Aerobic Digestion ☐ Volaties Reduction _____%
- ☐ Zimpro Solids Retention Time 9 days
- ☐ ATAD ☐ Chemical Addition
- ☐ Lime ☐ Type
- ☐ Raw/None ☐ Dosage
- ☐ Other

**7) Existing Sludge Dewatering**
- ☐ Belt Filter Press ☑ Centrifuge ☐ Vacuum Filter
- ☐ Plate and Frame ☐ Drying Bed ☐ Other
- ☐ Gravity Belt Thickener ☐ None

Throughput (Dry Tons/day) ~~6~~ 3
Flow Rate (Gallons per Minute) 180
Discharge Solids (%TS) ~20
Polymer Type ☑ Emulsion ☐ Dry ☐ Mannich
Polymer Name Polydyne Clarifloc WE-2012
Polymer Dosage (active lbs/ton)

Chemical Addition Prior to Polymer Injection
☐ Ferric ☐ Lime ☐ Permanganate ☐ Other ☑ None

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**Purpose for Laboratory Evaluation (please check):**

- ☒ Preparation for Pilot/Demonstration Testing
- ☐ Performance Evaluation for Existing Installation ANDRITZ Job#_____
- ☑ Performance Evaluation for Sales Quotation
- ☐ Other_____

**Testing Objectives:**

Equipment to be tested: ☐ Belt Filter Press ☑ Centrifuge ☐ Rotary Screen Thickener
☐ Screw Press ☐ Filter Press ☐ Gravity Belt Thickener

**Hazardous Materials:**

Hazardous or Non-hazardous: OSHA - EPA - DOT.

If Hazardous the following must be completed or sample will not be received:

- Prior notification to authorized ANDRITZ Laboratory Personnel 45 days before sample shipment. (Per EPA CFR 40 Regulations)
- MSDS supplied.
- List hazardous components and relative concentration and/or Chemical Analysis Data if available

N/A

I acknowledge that the information provided above is truthful and accurate to the best of my knowledge.

Name: Andrew Grant Title: WWTP Supervisor

Signature: [signature] Date: 5-9-2022

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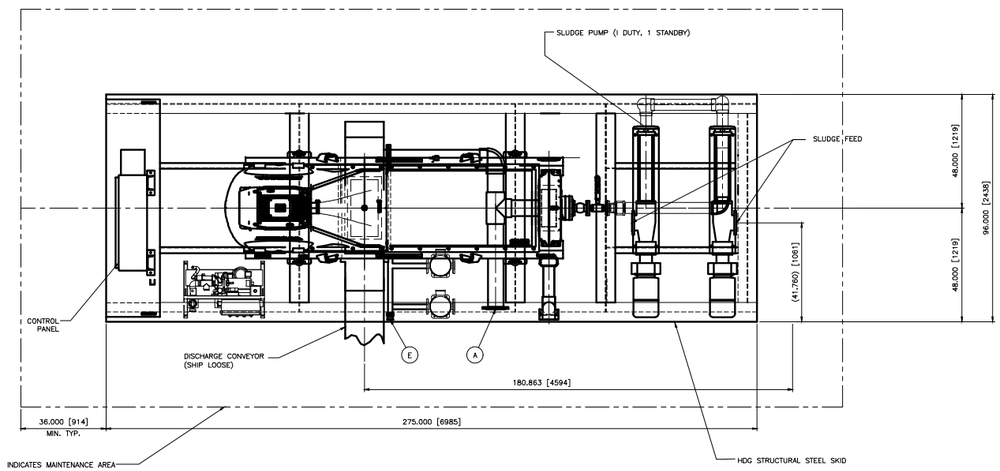
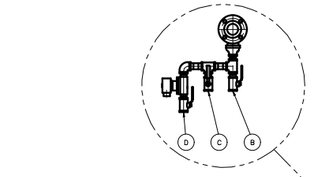
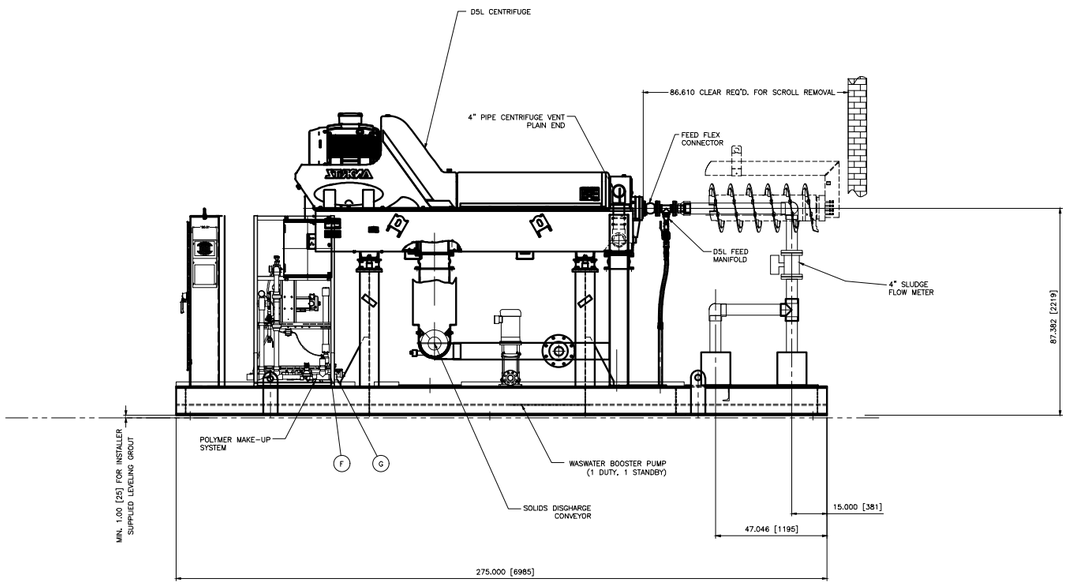
NOTES:

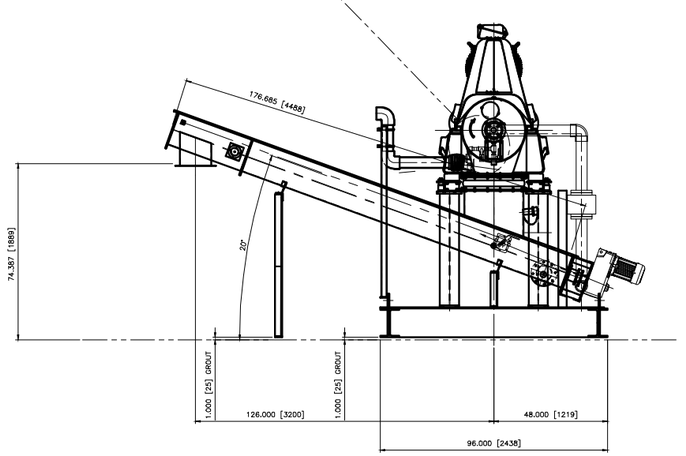
1. ALL PIPING TO AND FROM THE MACHINE TO BE COMPLETED WITH FLEXIBLE CONNECTIONS.
2. PROCESS REQUIREMENTS:
   WASH WATER: 44–88gpm @ 45–60 psi
   DURATION: SHUT DOWN: 15min.
   C.I.P.: 10min.
   AIR FLOW FROM CENTRATE CASING: 207 cfm [352 cubic meter/hr]
3. MINIMUM SLUDGE FEED PRESSURE SHALL BE 7.5 psi AT THE CENRIFUGE FEED FLANGE.
4. ALL VIBRATION PADS TO BE LEVEL WITHIN 1/32" [0.79 mm].
5. APPROXIMATE WEIGHT:
   TOTAL MACHINE EMPTY: 9,350 lbs [4,241 kg]
   BOWL EMPTY, SCROLL, PILLOW BLOCKS, GEARBOX: 4,083 lbs [1,852 kg]
   SCROLL+LIFTING BEAM 1,034 lbs [469 kg]
6. ALL DIMENSIONS ARE IN INCHES WITH MILLIMETERS IN [ ].

| PIPING CONNECTIONS | | |
|---|---|---|
| PORT | SIZE | DESCRIPTION |
| A | 6" CLASS 150 FLANGE | CENTRATE DISCHARGE |
| B | 1" FNPT | SLUDGE SAMPLE |
| C | 1" FNPT | POLYMER CONNECTION |
| D | 1" FNPT | WASHWATER CONNECTION |
| E | 2" MALE QUICK CONNECT | WASHWATER FEED INLET |
| F | 1" FNPT | POLYMER MAKE–UP INLET |
| G | 2" FNPT | POLYMER WATER INLET |

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| | | |
|---|---|---|
| ESTIMATED WEIGHT IN LBS: — | DRAWN BY: MDW | DATE 8/9/19 |
| UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES | CHECKED BY: | DATE |
| FABRICATION TOLERANCES .XXX±.040 ANG±1° HOLE±.020 | APPROVED BY: MW | DATE 8/9/19 |
| MACHINING TOLERANCES .XXX±.005 ANG±.5° HOLE±.020 | THIRD ANGLE PROJECTION | |
| MILL FINISH ALL OVER | | |

ANDRITZ
ANDRITZ SEPARATION, INC.
1010 COMMERCIAL BLVD. SOUTH
ARLINGTON, TEXAS 76001
PHONE: (817) 465–5611

TITLE: D5L – E2 CENTRIFUGE
# OBG – PUYALLUP LEACHATE SKID LAYOUT

| SIZE | DRAWING NUMBER | REV |
|---|---|---|
| D | 3177470–1 | 0 |

SCALE 1/16 | FILE 3177470–1 | SHEET 1 OF 1

## ANDRITZ - MAINTENANCE / SPARE PARTS REQUIRED - DECANTER TYPE D5L or D5LX - GREASE LUBE

January 2020

**CUSTOMER:**

1 - MACHINE

| OPERATING TIME | SERVICE REQUIREMENT | PARTS REQUIRED | | | PRICE DOLLARS |
|---|---|---|---|---|---|
| AT 3,000 HRS | Grease Scroll Bearings | 2 grease cartridge SKF2 | | $ | 42.00 |
| | Gearbox and Redex lubrication change | 5 KG - Energrease | | $ | 280.00 |
| | Copper Seals | 6 Copper Seals | | $ | 25.00 |
| | Belt Tension | | Parts Total | $ | 347.00 |
| | | | Estimated Onsite Labor Hours | | 1 Technician x 8 hrs |
| AT 6,000 HRS | Replace Feed End Bearing | Bearing & Seals | | $ | 462.00 |
| | Belt Replacement | 1 set of 5 belts | | $ | 330.00 |
| | Grease Scroll Bearings | 2 grease cartridge SKF2 | | $ | 42.00 |
| | Gearbox and Redex lubrication change | 5 KG - Energrease & 1 Quart Oil | | $ | 280.00 |
| | Copper Seals | 6 Copper Seals | | $ | 25.00 |
| | | | Parts Total | $ | 1,139.00 |
| | | | Estimated Onsite Labor Hours | | 1 Technician x 16 hrs |
| AT 9,000 HRS | Grease Scroll Bearings | 2 grease cartridge SKF2 | | | 42.00 |
| | Gearbox and Redex lubrication change | 5 KG - Energrease | | | 280.00 |
| | Copper Seals | 6 Copper Seals | | | 25.00 |
| | Belt Tension | | Parts Total | | 347.00 |
| | | | Estimated Onsite Labor Hours | | 1 Technician x 8 hrs |
| AT 12,000 HRS | Replace Drive and Feed High Speed Bearing | 2 Bearings | | $ | 780.00 |
| | Replace Scroll Thrust Bearing | 1 Bearing | | $ | 175.00 |
| | Grease for Bearing Replacement | 7 grease cartridge SKF2 or NBU15 for LX | | $ | 1,512.00 |
| | Seals Set for 12K HRS Service | Complete Seals for service | | $ | 1,022.00 |
| | Replace Eccentric Bearing in Gear Box | 1 Eccentric Bearing | | $ | 2,676.00 |
| | Replace Bowl Nozzles | 8 Nozzles | | $ | 5,082.00 |
| | Repalce Scroll Nozzles | 4 Nozzles | | $ | 3,504.00 |
| | Gearbox and Redex lubrication change | 5 KG - Energrease & 1 Quart Oil | | $ | 280.00 |
| | Copper Seals | 6 Copper Seals | | $ | 15.00 |
| | Belt Replacement | 1 set of 5 belts | | $ | 330.00 |
| | | | Parts Total | $ | 15,376.00 |
| | | | Estimated Onsite Labor Hours | | 2 Technicians x 32 hrs |
| AT 15,000 HRS | Grease Scroll Bearings | 2 grease cartridge SKF2 | | $ | 42.00 |
| | Gearbox and Redex lubrication change | 5 KG - Energrease | | $ | 280.00 |
| | Copper Seals | 6 Copper Seals | | $ | 25.00 |
| | Belt Tension | | Parts Total | $ | 347.00 |
| | | | Estimated Onsite Labor Hours | | 1 Technician x 8 hrs |

| | | | | | |
|---|---|---|---|---|---|
| AT 18,000 HRS | Replace Feed End Bearing | Bearing & Seals | | $ | 462.00 |
| | Belt Replacement | 1 set of 5 belts | | $ | 330.00 |
| | Grease Scroll Bearings | 2 grease cartridge SKF2 | | $ | 42.00 |
| | Gearbox and Redex lubrication change | 5 KG - Energrease & 1 Quart Oil | | $ | 280.00 |
| | Copper Seals | 6 Copper Seals | | $ | 25.00 |
| | | | Parts Total | $ | 1,139.00 |
| | | | Estimated Onsite Labor Hours | | 1 Technician x 16 hrs |
| AT 21,000 HRS | Grease Scroll Bearings | 2 grease cartridge SKF2 | | $ | 42.00 |
| | Gearbox and Redex lubrication change | 5 KG - Energrease | | $ | 280.00 |
| | Copper Seals | 6 Copper Seals | | $ | 25.00 |
| | Belt Tension | | Parts Total | $ | 347.00 |
| | | | Estimated Onsite Labor Hours | | 1 Technician x 8 hrs |
| AT 24,000 HRS | Replace Drive and Feed High Speed Bearing | 2 Bearings | | $ | 780.00 |
| | Replace Scroll Thrust Bearing | 1 Bearing | | $ | 175.00 |
| | Gease for Bearing Replacement | 7 grease cartridge SKF2 or NBU15 for LX | | $ | 1,512.00 |
| | Seals Set for 12K HRS Service | Complete Seals for service | | $ | 1,022.00 |
| | Replace All Internal Parts in Gear Box | 1 Set Internal Parts | | $ | 15,856.00 |
| | Replace Bowl Nozzles | 8 Nozzles | | $ | 5,082.00 |
| | Repalce Scroll Nozzles | 4 Nozzles | | $ | 3,504.00 |
| | Gearbox and Redex lubrication change | 5 KG - Energrease & 1 Quart Oil | | $ | 280.00 |
| | Copper Seals | 6 Copper Seals | | $ | 42.00 |
| | Belt Replacement | 1 set of 5 belts | | $ | 330.00 |
| | | | Parts Total | $ | 28,583.00 |
| | | | Estimated Onsite Labor Hours | | 2 Technicians x 40 hrs |
| AT 27,000 HRS | Grease Scroll Bearings | 2 grease cartridge SKF2 | | $ | 42.00 |
| | Gearbox and Redex lubrication change | 5 KG - Energrease | | $ | 280.00 |
| | Copper Seals | 6 Copper Seals | | $ | 25.00 |
| | Belt Tension | | Parts Total | $ | 347.00 |
| | | | Estimated Onsite Labor Hours | | 1 Technician x 8 hrs |
| AT 30,000 HRS | Replace Feed End Bearing | Bearing & Seals | | $ | 462.00 |
| | Belt Replacement | 1 set of 5 belts | | $ | 330.00 |
| | Grease Scroll Bearings | 2 grease cartridge SKF2 | | $ | 24.00 |
| | Gearbox and Redex lubrication change | 5 KG - Energrease & 1 Quart Oil | | $ | 280.00 |
| | Copper Seals | 6 Copper Seals | | $ | 25.00 |
| | | | Parts Total | $ | 1,121.00 |
| | | | Estimated Onsite Labor Hours | | 1 Technician x 16hrs |

## CENTRIFUGE REFERENCES – WASTEWATER SLUDGE DEWATERING

Washington / Oregon / Idaho

| LOCATION OF INSTALLATION | MODEL | TYPE OF SLUDGE | YEAR INSTALLED |
|---|---|---|---|
| Meridian WWTP<br>City of Meridian, ID | 3 x D5L | Anaerobically Digested | 2013 |
| Kamilche WRP<br>Lake Oswego, OR | 1 x D2L | WAS from MBR | 2008 |
| Tri-City WPCP<br>Oregon City, OR | 1 x D5LX | Anaerobically Digested | 2011 |
| Pierce County WWTP<br>University Place, WA | 2 x D5LL | Anaerobically Digested | 2004 |
| Sunnyside WWTP<br>Lake Stevens, WA | 2 x D5LL | Anaerobically Digested | 2009 |
| Sumner WWTP<br>Sumner, WA | 1 x D4L | Anaerobically Digested | 2004 |
| Shelton WWTP<br>Shelton, WA | 2 x D4LL | Aerobically Digested | 2010 |
| King County - Renton WWTP<br>Renton, WA | 3 x D7LL | Anaerobically Digested | 2004 |
| King County - Brightwater WWTP<br>Woodinville, WA | 2 x D6LL | Anaerobically Digested | 2009 |
| LOTT Clean Water Alliance<br>Olympia, WA | 2 x D6LX | Anaerobically Digested | 2017 |
| Snoqualmie WWTP<br>Snoqualmie, WA | 1 x D4L | Aerobically Digested WAS | 2018 |
| Lincoln City WWTP<br>Lincoln City, OR | 1 x D4L | Aerobically Digested | 2019 |
| Willow Lake WPCF<br>Salem, OR | 2 x D5LX | Anaerobically Digested | 2020 |
| Sumner WWTP<br>Sumner, WA | 1 x D5L | Anaerobically Digested | 2020 |

**ANDRITZ SEPARATION INC.**
1010 Commercial Blvd. S.
Arlington, Texas 76001
Tel. (817) 465-5611
Fax (817) 468-3961
separation.us@andritz.co

# Attachment B: Centrisys Proposal

TO: Benjamin Bossé, P.E.
Kennedy Jenks
240 Country Club Road, Suite A
Eugene, OR 97401
Direct: (541) 844-7802 | Mobile: (541) 321
Email: BenjaminBosse@KennedyJenks.com

DATE: 7/28/2022
REF.: Dewatering Centrifuge

# Budget Proposal
# NewPort, OR Dewatering
# CS18-4 2PH

**Centrisys Contact**
Jerod Swanson
Regional Sales Manager
Frisco, CO 80443
Direct: (612) 401-2006
Email: Jerod.swanson@centrisys.us

**Centrisys Representative**
Chris McCalib
Treatment Equipment Company
249 Main Ave. S Ste. 107 #322
North Bend, WA 98045
Direct: (206) 909-1546
Email: chris@tec-nw.com

Disclaimer: Please note that this is a very preliminary budget proposal .Centrisys would require basis of design, existing facility information and any lab or pilot testing data to confirm the sizing before moving forward with the design stage.

Centrisys is pleased to provide this budget quotation for the following:

**ITEM 1 TWO (2) DECANTER CENTRIFUGE UNIT COMPLETE WITH AUTOMATIC HYDRAULIC BACKDRIVE**

**1.A Centrifuge Specification**

| | |
|---|---|
| No. of units: | 2 |
| Model: | CS18-4 2PH |
| Inside bowl diameter (in): | 18 |
| Bowl length (in): | 70 |
| Bowl length to diameter ratio: | 4.0:1 |
| Beach angle (deg): | 15 |
| Maximum Bowl speed (RPM): | 3400 |
| Type of lubrication: | Automatic Grease |
| Main Motor HP: | 40 |
| Back Drive Motor HP: | 10 |
| *Max. Hydraulic Loading (gpm) | 100 |
| *Max. Solids Loading (lb/hr) | 1485 |

*Maximum loading rates for standard municipal sludges. Does not apply to all applications. Optimal performance does not occur at maximum loading levels.

**1.B. Scope of supply**

1. Each unit will be provided based on the attached drawing
   (i) Duplex SS Solid bowl
   (ii) Scroll conveyor with Duplex SS Scroll shaft; 304SS flights
   (iii) 304 SS lower and upper casing
   (iv) Solid and liquid flexible connectors
   (v) Dewatered Sludge and Centrate Chutes/Hoppers
   (vi) Powder coated carbon steel base/frame
   (vii) Vibration isolators
   (viii) Spare parts/tools
   (ix) Control Panel (water cooled)
      A. 304SS NEMA 4X Enclosure for each centrifuge
      B. Main circuit breaker
      C. VFD for main drive motor
      D. Allen Bradley PLC (compact logix), valve amplifier and motor starter for automatic hydraulic back drive system
      E. Ethernet communication and historical trending of key parameters
      F. 10” Allen-Bradley panel view touch screen
   (x) Instrumentation
      A. One (1) vibration sensor per unit
      B. One (1) main bearing temp sensor, type PT100 on each bearing
      C. One (1) each Bowl/Scroll speed sensor/unit
      D. One (1) Hydraulic oil level/temp, hydraulic pressure sensor/unit
   *(xi)* Automatic Grease Lubrication System
      A. One (1) low grease level sensor per unit
   (xii) One (1) trip and 5 days of startup assistance

**Budget Price:**

All the above for..... **$ 735,200.00**

F.O.B. Job Site, freight included, Taxes Excluded

**Optional Ancillary Equipment per unit:**

| | | | |
|---|---|---|---|
| Feed Pump | Adder | $ | 12,997 |
| Polymer System | Adder | $ | 18,620 |
| Diverter Gate | Adder | $ | 14,112 |
| Flowmeter | Adder | $ | 6,272 |
| 4 ft. Stand | Adder | $ | 11,760 |
| 4 ft. Stand, Walkway,ladder | Adder | $ | 18,620 |
| Conveyor (16 ft.) | Adder | $ | 31,780 |

**PAYMENT TERMS:**

30% with order; 60% upon shipment; 10% after startup not to exceed 90 days after shipment.

Lead Time: 20-22 weeks following receipt of the Approved drawings

**BUYER/OWNER RESPONSIBILITY (UNLESS INCLUDED AS ADDER):**

- Stand
- Feed pump
- Polymer system
- Flow meter
- Cake conveyor
- Anchor bolts.
- Building and building plans (Centrisys provides only the layout drawings without any responsibility of updating any plans or building)
- Building modifications
- Structural and Civil engineering labor
- Lubricants
- All utilities that are required for operation
- Unloading, uncrating, installation and installation supervision. Installation will, at minimum, require a forklift and possibly a crane/hoist.
- Readiness of the Equipment before requesting start-up service. Non-readiness may incur additional charges.
- Compatibility of Equipment materials of construction with process environment.
- Piping connections, platforms, gratings and railings unless stated otherwise.
  Any other auxiliary equipment or service not detailed above.

**NUMBER:** 12526 **DATE:** 8.29.22

**TO:** Benjamin Bossé, P.E.
Kennedy Jenks
240 Country Club Road, Suite A
Eugene, OR 97401
Direct: (541) 844-7802
Mobile: (541) 321-3355
Email: BenjaminBosse@KennedyJenks.com

---

# Budget Proposal
# Newport, Oregon Dewatering
# CS21-4HC 2PH

**Centrisys Contact**
Jerod Swanson
Regional Sales Manager
9586 58th place
Kenosha, WI 53144
Ph: (262) 654-6006
Direct: (612) 401-2006
Email: Jerod.swanson@centrisys.us

**Centrisys Representative**
Chris McCalib
Treatment Equipment Company
249 Main Ave S, Ste 107 #322
North Bend, WA 98045
Direct: (206)909-1546
Email: chris@tec-nw.com

Centrisys is pleased to provide this budget quotation for the following:

**ITEM 1. TWO (2) DECANTER CENTRIFUGE UNITS, MODEL CS21-4HC 2PH COMPLETE WITH AUTOMATIC HYDRAULIC BACKDRIVE**

### 1.A Basis of Design – Sludge Feed Characteristics

| | |
|---|---|
| Industry Type: | Municipal Wastewater |
| Application: | Aerobic Sludge |
| Number of units: | Two (one duty, one standby) |
| Design Feed Flow rate/Unit: | 172 gpm (excluding polymer flow) |
| Hydraulic throughput/Unit: | 225 gpm |
| Dry Solids loading: | 585.3 lbs/hr |
| Feed Concentration: | 0.68% |
| Operation time: | 64 hrs/week |

### 1.B Anticipated Performance*

| | |
|---|---|
| Solids capture rate/recovery: | ≥95% |
| Cake dryness: | 20-22% |
| Max Polymer consumption: | 19-22 lbs/Dry Ton |

*- Lab sample testing is recommended to confirm

### 1.C Centrifuge specification

| | |
|---|---|
| Model: | CS21-4 HC 2PH |
| Inside bowl diameter (in): | 22 |
| Bowl length (in): | 100 |
| Bowl length to diameter ratio: | 4.3:1 |
| Beach angle (deg): | 15 |
| Maximum Bowl speed (RPM): | 3150 |
| Type of lubrication: | Grease |
| Main Motor HP: | 75 |
| Back Drive Motor HP: | 15 |


9586 58th Place | Kenosha, WI 53144 USA | +1 (262) 654-6006 | info@centrisys-cnp.com | centrisys-cnp.com

CNP - a subsidiary of Centrifuge-Systems, LLC | ISO 9001:2015

## 1.D Scope of supply

1. Each unit will be provided based on the attached drawing CS21-4HC 2P Centrifuge GA.pdf
   (i) Centrifugally Casted Duplex SS Solid bowl
   (ii) Scroll conveyor with Duplex SS Scroll shaft; 316SS flights
   (iii) 316SS lower and upper casing
   (iv) Solid and liquid flexible connectors
   (v) Dewatered Sludge and Centrate Chutes/Hoppers
   (vi) Powder coated carbon steel base/frame
   (vii) Vibration isolators
   (viii) Spare parts/tools
   (ix) Control Panel (water cooled)
      A. 304SS NEMA 4X Enclosure for each centrifuge
      B. Main circuit breaker
      C. VFD for main drive motor
      D. Allen Bradley PLC (compact logix), valve amplifier and motor starter for automatic hydraulic back drive system
      E. Ethernet communication and historical trending of key parameters
      F. 10" Allen-Bradley panel view touch screen
   (x) Instrumentation
      A. One (1) vibration sensor per unit
      B. One (1) main bearing temperature sensor, type PT100 on each bearing
      C. One (1) each Bowl/Scroll speed sensor/unit
      D. One (1) Hydraulic oil level/temp, hydraulic pressure sensor/unit
   *(xi)* Automatic Grease Lubrication System
      A. One (1) low grease level sensor per unit
   (xii) Two (2) trips and 10 days or 80 hours (whichever occurs first) of startup assistance

## 1.E Optional Adders

(i) One (1) 16 foot u-trough conveyor, 9"diameter, approx. 25° incline. Includes motor

(ii) One (1) 11 foot u-trough conveyor, 9"diameter, approx. 25° incline. Includes motor

(iii) Power run through equipped on two (2) units.
   A. This feature allows the centrifuge to create its own power during power loss to allow self-cleaning without plant power input. Also, allows the machine to return to operating speed immediately upon power restore.

(iv) Remote monitoring equipped on two (2) units.
   A. This feature is to keep track of the operational and alarm status using plant computer. Also provides real-time text and/or email alerts for any significant system status changes on 32 key operating parameters.

(v) Two (2) HPU Containment Pans, stainless steel construction.

**BUDGET PRICE:**

All of the above for ..... $**948,600** USD

**OPTIONAL PRICE ADDERS – NOT INCLUDED IN BASE SCOPE OF SUPPLY**

One (1) 16 foot u-trough conveyor, 9" diameter ..... $**38,300** USD
One (1) 11 foot u-trough conveyor, 9" diameter ..... $**28,200** USD
Two (2) Power run-through features equipped ..... $**14,200** USD
Two (2) Remote monitoring feature equipped ..... $**16,900** USD
Two (2) HPU oil containment pans ..... $**5,800** USD

F.O.B. Job Site, freight included, taxes excluded.

**PAYMENT TERMS:**

30% with order; 60% upon shipment; 10% after startup not to exceed 90 days after shipment.

Lead Time: 40-45 weeks following receipt of the Approval drawings

## Warranty

**Five (5) Year Mechanical Warranty**

So long as the decanter centrifuge is used for the applications it was designed for and operated, serviced, and maintained per documented Centrisys guidelines, Centrisys shall warrant mechanical centrifuge equipment (centrifuge frame housing and structural rotor components) to be free of manufacturing defects in material and workmanship for a period of five (5) years. Consumables, wear repairs, preventative service from normal use, and provided ancillary equipment is not covered in this extended warranty

**Fifteen (15) Year Bowl Warranty**

Centrisys provides a fifteen (15) year warranty on the bowl center section, conical, and headwalls. This warranty will be in place as long as the customer has documented inspection and service compliance every 15,000 hours of operation and service is conducted per the supplied O&M manual.

Costs provided with Centrisys quote dated 8/2/2022:

| | | | |
|---|---|---|---|
| Polymer System | Adder | $ | 21,756 |
| 4 ft. Stand | Adder | $ | 21,560 |


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CNP - a subsidiary of Centrifuge-Systems, LLC | ISO 9001:2015

**BUYER/OWNER RESPONSIBILITY:**

- Stand
- Feed pump
- Polymer system
- Flow meter
- Cake conveyor (adder)
- Anchor bolts.
- Building and building plans (Centrisys provides only the layout drawings without any responsibility of updating any plans or building)
- Building modifications
- Structural and Civil engineering labor
- Lubricants
- All utilities that are required for operation
- Unloading, uncrating, installation and installation supervision. Installation will, at minimum, require a forklift and possibly a crane/hoist.
- Readiness of the Equipment before requesting start-up service. Non-readiness may incur additional charges.
- Compatibility of Equipment materials of construction with process environment.
- Piping connections, platforms, gratings and railings unless stated otherwise.
- Any other auxiliary equipment or service not detailed above.

Issued by

Ethan Banks
Applications Engineer

Date:8.29.22


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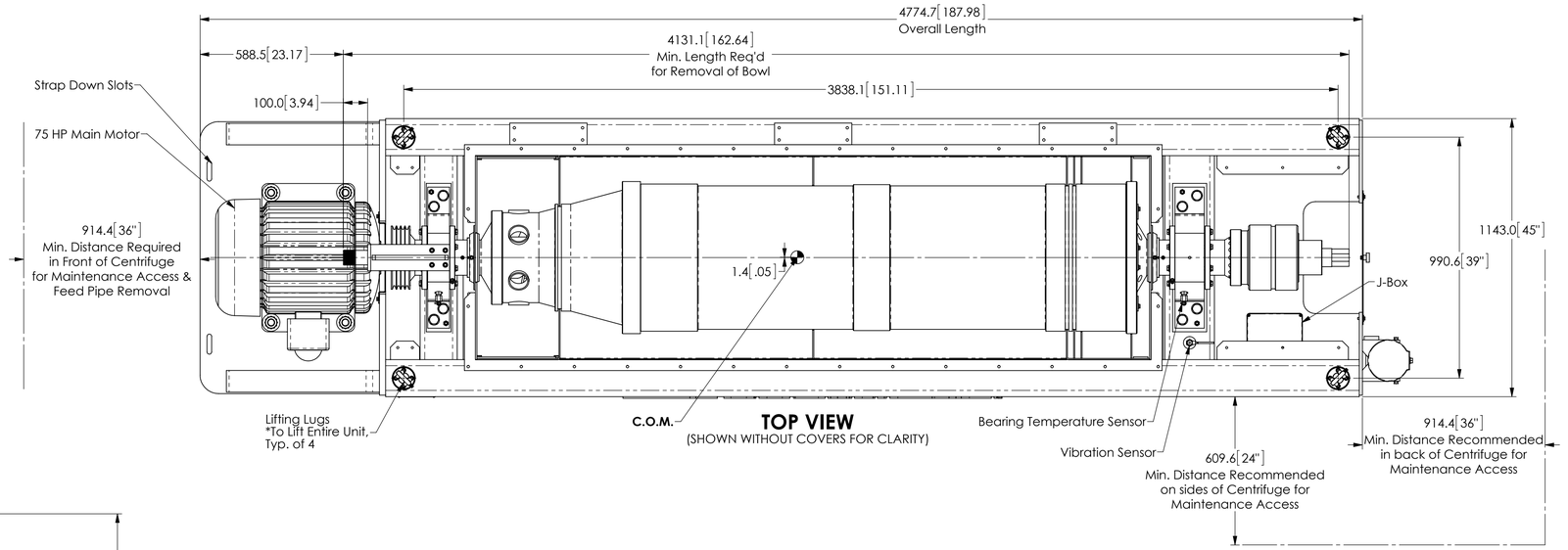
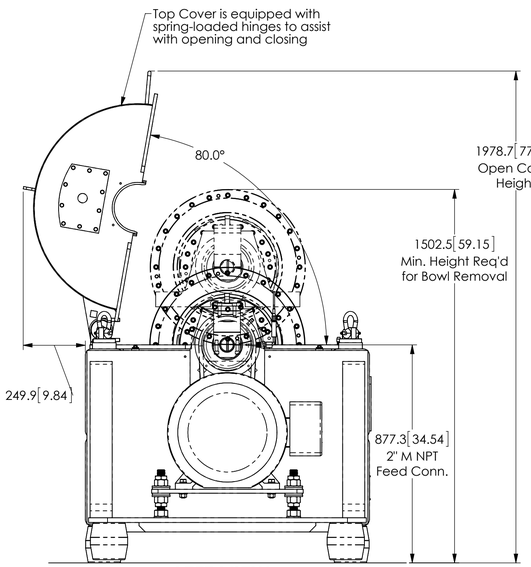
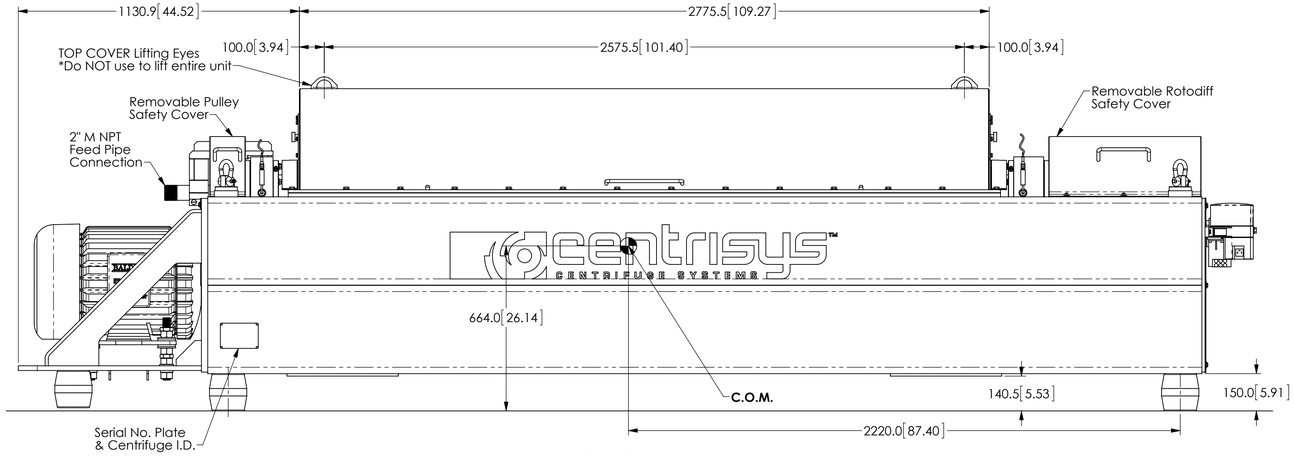
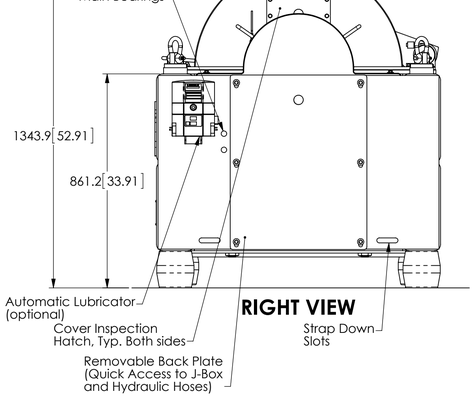


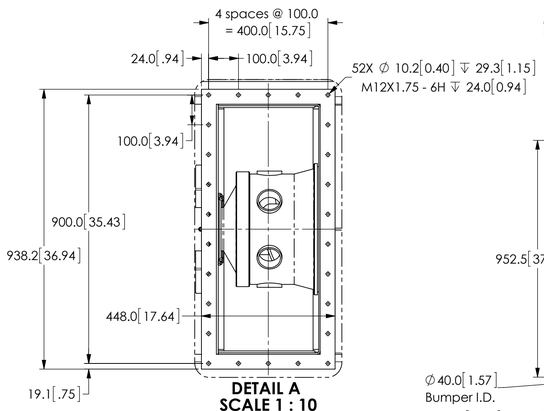

LEFT VIEW



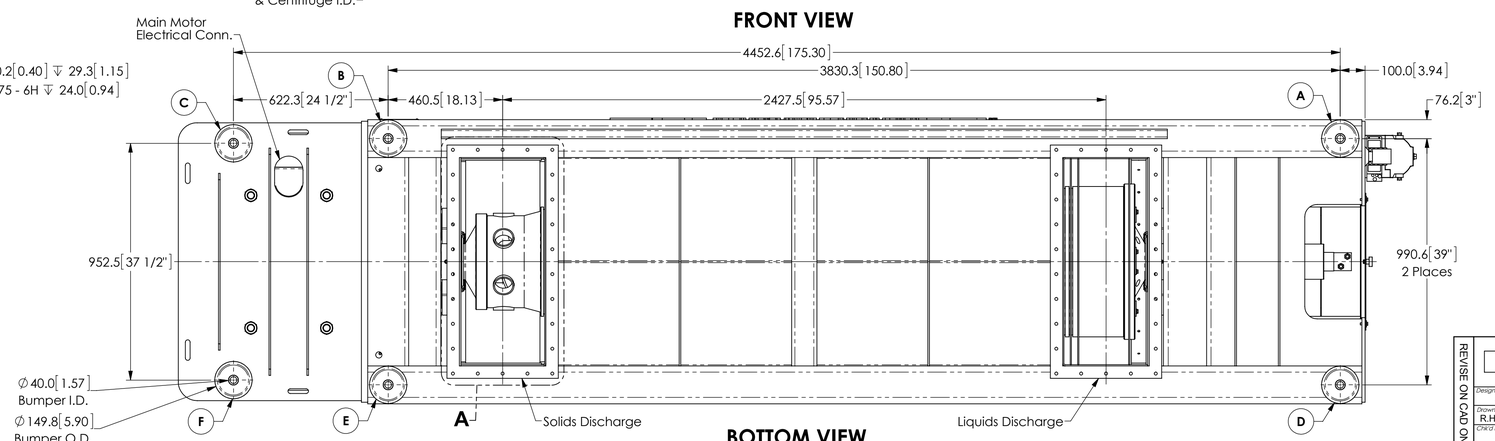

FRONT VIEW




RIGHT VIEW




DETAIL A
SCALE 1 : 10
TYPICAL FLANGE PATTERN




BOTTOM VIEW

| Weights: | lbs. [kg] |
|---|---|
| Rotating Assembly | 3700 [1678.3] |
| Bowl filling with SP 1.0 | 785 [356.0] |
| Complete Centrifuge (w/o filling) | 10000 [4536.0] |
| Static loads below each corner of complete centrifuge: | lbs. [kg] |
| A | 2132.6 [967.4] |
| B | 2230.9 [1011.9] |
| C | 625.0 [ 283.5] |
| D | 2132.6 [967.4] |
| E | 2230.9 [1011.9] |
| F | 625.0 [ 283.5] |
| Dynamic loads below each corner of complete centrifuge: | lbs. [kg] |
| A | 2365.1 [1072.8] |
| B | 2385.0 [1081.8] |
| C | 630.0 [285.8] |
| D | 2365.1 [1072.8] |
| E | 2385.0 [1081.8] |
| F | 630.0 [285.8] |
| Dynamic loads below each corner of complete centrifuge w/o filling @ start-up during critical: | lbs. [kg] |
| A | 2665.8 [1209.2] |
| B | 2788.6 [1264.9] |
| C | 781.3 [354.4] |
| D | 2665.8 [1209.2] |
| E | 2788.6 [1264.9] |
| F | 781.3 [354.4] |

*All Horizontal loads are approximately 5% of vertical loads.

*ALL DIMENSIONS ARE IN MILLIMETERS.
DIMENSIONS IN [ ] BRACKETS ARE IN INCHES.

REVISE ON C4D ONLY

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Kenosha, WI 53144
Tel: (262) 654-6006
Fax: (262) 764-8705

THIS PRINT IS PROVIDED ON A RESTRICTED BASIS AND IS NOT TO BE USED IN ANY WAY DETRIMENTAL TO THE INTERESTS OF CENTRISYS.

Designed by: - Date: -
Drawn by: R.H. Date: 11.1.2011
Chk'd by: - Date: -
Approved by: - Date: -

GD&T ASME Y14.5M1994+ Tolerancing Std. & Rules apply

3rd Angle Projection

Material(s): See BOM

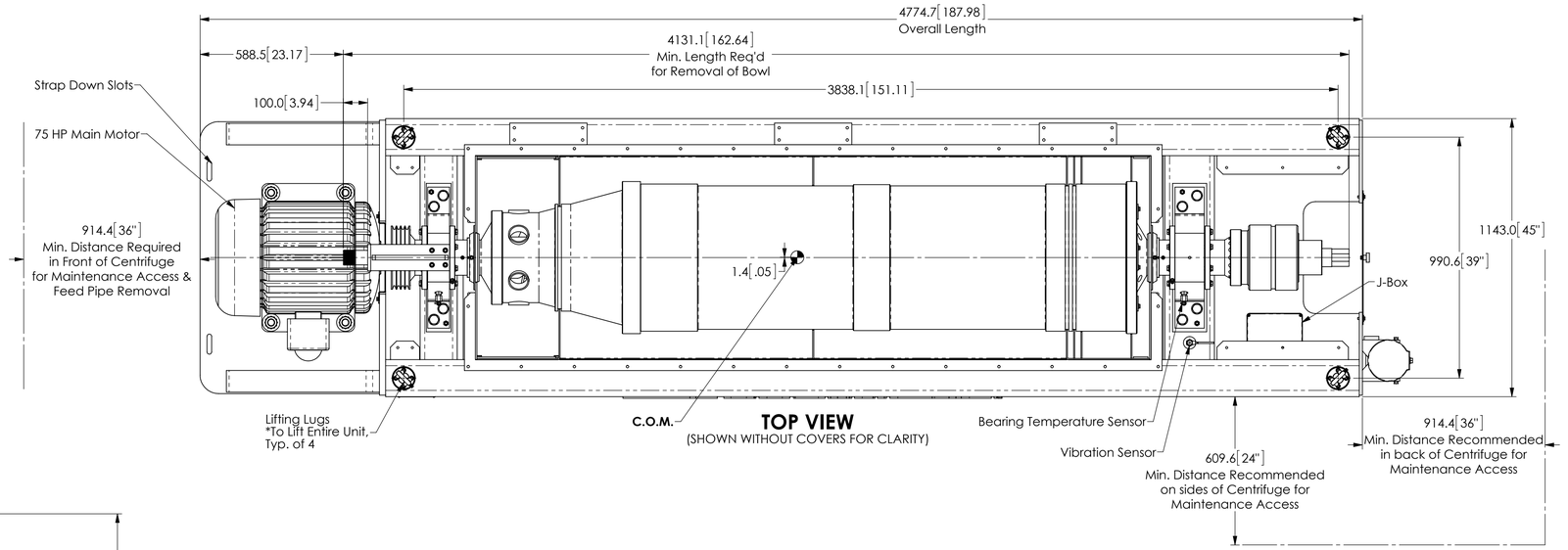
Estimated weight (lbs): ~10,000

Title: Cs21-4HC 2-Phase Centrifuge General Arrangement

Project:

Part #: 21300 Drawing #: M-D21300

Sht: 1 OF 1 Scale: 1:12 REV

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| Rotating Assembly | 3700 [1678.3] |
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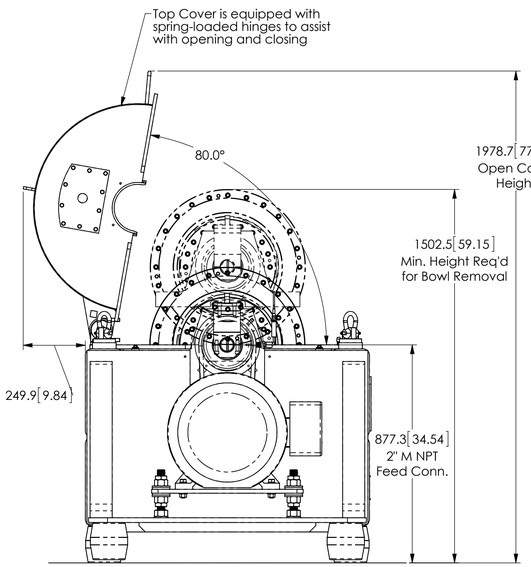
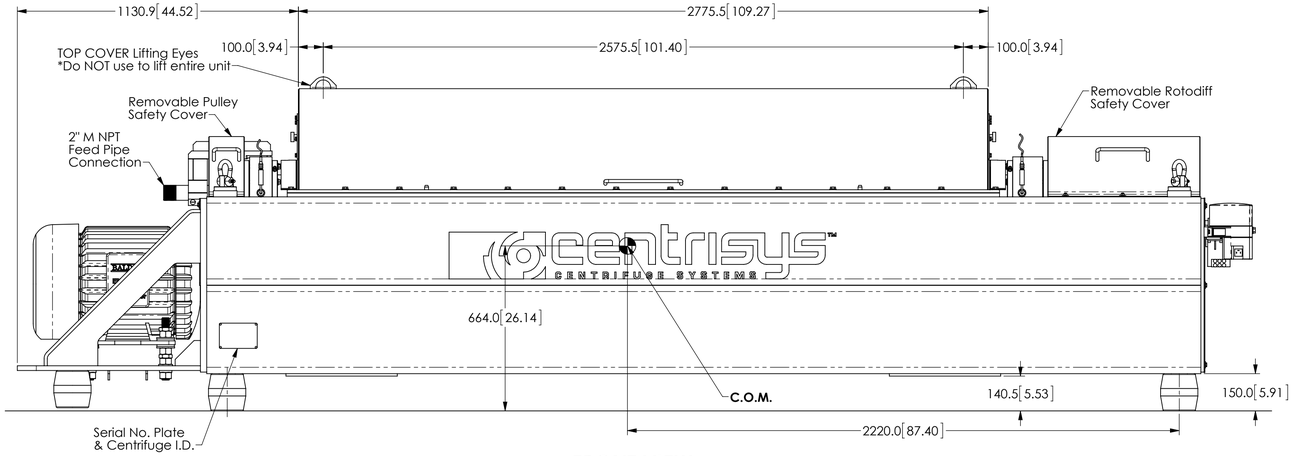
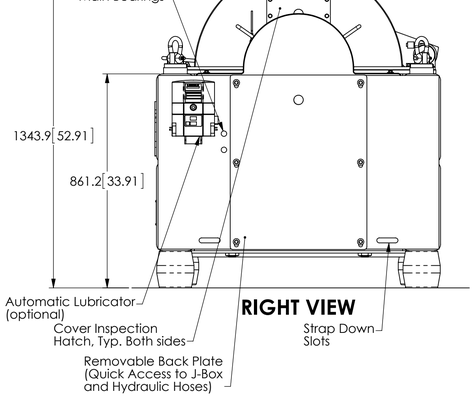


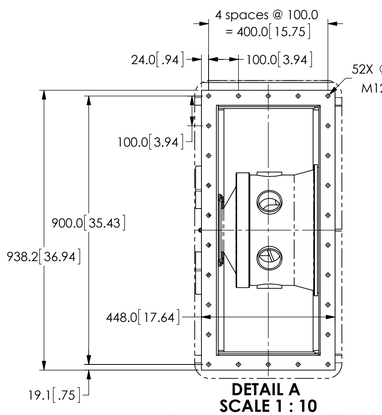

LEFT VIEW



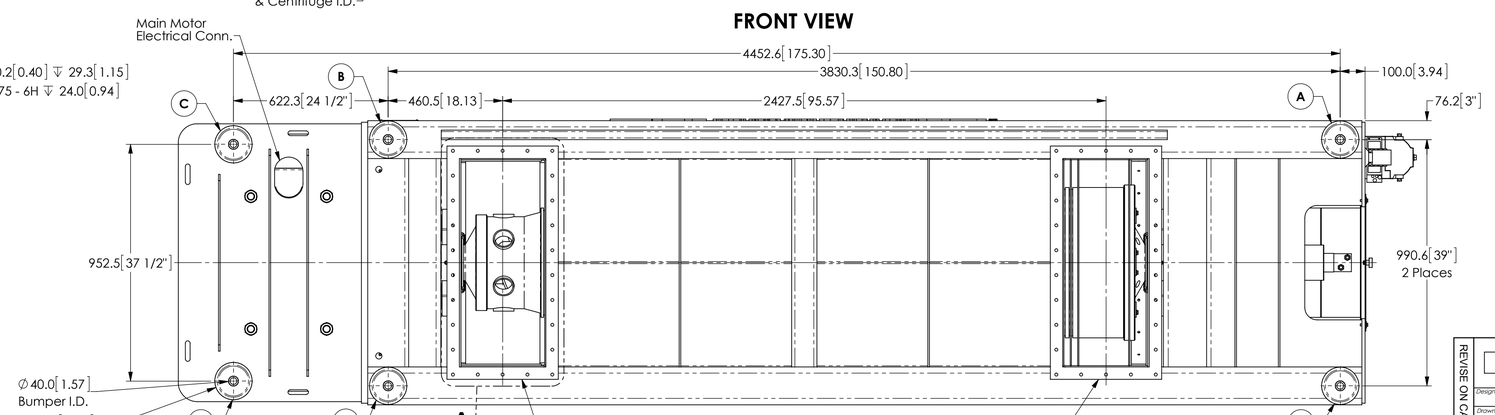

FRONT VIEW




RIGHT VIEW




DETAIL A
SCALE 1 : 10
TYPICAL FLANGE PATTERN




BOTTOM VIEW

*ALL DIMENSIONS ARE IN MILLIMETERS.
DIMENSIONS IN [ ] BRACKETS ARE IN INCHES.

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Title: Cs21-4HC 2-Phase Centrifuge
General Arrangement
Project:

| Designed by: - | Date: - |
|---|---|
| Drawn by: R.H. | Date: 11.1.2011 |
| Chk'd by: - | Date: - |
| Approved by: - | Date: - |

GD&T ASME Y14.5M1994+ Tolerancing Std. & Rules apply

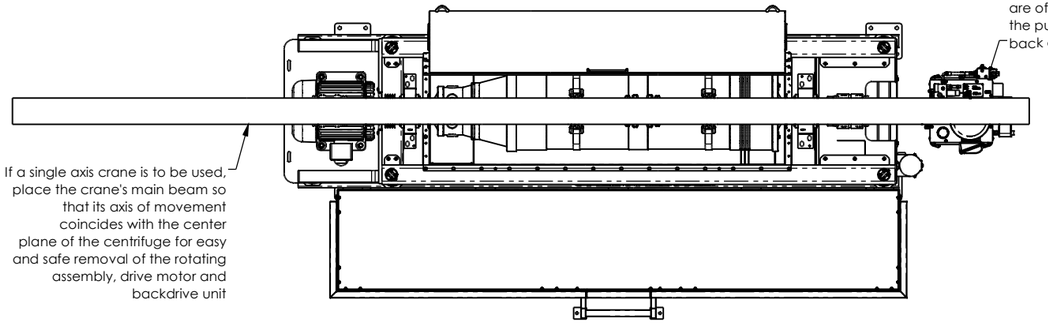
3rd Angle Projection

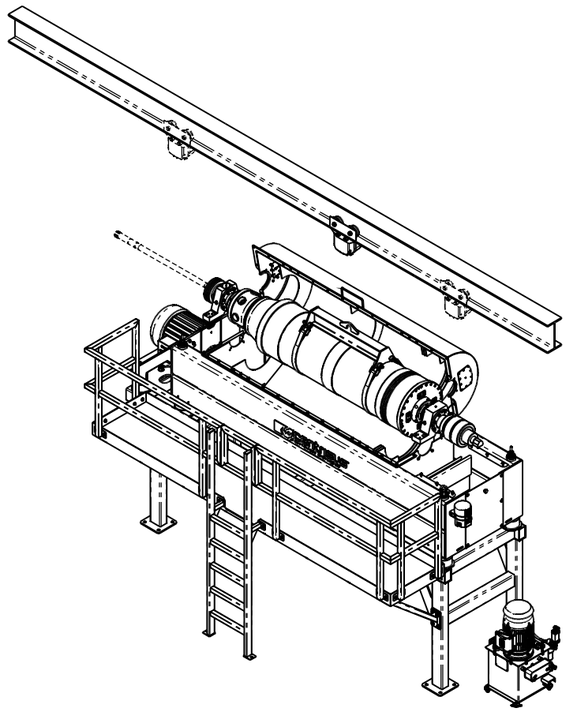
Material(s): See BOM

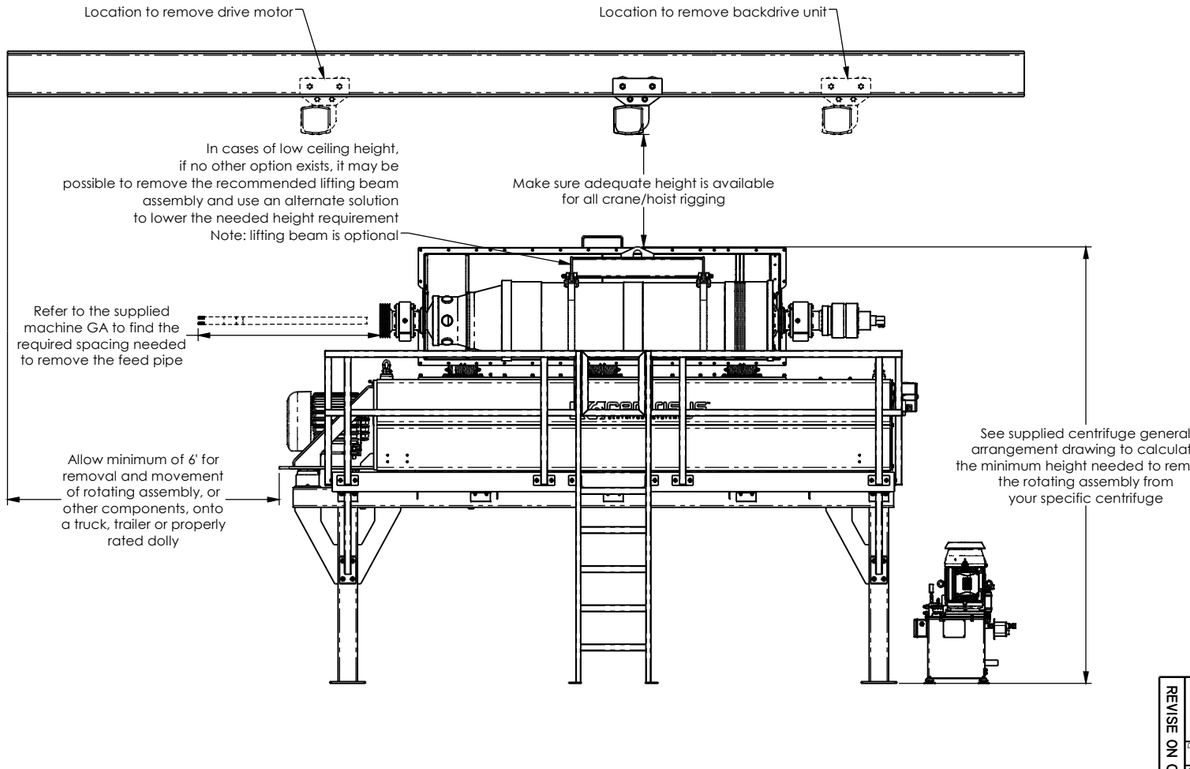
Estimated weight (lbs): ~10,000

Part #: 21300 | Drawing #: M-D21300

Sht: 1 OF 1 | Scale: 1:12 | REV



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| | | | | | |
|---|---|---|---|---|---|
| Designed by: – | Date: – | GD&T ASME Y14.5M1994+ Tolerancing Std. & Rules apply | 3rd Angle Projection | Material(s): See BOM | Title: Recommended general crane or hoist layout and positioning |
| Drawn by: KULSKI | Date: – | | | | Project: |
| Chk'd by: – | Date: – | | | Estimated weight (lbs): 7990 | Sheet Size: C / Drawing #: GA30681 |
| Approved by: – | Date: – | | | | Sht: 1 OF 1 / Scale: 1:30 / REV |

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# The Centrisys-Viscotherm Scroll Drive is the **Most Efficient** in the Centrifuge Industry

## Benefits of the Centrisys Hydraulics

Our hydraulic scroll drive is powerful and precise, achieving the highest torque-to-weight ratio with the best process control. By using hydraulics we eliminate the gearbox, and as a result simplify the design, radically reducing the number of moving parts and wear components. The Centrisys scroll drive delivers unmatched reliability with lower operating costs— a direct benefit to our customers.

**1 Hydraulics is a Trusted Technology:** Whether we realize it or not, hydraulics is a part of our daily lives. It is a reliable and precise technology that delivers maximum power using the smallest footprint. Hydraulic components are a fundamental part of the steering and braking system in every car manufactured today. Hydraulics are used in nearly all forms of daily travel: planes, trains, boats and cars. It is commonly used in manufacturing facilities from heavy lifting to material handling.

**2 Hydraulics is a Versatile Application:** It is used in industrial, military and transportation applications where there is no room for error, and where work is dangerous, dirty or unforgiving. Examples include jet airliners, railways, ships, nuclear submarines, elevators, construction equipment, mining, drilling, and more. This technology is so versatile that it can be used in widely differing environmental conditions – from the most sterile to the dirtiest.

**3 Hydraulic Scroll Drive Increases Capacity:** Precise speed control and the highest torque capabilities allow for increased through-put capacities.

**4 Hydraulic Scroll Drive Maximizes Recovered Energy:** The Centrisys CERS (Centrifuge Energy Recovery System) concept is equivalent to technology used in today's hybrid automobiles, high-performance race cars, and the aerospace industry. The Centrisys system captures energy from the rotating bowl. This recovered energy powers the hydraulic scroll drive at shutdown or power failure, allowing for seamless backup continued operation with controlled scroll speed. Since the scroll continues to unload solids from the bowl, it prevents costly dismantling to free up a blocked centrifuge.

**5 Our Hydraulic Technology Offers the Highest Energy Efficiency:** Hydraulic technology operates independently from the main drive. Gearbox machines generally rely on the main drive; using solids removal mechanisms that apply braking (additional drag) to the bowl and maindrive. (Think of driving a car with the parking brake on.) Unnecessary braking with gearbox technology results in the need for larger main drive motors. Commonly, a centrifuge requires a main drive motor that is 50% larger in comparison to a centrifuge with our hydraulic scroll drive system to accomplish the same job. For every one horsepower needed to move solids out of the machine, one horsepower must be added to the main drive to overcome this braking action. The Centrisys scroll drive uses only the energy needed to drive the scroll; it is independent of the main drive, therefore no energy from the main drive is wasted.

# Centrisys-Viscotherm Hydraulic Scroll Drive Based on ROTODIFF Technology **Outperforms** Our Competitors' Gearbox Drive

| | Centrisys-Viscotherm Hydraulic Scroll Drive | Competitors' Gearbox Drive | Centrisys Hydraulic Advantage |
|---|---|---|---|
| 1 | Highest torque-to-weight ratio; allows for proper balance to handle solids and hydraulic flow capacity | Lower torque-to-weight ratio; limits loading of solids, requiring larger or multiple machines | Powerful and Efficient Operation |
| 2 | Simple, compact, lightweight design | Complex, heavy design | Lower Maintenance |
| 3 | No gears, uses only slow-moving parts; creates less friction | Multiple gears and moving parts at higher speeds; creates more friction and higher power consumption | Long-term Reliability |
| 4 | Robust and reliable; process control with direct torque reading. The direct measurement of scroll torque and speed allows immediate response to process changes | Complicated calculations of different speeds through multiple gear reductions/ increases error/ dramatically slows response to process changes | Lower Maintenance, Energy Efficient |
| 5 | Simple and accurate measurement of scroll speed; provides precise control of differential with unlimited bowl speed options *Differential = speed of ROTODIFF* | Complicated, indirect measurement of scroll speed; calculated from bowl and pinion speed, gearbox ratio and control error *Differential = (bowl speed – pinion speed) / gearbox ratio* | Precise Measurement and Control |
| 6 | One set of V-belts | Multiple sets and types of belts | Precise Measurement and Control Lower Maintenance Cost |
| 7 | Lower overhung weight reduces load on main bearings; reduces machine vibration; *Less weight means less horsepower needed to operate* | Heavy overhung gear increases load and heat on main bearings, causing reduced bearing life *More weight means more horsepower needed to operate* | Lower Maintenance |
| 8 | Versatile design for multiple applications | Limited design requires different units for each application | Lower Maintenance, Energy Efficient, Versatile |
| 9 | Low energy consumption; power is not lost or wasted. Scroll drive operates independently from the main drive motor | Increased energy cost; gearbox design steals energy from the main drive. | Versatile, Energy Efficient, Lower Operating Cost |
| 10 | State-of-the-art technology CERS (Centrifuge Energy Recovery System) allows the hydraulic scroll drive to recover energy at shut down | All energy is lost at shut-down; no power recovered | Energy Efficient |
| 11 | 100% torque at all speeds, including standstill | Limited torque at maximum differential speed and standstill | More Powerful at All Speeds |
| 12 | Full range of differential speeds at all bowl speeds, including zero RPM, startup, shutdown and standstill | Limited range of differential speeds at lower bowl speeds and standstill | More Powerful at All Speeds |
| 13 | Low maintenance; continuous cleaning and cooling in a closed, 100% filtered system (filtered to 10 microns) | Unfiltered, uncooled closed system; retains all wear debris possibly shortening the gearbox life | Lower Maintenance, More Reliable |
| 14 | Pressure relief valves prevent high shock load, protecting the hydraulic system AND centrifuge; system does not transfer impact force to the shafting | Claims to have high shock load capability, but repeated high shock loads will damage and destroy in-line components and cause premature failure | Lower Maintenance, More Reliable |
| 15 | Standard on a Centrisys centrifuge | Standard on competitors' machines; if higher torque is required, hydraulic technology is offered as an upgrade | Lower Cost, Energy Efficient |
| 16 | No drag or parasitic loss on the main drive; uses only the energy required to convey solids | Robs energy from main drive; torque adds braking horsepower; increases drag on main drive motor | Efficient Operation |
| 17 | Capacity to run leading or lagging (optimized performance) | Limited to a one-direction process | Lower Maintenance, More Powerful and Efficient |
| 18 | No overheating of the hydraulic motor due to automatic, continuous heat dissipation through the oil conditioning system | External cooling often required; overheating is a common problem | Lower Maintenance, Longer Life |

# The **Truth** About Hydraulic Scroll Drives

## The Centrisys-Viscotherm hydraulic scroll drive system with ROTODIFF technology is the best in the industry. Check the facts below to clear up any misconceptions about our system.

**Misconception: Hydraulic drives are not efficient.**
**Fact:** With ROTODIFF technology our hydraulic system is the most capable in the industry. Fewer (slow-moving) parts create less friction, and energy loss is minimized. Precise control of the scroll at any speed increases centrifuge capabilities and efficiency, even when loading conditions fluctuate. Hydraulics do not put a drag or load on the main motor and use only the power needed to turn the scroll.

**Misconception: A hydraulic system is not effective in messy, dirty or hazardous environments.**
**Fact:** Hydraulic technology is commonly used in rugged environments with high levels of shock, vibration, dust, water, corrosive chemicals and other potential hazards. Industries using hydraulic technology include construction, agriculture, marine, military, mining, paper production, drilling and tunneling. Hydraulic systems are used in mines, chemical plants, near explosives and in paint applications, because they are inherently spark-free and can tolerate high temperatures. Hydraulics have the strength and reliability for jobs requiring the best, most durable heavy equipment.

**Misconception: Hydraulic systems are noisy.**
**Fact:** Our hydraulic scroll drive is quieter than a gearbox. It has been shown to reduce ambient noise by 15 dB over the older electric scroll drives.

**Misconception: Hydraulic systems are messy and leak.**
**Fact:** Because fluids are enclosed in a contained system, there is virtually no leakage in modern hydraulics. Advanced sealing techniques and materials and state-of-the-art electronics are so efficient that today's manufacturers can raise the operating pressures of their pumps. It is not unusual to find hydraulic systems operating without leakage at pressures 2,000-3,000 psi higher than just a few years ago.

**Misconception: A hydraulic drive is difficult to repair, requiring specialized technicians with hydraulic experience.**
**Fact:** With fewer slow-moving parts and a less complicated design, hydraulic drives are easier to repair than a standard gearbox. Maintenance technicians with the skills to fix gearbox drives are more than capable of repair and maintenance with hydraulics.

**Misconception: Hydraulic systems are more maintenance-intense than a typical gearbox.**
**Fact:** On average, hydraulics need only simple oil and filter preventive maintenance, just like a car.

**Misconception: Parts for the hydraulic drive are difficult to source.**
**Fact:** Centrisys has distribution centers across the United States and around the world for all hydraulic components. In fact, many parts can be shipped express overnight delivery.

**Misconception: Hydraulic technology is old and abandoned by other centrifuge manufacturers.**
**Fact:** Hydraulic technology remains a dominant system in modern industrial manufacturing. No other system is as efficient and effective in transferring energy through small tubes or hoses and other hard-to-reach parts. Hydraulic innovation is progressing at an astonishing rate – so quickly that some experts cite more progress in the last ten years than in the 50 preceding years combined. Competitive centrifuge suppliers have not abandoned a hydraulic scroll drive, since most will offer it as an upgrade to the gearbox.

## The Choice is Clear

When you compare the Centrisys hydraulic scroll drive to a gearbox drive, the better choice is the Centrisys system. Centrisys is the only USA repair facility (besides Viscotherm affiliates) authorized by Viscotherm AG to repair, service, and perform warranty work on Viscotherm hydraulic components in North America. Contact Centrisys for more information on products, hydraulic scroll drive, service, parts or any other questions

9586 58th Place | Kenosha, WI 53144 USA | +1 (262) 654-6006 | info@centrisys-cnp.com
North America | South America | Europe | Middle East | China

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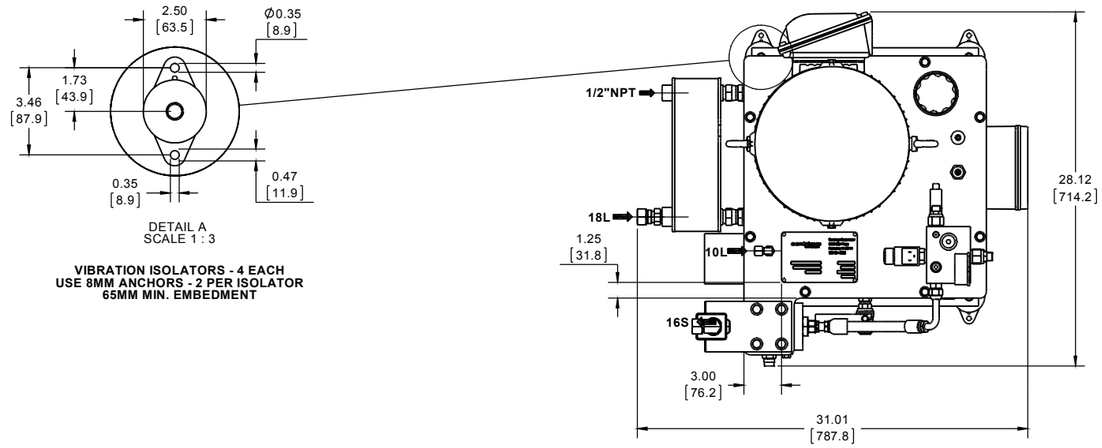
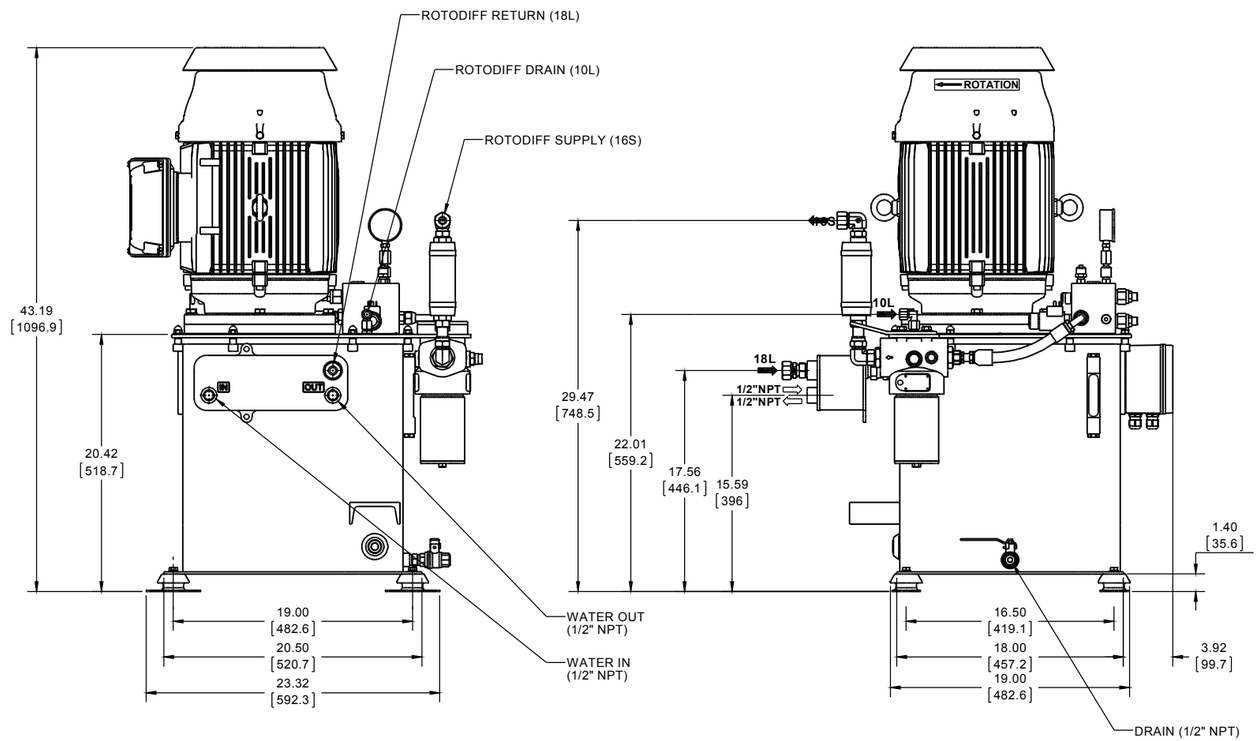
## CENTRISYS MODEL # CS11-22-Z-TW-21 / PART # G1700103-HPU

| | | |
|---|---|---|
| **Tank:** | Capacity: | 20 gal [76 l] |
| | Medium: | ISO VG 68 anti-wear hydraulic oil |
| | Weight (dry): | 450 lb [204 kg] |
| | Weight (filled): | 625 lb [284 kg] |
| **Electric Motor:** | Size: | 15 HP [11 kW] |
| | Frame: | NEMA 254TC with drip cover |
| | Manufacturer: | WEG 01518ET3ER254TC-W22-T-STAT |
| | Elec. Protection: | IP55 |
| | Voltage: | 230/460VAC / 3PH / 60HZ |
| | Thermostats | 1 per phase @ 155°C |
| | Full Load Amps: | 36 / 18 |
| | RPM: | 1765 |
| **Pump:** | Type: | External Gear |
| | Displacement: | 0.86 ci/rev [14.1 cc/rev] |
| | Max Flow: | 5.8 gpm [22 lpm] @ 4000 psi [276 bar] |
| **Regulation:** | Analog: | Pressure and flow |
| **Oil-Water Heat Exchanger:** | Type: | Brazed Plate |
| | Water requirement: | 80 gph [303 lph] min. flow / 68° F [20° C] max. temp |
| | Water connections: | 1/2" NPT female |
| **Control Block:** | Type: | CS3 / CS5.5 / CS7.5 / CS11<br>Proportional throttle valve<br>Pressure transducer 4-20mA<br>3-way bypass valve<br>Pressure gauge w/ shut-off 0-5000 psi [0-350 bar]<br>Safety relief valve 4300 psi [296 bar]<br>Needle valve (base speed valve) |
| **Level/Temp Switch:** | Level switching contact opens 3.13 in [80 mm] under max. level<br>Temp switching contact opens 158° F [70° C] high temp | |
| **Flow Meter:** | Type: | Visual 0.5-5 gpm [2-19 lpm] |
| **Oil Level Indicator:** | Type: | Visual sight glass 20 gal [76 l] to top of sight glass |
| **Hydraulic Connections:** | Pressure: | EO bite type (16S) |
| | Return: | EO bite type (18L) |
| | Drain: | EO bite type (10L) |
| **Power Unit Mounting** | Type: | 2-bolt captive vibration isolators (qty 4) |
| **Finish Protection:** | Type: | Sherwin Williams polyester powder coat<br>ANSI 70 Gray (PAS8-C0003) |
| **Hoses:** | Pressure hose 1/2" ID, 4000 psi [276 bar], 16S female swivel x 16S female swivel x 120 in [3050 mm]<br>Return hose 5/8" ID, 3000 psi [207 bar], 18L female swivel x 18L female swivel x 120 in [3050 mm] | |
| **Optional Accesories:** | G1300075-WM1 | Water modulating valve kit (includes bulb well) |
| | G1300075-MR20 | Mounting rail kit |
| | G1300075-DB | Desecant breather kit |
| | G1300075-TS | Temp switch Kit (Air cooler) |
| | G1300075-FS | Electrical filter switch |




| | | | |
|---|---|---|---|
| DRAWN BY: JP | DRAWN DATE: 08/01/2017 | PROJECT NUMBER: G1700103 | GRIMSTAD |
| CHECKED BY: DJ | CHECKED DATE: 08/01/2017 | S86W18498 Enterprise Drive<br>Muskego, Wisconsin 53150 | |

**CERTIFIED DRAWING**

This is an as-built drawing. Manual revisions are prohibited. Revisions are noted on sheet 1.

Signed By: John Porter Date: 08/07/2017

| REV | ECN | DATE | INITIALS | REVISION NOTES |
|---|---|---|---|---|
| 0 | N/A | 08/01/2017 | JP | INITIAL RELEASE |
| | | | | |
| | | | | |

REVISE ON CAD ONLY

centrisys CENTRIFUGE SYSTEMS
9586 58TH PLACE
KENOSHA, WI 53144
TEL: (262) 654-6006
FAX: (262) 654-6063

Designed by: – Date: –
Drawn by: A.A. Date: –
Chk'd by: – Date: –
Approved by: – Date: –

GD&T ASME Y14.5M1994+ Tolerancing Std. & Rules apply

3rd Angle Projection

Material(s): Estimated weight (lbs):

THIS PRINT IS PROVIDED ON A RESTRICTED BASIS AND IS NOT TO BE USED IN ANY WAY DETRIMENTAL TO THE INTERESTS OF CENTRISYS.

Title: CENTRISYS WEG HPU 11kW 22LPM CS11-22-Z-TW-21 WTR HE T-STATS

Project:

Part #: Drawing #: G1700103-HPU

Sht: 1 OF 7 Scale: 1:6 0

| ITEM | QTY | PART NUMBER | DESCRIPTION |
|---|---|---|---|
| 1 | 1 | RES00213-PCG | RESERVOIR, JM GRIMSTAD, 76L (20GAL) VERTICAL RESERVOIR |
| 2 | 1 | G1620-05-A-1 | SIGHT LEVEL GAUGE, LDI, 5" W/THERMOMETER |
| 3 | 1 | RCP00065-PCG | RESERVOIR COVER, JM GRIMSTAD, ATHALON 76L (20GAL) |
| 4 | 1 | 5201 | FILLER BREATHER, LDI, 40uM |
| 5 | 1 | 01518ET3ER254TC-W22-T-STAT | ELEC MOTOR, WEG, 11Kw (15HP), 1750RPM, 230-460VAC/3PH/60HZ, 254TC, W/DRIP COVER |
| 6 | 1 | GHP2A-D-20 | GEAR PUMP, MARZOCCHI, 0.97CIPR (15.9CCPR), RHR, SAE-A, 3915PSI (270BAR) CONTINOUIS |
| 7 | 1 | 032810-APA2 | ADAPTER RING, JM GRIMSTAD, 184-256TC ADAPTER TO "D" STYLE MOTOR ADAPTER |
| 8 | 1 | 3364 | ADAPTER, LDI, 184-256TC MOTOR TO SAE-A PUMP, FACE-TO-FACE OF 5.44" |
| 9 | 1 | 032810-01-GSK2 | GASKET, JM GRIMSTAD, PUMP ADAPTER RING |
| 10 | 1 | 032810-MPA2 | MOTOR RING, JM GRIMSATD, 184-256TC "C" FLANGE TO "D" FLANGE STYLE MOUNT |
| 11 | 1 | BA020383071503 | COUPLING HUB (PUMP), KTR, ROTEX 38 SERIES, 5/8" BORE X 5/32" KEYWAY |
| 12 | 1 | BA020383174100 | COUPLING HUB (MOTOR), KTR, ROTEX 38 SERIES, 1-5/8" BORE X 3/8" KEYWAY |
| 13 | 1 | 020381000042 | COUPLING INSERT, KTR, ROTEX 38 SERIES, 98A DUROMETER, PURPLE |
| 15 | 1 | G1300075-MA3 | MANIFOLD ASSEMBLY, JM GRIMSTAD, EXPLOSION PROOF |
| 16 | 1 | 032810-01-GSK1 | GASKET, JM GRIMSTAD, MANIFOLD |
| 17 | 1 | SS10RV3 | SUCTION STRAINER, LDI, 100 MESH 1"NPT 13GPM 2.5 PSI BYPASS |
| 18 | 1 | 10301-504-25 | CHECK VALVE, VONBERG, 1/2"NPT MALE / 1/2" FEMALE, INLINE, 25 PSI CRACKING |
| 19 | 1 | UH210A1604ZGH | FILTER HOUSING, PALL, 16SAE PORTS, 65PSI BYPASS, FOR 4" ATHALON ELEMENT |
| 20 | 1 | UE210AS04Z | FILTER ELEMENT, PALL, 12uM, VITON |
| 21 | 1 | RCA219DZ091Z | DIFFERENTIAL INDICATOR, PALL, VISUAL, 50 PSI |
| 22 | 1 | H600A-005 | FLOW METER, HEDLAND, 0.5-5.0 GPM ,ALUMINUM, -10SAE PORTS, 3500 PSI |
| 23 | 1 | MB00161 | MOUNTING PLATE, JM GRIMSTAD, HEADLAND FLOW METER, 304SS |
| 24 | 1 | 569510036001 | HEAT EXCHANGER, ITT, BRAZED PLATE, OIL-TO-WATER |
| 26 | 1 | G1300075-JBOX8 | ELECTRICAL JUNCTION BOX ASSEMBLY, JM GRIMSTAD |
| 27 | 1 | 5406-HHP-12 | FITTING, AIR-WAY, 3/4"NPT HOLLOW HEAD PLUG |
| 28 | 1 | 171N-12-NPT | BALL VALVE, PCI, BRASS, 1/2"NPT, 600 PSI |
| 29 | 1 | NT EL-K40T700-210-M20X1.5 | TEMP/LEVEL SWITCH, BUHLER, 160MM MIN HEIGHT, 70C NC SWITCHES |
| 30 | 1 | CENTRISYS-ENGRAVED-NAMEPLATE | NAMEPLATE, CENTRISYS, ENGRAVED WITH INFORMATION FROM CUSTOMER PO |
| 31 | 1 | G1300075-ISO2 | ISOLATION MOUNTING KIT, GRIMSTASD, STABLE-FLEX 3/8-16, NEOPRENE (INCLUDES ITEM 31.1 - 31.3) |
| 31.1 | 4 | 52045-10A | ISOLATION MOUNT, TECH PRODUCTS, STABLE FLEX 3/8-16, NEOPRENE |
| 31.2 | 4 | HHCS037C0870GR5ZP | HHCS, AMB, 0.38-16 X 1.00", GR5, ZINC PLATED (FASTENS ISO MOUNT TO RESERVOIR) |
| 31.3 | 4 | WMSL037-WASGR2ZP | LOCK WASHER, AMB, 0.38" MEDIUM, GR2, ZINC PLATED (FOR HEX HEAD CAP SCREWS ITEM 31.2) |
| 32 | 1 | VSTI1/2EDCF | FITTING, PARKER, 1/2BSPP HOLLOW HEX PLUG |
| 33 | 1 | HCH-08-16S-16S-120 | HOSE ASSY, PARKER, 1/2" ID, 4000 PSI, ISO 18752, 16S FEM STR SWIVEL BOTH ENDS, 120" LONG |
| 34 | 1 | LCH-10-18L-18L-120 | HOSE ASSY, PARKER, 5/8" ID, 3000 PSI, ISO 18752, 18L FEM STR SWIVEL BOTH ENDS, 120" LONG |

| ITEM | QTY | PART NUMBER | DESCRIPTION |
|---|---|---|---|
| 200 | 4 | HHCS050C112GR5ZP | HHCS, AMB, 0.50-13 X 1.12", GR5, ZINC PLATED (FASTENS PUMP ADAPTER RING TO COVER) |
| 201 | 4 | HHCS050C150GR5ZP | HHCS, AMB, 0.50-13 X 1.50", GR5, ZINC PLATED (FASTENS MOTOR RING TO PUMP ADAPTER RING) |
| 202 | 4 | HHCS050C125GR5ZP | HHCS, AMB, 0.50-13 X 1.25", GR5, ZINC PLATED (FASTENS PUMP ADAPTER TO PUMP ADAPTER RING) |
| 203 | 12 | WMSL050WASGR2ZP | LOCK WASHER, AMB, 0.50" MEDIUM, GR 2, ZINC PLATED (FOR HEX HEAD CAP SCREWS ITEM 200 - 202) |
| 204 | 4 | SCLH050C125ZP | SCLH, AMB, 0.50-13 X 1.25", LOW HEAD, ZINC PLATED (FASTENS MOTOR RING TO MOTOR) |
| 205 | 4 | WHCL050WASGR2ZP | LOCK WASHER, AMB, 0.50" HI-COLLAR, GR2, ZINC PLATED (FOR SOCKET HEAD CAP SCREWS ITEM 204) |
| 206 | 2 | HHCS037C100GR5ZP | HHCS, AMB, 0.38-16 X 1.00", GR5, ZINC PLATED (FASTENS PUMP TO PUMP/MOTOR ADAPTER) |
| 207 | 2 | WMSL037WASGR2ZP | LOCK WASHER, AMB, 0.38" MEDIUM, GR2, ZINC PLATED (FOR HEX HEAD CAP SCREWS ITEM 206) |
| 208 | 8 | NACR037CNUTGR2ZP | HEX NUT, AMB, 0.38-16 ACORN STYLE, GR2, ZINC PLATED (FASTENS RESERVOIR COVER TO THE TANK) |
| 209 | 8 | WSAE037WASGR2ZP | WASHER, AMB, 0.38" SAE, GR2, ZINC PLATED (FOR ACORN NUTS ITEM 208) |
| 210 | 4 | HHFB031C075GR5ZPWL | FLANGE HEAD, AMB, 0.31-18 X 0.75", GR5, ZINC PLATED (FASTENS MANIFOLD TO RESERVOIR COVER) |
| 211 | 4 | HHFB043C100GR5ZPWL | FLANGE HEAD, AMB, 0.44-14 X 1.00", GR5, ZINC PLATED (FASTENS BRACKET AND FILTER TO RES COVER) |
| 214 | 4 | DRIV006C018ZP | DRIVE SCREW, AMB, #6 X .19", TYPE U, ZINC PLATED (FASTENS CENTRISYS NAMEPLATE) |
| | | | |
| 300 | 1 | 5605-8-8-8 | FITTING, AIR-WAY, 1/2"NPT FEMALE / (2) 1/2"NPT FEMALE TEE (MANIFOLD T-PORT) |
| 301 | 1 | 2501-8-12 | FITTING, AIR-WAY, 3/4"NPT MALE / 08JIC MALE ELBOW (HE INLET PORT INSIDE TANK) |
| 302 | 2 | 6900-12-12 | FITTING, AIR-WAY, 12SAE MALE / 3/4"NPT SWIVEL (HE IN&OUT PORTS) |
| 305 | 1 | 5502-16-16 | FITTING, AIR-WAY, 1"NPT MALE / 1"NPT FEMALE ELBOW (STRAINER PORT) |
| 306 | 1 | 6805-16-16-NWO | FITTING, AIR-WAY, 16SAE MALE / 1"NPT FEMALE ELBOW (PUMP INLET PORT) |
| 307 | 1 | 2501-8-8 | FITTING, AIR-WAY, 08NPT MALE TO 08JIC MALE ELBOW (MANIFOLD T-PORT) |
| 308 | 1 | 5406-12-8 | FITTING, AIR-WAY, 3/4"NPT MALE / 1/2"NPT FEMALE REDUCER (HE CUST CONNECTION) |
| 309 | 1 | 318-12 | FITTING, AIR-WAY, 12JIC TUBE NUT (HE RETURN LINE INSIDE TANK) |
| 310 | 1 | 319-12 | FITTING, AIR-WAY, 12JIC TUBE SLEEVE (HE RETURN LINE INSIDE TANK) |
| 311 | 1 | 5406-HHP-8 | FITTING, AIR-WAY, 1/2"NPT MALE HEX HEAD PLUG (SHUT-OFF VALVE DRAIN PORT) |
| 312 | 1 | 25011212-MOD | FITTING, AIRWAY, 3/4"NPT MALE / 12JIC MALE ELBOW, 1/8" ANTI-SIPHON HOLE (HE RETURN LINE IN-TANK) |
| 313 | 1 | A10RLWD | FITTING, HATEC, 10-L X 1/4" MALE BSPP SOFT SEAL STUD COUPLING |
| 314 | 1 | VBDKO10L | FITTING, HATEC, 90 DEG SWIVEL ELBOW W/O-RING |
| 315 | 1 | 10-L | FITTING, HATEC, CAP (STO) W/TUBE NUT |
| 319 | 1 | FF6400-8-16-O | FITTING, AIR-WAY, 16SAE MALE / 08ORFS MALE STR CONNECTOR (PSI FILTER INLET PORT) |
| 320 | 2 | FF6400-8-8-O | FITTING, PARKER, 08SAE MALE / 08ORFS MALE STR CONNECTOR (MANIFOLD P-PORTS) |
| 321 | 1 | FF6801-10-10-NWO | FITTING, AIR-WAY, 10SAE MALE TO 10ORFS FEMALE ELBOW (FILTER OUTLET PORT) |
| 322 | 1 | FF6402-10-10-O | FITTING, AIR-WAY, 10ORFS FEMALE SWVL / 10SAE MALE STR CONNECTOR (FLOW METER INLET PORT) |
| 323 | 1 | FF6801-8-10-NWO | FITTING, AIR-WAY, 10SAE MALE TO 08ORFS MALE ELBOW (PUMP OUTLET PORT) |
| 324 | 1 | WEE16S7/8UNF | FITTING, PARKER, 10SAE MALE / 16MM TUBE ELBOW (FLOW METER OUTLET PORT) |
| 325 | 1 | GE18L1/2NPTCF | FITTING, PARKER, 18L METRIC 1/2"-14 NPT MALE CONNECTOR (HE CUST CONNECTION) |
| 329 | 1 | 6410-12-16-O | FITTING, AIR-WAY, 12SAE MALE / 16SAE FEMALE EXPANDER (PUMP INLET PORT) |
| 330 | 1 | 16-10F5OG5-S | FITTING, PARKER, 16SAE MALE / 10SAE FEMALE EXPANDER (FILTER OUTLET PORT) |
| | | | |
| 400 | 1 | F487TC-JS-J9-08-08-08-19 | HOSE ASM, PARKER, 1/2" ID, 4000 PSI, ISO 18752, 08ORFS STR / 08ORFS ELBOW |
| 401 | 1 | F487TC-JS-J1-08-08-08-9 | HOSE ASM, PARKER, 1/2" ID, 4000 PSI, ISO 18752, 08ORFS STR / 08ORFS LG ELBOW |
| 402 | 1 | F487TC-06-39-08-08-08-32 | HOSE ASM, PARKER, 1/2" ID, 4000 PSI, ISO 18752, 08JIC STR / 08JIC ELBOW |
| 403 | 2 | 5404-8-8 | FITTING, AIR-WAY, 1/2"NPT X 1/2"NPT X CLOSE NIPPLE (RESERVOIR DRAIN PORT & MANIFOLD T-PORT) |
| 404 | 1 | 1/2X6-S80-SMLS-BD-NIPPLE | NIPPLE, PIPE, 1/2"NPT SCH80 X 6" (BY-PASS CHECK VALVE OUTLET PORT) |
| 405 | 1 | 1X7-S80-SMLS-BD-NIPPLE | NIPPLE, PIPE, 1"NPT SCH80 X 7" (PUMP INLET PORT FOR) |
| 406 | 1 | 032810-TUBE-20 | TUBE, JM GRIMSTAD, 3/4" OD X .035" WALL, SAE J525 HYDRAULIC SEAMLESS STEEL |

**NOTES:**

1. TEST UNIT PER G1700103-HPU TEST PROCEDURE.
2. LABEL HEAT EXCHANGER PORTS "IN" & "OUT" PER SHEET 4 OF 7.
3. CONFIRM ELECTRIC MOTOR BOX ORIENTATION.

| DRAWN BY | DRAWN DATE | PROJECT NUMBER |
|---|---|---|
| JP | 08/01/2017 | G1700103 |
| CHECKED BY | CHECKED DATE | S86W18498 Enterprise Drive Muskego, Wisconsin 53150 |
| DJ | 08/01/2017 | |

GRIMSTAD

**CERTIFIED DRAWING**

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Signed By: John Porter Date: 08/07/2017

REVISE ON CAD ONLY

centrisys CENTRIFUGE SYSTEMS
9586 58TH PLACE KENOSHA, WI 53144
TEL: (262) 654-6006 FAX: (262) 654-6063

Designed by: – Date: –
Drawn by: A.A. Date: –
Chk'd by: – Date: –
Approved by: – Date: –

GD&T ASME Y14.5M1994+ Tolerancing Std. & Rules apply

3rd Angle Projection

Tolerance(s): Estimated weight (lbs):

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Title: CENTRISYS WEG HPU 11kW 22LPM CS11-22-Z-TW-21 WTR HE T-STATS
Project:
Part #:
Drawing #: G1700103-HPU
Sht: 2 OF 7
Scale: 1:12
0

| PLUMBING LINE SIZE CHART | | | PORT CODE CHART | |
|---|---|---|---|---|
| TYPE | SIZE | WALL THICKNESS | SIZE | TYPE |
| ST = CARBON STEEL TUBE | 02 = 1/8" | A = 0.028" | 02 = 1/8" | SF = SAE FEMALE |
| SST1 = STAINLESS STEEL TUBE (304) | 03 = 3/16" | B = 0.035" | 03 = 3/16" | SM = SAE MALE |
| SST2 = STAINLESS STEEL TUBE (316L) | 04 = 1/4" | C = 0.049" | 04 = 1/4" | NF = NPT FEMALE |
| CT = COPPER TUBE | 05 = 5/16" | D = 0.065" | 05 = 5/16" | NM = NPT MALE |
| LP = SCH40 BLACK PIPE | 06 = 3/8" | E = 0.083" | 06 = 3/8" | C61 = SAE FLANGE CODE 61 |
| MP = SCH80 BLACK PIPE | 08 = 1/2" | F = 0.095" | 08 = 1/2" | C62 = SAE FLANGE CODE62 |
| HP = SCH160 BLACK PIPE | 10 = 5/8" | G = 0.109" | 10 = 5/8" | JF = 37DEG JIC FEMALE |
| XP = SCHXXX BLACK PIPE | 12 = 3/4" | H = 0.120" | 12 = 3/4" | JM = 37DEG JIC MALE |
| GP = SCH40 GALVANIZED PIPE | 14 = 7/8" | I = 0.134" | 14 = 7/8" | BSF = BSPP FEMALE |
| BP = BRASS PIPE | 16 = 1" | | 16 = 1" | BSM = BSPP MALE |
| ST20D (TYPE SIZE WALL) | 20 = 1-1/4" | | 20 = 1-1/4" | BPF = BSPT MALE |
| 881-12 | 24 = 1-1/2" | | 24 = 1-1/2" | BPM = BSPT MALE |
| HOSES ARE CALLED OUT USING PARKER SERIES & SIZE REFERENCE. | 32 = 2" | | 32 = 2" | ** = OTHER SPEC SEE NOTES |
| | 40 = 2-1/2" | | 40 = 2-1/2" | |
| | 48 = 3" | | 48 = 3" | |
| | 64 = 4" | | 64 = 4" | |

#041410-1 DESICCANT BREATHER KIT FOR WEATHER PROOFING SOLD SEPERATELY. KIT INCLUDES:
1PC - #DC2 - DISPOSABLE BREATHER
1PC - #DC-15T - BAYONET ADAPTER

315
314
313
DRAIN LINE CONNECTION (10MM TUBE)

29
TLS1

15HP, 1765RPM
230/460VAC/3PH/60HZ
254TC, TEFC
36.0/18.0 FLA

5
M
7-13
6
5.8 GPM
4060 PSI

4
32
04BSF
08BSF
M20X1.5

2
J-BOX MOUNTED TO RESERVOIR
26

LP16
16NF
17
2.5 PSI
149uM

28
12NF

3
1
20 GALLON VERTICAL RESERVOIR

31

14
16
14.1
T2
10SF

14.5
RV
4060 PSI

14.6
BV
40-160 PSI

14.10
14.11
14.12
14.13
PT1
04BSF
XD
08SF

OR
1/4"NPT
0.020"
14.14

G2
04SF

0-5000 PSI
14.7
04NM
04NF
14.8
14.9
04SM

14.9
04SM
04SF
G1

08SF
P1
08NF
T1

14.4
NV
PV1
14.2
14.3

08SF
P2
487TC-8

33
SHIPPED LOOSE

CUST.CONNECTION TO HYD MOTOR (16MM TUBE)

22
23
10SF
0.5-5GPM

19
20
21
12SF
65 PSI
10uM

ANTI-SIPHON

24
12NF
12NM
08NF
WATER IN
08NF
WATER OUT
12NF
12NM
12NF

SHIPPED LOOSE
34

OPTIONAL WATER VALVE INSTALLED IN THE FIELD BY CENTRYSIS

487TC-8
ST12B

CUST.CONNECTION FROM HYD MOTOR (18MM TUBE)

18
08NF
25 PSI
LP08

27
12NF

| | | | |
|---|---|---|---|
| DRAWN BY: JP | DRAWN DATE: 08/01/2017 | PROJECT NUMBER: G1700103 | GRIMSTAD |
| CHECKED BY: DJ | CHECKED DATE: 08/01/2017 | S86W18498 Enterprise Drive Muskego, Wisconsin 53150 | |

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REVISE ON CAD ONLY

centrisys
CENTRIFUGE SYSTEMS
9586 58TH PLACE
KENOSHA, WI 53144
TEL: (262) 654-6006
FAX: (262) 654-6063

Designed by: - Date: -
Drawn by: A.A. Date: -
Chk'd by: - Date: -
Approved by: - Date: -

GD&T ASME Y14.5M1994+ Tolerancing Std. & Rules apply

3rd Angle Projection

Material(s):
Estimated weight (lbs):

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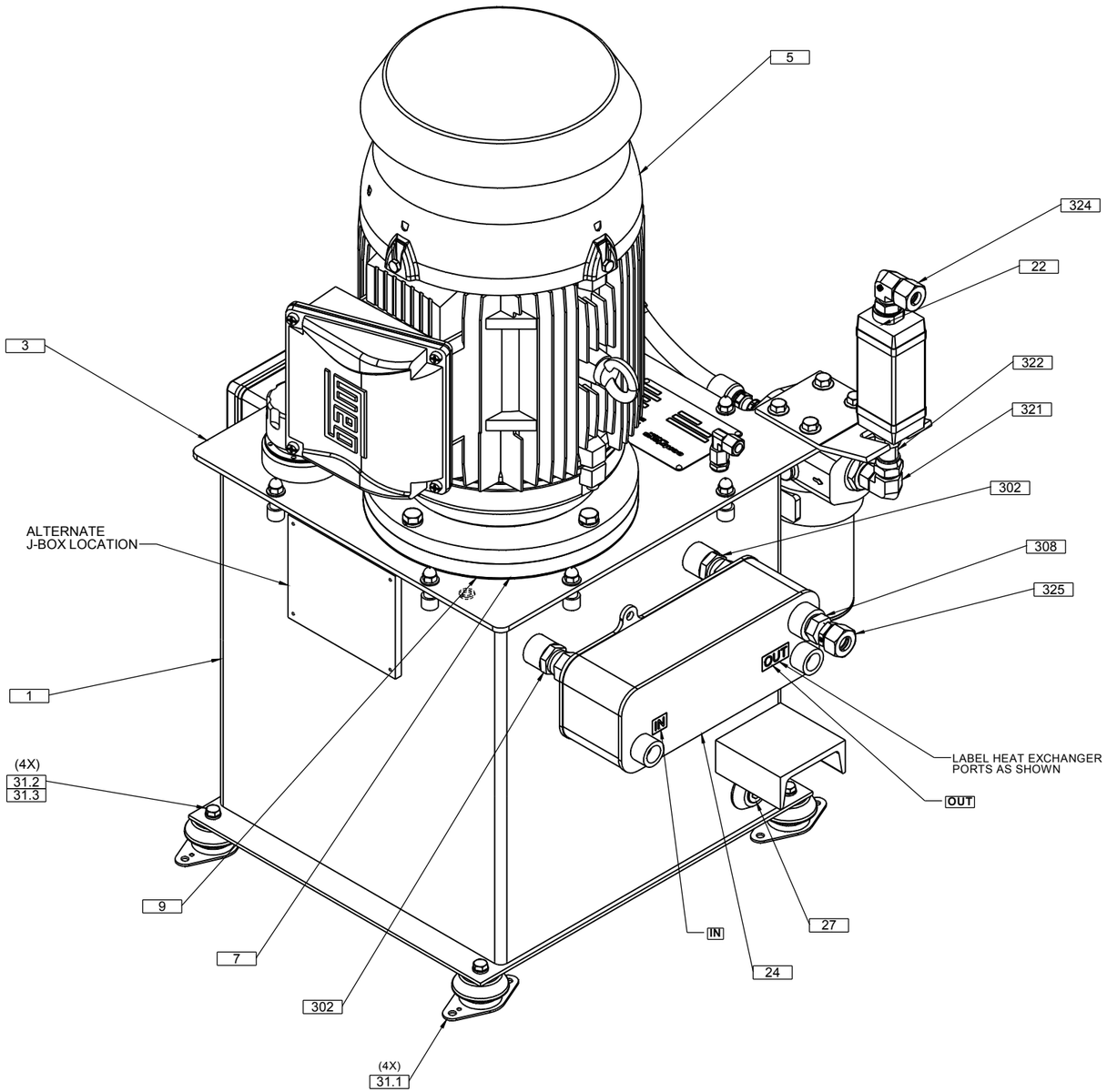
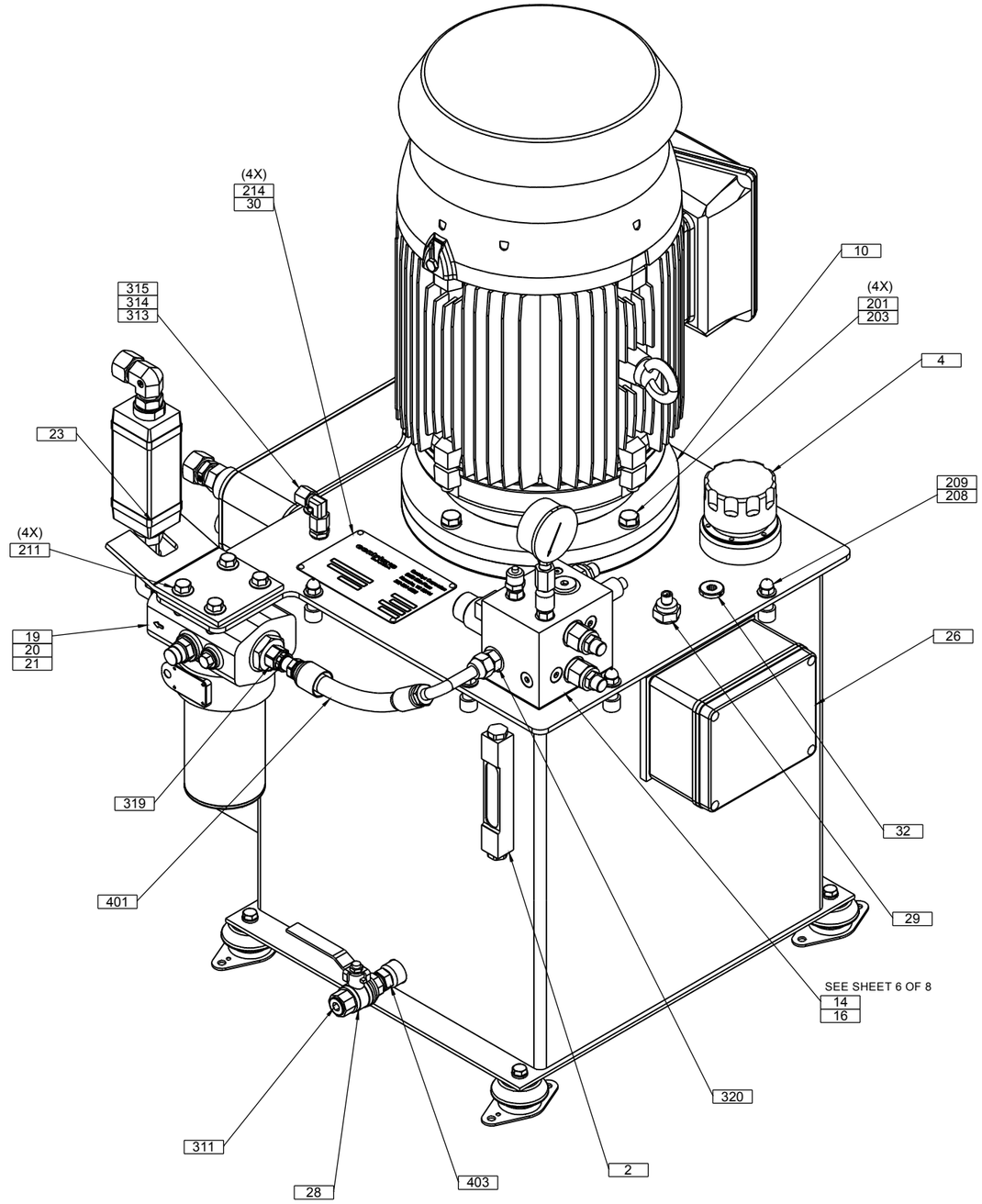
Title: CENTRISYS WEG HPU 11kW 22LPM CS11-22-Z-TW-21 WTR HE T-STATS
Project:
Part #:
Drawing #: G1700103-HPU
Sht: 3 OF 7
Scale: 1:12 0

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| JP | 08/01/2017 | G1700103 |
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Designed by: – Date: –
Drawn by: A.A. Date: –
Chk'd by: – Date: –
Approved by: – Date: –

GD&T ASME Y14.5M1994+ Tolerancing Std. & Rules apply

3rd Angle Projection

Material(s):

Estimated weight (lbs):

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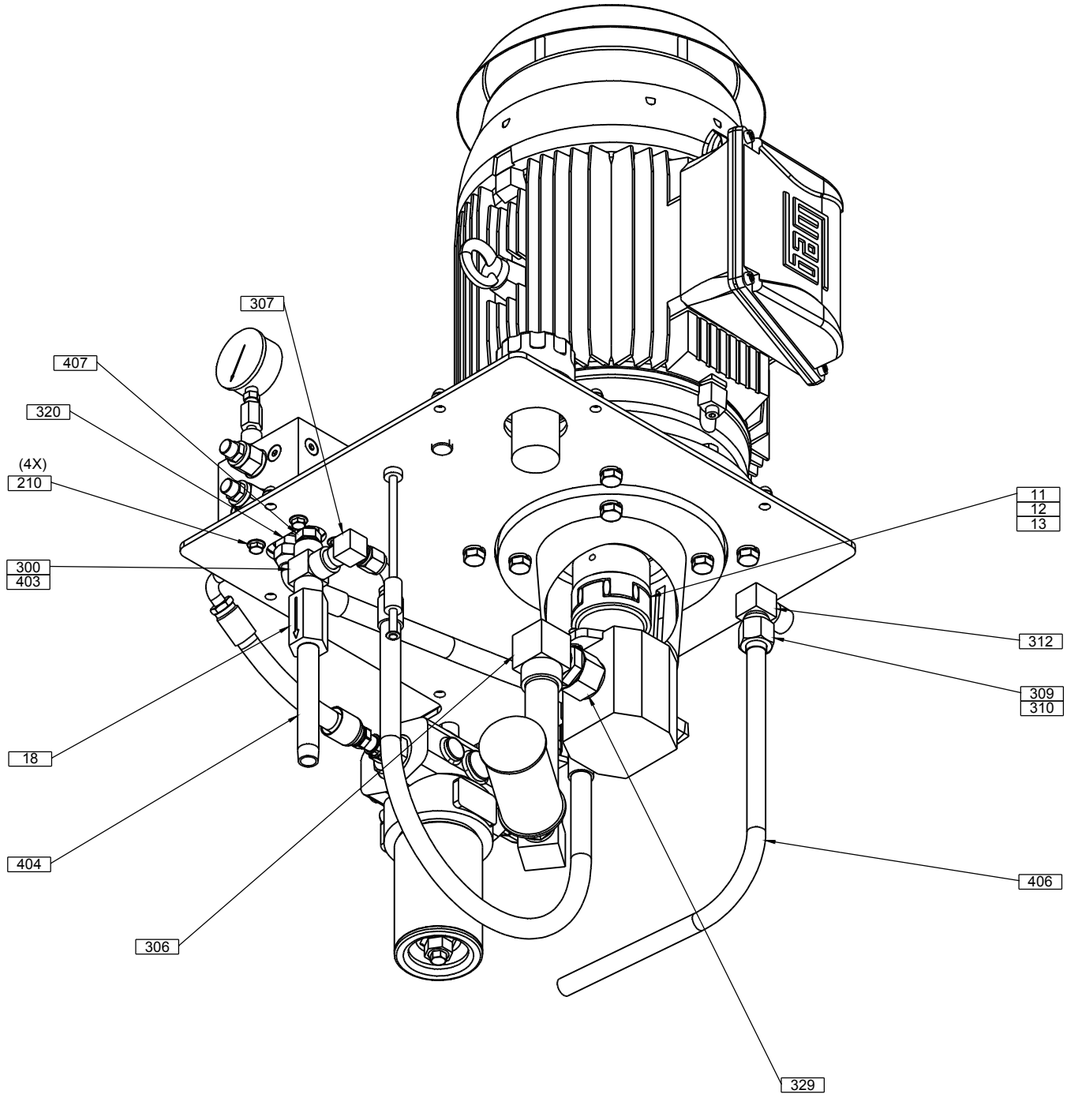
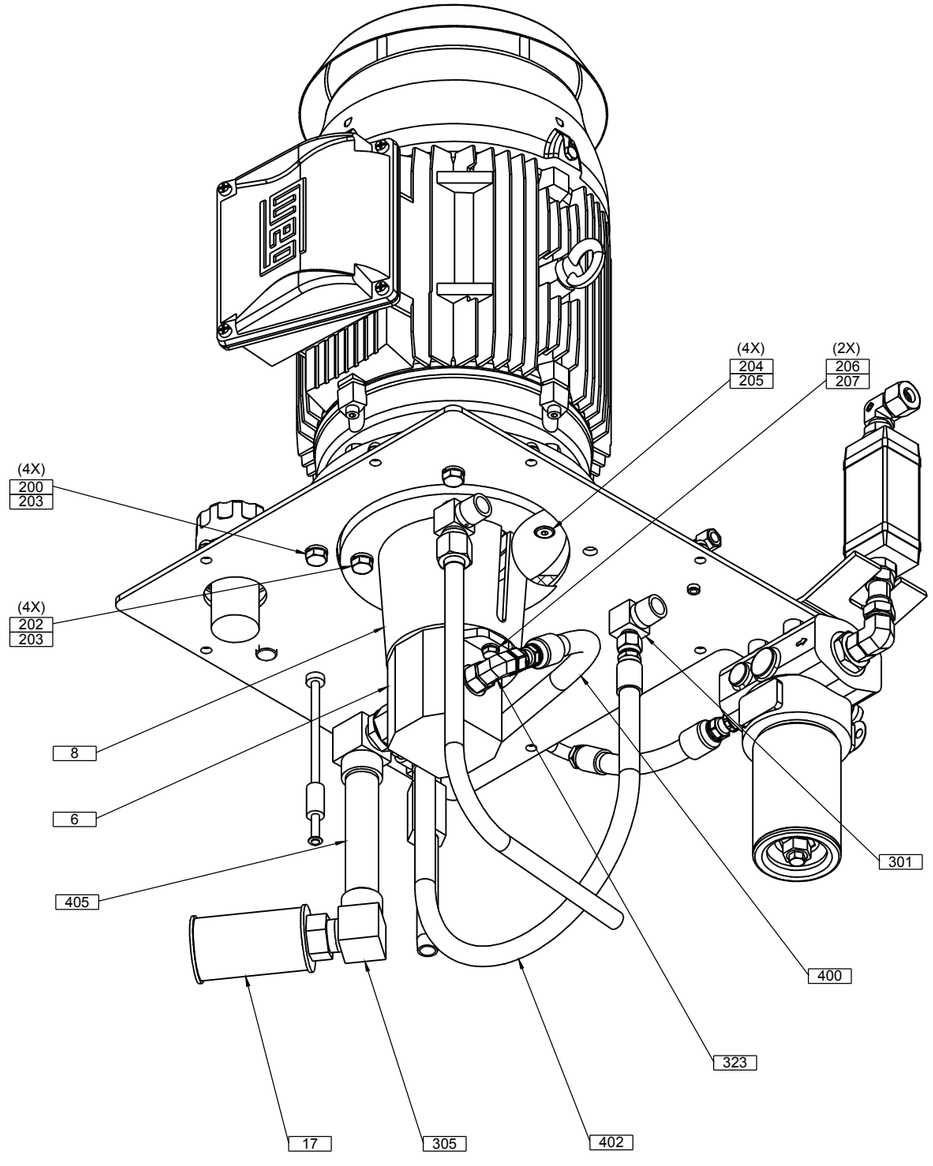
Title: CENTRISYS WEG HPU 11kW 22LPM CS11-22-Z-TW-21 WTR HE T-STATS

Project:

Part #: Drawing #: GI700103-HPU

Sht: 4 OF 7 Scale: 1:3 0




| DRAWN BY | DRAWN DATE | PROJECT NUMBER |
|---|---|---|
| JP | 08/01/2017 | G1700103 |
| CHECKED BY | CHECKED DATE | S86W18498 Enterprise Drive<br>Muskego, Wisconsin 53150 |
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| | |
|---|---|
| Designed by: – | Date: – |
| Drawn by: A.A. | Date: – |
| Chk'd by: – | Date: – |
| Approved by: – | Date: – |

GD&T ASME Y14.5M1994+ Tolerancing Std. & Rules apply

3rd Angle Projection

Material(s):

Estimated weight (lbs):

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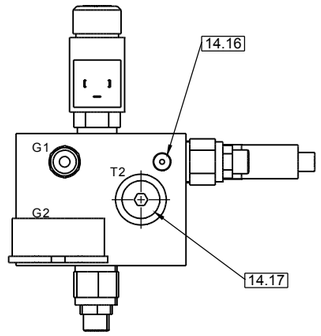
Title: CENTRISYS WEG HPU 11kW 22LPM CS11-22-Z-TW-21 WTR HE T-STATS

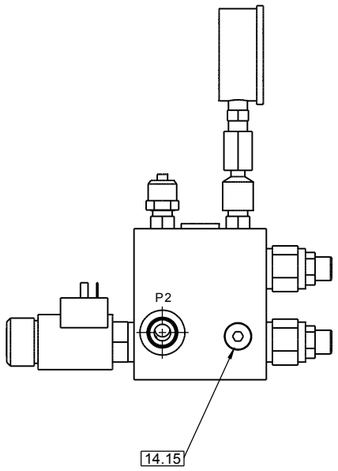
Project:

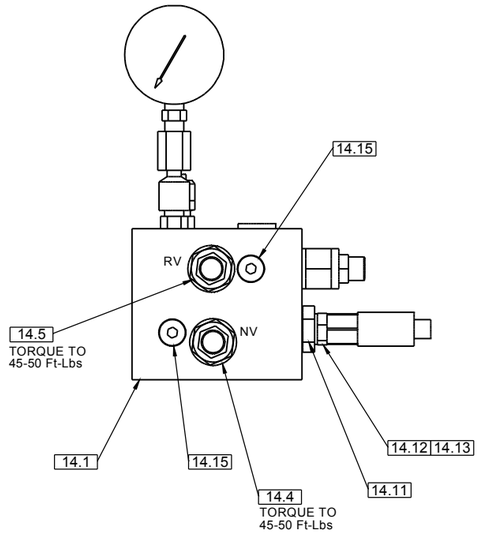
Part #: Drawing #: G1700103-HPU

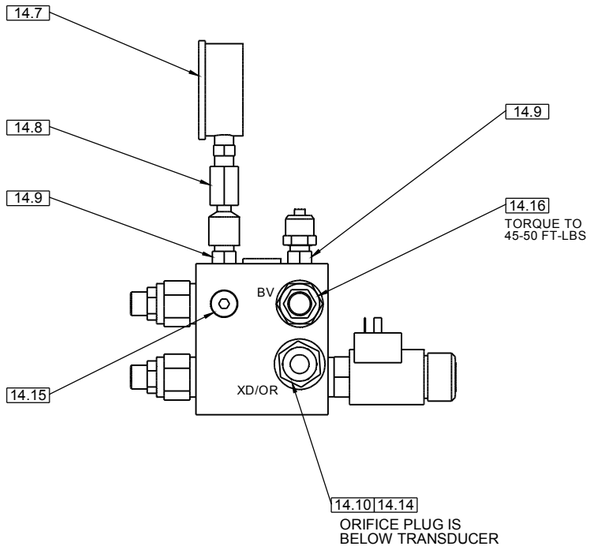
Sht: 5 OF 7 Scale: 1:3 0

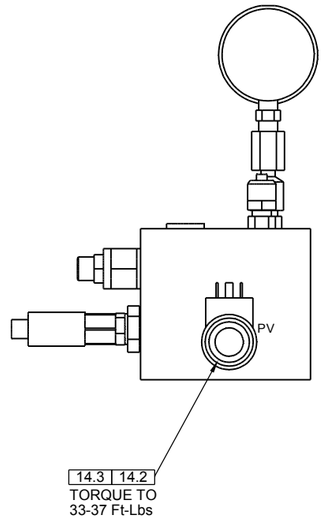
| ITEM | QTY | PART NUMBER | DESCRIPTION |
|---|---|---|---|
| 14 | 1 | G1300075-MA1 | CENTRISYS MANIFOLD ASSM, FIXED PUMP UNITS |
| 14.1 | 1 | BLK00202A-CC | BLOCK FOR CENTRISYS W/ORIFICE (WAS 020907-1-1BLK W/O ORIF) |
| 14.2 | 1 | 850254119 | VALVE, COMATROL, PROP 2-WAY CARTRIDGE (PSV10-NC-40-00-00-B-0) |
| 14.3 | 1 | M19P-24D-0.9A-DN | COIL, COMATROL, 24VDC HIRSCHMAN CONNECTION |
| 14.4 | 1 | FCVL-10-N-S-0-NV | VALVE, BUCHER, FLOW CONTROL CARTRIDGE, LOCKABLE |
| 14.5 | 1 | RVPS-10-N-S-0-50 | VALVE, BUCHER, P.O. RELIEF CARTRIDGE, SPOOL, 50-5000 PSI |
| 14.6 | 1 | LCEF-10-N-A-S-0-160 | VALVE, BUCHER, LOGIC CONTROL ELEMENT, PILOT TO CLOSE, 40-160 PSI |
| 14.7 | 1 | CF-1P-350-A | GAUGE, PCI, 0-5000 PSI [0-350 BAR], 1/4"NPT MALE BOTTOM MTD, 2.50" DIAL |
| 14.8 | 1 | H900-86 | FITTING, PCI, DIRECT GAGE CONNECTOR M16X2 / 1/4 NPT FEMALE, 5800 PSI |
| 14.9 | 2 | H900-11 | FITTING, PCI, TEST POINT M16X2 / 04SAE MALE, BUNA-N, 9100 PSI |
| 14.10 | 1 | PT250R-11-LI3-H1131 | TRANSDUCER, TURCK, 0-250 BAR, 4-20 MA, 1/4 BSPP FEMALE |
| 14.11 | 1 | RI1/2EDX1/4CF | FITTING, PARKER, 1/2" BSPP MALE TO 1/4" BSPP FEMALE ADAPTER |
| 14.12 | 1 | 9500-04 | SEAL WASHER, ADAPATALL, 1/4 BSPP MALE THREAD |
| 14.13 | 1 | 9000-04-04 | FITTING, ADAPTALL, 1/4 BSPP MALE TO 1/4 BSPP MALE ADAPTER |
| 14.14 | 1 | EH-20-SS | ORIFICE PLUG, OKEEFE CONTROLS, 1/4"NPT PLUG X .020" ORIFICE |
| 14.15 | 4 | 22S-S06 | PLUG, EPCO, 06SAE STR THRD, INTERNAL HEX, BUNA-N |
| 14.16 | 1 | 22S-S02 | PLUG, EPCO, 02SAE STR THRD, INTERNAL HEX, BUNA-N |
| 14.17 | 1 | 22S-S10 | PLUG, EPCO, 10SAE STR THRD, INTERNAL HEX, BUNA-N |

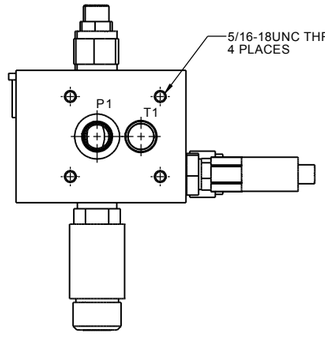



| | |
|---|---|
| P1, P2 | 8 SAE |
| T2 | 10 SAE |
| T1 | 1/2" NPT |
| XD | 1/2" BSP |
| G1, G2 | 4 SAE |

| DRAWN BY | DRAWN DATE | PROJECT NUMBER |
|---|---|---|
| JP | 08/01/2017 | G1700103 |
| CHECKED BY | CHECKED DATE | S86W18498 Enterprise Drive |
| DJ | 08/01/2017 | Muskego, Wisconsin 53150 |

GRIMSTAD

**CERTIFIED DRAWING**

This is an as-built drawing. Manual revisions are prohibited. Revisions are noted on sheet 1.

Signed By: John Porter Date: 08/07/2017

REVISE ON CAD ONLY

centrisys
CENTRIFUGE SYSTEMS
9586 58TH PLACE
KENOSHA, WI 53144
TEL: (262) 654-6006
FAX: (262) 654-6063

Designed by: - Date: -
Drawn by: A.A. Date: -
Chk'd by: - Date: -
Approved by: - Date: -

GD&T ASME Y14.5M1994+ Tolerancing Std. & Rules apply

3rd Angle Projection

Material(s):

Estimated weight (lbs):

THIS PRINT IS PROVIDED ON A RESTRICTED BASIS AND IS NOT TO BE USED IN ANY WAY DETRIMENTAL TO THE INTERESTS OF CENTRISYS.

Title: CENTRISYS WEG HPU 11kW 22LPM CS11-22-Z-TW-21 WTR HE T-STATS

Project:

Part #:

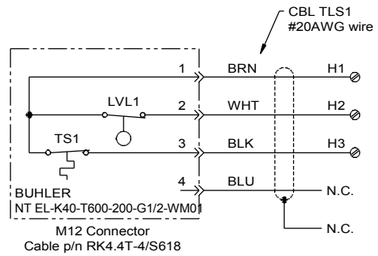
Drawing #: G1700103-HPU

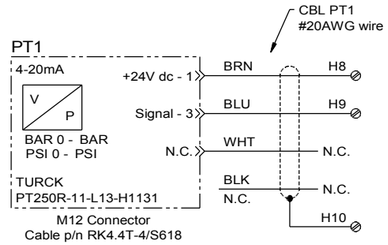
Sht: 6 OF 7

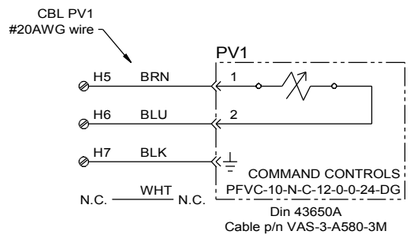
Scale: 1:2 0

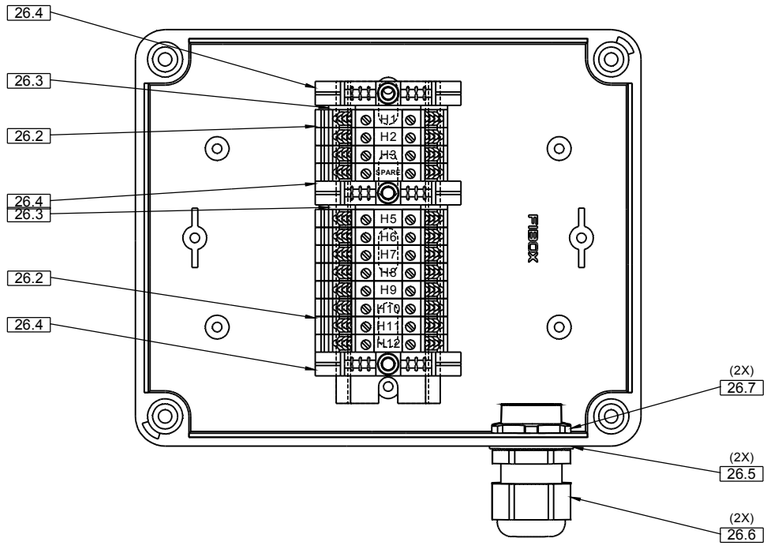
| ITEM | QTY | PART NO. | DESCRIPTION |
|---|---|---|---|
| 26 | 1 | G1300075-JBOX8 | ELECTRICAL J-BOX ASM, JM GRIMSTAD |
| 26.1 | 1 | PCH95G | POLYCARBONATE ENCLOSURE FIBOX, NEMA4, 6.7LX5.5WX3.7H |
| 26.2 | 14 | 57.504.0055.0 | TERMINAL BLOCK, WIELAND, 6MM |
| 26.3 | 2 | 07.311.0155 | END BARRIER, WIELAND, FOR 6MM TERMINAL BLOCK |
| 26.4 | 4 | Z5.522.8553 | END ANCHOR, WIELAND |
| 26.5 | 3 | SG1 | SEAL RING, CROUSE HINES, 1/2" PVC GASKET |
| 26.6 | 2 | PCG-1/2X | CORD GRIP, MENCOM, .197-.354", 1/2" NPT, GRAY PLASTIC |
| 26.7 | 2 | LN101SC | LOCK-NUT, T&B, 1/2"NPT |
| 26.8 | 2 | RK4.4T-4/S618 | 3 PIN CONNECTOR, TURCK, 4 METERS SHIELDED CABLE |
| 26.9 | 9 | 110075/8 | FERRULE, MIROMAR, INSULATED 8MM WHITE FOR #20GA WIRE |
| 26.10 | 1 | PG16-2X6 | CORD GRIP GLAND, MENCOM, 2 HOLE |
| 26.11 | 1 | VAS 3-A580-3M | CABLE, TURCK, N.O. DIN 43650 3+ GRD, 3 METERS, PVC JACKET |

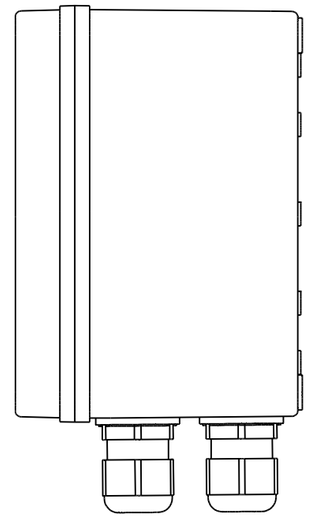
CABLE LENGTHS DETERMINED AFTER THE JBOX IS MOUNTED TO THE POWER UNIT.

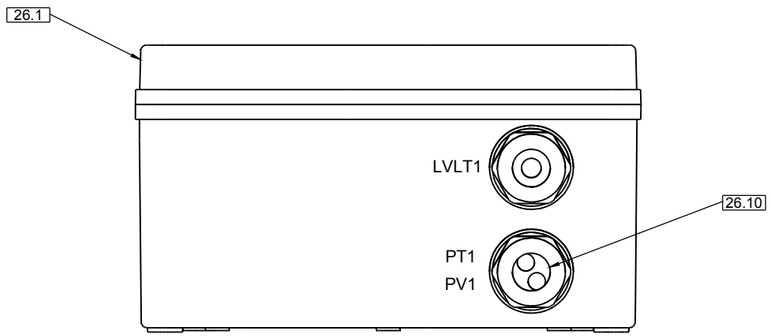





| DRAWN BY | DRAWN DATE | PROJECT NUMBER |
|---|---|---|
| JP | 08/01/2017 | G1700103 |
| CHECKED BY | CHECKED DATE | S86W18498 Enterprise Drive<br>Muskego, Wisconsin 53150 |
| DJ | 08/01/2017 | |

GRIMSTAD

**CERTIFIED DRAWING**

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Signed By: John Porter Date: 08/07/2017

REUSE ON CAD ONLY

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KENOSHA, WI 53144
TEL: (262) 654-6006
FAX: (262) 654-6063

Designed by: - Date: -
Drawn by: AA Date: -
CHK'd by: - Date: -
Approved by: - Date: -

GD&T ASME Y14.5M1994+ Tolerancing Std. & Rules apply

3rd Angle Projection

Material(s): -

Estimated weight (lbs): -

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Title: CENTRISYS WEG HPU 11kW 22LPM CS11-22-Z-TW-21 WTR HE T-STATS

Project:

Part #: Drawing #: G1700103-HPU

Sht: 7 OF 7 Scale: 1:1 0

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| End User Account Name | Ref Contact | Email (Ref Contact) (Contact) | Business Phone (Ref Contact) | Mobile Phone (Ref Contact) | City | State | Category Type | Industry Type | Industry Subtype | Mfr Model Type |
|---|---|---|---|---|---|---|---|---|---|---|
| El Mirage, AZ | Kevin Voight | kvoigt@elmirageaz.gov | (480) 825-0411 | | El Mirage | AZ | Capital - Municipal | Municipal Wastewater | | CS10-4 |
| City of Prescott, AZ | Ben Metzler | benjiman.metzler@prescott-az.gov | (928) 777-1641 | | Prescott | AZ | Capital - Municipal | Municipal Wastewater | Waste Activated Sludge | CS14-4 |
| City of Kingman, AZ - WWTP | | | | | Kingman | AZ | Capital - Municipal | Municipal Wastewater | Waste Activated Sludge | CS14-4 |
| City of Goodyear, AZ - Rainbow Plant | Rob Koontz | rob.koontz@goodyearaz.gov | (623) 882-7615 | 623-693-2488 | Goodyear | AZ | Capital - Municipal | Municipal Wastewater | Waste Activated Sludge | CS18-4 |
| City of Goodyear, AZ - 157th Ave Plant | Rob Koontz | rob.koontz@goodyearaz.gov | (623) 882-7615 | 623-693-2488 | Goodyear | AZ | Capital - Municipal | Municipal Water & Wastewater | Waste Activated Sludge, and Water Plant Sludge | CS18-4 |
| City of Goodyear, AZ - 157th Ave Plant | Rob Koontz | rob.koontz@goodyearaz.gov | (623) 882-7615 | 623-693-2488 | Goodyear | AZ | Capital - Municipal | Municipal Water & Wastewater | Waste Activated Sludge, and Water Plant Sludge | CS18-4 |
| Baker Commodities, Inc. - AZ | Manuel Camargo | mcamargo@bakercommodities.com | (602) 989-3171 | | Phoenix | AZ | Capital - Industrial | Animal Protein & By-products | Animal Rendering Wastewater | CS21-4HC |
| Liberty Water Palm Valley WRF | Terry Gilbertson | terry.gilbertson@libertywater.com | 623-935-3005 | 623-293-6277 | Goodyear | AZ | Capital - Municipal | Municipal Wastewater | Aerobically Digested Sludge | CS21-4HC |
| City of Goodyear, AZ - 157th Ave Plant | Rob Koontz | rob.koontz@goodyearaz.gov | (623) 882-7615 | 623-693-2488 | Goodyear | AZ | Capital - Municipal | Municipal Water & Wastewater | Waste Activated Sludge, and Water Plant Sludge | CS26-4 |
| Tenaya Lodge/DNC Parks & Resorts | Mike Morrise | mmorrise@delawarenorth.com | 559-683-6555 | | Fish Camp | CA | Capital - Municipal | Municipal Wastewater | Waste Activated Sludge | CS10-4 |
| Steen Research | Steve Temple | | | 814-931-7036 | Hayward | CA | Capital - Industrial | Food & Beverage | Other | CS14-4 |
| Modesto WholeSoy Company Tan Industries | Closed | | | | Modesto | CA | Capital - Industrial | Food & Beverage | Soy | CS14-4 |
| Chukchansi Gold Resort & Casino | Daniel Burns | | 1 | 559-692-5375 | CoarseGold | CA | Capital - Municipal | Municipal Wastewater | Dewatering | CS14-4 |
| Camp Pendleton | Kevin Ham | kevin.ham@usmc.mil | (760) 725-4018 | | Oceanside | CA | Capital - Municipal | Municipal Wastewater | Dewatering | CS14-4 |
| Lake of the Pines WWTP | Chad McBride | chad.mcbride@co.nevada.ca.us | (530) 265-7121 | | Auburn | CA | Capital - Municipal | Municipal Wastewater | Aerobically Digested Sludge | CS14-4 |
| Foster Farms Corporate - Livingston | Mike Norton | | +1 (360) 575-4911 | 1 | Porterville | CA | Capital - Industrial | Animal Protein & By-products | Poultry By-Products | CS14-4 |
| Petroleum Solids Control | Manuel Tollini | manuel@petroleumsolids.com | +1(562) 424-0254 | +1 (562) 254-6341 | Signal Hil | CA | Capital - Industrial | PetroChemical | Drilling Mud | CS18-3 |
| Petroleum Solids Control | Manuel Tollini | manuel@petroleumsolids.com | +1(562) 424-0254 | +1 (562) 254-6341 | Signal Hill | CA | Capital - Industrial | PetroChemical | Drilling Mud | CS18-3 |
| Petroleum Solids Control | Manuel Tollini | manuel@petroleumsolids.com | +1(562) 424-0254 | +1 (562) 254-6341 | Signal Hill | CA | Capital - Industrial | PetroChemical | Drilling Mud | CS18-3 |
| Petroleum Solids Control | Manuel Tollini | manuel@petroleumsolids.com | +1(562) 424-0254 | +1 (562) 254-6341 | Signal Hill | CA | Capital - Industrial | PetroChemical | Oil Refinery | CS18-3 |
| Lake Wildwood WWTP, County of | Brad Torres | brad.torres@co.nevada.ca.us | (530) 265-1555 | | Penn Valley | CA | Capital - Municipal | Municipal Wastewater | Waste Activated Sludge | CS18-4 |
| Tahoe Truckee Sanitation Agency | Richard Pallante | rpallante@ttsa.net | 530-587-2527 | | Truckee | CA | Capital - Municipal | Municipal Wastewater | Thickening | CS18-4 |
| Fallbrook Municipal Water District | Craig Brown | craigb@fpud.com | (760)728-1125 | | Fallbrook | CA | Capital - Municipal | Municipal Wastewater | | CS18-4 |
| Placer County Water Agency | Rick Bauer | RBauer@pcwa.net | 530-823-4924 | | Auburn | CA | Capital - Municipal | Municipal Water | Alum | CS18-4 |
| Sunsweet Growers, Inc. | Matt Kelly | | 1 | +1 (530) 682-7885 | Yuba City | CA | Capital - Industrial | Food & Beverage | Juice | CS18-4 |
| Valley Center Municipal Water District | Rick Beath | rbeath@valleycenterwater.org | 760-765-4547 | | Escondido | CA | Capital - Municipal | Municipal Water | TBD - To Be Determined | CS18-4 |
| City of Pacifica, CA - Calera Creek WWTP | Maria Aquilar | aguilarm@ci.pacifica.ca.us | 1 | 650-738-4662 | Pacifica | CA | Capital - Municipal | Municipal Wastewater | | CS18-4 |
| Foster Farms Corporate - Livingston | Ron Curiel | ron.curiel@fosterfarms.com | 209-394-5251 | 209-226-3641 | Livingston | CA | Capital - Industrial | Animal Protein & By-products | Poultry | CS21-4 |
| Foster Farms Corporate - Livingston | Ron Curiel | ron.curiel@fosterfarms.com | 209-394-5252 | 209-226-3642 | Livingston | CA | Capital - Industrial | Animal Protein & By-products | Poultry By-Products | CS21-4 |
| Sierra Process System, Inc. | Stan Ellis | sellis@bak.rr.com | 1 | +1 (661) 201-1000 | Bakersfield | CA | Capital - Industrial | PetroChemical | Oil Refinery | CS21-4 |
| Summit Environmental | | | | | Huntington Beach | CA | | | | CS21-4 |
| Synagro - CT - New Haven | Henry Glasser | | | 415-820-5600 | Modesto | CA | Capital - Industrial | Food & Beverage | Soy | CS21-4 |
| RL Environmental Services, INC | Randy Jackson | rjackson@rleinc.us | (661) 706-5200 | | Bakersfield | CA | Capital - Industrial | PetroChemical | Oil Refinery | CS21-4 |
| Tahoe Truckee Sanitation Agency | Richard Pallante | rpallante@ttsa.net | 530-587-2525 | | Truckee | CA | Capital - Municipal | Municipal Wastewater | Anaerobically Digested Sludge | CS21-4 |
| Tahoe Truckee Sanitation Agency | Richard Pallante | rpallante@ttsa.net | 530-587-2526 | | Truckee | CA | Capital - Municipal | Municipal Wastewater | Anaerobically Digested Sludge | CS21-4 |
| Kappa Products Corporation | Mike Vignovich | vignovich@petroleumsolids.com | +1 (562) 424-0254 | +1 (562) 254-4924 | Morris | CA | Capital - Industrial | PetroChemical | Oil Refinery | CS21-4 |
| Sierra Process System, Inc. | Stan Ellis | sellis@bak.rr.com | 1 | +1 (661) 201-1000 | Houston | CA | Capital - Industrial | PetroChemical | Oil Refinery | CS21-4 |
| Susanville Sanitary Community/Sanitary District | Steve Stump | steve@susanvillesanitarydistrict.com | (530) 257-5665 | | Susanville | CA | Capital - Municipal | Municipal Wastewater | Aerobically Digested Sludge | CS21-4 |
| City of Manteca, CA - Dept. of Public Works | Andrew Barrious | abarrious@ci.manteca.ca.us | 209-456-8470 | 1 | Manteca | CA | Capital - Municipal | Municipal Wastewater | Anaerobically Digested Sludge | CS21-4 |
| Sierra Process System, Inc. | Stan Ellis | sellis@bak.rr.com | 1 | +1 (661) 201-1000 | Bakersfield | CA | Capital - Industrial | PetroChemical | Oil Refinery | CS21-4 |
| City of Riverside, CA | Victor Corrales | vcorrales@riversideca.gov | 951-351-6205 | 951-288-8554 | Riverside | CA | Capital - Municipal | Municipal Wastewater | Anaerobically Digested Sludge | CS21-4HC |
| City of Delano, CA | Daniel Ulloa | dulloa@cityofdelano.org | (661) 721-3352 | | Delano | CA | Capital - Municipal | Municipal Wastewater | Primary & WAS Blend | CS21-4HC |
| Baker Commodities, Inc. - Los Angeles, CA | Jesse Hernandez | | +1 (323) 353-6918 | +1 (323) 353-6918 | Los Angeles | CA | Capital - Industrial | Animal Protein & By-products | Animal Rendering Wastewater | CS21-4HC |
| City of Patterson, CA | Victorio Tostado | vtostado@ci.patterson.ca.us | | 1 | Patterson | CA | Capital - Municipal | Municipal Wastewater | Aerobically Digested Sludge | CS21-4HC |
| EMWD Moreno Valley | Van tang | tangv@emwd.org | (951) 928-3777 | | Moreno Valley | CA | Capital - Municipal | Municipal Wastewater | Waste Activated Sludge | CS26-4 |
| EMWD Perris Eastern Municipal Water District | James Rhodes | rhodesj@emwd.org | (951) 928-3777 | | Perris Valley | CA | Capital - Municipal | Municipal Wastewater | Anaerobically Digested Sludge | CS26-4 |
| EMWD San Jacinto Eastern Municipal Water District | Mike Brem | brehmm@emwd.org | (951) 928-3777 | | San Jacinto | CA | Capital - Municipal | Municipal Wastewater | Waste Activated Sludge | CS26-4 |
| EMWD Temecula Eastern Municpal Water District | Brian Cohen | CohenB@emwd.org | 951-928-3777 | | Temecula | CA | Capital - Municipal | Municipal Wastewater | Waste Activated Sludge | CS26-4 |
| Inland Empire | Robert Delgado | rdelgado@ieua.org | (909)993-1679 | | Ontario | CA | Capital - Municipal | Municipal Wastewater | Anaerobically Digested Sludge | CS30-4 |
| Lyons CO | Wayne Ramey | wayner@recinc.net | 303-833-5505 | | Lyons | CO | Capital - Municipal | Municipal Wastewater | | CS10-4 |
| City of Delta, CO | Andy Mitchell | andy@cityofdelta.net | 970-874-7566 | 970-261-7916 | Delta | CO | Capital - Municipal | Municipal Wastewater | Anaerobically Digested Sludge | CS14-4 |
| Upper Thompson Sanitation District | Henery Newhouse | henery@utsd.org | 970-586-5389 | 970-646-5994 | Estes Park | CO | Capital - Municipal | Municipal Wastewater | Dewatering | CS18-4 |
| City of Montrose, CO - WWTP | Hyrum Webb | hwebb@cityofmontrose.org | 970-240-1452 | 970-901-0134 | Montrose | CO | Capital - Municipal | Municipal Wastewater | Aerobically Digested Sludge | CS18-4HC |
| City of Montrose, CO - WWTP | Hyrum Webb | hwebb@cityofmontrose.org | 970-240-1452 | 970-901-0134 | Montrose | CO | Capital - Municipal | Municipal Wastewater | Aerobically Digested Sludge | CS18-4HC |
| Silverthorne - Blue River WWTP | Jason Kruckerberg | JKruckeberg@silverthorne.org | +1 (970) 468-6152 | | Silverthorne | CO | Capital - Municipal | Municipal Wastewater | Dewatering | CS21-4 |
| JBS Swift & Company - Greeley CO | Fernando Meza | Fernando.meza@jbssa.com | 970-371-8589 | 970-371-8589 | Greeley | CO | Capital - Industrial | Animal Protein & By-products | Animal Rendering Wastewater | CS21-4HC |
| JBS Swift & Company - Greeley CO | Fernando Meza | Fernando.meza@jbssa.com | 970-371-8589 | 970-371-8589 | Greeley | CO | Capital - Industrial | Animal Protein & By-products | Three Phase (Fat Recovery) | CS21-4HC |
| JBS Swift & Company - NE Grand Island | Corbin Utley | corbin.utley@jbssa.com | 308-395-9437 | 308-258-1025 | Grand Island | CO | Capital - Industrial | Animal Protein & By-products | Three Phase (Fat Recovery) | CS21-4HC |
| Longmont CO | Matt Brunning | matt.brunning@longmontcolorado.gov | (303) 651-8748 | | Longmont | CO | Capital - Municipal | Municipal Wastewater | Anaerobically Digested Sludge | CS24-4EV |
| Dairy Specialists LLC | Randy Sorensen | randy@dairyspecialists.com | 970-330-1870 | +1 (970) 590-3838 | Hillrose | CO | Capital - Industrial | Animal Protein & By-products | Other | CS26-4 |
| Dairy Specialists LLC | Dave McGinley | dmcginley@dairyspecialists.com | (970) 330-1870 | (970) 590-3230 | Pierce | CO | Capital - Industrial | Industrial Wastewater | Primary Sludge | CS26-4 |
| Denver Metro Wastewater Reclamation District - (NTP) | Paul Gaetano | PGaetano@mwrd.dst.co.us | (303) 286-3147 | | Denver | CO | Capital - Municipal | Municipal Wastewater | ATAD | CS26-4 |
| Fort Collins - Drake WRF | Nick Russle | nrussell@fcgov.com | 970.217.9588 | | Fort Collins | CO | Capital - Municipal | Municipal Wastewater | Anaerobically Digested Sludge | CS26-4 |
| Denver Metro Wastewater Reclamation District | Daniel Stillwell | dstillwell@mwrd.dst.co.us | +1 (303) 286-3301 | | Denver | CO | Capital - Municipal | Municipal Wastewater | Primary & WAS Blend | CS26-4 |
| Kauai County - Waimea WWTP | Peter Honjo | waimeaww@kauai.gov | (808) 212-9928 | | Waimea | HI | Capital - Municipal | Municipal Wastewater | Aerobically Digested Sludge | Cs14-4 |
| Kauai County - Lihue STP | | | | | Lihue | HI | Capital - Municipal | Municipal Wastewater | | CS21-4 |
| Kauai County - Wailua STP | John Nakashima | jnakashima@kauai.gov | (808) 241-4082 | | Wailua | HI | Capital - Municipal | Municipal Wastewater | | CS10-4 |
| Kailua WWTP | Fil Quibilan | | 1 (808) 254-4063 | 808-254-1954 | Kailua | HI | Capital - Municipal | Municipal Wastewater | Anaerobically Digested Sludge | CS21-4HC |
| City of Blackfoot, ID | Eric Hadley | ehadley@cityofblackfoot.org | 208-785-8616 | | Blackfoot | ID | Capital - Municipal | Municipal Wastewater | Dewatering | CS21-4 |
| Douglas County Sewer District | Bob Edmonds | | +1 (775) 356-8004 | +1 (775) 772-0976 | Zephyr Cove | NV | Capital - Municipal | Municipal Wastewater | Aerobically Digested Sludge | CS21-4 |
| Pipe Maintenance Service, Inc. | John Martin | | | +1 (702) 373-5234 | North Las Vegas | NV | Capital - Industrial | Animal Protein & By-products | Three Phase (Fat Recovery) | CS21-4HC |
| Hubbard Public Works | Melinda Olinger | molinger@cityofhubbard.org | 503-982-9429 | | Hubbard | OR | Capital - Municipal | Municipal Wastewater | Waste Activated Sludge | CS10-4 |
| Pacific Coast Seafoods Bio Oregon AKA Pacific Surimi Joint Venture | B. Bigelow | | 1 | +1 (503) 338-2029 | Warrenton | OR | Capital - Industrial | Food & Beverage | Fish | CS21-4 |
| Crystal Ocean Seafood | | | | | Astoria | OR | Capital - Industrial | Food & Beverage | | CS21-4F |
| Peshastin/PUD No. 1 Chelan Cty | Dale Pipkin | dale.pipkin@chelanpud.org | (509) 663-8121 | | Peshastin | WA | Capital - Municipal | Municipal Wastewater | Aerobically Digested Sludge | CS10-4 |
| City of North Bend, WA | Don Deberg | ddeberg@northbendwa.gov | (425) 888-7652 | | North Bend | WA | Capital - Municipal | Municipal Wastewater | Aerobically Digested Sludge | CS14-4 |
| Ault Field Naval Air Station - Whidbey Island | | | | | Oak Harbor | WA | Capital - Municipal | Municipal Wastewater | Aerobically Digested Sludge | CS14-4 |
| Snoqualmie | Brian Gasper | bgasper@snoqualmiewa.gov | 425-888-1555 | | Snoqualmie | WA | Capital - Municipal | Municipal Wastewater | | CS14-4 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| City of Selah, WA - WWTP | Ben Arnold | ben.arnold.electric@gmail.com | (509) 698-7321 | | Selah | WA | Capital - Municipal | Municipal Wastewater | Aerobically Digested Sludge | CS18-4 |
| Southwest Suburban Sewer District | Brett Wittman | brett.wittman@swssd.com | 206 243 7770 | | Burien | WA | Capital - Municipal | Municipal Wastewater | Aerobically Digested Sludge | CS18-4 |
| Leavenworth WA WWTP | Antinio Muro | antoniom@cityofleavenworth.com | 509-548-5994 | | Leavenworth | WA | Capital - Municipal | Municipal Wastewater | Unfermented WAS | CS18-4 |
| Alaska Ocean Seafood, Inc. | | | | | Acortes | WA | Capital - Industrial | Food & Beverage | Fish | CS21-4 |
| Lamb-Weston ConAgra aka Twin City Foods - Prosser, WA | | | | | Prosser | WA | Capital - Industrial | Food & Beverage | Corn | CS21-4 |
| Environmental Management Corp. Quincy (formerly Earth Tech) | Travis Kirk | | 1 | +1 (509) 797-3008 | Quincy | WA | Capital - Industrial | Industrial Wastewater | Secondary Sludge | CS21-4 |
| City of Bremerton, WA | Travis Olsen | travis.olson@ci.bremerton.wa.us | (360) 473-5450 | | Bremerton | WA | Capital - Municipal | Municipal Wastewater | Anaerobically Digested Sludge | CS21-4 |
| J. Lieb Foods, Inc. | Daniel Critzer | | 1 | +1 (509) 930-6061 | Kennewick | WA | Capital - Industrial | Food & Beverage | Juice | CS21-4HC |
| Central Kitsap WA Treatment Plant | Dennis Graham | dgraham@co.kitsap.wa.us | (360) 337-5765 | | Central Kitsap | WA | Capital - Municipal | Municipal Wastewater | Anaerobically Digested Sludge | CS21-4HC |
| Vancouver City | Matt McCallum | matt.mccallum@jacobs.com | (360) 608-3447 | | Vancouver | WA | Capital - Municipal | Municipal Wastewater | Anaerobically Digested Sludge | CS26-4 |
| King County WA | Sekhar Palepu | sekhar.palepu@kingcounty.gov | (206) 263-3900 | | Seattle | WA | Capital - Municipal | Municipal Wastewater | Anaerobically Digested Sludge | CS26-4 |

# Attachment C: Velodyne Polymer System

**QTY.** **OPTION #2 DESCRIPTION**

**1** **VeloBlend Model VM-5P-1200-D-0-A-1 Liquid Polymer Blending System**

Polymer Flow Range: 0.25 to 5 GPH
Dilution Water Flow: 120 to 1200 GPH

Each unit shall include the following unless otherwise indicated:

1 Polymer Mixing Chamber:
- A. Series: VeloBlend VM
- B. Type: Staged Hydro-Mechanical
- C. Mixer Motor: ½ HP, 90 VDC, 1750 RPM, wash-down duty
- D. Mixer Shaft Seal: Mechanical with seal flushing assembly
- E. VeloCheck™ Neat Polymer Check Valve with Quick Release Pin
- F. Construction:
  1. Body: Stainless steel
  2. Impeller: Stainless steel
  3. Mechanical Seal: Ceramic, Carbon, Stainless steel, Viton
  4. Cover: Clear polycarbonate with stainless steel reinforced flange & discharge
- G. Pressure Rating: 100 psi
- H. Pressure Relief Valve: Brass

1 Neat Polymer Metering Pump Assembly:
- A. PVC FNPT union style polymer inlet
- B. Type: Progressive Cavity type
- C. Motor: ½ HP, 1750 RPM, 90 VDC, Wash-down duty motor with gear reducer
- D. Loss of polymer flow sensor
- E. Metering pump calibration assembly with isolation valves: 500 ml
- F. Plumbing: SCH. 80 PVC

1 Dilution Water Inlet Assembly shall be provided, including the following:
- A. Stainless steel FNPT water inlet connection
- B. Dilution water ON/OFF solenoid valve
- C. Control Valve: Manual rate control valve
- D. Primary dilution water flow meter type: Rotameter
- E. Low differential pressure alarm switch
- F. 0-160 psi inlet water pressure gauge (stainless steel, liquid filled)
- G. Plumbing: SCH. 80 PVC

1 Solution Discharge Assembly:
- A. Stainless steel FNPT solution discharge connection
- B. 0-160 psi solution discharge pressure gauge (stainless steel, liquid filled)
- C. Plumbing: SCH. 80 PVC

1 Control Panel:
- A. Enclosure: NEMA 4X FRP
- B. Power:
  1. Required: 120 VAC, 60 Hz., 1 Ph
  2. Disconnect: 10’ power cord with 120 VAC plug
- C. Motor controllers:
  1. Mixing Chamber
  2. Neat polymer metering pump
- D. Miscellaneous:
  1. Control circuit protection
  2. Control relays
  3. Power supplies
  4. Grounding blocks
  5. Numbers terminal blocks
  6. Wire labels, shrink-tube type

E. Operator Interface – Discrete Selector Switch
    1. System ON / OFF (reset) / REMOTE
    2. Ten-Turn Potentiometer – Metering Pump Control
    3. One-Turn Potentiometer – Mixer Speed Control
F. Status / Alarm Indicators:
    1. System Running Indication
    2. Main Power ON Indication
    3. LED Display Metering Pump Rate
    4. Low Water Differential Pressure Alarm
    5. Low Polymer Flow Alarm
G. Inputs (signals by others):
    1. Remote Start / Stop (discrete dry contact)
    2. Pacing Signal Based on Process Flow (4-20mA)
H. Outputs:
    1. System Running (discrete dry contact)
    2. System Remote Mode (discrete dry contact)
    3. Common Alarm (discrete dry contact)

1 System Skid:
A. Frame: 304 stainless steel, open frame design for access to all components
B. Fasteners: 304 SS
C. Designed for bolt-down

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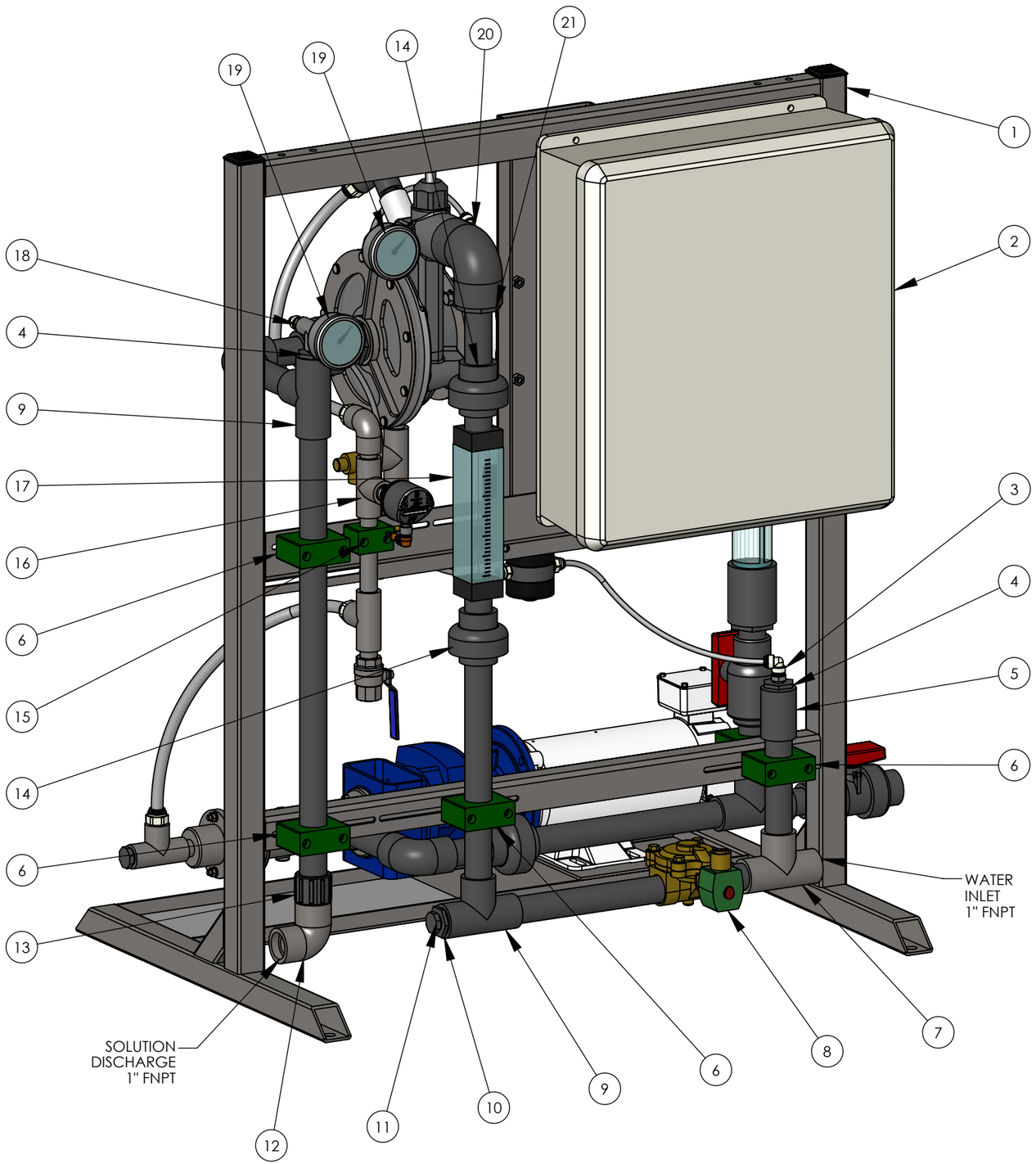


| REVISIONS | | | | |
|---|---|---|---|---|
| REV | ECO | DESCRIPTION | DATE | APPROVED |
| A | SO 5249 | INITIAL RELEASE | 5/7/19 | B HEALY |
| | | | | |
| | | | | |

NOTE: DRAWINGS ARE FOR GENERAL LAYOUT USE ONLY. SEE PROPOSAL FOR DETAILS OF THE PROPOSED SCOPE OF SUPPLY.

NOTES -

1) APPROXIMATE DRY WEIGHT 250 LBS

2) FOLLOW O&M PROCEDURES FOR DRAINING PRIOR TO STORAGE OR SHIPMENT

3) FRAME MATERIAL IS 304 SS AND HARDWARE IS 18-8 SS UNLESS OTHERWISE NOTED

| ITEM # | NUMBER | DESCRIPTION | QTY |
|---|---|---|---|
| 1 | 158-1353 | FRAME, VELOBLEND, COMPACT, 3 SPAN, 18X16 | 1 |
| 2 | 970-4000 | CONTROL PANEL ASSY, VM-P-D-0-A, STD | 1 |
| 3 | 194-1326 | ELBOW, 1/4" TUBE - 1/4 MNPT, PP | 2 |
| 4 | 194-2012 | REDUCER, BUSHING, 1" X 1/4", SXT, SR, SCH 80, PVC | 2 |
| 5 | 194-0445 | COUPLING, 1", SXS, PVC | 1 |
| 6 | 194-0027 | CLAMP, PIPE, 1", STAUFF | 5 |
| 7 | 194-0442 | TEE, 1", FPT, 304 SS | 1 |
| 8 | 248-0160 | VALVE, SOLENOID, 1" FNPT, BRASS/NBR, 120 VAC, ASCO | 1 |
| 9 | 194-0314 | TEE, 1" SOC, SCH 80, PVC | 3 |
| 10 | 194-0690 | REDUCER, BUSHING, 1" X 1/2", SXT, SCH 80, PVC | 1 |
| 11 | 194-0407 | PLUG, 1/2" , T, SCH 80, PVC | 3 |
| 12 | 194-0496 | ELBOW, 90, 1" NPT, 304 | 1 |
| 13 | 194-0618 | ADAPTER, MALE, 1", SCH 80, PVC, S X MPT | 1 |
| 14 | 194-0642 | UNION, 1", SXS, PVC/VITON | 4 |
| 15 | 194-0029 | CLAMP, PIPE, 1/2", STAUFF | 1 |
| 16 | 182-0462 | SENSOR ASSY, FLOW, THERMAL, SI5006, AC, 1/2" | 1 |
| 17 | 182-0088 | FLOW METER, ROTAMETER, 20 GPM, 1" FNPT | 1 |
| 18 | 194-0587 | TEE, 1/4", T X T X T, 304 | 1 |
| 19 | 182-0002 | GAUGE, PRESSURE, 2.5", 160 PSI, SS/BRASS, 1/4" MNPT, BACK MNT, GLYCERINE FILL | 2 |
| 20 | 194-0137 | ELBOW, 90 DEG, 1 1/2" SOC, PVC | 1 |
| 21 | 194-0687 | REDUCER, BUSHING, 1.5" X 1", SXS, SCH 80, PVC | 1 |

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES:
DECIMALS
.XX = ±.015
.XXX = ±.005
ANGLES ± 1°
63 MINIMUM
FILLET RADII TO BE .005 MAXIMUM
BREAK ALL EDGES .005/.010
MATERIAL
FILENAME 300-1108
DO NOT SCALE DRAWING

CAD GENERATED DRAWING, INTERPRET DRAWING PER ASME Y14.5M - 2009

| APPROVALS | DATE |
|---|---|
| MODELED B HEALY | 5/7/2019 |
| DRAWN B HEALY | 5/7/2019 |
| PROJECT MGR C HEUSEL | 5/7/2019 |
| PURCHASING MGR | |
| QUAL ENG | |

VELODYNE

VELOBLEND, VM-5P-1200-D-0-A-1

SIZE B | DWG. NO. 300-1108 | REV. A

SCALE 1:6 | CAD FILE: | SHEET 1 OF 3

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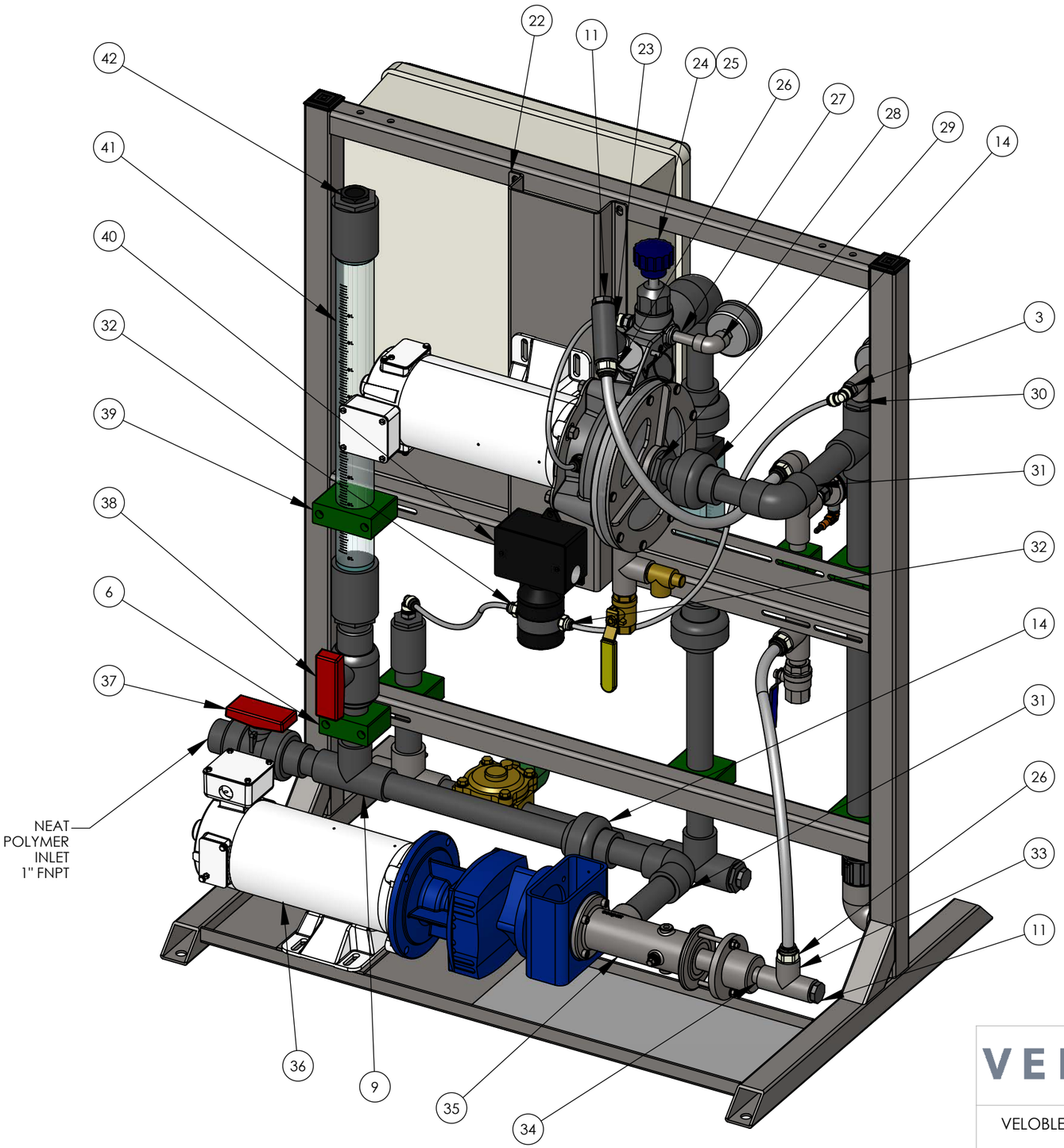
| ITEM # | NUMBER | DESCRIPTION | QTY |
|---|---|---|---|
| 22 | 158-0426 | BRACKET, MIXER MOUNT, VELOBLEND, UNIVERSAL | 1 |
| 23 | 194-0304 | TEE, 1/2", T X T X T, SCH 80, PVC | 1 |
| 24 | 200-0399 | VELOBLEND, 6", ACTIVE, CF16F, 1/2 HP, 90VDC | 1 |
| 25 | 200-0045 | ORIFICE, THROTTLE VALVE, .385", 20 GPM, 6" BLENDER | 1 |
| 26 | 194-0638 | ADAPTER, 1/2" TUBE - 1/2 MNPT, ACETAL | 2 |
| 27 | 194-0634 | NIPPLE, 1/4" X 2.00 L, 304 | 1 |
| 28 | 194-0055 | ELBOW, 90, 1/4", TXT, 304 | 1 |
| 29 | 194-0688 | REDUCER, BUSHING, 1.5" X 1", TXT, SCH 80, PVC | 1 |
| 30 | 194-0023 | NIPPLE, 1/4" X CLOSE, 304 | 1 |
| 31 | 194-0621 | ELBOW, 90, 1", S X S, SCH 80, PVC | 2 |
| 32 | 194-0641 | ADAPTER, 1/4" TUBE - 1/4 MNPT, ACETAL | 2 |
| 33 | 194-0021 | TEE, 1/2" FNPT, 304 | 1 |
| 34 | 194-0049 | NIPPLE, 1/2" X CLOSE, 304 | 1 |
| 35 | 215-0087 | PUMP, PROG CAV, .25 - 5 GPH, 3.15:1, SS/VITON | 1 |
| 36 | 191-0001 | MOTOR, 1/2 HP, 1750 RPM, 90 VDC, 56 C, WASH DOWN | 1 |
| 37 | 248-0004 | VALVE, BALL, 1" SOC - 1" FNPT, TRUE UNION, PVC/VITON | 1 |
| 38 | 248-0012 | VALVE, BALL, 1" SOC, COMPACT, PVC/VITON | 1 |
| 39 | 194-0026 | CLAMP, PIPE, 1.5", STAUFF | 1 |
| 40 | 182-0272 | SWITCH, PRESSURE DIFF, ASHCROFT, D4-24-B-60PSI | 1 |
| 41 | 110-0003 | CALIBRATION COLUMN, 500 ML, 1" FNPT | 1 |
| 42 | 194-1976 | VENT, BREATHER, POLYPROPYLENE, 1" MNPT | 1 |

NOTE: DRAWINGS ARE FOR GENERAL LAYOUT USE ONLY. SEE PROPOSAL FOR DETAILS OF THE PROPOSED SCOPE OF SUPPLY.




VELODYNE

VELOBLEND, VM-5P-1200-D-0-A-1

| SIZE | DWG. NO. | REV. |
|---|---|---|
| B | 300-1108 | A |
| SCALE 1:6 | DO NOT SCALE DRAWING | SHEET 2 OF 3 |

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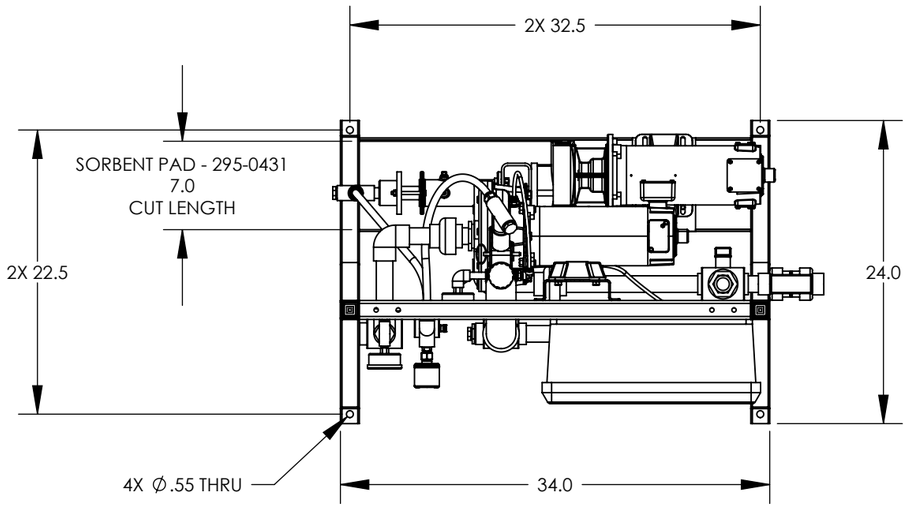


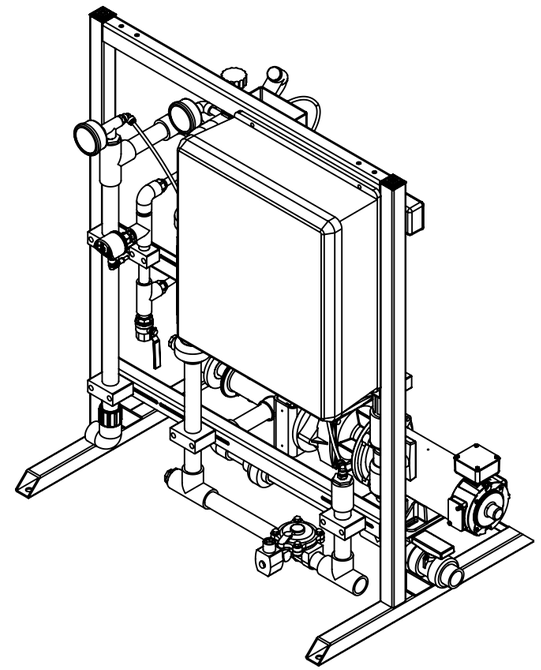

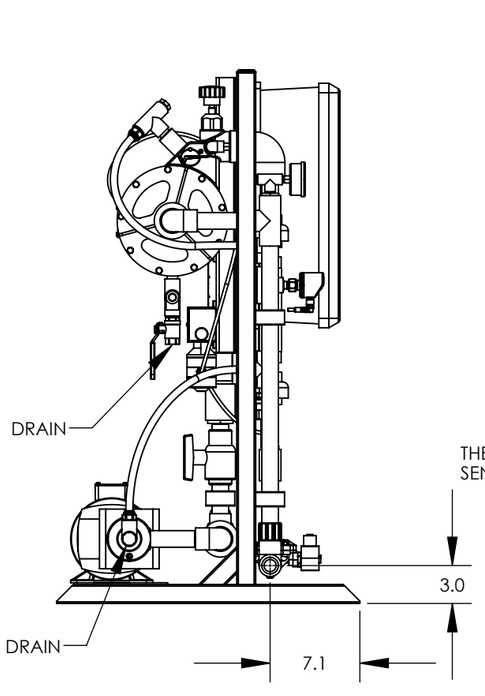


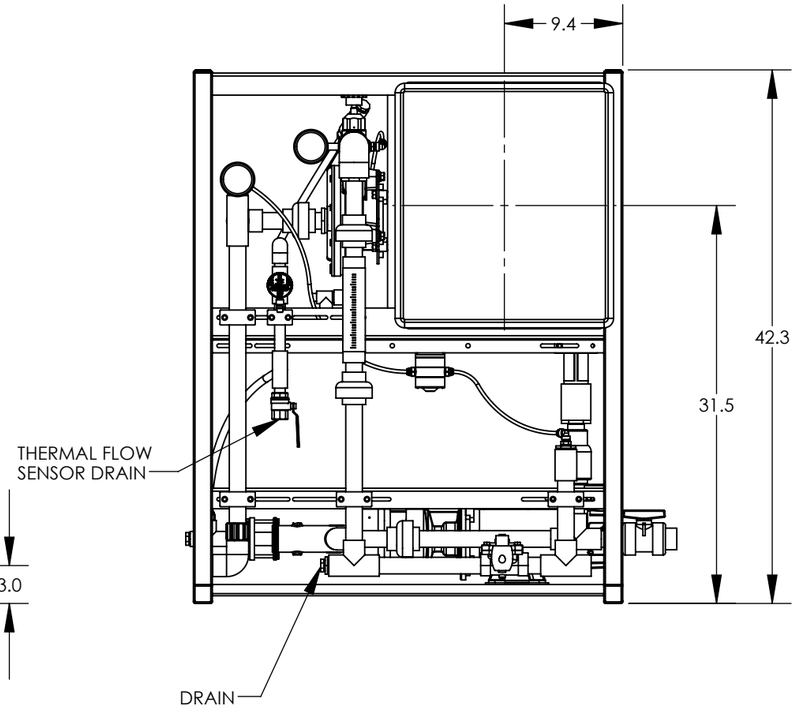


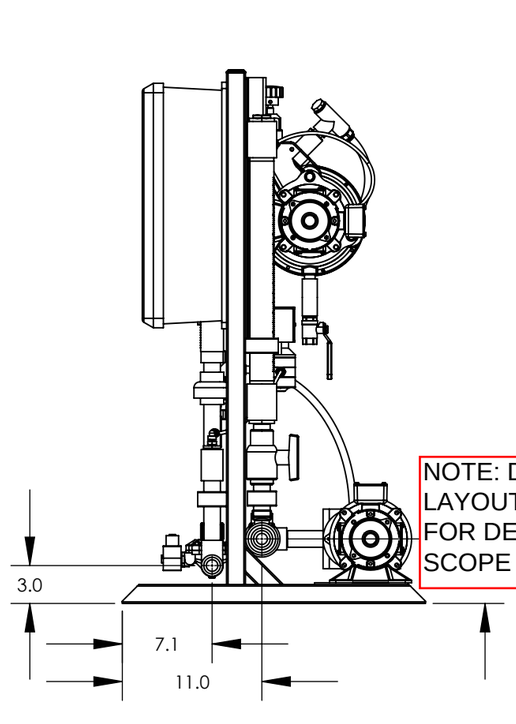


NOTE: DRAWINGS ARE FOR GENERAL LAYOUT USE ONLY. SEE PROPOSAL FOR DETAILS OF THE PROPOSED SCOPE OF SUPPLY.

VELODYNE

VELOBLEND, VM-5P-1200-D-0-A-1

| SIZE | DWG. NO. | REV. |
|---|---|---|
| B | 300-1108 | A |
| SCALE 1:12 | DO NOT SCALE DRAWING | SHEET 3 OF 3 |

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# Attachment D: Cost Estimate

**OPINION OF PROBABLE CONSTRUCTION COST**

**KENNEDY/JENKS CONSULTANTS**

**Project:** Newport Centrifuge Replacement - Scenario 1 - Andritz

**Building:**

**Prepared By:** BIB
**Date Prepared:** 8.22.2022
**K/J Proj. No.:** 2276008*00

**Estimate Type:**
- ■ **Conceptual**
- ☐ **Preliminary (w/o plans)**
- ☐ **Design Development @ __% Complete**
- ☐ **Construction**
- ☐ **Change Order**

**Current at ENR** 13,167.84
**Escalated to ENR**
**Mos. to Midpoint** 18

**SUMMARY BY DIVISION**

| Item No. | ITEM DESCRIPTION | | MATERIALS | INSTALLATION | SUB-CONTRACTOR (E&I/C) | TOTAL |
|---|---|---|---|---|---|---|
| 1 | Demo | | 0 | 22,000 | 0 | 22,000 |
| 2 | Temporary Dewatering Skid | | 0 | 66,000 | 19,800 | 85,800 |
| 3 | Concrete | | 5,000 | 3,500 | 0 | 8,500 |
| 4 | Metals | | 0 | 0 | 0 | 0 |
| 5 | High Performance Coatings | | 15,000 | 3,750 | 0 | 18,750 |
| 6 | Signage | | 500 | 500 | 0 | 1,000 |
| 7 | Centrifuges, Polymer | | 640,000 | 160,000 | 240,000 | 1,040,000 |
| 9 | Conveyors | | 86,400 | 21,600 | 32,400 | 140,400 |
| 10 | Spare Parts | | 20,000 | 0 | 0 | 20,000 |
| 11 | Piping | | 220,000 | 55,000 | 0 | 275,000 |
| 12 | Flow Meters | | 14,112 | 3,528 | 5,292 | 22,932 |
| | Subtotals | | 1,001,012 | 335,878 | 297,492 | 1,634,382 |
| | Contractor Indirects | 12% | 120,121 | 40,305 | 35,699 | 196,126 |
| | Subtotals | | 1,121,133 | 376,183 | 333,191 | 1,830,508 |
| | Contractor OH&P @ | 15% | 168,170 | 56,428 | 49,979 | 274,576 |
| | Subtotals | | 1,289,303 | 432,611 | 383,170 | 2,105,084 |
| | Estimate Contingency @ | 25% | | | | 526,271 |
| | Subtotal | | | | | 2,631,355 |
| | Escalation to Mid-Pt of Construction | 6.5% | | | | 256,557 |
| | Estimated Bid Price | | | | | 2,887,912 |
| | Market Conditions Contingency | 10.0% | | | | 288,791 |
| | Estimated Bid Price | | | | | 3,176,703 |
| | Engineering, Administrative, Permits, Legal | 38% | | | | 1,207,147 |
| | **Total Estimate** | | | | | **$4,400,000** |
| | | | | | | |

| Estimate Accuracy | |
|---|---|
| +40% | -20% |

| Estimated Range of Probable Cost | | |
|---|---|---|
| +40% | Total Est. | -20% |
| **$6,160,000** | **$4,400,000** | **$3,520,000** |

**OPINION OF PROBABLE CONSTRUCTION COST** — **KENNEDY/JENKS CONSULTANTS**

**Project:** Newport Centrifuge Replacement - Scenario 1 - Andritz

**Building, Area:**

**Prepared By:** BIB
**Date Prepared:** 8.22.2022
**K/J Proj. No.** 2276008*00

**Current at ENR** 13,167.84
**Escalated to ENR**
**Months to Midpoint of Construct** 18

**Estimate Type:** ■ Conceptual ☐ Preliminary (w/o plans) ☐ Design Development @ ☐ Construction ☐ Change Order % Complete

| Spec. Section | Item No. | Description | Qty | Units | Materials $/Unit | Materials Total | Installation $/Unit | Installation Total | Sub-contractor $/Unit | Sub-contractor Total | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **DIVISION 1 - GENERAL REQUIREMENTS** | | | | | | | | | | | |
| | | | | | | 0.00 | | 0.00 | | 0.00 | 0.00 |
| **SUBTOTAL - DIVISION 1** | | | | | | 0.00 | | 0.00 | | 0.00 | 0.00 |
| **DIVISION 2 - SITE WORK** | | | | | | | | | | | |
| | | | | | | | | | | | |
| | **Demo** | | | | | | | | | | |
| | | Remove centrifuges, conveyors, polymer system, controls | 1 | LS | | | 20,000.00 | 20,000.00 | | | 20,000.00 |
| | | Haul | 1 | LS | | | 1,000.00 | 1,000.00 | | | 1,000.00 |
| | | Disposal | 1 | LS | | | 1,000.00 | 1,000.00 | | | 1,000.00 |
| | | | | | | | | | | | |
| | **Temporary** | | | | | | | | | | |
| | | Dewatering Skid and Temp connections | 6 | Mo. | 0.00 | 0.00 | 0.00 | 0.00 | 11,000.00 | 66,000.00 | 66,000.00 |
| | | | | | | | | | | | |
| **SUBTOTAL - DIVISION 2** | | | | | | 0.00 | | 22,000.00 | | 66,000.00 | 88,000.00 |
| **DIVISION 3 - CONCRETE** | | | | | | | | | | | |
| | **Equipment Bases** | | | | | | | | | | |
| | | Concrete Base Slab on Grade | 10 | CY | 300.00 | 3,000.00 | 300.00 | 3,000.00 | 0.00 | 0.00 | 6,000.00 |
| | | Grout at Equipment Bases | 1 | LS | 2,000.00 | 2,000.00 | 500.00 | 500.00 | 0.00 | 0.00 | 2,500.00 |
| | | | | | | | | | | | |
| **SUBTOTAL - DIVISION 3** | | | | | | 5,000.00 | | 3,500.00 | | 0.00 | 8,500.00 |
| **DIVISION 4 - MASONRY** | | | | | | 0.00 | | 0.00 | | 0.00 | 0.00 |
| | | | | | | | | | | | |
| **SUBTOTAL - DIVISION 4** | | | | | | 0.00 | | 0.00 | | 0.00 | 0.00 |
| **DIVISION 5 - METALS** | | | | | | 0.00 | | 0.00 | | 0.00 | 0.00 |
| | **Centrifuges** | | | | | | | | | | |
| | | Dewatering Belt Modifications | 0 | LS | 50,000.00 | 0.00 | 12,500.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | | | | | | | |
| **SUBTOTAL - DIVISION 5** | | | | | | 0.00 | | 0.00 | | 0.00 | 0.00 |
| **DIVISION 6 - WOOD AND PLASTICS** | | | | | | 0.00 | | 0.00 | | 0.00 | 0.00 |
| | | | | | | 0.00 | | 0.00 | | 0.00 | 0.00 |
| **SUBTOTAL - DIVISION 6** | | | | | | 0.00 | | 0.00 | | 0.00 | 0.00 |
| **DIVISION 7 - THERMAL AND MOISTURE PROTECTION** | | | | | | 0.00 | | 0.00 | | 0.00 | 0.00 |
| | | | | | | | | | | | |
| **SUBTOTAL - DIVISION 7** | | | | | | 0.00 | | 0.00 | | 0.00 | 0.00 |
| **DIVISION 8 - DOORS AND WINDOWS** | | | | | | 0.00 | | 0.00 | | 0.00 | 0.00 |
| | | | | | | 0.00 | | 0.00 | | 0.00 | 0.00 |
| **SUBTOTAL - DIVISION 8** | | | | | | 0.00 | | 0.00 | | 0.00 | 0.00 |
| **DIVISION 9 - FINISHES** | | | | | | 0.00 | | 0.00 | | 0.00 | 0.00 |
| | | Concrete Finishes | 1 | LS | 5,000.00 | 5,000.00 | 1,250.00 | 1,250.00 | 0.00 | 0.00 | 6,250.00 |
| | | Piping Coatings | 1 | LS | 10,000.00 | 10,000.00 | 2,500.00 | 2,500.00 | 0.00 | 0.00 | 12,500.00 |
| | | | | | | | | | | | |
| **SUBTOTAL - DIVISION 9** | | | | | | 15,000.00 | | 3,750.00 | | 0.00 | 18,750.00 |
| **DIVISION 10 - SPECIALTIES** | | | | | | 0.00 | | 0.00 | | 0.00 | 0.00 |
| | | Misc. signage | 1 | LS | 500.00 | 500.00 | 500.00 | 500.00 | | 0.00 | 1,000.00 |
| **SUBTOTAL - DIVISION 10** | | | | | | 500.00 | | 500.00 | | 0.00 | 1,000.00 |
| **DIVISION 11 - EQUIPMENT** | | | | | | 0.00 | | 0.00 | | 0.00 | 0.00 |
| **Centrifuge Replacement (Andritz)** | | | | | | 0.00 | | 0.00 | | 0.00 | 0.00 |
| | | Centrifuges, includes: | 1 | LS | 640,000.00 | 640,000.00 | 160,000.00 | 160,000.00 | 0.00 | 0.00 | 800,000.00 |
| | | Stands | | | | | | | | | |
| | | Polymer System | | | | | | | | | |
| | | Conveyors | 1 | LS | 86,400.00 | 86,400.00 | 21,600.00 | 21,600.00 | 0.00 | 0.00 | 108,000.00 |
| | | Spare Parts | 1 | LS | 20,000.00 | 20,000.00 | 0.00 | 0.00 | 0.00 | 0.00 | 20,000.00 |
| | | | | | | | | | | | |
| **SUBTOTAL - DIVISION 11** | | | | | | 746,400.00 | | 181,600.00 | | 0.00 | 928,000.00 |
| **DIVISION 12 - FURNISHINGS** | | | | | | 0.00 | | 0.00 | | 0.00 | 0.00 |
| | | | | | | 0.00 | | 0.00 | | 0.00 | 0.00 |
| **SUBTOTAL - DIVISION 12** | | | | | | 0.00 | | 0.00 | | 0.00 | 0.00 |
| **DIVISION 13 - SPECIAL CONSTRUCTIONS** | | | | | | 0.00 | | 0.00 | | 0.00 | 0.00 |
| | | | | | | 0.00 | | 0.00 | | 0.00 | 0.00 |
| **SUBTOTAL - DIVISION 13** | | | | | | 0.00 | | 0.00 | | 0.00 | 0.00 |
| **DIVISION 14 - CONVEYING SYSTEMS** | | | | | | 0.00 | | 0.00 | | 0.00 | 0.00 |
| | | | | | | 0.00 | | 0.00 | | 0.00 | 0.00 |
| **SUBTOTAL - DIVISION 14** | | | | | | 0.00 | | 0.00 | | 0.00 | 0.00 |
| **DIVISION 15 -MECHANICAL** | | | | | | 0.00 | | 0.00 | | 0.00 | 0.00 |
| | **Process Piping** | | | | | | | | | | |
| | | Feed Piping | 1 | LS | 50,000.00 | 50,000.00 | 12,500.00 | 12,500.00 | 0.00 | 0.00 | 62,500.00 |
| | | 3W Piping | 1 | LS | 10,000.00 | 10,000.00 | 2,500.00 | 2,500.00 | 0.00 | 0.00 | 12,500.00 |
| | | Centrate Piping | 1 | LS | 100,000.00 | 100,000.00 | 25,000.00 | 25,000.00 | 0.00 | 0.00 | 125,000.00 |
| | | Vent Piping | 1 | LS | 50,000.00 | 50,000.00 | 12,500.00 | 12,500.00 | 0.00 | 0.00 | 62,500.00 |
| | | Polymer Piping | 1 | LS | 10,000.00 | 10,000.00 | 2,500.00 | 2,500.00 | 0.00 | 0.00 | 12,500.00 |
| | | | | | | | | | | | |
| **SUBTOTAL - DIVISION 15** | | | | | | 220,000.00 | | 55,000.00 | | 0.00 | 275,000.00 |
| **DIVISION 16 - ELECTRICAL** | | Note: Electrical costs are estimated to be 30% of the construction subtotal amount. | | | | 0.00 | | 0.00 | | 0.00 | 0.00 |
| | | Electrical Materials, Installation and Subcontractor | 1 | LS | 0.00 | 0.00 | 0.00 | 0.00 | 297,492.00 | 297,492.00 | 297,492.00 |
| | | | | | | | | | | | |
| **SUBTOTAL - DIVISION 16** | | | | | | 0.00 | | 0.00 | | 297,492.00 | 297,492.00 |
| **DIVISION 17 - INSTRUMENTATION** | | | | | | | | | | | |
| | **Centrifuges** | | | | | | | | | | |
| | | Flowmeters | 2 | EA | 7,056.00 | 14,112.00 | 1,764.00 | 3,528.00 | 0.00 | 0.00 | 17,640.00 |
| | | | | | | | | | | | |
| **SUBTOTAL - DIVISION 17** | | | | | | 14,112.00 | | 3,528.00 | | 0.00 | 17,640.00 |
| **AREA TOTAL** | | | | | | 1,001,012.00 | | 335,878.00 | | 297,492.00 | 1,634,382.00 |

**OPINION OF PROBABLE CONSTRUCTION COST** | **KENNEDY/JENKS CONSULTANTS**

**Project:** Newport Centrifuge Replacement - Scenario 1 - Centrisys

**Building:**

**Prepared By:** BIB
**Date Prepared:** 8.22.2022
**K/J Proj. No.:** 2276008*00

**Estimate Type:**
- ■ **Conceptual**
- ☐ **Preliminary (w/o plans)**
- ☐ **Design Development @ __% Complete**
- ☐ **Construction**
- ☐ **Change Order**

**Current at ENR** 13,167.84
**Escalated to ENR**
**Mos. to Midpoint** 18

**SUMMARY BY DIVISION**

| Item No. | ITEM DESCRIPTION | | MATERIALS | INSTALLATION | SUB-CONTRACTOR (E&I/C) | TOTAL |
|---|---|---|---|---|---|---|
| 1 | Demo | | 0 | 22,000 | 0 | 22,000 |
| 2 | Temporary Dewatering Skid | | 0 | 66,000 | 19,800 | 85,800 |
| 3 | Concrete | | 5,000 | 3,500 | 0 | 8,500 |
| 4 | Metals | | 0 | 0 | 0 | 0 |
| 5 | High Performance Coatings | | 15,000 | 3,750 | 0 | 18,750 |
| 6 | Signage | | 500 | 500 | 0 | 1,000 |
| 7 | Centrifuges, Polymer | | 777,340 | 194,335 | 291,503 | 1,263,178 |
| 9 | Conveyors | | 63,560 | 15,890 | 23,835 | 103,285 |
| 10 | Spare Parts | | 20,000 | 0 | 0 | 20,000 |
| 11 | Piping | | 220,000 | 55,000 | 0 | 275,000 |
| 12 | Flow Meters | | 14,112 | 3,528 | 5,292 | 22,932 |
| | Subtotals | | 1,115,512 | 364,503 | 340,430 | 1,820,445 |
| | Contractor Indirects | 12% | 133,861 | 43,740 | 40,852 | 218,453 |
| | Subtotals | | 1,249,373 | 408,243 | 381,281 | 2,038,898 |
| | Contractor OH&P @ | 15% | 187,406 | 61,237 | 57,192 | 305,835 |
| | Subtotals | | 1,436,779 | 469,480 | 438,473 | 2,344,733 |
| | Estimate Contingency @ | 25% | | | | 586,183 |
| | Subtotal | | | | | 2,930,916 |
| | Escalation to Mid-Pt of Construction | 6.5% | | | | 285,764 |
| | Estimated Bid Price | | | | | 3,216,680 |
| | Market Conditions Contingency | 10.0% | | | | 321,668 |
| | Estimated Bid Price | | | | | 3,538,348 |
| | Engineering, Administrative, Permits, Legal | 38% | | | | 1,344,572 |
| | **Total Estimate** | | | | | **$4,900,000** |

| Estimate Accuracy | |
|---|---|
| +40% | -20% |

| Estimated Range of Probable Cost | | |
|---|---|---|
| +40% | Total Est. | -20% |
| **$6,860,000** | **$4,900,000** | **$3,920,000** |

**OPINION OF PROBABLE CONSTRUCTION COST** — **KENNEDY/JENKS CONSULTANTS**

**Project:** Newport Centrifuge Replacement - Scenario 1 - Centrisys

**Building, Area:**

**Prepared By:** BIB
**Date Prepared:** 8.22.2022
**K/J Proj. No.** 2276008*00

**Current at ENR** 13,167.84
**Escalated to ENR**
**Months to Midpoint of Construct** 18

**Estimate Type:** ■ Conceptual ☐ Preliminary (w/o plans) ☐ Design Development @ — ☐ Construction ☐ Change Order — % Complete

| Spec. Section | Item No. | Description | Qty | Units | Materials $/Unit | Materials Total | Installation $/Unit | Installation Total | Sub-contractor $/Unit | Sub-contractor Total | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **DIVISION 1 - GENERAL REQUIREMENTS** | | | | | | | | | | | |
| | | | | | | 0.00 | | 0.00 | | 0.00 | 0.00 |
| **SUBTOTAL - DIVISION 1** | | | | | | 0.00 | | 0.00 | | 0.00 | 0.00 |
| **DIVISION 2 - SITE WORK** | | | | | | | | | | | |
| | | | | | | | | | | | |
| | **Demo** | | | | | | | | | | |
| | | Remove centrifuges, conveyors, polymer system, controls | 1 | LS | | | 20,000.00 | 20,000.00 | | | 20,000.00 |
| | | Haul | 1 | LS | | | 1,000.00 | 1,000.00 | | | 1,000.00 |
| | | Disposal | 1 | LS | | | 1,000.00 | 1,000.00 | | | 1,000.00 |
| | | | | | | | | | | | |
| | **Temporary** | | | | | | | | | | |
| | | Dewatering Skid and Temp connections | 6 | Mo. | 0.00 | 0.00 | 0.00 | 0.00 | 11,000.00 | 66,000.00 | 66,000.00 |
| | | | | | | | | | | | |
| **SUBTOTAL - DIVISION 2** | | | | | | 0.00 | | 22,000.00 | | 66,000.00 | 88,000.00 |
| **DIVISION 3 - CONCRETE** | | | | | | | | | | | |
| | **Equipment Bases** | | | | | | | | | | |
| | | Concrete Base Slab on Grade | 10 | CY | 300.00 | 3,000.00 | 300.00 | 3,000.00 | 0.00 | 0.00 | 6,000.00 |
| | | Grout at Equipment Bases | 1 | LS | 2,000.00 | 2,000.00 | 500.00 | 500.00 | 0.00 | 0.00 | 2,500.00 |
| | | | | | | | | | | | |
| **SUBTOTAL - DIVISION 3** | | | | | | 5,000.00 | | 3,500.00 | | 0.00 | 8,500.00 |
| **DIVISION 4 - MASONRY** | | | | | | 0.00 | | 0.00 | | 0.00 | 0.00 |
| | | | | | | | | | | | |
| **SUBTOTAL - DIVISION 4** | | | | | | 0.00 | | 0.00 | | 0.00 | 0.00 |
| **DIVISION 5 - METALS** | | | | | | 0.00 | | 0.00 | | 0.00 | 0.00 |
| | **Centrifuges** | | | | | | | | | | |
| | | Dewatering Belt Modifications | 0 | LS | 50,000.00 | 0.00 | 12,500.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | | | | | | | |
| **SUBTOTAL - DIVISION 5** | | | | | | 0.00 | | 0.00 | | 0.00 | 0.00 |
| **DIVISION 6 - WOOD AND PLASTICS** | | | | | | 0.00 | | 0.00 | | 0.00 | 0.00 |
| | | | | | | 0.00 | | 0.00 | | 0.00 | 0.00 |
| **SUBTOTAL - DIVISION 6** | | | | | | 0.00 | | 0.00 | | 0.00 | 0.00 |
| **DIVISION 7 - THERMAL AND MOISTURE PROTECTION** | | | | | | 0.00 | | 0.00 | | 0.00 | 0.00 |
| | | | | | | | | | | | |
| **SUBTOTAL - DIVISION 7** | | | | | | 0.00 | | 0.00 | | 0.00 | 0.00 |
| **DIVISION 8 - DOORS AND WINDOWS** | | | | | | 0.00 | | 0.00 | | 0.00 | 0.00 |
| | | | | | | 0.00 | | 0.00 | | 0.00 | 0.00 |
| **SUBTOTAL - DIVISION 8** | | | | | | 0.00 | | 0.00 | | 0.00 | 0.00 |
| **DIVISION 9 - FINISHES** | | | | | | 0.00 | | 0.00 | | 0.00 | 0.00 |
| | | Concrete Finishes | 1 | LS | 5,000.00 | 5,000.00 | 1,250.00 | 1,250.00 | 0.00 | 0.00 | 6,250.00 |
| | | Piping Coatings | 1 | LS | 10,000.00 | 10,000.00 | 2,500.00 | 2,500.00 | 0.00 | 0.00 | 12,500.00 |
| | | | | | | | | | | | |
| **SUBTOTAL - DIVISION 9** | | | | | | 15,000.00 | | 3,750.00 | | 0.00 | 18,750.00 |
| **DIVISION 10 - SPECIALTIES** | | | | | | 0.00 | | 0.00 | | 0.00 | 0.00 |
| | | Misc. signage | 1 | LS | 500.00 | 500.00 | 500.00 | 500.00 | | 0.00 | 1,000.00 |
| **SUBTOTAL - DIVISION 10** | | | | | | 500.00 | | 500.00 | | 0.00 | 1,000.00 |
| **DIVISION 11 - EQUIPMENT** | | | | | | 0.00 | | 0.00 | | 0.00 | 0.00 |
| **Centrifuge Replacement (Centrisys)** | | | | | | 0.00 | | 0.00 | | 0.00 | 0.00 |
| | | Centrifuges, includes: | 1 | LS | 777,340.00 | 777,340.00 | 194,335.00 | 194,335.00 | 0.00 | 0.00 | 971,675.00 |
| | | Stands | | | | | | | | | |
| | | Polymer System | | | | | | | | | |
| | | Conveyors | 1 | LS | 63,560.00 | 63,560.00 | 15,890.00 | 15,890.00 | 0.00 | 0.00 | 79,450.00 |
| | | Spare Parts | 1 | LS | 20,000.00 | 20,000.00 | 0.00 | 0.00 | 0.00 | 0.00 | 20,000.00 |
| | | | | | | | | | | | |
| **SUBTOTAL - DIVISION 11** | | | | | | 860,900.00 | | 210,225.00 | | 0.00 | 1,071,125.00 |
| **DIVISION 12 - FURNISHINGS** | | | | | | 0.00 | | 0.00 | | 0.00 | 0.00 |
| | | | | | | 0.00 | | 0.00 | | 0.00 | 0.00 |
| **SUBTOTAL - DIVISION 12** | | | | | | 0.00 | | 0.00 | | 0.00 | 0.00 |
| **DIVISION 13 - SPECIAL CONSTRUCTIONS** | | | | | | 0.00 | | 0.00 | | 0.00 | 0.00 |
| | | | | | | 0.00 | | 0.00 | | 0.00 | 0.00 |
| **SUBTOTAL - DIVISION 13** | | | | | | 0.00 | | 0.00 | | 0.00 | 0.00 |
| **DIVISION 14 - CONVEYING SYSTEMS** | | | | | | 0.00 | | 0.00 | | 0.00 | 0.00 |
| | | | | | | 0.00 | | 0.00 | | 0.00 | 0.00 |
| **SUBTOTAL - DIVISION 14** | | | | | | 0.00 | | 0.00 | | 0.00 | 0.00 |
| **DIVISION 15 -MECHANICAL** | | | | | | 0.00 | | 0.00 | | 0.00 | 0.00 |
| | **Process Piping** | | | | | | | | | | |
| | | Feed Piping | 1 | LS | 50,000.00 | 50,000.00 | 12,500.00 | 12,500.00 | 0.00 | 0.00 | 62,500.00 |
| | | 3W Piping | 1 | LS | 10,000.00 | 10,000.00 | 2,500.00 | 2,500.00 | 0.00 | 0.00 | 12,500.00 |
| | | Centrate Piping | 1 | LS | 100,000.00 | 100,000.00 | 25,000.00 | 25,000.00 | 0.00 | 0.00 | 125,000.00 |
| | | Vent Piping | 1 | LS | 50,000.00 | 50,000.00 | 12,500.00 | 12,500.00 | 0.00 | 0.00 | 62,500.00 |
| | | Polymer Piping | 1 | LS | 10,000.00 | 10,000.00 | 2,500.00 | 2,500.00 | 0.00 | 0.00 | 12,500.00 |
| | | | | | | | | | | | |
| **SUBTOTAL - DIVISION 15** | | | | | | 220,000.00 | | 55,000.00 | | 0.00 | 275,000.00 |
| **DIVISION 16 - ELECTRICAL** | | Note: Electrical costs are estimated to be 30% of the construction subtotal amount. | | | | 0.00 | | 0.00 | | 0.00 | 0.00 |
| | | Electrical Materials, Installation and Subcontractor | 1 | LS | 0.00 | 0.00 | 0.00 | 0.00 | 340,429.50 | 340,429.50 | 340,429.50 |
| | | | | | | | | | | | |
| **SUBTOTAL - DIVISION 16** | | | | | | 0.00 | | 0.00 | | 340,429.50 | 340,429.50 |
| **DIVISION 17 - INSTRUMENTATION** | | | | | | | | | | | |
| | **Centrifuges** | | | | | | | | | | |
| | | Flowmeters | 2 | EA | 7,056.00 | 14,112.00 | 1,764.00 | 3,528.00 | 0.00 | 0.00 | 17,640.00 |
| | | | | | | | | | | | |
| **SUBTOTAL - DIVISION 17** | | | | | | 14,112.00 | | 3,528.00 | | 0.00 | 17,640.00 |
| **AREA TOTAL** | | | | | | 1,115,512.00 | | 364,503.00 | | 340,429.50 | 1,820,444.50 |

**OPINION OF PROBABLE CONSTRUCTION COST** | **KENNEDY/JENKS CONSULTANTS**

**Project:** Newport Centrifuge Replacement - Scenario 2 - Andritz

**Building:**

**Prepared By:** BIB
**Date Prepared:** 8.22.2022
**K/J Proj. No.:** 2276008*00

**Estimate Type:**
- ■ **Conceptual**
- ☐ **Preliminary (w/o plans)**
- ☐ **Design Development @ __% Complete**
- ☐ **Construction**
- ☐ **Change Order**

**Current at ENR** 13,167.84
**Escalated to ENR**
**Mos. to Midpoint** 18

**SUMMARY BY DIVISION**

| Item No. | ITEM DESCRIPTION | | MATERIALS | INSTALLATION | SUB-CONTRACTOR (E&I/C) | TOTAL |
|---|---|---|---|---|---|---|
| 1 | Demo | | 0 | 22,000 | 0 | 22,000 |
| 2 | Temporary Dewatering Skid | | 0 | 66,000 | 19,800 | 85,800 |
| 3 | Concrete | | 5,000 | 3,500 | 0 | 8,500 |
| 4 | Metals | | 50,000 | 12,500 | 0 | 62,500 |
| 5 | High Performance Coatings | | 15,000 | 3,750 | 0 | 18,750 |
| 6 | Signage | | 500 | 500 | 0 | 1,000 |
| 7 | Centrifuges, Polymer, Conveyors | | 946,400 | 236,600 | 354,900 | 1,537,900 |
| 10 | Spare Parts | | 20,000 | 0 | 0 | 20,000 |
| 11 | Piping | | 220,000 | 55,000 | 0 | 275,000 |
| 12 | Flow Meters | | 14,112 | 3,528 | 5,292 | 22,932 |
| | Subtotals | | 1,271,012 | 403,378 | 379,992 | 2,054,382 |
| | Contractor Indirects | 12% | 152,521 | 48,405 | 45,599 | 246,526 |
| | Subtotals | | 1,423,533 | 451,783 | 425,591 | 2,300,908 |
| | Contractor OH&P @ | 15% | 213,530 | 67,768 | 63,839 | 345,136 |
| | Subtotals | | 1,637,063 | 519,551 | 489,430 | 2,646,044 |
| | Estimate Contingency @ | 25% | | | | 661,511 |
| | Subtotal | | | | | 3,307,555 |
| | Escalation to Mid-Pt of Construction | 6.5% | | | | 322,487 |
| | Estimated Bid Price | | | | | 3,630,042 |
| | Market Conditions Contingency | 10.0% | | | | 363,004 |
| | Estimated Bid Price | | | | | 3,993,046 |
| | Engineering, Administrative, Permits, Legal | 38% | | | | 1,517,357 |
| | **Total Estimate** | | | | | **$5,600,000** |

| Estimate Accuracy | |
|---|---|
| +40% | -20% |

| Estimated Range of Probable Cost | | |
|---|---|---|
| +40% | Total Est. | -20% |
| **$7,840,000** | **$5,600,000** | **$4,480,000** |

**OPINION OF PROBABLE CONSTRUCTION COST**

**KENNEDY/JENKS CONSULTANTS**

**Project:** Newport Centrifuge Replacement - Scenario 2 - Andritz

**Building, Area:**

**Prepared By:** BIB
**Date Prepared:** 8.22.2022
**K/J Proj. No.** 2276008*00

**Current at ENR** 13,167.84
**Escalated to ENR**
**Months to Midpoint of Construct** 18

**Estimate Type:** ■ Conceptual ☐ Preliminary (w/o plans) ☐ Design Development @ ☐ Construction ☐ Change Order % Complete

| Spec. Section | Item No. | Description | Qty | Units | Materials $/Unit | Materials Total | Installation $/Unit | Installation Total | Sub-contractor $/Unit | Sub-contractor Total | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **DIVISION 1 - GENERAL REQUIREMENTS** | | | | | | | | | | | |
| | | | | | | 0.00 | | 0.00 | | 0.00 | 0.00 |
| **SUBTOTAL - DIVISION 1** | | | | | | 0.00 | | 0.00 | | 0.00 | 0.00 |
| **DIVISION 2 - SITE WORK** | | | | | | | | | | | |
| | | | | | | | | | | | |
| | **Demo** | | | | | | | | | | |
| | | Remove centrifuges, conveyors, polymer system, controls | 1 | LS | | | 20,000.00 | 20,000.00 | | | 20,000.00 |
| | | Haul | 1 | LS | | | 1,000.00 | 1,000.00 | | | 1,000.00 |
| | | Disposal | 1 | LS | | | 1,000.00 | 1,000.00 | | | 1,000.00 |
| | | | | | | | | | | | |
| | **Temporary** | | | | | | | | | | |
| | | Dewatering Skid and Temp connections | 6 | Mo. | 0.00 | 0.00 | 0.00 | 0.00 | 11,000.00 | 66,000.00 | 66,000.00 |
| | | | | | | | | | | | |
| **SUBTOTAL - DIVISION 2** | | | | | | 0.00 | | 22,000.00 | | 66,000.00 | 88,000.00 |
| **DIVISION 3 - CONCRETE** | | | | | | | | | | | |
| | **Equipment Bases** | | | | | | | | | | |
| | | Concrete Base Slab on Grade | 10 | CY | 300.00 | 3,000.00 | 300.00 | 3,000.00 | 0.00 | 0.00 | 6,000.00 |
| | | Grout at Equipment Bases | 1 | LS | 2,000.00 | 2,000.00 | 500.00 | 500.00 | 0.00 | 0.00 | 2,500.00 |
| | | | | | | | | | | | |
| **SUBTOTAL - DIVISION 3** | | | | | | 5,000.00 | | 3,500.00 | | 0.00 | 8,500.00 |
| **DIVISION 4 - MASONRY** | | | | | | 0.00 | | 0.00 | | 0.00 | 0.00 |
| | | | | | | | | | | | |
| **SUBTOTAL - DIVISION 4** | | | | | | 0.00 | | 0.00 | | 0.00 | 0.00 |
| **DIVISION 5 - METALS** | | | | | | 0.00 | | 0.00 | | 0.00 | 0.00 |
| | **Centrifuges** | | | | | | | | | | |
| | | Dewatering Belt Modifications | 1 | LS | 50,000.00 | 50,000.00 | 12,500.00 | 12,500.00 | 0.00 | 0.00 | 62,500.00 |
| | | | | | | | | | | | |
| **SUBTOTAL - DIVISION 5** | | | | | | 50,000.00 | | 12,500.00 | | 0.00 | 62,500.00 |
| **DIVISION 6 - WOOD AND PLASTICS** | | | | | | 0.00 | | 0.00 | | 0.00 | 0.00 |
| | | | | | | 0.00 | | 0.00 | | 0.00 | 0.00 |
| **SUBTOTAL - DIVISION 6** | | | | | | 0.00 | | 0.00 | | 0.00 | 0.00 |
| **DIVISION 7 - THERMAL AND MOISTURE PROTECTION** | | | | | | 0.00 | | 0.00 | | 0.00 | 0.00 |
| | | | | | | | | | | | |
| **SUBTOTAL - DIVISION 7** | | | | | | 0.00 | | 0.00 | | 0.00 | 0.00 |
| **DIVISION 8 - DOORS AND WINDOWS** | | | | | | 0.00 | | 0.00 | | 0.00 | 0.00 |
| | | | | | | 0.00 | | 0.00 | | 0.00 | 0.00 |
| **SUBTOTAL - DIVISION 8** | | | | | | 0.00 | | 0.00 | | 0.00 | 0.00 |
| **DIVISION 9 - FINISHES** | | | | | | 0.00 | | 0.00 | | 0.00 | 0.00 |
| | | Concrete Finishes | 1 | LS | 5,000.00 | 5,000.00 | 1,250.00 | 1,250.00 | 0.00 | 0.00 | 6,250.00 |
| | | Piping Coatings | 1 | LS | 10,000.00 | 10,000.00 | 2,500.00 | 2,500.00 | 0.00 | 0.00 | 12,500.00 |
| | | | | | | | | | | | |
| **SUBTOTAL - DIVISION 9** | | | | | | 15,000.00 | | 3,750.00 | | 0.00 | 18,750.00 |
| **DIVISION 10 - SPECIALTIES** | | | | | | 0.00 | | 0.00 | | 0.00 | 0.00 |
| | | Misc. signage | 1 | LS | 500.00 | 500.00 | 500.00 | 500.00 | | 0.00 | 1,000.00 |
| **SUBTOTAL - DIVISION 10** | | | | | | 500.00 | | 500.00 | | 0.00 | 1,000.00 |
| **DIVISION 11 - EQUIPMENT** | | | | | | 0.00 | | 0.00 | | 0.00 | 0.00 |
| **Centrifuge Replacement (Andritz)** | | | | | | 0.00 | | 0.00 | | 0.00 | 0.00 |
| | | Centrifuges, includes: | 1 | LS | 946,400.00 | 946,400.00 | 236,600.00 | 236,600.00 | 0.00 | 0.00 | 1,183,000.00 |
| | | Stands | | | | | | | | | |
| | | Polymer System | | | | | | | | | |
| | | Conveyors | | | | | | | | | |
| | | Spare Parts | 1 | LS | 20,000.00 | 20,000.00 | 0.00 | 0.00 | 0.00 | 0.00 | 20,000.00 |
| | | | | | | | | | | | |
| **SUBTOTAL - DIVISION 11** | | | | | | 966,400.00 | | 236,600.00 | | 0.00 | 1,203,000.00 |
| **DIVISION 12 - FURNISHINGS** | | | | | | 0.00 | | 0.00 | | 0.00 | 0.00 |
| | | | | | | 0.00 | | 0.00 | | 0.00 | 0.00 |
| **SUBTOTAL - DIVISION 12** | | | | | | 0.00 | | 0.00 | | 0.00 | 0.00 |
| **DIVISION 13 - SPECIAL CONSTRUCTIONS** | | | | | | 0.00 | | 0.00 | | 0.00 | 0.00 |
| | | | | | | 0.00 | | 0.00 | | 0.00 | 0.00 |
| **SUBTOTAL - DIVISION 13** | | | | | | 0.00 | | 0.00 | | 0.00 | 0.00 |
| **DIVISION 14 - CONVEYING SYSTEMS** | | | | | | 0.00 | | 0.00 | | 0.00 | 0.00 |
| | | | | | | 0.00 | | 0.00 | | 0.00 | 0.00 |
| **SUBTOTAL - DIVISION 14** | | | | | | 0.00 | | 0.00 | | 0.00 | 0.00 |
| **DIVISION 15 -MECHANICAL** | | | | | | 0.00 | | 0.00 | | 0.00 | 0.00 |
| | **Process Piping** | | | | | | | | | | |
| | | Feed Piping | 1 | LS | 50,000.00 | 50,000.00 | 12,500.00 | 12,500.00 | 0.00 | 0.00 | 62,500.00 |
| | | 3W Piping | 1 | LS | 10,000.00 | 10,000.00 | 2,500.00 | 2,500.00 | 0.00 | 0.00 | 12,500.00 |
| | | Centrate Piping | 1 | LS | 100,000.00 | 100,000.00 | 25,000.00 | 25,000.00 | 0.00 | 0.00 | 125,000.00 |
| | | Vent Piping | 1 | LS | 50,000.00 | 50,000.00 | 12,500.00 | 12,500.00 | 0.00 | 0.00 | 62,500.00 |
| | | Polymer Piping | 1 | LS | 10,000.00 | 10,000.00 | 2,500.00 | 2,500.00 | 0.00 | 0.00 | 12,500.00 |
| | | | | | | | | | | | |
| **SUBTOTAL - DIVISION 15** | | | | | | 220,000.00 | | 55,000.00 | | 0.00 | 275,000.00 |
| **DIVISION 16 - ELECTRICAL** | | Note: Electrical costs are estimated to be 30% of the construction subtotal amount. | | | | 0.00 | | 0.00 | | 0.00 | 0.00 |
| | | Electrical Materials, Installation and Subcontractor | 1 | LS | 0.00 | 0.00 | 0.00 | 0.00 | 379,992.00 | 379,992.00 | 379,992.00 |
| | | | | | | | | | | | |
| **SUBTOTAL - DIVISION 16** | | | | | | 0.00 | | 0.00 | | 379,992.00 | 379,992.00 |
| **DIVISION 17 - INSTRUMENTATION** | | | | | | | | | | | |
| | **Centrifuges** | | | | | | | | | | |
| | | Flowmeters | 2 | EA | 7,056.00 | 14,112.00 | 1,764.00 | 3,528.00 | 0.00 | 0.00 | 17,640.00 |
| | | | | | | | | | | | |
| **SUBTOTAL - DIVISION 17** | | | | | | 14,112.00 | | 3,528.00 | | 0.00 | 17,640.00 |
| | | | | | | | | | | | |
| **AREA TOTAL** | | | | | | 1,271,012.00 | | 403,378.00 | | 379,992.00 | 2,054,382.00 |

**OPINION OF PROBABLE CONSTRUCTION COST** | **KENNEDY/JENKS CONSULTANTS**

**Project:** Newport Centrifuge Replacement - Scenario 2 - Centrisys

**Building:**

**Prepared By:** BIB
**Date Prepared:** 8.22.2022
**K/J Proj. No.:** 2276008*00

**Estimate Type:**
- ■ **Conceptual**
- ☐ **Construction**
- ☐ **Preliminary (w/o plans)**
- ☐ **Change Order**
- ☐ **Design Development @ __% Complete**

**Current at ENR** 13,167.84
**Escalated to ENR**
**Mos. to Midpoint** 18

**SUMMARY BY DIVISION**

| Item No. | ITEM DESCRIPTION | | MATERIALS | INSTALLATION | SUB-CONTRACTOR (E&I/C) | TOTAL |
|---|---|---|---|---|---|---|
| 1 | Demo | | 0 | 22,000 | 0 | 22,000 |
| 2 | Temporary Dewatering Skid | | 0 | 66,000 | 19,800 | 85,800 |
| 3 | Concrete | | 5,000 | 3,500 | 0 | 8,500 |
| 4 | Metals | | 50,000 | 12,500 | 0 | 62,500 |
| 5 | High Performance Coatings | | 15,000 | 3,750 | 0 | 18,750 |
| 6 | Signage | | 500 | 500 | 0 | 1,000 |
| 7 | Centrifuges | | 1,028,620 | 257,155 | 369,563 | 1,655,338 |
| 8 | Polymer System | | 21,756 | 5,439 | 8,159 | 35,354 |
| 9 | Conveyors | | 66,500 | 16,625 | 24,938 | 108,063 |
| 10 | Spare Parts | | 20,000 | 0 | 0 | 20,000 |
| 11 | Piping | | 220,000 | 55,000 | 0 | 275,000 |
| 12 | Flow Meters | | 14,112 | 3,528 | 5,292 | 22,932 |
| | Subtotals | | 1,441,488 | 445,997 | 427,751 | 2,315,236 |
| | Contractor Indirects | 12% | 172,979 | 53,520 | 51,330 | 277,828 |
| | Subtotals | | 1,614,467 | 499,517 | 479,081 | 2,593,064 |
| | Contractor OH&P @ | 15% | 242,170 | 74,928 | 71,862 | 388,960 |
| | Subtotals | | 1,856,637 | 574,444 | 550,943 | 2,982,023 |
| | Estimate Contingency @ | 25% | | | | 745,506 |
| | Subtotal | | | | | 3,727,529 |
| | Escalation to Mid-Pt of Construction | 6.5% | | | | 363,434 |
| | Estimated Bid Price | | | | | 4,090,963 |
| | Market Conditions Contingency | 10.0% | | | | 409,096 |
| | Estimated Bid Price | | | | | 4,500,060 |
| | Engineering, Administrative, Permits, Legal | 38% | | | | 1,710,023 |
| | **Total Estimate** | | | | | **$6,300,000** |

Estimate Accuracy
+40% -20%

| Estimated Range of Probable Cost | | |
|---|---|---|
| +40% | Total Est. | -20% |
| **$8,820,000** | **$6,300,000** | **$5,040,000** |

**OPINION OF PROBABLE CONSTRUCTION COST** — **KENNEDY/JENKS CONSULTANTS**

**Project:** Newport Centrifuge Replacement - Scenario 2 - Centrisys

**Building, Area:**

**Prepared By:** BIB
**Date Prepared:** 8.22.2022
**K/J Proj. No.** 2276008*00

**Current at ENR** 13,167.84
**Escalated to ENR**
**Months to Midpoint of Construct** 18

**Estimate Type:** ■ Conceptual ☐ Preliminary (w/o plans) ☐ Design Development @ ☐ Construction ☐ Change Order % Complete

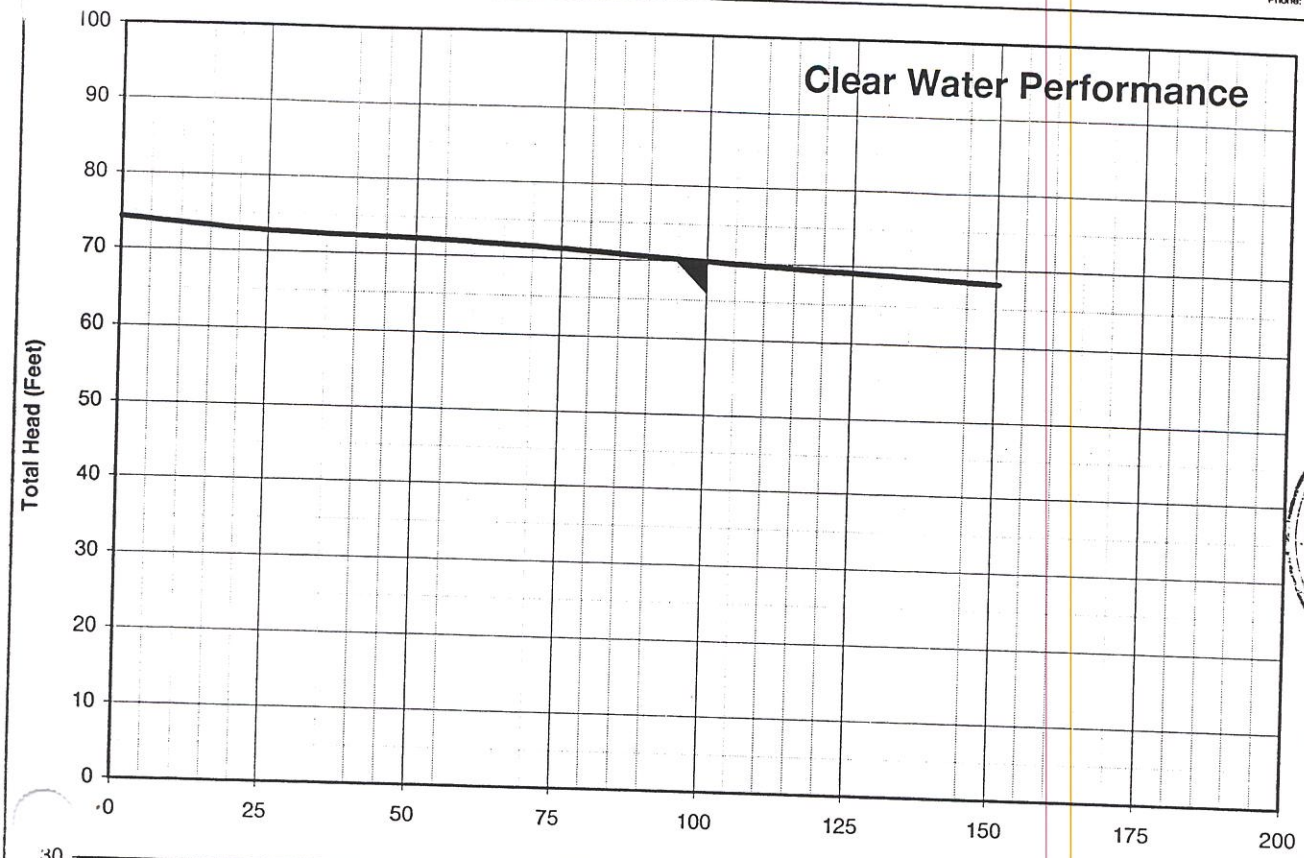
| Spec. Section | Item No. | Description | Qty | Units | Materials $/Unit | Materials Total | Installation $/Unit | Installation Total | Sub-contractor $/Unit | Sub-contractor Total | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **DIVISION 1 - GENERAL REQUIREMENTS** | | | | | | | | | | | |
| | | | | | | 0 | | 0 | | 0 | 0 |
| **SUBTOTAL - DIVISION 1** | | | | | | 0 | | 0 | | 0 | 0 |
| **DIVISION 2 - SITE WORK** | | | | | | | | | | | |
| | | | | | | | | | | | |
| | **Demo** | | | | | | | | | | |
| | | Remove centrifuges, conveyors, polymer system, controls | 1 | LS | | | 20,000.00 | 20,000 | | | 20,000 |
| | | Haul | 1 | LS | | | 1,000.00 | 1,000 | | | 1,000 |
| | | Disposal | 1 | LS | | | 1,000.00 | 1,000 | | | 1,000 |
| | | | | | | | | | | | |
| | **Temporary** | | | | | | | | | | |
| | | Dewatering Skid and Temp connections | 6 | Mo. | 0.00 | 0 | 0.00 | 0 | 11,000 | 66,000 | 66,000 |
| | | | | | | | | | | | |
| **SUBTOTAL - DIVISION 2** | | | | | | 0 | | 22,000 | | 66,000 | 88,000 |
| **DIVISION 3 - CONCRETE** | | | | | | | | | | | |
| | **Equipment Bases** | | | | | | | | | | |
| | | Concrete Base Slab on Grade | 10 | CY | 300.00 | 3,000 | 300.00 | 3,000 | 0 | 0 | 6,000 |
| | | Grout at Equipment Bases | 1 | LS | 2,000.00 | 2,000 | 500.00 | 500 | 0 | 0 | 2,500 |
| | | | | | | | | | | | |
| **SUBTOTAL - DIVISION 3** | | | | | | 5,000 | | 3,500 | | 0 | 8,500 |
| **DIVISION 4 - MASONRY** | | | | | | 0 | | 0 | | 0 | 0 |
| | | | | | | | | | | | |
| **SUBTOTAL - DIVISION 4** | | | | | | 0 | | 0 | | 0 | 0 |
| **DIVISION 5 - METALS** | | | | | | 0 | | 0 | | 0 | 0 |
| | **Centrifuges** | | | | | | | | | | |
| | | Dewatering Belt Modifications | 1 | LS | 50,000.00 | 50,000 | 12,500.00 | 12,500 | 0 | 0 | 62,500 |
| | | | | | | | | | | | |
| **SUBTOTAL - DIVISION 5** | | | | | | 50,000 | | 12,500 | | 0 | 62,500 |
| **DIVISION 6 - WOOD AND PLASTICS** | | | | | | 0 | | 0 | | 0 | 0 |
| | | | | | | 0 | | 0 | | 0 | 0 |
| **SUBTOTAL - DIVISION 6** | | | | | | 0 | | 0 | | 0 | 0 |
| **DIVISION 7 - THERMAL AND MOISTURE PROTECTION** | | | | | | 0 | | 0 | | 0 | 0 |
| | | | | | | | | | | | |
| **SUBTOTAL - DIVISION 7** | | | | | | 0 | | 0 | | 0 | 0 |
| **DIVISION 8 - DOORS AND WINDOWS** | | | | | | 0 | | 0 | | 0 | 0 |
| | | | | | | 0 | | 0 | | 0 | 0 |
| **SUBTOTAL - DIVISION 8** | | | | | | 0 | | 0 | | 0 | 0 |
| **DIVISION 9 - FINISHES** | | | | | | 0 | | 0 | | 0 | 0 |
| | | Concrete Finishes | 1 | LS | 5,000.00 | 5,000 | 1,250.00 | 1,250 | 0 | 0 | 6,250 |
| | | Piping Coatings | 1 | LS | 10,000.00 | 10,000 | 2,500.00 | 2,500 | 0 | 0 | 12,500 |
| | | | | | | | | | | | |
| **SUBTOTAL - DIVISION 9** | | | | | | 15,000 | | 3,750 | | 0 | 18,750 |
| **DIVISION 10 - SPECIALTIES** | | | | | | 0 | | 0 | | 0 | 0 |
| | | Misc. signage | 1 | LS | 500.00 | 500 | 500.00 | 500 | | 0 | 1,000 |
| **SUBTOTAL - DIVISION 10** | | | | | | 500 | | 500 | | 0 | 1,000 |
| **DIVISION 11 - EQUIPMENT** | | | | | | 0 | | 0 | | 0 | 0 |
| **Centrifuge Replacement (Centrisys)** | | | | | | 0 | | 0 | | 0 | 0 |
| | | Centrifuges, includes: | 1 | LS | 985,500 | 985,500 | 246,375 | 246,375 | 0 | 0 | 1,231,875 |
| | | Power run-through option | | | | | | | | | |
| | | Remote monitoring | | | | | | | | | |
| | | Extended 15-year scroll warranty | | | | | | | | | |
| | | Hydraulic Containment Pans | | | | | | | | | |
| | | Stands | 2 | EA | 21,560 | 43,120 | 5,390 | 10,780 | 0 | 0 | 53,900 |
| | | Polymer System | 1 | EA | 21,756.00 | 21,756 | 5,439 | 5,439 | 0 | 0 | 27,195 |
| | | Conveyors | 1 | LS | 66,500.00 | 66,500 | 16,625 | 16,625 | 0 | 0 | 83,125 |
| | | Spare Parts | 1 | LS | 20,000.00 | 20,000 | 0 | 0 | 0 | 0 | 20,000 |
| | | | | | | | | | | | |
| **SUBTOTAL - DIVISION 11** | | | | | | 1,136,876 | | 279,219 | | 0 | 1,416,095 |
| **DIVISION 12 - FURNISHINGS** | | | | | | 0 | | 0 | | 0 | 0 |
| | | | | | | 0 | | 0 | | 0 | 0 |
| **SUBTOTAL - DIVISION 12** | | | | | | 0 | | 0 | | 0 | 0 |
| **DIVISION 13 - SPECIAL CONSTRUCTIONS** | | | | | | 0 | | 0 | | 0 | 0 |
| | | | | | | 0 | | 0 | | 0 | 0 |
| **SUBTOTAL - DIVISION 13** | | | | | | 0 | | 0 | | 0 | 0 |
| **DIVISION 14 - CONVEYING SYSTEMS** | | | | | | 0 | | 0 | | 0 | 0 |
| | | | | | | 0 | | 0 | | 0 | 0 |
| **SUBTOTAL - DIVISION 14** | | | | | | 0 | | 0 | | 0 | 0 |
| **DIVISION 15 -MECHANICAL** | | | | | | 0 | | 0 | | 0 | 0 |
| | **Process Piping** | | | | | | | | | | |
| | | Feed Piping | 1 | LS | 50,000.00 | 50,000 | 12,500.00 | 12,500 | 0 | 0 | 62,500 |
| | | 3W Piping | 1 | LS | 10,000.00 | 10,000 | 2,500.00 | 2,500 | 0 | 0 | 12,500 |
| | | Centrate Piping | 1 | LS | 100,000.00 | 100,000 | 25,000.00 | 25,000 | 0 | 0 | 125,000 |
| | | Vent Piping | 1 | LS | 50,000.00 | 50,000 | 12,500.00 | 12,500 | 0 | 0 | 62,500 |
| | | Polymer Piping | 1 | LS | 10,000.00 | 10,000 | 2,500.00 | 2,500 | 0 | 0 | 12,500 |
| | | | | | | | | | | | |
| **SUBTOTAL - DIVISION 15** | | | | | | 220,000 | | 55,000 | | 0 | 275,000 |
| **DIVISION 16 - ELECTRICAL** | | Note: Electrical costs are estimated to be 30% of the construction subtotal amount. | | | | 0 | | 0 | | 0 | 0 |
| | | Electrical Materials, Installation and Subcontractor | 1 | LS | $0.00 | $0 | $0.00 | $0 | $427,751 | $427,750.50 | $427,751 |
| | | | | | | | | | | | |
| **SUBTOTAL - DIVISION 16** | | | | | | 0 | | 0 | | 427,751 | 427,751 |
| **DIVISION 17 - INSTRUMENTATION** | | | | | | | | | | | |
| | **Centrifuges** | | | | | | | | | | |
| | | Flowmeters | 2 | EA | $7,056.00 | 14,112 | $1,764.00 | 3,528 | $0.00 | 0 | 17,640 |
| | | | | | | | | | | | |
| **SUBTOTAL - DIVISION 17** | | | | | | 14,112 | | 3,528 | | 0 | 17,640 |
| | | | | | | | | | | | |
| **AREA TOTAL** | | | | | | 1,441,488 | | 445,997 | | 427,751 | 2,315,236 |

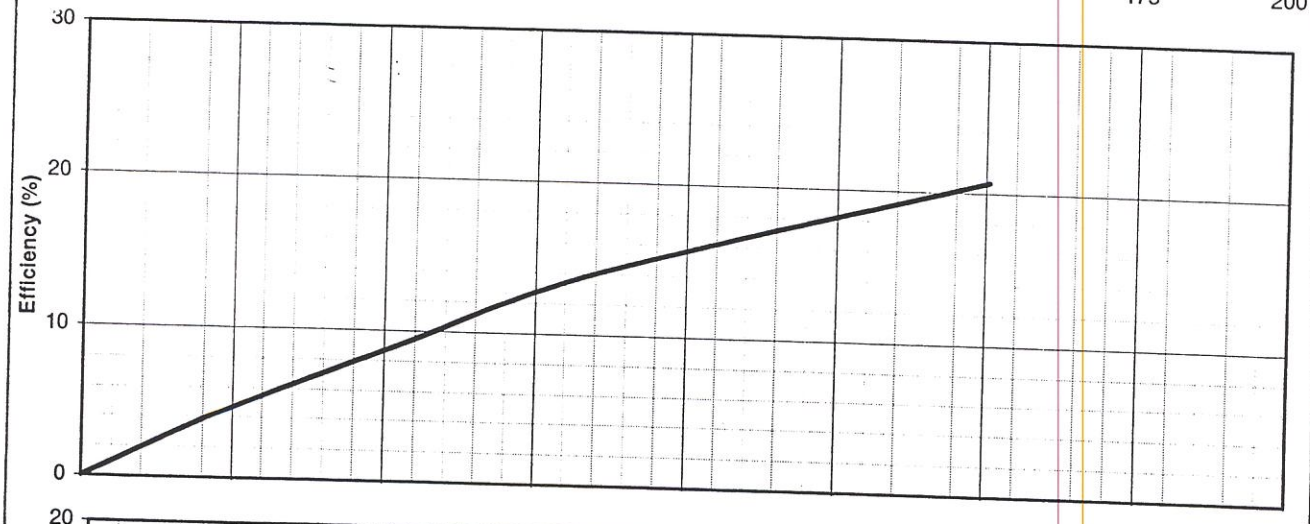
# Attachment E: Dewatering Feed Pump Curve

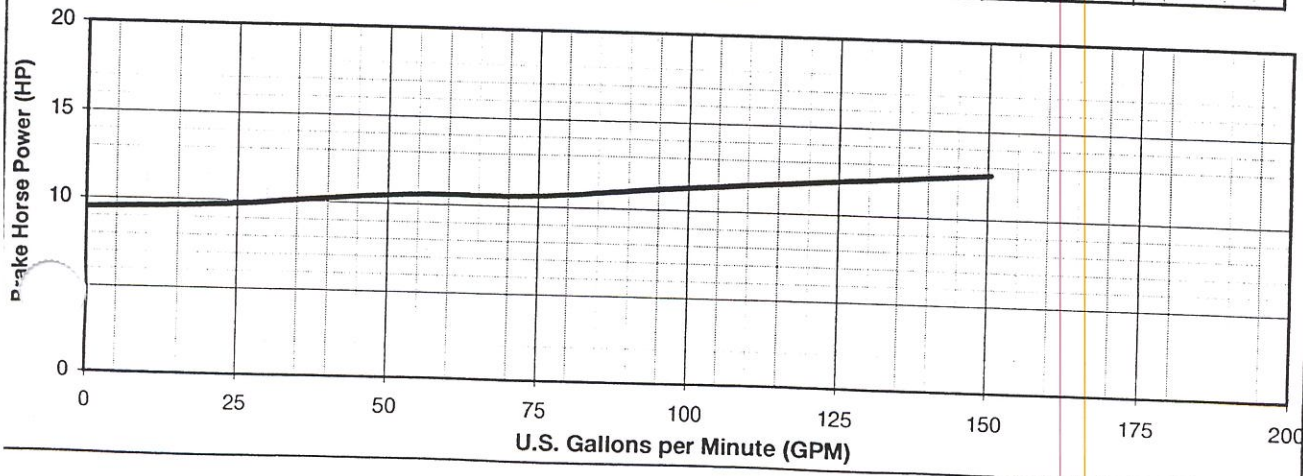
# WEMCO PUMP 3 x 3 Model C

WEIR SPECIALTY PUMPS

440 W. 800 S. Salt Lake City, Utah 84110
Phone: (801) 359-8731 Fax: (801) 355-9303




SALES ORDER NO: DW03292

RPM: 1309

Exp 12/31/03

Professional Engineer (Civil) CERTIFICATE NO. 8900 F. C. DATE SIGNED 9/20/01 Arizona U. S. A.

Customer: Slayden Construction, Inc.

Customer PO. 221-11314

Pump ID

Certified

© Copyright 2001 WEIR Specialty Pumps
All Rights Reserved.

BASED ON: TEST

DATE: 9/20/01

SERIAL NO.: 01DW03292-01

TEST NO.: 12214-1-0

Impeller Size: Full

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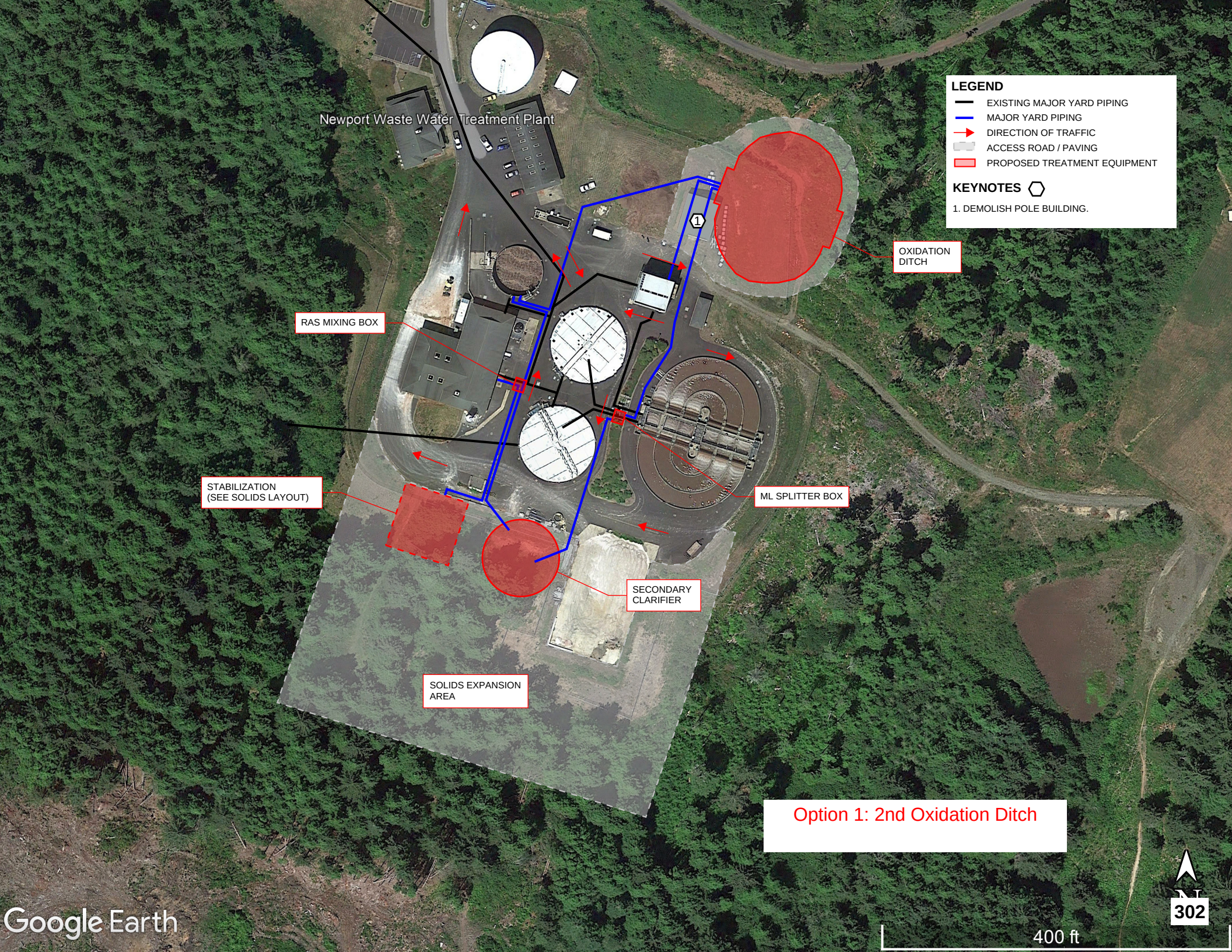
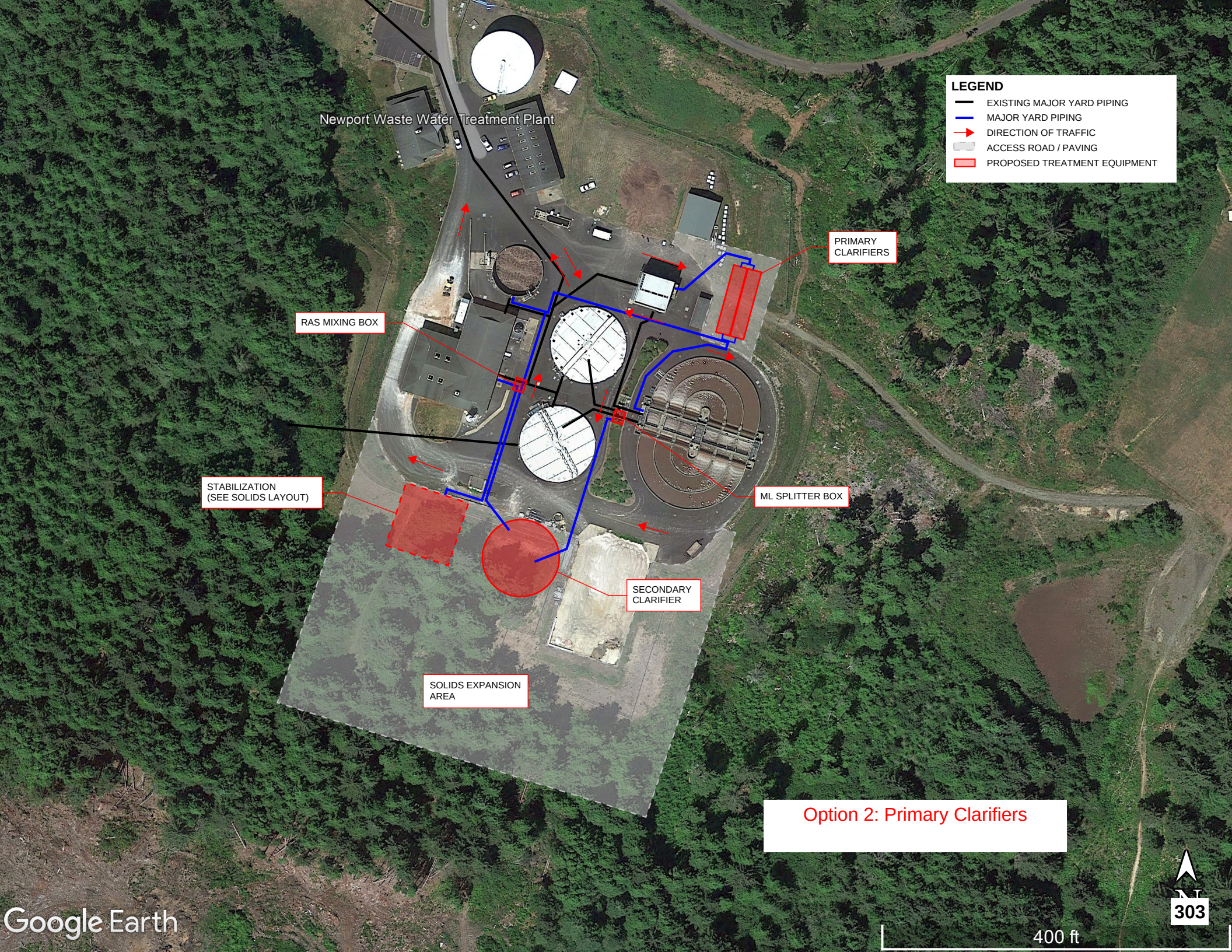
# Appendix F Alternative Site Plans



Use of contents on this sheet is subject to the limitations specified at the end of this document.


Newport Waste Water Treatment Plant
LEGEND
EXISTING MAJOR YARD PIPING
MAJOR YARD PIPING
DIRECTION OF TRAFFIC
ACCESS ROAD / PAVING
PROPOSED TREATMENT EQUIPMENT
KEYNOTES
1. DEMOLISH POLE BUILDING.
1
OXIDATION DITCH
RAS MIXING BOX
STABILIZATION (SEE SOLIDS LAYOUT)
ML SPLITTER BOX
SECONDARY CLARIFIER
SOLIDS EXPANSION AREA
Option 1: 2nd Oxidation Ditch
N
302
400 ft
Google Earth


Newport Waste Water Treatment Plant
LEGEND
EXISTING MAJOR YARD PIPING
MAJOR YARD PIPING
DIRECTION OF TRAFFIC
ACCESS ROAD / PAVING
PROPOSED TREATMENT EQUIPMENT
PRIMARY CLARIFIERS
RAS MIXING BOX
STABILIZATION (SEE SOLIDS LAYOUT)
ML SPLITTER BOX
SECONDARY CLARIFIER
SOLIDS EXPANSION AREA
Option 2: Primary Clarifiers
303
400 ft
Google Earth

# Appendix G Alternatives Workshop Meeting Minutes



Use of contents on this sheet is subject to the limitations specified at the end of this document.

# Meeting Minutes

Street Address
City, ST Zip

T: 503.244.7005
F: 503.244.9095

**Prepared for:** City of Newport
**Project Title:** WWTP Master Plan
**Project No.:** 158211 / Task Order 26

**Purpose of Meeting:** Alternatives Evaluation Workshop **Date:** April 25, 2023
**Meeting Location:** Vance Avery WWTP **Time:** 10:00 a.m. – 2:00 p.m.
**Minutes Prepared by:** Jennifer Kersh, BC

**Attendees:**
David Powell, Newport
Aaron Collett, Newport
A. Grant, Newport
Clare Paul, Newport
Mark Strahota, BC
Josh Johnson, BC
Greg Humm, BC
Jennifer Kersh, BC
Holly Tichenor, BC
Adam Klein, BC
Mark Cullington, KJ
Ben Bosse, KJ

The notes below summarize key discussions with City of Newport staff:

General/Schedule

1. Dave Powell will present to city council on June 5 to advocate for funding required for the WWTP improvements. Council is aware approximately $60 million is planned.
2. Dave has 5-10 minutes to present the latest information from the master planning effort.
3. BC offered to prepare a short presentation for the upcoming meeting.
4. Rates will be raised by about 12% at the end of June with potentially more increases into the future.
5. Clare recommended uploading a draft master plan report online for public comment when ready.

Critical Success Factors

1. Add communication of the need and urgency of upgrades as a CSF.
    a. Public outreach needed for rate increase.

Flows and Loads

1. Loading to the WWTP is expected to increase by about 12% by 2040.
2. As discussed previously, Newport is subject to a sharp increase in flows and loads during the summer months and holiday weekends due to increases in tourism.
3. Additional development is expected even in areas that appear “undevelopable” due to steep slopes (this is largely driven by a tight housing market).

4. Base flow forecasts are based on permanent residents, but peak flows are tourism driven – i.e. peak BOD load occurs on summer holiday weekends.
5. BC will include a discussion regarding major industry/tourism influences in the master plan.
6. Aaron recommended these concepts be distilled down to simple graphics for presentation to city council. Technical graphs are too detailed for this purpose.

<u>WWTP Alternatives</u>

1. Composing and drying:
    a. Composting can be odorous but can be controlled by covering the process and/or using room ventilation. Foul air control and leachate control are critical.
    b. Mark C. recommended the City visit facilities currently composting and drying for comparative purposes.
    c. Approximately one full-time equivalent (FTE) is recommended that is dedicated to the composting process.
    d. Composting is more dependent on biosolids land application than dryers due to quantity of solids. During the off-season, additional measures such as bagging/storage may be required.
        i. Some agencies are able to send compost to landscaping companies, where it is blended as a commercial product.
    e. Composting provides a "Class B offramp" for the timeframes a Class A product is not required.
    f. Per Grant, composting is labor intensive and logistically difficult.
    g. Drying is a mature technology that is more common on the east coast where land application is not as practical.
    h. A stabilization process is recommended upstream of the drying process. Otherwise the rewetted product is odorous.
    i. Drying requires a much smaller footprint than composting.
    j. Drying is recommended as a precursor for treatment of PFAS. Ceiling limits for land application are not anticipated to be incorporated into regulations in the near future.
    k. Grant has concerns with fire hazards associated with dryers.
    l. Aaron notes they still get complaints when biosolids trucks go by due primarily to lack of understanding / familiarity.
    m. Grant points out that composted biosolids meet Class A, as the plant currently does, but composted biosolids look more like a landscaping product with the added carbon material.
    n. Dave mentioned certain members of City Council strongly prefer greener and more environmentally friendly options. Composting may be more "publicly palatable" for this reason.
2. Aerobic versus anaerobic digestion:
    a. Gas produced from anaerobic digestion can potentially be reused for digestor heating and other processes such as drying.
    b. Grant noted that captured gas must be cleaned prior reuse. Flaring of the gas may be a simpler option.
    c. Clare prefers aerobic digestion as anaerobic digestion is more typical for larger treatment plants.
3. Primary clarifiers versus a second oxidation ditch:
    a. Grant suggested primary clarifiers could act as a stabilization tank to accommodate for slug loading to the plant.
    b. Adam suggested a selector could be added upstream of an oxidation ditch to potentially serve the same purpose.

   c. A bypass line could be routed around the primary clarifiers to provide additional process flexibility.
4. Odor control:
   a. Dave inquired whether odor control would be added to each process or a single odor control unit would service the entire plant. Due to costs associated with running ductwork around the entire plant, individual odor control units (carbon scrubbers) are recommended at each process with short runs of ductwork to the odorous areas.
   b. Grant mentioned winter and summer sludges are distinctly different, with different odors.
   c. Options with no stabilization are significantly more odorous and would require additional odor control measures.
5. Scoring:
   a. Greg suggested the scoring criteria adopted may be overly complex. Two categories may be simpler and more appropriate for the evaluation. "Community" and "operations" were recommended.
   b. "Community" could refer to the benefits associated with less odorous options, greener/environmentally friendly options, and options that create local jobs.

<u>Communication/Funding Support</u>

1. Dave is currently trying to gain support from the Council for $60 million for the recommended upgrades. To help cover the costs, a 12% rate increase has been approved and will be effective at the end of June, with more increases possible afterwards.
2. Dave suggested the Council may be leaning on the City Manager for approval to move forward on obtaining additional funding. There seems to be a lack of effective communication within the Council and limited understanding of the key issues. The Council tends to prioritize other issues over the WWTP, such as homelessness, parks, and dam improvements.
3. Holly presented a recent example from Vancouver, WA that demonstrated an effort to secure funding for critical upgrades. She stressed the importance of simple and effective graphics, with personal elements such as photos of operators and workers. She recommended having individual conversations with each Council member, which could be effective in swaying the decisions of the entire Council and securing the required funding.
4. Dave intends to keep the project phasing as is and suggested the column chart graphic with funding plan for council use.
5. Question about differences between master planning and facility planning based on funding questions. Facility Plan may require official DEQ submittal, but BC will confirm and follow up. Aaron notes that grants are available from Business Oregon for Facility Plan costs, which may apply to this project.

<u>WWTP Headworks</u>

1. Clare noted there is significant rusting on the underside of the headworks building, and Grant agreed.
2. For Alternative 2, Grant suggested the proposed layout of the new screens could be flipped to optimize access to the doors on the new screens. BC has no concerns with this re-arrangement.
3. The City agreed in concept to carbon adsorption as the preferred odor control option.
4. "Ragging" has been a significant issue with the existing auger screens.
5. It was noted the preliminary costs presented are construction only and do not include engineering and administrative costs.

Northside PS Alternatives

1. Greg presented a summary of the alternatives, associated costs, and phasing options for Northside PS. Four options have been developed – two are short term options that are designed to smooth out cash flow with WWTP costs and two are long term, buildout options.
2. The options had been discussed in previous meetings with David and Grant. The outcome of those meeting has been a consensus to proceed with Alternative 2 which will make improvements to the existing NSPS to replace aging equipment to improve reliability and upgrade other areas of the facility to allow it to operate for another 10+ years. During that 10 year +/- interval, the City will be making investments at the WWTP. At the end of the 10 year +/- interval, a new buildout pump station will need to be constructed and the existing NSPS decommissioned.
3. Estimated construction costs for the 4 alternatives have now been developed and these were presented as well.
4. The MP will describe each alternative and recommend implementation of Alternative 2. David, Clare, Grant, and Aaron were in agreement with this decision.

Conclusions and Next Steps

1. Additional discussion is required to confirm the requirements for the upcoming facilities plan that will follow the master plan report.
2. BC to recommend a single WWTP alternative as a part of the master plan, guided by discussions in the workshop.
3. BC to provide a finalized master plan report to the City at the end of June.

# Appendix H Northside Pump Station Alternative TM





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# Technical Memorandum

Prepared for: City of Newport

Project Title: Wastewater Treatment Master Plan–Phase II

Project No.: 158211

**Technical Memorandum**

Subject: Analysis of Northside Pump Station Upgrade Alternatives

Date: June 9, 2023, (finalized May 9, 2025)

To: David Powell, P.E.

From: Mark Strahota, P.E.

Prepared by: Gregory Humm, P.E.

Reviewed by: Jennifer Kersh, P.E.

*Limitations:*

*This document was prepared solely for City of Newport in accordance with professional standards at the time the services were performed and in accordance with the contract between City of Newport and Brown and Caldwell dated March 9, 2017. This document is governed by the specific scope of work authorized by City of Newport; it is not intended to be relied upon by any other party except for regulatory authorities contemplated by the scope of work. We have relied on information or instructions provided by City of Newport and other parties and, unless otherwise expressly indicated, have made no independent investigation as to the validity, completeness, or accuracy of such information.*

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# List of Abbreviations

| | |
|---|---|
| AACE | Association for the Advancement of Cost Engineering |
| BC | Brown and Caldwell |
| City | City of Newport |
| CIP | Capital Improvement Plan |
| DEQ | (Oregon) Department of Environmental Quality |
| HI | Hydraulic Institute |
| MCC | Motor Control Center |
| mgd | million gallon(s) per day |
| NFPA | National Fire Protection Association |
| MH | manhole |
| NEC | National Electric Code |
| NPDES | National Pollutant Discharge Elimination System |
| NSPS | Northside Pump Station |
| OSHA | Occupational Health and Safety Administration |
| OSSC | Oregon Structural Specialty Code |
| PLC | Programmable Logic Controller |
| PS | Pump station |
| RUL | remaining useful life |
| VFD | variable frequency drive |
| Waterdude | Waterdude Solutions |
| WWTMP | Wastewater Treatment Master Plan |
| WWTP | Wastewater Treatment Plant |



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# Section 1: Introduction and Facility Overview

## 1.1 Purpose

This memorandum is a component of the City of Newport's (City) Wastewater Treatment Master Plan (WWTMP). The purpose of the WWTMP is to evaluate the City's existing wastewater treatment infrastructure, operational procedures, and equipment performance and develop a 20-year Capital Improvement Plan (CIP) that will address treatment needs for the projected population growth, future flow and organic load conditions, and possible future regulations.

Development of the CIP involves identifying and comparing improvement alternatives based on criticality, estimated capital costs, estimated operation and maintenance costs, risks, and cash flow. An implementation schedule outlining the timing and phasing of improvements is a key element of the CIP.

This memorandum presents this information specifically for the Northside Pump Station (NSPS). Alternatives for improving and upgrading the facility are developed and evaluated. Based on the outcome of this evaluation, recommended upgrades are described and an overall plan for the facility and site has been formulated. The cost and timing for making the recommended upgrades has been integrated into the overall wastewater CIP.

## 1.2 Background

In 2002, the City constructed the Vance Avery Wastewater Treatment Plant (WWTP) in South Beach, Oregon. In doing so, the former WWTP located north of Yaquina Bay was decommissioned and transformed into a pumping facility that functions to pump wastewater to the new WWTP. The pump station is now known as the NSPS.

The pump station itself was constructed using one of the clarifier basins from the existing WWTP to form the screening channels, grit basin, wetwell, and pump room. As a result, the station is unique and the wetwell layout is unusual in terms of meeting industry-wide design standards. Even so, the facility has served its purpose very well since it was re-purposed as a pumping facility in 2002. On the other hand, the uniqueness of the station also creates performance and operational issues which will be presented in this memorandum.

Approximately 90-percent of the City's wastewater is generated through development north of Yaquina Bay. This significant portion of the overall wastewater flow is conveyed to the NSPS and then pumped to the WWTP through a force main that crosses the bay. Removal of rags, grit, sand, and other solid materials from the wastewater is critical to wastewater conveyance to the WWTP. Poor removal performance will result in an accumulation of material in the force main, eventually impacting hydraulic capacity or possibly blocking the pipe entirely. Cleaning the pipe is inherently difficult due to the length and installation on the bay bottom, so efficient removal of debris is vitally important.

The NSPS has been in service for over 20 years and its equipment is approaching the end of its service life. Maintenance costs are expected to increase, and the reliability of the facility will become increasingly more important as the facility continues to age. Additionally, several operator safety issues are evident and require correction. With these issues growing more significant over time, the City has requested an analysis of NSPS improvement options as part of the overall WWTMP that Brown and Caldwell (BC) is preparing.



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# Section 2: Current Conditions, Station Performance, and Previous Work

## 2.1 Facility Description

The NSPS utilizes two inclined screw-type mechanical screens to removed rags and other large debris from the influent wastewater. A grit removal basin is used to remove grit and other settleable debris from the influent wastewater to provide preliminary treatment. Accumulated grit is removed from the basin in a slurry, which is then dewatered. Material removed by the screens is bagged and manually transported in a wheelbarrow to a dumpster, which also receives dewatered grit from the grit removal process.

The wastewater enters the pump station through three channels where the three existing screening systems are located–the two outer channels contain the mechanical screens and the middle channel has a manual bar screen. Once the wastewater passes the screens, it moves to the grit chamber where further separation of sand, gravel, and other heavy solids takes place. Following the grit chamber is the wetwell where water collects before being pumped to the WWTP.

## 2.2 Site Development

As noted above, the NSPS site was formerly the City's original WWTP. Several abandoned and decommissioned wastewater structures still exist on the site. These include a trickling filter, clarifier basins, an anaerobic digestion facility, and chlorine contact basin. A network of buried piping and electrical ductbanks also exist below the ground surface, most notably the influent gravity sewer pipe and effluent pipeline which are still in use and are critical to continued operation.

Additionally, the site is used by other City departments including the fire department for training, police department for impounding vehicles, and a public works maintenance shop. Although these facilities and activities can co-exist with wastewater operations, it would be beneficial to eventually reduce or eliminate these additional activities being performed onsite altogether, so that the site is dedicated exclusively to wastewater operations. The City plans to begin this effort by relocating the vehicle impoundment activities by the police department to the WWTP.

A suggested site layout that accounts for a future new pump station is shown in Figure 1. The layout is based on demolition of decommissioned wastewater structures (i.e., trickling filter, digestion facility, and clarifiers), elimination of police activities, construction of a dechlorination facility and vehicle parking garage, and a future NSPS. Demolition of wastewater structures can happen over time as funds become available and as additional space is needed. The fire department training facility would remain, as there are no alternate locations for this type of facility within the City.



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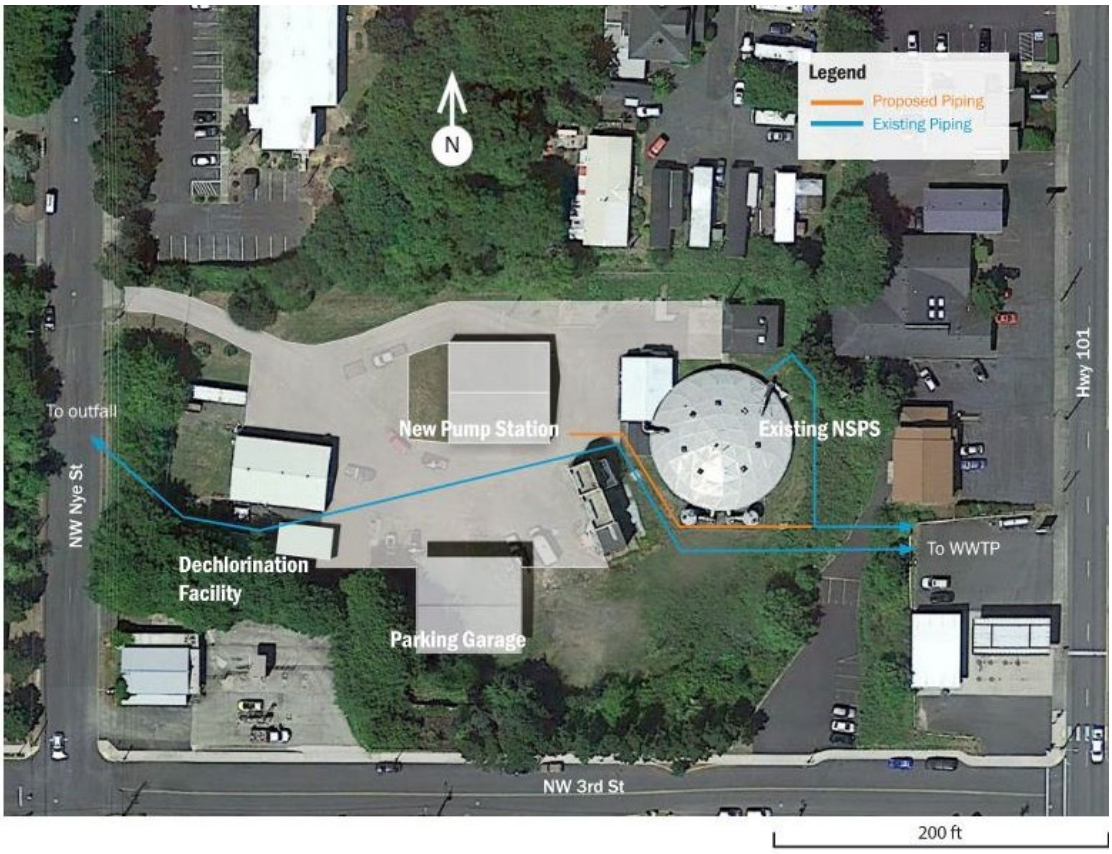


**Figure 1. Site Development with new (future) pump station**

## 2.3 Condition Assessments

Condition assessments were previously completed by Waterdude Solutions (Waterdude) and BC to identify conditions within the NSPS that require attention. These assessments are summarized in this section.

### 2.3.1 Waterdude 2018 Assessment

A condition assessment was completed by Waterdude for the WWTP and NSPS. Waterdude prepared an initial condition assessment report in January 2018 and an update to this report in 2021. Their *Wastewater Treatment Facilities Condition Assessment Update,* dated October 11, 2021, provides a criticality assessment which evaluates the overall condition rating of each system and identifies systems that pose the highest risk. The systems that are deemed most at risk are:

- NSPS
- Headworks
- Septage
- Solids Handling



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Specifically, for the NSPS, the 2021 update report concludes that screening and grit removal systems and the pump station structure itself are in Fair to Poor condition. The condition of the station is a challenge to the ongoing operation and maintenance of the station. The screens were determined to be approaching their end of service life and the geodesic dome over the structure is leaking and in poor condition. Leaks are noted to cause humid conditions inside the structure which results in corrosion, slip hazards, and premature electrical equipment failure. Furthermore, odorous air treatment is not occurring because the odor control system is not in use.

### 2.3.2 Brown and Caldwell 2019 Assessments

In addition, BC also performed inspections of the facility to assess its condition and identify problem areas. An inspection performed in May 2019 identified the following issues:

- An electrical fault on the power cables feeding Raw Sewage Pump No. 1 required replacement of the cables using the spare conduit that was originally provided for (un-installed) Pump No. 4. Field tests determined that numerous existing power cables between the Electrical Building and pump station are in poor condition and should be replaced. Refer to Section 3.4.1 for additional detail.
- Grit system is in poor condition and lacks the redundancy that should be provided given the potential for blockage of the force main from an accumulation of solids that would pass through the station in the event the grit system is out-of-service. Failure of the grit piping in the lower pump room would cause flooding of the station. Overall, the grit system is considered high risk in terms of reliability; there are consequences of system failure. Refer to Section 3.2 for additional detail.
- The geodesic dome cover is leaking primarily where the structural supports anchor to the perimeter concrete wall. See photos in Figure 2 on the following page. These connections are complicated with structural shapes coming together at various angles with numerous bolts and gusset plates. Sealing these connections is difficult to accomplish properly, causing leakage to occur at these locations. The cover is also leaking at localized spots throughout the cover panels. These leaks are likely the result of deterioration of the seals at the edges of the individual triangular cover panels. Refer to Section 3.3 for additional details.



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**Figure 2. Examples of rainwater leakage through geodesic dome**

### 2.3.3 Electrical Investigation

In 2012, an electrical fault occurred within the power cables feeding Raw Sewage Pump No. 1. The fault occurred on the load-side cables to the pump motor and was resolved by installing new conductors to the motor using the spare conduit to (un-installed) Pump No. 4. Although the exact cause of failure is unknown, it was suspected that the buried ductbank between the Electrical Building and the pump station had been damaged, possibly due to settlement. An investigation was conducted in May 2019 to test the other cables in the same ductbank to determine whether other existing circuits were also damaged or at risk of failure.

Based on the testing results and visual observations, the action items listed below were provided to the City in May 2019.

1. Replace the existing power cables for Raw Sewage Pumps No. 1, 2, and 3 with new variable frequency drive (VFD)-rated, multi-conductor cable with grounds.
2. Replace the existing conductor cables for Rotary Screen No. 1 with new conductors.
3. Existing spare conduits between the Electrical Building and the pump station are suitable for use provided each conduit is tested and cleaned prior to pulling new cables into place.
4. Install new conduits between the Electrical Building and the pump station for future equipment (Grit Pump No. 2, Raw Sewage Pump No. 4, Screenings Conveyor, plus any spare conduits). These can be installed in either an overhead configuration or buried. If buried, inspect the existing ductbank for damage when it is exposed for construction of the new conduits.

### 2.3.4 Remaining Useful Life Estimates

Results from the condition assessments and electrical investigation described above informed general estimates of the remaining useful life (RUL). Developing RUL estimates can be risk- and scientifically-based, highly detailed assessments that are generated through statistical analysis of operation and maintenance



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information. RUL estimates prepared for this planning level effort have not been made using these detailed analyses; rather, they are general estimates that have been developed to provide a framework for prioritizing and scheduling upgrades and improvements to the NSPS.

The generalized approach taken to develop RUL estimates consisted of estimating remaining life for individual components of the overall facility. These estimates are tabulated in Table 1.

**Table 1. Estimated RUL for Station Components and Basis for Remaining Life Estimates**

| Station Component | Estimated RUL (years) | Basis for RUL Estimate |
|---|---|---|
| Screens | 2-3 | Poor condition, numerous known issues impacting remaining life. |
| Grit System | 2-5 | Condition of paddle in grit basin is unknown (not visible). An un-installed replacement grit pump is available. Classifier and washer are in poor condition. Grit piping and valves are likely near end of service life due to abrasive conditions. |
| Electrical Wiring to Pumps | 2-4 | Known deterioration of conductors between Electrical Building and pump station, likely remaining life of two to four years. |
| Ventilation System | 3-5 | Supply fan and foul air fans likely at end of life; odor treatment system is not functional; louvers have deteriorated and require replacement. |
| Geodesic Dome | 10-15 | Dome has localized leakage points and City employees report deterioration. Life may possibly be extended through on-going maintenance. |
| Electrical and Instrumentation Systems | 5-10 | Motor Control Center (MCC) needs a thorough assessment, approximately ten years of remaining service would be expected. Control panels within pump station are in poor condition although internal components may be operable for five to ten years |
| Wastewater Pumps | 10-15 | Pumps are in good condition; a spare, un-installed pump is available. Normal, on-going maintenance is necessary. |
| Wastewater Piping and Valves | 20-30 | Appears to be in good condition. |
| Concrete Structure | 20-30 | Structure is in good condition; minor, localized signs of degradation. Wetwell is not visible, an inspection is needed to determine actual condition. |

The assessments from Table 1 above are shown graphically in Figure 3.

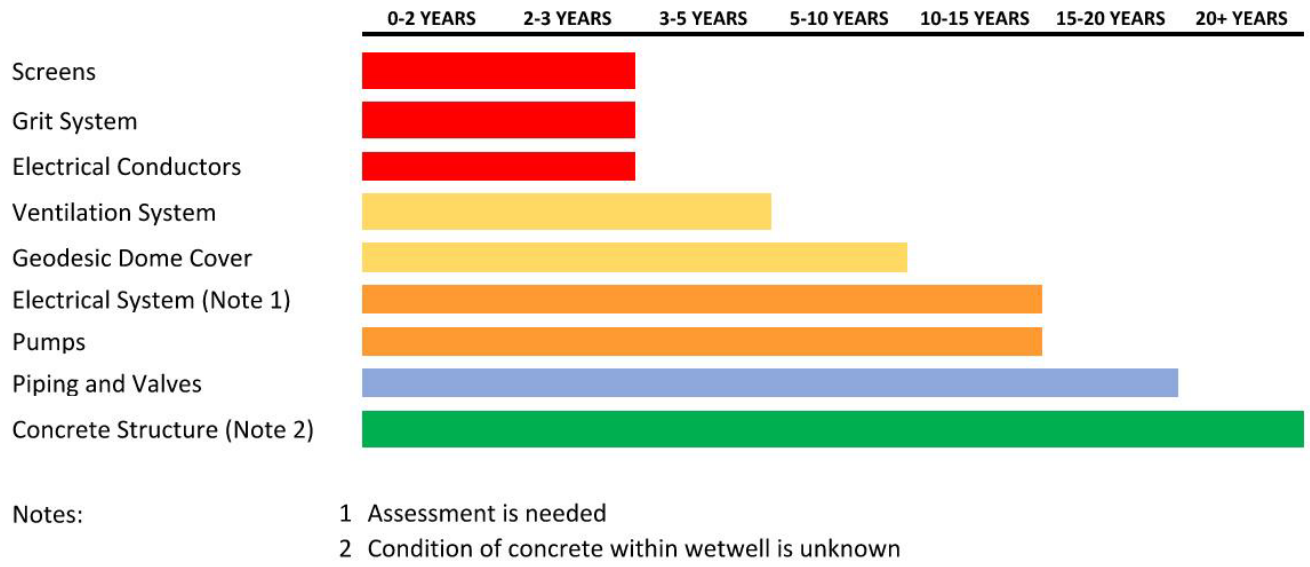


**Figure 3. Summarized graphical representation of RUL estimates**



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Observations that can be made using the condition assessment information and general RUL estimates described above include:

- High priority improvements include replacing the screens and grit system components, electrical cables to the Raw Sewage Pumps, and ventilation fans.
- At least three components of the NSPS are of immediate concern and replacement to these components should be considered a high priority for continued moderately reliable operation until more extensive improvements, or a new pumping facility, can be constructed and placed into service.
- A pivot point of about ten years seems apparent. With completion of the high-priority improvements (i.e., screens, grit system, electrical cables, and fans), reliable operation of the facility for another ten years appears realistic. Reliability concerns will begin increasing towards the end of that time and beyond unless additional improvements are made. If those additional improvements are completed, the existing facility could have a realistic service life of twenty years or more (beyond the initial ten years).

These observations have allowed development of upgrade alternatives for the facility. These are presented in Section 4.1 and described in Table 2 on the following page.

**Table 2. Upgrade Alternatives for NSPS Based on RUL**

| Alternative | Name | Description |
|---|---|---|
| Alternative 1 | "Bare Minimum" Alternative | Make immediate minor improvements to increase reliability and provide time for design and construction of a new buildout pump station, then abandon/decommission the existing NSPS. |
| Alternative 2 | "10-Year Alternative" | Replace equipment to extend service life by ten years to allow the City to make investments at the WWTP, then construct a new pump station and abandon/decommission the existing NSPS. |
| Alternative 3 | "New Dry Weather Facility" | Construct a new pumping facility with capacity for dry weather flows and upgrade the existing NSPS to serve as a wet weather pumping facility. |
| Alternative 4 | "New Buildout Facility" | Construct a new pumping facility with capacity for buildout flows and abandon/decommission the existing NSPS. |

## 2.4 Operational Performance of Screens

Screen performance has been historically problematic and tolerable operation has been diminishing over time. Screen performance issues include:

- Inefficiency at moving floating material from the channel–debris becomes trapped in the approach channel and must be manually removed.
- Overall poor debris removal performance causing blinding, reducing hydraulic capacity resulting in surcharging the influent sewer, ultimately resulting in overflows at the upstream manhole (MH).
- Debris accumulation in the compaction chamber at the top of the screen, causing jamming of the unit and requiring manual removal by operations staff.
- Corrosion and overall degradation of the equipment leading to a lack of cleanliness of the area around the screens and leakage.
- Handling of screened material and transporting bagged debris to the dumpster resulting in significant manual labor and negative impacts to operator safety.



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Figure 4. Existing Auger Screens

## 2.5 Previous Upgrade Projects

In 2018, the City considered the replacement of a screen. In 2023, the design of a dechlorination facility was completed. The details of these projects are discussed in this section.

### 2.5.1 Screen Replacement Project

The City initiated a screen replacement project in 2018 but halted the project before the final design phase. The scope of the project included an analysis of feasible alternatives for replacing the existing screens with new screens and improvements to the screenings processing and management systems. The analysis considered available types of screens, screening washing/compacting systems, conveying systems, and alternatives for improving hydraulics in the existing channel. Reliability and redundancy considerations were identified and capital, operations, and maintenance costs for implementing the recommended improvements were developed. Refer to Section 3.1 for additional details.

### 2.5.2 Effluent Dechlorination Facility

Currently, effluent is chlorinated at the WWTP to comply with disinfection requirements stipulated in the National Pollutant Discharge Elimination System (NPDES) discharge permit. The chlorine dose is set such that residual chlorine is below the permitted concentration prior to discharge. The point of compliance is at the NSPS. However, without a means of controlling effluent residual chlorine dose through a dechlorination process, compliance with the permitted effluent chlorine concentration limit is difficult. The limit has been exceeded periodically in violation of the NPDES permit.

To improve control and better achieve compliance, the Oregon Department of Environmental Quality (DEQ) is requiring the City to dechlorinate the final effluent prior to discharge. A dechlorination facility that would meter sodium bisulfite into the effluent to reduce and control residual chlorine concentration will be needed at the NSPS. The City is currently working to establish funding for this facility. When funding is in place, design is scheduled to begin in Summer 2023 and construction of the facility will be completed in 2024.

In addition to constructing the new sodium bisulfite facility, two existing structures at the site are to be demolished to create space for parking, turn-around for chemical deliveries, a new vehicle garage (pre-engineered metal building), and a future replacement pump station. Specifically, the existing digester and clarifier structures at the NSPS site are to be demolished with a new vehicle storage garage constructed.



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# Section 3: Improvements to Existing NSPS

Four alternatives for improving the NSPS have been developed as summarized in Table 2 and described in detail in Section 4. In three of these alternatives, the existing NSPS would be upgraded and would remain in service–at least in the near term. Alternative 4 is the only alternative that involves immediately constructing a new pumping facility and decommissioning the existing station.

Thus, improvements to the existing NSPS that would be undertaken in Alternatives 1, 2, and 3 have been defined through the previous work described in the preceding sections. These are briefly described in the following sections with references to previous documents have can be referenced for additional detail.

## 3.1 Screening Process Improvements

Channel modifications to reduce surcharging the incoming sewer pipe during high-flow events were developed as part of the screen replacement project. The modifications are described in this section.

### 3.1.1 Overview

Wastewater flows from the influent sewer pipe into a head box at the upstream end of the three screen channels. After passing through the screens, the wastewater enters the grit chamber and then flows into the wetwell.

During high flow events, the headloss through the channels and screens causes water to back up into the head box and influent pipe. Plugging or "blinding" of the screens caused by poor screen performance further restricts flow from passing into the downstream grit chamber. In the past, the combination of high flows, screen blinding, and headlosses through the system has resulted in overtopping MH-1, which is at the entrance to the pump station.

### 3.1.2 Hydraulic Performance

A hydraulic analysis was completed to assess the hydraulic performance of the channels, establish the hydraulic capacities of each screen channel, and determine the allowable headloss through the channels.

A Visual Hydraulic model of the screen channel arrangement was developed and used to assess the flow split between the channels. With two channels in operation, an unequal flow distribution is apparent with about 5.4 million gallons per day (mgd) conveyed through the Screen 1 channel and 3.8 mgd through the Screen 2 channel. Unequal flow distribution will tend to overload Screen 1 with debris, increasing the risk of blinding–refer to Figure 5.

The Visual Hydraulics model was also used to assess the risk of overflowing MH-1. Assuming six inches of headloss through the screens and with unequal flow distribution through the channels, the peak flow rate of 9.2 mgd would surcharge the incoming sewer such that the water surface elevation in MH-1 will be only about 1.2 feet below the MH rim. Screen losses are dynamic and fluctuate according to the amount of debris that has accumulated on the screen. The screen loss increases as debris collects on the face of the screen and decreases after the screen is cleaned. As a result, the existing screens that are installed in the channels have blinded and caused overtopping of MH-1 in the past.

Water surface elevations at peak flow are shown in Figure 6.



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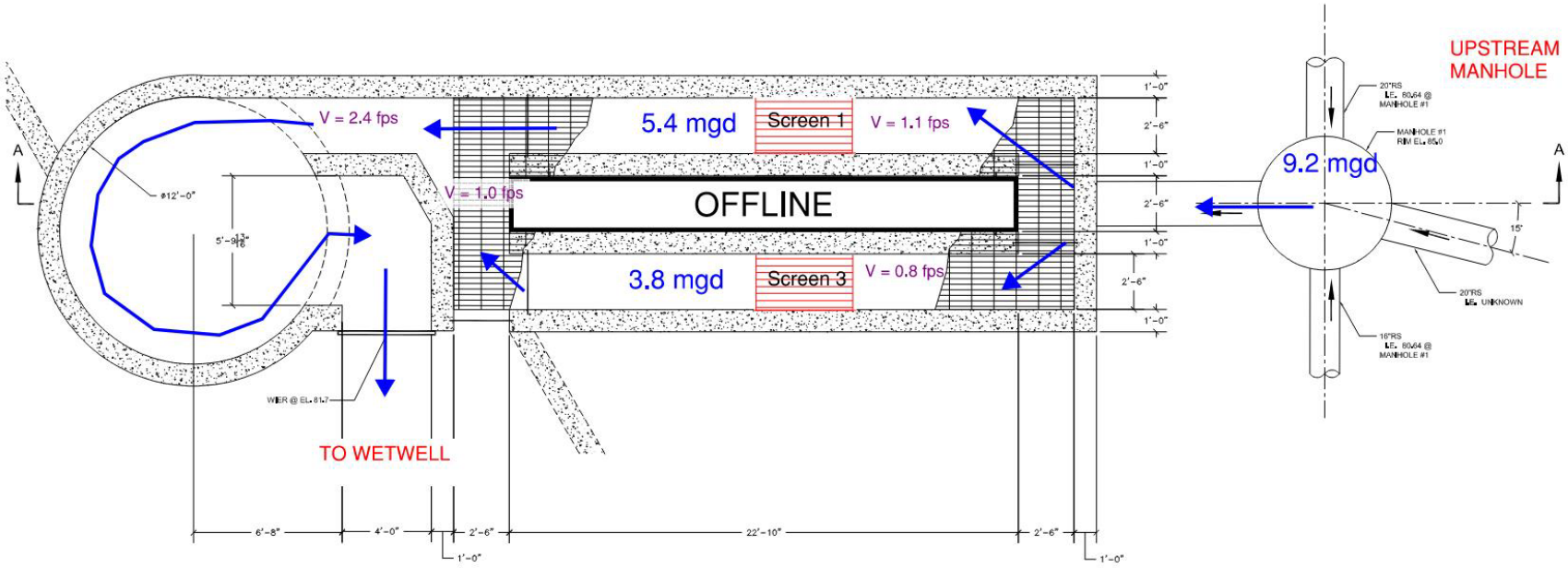


**Figure 5. Flow Distribution Diagram–Existing Screen Channel**



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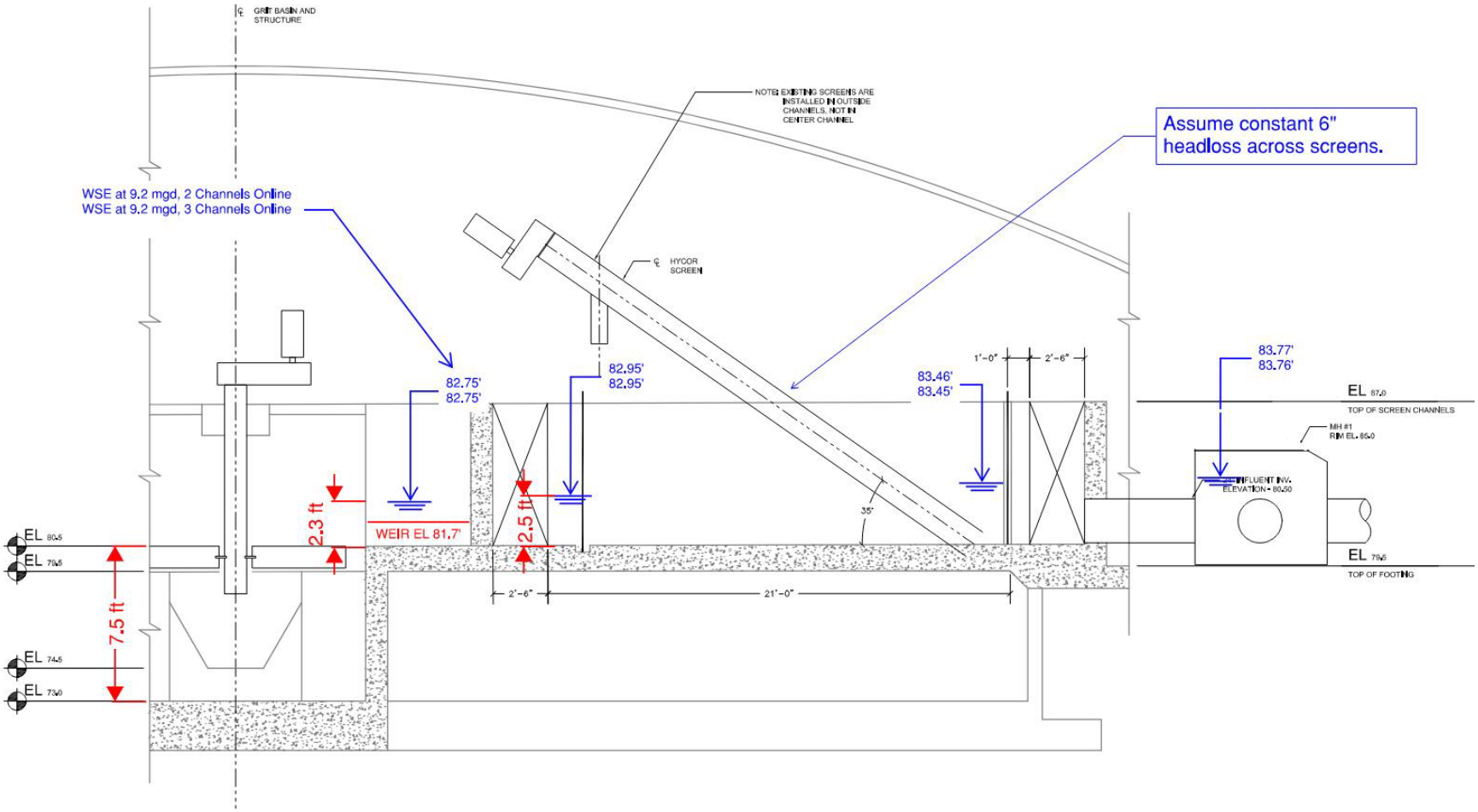


**Figure 6. Water Surface Elevations at Screen Channel**



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### 3.1.3 Screen Channel Modifications for Improved Performance

Equalizing the distribution of flow between the three channels and reducing the risk of overflowing MH-1 can be accomplished through channel modifications. These modifications, shown in Figure 7, would be made in conjunction with installation of new screens in the channels. A screenings conveyor could also be installed as described in Section 3.1.5.

One of the three existing channels would be configured as an emergency bypass channel that would route flow around the screens, in the event they become blinded, and their combined capacity is less than the influent flow rate. The water level upstream of the screens would increase to a point where the level is above the elevation of the bypass weir. From which, water begins to enter the emergency channel flowing directly into the wetwell.



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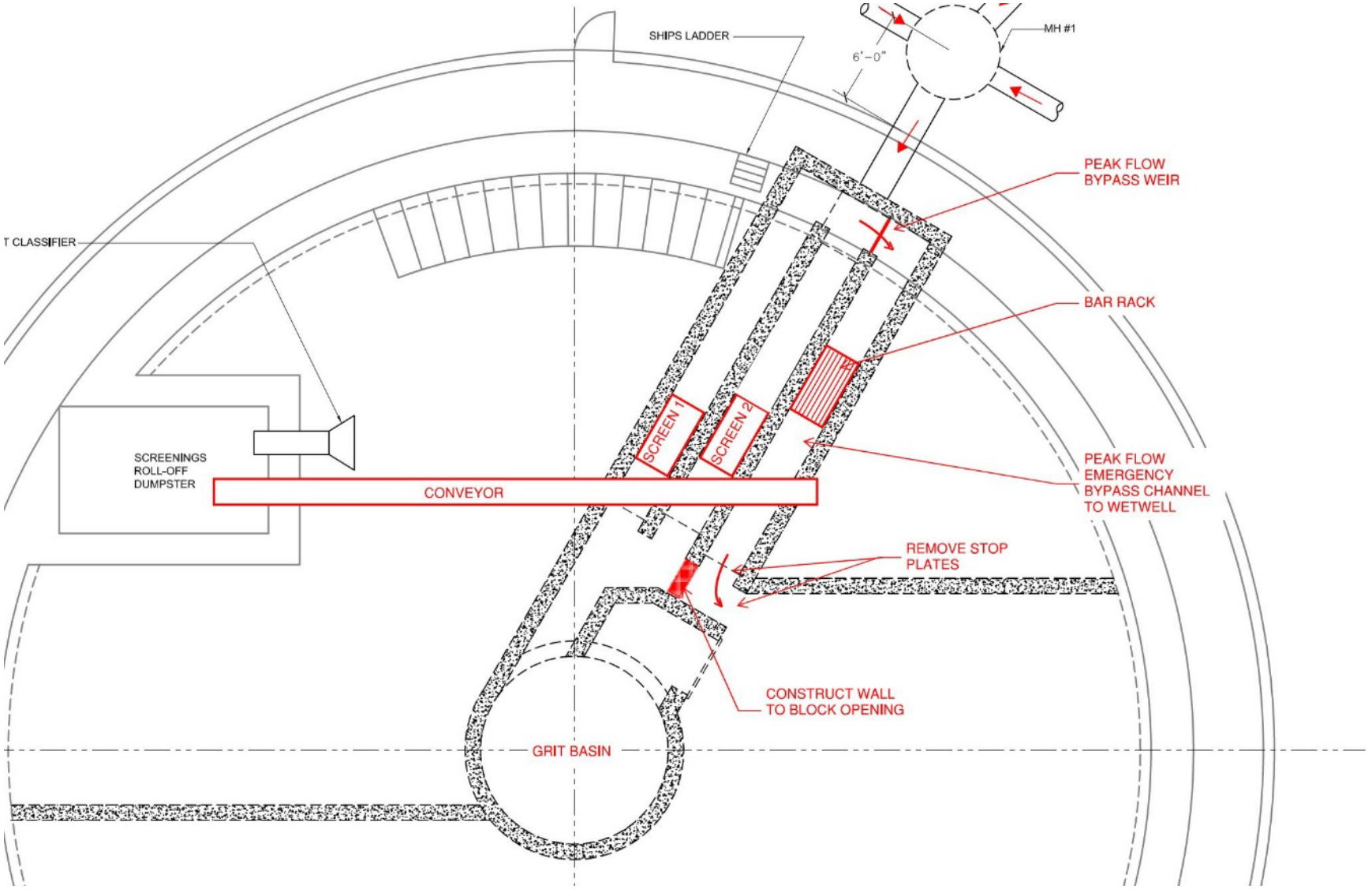


**Figure 7. Recommended Channel Modifications**



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### 3.1.4 Screen Replacement

A wide variety of screening technologies and screen designs are offered by reputable manufacturers with extensive experience in the wastewater industry. Screen options are typically evaluated during a preliminary design phase, thus selecting a specific screen technology would be beyond the scope of a planning study.

For the purposes of this planning study, it is assumed that the new screens will match the type of screen that will be installed at the WWTP headworks. Table 3 below provides the recommended basis of design.

**Table 3. Recommended Basis of Design for Replacement Screens at Existing NSPS**

| Design Parameter | Value |
|---|---|
| Number of Mechanical Screens (installed in outside channels) | 2 |
| Flow Capacity, each | 5.4 mgd |
| Number of Channels and Screens in Operation | 1 at flows up to 4.6 mgd<br>2 at flows above 4.6 mgd |
| Number of Bar Racks (installed in center channel) | 1 |
| WS Elevation in MH #1 at Peak Flow (assumes 6" loss across screens) | EL 83.8 |
| Freeboard in MH #1 | 1.2 feet |
| Freeboard in Screen Channel | 3.5 feet |

### 3.1.5 Screening Conveyor

Material removed by the existing screens is compacted and discharged from the screen into a plastic bag. A wheelbarrow is placed below the discharge chute to hold the bag, so it does not break open. When the bag is full, the operators must maneuver the wheelbarrow over to the dumpster, lift the heavy bag into a pivoting trough device, and manually flip the trough so the bags fall into the dumpster. This procedure has caused back and hand injuries and is an on-going safety issue. A safer way to move the screened material into the dumpster is by conveyor.

As shown in Figure 7, the conveyor will be arranged adjacent to the screening discharge locations. The installation will be extended across the emergency channel in case the screens are rearranged, or a third screen is eventually installed in the emergency channel. Screened solids will be conveyed across the pump station to the dumpster continuously, erasing the need for frequent manual transportation of bagged waste. While the conveyor will require some degree of maintenance and additional power, the resulting process is far safer and less time-consuming for the operations team.

## 3.2 Grit System Improvements

The existing grit removal system consists of a grit basin, grit pump, grit classifier, and grit washer. The overall system is in poor condition with limited remaining service life. Therefore, upgrading this system is ranked as a high priority and should be a component of any facility upgrade alternative in which the existing NSPS would remain in operation (i.e., all alternatives except Alternative 4).

### 3.2.1 Grit Pump and Piping

The lack of redundancy within the existing grit pumping system is considered high risk for the NSPS from both a reliability and risk-of-failure perspective. The existing pump is nearing the end of its service life. The City has ordered a new pump (wet end only) to replace the existing pump. Depending upon the condition of



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the existing pump, the City may elect to rebuild the pump so that it would be a spare pump that could be (quickly) installed, if necessary.

The existing piping is also nearing the end of its service life, which is typically estimated to be 20 years based on the propensity for erosion of the interior pipe wall from the grit slurry moving through the piping. Ninety-degree elbows are especially susceptible to erosion. In the case of the NSPS, a failure of the piping could potentially flood the basement of the station, thus the consequences of failure are very high.

In addition to having a spare pump, a new grit pump could be installed to increase redundancy and improve reliability. The grit piping at the classifier area must be reconfigured to allow installation of the screenings belt conveyor, as such, all grit piping and valves should be replaced with new piping.

### 3.2.2 Grit Classifier and Washer

The grit classifier and washer, both deemed to be in very poor condition, should be replaced in their entirety, including the associated piping, valves, conduit and wire, and electrical equipment.

## 3.3 Geodesic Dome Replacement

City staff have reported rapid deterioration of the geodesic dome that covers the pump station. Deterioration has resulted in water leakage through the roof panels, roof panels blowing off during medium- to high-velocity wind gusts, and brittleness of the skylights which have resulted in failures.

The 2021 condition assessment undertaken by Waterdude noted rainwater leakage through the dome (refer to Section 2.3) and recommended full replacement of the dome. BC also noted this deterioration during a subsequent condition assessment inspection and evaluated replacement in more detail with structural assessments and cost estimates.

The structural assessment concluded that the perimeter concrete wall that the dome is anchored to would need to be strengthened to meet current building code requirements. While strengthening the wall could be done in a variety of ways, for the basis of the cost evaluation it was assumed that the wall would be reinforced with concrete buttresses around the exterior of the wall. This increased the estimated cost of the dome replacement to about $1.6 million (February 2021).

Initially (2021), a second driver for replacing the cover was to simplify pump removal, which–because of design deficiencies in the original design–is difficult to accomplish, labor intensive, and dangerous to personnel. Currently, pump removal is accomplished using a gantry crane/hoist, pallet mover, and forklift to move the pump area in the basement to a flatbed truck outside the building, which is cumbersome and time-consuming. On one occasion, a pump was damaged during the removal process. Replacing the cover offered an opportunity to mitigate damage by adding a dormer with a crane and hoist for safe, proper removal of the wastewater pumps.

However, the structural upgrades to the perimeter wall that would be necessary, combined with escalation due to pushing the project several years into the future, significantly increases the cost of dome replacement. Investing in a new cover for the facility–especially under upgrade alternatives in which the existing facility is ultimately abandoned (Alternatives 1, 2, and 4)–does little towards improving the facility operation. While acknowledging the cover is in poor condition, nonetheless, our recommendation is not to include replacement under any of the upgrade options except Alternative 3.

## 3.4 Ventilation System Upgrades

The ventilation system for the existing station includes supply and exhaust fans and an activated carbon scrubber. The supply air fans run continuously to maintain a fresh air environment within the station that is essential for personnel to enter the structure.



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A condition assessment was completed in 2022 and the fans and fan motors were determined to be in poor condition. The activated carbon scrubber for the exhaust air is not functional and has been abandoned-in-place since 2017. Replacement of the entire system is necessary and included in Alternatives 1, 2, and 3.

## 3.5 Electrical Upgrades

Based on the testing results and visual observations described in Section 2.3.3, the action items listed below have been incorporated into the overall upgrade recommendations for NSPS.

1. Replace the existing power cables for Raw Sewage Pumps No. 1, 2, and 3 with new VFD-rated, multi-conductor cable with grounds.
2. Replace the existing conductor cables for Rotary Screen No. 1 with new conductors.
3. Existing spare conduits between the Electrical Building and the pump station are suitable for use provided each conduit is tested and cleaned prior to pulling new cables into place.
4. Install new conduits between the Electrical Building and the pump station for future equipment (i.e., Grit Pump No. 2, Raw Sewage Pump No. 4, Screenings Conveyor, plus any spare conduits). These can be installed in either an overhead configuration or buried. If buried, inspect the existing ductbank for damage when it is exposed for construction of the new conduits.

**Programmable Logic Controller (PLC) Replacement**: The existing PLC is reaching the end of its service life, as are other PLCs in the City's wastewater facilities. However, replacement parts are difficult to find and procure from vendors. The City has proactively instituted a PLC replacement plan wherein at least one PLC is replaced each year. PLC replacement at NSPS is assumed to fall under this program and therefore has not been included in the CIP for the NSPS.

# Section 4: Analysis of Facility Upgrade Alternatives

Four alternatives for upgrading the NSPS have been developed and are described and analyzed in this section. In addition to estimated construction cost, the analysis considers the implementation schedule for each option, which is an important consideration from a cash flow perspective. In addition to investments at the NSPS, the City will also be making improvements to the WWTP and the schedule and cost for those improvements must be considered to match available funds.

The improvements described under these alternatives are in addition to construction of the dechlorination facility (required for NPDES permit compliance as mandated by DEQ) and the site improvements described in Section 2.5.2.

## 4.1 Upgrade Alternatives

Four alternatives considered for the NSPS upgrades are discussed in this section. The first three alternatives recommend minor to extensive modifications to the existing pump station. Alternative 4 proposes demolition of the pump station. The schedules and costs associated with these alternatives are in the respective sections following.

### 4.1.1 Alternative 1–"Bare Minimum" Investment

The objective of this alternative is to minimize the capital investment in the existing facility by making minor improvements to extend the life of the facility (Phase I) until a new, buildout facility can be constructed and commissioned (Phase II). After the new facility is in service, the existing station will be decommissioned. Design of the improvements recommended under this alternative would need to begin immediately such that construction of the upgraded facility is completed by 2026.



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Improvements to the existing NSPS under this alternative are the highest priority items and related to condition, performance, and operator safety. The improvements listed in Table 4 below are considered the minimum required to increase reliability and to extend service life until the new facility is operational. The new replacement pumping facility would need to be constructed and commissioned by 2031.

**Table 4. Recommended Upgrades for Alternative 1 ("Bare Minimum" Alternative)**

| Component | Description | TM Cross Reference | Notes |
|---|---|---|---|
| Screens | Replace both screens | Section 3.1.4 | Emergency bypass channel (Section 3.1.3) and screening conveyor (Section 3.1.5) not included in scope of alternative. |
| Ventilation | Replace supply and exhaust fans | Section 3.4 | Carbon scrubber replacement not included in scope of alternative. |
| Electrical | • Replace power conductors to pumps and screens<br>• Add new conduits for future | Section 3.5 | PLC replacement part of City's overall program. |

### 4.1.2 Alternative 2–Improvements to Extend Service Life ("10-Year Alternative")

This alternative improves the existing NSPS by replacing and upgrading equipment to increase reliability and extend the service life by ten years. Similar to Alternative 1, a new station (either a dry weather flow facility or a buildout pump station) would need to be constructed at the end of this time frame, but the costs for the new station are pushed further into the future to allow the City to devote funds to WWTP improvements as a higher priority than making investments to the NSPS. Improvements listed in Table 5 below would be made under this alternative.

**Table 5. Recommended Upgrades for Alternative 2 ("10-Year Alternative")**

| Component | Description | TM Cross Reference | Notes |
|---|---|---|---|
| Screening System | Replace both screens | Section 3.1.4 | |
| | Add screening conveyor | Section 3.1.5 | |
| | Modify screen channels to add emergency bypass channel | Section 3.1.3 | Includes replacing channel isolation plates with actuated slide gates. |
| Grit Removal System | Replace basin mechanism, grit pump and piping, grit cyclone, and grit washer | Section 3.2 | |
| Ventilation | Replace supply and exhaust fans | Section 3.4 | Carbon scrubber replacement not included in scope of alternative. |
| Electrical | • Replace power conductors to pumps and screens<br>• Add new conduits for future | Section 3.5 | PLC replacement part of City's overall program. |

### 4.1.3 Alternative 3–New Dry Weather Pump Station with Existing Facility

This alternative entails constructing a new pumping facility on the site but keeping the existing NSPS in operation as well. The new station would function as a "duty" station, operating daily and pumping all influent flow up to its full capacity. The existing station would serve as a wet weather pumping facility. A schematic of the concept is shown in Figure 8.

The capacity of the new duty station would be equivalent to the highest estimated diurnal peak flow that would occur during the dry weather. This sizing criterion would reduce the frequency of placing the second pump station (the existing NSPS) in operation during the dry weather season. The existing NSPS would be upgraded and re-purposed as a peak flow facility and would also be capable of serving as a standby facility



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that would be placed into operation whenever influent flows exceed the capacity of the duty station or in the event the duty station is out of service.

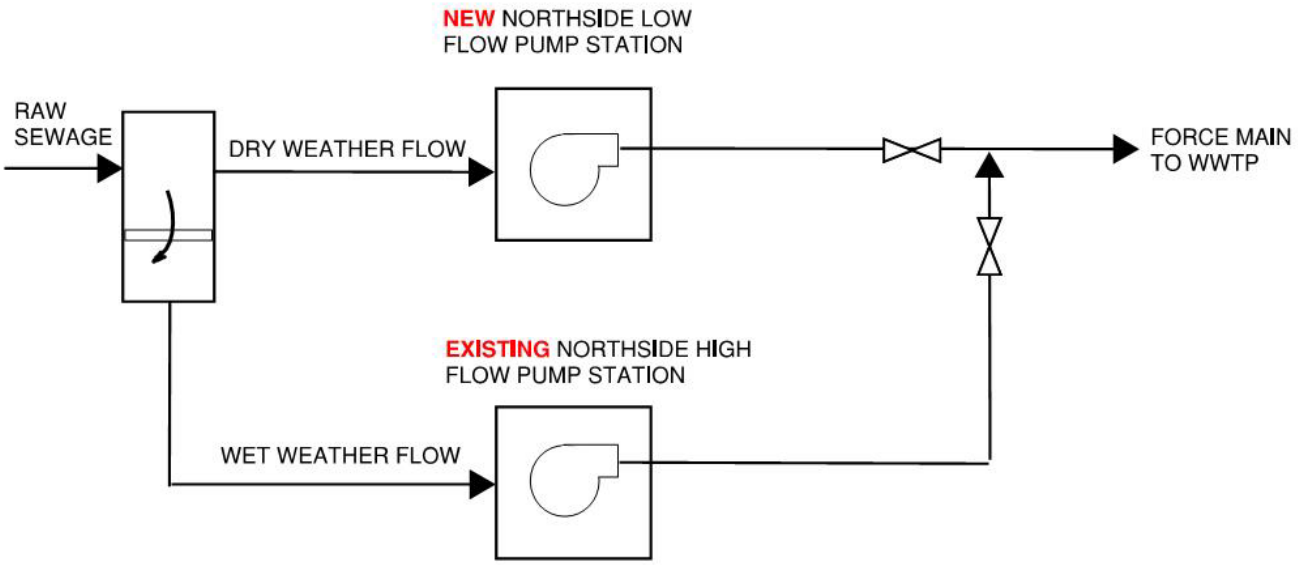


**Figure 8. Flow Schematic for Separate Dry Weather and Wet Weather Pump Stations**

Although this alternative was fully developed and evaluated, it was eliminated as a viable option based on total cost and the need to maintain two separate pumping facilities, whereas each of the other alternatives consists of a single pump station. In addition to this alternative having the highest estimated capital cost, operation and maintenance costs would also be higher than any of the other alternatives because there would be two stations to operate and maintain rather than just a single station.

### 4.1.4 Alternative 4–Construct New Buildout Facility without Existing Facility

In this alternative, a new pumping facility would be constructed and the existing NSPS would be decommissioned. The new station would be designed as a state-of-the-art facility, meeting all current codes and standards of practice such as:

- Hydraulic Institute [HI] standards for pumping stations
- Building codes
- Structural codes (Oregon Structural Specialty Code [OSSC])
- Safety guidelines and requirements of the Occupational Health and Safety Administration (OHSA)
- Fire and life safety codes mandated by the National Fire Protection Association (NFPA)
- Electrical codes by the National Electric Code (NEC).

Under this alternative, the City would not make further investments in the existing NSPS. Instead, design of the buildout facility would begin immediately, and the new station would be constructed as quickly as possible to minimize the length of time the existing NSPS would remain in service in its current condition.

A schematic of the buildout facility is shown in Figure 9 and the components of the new facility are listed in Table 6.



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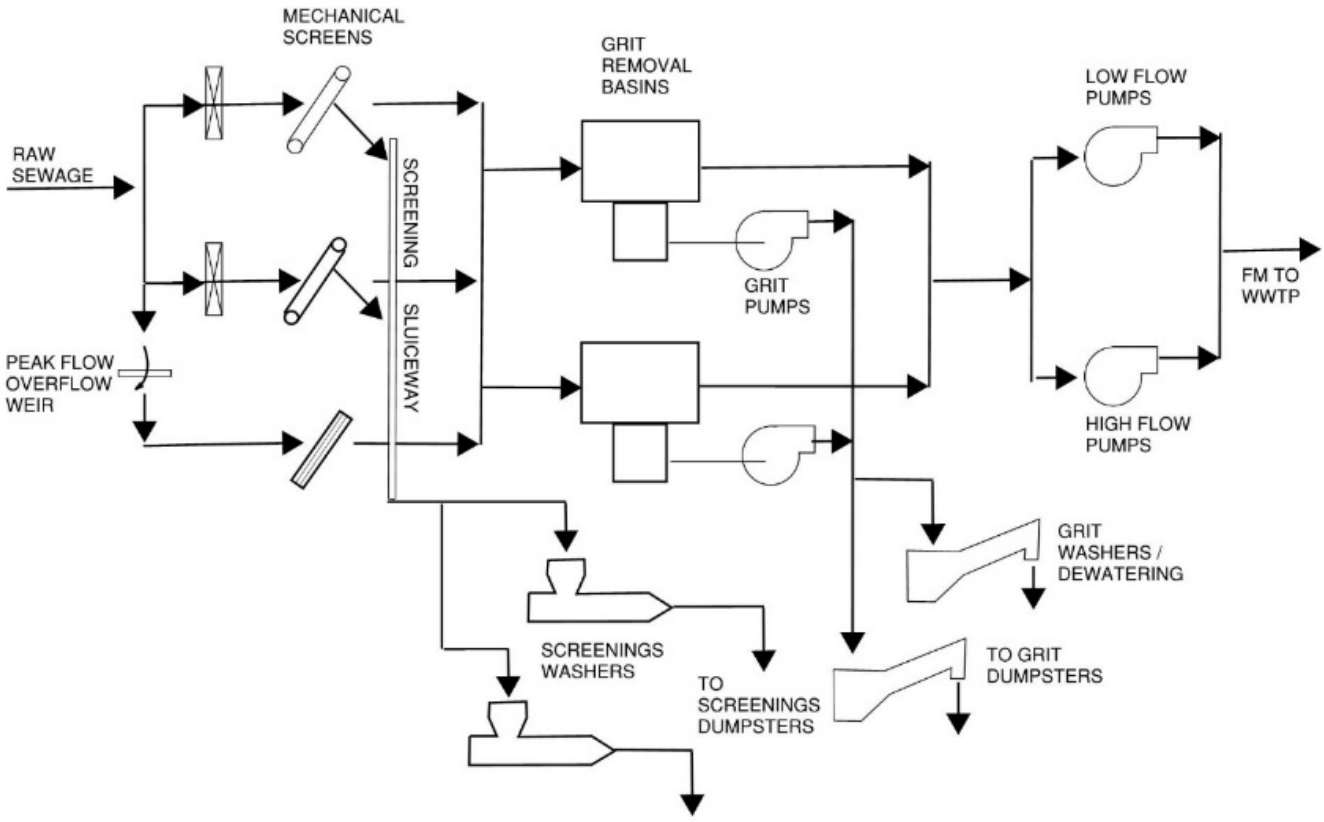


Figure 9. Process Flow Schematic for New Pump Station

| Table 6. Planning Level Components of Buildout PS | |
|---|---|
| **Process Components** | **Number** |
| Mechanical Screens | 2 |
| Screen Conveyance | Belt conveyor or sluiceway |
| Screenings Washers | 2 |
| Grit Removal Basins | 2 |
| Grit Classifier/Washer | 2 |
| Low Flow Pumps | 3 |
| High Flow Pumps | 2 |
| **Other Station Components** | |
| Bridge crane/hoist | Electrical room |
| Surge control tanks | Control room |
| Standby generator | Ventilation system |
| Foul air treatment system | Restroom |
| Pig launch station | Spare parts storage area |



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## 4.2 Implementation Schedules

Each alternative has a unique implementation schedule as shown below in Figure 10. Due to the poor condition of the existing NSPS, all alternatives would start as soon as the City has established funding for the selected project.

Alternatives 1 and 2 require follow-on projects; these would occur after the initial upgrades have been completed to improve station reliability. Conversely, Alternatives 3 and 4 are standalone projects since these alternatives entail constructing a new pumping facility.

The gap between the two phases is designed to allow the City to shift focus to the WWTP and make upgrade investments at that facility while managing and stretching funding requirements.

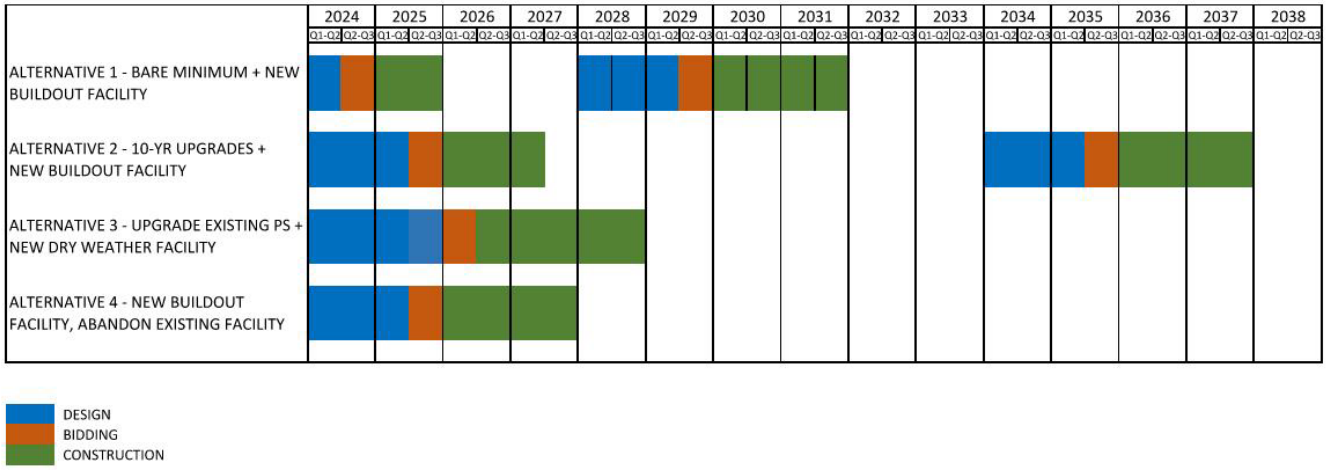


**Figure 10. Implementation Schedules for NSPS Upgrade Alternatives**

## 4.3 Cost Evaluations

The Association for the Advancement of Cost Engineering (AACE) International Class 4 level capital cost estimates have been prepared for each alternative. These are summarized in Table 7. Costs shown in Table 7 have been escalated to the approximate mid-point of construction according to the implementation schedules shown in Figure 10. Costs include a 40-percent contingency to cover unforeseen conditions and to account for unknown items that arise as the design is developed.



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| Table 7. Estimated Construction Costs for Northside Pump Station Alternatives | | | |
|---|---|---|---|
| Alternative | Description | Construction Mid-Point | Estimated Cost (Million) |
| 1 | Bare Minimum | | |
| | Initial Upgrade to Existing Station | 2025 | $3.1 |
| | New Buildout Station | 2031 | $27.9 |
| | **Total, Alternative 1** | | **$31.0** |
| 2 | 10-Year Extension | | |
| | Initial Upgrade to Existing Station | 2026 | $5.0 |
| | New Buildout Station | 2036 | $33.9 |
| | **Total, Alternative 2** | | **$38.9** |
| 3 | New Dry Weather Station | 2028 | **$27.9** |
| 4 | New Buildout Station | 2027 | **$22.9** |

The cost for the dechlorination facility project, which includes a limited amount of site improvements (e.g., pavement, etc.) and demolition of existing structures on the site, is not included in the alternative costs since this will be an independent, standalone project that the City will undertake for DEQ compliance.

Replacement of the geodesic dome is not included as part of any alternative that keeps the existing station in service (i.e., Alternatives 1, 2, and 3). Engineering costs for design and construction phase services are also not included. A detailed breakdown of costs is provided in Attachment A.

# Section 5: Recommended Improvement Plan

Alternatives were presented to City staff at meetings in March and April 2023 for discussion and input. Alternative 3, as stated earlier, was eliminated due the cost of implementation and need to maintain two facilities rather than just a single pumping station.

Alternative 2 was selected as the preferred alternative for several reasons. Although the total cost of this alternative is the highest of the three remaining alternatives, making a relatively small initial investment to increase station reliability fully utilizes the remaining service life of the station. By the time the buildout station is completed and operational, the existing NSPS will have reached the end of its reasonable service life.

Secondly, the gap between the initial upgrade project and the ultimate facility fits well into the overall CIP, allowing the City to spread the costs of the NSPS and WWTP upgrades over a reasonable time frame. The City will need to spend substantial funds on the WWTP improvements. If construction at NSPS overlaps with that work, funding both projects together may present an undesirable financial situation for the City. Therefore, Alternative 2 provides the City with a longer “window” to postpone costs for design and construction of the replacement buildout station until after the WWTP upgrades have been completed.

As a result, the CIP developed for the WWTMP has been based on implementation of Alternative 2.



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# Attachment A: Construction Cost Estimates



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**CITY OF NEWPORT**
**NORTHSIDE PUMP STATION MASTER PLAN**

OVERALL COST SUMMARY OF ALTERNATIVES
MARCH 2023

| Alternative | Description | Construction Mid-Point | Estimated Cost at Mid-Point (Million) |
|---|---|---|---|
| 1 | Bare Minimum | | |
| | Initial Upgrade to Existing Station | 2025 | $3.1 |
| | New Buildout Station | 2031 | $27.9 |
| | **Total, Alt 1** | | **$31.0** |
| | | | |
| 2 | 10-Yr Extension | | |
| | Initial Upgrade to Existing Station | 2026 | $5.0 |
| | New Buildout Station | 2036 | $33.9 |
| | **Total, Alt 2** | | **$38.9** |
| | | | |
| 3 | New DW Station | 2028 | **$27.9** |
| | | | |
| 4 | New Buildout Station | 2027 | **$22.9** |

**Project: Newport Wastewater Master Plan**
**Client: City of Newport OR**

**Northside Pump Station Alternative 1 - Bare Minimum**

| | |
|---|---|
| **Date of Estimate** | **March-23** |
| **February 2023 20-city ENR** | **13176** |
| **Projected Date of Mid-Point of Construction** | **July-25** |

## Estimated Construction Costs Summary for Master Plan CIP ("Bare Minimum" Alternative)

| Item | | Estimated Total |
|---|---|---|
| | | |
| Mobilization/Demobilization - Alt 1 Bare Minimum | $ | 43,000 |
| Screen Replacement, no conveyor | $ | 1,181,000 |
| Electrical Upgrades | $ | 193,000 |
| HVAC Improvements | $ | 96,000 |
| | | |
| **Subtotal Direct Construction Costs @ Mid-Point of Construction** | **$** | **1,513,000** |
| | | |
| Div 0 General Rqmnts @ 12% | $ | 182,000 |
| Contractor OH&P @15% | $ | 255,000 |
| Bonds, Insurance, and Taxes @ 4% | $ | 78,000 |
| | | |
| Subtotal, Construction Cost w Markups | $ | 2,028,000 |
| | | |
| Estimating Contingency @ 40% | $ | 812,000 |
| | | |
| Subtotal Estimated 2023 Construction Cost | $ | 2,840,000 |

**Project: Newport Wastewater Master Plan**
**Client: City of Newport OR**
**Northside Pump Station Alternative 2 - 10-Year Alternative**

| | |
|---|---|
| **Date of Estimate** | **March-23** |
| **February 2023 20-city ENR** | **13176** |
| **Projected Date of Mid-Point of Construction** | **July-25** |

## Estimated Construction Costs Summary for Master Plan CIP ("10-Year" Alternative)

| Item | | Estimated Total |
|---|---|---|
| | | |
| Mobilization/Demobilization - Alt 2, 3, and 4 (Larger Projects) | $ | 187,000 |
| Screen Replacement, incl conveyor addition | $ | 1,609,000 |
| Grit System Replacement | $ | 355,000 |
| Electrical Upgrades | $ | 193,000 |
| HVAC Improvements | $ | 96,000 |
| Misc Building Improvements | $ | 15,000 |
| | | |
| **Subtotal Direct Construction Costs @ Mid-Point of Construction** | **$** | **2,455,000** |
| | | |
| Div 0 General Rqmnts @ 12% | $ | 295,000 |
| Contractor OH&P @15% | $ | 413,000 |
| Bonds, Insurance, and Taxes @ 4% | $ | 127,000 |
| | | |
| Subtotal, Construction Cost w Markups | $ | 3,290,000 |
| | | |
| Estimating Contingency @ 40% | $ | 1,316,000 |
| | | |
| Subtotal Estimated 2023 Construction Cost | $ | 4,606,000 |

**Project: Newport Wastewater Master Plan**
**Client: City of Newport OR**
**Northside Pump Station Alternative 3 - New Dry Weather PS**

| | |
|---|---|
| **Date of Estimate** | **March-23** |
| **February 2023 20-city ENR** | **13176** |
| **Projected Date of Mid-Point of Construction** | **July-25** |

## Estimated Construction Costs Summary for Master Plan CIP ("New Dry Weather PS" Alternative)

| Item | | Estimated Total |
|---|---|---|
| | | |
| Mobilization/Demobilization - Alt 2, 3, and 4 (Larger Projects) | $ | 187,000 |
| Construct Dry Weather Pump Station | | |
| Pumping System | $ | 3,164,000 |
| Screening and Grit Removal Systems | $ | 5,597,000 |
| HVAC and Foul Air Treatment | $ | 913,000 |
| Yard Piping and Yard Electrical | $ | 487,000 |
| Site Improvements | $ | 112,400 |
| | | |
| Upgrade Existing Pump Station | | |
| Screen Replacement, incl conveyor addition | $ | 1,609,000 |
| Grit System Replacement | $ | 355,000 |
| Electrical Upgrades | $ | 193,000 |
| HVAC Improvements | $ | 96,000 |
| Misc Building Improvements | $ | 15,000 |
| | | |
| **Subtotal Direct Construction Costs @ Mid-Point of Construction** | **$** | **12,728,400** |
| | | |
| Div 0 General Rqmnts @ 12% | $ | 1,528,000 |
| Contractor OH&P @15% | $ | 2,139,000 |
| Bonds, Insurance, and Taxes @ 4% | $ | 656,000 |
| | | |
| Subtotal, Construction Cost w Markups | $ | 17,051,400 |
| | | |
| Estimating Contingency @ 40% | $ | 6,820,600 |
| | | |
| Subtotal Estimated 2023 Construction Cost | $ | 23,872,000 |

**Project: Newport Wastewater Master Plan**
**Client: City of Newport OR**

**Northside Pump Station Alternative 4 - New Buildout PS**

| | |
|---|---|
| **Date of Estimate** | **March-23** |
| **February 2023 20-city ENR** | **13176** |
| **Projected Date of Mid-Point of Construction** | **July-27** |

## Estimated Construction Costs Summary for Master Plan CIP ("New Buildout PS" Alternative)

| Item | | Estimated Total |
|---|---|---|
| | | |
| Mobilization/Demobilization - Alt 2, 3, and 4 (Larger Projects) | $ | 187,000 |
| Construct Buildout Pump Station | | |
| PS Structure | $ | 3,976,000 |
| Pumping System + Process Piping | $ | 1,300,000 |
| Screening and Grit Removal + Process Piping | $ | 2,523,000 |
| HVAC, Plumbing, and Odor Control | $ | 1,212,000 |
| Yard Piping | $ | 262,000 |
| Sitework | $ | 112,400 |
| Electrical and Instrumentation | $ | 1,095,000 |
| | | |
| Decommission Existing PS | $ | 200,000 |
| | | |
| **Subtotal Direct Construction Costs @ Mid-Point of Construction** | **$** | **10,867,400** |
| | | |
| Div 0 General Rqmnts @ 12% | $ | 1,305,000 |
| Contractor OH&P @15% | $ | 1,826,000 |
| Bonds, Insurance, and Taxes @ 4% | $ | 560,000 |
| | | |
| Subtotal, Construction Cost w Markups | $ | 14,558,400 |
| | | |
| Estimating Contingency @ 40% | $ | 5,823,400 |
| | | |
| Subtotal 2023 Estimated Construction Cost | $ | 20,382,000 |

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# Appendix I Northside Pump Station Dechlorination Cost Estimate



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**Project: Newport Dechlorination Facility**
**Client: City of Newport OR**

| | |
|---|---|
| **Date of Estimate** | **November-22** |
| **Projected Date of Mid-Point of Construction** | **July-24** |
| **Projected ENR at Mid-point Construction** | **14524** |

## Estimated Construction Costs Summary - to assist the City in establishing funding for the new facilities

| Item | Estimated Phase A Total | Estimated Phase B Total |
|---|---|---|
| Mobilization & Demobilization | $ 38,000 | $ 9,000 |
| Site Work | $ 230,000 | $ 99,000 |
| Pre-Engineered Metal Buildings | $ 558,000 | $ - |
| Bisulfite Equipment | $ - | $ 357,000 |
| **Subtotal Direct Construction Costs @ Mid-Point of Construction** | **$ 1,244,000** | **$ 456,000** |
| Div 0 General Rqmnts @ 12% | $ 149,300 | $ 54,800 |
| Contractor OH&P @15% | $ 209,000 | $ 76,700 |
| Subtotal Construction Costs | $ 1,603,000 | $ 588,000 |
| Estimating Contingency, 30% | $ 374,000 | $ 137,000 |
| **Grand Total** | **$ 1,980,000** | **$ 730,000** |

## Phase A Mobilization/Demobilization

| | Quantity | Unit | Unit Cost | Inst'n Factor | Cost |
|---|---|---|---|---|---|
| **Mobilization** | | | | | |
| Establish staging area - fencing, trailers, rock, etc. | 1 | LS | $ 12,000 | 1.00 | $ 12,000 |
| Construction Equipment Transport | 1 | LS | $ 10,000 | 1.00 | $ 10,000 |
| Trailer Rental (2 for 12 months) | 12 | Month | $ 400 | 1.00 | $ 4,800 |
| Worker sanitation (handwash stations, portable toilets, etc.) | 12 | Month | $ 75 | 1.00 | $ 900 |
| **Groundwater/Stormwater Control** | | | | | |
| Groundwater Dewatering | 1 | LS | $ 2,000 | 1.00 | $ 2,000 |
| **Erosion Control** | | | | | |
| Establish EC controls | 1 | LS | $ 5,000 | 1.00 | $ 5,000 |
| **Total** | | | | | **$ 34,700** |

## Phase B Mobilization/Demobilization

| | Quantity | Unit | Unit Cost | Inst'n Factor | Cost |
|---|---|---|---|---|---|
| **Mobilization** | | | | | |
| Trailer Rental (2 for 18 months) | 18 | Month | $ 400 | 1.00 | $ 7,200 |
| Worker sanitation (handwash stations, portable toilets, etc.) | 18 | Month | $ 75 | 1.00 | $ 1,350 |
| **Groundwater/Stormwater Control** | | | | | |
| Groundwater Dewatering | | | | | |
| **Total** | | | | | **$ 8,550** |

## Phase A Site Work

| | Quantity | Unit | Unit Cost | Inst'n Factor | Cost |
|---|---|---|---|---|---|
| Clear site (100'x75'), remove debris, dispose offsite | 900 | SY | $ 7.00 | 1.00 | $ 6,300 |
| **Demolition** | | | | | |
| Old Digester Complex | | | | | |
| Demo and Remove Structures | 7,870 | sf | $ 2 | 1.00 | $ 15,740 |
| Excavate around belowgrade structure to expose | 814 | cy | $ 20 | 1.00 | $ 16,281 |
| Haul debris to offsite disposal (10 cy dump truck + tipping fee) | 29 | trips | $ 200 | 1.22 | $ 7,175 |
| Backfill cavity w engineered fill | 1,178 | cy | $ 40 | 1.00 | $ 47,100 |
| Old Clarifier near Garage PEMB | | | | | |
| Demo and Remove Structures | 8,902 | sf | $ 2 | 1.00 | $ 17,804 |
| Haul debris to offsite disposal (10 cy dump truck + tipping fee) | 33 | trips | $ 200 | 1.22 | $ 8,045 |
| Backfill w engineered fill | 353 | cy | $ 40 | 1.00 | $ 14,130 |
| Old Clarifier Near TF | | | | | |
| Remove top 5 ft of walls | 1,413 | sf | $ 2 | 1.00 | $ 2,826 |
| Fill clarifier w clean fill | 2,355 | cy | $ 10 | 1.00 | $ 23,550 |
| Remove miscellaneous abandoned buried piping and utilities, excavation, pipe removal, backfill, and disposal | 1 | LS | $ 20,000 | 1.00 | $ 20,000 |
| Rough grade site | 1 | LS | $ 5,000 | 1.00 | $ 5,000 |
| Allowance for New Asphalt + Roadway Base | 1 | LS | $ 20,000 | 1.22 | $ 24,400 |
| **Total** | | | | | **$ 208,351** |

## Phase B Site Work

| | Quantity | Unit | Unit Cost | Inst'n Factor | Cost |
|---|---|---|---|---|---|
| **Yard Piping (incl trench excav, piping, trench backfill/compaction)** | | | | | |
| Gravity Sewer (Connect to temp pipe) | 50 | LF | $ 40 | 1.00 | $ 2,000 |
| Potable Water | 100 | LF | $ 40 | 1.00 | $ 4,000 |
| Chlorinated Effluent Sample | 150 | LF | $ 40 | 1.00 | $ 6,000 |
| Dechlorinated Effluent Sample | 150 | LF | $ 40 | 1.00 | $ 6,000 |
| **Yard Electrical** | | | | | |
| Ductbank Construction (to Electrical Building) | 1,000 | LF | $ 30 | 1.22 | $ 36,600 |
| Finish grade site | 1 | LS | $ 5,000 | 1.00 | $ 5,000 |
| Allowance for New Asphalt + Roadway Base | 1 | LS | $ 20,000 | 1.22 | $ 24,400 |
| Allowance for Landscaping | 1 | LS | $ 5,000 | 1.22 | $ 6,100 |
| **Total** | | | | | **$ 90,100** |

## Pre-Engineered Metal Buildings

| | Quantity | Unit | Unit Cost | Inst'n Factor | Cost |
|---|---|---|---|---|---|
| **Structural Excavation** | | | | | |
| Bisulfite Building | | | | | |
| Excavation for wall footings | 74 | CY | $ 20 | 1.00 | $ 1,481 |
| Additional excavation for column footings | 1 | LS | $ 1,000 | 1.00 | $ 1,000 |
| Backfill and Compact | 44 | CY | $ 15 | 1.00 | $ 667 |
| Parking Garage | | | | | |
| Excavation for wall footings | 178 | CY | $ 20 | 1.00 | $ 3,556 |
| Additional excavation for column footings | 1 | LS | $ 1,000 | 1.00 | $ 1,000 |
| Backfill and Compact | 107 | CY | $ 15 | 1.00 | $ 1,600 |
| **Cast-in-Place Concrete** | | | | | |
| Bisulfite Building | | | | | |
| Perimeter footing | 19 | CY | $ 400 | 1.00 | $ 7,407 |
| Column Footings @ 18" Thick | 8 | EA | $ 1,600 | 1.00 | $ 12,800 |
| Stem Wall | 15 | CY | $ 300 | 1.00 | $ 4,444 |
| Building Slab | 22 | CY | $ 250 | 1.00 | $ 5,556 |
| Base Rock | 58 | CY | $ 40 | 1.00 | $ 2,333 |
| Conainment Walls at Storage Area | 4 | CY | $ 250 | 1.00 | $ 972 |
| Parking Garage | | | | | |
| Perimeter footing | 44 | CY | $ 400 | 1.00 | $ 17,778 |
| Column Footings @ 18" Thick | 12 | EA | $ 1,600 | 1.00 | $ 19,200 |
| Stem Wall | 36 | CY | $ 300 | 1.00 | $ 10,667 |
| Building Slab | 132 | CY | $ 250 | 1.00 | $ 33,102 |
| Base Rock | 207 | CY | $ 40 | 1.00 | $ 8,296 |
| **Pre-Engineered Metal Buildings** | | | | | |
| Bisulfite Building | | | | | |
| Vendor Cost w/ GC Markup | 1 | LS | $ 45,000 | 1.22 | $ 54,900 |
| Erection | 10 | day | $ 4,000 | 1.22 | $ 48,800 |
| Exclusions/Adders - see separate spreadsheet | | | | | $ 8,300 |
| Parking Garage | | | | | |
| Vendor Cost w/ GC Markup | 1 | LS | $ 115,000 | 1.22 | $ 140,300 |
| Erection | 15 | day | $ 4,000 | 1.22 | $ 73,200 |
| Exclusions/Adders - see separate spreadsheet | | | | | $ 43,888 |
| **Miscellaneous Adders** | | | | | |
| Sanitary sewer stub-out | 1 | EA | $ 3,000 | 1.00 | $ 3,000 |
| Slab blockout for utilities | 1 | EA | $ 2,000 | 1.00 | $ 2,000 |
| **Estimated Cost for Construction of Pre-Engineered Metal Buildings** | | | | | **$ 506,247** |

## Pre-Engineered Metal Building Adders

| | Quantity | Unit | Unit Cost | Inst'n Factor | Cost |
|---|---|---|---|---|---|
| **PEMB Adders - Parking Garage** | | | | | |
| Anchor Bolts | | | | | |
| Columns - 15 with 4 ABs each (1-1/4" x 24" long) | 60 | EA | $ 100 | 1.00 | $ 6,000 |
| Doors | | | | | |
| Overhead Doors | | | | | |
| 12' x 12' (electric) | 2 | EA | $ 4,000 | 1.68 | $ 13,440 |
| 10' x 10' (electric) | 2 | EA | $ 3,500 | 1.68 | $ 11,760 |
| Mandoors | | | | | |
| 3' x 7' metal door with hardware | 2 | EA | $ 1,000 | 1.22 | $ 2,440 |
| Wall Insulation | 1 | LS | $ 5,000 | 1.22 | $ 6,100 |
| Vapor Barrier | 3,000 | SF | $ 1 | 1.22 | $ 3,660 |
| Roof Drains and Downpouts | 4 | EA | $ 100 | 1.22 | $ 488 |
| **PEMB Adders - Bisulfite Building** | | | | | |
| Anchor Bolts | | | | | |
| Columns - 22 ABs 1-1/4" x 24" long | 22 | EA | $ 100 | 1.00 | $ 2,200 |
| Mandoor | | | | | |
| 3' x 7' metal door with hardware | 1 | EA | $ 1,000 | 1.22 | $ 1,220 |
| Wall Insulation | 1 | LS | $ 3,500 | 1.22 | $ 4,270 |
| Vapor Barrier | 300 | SF | $ 1 | 1.22 | $ 366 |
| Roof Drains and Downpouts | 2 | EA | $ 100 | 1.22 | $ 244 |
| Louver | | | | | |
| **Estimated Cost for Construction of Additional Items Excluded by PEMB Manufacturer** | | | | | **$ 52,188** |

## Bisulfite Facility

| | Quantity | Unit | Unit Cost | Inst'n Factor | Cost |
|---|---|---|---|---|---|
| **Bisulfite Facility** | | | | | |
| Chlorine Residual Analyzers | 2 | EA | $ 1,500 | 1.68 | $ 5,040 |
| Bisulfite Storage Tank w/ Level Sensing, drain valve, overflow, truck loading control panel, etc. | 1 | EA | $ 12,000 | 1.68 | $ 20,160 |
| Bisulfite piping, valves and supports - containment area | 1 | LS | $ 5,000 | 1.22 | $ 6,100 |
| Tank exhaust scrubber | 1 | EA | $ 3,000 | 1.22 | $ 3,660 |
| Bisulfite feed system w/in building - metering pump, piping, valves, supports | 1 | EA | $ 14,000 | 1.68 | $ 23,520 |
| Paint gypsum board in restroom | 300 | SF | $ 16 | 1.22 | $ 5,856 |
| Other Coatings | 1 | LS | $ 3,000 | 1.22 | $ 3,660 |
| Signs | 6 | EA | $ 35 | 1.00 | $ 210 |
| Fire Extinguishers | 2 | EA | $ 300 | 1.00 | $ 600 |
| Emergency Shower/Eyewash + Tepid Water System | 1 | EA | $ 8,500 | 1.68 | $ 14,280 |
| HVAC Fans and Ducting | 1 | EA | $ 4,000 | 1.68 | $ 6,720 |
| Backflow preventer | 1 | LS | $ 750 | 1.38 | $ 1,035 |
| Workbench and Cabinets | 1 | LS | $ 1,000 | 1.00 | $ 1,000 |
| Floor Drains and Cleanouts | 4 | EA | $ 500 | 1.22 | $ 2,440 |
| Restroom fixtures and piping | 1 | LS | $ 4,000 | 1.22 | $ 4,880 |
| **Electrical** | | | | | |
| Control Panels, Lighting Panels, electrical devices | 1 | LS | $ 50,000 | 1.38 | $ 69,000 |
| Conduit, wiring, terminations at equipment | 1 | LS | $ 50,000 | 1.38 | $ 69,000 |
| Electrical at existing Electrical Building | 1 | LS | $ 20,000 | 1.38 | $ 27,600 |
| Difficult factor/unknowns in Electrical Building | 1 | LS | $ 10,000 | 1.38 | $ 13,800 |
| Lighting protection, grounding system @ 2 Buildings | 1 | LS | $ 7,000 | 1.38 | $ 9,660 |
| Misc electrical allowance | 1 | LS | $ 10,000 | 1.38 | $ 13,800 |
| Fluorescent Lighting at Bisulfite Facility | 10 | EA | $ 600 | 1.38 | $ 8,280 |
| Fluorescent Lighting at Parking Garage | 16 | EA | $ 600 | 1.38 | $ 13,248 |
| **Estimated Cost for Construction of Bisulfite Facility** | | | | | **$ 323,549** |

# Appendix J Solids Basis of Design TM



Use of contents on this sheet is subject to the limitations specified at the end of this document.

22 August 2022

# Technical Memorandum

To: Josh Johnson, Brown & Caldwell

From: Mark Cullington, Kennedy Jenks
Ben Bosse, Kennedy Jenks
Matt Horton, Kennedy Jenks

Reviewed By: Luke Werner, Kennedy Jenks

Subject: Solids Stream Basis of Design
Newport WWT Master Plan – Phase II, Brown & Caldwell Project No. 158211
City of Newport
K/J Project No. 2276008*00

## Introduction

The City of Newport (City) owns and operates the Vance Avery Wastewater Treatment Plant (WWTP) constructed in 2002 and located in South Beach, Oregon. The WWTP is an activated sludge plant with a peak wet weather capacity of 15 million gallons per day (mgd) that currently receives an average annual flow of approximately 2 mgd. In 2022, the City authorized Brown & Caldwell (BC) to perform master planning for the WWTP. BC has subcontracted with Kennedy/Jenks Consultants (Kennedy Jenks) in an agreement dated 11 March 2022 to complete a Biosolids Alternatives Evaluation for the solids stream at the WWTP. The evaluation will assess biosolids management alternatives to provide a long-term biosolids handling, treatment, and beneficial use or disposal portfolio for the City's WWTP operations. Recommendations from the evaluation will account for hauled waste at the WWTP, solids stabilization and storage, dewatering, Class A and/or B treatment technologies, beneficial use, and compliance with Oregon Department of Environmental Quality's (DEQ) biosolids regulations. Regulatory trends will be incorporated in order to project compliance requirements into the planning horizon. The information from the evaluation will be incorporated by BC and the City into the Newport Wastewater Treatment Master Plan.

The purpose of this Technical Memorandum (TM) is to develop Basis of Design criteria for preliminary sizing of solids treatment processes that will be considered in the Biosolids Alternatives Evaluation. Basis of Design criteria include solids flows and loads, wasting schedules and solids characteristics such as percent total solids (TS), Total Suspended Solids (TSS) and Volatile Suspended Solids (VSS) content. This TM presents Basis of Design criteria for a 20-year design period.

## Existing Conditions

The current solids process at the WWTP includes pumping waste activated sludge (WAS) to an aerobic tank for storage and thickening, dewatering using centrifuges, and stabilization of the

biosolids using RDP Technologies' lime pasteurization system, resulting in a Class A Exceptional Quality (EQ) biosolids product. The WWTP process flow diagram is shown on Figure 1.

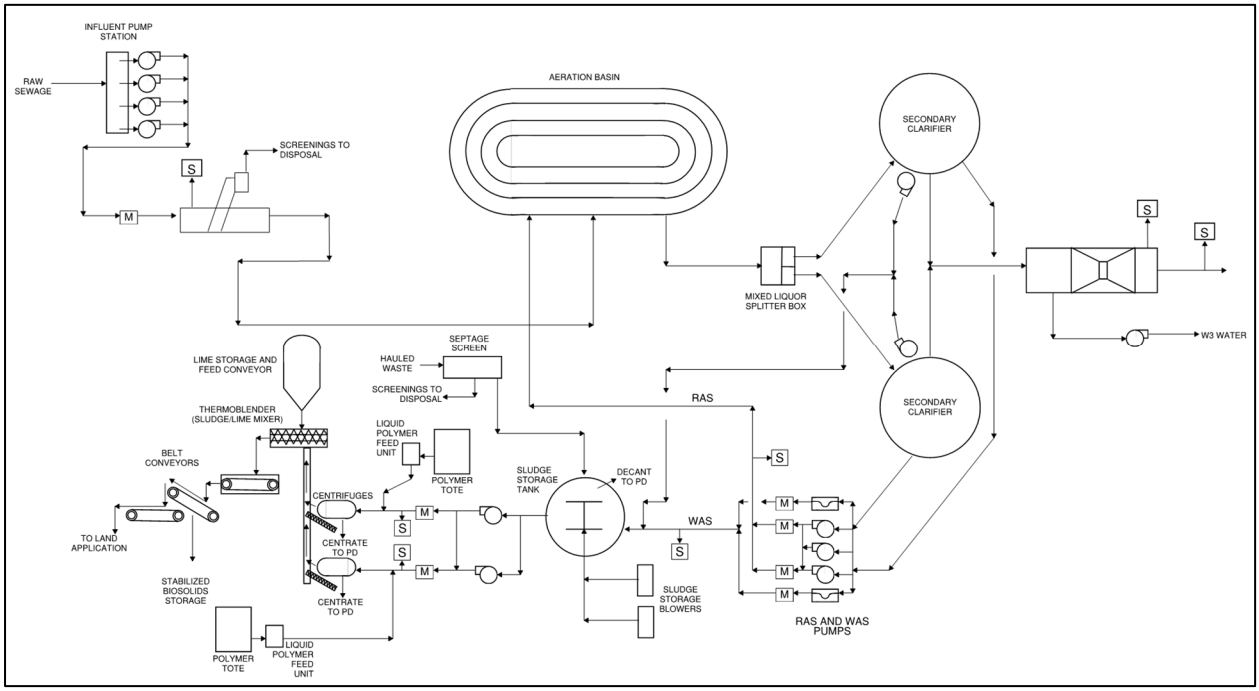


**Figure 1: Current Process Flow Diagram**

## Solids Stream Design Criteria

Kennedy Jenks, with assistance from the City and BC, has developed the Basis of Design criteria presented in this section. The Basis of Design criteria are needed for the preliminary sizing of solids stream processes and are based on plant operational data and future flows and loads. Wastewater treatment plant flows and loads, as well as solids stream projected loadings, were developed by BC and are presented in Tables 1 and 2, respectively. Design criteria for solids stream unit processes that may be considered as part of the Biosolids Alternatives Evaluation are summarized below and presented in Tables 3 through 8.

- **Hauled Waste** – a packaged system to receive septage and other hauled waste will be included with each biosolids alternative. The packaged system described is based on a Huber RoFas system, which in Kennedy Jenks' research has not shown to be prone to ragging, and includes an integral grit removal process. The packaged system is available with or without a ticketing system for tracking hauled waste loads and is used in other wastewater facilities in Oregon.

- **Solids Storage** – the existing sludge storage tank will be assumed to continue to receive WAS and hauled waste, similar to current WWTP operations. The ability of the tank to thicken solids to a desirable solids concentration for dewatering will impact biosolids alternatives that do not include thickening and stabilization unit processes, such as aerobic or anaerobic digestion. Either additional storage volume or a lower dewatering feed solids concentration may be considered for these alternatives.

- **Thickening** – a mechanical thickening process may be considered for biosolids alternatives that include a stabilization unit process, such as aerobic or anaerobic digestion. Thickening facilities would receive flow from the sludge storage tank at 0.5 to 0.7% TS and produce 4 to 5% TS thickened solids product.

- **Solids Stabilization** – biosolids alternatives will be developed both with and without stabilization to understand the costs and benefits of aerobic or anaerobic digestion to reduce the overall mass of biosolids for further treatment and disposal.

- **Dewatering** – dewatering of biosolids, whether following stabilization or directly from the sludge storage tank, will be evaluated. Dewatered biosolids will consist of a 20% TS cake that will be conveyed to further treatment to produce Class A or B biosolids.

- **Class A Biosolids Treatment** – processes such as composting and mechanical dryers will be evaluated for the production of Class A biosolids in comparison to the existing RDP lime pasteurization process. These processes will result in a finished biosolids product that can be beneficially applied to agricultural lands, or sold or given away to the general public as a soil amendment.

**Table 1: Wastewater Treatment Plant Flows and Loads[a]**

| Parameter | Year | | | | | |
|---|---|---|---|---|---|---|
| | 2021 | 2030 | 2040 | 2050 | 2060 | Buildout[b] |
| **Flows, mgd** | | | | | | |
| Average Annual | 1.8 | 1.9 | 2.0 | 2.0 | 2.0 | 2.0 |
| Max Month (MMWWF) | 3.3 | 3.6 | 3.7 | 3.8 | 3.8 | 3.8 |
| Peak Day (PDWWF) | 6.5 | 7.0 | 7.4 | 7.5 | 7.5 | 7.5 |
| **Loads, ppd[c]** | | | | | | |
| **$BOD_5$[d]** | | | | | | |
| Average Annual | 3,200 | 3,414 | 3,561 | 3,599 | 3,608 | 3,617 |
| Max Month | 4,250 | 4,560 | 4,764 | 4,817 | 4,830 | 4,843 |
| Peak Day | 6,500 | 7,024 | 7,375 | 7,466 | 7,488 | 7,510 |
| **TSS[e]** | | | | | | |
| Average Annual | 2,775 | 2,993 | 3,142 | 3,180 | 3,191 | 3,200 |
| Max Month | 4,000 | 4,309 | 4,525 | 4,581 | 4,594 | 4,608 |

| Parameter | Year | | | | | |
|---|---|---|---|---|---|---|
| | 2021 | 2030 | 2040 | 2050 | 2060 | Buildout[b] |
| Peak Day | 6,800 | 7,332 | 7,699 | 7,793 | 7,817 | 7,840 |

**Notes:**
(a) Flows and loads values were developed by BC and provided via an email dated 10 May 2022.
(b) Buildout is projected to occur in year 2070 per BC.
(c) ppd = pounds per day.
(d) $BOD_5$ = biochemical oxygen demand.
(e) TSS = total suspended solids.

**Table 2: Solids Stream Projected Loadings[a]**

| Parameter | Condition | | | |
|---|---|---|---|---|
| | 2022 Average | 2040 Average | 2040 Maximum Month | 2040 Maximum Week |
| **Waste Activated Sludge** | | | | |
| Solids, ppd | 3,200 | 3,561 | 4,451 | 5,341[b] |
| Solids, pph[c] | 133 | 148 | 185 | 223 |
| Solids concentration, %TS[d] | 0.55 | 0.55 | 0.55 | 0.55 |
| Flow, gpd[e] | 69,720 | 77,580 | 96,970 | 116,440 |
| Flow, gpm[f] | 48 | 54 | 67 | 81 |
| **Hauled Waste[g]** | | | | |
| Solids, ppd | 137 | 152 | 191 | 229 |
| Solids concentration, %TS | 1.8 | 1.8 | 1.8 | 1.8 |
| Flow, gpd | 913 | 1,015 | 1,269 | 1,523 |

**Notes:**
(a) Flows and loads values were developed by BC and provided via an email dated 10 May 2022.
(b) Based on maximum week WAS solids loading peaking factor of 1.5, per BC.
(c) pph = pounds per hour. Assumes wasting occurs 24 hours per day, 7 days per week.
(d) TS = total solids. Average WAS concentration per BC.
(e) gpd = gallons per day.
(f) gpm = gallons per minute.
(g) 2022 average hauled waste flows and loads are based on WWTP annual biosolids reports (2018 through 2021) and an average solids concentration of 1.8%. Year 2040 hauled waste flows and loads are based on WAS peaking factors.

**Table 3: Hauled Waste Design Criteria**

| Parameter | Value |
|---|---|
| **Hauled Waste** | |
| Design Condition | Maximum Week[a] |
| Redundancy | No Standby[b] |

| Parameter | Value |
|---|---|
| Type | Packaged System[c] |
| Location | Covered[d] |
| Number of Truck Connections | 1[e] |
| Capacity, gpm | 600[f] |
| Maximum Solids Content, %TS | 5% |
| Truck Unload Time | 1-5 minutes[g] |
| On-skid Flow Meter | Yes |
| On-skid pH Monitoring | Yes |
| Load Tracking and Monitoring | Not Provided[h] |
| Integral Rock Trap | Not Provided[h] |
| Odor Control | Yes[i] |
| Utility Requirements | Washwater[j] |
| **Septage Screening** | |
| Type | Drum, Perforated Plate |
| Integral Washer/Compactor | Yes |
| Screenings Disposal | Screenings Receptacle |
| Washwater Disposal | Plant Drain |
| **Grit Removal** | |
| Type | Longitudinal Grit Trap |
| Grit Disposal | Grit Receptacle |
| Grease Removal | Yes[k] |

**Notes:**
(a) Standard Design Condition.
(b) 1 duty system.
(c) Includes septage screening and grit removal.
(d) Adjacent to existing septage receiving.
(e) City to determine if hauler activity may justify a second truck connection.
(f) At maximum solids concentration of 5%. Based on manufacturer (Huber) capacity data.
(g) Truck volumes range from 1,000 to 2,500 gallons per load.
(h) City to verify.
(i) Enclosed Equipment with Foul Air Duct Connections.
(j) 30 gpm at 75 psi.
(k) Grease skimmer, transfer screw and pump.

**Table 4: Sludge Storage Design Criteria**

| Parameter | Value |
|---|---|
| **Sludge Storage Tank** | |
| Design Condition | Max Week |

| Parameter | Value |
|---|---|
| Redundancy[a] | No Standby |
| Diameter, ft[b] | 60 |
| Sidewater Depth, ft | 17 |
| Volume, gallons | 360,000 |
| **Performance** | |
| HRT, Days[c] | 3.1 |
| Decant, gpd | 59,000 |
| Decant %TS[d] | 0.11 |
| Decant Solids Load, ppd | 546 |

**Notes:**
(a) Assumes existing Sludge Storage Tank is maintained.
(b) ft = feet.
(c) HRT = hydraulic retention time, at maximum week WAS and hauled waste loading.
(d) Based on WWTP operating data provided by BC via email dated 28 April 2022.

The decant rate assumes the sludge holding tank is decanted on a daily basis at a rate of 50% of tank influent flow to produce a thickened solids concentration of 1% to dewatering. Discussions with WWTP operations staff indicate the capacity to effectively decant the holding tank is limited to 20% of the tank influent flow. The Biosolids Evaluation Report will need to consider increasing the storage tank volume to produce a thickened solids concentration of 1%. Alternatively, the Biosolids Evaluation Report may consider lower decant rates that produce a thickened solids concentration of 0.6 to 0.7% TS, similar to current WWTP operations.

Mechanical thickening is recommended for alternatives considering solids stabilization, ie aerobic or anaerobic digestion. Mechanical thickening design criteria are summarized in Table 5.

**Table 5: Mechanical Thickening Design Criteria**

| Parameter | Value |
|---|---|
| **Thickening** | |
| Design Condition | Max Week |
| Redundancy[a] | No standby |
| Solids Capture, %[b] | 95 |
| Solids concentration, %TS | |
| Anaerobic Digestion[c] | 5 |
| Aerobic Digestion[b] | 4 |
| Polymer Usage, active lbs/dry ton[d] | 6-10 |

**Notes:**
(a) Parallel units would be provided. Assumes 64 operating hours per week.
(b) Typical Design Standard, Metcalf and Eddy, 4th Edition.
(c) Typical range is 4 to 6% (Table 22.8 WEF Manual of Practice 8).
(d) Typical range (Table 20.8 WEF Manual of Practice 8).

**Table 6: Solids Stabilization Design Criteria**

| Parameter | Value |
|---|---|
| **Solids Stabilization** | |
| Design Condition | Max Month |
| Redundancy | No standby |
| Volatile Solids Concentration, %VS[a] | 83 |
| **Aerobic Digestion** | |
| Solids Loading, lbs VS/ft$^3$/day[b] | 0.1 - 0.3 |
| VS Destruction, %[c] | 40 |
| Class B Solids Retention Time[d] | 40 days at 68°F; 60 days at 59°F |
| Aeration Requirements[e] | 2-3 |
| Digested Solids Concentration, %TS[f] | 2-3 |
| **Anaerobic Digestion** | |
| Solids Loading, lbs VS/ft$^3$/day[g] | 0.16 |
| VS Destruction, %[h] | 55 |
| Class B Solids Retention Time, day[i] | 20 |
| Class B Temperature Requirement, °F[j] | 95 |
| Mixing Requirements, turnovers per day[k] | 8-12 |
| Digester Gas Production, ft$^3$/lb VS/day[l] | 15 |
| Digested Solids Concentration, %TS[m] | 2.8 |

**Notes:**

(a) VSS:TSS ratio provided by BC via an email dated 10 May 2022.
(b) Typical Design Standard, Metcalf and Eddy, 4th Edition.
(c) CFR Part 503 requires minimum 38% for Class B Typical range is 35 to 50% (Page 22-98 WEF Manual of Practice 8)
(d) Per 40 CFR 503.32(b)(3)
(e) lb of O2 per lb of VSS destroyed
(f) Assumes 4% TS loading to aerobic digestion.
(g) Typical range is 0.12 to 0.16 (Page 22-33 WEF Manual of Practice 8)
(h) Typical range is 40 to 65% (Table 22.11 WEF Manual of Practice 8)
(i) Minimum SRT of 15 days per 40 CFR Part 503 at temperatures between 95 to 131°F
(j) Temperature range 95 to 131°F per 40 CFR Part 503
(k) Mixing energy may also be determined based on volume, at 3.3 to 4.2 Hp per million gallons.
(l) Typical design standard.
(m) Assumes 5% TS loading to anaerobic digestion.

**Table 7: Dewatering Design Criteria**

| Parameter | Value |
|---|---|
| **Dewatering** | |
| Design Condition | Max Month |
| Redundancy[a] | No standby |
| Solids Capture, %[b] | 90-95 |
| Cake Concentration, %TS | |
| Aerobic Digestion[c] | 18 |
| Anaerobic Digestion[d] | 22 |
| Polymer Usage, active lbs/dry ton[e] | 16-20 |

**Notes:**

(a) Parallel units would be provided. Assumes 64 operating hours per week.
(b) Standard range for centrifuge technology. Higher percent capture is associated with higher feed solids concentration.
(c) Typical range for aerobically digested sludge is 18 to 22%.
(d) Typical range for anaerobically digested sludge is 20 to 25%.
(e) Based on sludge testing performed by Andritz, dated 2 June 2022.

**Table 8: Class A Biosolids Treatment Design Criteria**

| Parameter | Value |
|---|---|
| **Biosolids Treatment** | |
| Design Condition | Max Month |
| Redundancy | No Standby |
| Location | Onsite |
| **Compost** | |
| Bulking Agent:Solids Loading Ratio[a] | 1.2:1 |
| Time Requirement, weeks | 6-7 |
| Area Requirements | |
| Bulking Agent, $ft^2$ per lb[b,c] | 2-3 |
| Treatment, $ft^2$ per lb[b,d] | 3 |
| Finished Product Storage, $ft^2$ per lb[b,e,f] | 3 |
| Finished Product Volume, $ft^3$ per lb[b,g] | 0.25 |
| **Drying** | |
| Fuel Source | Natural Gas |
| Temperature[h] | 212 to 400°F |
| Product Solids Concentration, %TS | > 90% |

| Parameter | Value |
|---|---|
| Finished Product Storage | Super Sacks |
| **Lime Heat Pasteurization** | |
| Lime:Solids Loading Ratio(i) | 0.4 |
| Time Requirement, minutes | 30 |
| Temperature Requirement | > 158°F |
| pH Requirement | 12 or higher |

**Notes:**

(a) Wet lbs basis.
(b) Lbs dewatered solids, dry basis.
(c) Assumes 90 days storage, 12' high (H) piles.
(d) Assumes 8'H piles.
(e) Assumes 90 days storage, 8'H piles.
(f) Assumes conservative mass reduction of 10%.
(g) Assumes typical mass reduction of 25%.
(h) Varies with technology (e.g. indirect dryers, direct dryers, belt dryers).
(i) Dry lbs basis from typical design criteria for existing RDP system.

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# Appendix K Solids Equipment Vendor Proposals



Use of contents on this sheet is subject to the limitations specified at the end of this document.

BUDGET PROPOSAL

## Newport, OR

**Equipment:**
HUBER Sludge Acceptance Plant RoFAS 1

**Represented by:**
Goble Sampson Associates
Doug Allie
(425) 392-0491
dallie@goblesampson.com

**Regional Sales Director:**
Ronald Maiorana
704-990-2422
Ronald.Maiorana@hhusa.net

**Project Number:** 491149
**Revision:** 0
**Date:** 10/25/2022

## Design Information RoFAS

| Technical Data | | |
|---|---|---|
| Maximum Flow Rate | **600** | **GPM** |
| Solids Content at Max Flow Rate | **5%** | **%** |
| Drum Perforation Sizing | **10** | **mm** |
| Diameter of Drum | **3.94** | **feet** |
| Length of Drum | **9.24** | **feet** |
| Approximate empty weight | **2756** | **lbs** |
| Approximate loaded weight | **4960** | **lbs** |
| Wash Water Consumption | **40** | **GPM** |
| Wash Water minimum pressure | **100** | **PSI** |
| Installation Angle of Drum | **10** | **°** |
| ANSI Inlet Diameter | **4** | **inch** |
| ANSI Outlet Diameter | **8** | **inch** |

## Equipment Details

| Model | HUBER Sludge Acceptance Plant RoFAS 1 |
|---|---|
| Quantity | 1 |
| Material | 304L Stainless Steel Construction; picked and passivated in acid bath |
| Screenings Wash | One (1) spraybar system used to clean screenings |
| Solenoid Valve | One (1x) 1-1/2 inch size diameter Class1 Division1 120VAC 60Hz single phase Brass body |
| Drive Motor | 3HP, 480 VAC, 3ph, 60 Hz, S.F. 1.15, Class 1 Division 1 |
| Actuator/Valve | Electric actuator with PVC Ball Valve |
| Flow Meter | Magnetic flow meter |
| Level Sensor | Pressure transducer |
| pH Sensor | 4-20mA pH Sensor |
| Odor Flange | ANSI Flange for odor control connection |
| Supports | 304L Stainless Steel Construction |
| Anchor Bolts | M12, 316L, Included |

## Design Information WAP

| Technical Data | | |
|---|---|---|
| Screenings Capacity | **212** | **cu.ft/hr** |
| Drain Pan Perforation Sizing | **5** | **mm** |
| Approximate empty weight | **1323** | **lbs** |
| Wash Water Consumption | **24** | **gpm** |
| Wash Water minimum pressure | **30-75** | **psi** |
| ANSI Outlet Diameter (WAP6 or Larger) | **4** | **inch** |

## Equipment Details

| Model | HUBER Wash Press WAP 6 |
|---|---|
| Quantity | 1 |
| Material | 304L Stainless Steel Construction; picked and passivated in acid bath |
| Auger Material | 304L Stainless Steel Construction; picked and passivated in acid bath with shafted screw design |
| Solenoid Valve(s) | Two (2x), 1-inch size diameter, Class 1 Division 1, 120 VAC, 60 Hz single phase, Brass body |
| Drain Pan | Latched, 3.5" NPT Connection |
| Inlet Hopper | Enclosed feed hopper, inspection Hatch Included |
| Discharge Pipe | 304L stainless steel with endless bagger |
| Motor | 7.5 HP, 480 VAC, 3ph, 60 Hz, S.F. 1.15, Class 1 Division 1 |
| Supports | 304L Stainless Steel Construction |
| Anchor Bolts | M12, 316L, Included |

## Design Information Ro6

| Technical Data | | |
|---|---|---|
| Maximum Flow | **950** | **GPM** |
| Approximate empty weight | **5600** | **lbs** |
| Approximate loaded weight | **27550** | **lbs** |
| ANSI Inlet Diameter | **10** | **inch** |
| ANSI Outlet Diameter | **12** | **inch** |
| Grit Tank Design | **Non-aerated** | **-** |

## Equipment Details

| Model | HUBER Longitudinal Grit Trap Ro6 |
|---|---|
| Quantity | 1 |
| Material | 304L Stainless Steel Construction; picked and passivated in acid bath |
| Tank Covers | Removable standard non-walkable covers |
| Horizontal Screw | 304L Stainless Steel Construction; shafted grit transfer screw |
| Inclined Screw | 304L Stainless Steel Construction; shafted grit removal screw |
| Hor. Screw Motor | 0.75 HP, 480 VAC, 3ph, 60 Hz, S.F. 1.15, Class 1 Division 1 |
| Incl. Screw Motor | 0.75 HP, 480 VAC, 3ph, 60 Hz, S.F. 1.15, Class 1 Division 1 |
| Chute | Closed grit discharge chute |
| Grease System | Grease skimmer, grease transfer screw, and grease pump |
| Skimmer Motor | 0.16 HP, 480 VAC, 3ph, 60 Hz, S.F. 1.15, Class 1 Division 1 |
| Grease Screw | 0.75 HP, 480 VAC, 3ph, 60 Hz, S.F. 1.15, Class 1 Division 1 |
| Grease Pump | 3.0 HP, 480 VAC, 3ph, 60 Hz, S.F. 1.15, Class 1 Division 1 |
| Supports | 304L Stainless Steel Construction |
| Anchor Bolts | M12, 316L, Included |

## Control Details

| One (1) Main Control Panel | |
|---|---|
| Enclosure | NEMA 4X, Stainless Steel |
| PLC | Allen Bradley MicroLogix |
| HMI | Allen Bradley PanelView Plus 800 |
| Pre-programmed and Factory Tested | |

## Pricing

| Equipment | Model | Quantity | Pricing |
|---|---|---|---|
| HUBER Sludge Acceptance Plant | RoFAS 1 | 1 | Included |
| HUBER Wash Press | WAP 6 | 1 | Included |
| HUBER Longitudinal Grit Trap | Ro6 60 | 1 | Included |
| HUBER Control Panel | HUBER Standard | 1 | Included |
| Freight and Startup Services | Standard HUBER Start-up Services | 3 days, 1 trip | Included |
| **TOTAL:** | | | **$495,000.00** |

Standard delivery is 22-30 weeks from approval of submittals.

Thank you for your interest in HUBER Technology, Inc. If you have any questions, please do not hesitate to contact our Regional Sales Director or our local sales representative.

This proposal has been reviewed for accuracy and approved for issue by: JW

## Notes and Technical Clarifications

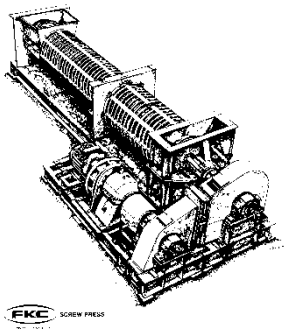
1. Equipment specification and drawings are available upon request.
2. If there are site-specific hydraulic constraints that must be applied, please consult the manufacturer's representative to ensure compatibility with the proposed system.
3. Electrical motor disconnects required per local NEC code are not included in this proposal.
4. All electrical interconnections, motor disconnects, wirings, junction boxes, and terminations between the equipment and electrical components are to be provided by installing contractor.
5. HUBER Technology warrants all components of the system against faulty workmanship and materials for a period of 12 months from date of start-up or 18 months after shipment, whichever occurs first.
6. Budget estimate is based on Huber Technology's standard Terms & Conditions and is quoted in US dollars unless otherwise stated.
7. Equipment recommendations are based on information provided to Huber Technology. Subsequent information which differs from what has been provided may alter the equipment recommendation.
8. Any item not specifically listed is not considered part of this scope of supply. Please contact the HUBER Technology representative listed for further clarification.
9. HUBER will ship all equipment to site inside of 20', 40' or 40'OT ocean containers as deemed appropriate by our factory. HUBER will not ship any equipment on flatbed truck. Flatbed truck shipping means that the equipment would need to be transferred at port from factory packaged containers to the flatbed. This process it out of HUBER's control and it is our experience that equipment always gets damaged during this process.
10. Equipment that is broken out in "Pricing" tab are only valid when packaged together.
11. All piping to and from the equipment is to be supplied by the installing contractor.
12. Please note the pH sensor can be tied into our standard equipment panel, where the pH level can be displayed on the HMI for operator or SCADA use.

**FKC CO., LTD.**

2708 West 18th Street
Port Angeles, WA 98363

(360) 452-9472
FAX (360) 452-6880

May 24, 2023



Victor Pedroni
Pedroni & Co. LLC
Tel: (425) 369-6164
Email: victor@pedroni-co.com

**Re: FKC Co., Ltd. Quotation QT04-052423RW**
**Newport OR WWTP – FKC Thickening Equipment**

Victor:

FKC is pleased to provide this proposal for thickening of Waste Activated Sludge at the Newport, OR WWTP. This proposal includes:

(2) Two FKC Model RST-S630x2000L Rotary Screen Thickener (RST) with Support Frame
(2) Two Discharge Hopper w/ custom connection to TWAS Pump
(2) Two FKC Model 150GL Flocculation Tank with Agitator Assembly
(2) One 1.5-inch Solenoid Valve
(2) VeloBlend Liquid Polymer Blending Systems
All Required spare parts/All required start-up services
All Required training and performance testing

All items listed are shipped separate and loose to be assembled/installed by others.

Please note that the pricing found in this quote does not include all the other equipment necessary for a complete thickening application; i.e. feed pump, thickened sludge pump, local control panel, field instrumentation, etc.

We hope this information is helpful. Please contact this office if you have questions, or if you need anything further.

Sincerely,
FKC Co., Ltd.

Ryan Whitmore

# FKC
# Rotary Drum Thickener
# with
# Flocculation Tank

## QT04-052423RW
## May 24, 2023

# Table of Contents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## A. Proposed Equipment

| Qty. | Description | FOB Newport OR WWTP |
|---|---|---|
| **2** | FKC Rotary Screen Thickener<br>Model RST-S630x2000L | **See Price Summary Paragraph B.3.** |
| | Material: | 100% Municipal WAS |
| | Inlet Capacity: | Up to 100 gpm |
| | Inlet consistency: | 0.5% TS or Higher |
| | Polymer Dose: | Not to exceed 10 lbs active polymer per ton dry solids |
| | Outlet consistency: | 4% TS or Higher - Aerobically Digested<br>5% TS or Higher – Anaerobically Digested<br>(lab sample required to guarantee results) |
| | Solids Capture Rate | 95% |
| | Materials of construction: | SS-304L wetted parts<br>SS-304L Base<br>SS-304L Support Legs & Frame<br>Other Painted Carbon Steel |
| | Speed reducer: | SEW Eurodrive Gearbox<br>Motor: 1.5 HP 480V/3PH/60Hz |
| | Other: | Two (2) 150GL Flocculation Tank<br>SEW Eurodrive Gearbox<br>Motor: 1 HP 480V/3PH/60Hz |
| | Delivery: | Delivery within seven (8) months after notice to proceed with manufacturing. |

*Prices do not include taxes or bonding requirements

## B. Miscellaneous

### 1. Delivery

On-site delivery will be within eight (8) months after notice to proceed with manufacturing.

### 2. Shipping Arrangements

The FKC thickening equipment will be shipped best way overland from Port Angeles, Washington to Newport, OR.

### 3. Equipment Summary

The following summarizes the equipment offered:

(2) Two FKC Model RST-S630x2000L Rotary Screen Thickener (RST) with Support Frame
(2) Two Custom Discharge Hopper w/ connection to TWAS Pump
(2) Two FKC Model 150GL Flocculation Tank with Agitator Assembly
(2) Two 1.5-inch Slow-Closing Solenoid Valve

---

**US$ 181,100 FOB Newport OR WWTP**

**Optional Polymer Blending System Adder:**
(2) Two VeloBlend Liquid Polymer Blending System

---

**US$ 61,300 FOB Newport OR WWTP**

This quotation and pricing does not include taxes or bonding.

Please note that the pricing found in this quote does not include all the other equipment necessary for a complete thickening application; i.e. polymer system, feed pump, TWAS pump, control panel, field instrumentation, etc.

### 4. Options Offered

No Options are offered at this time.

### 5. Effective Period

This proposal shall remain valid 60 days from the date of the proposal.

## 6. Payment Terms

10% with submittal approval
90% with delivery
Net 30 days

FKC understands that with some contract requirements, up to 10% of each milestone payment may be retained until successful performance is demonstrated.

## 7. Installation

The Rotary Screen Thickener is shipped ready for installation.

The Flocculation Tank is shipped ready for installation. Field assembly of the agitator drive, base and blades are required.

The Solenoid Valve is shipped loose for field installation by others.

## 8. Operator Training and Start Up

One (1) trips, three (3) person-days are provided for on-site services including start-up, performance testing and training of the Rotary Screen Thickener and Flocculation Tank.

Other installation and erection assistance are not included in the price of the equipment and generally are not required. However, the service is available for our standard service rates (see the enclosed rate sheet).

## 9. Warranty

FKC's mechanical warranty covers material and workmanship for a period of twelve (12) months from start-up or eighteen (18) months from delivery whichever occurs first.

## 10. Documentation Schedule

The drawings provided with this scope of supply are reference drawings only.

A. Approval Drawings - within 3 weeks after receipt of purchase order
   Buyer must return approval drawings within 14 days
   or delivery schedule will be affected
B. Certified Drawings - within 2 weeks after return of approval drawings
C. Operation and Maintenance Manuals - 14-16 weeks after receipt of order

## 11. Performance Guarantee

The performance figures and conditions denoted in section A of this proposal constitute FKC Co., Ltd.'s performance guarantee and the conditions required to meet the guarantee. All of the consistency figures are based on total solids (TS) not total suspended solids (TSS).

If performance is not met, FKC will provide all parts, engineering, and labor associated with the work necessary to bring the equipment into conformance with the performance guarantee.

## 12. Notes and Clarifications

No notes or clarification are offered at this time.

## 13. Spare Parts List

No spare parts are required for the first 1-2 years of operation. A list of long-term spares in available upon request.

## 14. Service Rates

The following are rates and terms for professional and technical services furnished by FKC: If required, round-trip airfare (coach class) from Port Angeles, WA to airport nearest work site.

Weekdays

$1,200.00 - Per eight (8) hour day on weekdays plus, lodging, and rental car expenses.
$225.00 - Per hour for all hours exceeding eight (8) hour workday on weekdays.

Saturdays, Sundays and Holidays

$1,800.00 - Per eight (8) hour day plus lodging and rental car expenses.
$350.00 - Per hour for all hours exceeding eight (8) hour workday.

Travel Time - Weekdays

$80.00 - Per hour travel time. (Not to exceed $990/day)

Travel Time – Weekends and US Holidays

$120.00 - Per hour travel time (Not to exceed $1,440/day)

## Benjamin Bosse

**From:** Eric Hunter <erich@beaver-equipment.com>
**Sent:** Tuesday, May 30, 2023 7:59 PM
**To:** Benjamin Bosse
**Subject:** Re: Newport WWTP Conveyor Quote Request
**Attachments:** Serpentix Pathwinder (Model-P2) - Technical Data.pdf; Serpentix Flight Distribution (Model-FD) - Presentation.pdf; Pages from Newport Isometric and H Record Drawings - SX Marked (5.26.2023).pdf

**EXTERNAL EMAIL**

**This email includes an ATTACHMENT from outside of KJ and could contain malicious links.**
Ensure email is from a **trusted** sender before opening the attachment.
Never enter your login credentials if prompted. Contact **IST** if you have any questions.

Good Evening Ben,

Please see below for conveyor budget pricing from Serpentix. Keep me posted as you start to get into the design details.

*CONVEYOR-A (forward running only - south direction): ~$87,650 USD*
*==========*
** complete mechanical Model-P2 conveyor, with fully assembled 2HP drive station and tension station*
** pre-assembled chain in 401 link sections; 26in belting assembled in 4'-0" sections from factory*
** track - 304 stainless steel construction*
** zero speed sensor (120VAC | 1ph), emergency pull-cord switches (120VAC | 1ph)*
** solenoid oiler bottle (120VAC | 1ph) for track lubrication*
** skirtboards (at loading area) - 3/8" HDPE w/ 304SS brackets*
** drip pans - 16ga galvanized sheet w/ 304SS brackets*
** supports - ASTM A572 Grade-50, hot-dipped galvanized construction*
** assembly hardware - 304SS standard*
** one (1x) trip for one (1x) day of equipment start-up certification and O&M training*
** Serpentix's standard NEMA 4X control panel for forward operation direction; includes motor starter, control relay logic, operator indicators / switches, run permissive for AUTO mode, select-able HAND mode*
** warranty - One (1x) year warranty from equipment start-up, that covers against defects in materials and workmanship; does not include failures caused by abuse, negligence or lack of preventative maintenance. Parts only supplied by Serpentix if warranty claim is validated - time / labor of removal and installation is the responsibility of the Owner.*
** freight to the jobsite*

*CONVEYOR-B (forward running only - west direction): ~$129,385 USD*
*==========*
** complete mechanical Model-P2 conveyor, with fully assembled 3HP drive station and tension station*
** pre-assembled chain in 401 link sections; 26in belting assembled in 4'-0" sections from factory*
** track - 304 stainless steel construction*
** zero speed sensor (120VAC | 1ph), emergency pull-cord switches (120VAC | 1ph)*
** solenoid oiler bottle (120VAC | 1ph) for track lubrication*
** skirtboards (at loading area) - 3/8" HDPE w/ 304SS brackets*
** drip pans - 16ga galvanized sheet w/ 304SS brackets*
** supports - ASTM A572 Grade-50, hot-dipped galvanized construction*
** assembly hardware - 304SS standard*

** one (1x) trip for one (1x) day of equipment start-up certification and O&M training*
** Serpentix's standard NEMA 4X control panel for forward operation direction; includes motor starter, control relay logic, operator indicators / switches, run permissive for AUTO mode, select-able HAND mode*
** warranty - One (1x) year warranty from equipment start-up, that covers against defects in materials and workmanship; does not include failures caused by abuse, negligence or lack of preventative maintenance. Parts only supplied by Serpentix if warranty claim is validated - time / labor of removal and installation is the responsibility of the Owner.*
** freight to the jobsite*

*CONVEYOR-C (both forward & reverse operation - north/south direction): ~$43,520 USD*
*==========*
** complete mechanical Model-FD conveyor; with fully assembled 2HP drive station and tension station*
** Model-FD track - 304 stainless steel; 24" width low-profile*
** open flange discharges at either end of conveyor (no knife gates)*
** assembly hardware - 304SS*
** suspended supports - A572 Grade-50 steel, hot-dipped galvanized*
** one (1x) trip for one (1x) day of equipment start-up certification and O&M training*
** Serpentix's NEMA 4X main control panel (MCP) for forward & reverse operation direction; includes REVERSING CONTACT motor starter, control relay logic, operator indicators / switches, run permissive for AUTO mode.*
** Serpentix's NEMA 4X local control station (LCS) for select-able HAND mode [HOA switch], & selector switches for knife gates*
** warranty - One (1x) year warranty from equipment start-up, that covers against defects in materials and workmanship; does not include failures caused by abuse, negligence or lack of preventative maintenance. Parts only supplied by Serpentix if warranty claim is validated - time / labor of removal and installation is the responsibility of the Owner.*
** freight to the jobsite*

*==========*

*NOTE: Excluded from the budget pricing:*
** anchors / anchorage (typically contractor's responsibility)*
** cross mounting beam / building beams / foundation design, if applicable (structural engineer's responsibility)*
** structural design calculations, and PE stamping*

*==========*
*==========*

Thanks,

Eric Hunter
Sales Engineer
801.803.2082
EricH@Beaver-Equipment.com

On May 26, 2023, at 12:43 PM, Eric Hunter <erich@beaver-equipment.com> wrote:

Hi Ben,

engineered COMPOST systems

# BUDGETARY QUOTATION

*Client:* Kennedy Jenks
*Facility:* Newport OR WWTP
*By:* Tim O'Neill, Chris Anderson
*Date:* 5/26/2023
*Basis:* Biosolids composting system sized for 2030 maximum month consisting of a reversing aeration active phase CASP with a biofilter and a positive aeration secondary (curing) ASP.

| **Feedstock** | units | | |
|---|---|---|---|
| Biosolids | Dry Ton/yr | 739 | |
| Dewatered Cake Solids | % | 20% | |
| Fresh Woody Amendment | WT/yr | 4,436 | |
| Nominal Ratio: Woody Amendment/Feedstock | ton/ton | 1.2 | |
| Total Mix | WT/yr | 8,133 | |
| Throughput (365 d/yr) | TPD | 22 | |
| Nominal Mix Density | lb/CY | 873 | |
| Mix Moisture (initial) | % | 60% | |

| **Sizing** | (US units) | Active | Secondary |
|---|---|---|---|
| Aeration Type | | Reversing | Positive |
| Aeration Floor Type | | Trench | B/G Sparger |
| Pile Arrangement | | Bunker | Mass Bed |
| Retention Time | days | 20 | 20 |
| Independent Control & Aeration Zones | # | 5 | 5 |
| Zone Width | ft | 20 | 20 |
| Zone Length | ft | 40 | 33 |
| Pile Depth | ft | 8.0 | 8.0 |
| Cover Depth | ft | 1.0 | 0.0 |
| Mix Volume per Zone | CY | 210 | 180 |
| Total Aerated Volume Capacity | CY | 1,050 | 900 |

| **Mechanical** | | Active | Secondary |
|---|---|---|---|
| Aeration Rate - Peak Single Zone Capacity | CFM/CY | 6.0 | 2.5 |
| Fan Power - Installed (total) | HP | 22.5 | 5 |
| Pile Surface Irrigation | | Automated | |

| **Process Area** | | Active | Secondary |
|---|---|---|---|
| Biofilter Area | ft^2 | 690 | 0 |

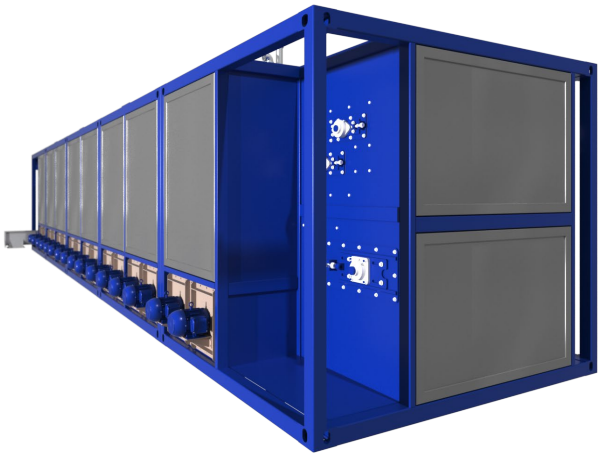
| **Cost Estimate** | | |
|---|---|---|
| Total ECS Scope of Work ($USD) | | **$ 890,000** |

Notes
- Mix volumes are approximate and should be adjusted for actual feedstock properties.
- Cost estimate assumes delivery of ECS standard submittals, parts, and technical support.
- ECS provides non-stamped shop drawings

**NUMBER:** 12843 **DATE:** 12/2/22

**TO:** Kennedy Jenks **REF:** Belt Dryer

# Proposal
# City of Newport, OR
# Low Temperature Belt Drying System



**Centrisys Contact**
Jerod Swanson
Regional Sales Manager
9586 58th place
Kenosha, WI 53144
Ph: (262) 654-6006
Direct: (612) 401-2006
Email: Jerod.swanson@centrisys.us

**Centrisys Representative**
Chris McCalib
Treatment Equipment Company (TEC)
249 Main Ave S, Ste 107 #322
North Bend, Washington 98045
Ph: (425) 641-4306
Direct: (206) 909-1546
Email: chris@tec-nw.com

## One (1) LT 220 BELT DRYER

### ITEM 1. DRYER DESIGN

| | |
|---|---|
| Aerobic 16/4: | |
| Media: | Aerobic |
| Media Input Rate: | 1172 lbs wet/hr |
| Operation Time: | 16 hours a day, 4 days a week |
| DS-Concentration Inlet: | 20.0% |
| DS-Concentration Outlet: | min 90 % |
| Evap. Capacity Required: | 1139 lbs-$H_2O$/h |

| | |
|---|---|
| Aerobic 24/5: | |
| Media: | Aerobic |
| Media Input Rate: | 782 lbs wet/hr |
| Operation Time: | 24 hours a day, 5 days a week |
| DS-Concentration Inlet: | 20.0% |
| DS-Concentration Outlet: | min 90 % |
| Evap. Capacity Required: | 608 lbs-$H_2O$/h |

| | |
|---|---|
| Anaerobic 16/4: | |
| Media: | Anaerobic |
| Media Input Rate: | 955 lbs wet/hr |
| Operation Time: | 24 hours a day, 5 days a week |
| DS-Concentration Inlet: | 20.0% |
| DS-Concentration Outlet: | min 90 % |
| Evap. Capacity Required: | 922 lbs-$H_2O$/h |

| | |
|---|---|
| Anaerobic 24/5: | |
| Media: | Anaerobic |
| Media Input Rate: | 510 lbs wet/hr |
| Operation Time: | 24 hours a day, 5 days a week |
| DS-Concentration Inlet: | 20.0% |
| DS-Concentration Outlet: | min 90 % |
| Evap. Capacity Required: | 396 lbs-$H_2O$/h |

### ITEM 2. DESCRIPTION OF UNIT

| | |
|---|---|
| DLT 220: | |
| Number of unit: | 1 |
| Model: | LT 220 |
| Dimensions (HxWxL): | 12 x 10.5 x 27 ft for one dryer |
| Clearance Requirement: | 4 ft |
| Heat Source: | Hot water loop |

| | |
|---|---|
| DLT 320: | |
| Number of unit: | 1 |
| Model: | LT 320 |
| Dimensions (HxWxL): | 12 x 10.5 x 36 ft for one dryer |
| Clearance Requirement: | 4 ft |
| Heat Source: | Hot water loop |

| | |
|---|---|
| DLT 420: | |
| Number of unit: | 1 |
| Model: | LT 420 |
| Dimensions (HxWxL): | 12 x 10.5 x 45 ft for one dryer |
| Clearance Requirement: | 4 ft |
| Heat Source: | Hot water loop |

## ITEM 3. SCOPE OF SUPPLY

1. One low temperature belt dryer
2. One sludge feed cake pump
3. Controls in non-classified environment
4. In unit feed and distribution system
5. In unit heat recovery system
6. Start-up assistance
7. Freight

## ITEM 4. Dryer Operation and Maintenance Requirement

1. Check feedline pressure, belt tension and temperature on the control panel monitor; take dried sludge sample (once per shift)
2. Clean the matrix of sludge feeding system and sensors (once per a week)
3. Inspect and adjust the sludge feeder system and clean belt (once per a month)
4. Grease bearing and chains (once every 3 months)
5. Clean sludge build up inside the dryer and on the heat exchanger (once a year)

## ITEM 5. ANCILLARY PROCESS (NOT INCLUDED IN SOP AND PROPOSED PRICE)

1. Odor control system (i.e. biofilter or chemical scrubbers) and exhaust system
2. Heat distribution system (i.e. Hot water loop consist of CHP, boiler, primary and secondary circulation pumps, expansion tanks, heat rejection unit) to provide hot water (194F) to each dryer at the normal operational condition

**ITEM 6. PURCHASE PRICE:**

| | |
|---|---|
| **Aerobic 24/5: One (1) DLT220 Unit** ..... | **$1,700,500** USD |
| **Anaerobic 24/5: One (1) DLT220 Unit** ..... | **$1,700,500** USD |
| **Anaerobic 16/4: One (1) DLT320 Unit** ..... | **$1,883,300** USD |
| **Aerobic 16/4: One (1) DLT420 Unit** ..... | **$2,083,000** USD |

F.O.B. Jobsite, freight included, taxes excluded.

**VALIDITY:**

Purchase Price is valid for sixty (60) calendar days from Quotation date, for shipment of Equipment within the timetable stated below in ITEM 6.

**PAYMENT TERMS:**

30% with order; 60% upon shipment; 10% after startup not to exceed 90 days after shipment.

**ITEM 7. TIMETABLE**

| | |
|---|---|
| Submittal phase: | 8-10 weeks after the order receipt |
| Approval phase: | 4 weeks for the customer to approve the drawings |
| Shipment phase: | 50-60 weeks following receipt of the Approval drawings |

**Dates are subject to confirmation upon receipt of written Purchase Order.**

**ITEM 8. WARRANTY**

One (1) year from the equipment start up or eighteen (18) months from delivery.

**ITEM 9. START UP ASSISTANCE**

Centrisys will furnish factory representatives for 20 days over 5 weeks to assist in installation inspection, start-up supervision, and operator training. Dates of service to be scheduled upon Buyer's written request.

**ITEM 10. BUYER/OWNER RESPONSIBILITY OR NOT INCLUDED AT THIS TIME:**

- Engineering support or site visit stated otherwise
- Wiring and conduit for control panel
- Dewatered cake feed pump/conveyor
- Material conveyance to, from and between equipment
- Odor control, exhaust ducting, fan and stack.
- Heat distribution system
- All utilities that are required for operation
- Unloading, uncrating, installation and installation supervision.
- Temporary dryer installation.
- Readiness of the Equipment before requesting start-up service. Non-readiness may incur additional charges.
- Compatibility of Equipment materials of construction with process environment.
- Piping connections, platforms, gratings and railings unless stated otherwise
- Bonding for the equipment
- Any other auxiliary equipment or service not detailed above.

Issued by
Brett Bevers
Applications Engineer
Date: 12/2/22

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# Appendix L Disinfection Improvement Costs



Use of contents on this sheet is subject to the limitations specified at the end of this document.

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Alternative: | | Disinfection Improvements | | | | | | | |
| Last Updated: | | 8/25/2023 | | | | | | | |
| QC/QC Date: | | | | | | | | | |
| | | | | | | | | | |
| **Detail Capital Costs** | | | | | | | | | |
| | | | | | | | | | |
| Component/Item | | | | | Quantity | Units | Unit Cost | Bare Cost | Capital Cost |
| Disinfection | | | | | | | | | |
| | Peristaltic Pumps and Skids (33 GPM) | | | | 2 | ea | 13,000 | $26,000 | $57,585 |
| | Chlorine Analyzer Assembly | | | | 1 | ea | 11,000 | $11,000 | $24,363 |
| | 0.5 HP Submersible Pump | | | | 1 | ea | 2,000 | $2,000 | $4,430 |
| | Submersible Mixer | | | | 1 | ea | 6,000 | $6,000 | $13,289 |
| | Installation | | | | 1 | ls | 7,000 | $7,000 | $15,504 |
| | Electrical Allowance | | | | 1 | ls | 11,000 | $11,000 | $24,363 |
| | | | | | | | | | |
| Assumes project will be D/B/B | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | $63,000 | |
| | | | | | | | | | |
| Construction Markups | | | | | | | | | |
| | Contractor Overhead and Profit | | | | 15 | % | | $9,450 | |
| | | Subtotal | | | | | | $72,450 | |
| | Contractor General Conditions | | | | 12 | % | | $8,694 | |
| | | Subtotal | | | | | | $81,144 | |
| | Undesigned/Undeveloped Detail Contingency | | | | 40 | % | | $32,458 | |
| | | Subtotal | | | | | | $113,602 | |
| | Bonds and Insurance | | | | 3.5 | % | | $3,976 | |
| | | Subtotal | | | | | | $117,578 | |
| | Oregon Corporate Activity Tax | | | | 0.57 | % | | $670 | |
| | | Subtotal | | | | | | $118,248 | |
| | Escalation to Midpoint (March 2027) | | | | 18 | % | | $21,285 | |
| | | **SUBTOTAL CONSTRUCTION COST** | | | | | | **$139,532** | |
| | | | | | | | | | |
| Other Markups | | | | | | | | | |
| | Risk Based Contingency | | | | 0 | % | | $0 | |
| | | Subtotal | | | | | | $139,532 | |
| | Soft Costs | | | | 0 | % | | $0 | |
| | | | | | | | | | |
| **TOTAL CAPITAL COST** | | | | | | | | **$139,532** | **$139,532** |

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# Land Conservation and Development Department

## Chapter 660

### Division 11
### PUBLIC FACILITIES PLANNING

**660-011-0045**
**Adoption and Amendment Procedures for Public Facility Plans**

(1) The governing body of the city or county responsible for development of the public facility plan shall adopt the plan as a supporting document to the jurisdiction's comprehensive plan and shall also adopt as part of the comprehensive plan:

(a) The list of public facility project titles, excluding (if the jurisdiction so chooses) the descriptions or specifications of those projects;

(b) A map or written description of the public facility projects' locations or service areas as specified in sections (2) and (3) of this rule; and

(c) The policy(ies) or urban growth management agreement designating the provider of each public facility system. If there is more than one provider with the authority to provide the system within the area covered by the public facility plan, then the provider of each project shall be designated.

(2) Certain public facility project descriptions, location or service area designations will necessarily change as a result of subsequent design studies, capital improvement programs, environmental impact studies, and changes in potential sources of funding. It is not the intent of this division to:

(a) Either prohibit projects not included in the public facility plans for which unanticipated funding has been obtained;

(b) Preclude project specification and location decisions made according to the National Environmental Policy Act; or

(c) Subject administrative and technical changes to the facility plan to ORS 197.610(1) and (2) or 197.835(4).

(3) The public facility plan may allow for the following modifications to projects without amendment to the public facility plan:

(a) Administrative changes are those modifications to a public facility project which are minor in nature and do not significantly impact the project's general description, location, sizing, capacity, or other general characteristic of the project;

(b) Technical and environmental changes are those modifications to a public facility project which are made pursuant to "final engineering" on a project or those that result from the findings of an Environmental Assessment or Environmental Impact Statement conducted under regulations implementing the procedural provisions of the National Environmental Policy Act of 1969 (40 CFR Parts 1500–1508) or any federal or State of Oregon agency project development regulations consistent with that Act and its regulations.

(c) Public facility project changes made pursuant to subsection (3)(b) of this rule are subject to the administrative procedures and review and appeal provisions of the regulations controlling the study (40 CFR Parts 1500–1508 or similar regulations) and are not subject to the administrative procedures or review or appeal provisions of ORS Chapter 197, or OAR chapter 660 division 18.

(4) Land use amendments are those modifications or amendments to the list, location or provider of, public facility projects, which significantly impact a public facility project identified in the comprehensive plan and which do not qualify

under subsection (3)(a) or (b) of this rule. Amendments made pursuant to this subsection are subject to the administrative procedures and review and appeal provisions accorded "land use decisions" in ORS Chapter 197 and those set forth in OAR chapter 660 division 18.

**Statutory/Other Authority:** ORS 183 & 197
**Statutes/Other Implemented:** ORS 197.712
**History:**
LCDC 4-1984, f. & ef. 10-18-84

Please use this link to bookmark or link to this rule.

v2.1.3

System Requirements Privacy Policy Accessibility Policy Oregon Veterans Oregon.gov

**Oregon State Archives** • 800 Summer Street NE • Salem, OR 97310
Phone: 503-373-0701 • Fax: 503-373-0953 • Adminrules.Archives@sos.oregon.gov

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**Derrick Tokos**

**From:** DLCD Plan Amendments <plan.amendments@dlcd.oregon.gov>
**Sent:** Wednesday, July 16, 2025 4:30 PM
**To:** Derrick Tokos
**Subject:** Confirmation of PAPA Online submittal to DLCD

**Newport**

Your notice of a proposed change to a comprehensive plan or land use regulation has been received by the Oregon Department of Land Conservation and Development.
Local File #: 2-CP-25
DLCD File #: 005-25
Proposal Received: 7/16/2025
First Evidentiary Hearing: 8/25/2025
Final Hearing Date: 10/6/2025
Submitted by: dtokos

If you have any questions about this notice, please reply or send an email to plan.amendments@dlcd.oregon.gov.

**NOTICE OF A PUBLIC HEARING.**

The City of Newport Planning Commission will hold a public hearing on Monday, August 25, 2025, at 7:00 p.m. in the City Hall Council Chambers to review and make a recommendation to the Newport City Council on a Comprehensive Plan text amendment (File No. 2-CP-25). The proposed legislative amendments are to the "Wastewater Facilities" and "Goals and Policies" sections of the "Public Facilities" element of the Newport Comprehensive Plan. Amendments incorporate the final "Wastewater Treatment Master Plan, by Brown and Caldwell, dated May 2025" in to the Comprehensive Plan. The Newport Comprehensive Plan Section entitled "Administration of the Plan" (pp. 420-421) requires findings regarding the following for such amendments: A. Data, Text, Inventories or Graphics Amendment: 1) New or updated information. B. Conclusions Amendment: 1) Change or addition to the data, text, inventories, or graphics which significantly affects a conclusion that is drawn for that information. C. Goal and Policy Amendments: 1) A significant change in one or more conclusions; or 2) A public need for the change; or 3) A significant change in community attitudes or priorities; or 4) A demonstrated conflict with another plan goal or policy that has a higher priority; or 5) A change in a statute or statewide agency plan; and 6) All the Statewide Planning Goals. D. Implementation Strategies Amendments: 1) A change in one or more goal or policy; or 2) A new or better strategy that will result in better accomplishment of the goal or policy; or 3) A demonstrated ineffectiveness of the existing implementation strategy; or 4) A change in the statute or state agency plan; or 5) A fiscal reason that prohibits implementation of the strategy. Testimony and evidence must be directed toward the request above or other criteria, including criteria within the Comprehensive Plan and its implementing ordinances, which the person believes to apply to the decision. Testimony may be submitted in written or oral form. Oral testimony and written testimony will be taken during the course of the public hearing. The hearing may include a report by staff, testimony from proponents, testimony from opponents, and questions and deliberation by the Planning Commission. Written testimony sent to the Community Development (Planning) Department, City Hall, 169 SW Coast Hwy, Newport, OR 97365, must be received by 3:00 p.m. the day of the hearing to be included as part of the hearing or must be personally presented during testimony at the public hearing. Material related to the proposed amendment may be reviewed or a copy purchased at the Newport Community Development (Planning) Department (address above). Please note that this is a legislative public hearing process and changes to the proposed amendment may be recommended and made through the public hearing process and those changes may also be viewed or a copy purchased. Contact Derrick Tokos, AICP, Newport Community Development Director, (541) 574-0626, email address d.tokos@newportoregon.gov (mailing address above).

***(For Publication Once on Wednesday, August 13, 2025)***

may have been used in manufacturing methamphetamines, the chemical components of which are known to be toxic. Prospective purchasers of residential property should be aware of this potential danger before deciding to place a bid for this property at the trustee's sale. In construing this notice, the masculine gender includes the feminine and the neuter, the singular includes plural, the word "grantor" includes any successor in interest to the grantor as well as any other persons owing an obligation, the performance of which is secured by the Deed of Trust, the words "trustee" and " beneficiary" include their respective successors in interest, if any. Dated: 7/18/2025 CLEAR RECON CORP 1915 NE Stucki Avenue, Suite 400 Hillsboro, OR 97006 Phone: 858-750-7777 866-931-0036 By: Name: Hamsa Uchi Authorized Signatory of Trustee. A13 A20 A27 S3

**NOTICE OF A PUBLIC HEARING. LCL25-0364**

The City of Newport Planning Commission will hold a public hearing on Monday, August 25, 2025, at 7:00 p.m. in the City Hall Council Chambers to review and make a recommendation to the Newport City Council on a Comprehensive Plan text amendment (File No. 2-CP-25). The proposed legislative amendments are to the "Wastewater Facilities" and "Goals and Policies" sections of the "Public Facilities" element of the Newport Comprehensive Plan. Amendments incorporate the final "Wastewater Treatment Master Plan, by Brown and Caldwell, dated May 2025" in to the Comprehensive Plan. The Newport Comprehensive Plan Section entitled "Administration of the Plan" (pp. 420-421) requires findings regarding the following for such amendments: A. Data, Text, Inventories or Graphics Amendment: 1) New or updated information. B. Conclusions Amendment: 1) Change or addition to the data, text, inventories, or graphics which significantly affects a conclusion that is drawn for that information. C. Goal and Policy Amendments: 1) A significant change in one or more conclusions; or 2) A public need for the change; or 3) A significant change in community attitudes or priorities; or 4) A demonstrated conflict with another plan goal or policy that has a higher priority; or 5) A change in a statute or statewide agency plan; and 6) All the Statewide Planning Goals. D. Implementation Strategies Amendments: 1) A change in one or more goal or policy; or 2) A new or better strategy that will result in better accomplishment of the goal or policy; or 3) A demonstrated ineffectiveness of the existing implementation strategy; or 4) A change in the

## 999 PUBLIC NOTICES

statute or state agency plan; or 5) A fiscal reason that prohibits implementation of the strategy. Testimony and evidence must be directed toward the request above or other criteria, including criteria within the Comprehensive Plan and its implementing ordinances, which the person believes to apply to the decision. Testimony may be submitted in written or oral form. Oral testimony and written testimony will be taken during the course of the public hearing. The hearing may include a report by staff, testimony from proponents, testimony from opponents, and questions and deliberation by the Planning Commission. Written testimony sent to the Community Development (Planning) Department, City Hall, 169 SW Coast Hwy, Newport, OR 97365, must be received by 3:00 p.m. the day of the hearing to be included as part of the hearing or must be personally presented during testimony at the public hearing. Material related to the proposed amendment may be reviewed or a copy purchased at the Newport Community Development (Planning) Department (address above). Please note that this is a legislative public hearing process and changes to the proposed amendment may be recommended and made through the public hearing process and those changes may also be viewed or a copy purchased. Contact Derrick Tokos, AICP, Newport Community Development Director, (541) 574-0626, email address d.tokos@newportoregon.gov (mailing address above).

**LCL25-0365 CITY OF NEWPORT NOTICE OF A PUBLIC HEARING.**

The Newport Planning Commission will hold a public hearing on Monday, August 25, 2025, at 7:00 p.m. in the City Hall Council Chambers to review and make a recommendation to the Newport City Council on File No. 3-Z-25, which includes housekeeping amendments to Newport Municipal Code (NMC) Chapter 14 and changes required as part of HB 2138 (2025). Pursuant to Newport Municipal Code (NMC) Section 14.36.010, the Commission must find that the change is required by public necessity and the general welfare of the community in order for it to make a recommendation to the City Council that the amendments be adopted. Testimony and evidence must be directed toward the request above or other criteria, including criteria within the Comprehensive Plan and its implementing ordinances, which the person believes to apply to the decision. Failure to raise an issue with sufficient specificity to

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cation, all documents and evidence submitted by or on behalf of the applicant, applicable criteria, and other relevant information are available for inspection at no cost, and copies can be provided at reasonable cost. A copy of the staff report will be available for inspection at no cost seven days prior to the hearing, and copies can be provided at reasonable cost. Written comments may be submitted to the City of Yachats at 501 Highway 101 N, Yachats, OR, mailed to P.O. Box 345, Yachats, OR 97498 or emailed to recorder@yachatsmail.org. The deadline for submitting written comments is Friday, July 11, 2025 at 4:00 p.m. Written testimony received prior to the deadline will be forwarded to the Planning Commission. The public may provide oral testimony at the July 15, 2025 public hearing. Failure to raise an issue in person, by letter or by email, or failure to provide statements or evidence sufficient to allow the decision-maker an opportunity to respond to the issue precludes appeal to the Land Use Board of Appeals based on that issue.

**LCL25-0370 IN THE CIRCUIT COURT OF THE STATE OF OREGON FOR THE COUNTY OF LINCOLN**

Probate Department In the Matter of Lawrence L. Sondenaa, Deceased. No. 25PB05962 NOTICE TO INTERESTED PERSONS Notice is herby given pursuant to ORS 113.155 that the undersigned, Jeffrey C. Pridgeon, Attorney for Heather Quinton, who has been appointed and has qualified as the personal representative of the estate as of July 25, 2025. All persons having claims against the estate are hereby required to present the same, with proper vouchers, within four months after the date of first publication of this notice, as stated below, to the personal representative at: Heather Quinton, 1102 7th Street, Lafayette, OR 97127 or they may be barred. All persons whose rights may be affected by the proceedings in this estate may obtain additional information from the records of the courts, the personal representative or the attorney for the personal representative. Date first published: August 13, 2025. /S/ Jeffrey C. Pridgeon, Attorney for Personal Representative, Heather Quinton.

**LCL25-0371 A REGULAR MEETING OF THE BOARD OF DIRECTORS OF CENTRAL LINCOLN PUD**

Will be held at 9:00 a.m. on Wednesday August 20, 2025 at 2129 N. Coast Hwy. Newport.

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bidding website, please contact QuestCDN at 952-233-1632 or info@questcdn.com. The Issuing Office for the Bidding Documents is: Civil West Engineering Services, Inc. 409 SW 10th Street, Newport, OR 97365, Ph: (541) 264-7040, Prospective Bidders may obtain or examine the Bidding Documents at the Issuing Office by appointment only on Monday through Friday between the hours of 8am-5pm and may obtain copies of the Bidding Documents from the Issuing Office as described below. Partial sets of Bidding Documents will not be available from the Issuing Office. Neither Owner nor Engineer will be responsible for full or partial sets of Bidding Documents, including addenda, if any, obtained from sources other than the designated website or Issuing Office. Optional printed copies of the Bidding Documents may be obtained from the Issuing Office by paying a nonrefundable price of $140.00 for each set. Please make checks for Bidding Documents payable to Civil West Engineering Services and send to 486 E Street, Coos Bay, OR 97420. Questions regarding this solicitation can be addressed to: Chris Janigo, PE, PLS, Project Manager, Civil West Engineering Services, Inc. cjanigo@civilwest.net, 907-947-3969 Pre-bid Conference A non-mandatory pre-bid conference for the Project will be held at September 3rd, 2025 at 2:00- PM at Toledo City Hall, 206 N Main St. Toledo, OR 97391. Attendance at the pre-bid conference is not required but is recommended. Instructions to Bidders. For all further requirements regarding bid submittal, qualifications, procedures, and contract award, refer to the Instructions to Bidders that are included in the Bidding Documents. This Advertisement is issued by: Owner: City of Toledo, By: Brian Lorimor, Title: Public Works Director, Date: August 13th 2025, Lincoln County Leader, Newport, Lincoln County, Oregon] August 13th & 15th 2025, Daily Journal of Commerce, Portland, OR, August 13th 2025

**LCL25-0373 PURSUANT TO ORS CHAPTER 819**

Notice is hereby given that the following vehicle will be sold, for cash to the highest bidder, on

## 999 PUBLIC NOTICES

8/26/2025. The sale will be held at 10:00am by COAST TOWING INC, 110 NW 55TH ST, NEWPORT, OR 2025 NISS ALT 4D VIN= 1N4BL4DV0SN306222 Amount due on lien $1115.00 Reputed owner(s) > EAN HOLDINGS, LLC

**LCL25-0374 PUBLIC NOTICE**

The Pacific Communities Health District Board of Directors will hold a Virtual meeting on Tuesday, August 19, 2025, at 4:00 p.m. by Microsoft Teams or in person at Samaritan Pacific Communities Hospital 930 SW Abbey St, Newport, Oregon 97365, Conference room 1. Persons interested in joining the Virtual meeting must have the Microsoft Teams downloaded on a personal computer or cell phone. To request a Teams Meeting invite please email cmacnab@samhealth.org or call 541-574-4674. To join by phone (audio only) option, directly call 1-971-254-1254, followed by Conference ID: 690 365 553#. Agenda: Call to Order, Additions or Change to Agenda, Approval of Minutes from July 15, 2025, Invitation for Citizen Comments, Bylaws Revisions/Resolution, Financial Reports, Report from Legal Counsel, Construction/Facilities/Water Resiliency Update, Hospital Update, PCHD Foundation Update, Board Items, Adjourn. Catherine Macnab, Recorder, PACIFIC COMMUNITIES HEALTH DISTRICT. For additional information contact 541-574-4674 or www.pchdistrict.org

**LCL25-0375 LEGAL NOTICE TO INTERESTED PERSONS**

NOTICE IS HEREBY GIVEN that ANA G. ARIAS has been appointed Personal Representative ("PR") of the Estate of MARTHA A. CHRISTOPHERSON, Deceased, by the Lincoln County Circuit Court of the State of Oregon probate No. 25PB06799. All persons having claims against the Estate are required to present them, with proper vouchers, within four (4) months after the date of first publication of this notice to the PR at the address below or the claims may be barred. All persons whose rights may be affected by the proceedings may obtain additional information from the records of the Court, the PR or the attorneys for the PR. DATED and first

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published August 13, 2025. ANA G. ARIAS, c/o ANNIE M. NELSON, OSB No. 114866, Saalfeld Griggs PC, 404 SW Columbia St. Ste. 150, Bend, Oregon 97702, TEL: (541) 693-1070, FAX: (503) 371-2927, Attorneys for Personal Representative.

**LCL25-0376 SELF STORAGE PUBLIC SALE**

Safe-Lock Storage, 3639 SE Ash St South Beach, Oregon 97366, Saturday, 8/30/2025 @ 10:00am. C06 - Rich Rouske, K19 - Jose Rodriguez Aguilar, T15 - Nate Purdy, T23 - Richard Prozinski. Sale Subject to Cancellation. Safe-Lock Storage reserves the Right to refuse any and all bids.

**LCL25-0353 TRUSTEE'S NOTICE OF SALE TS NO.: 180466 APN: R226493**

Reference is made to that certain deed made by Joni McSpadden, A Single Person as Grantor to Quality Loan Service Corporation of Washington, as Trustee, in favor of Mortgage Electronic Registration Systems, Inc. as designated nominee for Home Point Financial Corporation its successors and assigns as Beneficiary, dated 05/05/2022, recorded 05/05/2022, in the official records of Lincoln County, Oregon as Instrument No. 2022-04762 In Book xx, Page xx covering the following described real property situated in said County and State, to wit: Lot 5, Block 7, FIRST ADDITION TO FAIRWAY HEIGHTS - PHASE II, according to the plat filed October 22, 1981, in Plat Book 13, Page 48, Lincoln County Records, in the City of Waldport, Lincoln County, Oregon. Commonly known as: 1575 SW Fairway Dr, Waldport, OR 97394 The current beneficiary is Nationstar Mortgage LLC pursuant to assignment of deed of trust recorded on 12/14/2023 as Inst No. 2023-08641 in the records of Lincoln, Oregon. The beneficiary has elected and directed successor trustee to sell the said real property to satisfy the obligations secured by said trust deed and notice has been recorded pursuant to Section 86.752(3) of Oregon Revised Statutes: the default for which the foreclosure is made is the grantor's failure to: Make the monthly payments commencing with the payment due on 07/01/2024 and continuing each month until this

trust goes plus each withi ing date othe es a forec ther or co subje trust said ciary oblig said diate said lowin balar $308 Princ amou Inter 07/12 of: $ Susp amou Escro amou Late amou Corp the a 8. La um i $167. Due $25.0 Reco amou 3PTY the ar Toget there 4.875 until accru thereo fees, and a by the ant to deed pal su togeth thereo 4.875 from accru thereo fees, and a by the ant to deed notice that trustee at the Stand estab 187.11 Statut entran County West port, of Linc gon, s to the cash said d erty w had or vey at execut said tr with a

8/13/2025

# Super Crosswor

**ACROSS**

1 Served in blazing liquor
7 Longtime
50 Review of a classic board game?
54 Quiver
94 Of atomic weapons
96 "... or — thought!"

**DOWN**

1 Big ice sheet
2 They may be chapped

# City of Newport
## Planning Commission Regular Session Minutes
## July 14, 2025

**LOCATION:** CITY COUNCIL CHAMBERS, NEWPORT CITY HALL 169 SW COAST HIGHWAY NEWPORT
**Time Start:** 7:00 P.M. **Time End:** 7:10 P.M.

### ATTENDANCE LOG/ROLLCALL

| COMMISSIONER/ ADVISORY MEMBER | STAFF |
|---|---|
| Chair Bill Branigan | Derrick Tokos, Community Development Director |
| Commissioner Bob Berman | Sherri Marineau, Community Development Dept. |
| Commissioner Jim Hanselman | |
| Commissioner Gary East | **PUBLIC** |
| Commissioner Braulio Escobar (absent, excused) | |
| Commissioner John Updike | |
| Commissioner Robert Bare | |
| | |

| AGENDA ITEM | ACTIONS |
|---|---|
| **REGULAR MEETING** | |
| **CALL TO ORDER AND ROLL CALL**<br>a. Roll Call | None. |
| **APPROVAL OF THE MINUTES**<br>a. Meeting minutes of Work Session Meeting on June 23, 2025.<br>b. Meeting minutes of Regular Session Meeting on June 23, 2025. | Motion by Berman, seconded by East, to approve the work session meeting minutes of June 23, 2025 as written. MOTION carried unanimously with Branigan, Berman, Hanselman, East, Updike, and Bare all voting in favor.<br><br>Motion by Berman, seconded by East, to approve the regular session meeting minutes of June 23, 2025 as written. MOTION carried unanimously with Branigan, Berman, Hanselman, East, Updike, and Bare all voting in favor. |
| **CITIZEN/PUBLIC COMMENT** | None. |
| **ACTION ITEMS**<br>**Initiate Legislative Process for Draft Zoning Ordinance Housekeeping Amendments.** | Motion was made by Berman, seconded by Updike, to initiate the legislative process for the draft Zoning Ordinance housekeeping amendments. MOTION carried unanimously with Branigan, Berman, Hanselman, East, Updike, and Bare all voting in favor. |

| | |
|---|---|
| **Initiate Legislative Process to Amend the Wastewater Section of the Comprehensive Plan.** | Motion was made by Berman, seconded by Bare, to initiate the legislative process to amend the Wastewater Section of the Comprehensive Plan. MOTION carried unanimously with Branigan, Berman, Hanselman, East, Updike, and Bare all voting in favor. |
| **DIRECTORS COMMENTS** | Tokos reported that a public hearing on the geologic hazards reports will be held at the next City Council meeting.<br><br>The City received the Wyndhaven Phase 3 plan on June 30th. Developers are utilizing the provision for market-rate developments with over 20 units, which allows the City to cover plan review and inspection fees using Affordable Housing Excise Tax funds.<br><br>OSU will be dredging the 40th Street pond in August, and the City has entered into a reimbursement agreement to provide funding that supports removing additional material during the process. This item is scheduled to be presented to the City Council at their upcoming meeting. In addition, the City is working with ODOT on signalization at 40th Street, though progress has been slow due to staffing reductions at ODOT. |

Submitted by: Sherri Marineau

Sherri Marineau, Executive Assistant

Case File: 3-Z-25
Hearing Date: August 25, 2025/Planning Commission

# PLANNING STAFF MEMORANDUM
## FILE No. 3-Z-25

I. **Applicant:** Initiated by motion of the Newport Planning Commission on July 14, 2025.

II. **Request:** Housekeeping amendments to Chapters 14.01, 14.02, 14.03, 14.10, 14.11, 14.12, 14.13, 14.14, 14.16, 14.17, 14.19, 14.21, 14.23, 14.25, 14.28, 14.31, 14.35, 14.38, 14.41, 14.47, 14.48 and 14.52, of Title XIV of the Newport Municipal Code and changes to comply with HB 2138 (2025).

III. **Findings Required:** This is a legislative action whereby the City Council, after considering a recommendation by the Newport Planning Commission, must determine that the changes to the Newport Municipal Code (NMC) are necessary and further the general welfare of the community (NMC 14.36.010).

IV. **Planning Staff Memorandum Attachments:**

Attachment "A" – Draft Copy of Ordinance No. 2025-06 (changes shown in mark-up format)
Attachment "B" – HB 2138 (2025)
Attachment "C" – Referenced ORS Chapter 197A Provisions
Attachment "D" – OAR 414-305-0920
Attachment "E" – Minutes from the July 14, 2025 Planning Commission Work Session
Attachment "F" – Public Hearing Notice

V. **Notification:** The Department of Land Conservation & Development received notice of the proposed legislative amendment on July 16, 2025. Notice of this August 25, 2025 Planning Commission hearing was published in the Lincoln County Leader on August 13, 2025 (Attachment "F").

VI. **Comments:** No comments have been received regarding the proposed amendments.

VII. **Discussion of Request:** The Newport Zoning Ordinance, codified in Title XIV of the Municipal Code is amended on a regular basis, and those revisions over time have led to discrepancies and erroneous citations that can be confusing to the public. Additionally, there are sections of the ordinance that have not been amended in decades and contain provisions that are outdated as it relates to current technology and planning practices. To address the issue, the Planning Commission met in work session on January 23, 2025 to define a scope of work for a set of housekeeping amendments that will address the various code issues as part of a single legislative package. The Commission met again at a July 14, 2025 work session to refine the amendments, and formally initiated the legislative process at its regular meeting that same evening.

The 2025 regular session of the Oregon Legislature concluded with the passage of a number land use related bills, but few that require the City amend its Zoning Ordinance. One bill though that does necessitate changes at the local level is HB 2138, and since the changes are relatively targeted, the Planning Commission elected to include them in the housekeeping package.

VIII. **Conclusion and Recommendation:** The Planning Commission should review the proposed amendments and make a recommendation to the City Council as to whether or not they are necessary and further the general welfare of the community (ref: NMC 14.36.010). This would be done by motion and vote of the Commission members present. In making a motion the Commission should specifically reference the policy options or any other revisions they wish to see incorporated as part of their recommendation. If the Commission is not prepared to make a recommendation, or desires additional information or code revisions before it does so, then it may continue the hearing to a date certain.

Derrick I. Tokos, AICP
Community Development Director
City of Newport

August 21, 2025

# CITY OF NEWPORT

## ORDINANCE NO. 2025-06

## AN ORDINANCE CONSISTING OF A PACKAGE OF HOUSEKEEPING AMENDMENTS TO VARIOUS CHAPTERS OF THE NEWPORT ZONING ORDINANCE CODIFIED IN TITLE XIV OF THE NEWPORT MUNICIPAL CODE

(Newport File No. 3-Z-25)

**Findings:**

1. The Newport Zoning Ordinance, codified in Title XIV of the Municipal Code is amended on a regular basis, and those revisions over time have led to discrepancies and erroneous citations that can be confusing to the public. Additionally, there are sections of the ordinance that have not been amended in decades and contain provisions that are outdated as it relates to current technology and planning practices.

2. To address the issue, the Planning Commission met in work session on January 23, 2025 to define a scope of work for a set of housekeeping amendments that will address the various code issues as part of a single legislative package. The Commission met again at a July 14, 2025 work session to refine the amendments, and formally initiated the legislative process at its regular meeting that same evening.

3. The 2025 regular session of the Oregon Legislature concluded with the passage of a number land use related bills, but few that require the City amend its Zoning Ordinance. One bill though that does necessitate changes at the local level is HB 2138, and since the changes are relatively targeted the Planning Commission elected to include them in the housekeeping package.

4. The Planning Commission held a public hearing on August 25, 2025 to consider testimony and comment on the draft package of housekeeping amendments and, at the conclusion of the hearing, passed a motion recommending the City Council adopt the changes. In making its recommendation, the Commission concluded that the amendments satisfy the City's requirement that legislative amendments be necessary and further the general welfare of the community because they ensure that the Municipal Code provisions are up to date with current planning practices and technology, resolve known discrepancies, correct erroneous citations, and comply with state law. The specific amendments forwarded by the Commission for the City Council's consideration are summarized as follows:

DRAFT

a. NMC Chapter 14.01, Purpose, Applicability, and Definitions. Title revised to read "General Provisions" to accommodate additional provisions that apply to the entire code.

b. NMC 14.01.005, Official Names. This section is a new provision that lists a number of terms used to describe the Zoning Ordinance, so it is clear that they are referring to the same document.

c. NMC 14.01.010, Purpose. Section is being amended to remove ordinance reference, since naming of the document is addressed under NMC 14.01.005. The last sentence reads like a finding, and is not really a part of the purpose clause, so it is being deleted.

d. NMC 14.01.010, Applicability. Edits to this section are non-substantive and are for clarity.

e. NMC 14.01.015, Rules of Code Construction. This new section provides direction for how language in Title XIV is to be interpreted. It consolidates concepts scattered throughout the Zoning Ordinance into a single section where they can be viewed collectively.

f. NMC 14.01.020, Definitions. Language providing direction for how terms are to be interpreted has been deleted in favor of the "Rules of Code Construction" section above; a definition for "accessible unit" has been added and the definitions for "affordable housing" and "cottage cluster" have been amended to comply with HB 2138 (2025); the definition of "boarding, lodging, and rooming house" has been deleted as redundant given changes to the definition of "single room occupancy" required by HB 2138; and the definition of "townhouse" is being revised to align with the definition of the same term listed in ORS Chapter 197A.420. Additionally, definitions for "lumber and other building materials dealer" and "lumber yard" have been deleted because they are not referenced elsewhere in the Zoning Ordinance.

g. NMC 14.01.025, Compliance Required. Section is being relocated within the Chapter.

h. NMC 14.01.030, Relationship to Easements, Covenants, and Agreements. New section, commonly found in municipal codes, that that speaks to the relationship between Title XIV and other regulatory instruments.

i. NMC 14.01.035, Rights-of-Way. A new section clarifying that rights-of-way are regulated just like private lots and parcels. The language also notes that there is a relationship between Titles IX and XIV of the Newport Municipal Code with respect to development activities in public rights-of-way.

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j. NMC 14.01.040, County, Regional, State, and Federal Laws. A new section that makes it clear that references in Title XIV to county, regional, state, or federal regulations do not imply that the City will enforce those regulations.

k. NMC Chapter 14.02, Establishment of Zones. Chapter title is being modified to "Zoning Map" since the establishment of zone districts is addressed in Chapter 14.03.

l. NMC 14.02.010, Establishment of Zones. Section is being deleted because it is redundant. The establishment of zoning districts is addressed in Section 14.03.020.

m. NMC 14.02.010, Establishment of a Zoning Map. Section is being amended to eliminate redundant language related to establishing zones, and references to maintenance of an official paper map. Additionally, the changes identify the parties responsible for maintaining and archiving maps, clarify where the official adoption documents are to be kept, and allow maps to be maintained digitally.

n. NMC 14.02.030, Zone Boundaries. The changes eliminate reference to railroad tracks since none exist in Newport. All other revisions are for clarification.

o. NMC 14.03.010, Purpose. Edits to this section are non-substantive and are for clarity.

p. NMC 14.03.030, Zoning Overlays. Existing provisions in this section are being deleted as redundant. They are being replaced with language capturing the fact that the City utilizes zoning overlays in certain circumstances, and lists those that are applicable within the City.

q. NMC 14.03 .040, Intent of Zoning District. Edits to this section are non-substantive and are for clarity.

r. NMC 14.03.050, Residential Uses. Table in this section is being updated to eliminate reference to rooming and boarding houses, and increase the density limits for single room occupancy, accessible units, and affordable units to comply with HB 2138 (2025).

s. NMC 14.03.080, Water-dependent and water-related Uses. Changes correct a typographical error.

t. NMC 14.10.040, Communication Facilities. Revision to this section corrects a bad cross-reference.

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u. NMC 14.11.010, Required Yards. Existing language refers to required yards as being limited to those listed in Table A. In addition to Table A, Chapter 14.11 includes required yards for grouped buildings, garage setbacks, and certain exceptions to yard requirements. Therefore, it is prudent to reference the overarching chapter as opposed to just Table A, and that is the nature of the amendment.

v. NMC 14.11.050, General Exceptions to Required Yard. Codifies existing practice of applying setbacks as they relate to no-build easements, which are needed at times to accommodate redevelopment on infill properties that cannot meet modern setback requirements. The use of no-build easements is also an alternative to a property line adjustment, which might not be palatable to all parties. Additionally, language has been added to make it clear that yard requirements can be reduced via adjustment or variance.

w. NMC 14.12.010, Minimum Size. Section addresses minimum lot sizes. Language being deleted references substandard lots and parcels, which are regulated under the non-conforming use code (NMC 14.32.050). It is being removed as redundant.

x. NMC 14.12.020, Exceptions to Lot Size Requirements. Legacy language in this section that is being removed conflicts with the provisions of NMC 14.32.050, which allow non-conforming lots to be developed as if they were conforming, provided they satisfy the regulations applicable to the intended use. New sub-section (B) notes that lot sizes can be reduced below minimums with an approved adjustment or variance, an allowance that was added with Ordinance No. 2222.

y. NMC 14.13.010, Density Limitations. As with Chapter 14.12, the legacy language being removed conflicts with the provisions of NMC 14.32.050, which allows non-conforming lots to be developed as if they were conforming provided they satisfy the regulations applicable to the intended use.

z. NMC 14.14.030, Number of Parking Spaces Required. Implements off-street parking limits for single room occupancy units imposed by HB 2138 (2025).

aa. NMC 14.14.100, Special Area Parking Requirements. Revised to correct an inaccurate street reference in the City Center area.

bb. NMC 14.16.020, General Provisions. Section applies to accessory uses and structures. The Community Development Director is charged with interpreting whether or not a proposed development qualifies as an accessory use or structure, with an appeal option to the Planning Commission. The Director may defer to the Planning Commission, and the revision clarifies that a decision by the Commission can only occur after a public hearing has been held.

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cc. NMC 14.17.030, Clear Vision Area Requirements. This section is being revised to allow a narrow exception to the three foot maximum front yard fence height limitation, providing flexibility for child care providers that are required to have four foot fences around the perimeter of their outdoor activity areas per OAR 414-305-0920.

dd. NMC 14.19.030, Applicability. Chapter sets out landscaping requirements for new development and redevelopment. Edits to this section are for clarity and are not substantive.

ee. NMC 14.19.060, Landscaping Requirements for Additions and Remodels. This chapter does not apply to single family detached and attached housing (NMC 14.19.030). The existing scaled valuation with a CPI-U adjustment is onerous to implement, requiring annual recalculation. The new language replaces this approach with a requirement that landscaping standards be met for projects that constitute a "substantial improvement." The term substantial improvement is used in the City's design districts and flood hazard areas. It is a defined term that, with some exceptions, is an improvement that equals or exceeds 50% of the market value of the structure.

ff. NMC 14.21.090, Erosion Control Measures. The amendment revises the design storm from 20 to 25-years so that it aligns with provisions in Section 14.21.100 that require storm run-off be managed on an on-going basis (i.e. not just when ground disturbance is occurring).

gg. NMC 14.23.020, Notice. Section applies to the alteration of historic buildings and sites. Change replaces reference to "News-Times" with generalized print/digital format language added to NMC Chapter 14.52 in 2024 (Ord. 2216).

hh. NMC 14.25.005, Purpose. Chapter sets out land use regulations for short-term rentals. The code currently has two 14.25.010 citations. The revision remedies the problem. The other change to the section is grammatical in nature.

ii. NMC 14.25.020, Establishment of a Vacation Rental Overlay Zone. Revision corrects a typographical error in a referenced street address.

jj. NMC 14.28.070, Uses Prohibited in an R-4/"High Density Multi-Family Residential" Zoning District. Chapter applies to new development inside the Iron Mountain Impact Area. The revision replaces the reference to "boarding, lodging, or rooming houses" with "single room occupancies," as they are the same use and the city is required to regulate for single room occupancies under state law.

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kk. NMC 14.31.090, Subdivision Required. Chapter applies to the construction of townhouses and cottage clusters. The change to the code language removes a reference to the Subdivision Ordinance, which was previously in a separate title of the Municipal Code. It has since been added as Chapter 14.48 of Title XIV.

ll. NMC 14.35.070, Criteria for Approval of a Preliminary Development Plan. Replaces reference to the old Subdivision Ordinance.

mm. NMC 14.38.050, Standards for Review. This section relates to the Ocean Shorelands Overlay Zone. The revision corrects an outdated code citation.

nn. NMC 14.41.010, Applicability. Section applies to the construction of assisted living facilities in R-2 zones. The revisions eliminate the requirement that such projects must first obtain a discretionary conditional use permit. Assisted living is a type of "needed housing" under ORS 197A.018, which means the City must provide a set of clear and objective approval standards.

oo. NMC 14.41.030, Standards. Deleted discretionary standards for the approval of assisted living facilities in R-2 zones to comply with the "needed housing" provisions of ORS 197A.018. The Revisions further eliminate redundant application submittal requirements and clarify the nature of permissible after hours deliveries.

pp. NMC 14.47.020, Applicability. This section relates to pedestrian access requirements. The amendments eliminate a cross-reference to the definitions section of Title XIV because the subject terms are not defined.

qq. NMC 14.48.030, Lots and Parcels. Revision removes a page footer that was inadvertently included in the text of the approval standard.

rr. NMC 14.48.050, Minor Replats and Partitions. Revision clarifies a standard that had been an incomplete sentence.

ss. NMC 14.52.020, Description of Land Use Actions/Decision-Making Procedures. Change is being made to clarify that staff makes the initial interpretation of the Zoning Ordinance, and if a party is unhappy with that interpretation then they can appeal it to the Planning Commission.

tt. NMC 14.52.030, Approving Authorities. Amendment is the same as the above, clarifying that staff makes the initial Zoning Ordinance interpretation, with that staff decision being appealable to the Commission.

5. The City Council held a public hearing on October 6, 2025 regarding the question of the proposed amendments, and, after considering the recommendation of the

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Planning Commission and evidence and argument in the record, adopted the ordinance, concluding that it is necessary and furthers the general welfare of the community.

6. Information in the record, including affidavits of mailing and publication, demonstrate that appropriate public notification was provided for both the Planning Commission and City Council public hearings.

THE CITY OF NEWPORT ORDAINS AS FOLLOWS:

**Section 1.** Findings. The findings set forth above are hereby adopted in support of the amendments to Chapters 14.01, 14.02, 14.03, 14.10, 14.11, 14.12, 14.13, 14.14, 14.16, 14.17, 14.19, 14.21, 14.23, 14.25, 14.28, 14.31, 14.35, 14.38, 14.41, 14.47, 14.48 and 14.52, of Title XIV of the Newport Municipal Code adopted by Section 2 of this Ordinance.

**Section 2.** Municipal Code Amendment. Chapters 14.01, 14.02, 14.03, 14.10, 14.11, 14.12, 14.13, 14.14, 14.16, 14.17, 14.19, 14.21, 14.23, 14.25, 14.28, 14.31, 14.35, 14.38, 14.41, 14.47, 14.48 and 14.52, of Title XIV of the Newport Municipal Code are hereby amended as set forth in Exhibit "A".

**Section 3.** Effective Date. This ordinance shall take effect 30 days after adoption.

Date adopted and read by title only: _____

Signed by the Mayor on _____, 2025.

_____
Jan Kaplan, Mayor

ATTEST:

_____
Allie Anderson, City Recorder

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(Unless otherwise specified, new language is shown in double underline, and text to be removed is depicted with ~~strikethrough~~.)

# CHAPTER 14.01 GENERAL PROVISIONS**

## 14.01.005 Official Names

The official name of this Title is "Title XIV, Zoning Ordinance" of the Newport Municipal Code and it may be referred to as "Title XIV," "Ordinance," or the "Code."

## 14.01.010 Purpose

The several purposes of Title XIV are to implement the Comprehensive Plan; to encourage the most appropriate use of the land; to conserve and stabilize the value of property; to aid in the rendering of fire and police protection; to provide adequate open spaces for light and air; to lessen the congestion on streets; to allow for orderly growth in the city; to prevent undue concentration of population; to facilitate adequate provisions for community utilities and facilities such as water, sewerage, electrical distribution systems, transportation, schools, parks, and other public requirements; and, in general, to promote public health, safety, convenience, and general welfare.

## 14.01.010 Applicability

The rules, requirements, and provisions of Title XIV, are in addition and not in lieu of any prior ordinance, resolution, rule, requirement, or procedure previously adopted by the City of Newport except as may have been expressly repealed, provided, however, that the provisions of this ordinance shall be controlling in cases where there may be conflicting provisions.

## 14.01.015 Rules of Code Construction

A. The Community Development Director, or designee, shall have the initial authority and responsibility to interpret all terms, provisions, and requirements of this Title. Persons may request an interpretation in writing as outlined in Chapter 14.52, with such interpretations being subject to appeal to the Planning Commission and City Council.

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B. The terms or words used in this Title shall be interpreted as follows where the context demands; words in the present tense include the future; the singular number includes the plural and the plural number includes the singular; the word "shall" is mandatory and not discretionary; the word "may" is permissive; the masculine gender includes the feminine and neuter; and references to this "Title" "code" or "ordinance" shall be deemed to include the full text of the document, the accompanying zoning map(s) and all appurtenant amendments.

C. This Title shall be read literally. Regulations are not more or less strict than is stated.

D. Terms not defined in this Title shall be understood to have their ordinary or natural meaning.

E. Heading for sections and subsections of this Title are for convenience and reference purposes only, and do not affect in any way the meaning of the underlying provisions.

## 14.01.020 Definitions

The following words and phrases shall be construed to have the specific meaning assigned to them by definition.
***

Accessible Unit. Means a unit of housing that complies with the "Type A" requirements applicable to units as set forth in the Standard for Accessible and Usable Buildings and Facilities published by the International Code Council and as referenced by state building code.

***

Affordable Housing. Means residential property in which:

A. Each unit on the property is made available to own or rent to families with incomes of 80 percent or less of the area median income as determined by the Oregon Housing Stability Council based on information from the United States Department of Housing and Urban Development; or

B. At least half of the units on the property are made available to own or rent to families with incomes of 60 percent or less of the area median income as determined by the Oregon



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Housing Stability Council based on information from the United States Department of Housing and Urban Development.

C. Affordability under (A) and (B) is enforceable, including as described in ORS 456.270 to 456.295, for a duration of no less than 30 years.

D. A unit of housing that is subject to an affordable housing covenant, as described in ORS 456.270 to 456.295 that:

1. Makes the unit available to purchase for a maximum sales price and requires that the unit be purchased by a household with an income below 120 percent of median income, with both the maximum price and income threshold as published per region on an annual basis by the division of the Oregon Department of Administrative Services that serves as office of economic analysis; and

2. Is enforceable for a duration of not less than 10 years from the date of the certificate of occupancy.

***

***

Cottage cluster. Means a grouping of dwelling units that are detached or attached in subgroupings of up to four units in any configuration; have a common courtyard; and each has a footprint or floor area that is less than 900 square feet.

***

***

Single Room Occupancy. A residential development with no fewer than four attached or detached units that are independently rented and lockable and providing living and

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sleeping space for the exclusive use of an occupant, but require that the occupant share sanitary or food preparation facilities with other units in the occupancy.

**Townhouse**. A dwelling unit constructed in a row of two or more attached units, where each dwelling unit is located on an individual lot or parcel and shares at least one common wall with an adjacent unit.

### 14.01.025 Compliance Required

No structure or lot shall hereafter be used or occupied, and no structure or part thereof shall be erected, moved, reconstructed, extended, enlarged, or altered contrary to the provisions of this ordinance.

### 14.01.030 Relationship to Easements, Covenants and Agreements

It is not the intent of this Title to interfere with, abrogate, or annul any easements, covenants, or other agreements between parties; provided, however, that where language in this Title imposes a greater restriction upon the use of land than such easements, covenants, or agreements, the provisions of this Title shall govern.

### 14.01.035 Rights-of-Way

Land within public and private rights-of-way are subject to the provisions of Title XIV. Permitting of earthwork, tree clearing and development activities within public rights-of-way is further regulated under Title IX.

### 14.01.040 County, Regional, State, and Federal Laws

References in this Title to county, regional, state or federal regulations are for informational purposes, and do not constitute a complete list of such regulations. The City is not responsible for enforcing cited county, regional, state or federal regulations unless the language in Title XIV explicitly conveys the City's intent to enforce the regulations.

## CHAPTER 14.02 ZONING MAP

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## 14.02.010 Establishment of a Zoning Map

A. The location and boundaries of the zone districts designated in Section 14.03.020 and Overlays designated in Section 14.03.030 are shown on a map entitled: "Zoning Map of the City of Newport", which, together with all explanatory matter thereon, is hereby adopted by reference and designed to be a part of this Title.

B. Amendments to the Zoning Map of the City of Newport may be made in accordance with Chapter 14.36 of this Title. Copies of all map amendments shall be dated with the effective date of the document adopting the map amendment and shall be maintained without change, together with the adopting document, on file in the office of the City Recorder.

C. The Community Development Director shall maintain an up-to-date copy of the Zoning Map of the City of Newport to be revised from time to time so that it accurately portrays changes of zoning boundaries. The Zoning Map may be maintained in a digital form.

D. Regardless of the existence of purported copies of the Zoning Map of the City of Newport which may from time to time be made or published, the map amendments and adoption documents located in the office of the City Recorder, shall be the final authority as to current zoning status of land and water areas, buildings, and other structures in the city.

E. Replacement of Zoning Map of the City of Newport. In the event that the map amendments and adoption documents on file with the City Recorder become damaged, destroyed, lost, or difficult to interpret because of the nature or number of changes and additions, the City Council may, by ordinance, adopt a new Zoning Map of the City of Newport which shall supersede the prior Zoning Map. T

F.

## 14.02.030 Zone Boundaries

Where uncertainty exists as to the boundaries of zone districts as shown on the Zoning Map of the City of Newport, the following rules may apply:

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A. Boundaries indicated as approximately following the center line of streets, highways, or alleys shall be construed to follow such center lines.

B. Boundaries indicated as approximately following platted lot lines shall be construed as following such lot lines.

C. Boundaries indicated as approximately following city limits shall be construed as following city limits.

D. Boundaries indicated as following shore lines shall be construed to follow the mean higher high water line of such shore lines, and, in the event of change in the shore line, shall be construed as moving with the actual shore line; boundaries indicated as approximately following the center lines of streams, rivers, canals, lakes, or other bodies of water shall be construed to follow such center lines. Areas below the mean higher high water or the line of non-aquatic vegetation in the estuarine area shall be considered to be in the estuarine management unit rather than the adjacent shore land zone.

E. Boundaries indicated as parallel to or extensions of geographic features indicated in Subsections A through D above, shall be so construed. Distances not specifically indicated on the Zoning Map of the City of Newport shall be determined by the scale of the Map.

F. Where a zone boundary divides a lot between two zones, the entire lot shall be placed in the zone that accounts for a greater area of the lot by the adjustment of the boundaries, provided the boundary adjustment is a distance of less than 20 feet.

## CHAPTER 14.03 ZONING DISTRICTS

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## 14.03.010 Purpose.

This Chapter establishes zoning districts for the City of Newport and delineates uses for each district. Each zoning district is intended to service a general land use category that has common location, development, and use characteristics. The quantity and availability of lands within each zoning district shall be based on the community's need as determined by the Comprehensive Plan. Establishing the zoning districts also implements the Comprehensive Plan Map as set forth in the Comprehensive Plan.

## 14.03.020 Establishment of Zoning Districts.

This section separates the City of Newport into five (5) basic classifications and eighteen (18) use districts as follows:

A. Districts zoned for residential use(s).

1. R-1 Low Density Single-Family Residential.
2. R-2 Medium Density Single-Family Residential.
3. R-3 Medium Density Multi-Family Residential.
4. R-4 High Density Multi-Family Residential.

B. Districts zoned for commercial use(s).

1. C-1 Retail and Service Commercial.
2. C-2 Tourist Commercial.
3. C-3 Heavy Commercial.

C. Districts zoned for industrial use(s).

1. I-1 Light Industrial.
2. I-2 Medium Industrial.
3. I-3 Heavy Industrial.
4. W-1 Water Dependent.
5. W-2 Water Related.

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D. Districts zoned for public use(s).

1. P-1 Public Structures.

2. P-2 Public Parks.

3. P-3 Public Open Space.

E. Districts zoned for estuary use(s).

1. E-C Estuary Conservation

2. E-D Estuary Development

3. E-N Estuary Natural

## 14.03.030 Zoning Overlays

Zoning Overlays establish additional regulations beyond those established with zoning districts. In some cases, a Zoning Overlay may provide exceptions to or supersede regulations in the zone districts. Zoning Overlays may be maintained in a digital form, and those applicable to land within the City of Newport are identified as follows: A. Flood Hazard Overlay (NMC Chapter 14.20)

B. Geologic Hazards Overlay (NMC Chapter 14.21)

C. Airport Restricted Area (NMC Chapter 14.22)

D. Beach and Sand Dune Areas (NMC Chapter 14.24)

E. Vacation Rental Overlay (NMC Chapter 14.25)

F. Iron Mountain Impact Area (NMC Chapter 14.28)

G. Design Review Districts (NMC Chapter 14.30)

H. Ocean Shorelands Overlay (NMC Chapter 14.38)

I. South Beach Open Space Overlay (NMC Chapter 14.42)

J. South Beach Transportation Overlay (NMC Chapter 14.43)

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K. Tsunami Hazard Overlay (NMC Chapter 14.50)

## 14.03.040 Intent of Zoning Districts.

Each zoning district is intended to serve a general land use category that has common locations, development, and service characteristics. The following sections specify the intent of each zoning district:

***

W-2/"Water-Related." The intent of the W-2 district is to provide areas within and adjacent to the Yaquina Bay Shorelands for water-dependent, water-related, and other uses that are compatible or in conjunction with water-dependent and water-related uses. In determining whether or not a use is water-related, the following shall be uses:

A. The proposed use is directly associated with a water-dependent use by supplying materials or services, or by using products of water-dependent uses; and

***

## 14.03.050 Residential Uses.

The following list sets forth the uses allowed within the residential land use classification. Uses not identified herein are not allowed. Short-term rentals are permitted uses in the City of Newport's R-1, R-2, R-3 and R-4 zone districts subject to requirements of Section 14.25.

"P" = Permitted uses.
"C" = Conditional uses; permitted subject to the approval of a conditional use permit.
"X" = Not allowed.

| A. | Residential | R-1 | R-2 | R-3 | R-4 |
|---|---|---|---|---|---|
| | 1. Single-Family | P | P | P | P |
| | 2. Two-family [7] | P | P | P | P |
| | 3. Townhouse | X | P | P | P |
| | 4. Single Room Occupancy [4, 6] | P | P | P | P |
| | 5. Cottage Cluster | X | X | P | P |
| | 6. Multi-family | X | X | P | P |

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| | | | | | |
|---|---|---|---|---|---|
| | 7. Manufactured Homes [1] | P | P | P | P |
| | 8. Manufactured Dwelling Park | X | P | P | P |
| B. | Accessory Dwelling Units | P | P | P | P |
| | (B. was added on the adoption of Ordinance No 2055 on June 17, 2013; and subsequent sections relettered accordingly. Effective July 17, 2013.) | | | | |
| C. | Accessory Uses | P | P | P | P |
| D. | Home Occupations | P | P | P | P |
| E. | Community Services | | | | |
| | 1. Parks | P | P | P | P |
| | 2.Publicly Owned Recreation Facilities | C | C | C | C |
| | 3. Libraries | C | C | C | C |
| | 4.Utility Substations | C | C | C | C |
| | 5.Public or Private Schools | C | C | C | P |
| | 6. Family Child Care Home | P | P | P | P |
| | 7. Child Care Center | C | C | C | C |
| | 8. Religious Institutions/Places of Worship | C | C | C | C |
| | 9. Emergency Shelter [5] | P | P | P | P |
| F. | Residential Care Homes | P | P | P | P |
| G. | Nursing Homes | X | X | C | P |
| H. | Motels and Hotels [3.] | X | X | X | C |
| I. | Professional Offices | X | X | X | C |
| | | | | | |
| J. | Beauty and Barber Shops | X | X | X | C |
| K. | Colleges and Universities | C | C | C | C |
| L. | Hospitals | X | X | X | P |
| M. | Membership Organizations | X | X | X | p |
| N. | Museums | X | X | X | P |
| O. | Condominiums [2] | X | P | P | P |
| P. | Hostels | X | X | X | C |
| Q. | Golf Courses | C | C | C | X |
| R. | Recreational Vehicle Parks | X | X | X | C |
| S. | Necessary Public Utilities and Public Service Uses or Structures | C | C | C | C |
| T. | Residential Facility* | X | X | P | P |
| U. | Movies Theaters** | X | X | X | C |
| V. | Assisted Living Facilities*** | X | P | P | P |
| W. | Bicycle Shop**** | X | X | X | C |
| X. | Short-Term Rentals (subject to requirements of Chapter 14.25) | P | P | P | P |
| Y. | Transportation Facilities | P | P | P | P |

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[1] Manufactured homes may be located on lots, parcels or tracts outside of a manufactured dwelling park subject to the provisions listed in NMC 14.06.020.

[2] Condominiums are a form of ownership allowed in all zones within dwelling types otherwise permitted pursuant to subsection (A).

[3] Hotels/motels units may be converted to affordable housing provided they are outside of the Tsunami Hazard Overlay Zone.

[4] A building with four to six units on a lot or parcel in an R-1 or R-2 zone district, or a combination of buildings of at least four units each subject to the density limitations of an R-3 or R-4 zone district.

[5.] Subject to a public hearing before the Newport City Council to establish compliance with the requirements of ORS 197.782.

[6.] Density limit shall be three times the maximum number of multi-family units for lots or parcels where five or more multi-family units are allowed.

[7] If one or more of the units is an accessible or affordable unit, then one additional attached or detached dwelling unit shall be permitted notwithstanding the density limits of the zone district.

***

## 14.03.080 Water-dependent and Water-related Uses.

The following list sets forth the uses allowed with the water-dependent and water-related land use classifications. Uses not identified herein are not allowed.

"P" = Permitted uses.

"C" = Conditional uses permitted subject to the approval of a conditional use permit.

"X" = Not allowed.

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| | | | |
|---|---|---|---|
| 19. | Manufacturing in Conjunction with Uses Permitted Outright in a C-2 District | X | C |

***

## CHAPTER 14.10 HEIGHT LIMITATIONS AND COMMUNICATION FACILITY STANDARDS

***

### 14.10.040 Communication Facilities

New communication facilities shall satisfy the following standards:

***

D. Freestanding communication facilities that exceed the maximum building height of the zone district, as set forth in Section 14.13.020, Table A, shall be enclosed by security fencing not less than six feet in height.

***

## CHAPTER 14.11 REQUIRED YARD, SETBACKS, AND SOLID WASTE/RECYCLABLE MATERIALS STORAGE AND ACCESS REQUIREMENTS

### 14.11.010 Required Yards

A building, or portion thereof, hereafter erected shall not intrude into the required yard listed in this chapter for the zone indicated.

***

### 14.11.050 General Exceptions to Required Yard

C. Dwelling Units Above Stores. Yards are not required for dwellings above businesses unless the dwelling area exceeds 50% of the floor area of the business or dwelling.

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E. No-Build Easements. In circumstances where a recorded no-build easement exists along a common property line, the easement area shall be construed as being a portion of the easement holder's required yard, provided no portion of a building extends beyond the property line.

F. Any person seeking an exception to required yard limitations of this chapter shall do so by applying for an adjustment or variance as described in Section 14.33 of this Code, and consistent with Section 14.52, Procedural Requirements.**

***

## CHAPTER 14.12 MINIMUM LOT SIZE

### 14.12.010 Minimum Size

All lots hereafter created within the City of Newport shall have a minimum lot area and width as listed in Table A of NMC 14.13.020 for the zone indicated.

### 14.12.020 Exceptions to Lot Size Requirements

A. Lots or parcels created on or before September 7, 1982, the effective date of this ordinance, that do not meet the minimum lot area and width requirements listed in Table A of NMC 14.13.020 for the zone may be developed as non-conforming lots, as provided in Section 14.32.050.

B. Any person seeking an exception to the lot size requirements of this chapter shall do so by applying for an adjustment or variance as described in Section 14.33 of this Code, and consistent with Section 14.52, Procedural Requirements.

***

## CHAPTER 14.13 DENSITY LIMITATIONS

### 14.13.010 Density Limitations

A residential building structure or portion thereof hereafter erected shall not exceed the maximum living unit density listed



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in Table A, as hereinafter set forth, for the zone indicated, unless an exception is granted via an adjustment or variance as described in Section 14.33 of this Code, and consistent with Section 14.52, Procedural Requirements.

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## CHAPTER 14.14 PARKING AND LOADING REQUIREMENTS

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### 14.14.030 Number of Parking Spaces Required

F. Parking shall be required at the following rate. All calculations shall be based on gross floor area unless otherwise stated.

***

26. Single Room Occupancy, 1 space for every 3 rooms

***

### 14.14.100 Special Area Parking Requirements

A. The boundary of the special areas are defined as follows:

***

1. City Center. That area bounded by SW Fall Street, SW 7th Street, SW Neff Way, SW Alder Street, SW 2nd Street, SW Nye Street, Olive Street, SE Benton Street, SW 10th Street, SW Angle Street, SW 11th Street, SW Hurbert Street, and SW 10th Street.

## CHAPTER 14.16 ACCESSORY USES AND STRUCTURES

***

### 14.16.020 General Provisions

A. Accessory uses and structures are those of a nature customarily incidental and subordinate to the primary use of a property. Typical accessory structures include detached garages, sheds, workshops, greenhouses, gazebos, and similar structures that, with the exception of Accessory Dwelling Units, are not intended for habitation by people. The Community Development Director, or the

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Director's designee, shall determine if a proposed accessory use is customarily associated with, and subordinate to, a primary use and may at his/her discretion elect to defer the determination to the Planning Commission. A determination by the Planning Commission shall be processed and authorized under a Type III decision making procedure as provided by Section 14.52, Procedural Requirements.

## CHAPTER 14.17 CLEAR VISION AREAS

***

### 14.17.030 Clear Vision Area Requirements

A. A clear vision area shall contain no planting, fence, wall, structure, or temporary or permanent obstruction, except for an occasional utility pole or tree, exceeding three feet in height, measured from the top of the curb, or where no curb exists, from the street centerline grade. Trees located within a clear vision area shall have their branches and foliage removed to the height of eight feet above the grade.

B. Notwithstanding subsection (A), a fence within a clear vision area may be up to four feet in height if it is required to comply with state requirements for outdoor activity areas associated with a Family Child Care Home or Child Care Center.

## CHAPTER 14.19 LANDSCAPING REQUIREMENT

***

### 14.19.030 Applicability

The provisions of this chapter shall apply to all new commercial, industrial, public/institutional, and multi-family development, including additions to existing development or remodels.

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### 14.19.060 Landscaping Requirements for Additions and Remodels

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For purposes of this section, addition means any development that increases the floor area of a building. Remodel is any work requiring a building permit. For additions and remodels, landscaping shall be provided as follows:

A. Area. If the subject development after completion complies with the requirements for new development, no additional landscaping is required. If the subject development does not comply with the requirement for new development, landscaping shall be installed when there is a substantial improvement to the development.

In the case where a second addition or remodel is commenced within one year of the first addition or remodel, the two projects shall be counted as one with regard to determining whether or not the threshold for substantial improvement is met.

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## CHAPTER 14.21 GEOLOGIC HAZARDS OVERLAY

***

### 14.21.090 Erosion Control Measures

A certified engineering geologist, geotechnical engineer, or qualified civil engineer shall address the following standards:

***

G. All drainage provisions shall be designed to adequately carry existing and potential surface runoff from the 25-year frequency storm to suitable drainageways such as storm drains, natural watercourses, or drainage swales. In no case shall runoff be directed in such a way that it significantly decreases the stability of known landslides or areas identified as unstable slopes prone to earth movement, either by erosion or increase of groundwater pressure.

## CHAPTER 14.23 HISTORIC BUILDINGS AND SITES

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### 14.23.020 Notice

Notice of intent shall be published for two consecutive weeks in a print format or digital newspaper generally available in the city prior to a hearing by the Planning Commission.

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## CHAPTER 14.25 SHORT-TERM RENTAL LAND USE REGULATIONS

### 14.25.005 Purpose

This chapter establishes criteria by which short-term rental uses may be permitted in order to ensure the safety and convenience of renters, owners, and neighboring property owners; protect the character of residential neighborhoods; protect the City's supply of needed housing; and address potential negative effects such as excessive noise, overcrowding, illegal parking, and nuisances (e.g. accumulation of refuse, light pollution, etc.).

It is the intent of these regulations to strike a reasonable balance between the need to limit short-term rental options within neighborhoods to ensure compatibility, while also recognizing the benefits of short-term rentals in providing recreation and employment opportunities, as well as transitional housing for tourists, employees of businesses, and others who need housing for a limited duration.

***

### 14.25.020 Establishment of a Vacation Rental Overlay Zone

A Vacation Rental Overlay Zone is hereby established to identify areas within the city limits where vacation rentals are compatible uses and, by exclusion from the overlay, areas where vacation rentals are prohibited in order to protect the City's supply of needed housing and character of its residential neighborhoods. The sole purpose of the Vacation Rental Overlay Zone is to identify where vacation rentals are permitted uses and does not alleviate a vacation rental from having to satisfy requirements that are otherwise applicable under the Newport Municipal Code.

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The Vacation Rental Overlay Zone shall be indicated on the Zoning Map of the City of Newport with the letters VROZ and is the area described as follows:

Real property lying within the corporate limits of the City of Newport beginning at the southwest corner of the intersection of NW 12th Street and US 101; thence west along the south line of NW 12th Street to the statutory beach line of the Pacific Ocean; thence southerly along the statutory beach line of the Pacific Ocean to the north line of SW 95th Street; thence east along the north line of SW 95th Street to its intersection with US 101; thence south along the west line of US 101 to a point opposite the south line of SE 98th Street; thence east across US 101 to the southeast corner of the intersection of US 101 and SE 98th Street, such point being coterminous with the Wolf Tree Destination Resort Site incorporated into the Newport Urban Growth Boundary pursuant to City of Newport Ordinance No. 1520; thence southerly, easterly, northerly, and westerly around the perimeter of the Wolf Tree Destination Resort Site to a point at the northeast corner of the intersection of SE 98th Street and US 101; thence north along the east line of US 101 to its intersection with SW Naterlin Drive; thence north and east along the south line of SW Naterlin Drive to SW Bay Street; thence south and east along the south line of SW Bay Street to the Mean Higher High Water(MHHW) line of Yaquina Bay; thence easterly and northerly along the MHHW line to its intersection with the Newport Urban Growth Boundary; thence northerly along the Urban Growth Boundary line to the south line of the Yaquina Bay Road; thence west along the south line of the Yaquina Bay Road to the point where it transitions into SE Bay Boulevard; thence west along the south line of SE Bay Boulevard to SE Moore Drive; thence north and west along the east line of SE Moore Drive to US 20; thence west along the south line of US 20 to the west line of SE Grant Street; thence north across US 20 to the west line of NE Grant Street; thence north along the west line of NE Grant Street to NE 1st Street; thence west along the north line of NE 1st Street to US 101; thence north along the east line of US 101 to the north line of NE 12th Street; thence west across US 101 to the point of beginning.

***

## CHAPTER 14.28 IRON MOUNTAIN IMPACT AREA

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### 14.28.070 Uses Prohibited in an R-4/"High Density Multi-Family Residential" Zoning District*

The following uses are prohibited in the Iron Mountain Impact Area:

A. Hospitals.

B. Schools, Libraries, Colleges, Churches, Clubs, Lodge Halls, and Museums.

C. Motels, Hotels, and Time-Share Projects.

D. Bed and Breakfast Facilities.

E. Single Room Occupancies.

F. Golf Courses.

G. Recreational Vehicle Parks.

H. Hostels.

I. Any other use not listed in the permitted list contained in Section 14.28.060 of this Code.

## CHAPTER 14.31 TOWNHOUSES AND COTTAGE CLUSTERS

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### 14.31.090 Subdivision Required

Townhouse and cottage cluster projects will require a segregation of lots, a partition, or subdivision, subject to the provisions of Chapter 14.48, as applicable.

## CHAPTER 14.35 PD, PLANNED DEVELOPMENTS

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### 14.35.070 Criteria for Approval of a Preliminary Development Plan

The approval authority may approve an application for a Preliminary Development Plan when it finds that the application complies with the following criteria:

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G. Financial assurance or bonding may be required to assure completion of the streets and utilities in the planned development prior to final approval as for a subdivision (see Chapter 14.48).

## CHAPTER 14.38 OCEAN SHORELANDS OVERLAY ZONE

***

### 14.38.040 Procedure

Upon receipt of a request for a land use action or a building permit for property within the Ocean Shorelands, the Planning Director shall determine which natural resource is applicable. Applicants requesting approval of land use actions or building permits within areas subject to the provisions of this section shall submit, along with any application, a detailed site plan and written statement demonstrating how the proposed activities will conform to applicable standards in the section.

Upon acceptance of the application, the Community Development Department shall process the request in accordance with a Type II Land Use Action decision process consistent with Section 14.52, Procedural Requirements.**

### 14.38.050 Standards for Review

The following standards for the applicable natural resource shall be used in considering the findings required in Section 14.38.040:

***

## CHAPTER 14.41 ASSISTED LIVING FACILITIES IN R-2 ZONES

### 14.41.010 Applicability

The requirements for an assisted living facility in an R-2 zone set forth in this section are in addition to other applicable provisions of this Title. In the event of a conflict, the requirements of this Chapter shall govern.

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For the purpose of this section, an assisted living facility is defined in Section 14.01.010 "Definitions" of this Ordinance.

## 14.41.020 Purpose

The purpose of this section is to provide for assisted living facilities in the R-2 zoning districts. It is also the intent of this section to require development criteria so as to minimize the impacts of assisted living facilities on surrounding properties.

## 14.41.030 Standards

Assisted living facilities in an R-2 zone shall comply with the following:

A. The minimum lot size shall be two (2) acres.

B. Parking requirements shall be 0.8 spaces per unit, or greater, as may be required by the reviewing body to meet the needs of the proposal. Parking shall be provided on-site, and it shall not be allowed in a required front yard.

C. The total number of units shall not exceed one (1) unit per 3,750 square feet of lot area.

D. The parking area shall be screened from adjoining properties by a sight-obscuring fence or landscaping.

E. One (1) on-premise sign is allowed. Such sign may be a wall sign or a pole/ground sign as defined in the City of Newport Sign Ordinance. The sign shall be limited to 10 square feet and shall not be internally illuminated. External illumination shall be so directed as to not shine directly onto any adjacent building. Pole/ground signs shall be no higher than five (5) feet in height and shall be so placed as to not create a vision clearance at street intersections or at street and driveway intersections.

F. An assisted living facility in an R-2 zone shall comply with the width, frontage, lot coverage, and building height requirements of the R-2 zone.

G. Buildings, structures, or portions thereof shall comply with the required yards and setbacks of the R-2 zone, except that side and rear setbacks shall be a minimum of one (1)

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foot per unit, and all setbacks shall additionally be increased by one (1) foot for every foot by which the building exceeds a height of 25 feet.

H. Commercial deliveries of food to an assisted living facility in an R-2 zone shall be allowed only during the hours between 8:00 A.M. and 5:00 P.M.

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## CHAPTER 14.47 PEDESTRIAN ACCESS

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### 14.47.020 Applicability

The provisions of this chapter shall apply to all new or substantial improvements to commercial, industrial, public/institutional, and multifamily development. Where the provisions of this chapter conflict with facilities identified in the Newport Parks and Recreation Master Plan, the Newport Parks and Recreation Master Plan shall govern.

***

## CHAPTER 14.48 LAND DIVISIONS

***

### 14.48.030 Lots and Parcels

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G. Development Constraints. No lot or parcel shall be created with more than 50 % of its land area containing wetlands or lands where the city restricts development to protect significant Statewide Land Use Planning Goal 5 or Goal 17 resources, except that areas designated as open space within a land division may contain up to 100% of a protected resource. Modifications to this requirement may be made by the approval authority if the approval authority determines that the proposed lot or parcel contains sufficient land area to allow for construction on the lot or parcel without impacting the resource or that a variance or

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other permit has been obtained to allow for impacts on the identified resource.

***

### 14.48.050 Minor Replats and Partitions

A. Approval Criteria. The criteria for approval are as follows:

1. The tentative plan complies with the definition of a replat or partition, as appropriate.

2. All lots or parcels within the tentative plan meet the requirements of Section 14.48.030. Alternatively, if the original lots or parcels were nonconforming, the resultant lots or parcels may be allowed without a variance if they are less nonconforming.

3. Approval of the tentative plan does not interfere with the provision of key public facilities.

4. The applicant has agreed to sign a consent to participate in sewer, water, or street local improvement districts that the subject lots or parcels would be part of once those districts are formed. The consent shall be a separate document recorded upon the lots or parcels subject to the partition. The document shall be recorded prior to final plat approval.

5. Public facilities serving the minor replat or partition are adequate under Section 14.48.040. Proposed streets within the minor replat or partition comply with the standards under Section 14.48.015, including any allowed modifications.

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## CHAPTER 14.52 PROCEDURAL REQUIREMENTS

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### 14.52.020 Description of Land Use Actions/Decision-Making Procedures

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C. Type III Land Use Actions. Type III decisions are considered quasi-judicial land use actions and generally are made by the Planning Commission after public notice and a public hearing. Type III decisions generally use discretionary criteria or involve land use actions with larger impacts than those reviewed under a Type I or Type II procedure. Examples of Type III actions include Conditional Use Permits that generate more than 50 trips per day, variances, and preliminary and final planned development applications. An appeal of a Type III permit decision is heard by the City Council.

## 14.52.030 Approving Authorities

The approving authority for the various land use and ministerial actions shall be as follows:

***

B. Planning Commission. A public hearing before the Commission is required for all land use actions identified below. Items with an "*" are subject to Planning Commission review as defined in the section of the ordinance containing the standards for that particular type of land use action. Planning Commission decisions may be appealed to the City Council.

1. Conditional use permits*.
2. Planned destination resorts - preliminary and final development plans*.
3. Planned developments.
4. Variances.
5. Adjustments*.
6. Design review*.
7. Any land use decision defined as a Type III action.
8. Any land use action seeking to modify any action or conditions on actions above previously approved by the Planning Commission where no other modification process is identified.

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9. Appeal of the Community Development Director decision under a Type I or Type II action.

C. Community Development Director. Land use actions decided by the Director are identified below. A public hearing is not required prior to a decision being rendered. Items with an "*" are subject to Director review as defined in the section of the ordinance containing the standards for that particular type of land use action. Decisions made by the Community Development Director may be appealed to the Planning Commission.

1. Conditional use permits*.

2. Subdivision.

3. Partitions.

4. Replats.

5. Estuarine review.

6. Adjustments*.

7. Nonconforming use changes or expansions.

8. Design review*.

9. Ocean shorelands review.

10. Interpretations of provisions of the Comprehensive Plan or Zoning Ordinance that require factual, policy, or legal discretion.

11. Any land use decision or limited land use decision defined as a Type I or Type II action.

12. Any land use action seeking to modify any action or conditions on actions above previously approved by the Community Development Director where no other modification process is identified.

13. Ministerial actions necessary to implement Title XIV of the Newport Municipal Code, including final plats, property line adjustment conveyance documents, public improvement agreements, temporary uses

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(unless an alternative process is provided), and confirmation that building permits satisfy clear and objective approval standards.

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83rd OREGON LEGISLATIVE ASSEMBLY--2025 Regular Session

# Enrolled
# House Bill 2138

Introduced and printed pursuant to House Rule 12.00. Presession filed (at the request of Governor Tina Kotek for Office of the Governor)

CHAPTER .....

AN ACT

Relating to land use; creating new provisions; amending ORS 34.020, 34.102, 92.031, 92.044, 92.325, 93.277, 94.776, 184.453, 184.633, 197.015, 197.090, 197.200, 197.245, 197.360, 197.365, 197.724, 197.794, 197.796, 197.825, 197.830, 197A.015, 197A.400, 197A.420, 197A.430, 197A.465, 197A.470, 215.402, 215.416, 215.427, 215.429, 223.299, 227.160, 227.173, 227.175, 227.178, 227.179, 227.184, 421.649 and 476.394 and sections 3 and 4, chapter 639, Oregon Laws 2019, and section 1, chapter 110, Oregon Laws 2024; repealing ORS 92.377, 197.370, 197.375, 197.380, 197.726 and 197.727; and declaring an emergency.

**Be It Enacted by the People of the State of Oregon:**

## MIDDLE HOUSING

**SECTION 1.** ORS 197A.420 is amended to read:

197A.420. (1) As used in this section **and section 3 of this 2025 Act**:

(a) "City" [*or*] **includes a local government with jurisdiction over unincorporated lands within an urban growth boundary.**

**(b)** "City with a population of 25,000 or greater" includes, regardless of size, any city within Tillamook County and the communities of Barview/Twin Rocks/Watseco, Cloverdale, Hebo, Neahkahnie, Neskowin, Netarts, Oceanside and Pacific City/Woods.

[*(b) "Cottage clusters" means groupings of no fewer than four detached housing units per acre with a footprint of less than 900 square feet each and that include a common courtyard.*]

[*(c) "Middle housing" means:*]

[*(A) Duplexes;*]

[*(B) Triplexes;*]

[*(C) Quadplexes;*]

[*(D) Cottage clusters; and*]

[*(E) Townhouses.*]

**(c) "Cottage cluster" means a grouping of dwelling units:**

**(A) That are detached or attached in subgroupings of up to four units in any configuration;**

**(B) That have a common courtyard; and**

**(C) That each have a small footprint or floor area.**

**(d) "Duplex" means two attached or detached dwellings in any configuration on a lot or parcel, other than a lot or parcel created by a middle housing land division.**

**(e)(A) "Middle housing" means housing that consists of duplexes, triplexes, quadplexes, cottage clusters or townhouses.**

**(B) "Middle housing" includes dwelling units that are:**

**(i) Additional units allowed under section 3 of this 2025 Act; and**

**(ii) Existing dwelling units to which additional units are added under subsection (4) of this section.**

**(f) "Middle housing land division" has the meaning given that term in ORS 92.031.**

**(g) "Quadplex" means four attached or detached dwellings in any configuration on a lot or parcel, other than a lot or parcel created by a middle housing land division.**

[*(d)*] **(h)** [*"Townhouses"*] **"Townhouse"** means a dwelling unit constructed in a row of two or more attached units, where each dwelling unit is located on an individual lot or parcel and shares at least one common wall with an adjacent unit.

**(i) "Triplex" means three attached or detached dwellings in any configuration on a lot or parcel, other than a lot or parcel created by a middle housing land division.**

**(j) "Zoned for residential use" means land that:**

**(A) Is within an urban growth boundary;**

**(B) Has base zoning for, or is designated to allow, residential uses;**

**(C) Allows the development of a detached single-unit dwelling;**

**(D) Is not zoned primarily for commercial, industrial, agricultural or public uses; and**

**(E) Is incorporated or urban unincorporated land.**

(2) Except as provided in subsection (4) of this section, **each county,** each city with a population of 25,000 or greater**,** and each [*county or*] city **with a population of 1,000 or greater** within [*a metropolitan service district*] **Metro,** shall allow the development of[*:*]

[*(a)*] all middle housing types [*in areas*] **on each lot or parcel** zoned for residential use**.** [*that allow for the development of detached single-family dwellings; and*]

[*(b) A duplex on each lot or parcel zoned for residential use that allows for the development of detached single-family dwellings.*]

(3) [*Except as provided in subsection (4) of this section,*] Each city not within [*a metropolitan service district*] **Metro** with a population of 2,500 or greater and less than 25,000 shall allow the development of a duplex on each lot or parcel zoned for residential use**.** [*that allows for the development of detached single-family dwellings. Nothing in this subsection prohibits a local government from allowing middle housing types in addition to duplexes.*]

[*(4)(a) Except within Tillamook County, this section does not apply to:*]

[*(A) Cities with a population of 1,000 or fewer, except inside of Tillamook County;*]

[*(B) Lands not within an urban growth boundary;*]

[*(C) Lands that are not incorporated and also lack sufficient urban services, as defined in ORS 195.065; or*]

[*(D) Lands that are not incorporated and are zoned under an interim zoning designation that maintains the land's potential for planned urban development.*]

[*(b) This section does not apply to lands that are not zoned for residential use, including lands zoned primarily for commercial, industrial, agricultural or public uses.*]

**(4)(a) Each city required to allow middle housing under subsection (2) or (3) of this section, excluding urban unincorporated land not within Metro, shall allow the lot or parcel to include existing housing consisting of:**

**(A) One single-unit dwelling;**

**(B) One single-unit dwelling plus one accessory dwelling unit; or**

**(C) One duplex.**

**(b) The city may require only the new units, and not the existing units, to comply with siting and design standards adopted under subsection (5) of this section.**

**(c) Existing units on the lot or parcel may be separated from the new units by a middle housing land division and are considered a single unit for the purposes of such division.**

(5) Local governments**:**

**(a)** May regulate siting and design of middle housing required to be permitted under this section, provided that the regulations do not[,] individually or cumulatively[,] discourage**, through unreasonable costs or delay,** the development of all middle housing types permitted in the area [*through unreasonable costs or delay*].

**(b)** [*Local governments*] May regulate middle housing to comply with protective measures adopted pursuant to statewide land use planning goals.

**(6)(a) A local government may not, based on traffic impacts from any individual middle housing development allowed under this section or section 3 of this 2025 Act:**

**(A) Require a traffic impact analysis; or**

**(B) Attribute an exaction other than a generally applicable system development charge or fee-in-lieu variance charge or a development requirement specific to the lot or parcel or its frontage.**

**(b) This subsection does not apply to:**

**(A) Developments of townhouses or cottage clusters with more than twelve units.**

**(B) Lots or parcels created by a division of land, other than a middle housing land division, that occurred within the previous five years.**

[*(6)*] **(7)** This section does not prohibit local governments from permitting:

(a) [*Single-family*] **Single-unit** dwellings in areas zoned to allow for [*single-family*] **single-unit** dwellings; or

(b) Middle housing in areas not required under this section.

[*(7)*] **(8)** A local government that amends its comprehensive plan or land use regulations relating to allowing additional middle housing is not required to consider whether the amendments significantly affect an existing or planned transportation facility.

**SECTION 2. Section 3 of this 2025 Act is added to and made a part of ORS chapter 197A.**

**SECTION 3. (1) As used in this section:**

**(a) "Accessible unit" means a unit of housing that complies with the "Type A" requirements applicable to units as set forth in the Standard for Accessible and Usable Buildings and Facilities published by the International Code Council and as referenced by the state building code.**

**(b) "Affordable unit" means a unit of housing that is subject to an affordable housing covenant, as described in ORS 456.270 to 456.295, that:**

**(A) Makes the unit available to purchase for a maximum sales price and requires that the unit be purchased by a household with an income below 120 percent of median income, with both the maximum price and income threshold as published per region on an annual basis by the division of the Oregon Department of Administrative Services that serves as office of economic analysis; and**

**(B) Is enforceable for a duration of not less than 10 years from the date of the certificate of occupancy.**

**(2) The definitions in ORS 197A.420 apply to this section.**

**(3) On any lot or parcel on which middle housing may be sited under ORS 197A.420 (2) or (3), except for urban unincorporated land not within Metro, if one or more of the units of middle housing is an accessible or affordable unit, a city shall allow, subject to ORS 197A.420 (5), the additional development of:**

**(a) For any allowable duplex or triplex, one additional attached or detached dwelling unit, resulting in a triplex or quadplex.**

**(b) For any allowable townhouse, quadplex or cottage cluster, up to two additional attached or detached dwelling units, resulting in additional townhouse or cottage cluster units or attached or detached five-unit or six-unit developments.**

**(4) The additional units under this section are subject to the regulations under ORS 197A.420 (5), except that a city must allow commensurate increases to the developable area, floor area, height or density requirements to allow for the development of the units.**

**(5) This section does not limit a local government from enacting density bonuses that provide a greater number of accessible or affordable units, or housing that is affordable to more families, than required by this section.**

**SECTION 3a.** ORS 197A.015, as amended by section 1, chapter 102, Oregon Laws 2024, is amended to read:

197A.015. As used in this chapter:

(1) "Allocated housing need" means the housing need allocated to a city under ORS 184.453 (2) as segmented by income level under ORS 184.453 (4).

(2) "Buildable lands" means lands in urban and urbanizable areas that are suitable, available and necessary for the development of needed housing over a 20-year planning period, including both vacant land and developed land likely to be redeveloped.

(3) "City" and "city with a population of 10,000 or greater" includes, regardless of size:

(a) Any city within Tillamook County and the communities of Barview/Twin Rocks/Watseco, Cloverdale, Hebo, Neahkahnie, Neskowin, Netarts, Oceanside and Pacific City/Woods; and

(b) A county with respect to its jurisdiction over Metro urban unincorporated lands.

(4) "Development-ready lands" means buildable lands that are likely to support the production of housing during the period of their housing production target under ORS 184.455 (1) because the lands are:

(a) Currently annexed and zoned to allow housing through clear and objective standards and procedures;

(b) Readily served through adjacent public facilities or identified for the near-term provision of public facilities through an adopted capital improvement plan; and

(c) Not encumbered by any applicable local, state or federal protective regulations or have appropriate entitlements to prepare the land for development.

(5) "Government assisted housing" means housing that is financed in whole or part by either a federal or state housing agency or a housing authority as defined in ORS 456.005, or housing that is occupied by a tenant or tenants who benefit from rent supplements or housing vouchers provided by either a federal or state housing agency or a local housing authority.

(6) "Housing capacity" means the number of needed housing units that can be developed on buildable lands within the 20-year planning period based on the land's comprehensive plan designation and capacity for housing development and redevelopment.

(7) "Housing production strategy" means a strategy adopted by a local government to promote housing production under ORS 197A.100.

(8) "Manufactured dwelling," "manufactured dwelling park," "manufactured home" and "mobile home park" have the meanings given those terms in ORS 446.003.

(9) "Metro urban unincorporated lands" means [*lands*] **urban unincorporated lands** within the Metro urban growth boundary**.** [*that are identified by the county as:*]

[*(a) Not within a city;*]

[*(b) Zoned for urban development;*]

[*(c) Within the boundaries of a sanitary district or sanitary authority formed under ORS chapter 450 or a district formed for the purposes of sewage works under ORS chapter 451;*]

[*(d) Within the service boundaries of a water provider with a water system subject to regulation as described in ORS 448.119; and*]

[*(e) Not zoned with a designation that maintains the land's potential for future urbanization.*]

(10) "Periodic review" means the process and procedures as set forth in ORS 197.628 to 197.651.

(11) "Prefabricated structure" means a prefabricated structure, as defined in ORS 455.010, that is relocatable, more than eight and one-half feet wide and designed for use as a [*single-family*] **single-unit** dwelling.

**(12) "Urban unincorporated lands" means lands within an urban growth boundary that are identified by the county as:**

**(a) Not within a city;**

**(b) Zoned for urban development;**

**(c) Within the boundaries of a sanitary district or sanitary authority formed under ORS chapter 450 or a district formed for the purposes of sewage works under ORS chapter 451;**

**(d) Within the service boundaries of a water provider with a water system subject to regulation as described in ORS 448.119; and**

**(e) Not zoned with a designation that maintains the land's potential for future urbanization.**

**SECTION 4.** Section 3, chapter 639, Oregon Laws 2019, as amended by section 21, chapter 223, Oregon Laws 2023, and section 3, chapter 283, Oregon Laws 2023, is amended to read:

**Sec. 3.** (1) Notwithstanding ORS 197.646, a local government shall adopt land use regulations or amend its comprehensive plan to implement ORS [*197.758*] **197A.420 or section 3 of this 2025 Act** no later than:

(a) June 30, 2021, for each city subject to ORS 197.758 (3) (2021 Edition) **as in effect on January 1, 2023**;

(b) June 30, 2022, for each local government subject to ORS [*197.758 (2)*] **197A.420 (2),** except as provided in [*paragraph (d)*] **paragraphs (d) to (f)** of this subsection;

(c) June 30, 2025, for each city subject to ORS [*197.758 (3), as amended by section 20 of this 2023 Act*] **197A.420 (3) but not included in paragraph (a) of this subsection**; [*or*]

(d) July 1, 2025, for each city, as defined in ORS [*197.758*] **197A.420**, in Tillamook County[.]**;**

**(e) Except as provided in paragraph (f) of this subsection, January 1, 2027, for cities to conform with section 3 of this 2025 Act or the amendments to ORS 197A.420 by section 1 of this 2025 Act; or**

**(f) January 1, 2028, for cities to conform with amendments to ORS 197A.420 by section 1 of this 2025 Act pertaining to changes relating to cottage clusters.**

(2) The Land Conservation and Development Commission, with the assistance of the Building Codes Division of the Department of Consumer and Business Services, shall develop a model middle housing ordinance no later than December 31, 2020.

(3) A local government that has not acted within the time provided under subsection (1) of this section shall directly apply the model ordinance developed by the commission under subsection (2) of this section [*under*] **as provided by** ORS 197.646 (3) until the local government acts as described in subsection (1) of this section.

(4) In adopting regulations or amending a comprehensive plan under this section, a local government shall consider ways to increase the affordability of middle housing by considering ordinances and policies that include but are not limited to:

(a) Waiving or deferring system development charges;

(b) Adopting or amending criteria for property tax exemptions under ORS 307.515 to 307.523, 307.540 to 307.548 or 307.651 to 307.687 or property tax freezes under ORS 308.450 to 308.481; and

(c) Assessing a construction tax under ORS 320.192 and 320.195.

**SECTION 5.** Section 4, chapter 639, Oregon Laws 2019, as amended by section 22, chapter 223, Oregon Laws 2023, is amended to read:

**Sec. 4.** (1) The Department of Land Conservation and Development may grant to a local government that is subject to ORS [*197.758*] **197A.420** an extension of the time allowed to adopt land use regulations or amend its comprehensive plan under section 3, chapter 639, Oregon Laws 2019.

(2) An extension under this section may be applied only to specific areas where the local government has identified water, sewer, storm drainage or transportation services that are significantly deficient and for which the local government has established a plan of actions that will remedy the deficiency in those services that is approved by the department. The extension may not extend beyond the date that the local government intends to correct the deficiency under the plan.

(3) In areas where the extension under this section does not apply, the local government shall apply its own land use regulations consistent with section 3 (1), chapter 639, Oregon Laws 2019, or the model ordinance developed under section 3 (2), chapter 639, Oregon Laws 2019.

(4) A request for an extension by a local government must be filed with the department no later than:

(a) December 31, 2020, for a city subject to ORS 197.758 (3) (2021 Edition)**, as in effect on January 1, 2023**.

(b) June 30, 2021, for a local government subject to ORS [*197.758 (2)*] **197A.420 (2)**.

(c) June 30, 2024, for each city subject to ORS [*197.758 (3), as amended by section 20 of this 2023 Act*] **197A.420 (3)**.

**(d) June 30, 2026, only for unincorporated urban lands.**

(5) The department shall grant or deny a request for an extension under this section:

(a) Within 90 days of receipt of a complete request from a city subject to ORS [*197.758 (3)*] **197A.420 (3)**.

(b) Within 120 days of receipt of a complete request from a local government subject to ORS [*197.758 (2)*] **197A.420 (2)**.

(6) The department shall adopt rules regarding the form and substance of a local government's application for an extension under this section. The department may include rules regarding:

(a) Defining the affected areas;

(b) Calculating deficiencies of water, sewer, storm drainage or transportation services;

(c) Service deficiency levels required to qualify for the extension;

(d) The components and timing of a remediation plan necessary to qualify for an extension;

(e) Standards for evaluating applications; and

(f) Establishing deadlines and components for the approval of a plan of action.

**SECTION 5a.** ORS 184.453, as amended by section 6, chapter 102, Oregon Laws 2024, is amended to read:

184.453. (1) On an annual basis the Oregon Department of Administrative Services shall conduct a statewide housing analysis. The analysis must be conducted statewide and segmented into regions as determined by the department. The analysis shall estimate factors including, but not limited to:

(a) Projected needed housing units over the next 20 years;

(b) Current housing underproduction;

(c) Housing units needed for people experiencing homelessness; and

(d) Housing units projected to be converted into vacation homes or second homes during the next 20 years.

(2) At the time the department performs the housing analysis under subsection (1) of this section, the department shall allocate a housing need for each city. For Metro urban unincorporated lands, as defined in ORS 197A.015, the department shall make one allocation for each county in Metro.

(3) In making an allocation under subsection (2) of this section, the department shall consider:

(a) The forecasted population growth under ORS 195.033 or 195.036;

(b) The forecasted regional job growth;

(c) An equitable statewide distribution of housing for income levels described in subsection (4) of this section;

(d) The estimates made under subsection (1) of this section;

(e) For cities within Metro, the needed housing projected under ORS 197A.348 (2); and

(f) The purpose of the Oregon Housing Needs Analysis under ORS 184.451 (1).

(4) In estimating and allocating housing need under this section, the department shall segment need by the following income levels:

(a) Housing affordable to households making less than 30 percent of median family income;

(b) Housing affordable to households making 30 percent or more and less than 60 percent of median family income;

(c) Housing affordable to households making 60 percent or more and less than 80 percent of median family income;

(d) Housing affordable to households making 80 percent or more and less than 120 percent of median family income; and

(e) Housing affordable to households making 120 percent or more of median family income.

**(5) On an annual basis, the department shall publish maximum sales prices and income affordability requirements, by region, as described in section 3 (1) of this 2025 Act.**

**SINGLE ROOM OCCUPANCIES**

**SECTION 6.** ORS 197A.430 is amended to read:

197A.430. (1) As used in this section, "single room occupancy" means a residential development with no fewer than four attached **or detached** units that are independently rented and lockable and provide living and sleeping space for the exclusive use of an occupant, but require that the occupant share sanitary or food preparation facilities with other units in the occupancy.

(2) Within an urban growth boundary, each local government shall allow the development of a single room occupancy:

(a) With up to six units on each lot or parcel zoned to allow for the development of a detached [*single-family*] **single-unit** dwelling; and

[*(b) With the number of units consistent with the density standards of a lot or parcel zoned to allow for the development of residential dwellings with five or more units.*]

**(b) With up to three times the number of units allowed by the maximum density standards of a lot or parcel on which is allowed multiunit housing with five or more dwelling units.**

**(3)(a) For a single room occupancy, a local government may not require more parking for every three single room occupancy units than the local government requires for:**

**(A) A single detached dwelling, if the single room occupancy development has six or fewer units; or**

**(B) A dwelling unit in a multiunit housing development, if the single room occupancy development has more than six units.**

**(b) This subsection does not apply to a single room occupancy used as a residential care facility as defined in ORS 443.400.**

**SECTION 6a. A local government shall comply as described in ORS 197.646 (1) with the new requirements imposed under the amendments to ORS 197A.430 by section 6 of this 2025 Act on or before January 1, 2027.**

**PROMOTING HOUSING DENSITY**

**SECTION 7.** ORS 93.277 is amended to read:

93.277. A provision in a recorded instrument affecting real property is [*not enforceable if:*] **void and unenforceable, as being against the policy of this state of promoting housing availability and affordability and affirmatively furthering fair housing as defined in ORS 197A.100, if, within an urban growth boundary as defined in ORS 197.015,**

[*(1)*] the provision would allow the development of a [*single-family*] **single-unit** dwelling on the real property but would prohibit the development of, or the partitioning or subdividing of lands under ORS 92.031 for:

[*(a)*] **(1)** Middle housing, as defined in ORS 197A.420; or

[*(b)*] **(2)** An accessory dwelling unit allowed under ORS 197A.425 [*(1); and*]**.**

[*(2) The instrument was executed on or after January 1, 2021.*]

**SECTION 7a. If House Bill 3144 becomes law, section 7 of this 2025 Act (amending ORS 93.277) is repealed and ORS 93.277, as amended by section 1, chapter 274, Oregon Laws 2025 (Enrolled House Bill 3144), is amended to read:**

93.277. **(1) A provision in a recorded instrument affecting real property is void and unenforceable, as being against the policy of this state of promoting housing availability and affordability and affirmatively furthering fair housing as defined in ORS 197A.100, if, within an urban growth boundary as defined in ORS 197.015, the provision would allow the development of a single-unit dwelling on the real property but would prohibit the development of, or the partitioning or subdividing of lands under ORS 92.031 for:**

**(a) Middle housing, as defined in ORS 197A.420; or**

**(b) An accessory dwelling unit allowed under ORS 197A.425.**

[*(1)*] **(2)** A provision in a recorded instrument affecting real property is not enforceable if the provision would allow the development of a [*single-family*] **single-unit** dwelling on the real property but would prohibit the development of[*, or the partitioning or subdividing of lands under ORS 92.031 for*]:

[*(a) Middle housing, as defined in ORS 197A.420;*]

[*(b) An accessory dwelling unit allowed under ORS 197A.425 (1);*]

[*(c)*] **(a)** A manufactured dwelling, as defined in ORS 446.003; or

[*(d)*] **(b)** A prefabricated structure, as defined in ORS 197A.015.

[*(2)*] **(3) Subsection (2) of** this section applies only [*if the*] **to an** instrument[*:*]

[*(a) Contains a provision described under subsection (1)(a) or (b) of this section and was executed on or after January 1, 2021.*]

[*(b) Contains a provision described under subsection (1)(c) or (d) of this section and was*] executed on or after [*effective date of this 2025 Act*] **January 1, 2026**.

**SECTION 8. ORS 93.277 applies to instruments executed before, on or after January 1, 2021.**

**SECTION 9.** ORS 94.776 is amended to read:

94.776. (1) A provision in a governing document [*that is adopted or amended on or after January 1, 2020,*] is void and unenforceable**, as being against the policy of this state of promoting housing availability and affordability and affirmatively furthering fair housing as defined in ORS 197A.100,** to the extent that the provision would prohibit or have the effect of unreasonably restricting the development of, or the dividing of lands under ORS 92.031 for, housing**, including accessory dwelling units or middle housing,** that is otherwise allowable under the maximum density of the zoning for the land.

(2) Lots or parcels [*resulting*]**, as those terms are defined in ORS 92.010, that result** from the division of land in a planned community are subject to the governing documents of the planned community [*and*]**. Any resulting dwelling units** are allocated assessments and voting rights on the same basis as existing units.

**SECTION 10. ORS 94.776 applies to governing documents that were adopted before, on or after January 1, 2020.**

**SECTION 11. The amendments to ORS 93.277 and 94.776 by sections 7 and 9 of this 2025 Act become operative on January 1, 2027.**

**SECTION 12. The repeal of section 7 of this 2025 Act (amending ORS 93.277) by section 7a of this 2025 Act and the amendments to ORS 93.277 by section 7a of this 2025 Act become operative on January 1, 2027.**

**SECTION 13.** ORS 197A.400, as amended by section 2, chapter 533, Oregon Laws 2023, and section 4, chapter 111, Oregon Laws 2024, is amended to read:

197A.400. (1)**(a)** Except as provided in subsection (3) of this section, a local government may adopt and apply only clear and objective standards, conditions and procedures regulating**:**

**(A)** The development of housing[*, including needed housing, on land within an urban growth boundary, unincorporated communities designated in a county's acknowledged comprehensive plan after December 5, 1994, nonresource lands and areas zoned for rural residential use as defined in ORS 215.501.*]**; and**

**(B) Tree removal codes related to the development of housing.**

**(b)** The standards, conditions and procedures:

[*(a)*] **(A)** May include, but are not limited to, one or more provisions regulating the density or height of a development.

[*(b)*] **(B)** May not have the effect, either in themselves or cumulatively, of discouraging needed housing through unreasonable cost or delay.

[*(c)*] **(C)** May be contained in a comprehensive plan, land use regulation or an ordinance relating to housing adopted by a city that adopts, including by reference, a model ordinance adopted by the

Land Conservation and Development Commission that comports with any qualifications, conditions or applicability of the model ordinance.

**(c) This subsection applies only within:**

**(A) An urban growth boundary;**

**(B) An unincorporated community designated in a county's acknowledged comprehensive plan after December 5, 1994;**

**(C) Nonresource land; or**

**(D) An area zoned for rural residential use as defined in ORS 215.501.**

(2) The provisions of subsection (1) of this section do not apply to:

(a) An application or permit for residential development in an area identified in a formally adopted central city plan, or a regional center as defined by Metro, in a city with a population of 500,000 or greater.

(b) An application or permit for residential development in historic areas designated for protection under a land use planning goal protecting historic areas.

(3) In addition to an approval process for needed housing based on clear and objective standards, conditions and procedures as provided in subsection (1) of this section, a local government may adopt and apply an alternative approval process for applications and permits for residential development based on approval criteria that are not clear and objective if:

(a) The applicant retains the option of proceeding under the approval process that meets the requirements of subsection (1) of this section;

(b) The approval criteria for the alternative approval process comply with applicable statewide land use planning goals and rules; and

(c) The approval criteria for the alternative approval process authorize a density at or above the density level authorized in the zone under the approval process provided in subsection (1) of this section.

(4) Subject to subsection (1) of this section, this section does not infringe on a local government's prerogative to:

(a) Set approval standards under which a particular housing type is permitted outright;

(b) Impose special conditions upon approval of a specific development proposal; or

(c) Establish approval procedures.

## EXPEDITED AND MIDDLE HOUSING LAND DIVISIONS

**SECTION 14.** ORS 92.031, as amended by section 10, chapter 102, Oregon Laws 2024, is amended to read:

92.031. (1) As used in this section, "middle housing land division" means a partition or subdivision of a lot or parcel on which the development of middle housing is allowed under ORS 197A.420 (2) or (3) **or section 3 of this 2025 Act**.

(2) A city or county shall approve a tentative plan for a middle housing land division if the application includes:

[*(a) A proposal for development of middle housing in compliance with the Oregon residential specialty code and land use regulations applicable to the original lot or parcel allowed under ORS 197A.420 (5);*]

[*(b)*] **(a)** Separate utilities**, other than water or wastewater,** for each dwelling unit;

**(b) A proposal for development of middle housing that is in compliance or must comply with the Oregon residential specialty code and land use regulations under ORS 197A.420 (5) that are applicable to the original lot or parcel and which may consist of:**

**(A) A single duplex, triplex, quadplex, cottage cluster or structure containing townhouses;**

**(B) Additional units as allowed by section 3 (3) of this 2025 Act; and**

**(C) Retained or rehabilitated existing units allowed under ORS 197A.420 (4), if any;**

(c) Proposed easements necessary for each dwelling unit on the plan for:

(A) Locating, accessing, replacing and servicing all utilities;

(B) Pedestrian access from each dwelling unit to a private or public road;

(C) Any common use areas or shared building elements;

(D) Any dedicated driveways or parking; and

(E) Any dedicated common area;

(d) Exactly one dwelling unit on each resulting lot or parcel, except for**:**

**(A)** Lots, parcels or tracts used as common areas**; or**

**(B) Lots or parcels with a detached single-unit dwelling and accessory dwelling unit or a duplex as allowed under ORS 197A.420 (4)**; and

(e) Evidence demonstrating how buildings or structures on a resulting lot or parcel will comply with applicable building codes provisions relating to new property lines and, notwithstanding the creation of new lots or parcels, how structures or buildings located on the newly created lots or parcels will comply with the Oregon residential specialty code.

(3) A city or county may add conditions to the approval of a tentative plan for a middle housing land division to:

(a) **Subject to subsection (6) of this section,** prohibit the further division of the resulting lots or parcels.

(b) Require that a notation appear on the final plat indicating that the approval was given under this section.

(4) In reviewing an application for a middle housing land division, a city or county:

(a) Shall apply the procedures [*under ORS 197.360 to 197.380*] **applicable to an expedited land division under ORS 197.365, if requested by the applicant and without regard to the criteria in ORS 197.360 (1)**.

(b) May require street frontage improvements where a resulting lot or parcel abuts the street consistent with land use regulations implementing ORS 197A.420.

(c) May not subject an application to approval criteria except as provided in this section, including that a lot or parcel require driveways, vehicle access, parking or minimum or maximum street frontage.

(d) May not subject the application to procedures, ordinances or regulations adopted under ORS 92.044 or 92.046 that are inconsistent with this section or**, only if requested by the applicant, ORS 197.365** [*ORS 197.360 to 197.380*].

(e) [*May*] **Shall** allow the submission of an application **for a tentative plan** for a middle housing land division **before, after or** at the same time as the submission of an application for building permits for the middle housing.

(f) May require the dedication of right of way if the original parcel did not previously provide a dedication.

**(g) May require separate water and wastewater utilities for each dwelling unit.**

**(h) Shall allow any existing units allowed under ORS 197A.420 (4) to be considered a single middle housing unit and allow for the unit to be allocated its own lot or parcel by the division.**

(5) The type of middle housing developed on the original parcel is not altered by a middle housing land division.

[*(6) Notwithstanding ORS 197A.425 (1), a city or county is not required to allow an accessory dwelling unit on a lot or parcel resulting from a middle housing land division.*]

**(6) Notwithstanding ORS 197A.425 (1) and subsection (4)(d) and (e) of this section, a city or county may prohibit or add approval criteria to the allowance of a new accessory dwelling unit on, or a subsequent middle housing land division of, a lot or parcel resulting from a middle housing land division:**

**(a) To the extent allowed under this section and ORS 197A.420; and**

**(b) Provided that the middle housing land division lots or parcels may be used to create housing that is at or above the minimum density for the zoning of the land.**

(7) Notwithstanding any other provision of ORS 92.010 to 92.192, within the same calendar year as an original partition **that was not a middle housing land division**, a city or county may allow one **or more** of the resulting vacant parcels to be further [*divided*] **partitioned** into not more than three parcels through a middle housing land division**.**[*, provided that:*]

[*(a) The original partition was not a middle housing land division; and*]

[*(b) The original parcel or parcels not divided will not be part of the resulting partition plat for the middle housing land division.*]

(8) The tentative approval of a middle housing land division is void if and only if a final subdivision or partition plat is not approved within three years of the tentative approval. Nothing in this section [*or ORS 197.360 to 197.380*] prohibits a city or county from requiring a final plat before issuing building permits.

**SECTION 15.** ORS 92.044 is amended to read:

92.044. (1)(a) The governing body of a county or a city shall, by regulation or ordinance, adopt standards and procedures, in addition to those otherwise provided by law, governing, in the area over which the county or the city has jurisdiction under ORS 92.042, the submission and approval of tentative plans and plats of subdivisions[,] **and** tentative plans and plats of partitions [*in exclusive farm use zones established under ORS 215.203*].

(b) The standards [*shall*] **must** include, taking into consideration the location and surrounding area of the proposed subdivisions or partitions, requirements for:

(A) Placement of utilities subject to subsection (7) of this section, for the width and location of streets or for minimum lot sizes and other requirements the governing body considers necessary for lessening congestion in the streets;

(B) Securing safety from fire, flood, slides, pollution or other dangers;

(C) Providing adequate light and air**,** including protection and assurance of access to incident solar radiation for potential future use;

(D) Preventing overcrowding of land;

(E) Facilitating adequate provision of transportation, water supply, sewerage, drainage, education, recreation or other needs; and

(F) Protection and assurance of access to wind for potential electrical generation or mechanical application.

(c) The [*ordinances or regulations shall establish*] **procedures must provide for:**

**(A)** The form and contents of tentative plans of partitions and subdivisions submitted for approval.

[*(d)*] **(B)** [*The procedures established by each ordinance or regulation shall provide for*] The coordination in the review of the tentative plan of any subdivision or partition with all affected city, county, state and federal agencies and all affected special districts.

**(C) A method by which the city or county may approve a plan or plat that includes further division of one or more of the resulting lots or parcels via concurrently submitted applications for middle housing land divisions under ORS 92.031, all to be approved within the timelines provided under ORS 215.427 or 227.178.**

(2)(a) The governing body of a city or county may provide for the delegation of any of its lawful functions with respect to subdivisions and partitions to the planning commission of the city or county or to an official of the city or county appointed by the governing body for such purpose.

(b) If an ordinance or regulation adopted under this section includes the delegation to a planning commission or appointed official of the power to take final action approving or disapproving a tentative plan for a subdivision or partition, such ordinance or regulation may also provide for appeal to the governing body from such approval or disapproval.

(c) The governing body may establish, by ordinance or regulation, a fee to be charged for an appeal under ORS chapter 197, 197A, 215 or 227, except for an appeal under ORS 197.805 to 197.855.

(3) The governing body may, by ordinance or regulation, prescribe fees sufficient to defray the costs incurred in the review and investigation of and action upon proposed subdivisions that are

submitted for approval pursuant to this section. As used in this subsection, "costs" does not include costs for which fees are prescribed under ORS 92.100 and 205.350.

(4) The governing body may, by ordinance or regulation, prescribe fees sufficient to defray the costs incurred in the review and investigation of and action upon proposed partitions that are submitted for approval pursuant to this section.

(5) Ordinances and regulations adopted under this section [*shall*] **must** be adopted in accordance with ORS 92.048.

(6) Any ordinance or regulation adopted under this section [*shall*] **must** comply with the comprehensive plan for the city or county adopting the ordinance or regulation.

(7) Unless specifically requested by a public or private utility provider, the governing body of a city or county may not require a utility easement except for a utility easement abutting a street. Utility infrastructure may not be placed within one foot of a survey monument location noted on a subdivision or partition plat. The governing body of a city or county may not place additional restrictions or conditions on a utility easement granted under this chapter.

(8) For the purposes of this section:

(a) "Incident solar radiation" means solar energy falling upon a given surface area.

(b) "Wind" means the natural movement of air at an annual average speed measured at a height of 10 meters of at least eight miles per hour.

**SECTION 16.** ORS 215.427, as amended by section 7, chapter 102, Oregon Laws 2024, and section 8, chapter 110, Oregon Laws 2024, is amended to read:

215.427. [*(1) Except as provided in subsections (3), (5) and (10) of this section, for land within an urban growth boundary and applications for mineral aggregate extraction, the governing body of a county or its designee shall take final action on an application for a permit, limited land use decision or zone change, including resolution of all appeals under ORS 215.422, within 120 days after the application is deemed complete. The governing body of a county or its designee shall take final action on all other applications for a permit, limited land use decision or zone change, including resolution of all appeals under ORS 215.422, within 150 days after the application is deemed complete, except as provided in subsections (3), (5) and (10) of this section.*]

**(1) Except as provided in subsections (3), (5) and (10) of this section, the governing body of a county or its designee shall take final action on an application, including resolution of all appeals under ORS 215.422, within the shortest applicable period of the following periods, all of which begin on the date that the application is deemed complete:**

**(a) 150 days;**

**(b) 120 days, for land within an urban growth boundary or for applications for mineral aggregate extraction;**

**(c) 100 days, for an application for the development of affordable housing as provided in ORS 197A.470; or**

**(d) 63 days, for an expedited land division under ORS 197.365.**

(2) If an application [*for a permit, limited land use decision or zone change*] is incomplete, the governing body or its designee shall notify the applicant in writing of exactly what information is missing within 30 days of receipt of the application and allow the applicant to submit the missing information. The application [*shall be*] **is** deemed complete for the purpose of subsection (1) of this section [*and ORS 197A.470*] upon receipt by the governing body or its designee of:

(a) All of the missing information;

(b) Some of the missing information and written notice from the applicant that no other information will be provided; or

(c) Written notice from the applicant that none of the missing information will be provided.

(3)(a) If the application was complete when first submitted or the applicant submits additional information within 180 days of the date the application was first submitted, approval or denial of the application must be based:

(A) Upon the standards and criteria that were applicable at the time the application was first submitted; or

(B) For an application relating to development of housing, upon the request of the applicant, those standards and criteria that are operative at the time of the request.

(b) If an applicant requests review under different standards as provided in paragraph (a)(B) of this subsection:

(A) For the purposes of this section, any applicable timelines for completeness review and final decisions restart as if a new application were submitted on the date of the request;

(B) For the purposes of this section**,** [*and ORS 197A.470*] the application is not deemed complete until:

(i) The county determines that additional information is not required under subsection (2) of this section; or

(ii) The applicant makes a submission under subsection (2) of this section in response to a county's request;

(C) A county may deny a request under paragraph (a)(B) of this subsection if:

(i) The county has issued a public notice of the application; or

(ii) A request under paragraph (a)(B) of this subsection was previously made; and

(D) The county may not require that the applicant:

(i) Pay a fee, except to cover additional costs incurred by the county to accommodate the request;

(ii) Submit a new application or duplicative information, unless information resubmittal is required because the request affects or changes information in other locations in the application or additional narrative is required to understand the request in context; or

(iii) Repeat redundant processes or hearings that are inapplicable to the change in standards or criteria.

(4) On the 181st day after first being submitted, the application is void if the applicant has been notified of the missing information as required under subsection (2) of this section and has not submitted:

(a) All of the missing information;

(b) Some of the missing information and written notice that no other information will be provided; or

(c) Written notice that none of the missing information will be provided.

(5) The period set in subsection (1) of this section [*or the 100-day period set in ORS 197A.470*] may be extended for a specified period of time at the written request of the applicant. The total of all extensions, except as provided in subsection (10) of this section for mediation, may not exceed 215 days.

(6) The period set in subsection (1) of this section applies:

(a) Only to decisions wholly within the authority and control of the governing body of the county; and

(b) Unless the parties have agreed to mediation as described in subsection (10) of this section or ORS 197.319 (2)(b).

(7) Notwithstanding subsection (6) of this section, the period set in subsection (1) of this section [*and the 100-day period set in ORS 197A.470 do*] **does** not apply to:

(a) A decision of the county making a change to an acknowledged comprehensive plan or a land use regulation that is submitted to the Director of the Department of Land Conservation and Development under ORS 197.610; or

(b) A decision of a county involving an application for the development of residential structures within an urban growth boundary, where the county has tentatively approved the application and extends these periods by no more than seven days in order to assure the sufficiency of its final order.

(8) [*Except when an applicant requests an extension under subsection (5) of this section,*] If the governing body of the county or its designee does not take final action on an application [*for a permit, limited land use decision or zone change within 120 days or 150 days, as applicable, after the application is deemed complete,*] **within the applicable periods allowed under subsections (1) and**

**(5) of this section,** the county shall refund to the applicant either the unexpended portion of any application fees or deposits previously paid or 50 percent of the total amount of such fees or deposits, whichever is greater. The applicant is not liable for additional governmental fees incurred subsequent to the payment of such fees or deposits. However, the applicant is responsible for the costs of providing sufficient additional information to address relevant issues identified in the consideration of the application.

(9) A county may not compel an applicant to waive the period set in subsection (1) of this section or to waive the provisions of subsection (8) of this section or ORS [*197A.470 or*] 215.429 as a condition for taking any action on an application**,** [*for a permit, limited land use decision or zone change*] except when such applications are filed concurrently and considered jointly with a plan amendment.

(10) The periods set forth in subsections (1) and (5) of this section [*and ORS 197A.470*] may be extended by up to 90 additional days, if the applicant and the county agree that a dispute concerning the application will be mediated.

**(11) As used in this section, "application" means an application for:**

**(a) A permit;**

**(b) A limited land use decision;**

**(c) A zone change;**

**(d) A consolidated zone change and permit described under ORS 215.416;**

**(e) An expedited land division under ORS 197.365; or**

**(f) A plat consisting of a land division and middle housing land division as described in ORS 92.044 (1)(c)(C).**

**SECTION 17.** ORS 227.178, as amended by section 8, chapter 102, Oregon Laws 2024, and section 9, chapter 110, Oregon Laws 2024, is amended to read:

227.178. (1) Except as provided in subsections (3), (5) and (11) of this section, the governing body of a city or its designee shall take final action on an application [*for a permit, limited land use decision or zone change*], including resolution of all appeals under ORS 227.180, within [*120 days after*] **the shortest applicable period of the following periods, all of which begin on the date that** the application is deemed complete[.]**:**

**(a) 120 days;**

**(b) 100 days, for an application for the development of affordable housing as provided in ORS 197A.470; or**

**(c) 63 days, for an expedited land division under ORS 197.365.**

(2) If an application [*for a permit, limited land use decision or zone change*] is incomplete, the governing body or its designee shall notify the applicant in writing of exactly what information is missing within 30 days of receipt of the application and allow the applicant to submit the missing information. The application [*shall be*] **is** deemed complete for the purpose of subsection (1) of this section [*or ORS 197A.470*] upon receipt by the governing body or its designee of:

(a) All of the missing information;

(b) Some of the missing information and written notice from the applicant that no other information will be provided; or

(c) Written notice from the applicant that none of the missing information will be provided.

(3)(a) If the application was complete when first submitted or the applicant submits the requested additional information within 180 days of the date the application was first submitted, approval or denial of the application must be based:

(A) Upon the standards and criteria that were applicable at the time the application was first submitted; or

(B) For an application relating to development of housing, upon the request of the applicant, those standards and criteria that are operative at the time of the request.

(b) If an applicant requests review under different standards as provided in paragraph (a)(B) of this subsection:

(A) For the purposes of this section, any applicable timelines for completeness review and final decisions restart as if a new application were submitted on the date of the request;

(B) For the purposes of this section**,** [*and ORS 197A.470*] the application is not deemed complete until:

(i) The city determines that additional information is not required under subsection (2) of this section; or

(ii) The applicant makes a submission under subsection (2) of this section in response to a city's request;

(C) A city may deny a request under paragraph (a)(B) of this subsection if:

(i) The city has issued a public notice of the application; or

(ii) A request under paragraph (a)(B) of this subsection was previously made; and

(D) The city may not require that the applicant:

(i) Pay a fee, except to cover additional costs incurred by the city to accommodate the request;

(ii) Submit a new application or duplicative information, unless information resubmittal is required because the request affects or changes information in other locations in the application or additional narrative is required to understand the request in context; or

(iii) Repeat redundant processes or hearings that are inapplicable to the change in standards or criteria.

(4) On the 181st day after first being submitted, the application is void if the applicant has been notified of the missing information as required under subsection (2) of this section and has not submitted:

(a) All of the missing information;

(b) Some of the missing information and written notice that no other information will be provided; or

(c) Written notice that none of the missing information will be provided.

(5) The [*120-day*] period set in subsection (1) of this section [*or the 100-day period set in ORS 197A.470*] may be extended for a specified period of time at the written request of the applicant. The total of all extensions, except as provided in subsection (11) of this section for mediation, may not exceed 245 days.

(6) The [*120-day*] period set in subsection (1) of this section applies:

(a) Only to decisions wholly within the authority and control of the governing body of the city; and

(b) Unless the parties have agreed to mediation as described in subsection (11) of this section or ORS 197.319 (2)(b).

(7) Notwithstanding subsection (6) of this section, the [*120-day*] period set in subsection (1) of this section [*and the 100-day period set in ORS 197A.470 do*] **does** not apply to:

(a) A decision of the city making a change to an acknowledged comprehensive plan or a land use regulation that is submitted to the Director of the Department of Land Conservation and Development under ORS 197.610; or

(b) A decision of a city involving an application for the development of residential structures within an urban growth boundary, where the city has tentatively approved the application and extends these periods by no more than seven days in order to assure the sufficiency of its final order.

(8) [*Except when an applicant requests an extension under subsection (5) of this section,*] If the governing body of the city or its designee does not take final action on an application [*for a permit, limited land use decision or zone change within 120 days after the application is deemed complete*] **within the period set in subsection (1) of this section**, the city shall refund to the applicant, subject to the provisions of subsection (9) of this section, either the unexpended portion of any application fees or deposits previously paid or 50 percent of the total amount of such fees or deposits, whichever is greater. The applicant is not liable for additional governmental fees incurred subsequent to the payment of such fees or deposits. However, the applicant is responsible for the costs of providing sufficient additional information to address relevant issues identified in the consideration of the application.

(9)(a) To obtain a refund under subsection (8) of this section, the applicant may either:

(A) Submit a written request for payment, either by mail or in person, to the city or its designee; or

(B) Include the amount claimed in a mandamus petition filed under ORS 227.179. The court shall award an amount owed under this section in its final order on the petition.

(b) Within seven calendar days of receiving a request for a refund, the city or its designee shall determine the amount of any refund owed. Payment, or notice that no payment is due, shall be made to the applicant within 30 calendar days of receiving the request. Any amount due and not paid within 30 calendar days of receipt of the request shall be subject to interest charges at the rate of one percent per month, or a portion thereof.

(c) If payment due under paragraph (b) of this subsection is not paid within 120 days after the city or its designee receives the refund request, the applicant may file an action for recovery of the unpaid refund. In an action brought by a person under this paragraph, the court shall award to a prevailing applicant, in addition to the relief provided in this section, reasonable attorney fees and costs at trial and on appeal. If the city or its designee prevails, the court shall award reasonable attorney fees and costs at trial and on appeal if the court finds the petition to be frivolous.

(10) A city may not compel an applicant to waive the [*120-day*] period set in subsection (1) of this section or to waive the provisions of subsection (8) of this section or ORS [*197A.470 or*] 227.179 as a condition for taking any action on an **application,** [*for a permit, limited land use decision or zone change*] except when such applications are filed concurrently and considered jointly with a plan amendment.

(11) The periods set forth in subsections (1) and (5) of this section [*and ORS 197A.470*] may be extended by up to 90 additional days, if the applicant and the city agree that a dispute concerning the application will be mediated.

**(12) As used in this section, "application" means an application for:**

**(a) A permit;**

**(b) A limited land use decision;**

**(c) A zone change;**

**(d) A consolidated zone change and permit described under ORS 227.175;**

**(e) An expedited land division under ORS 197.365; or**

**(f) A plat consisting of a land division and middle housing land division as described in ORS 92.044 (1)(c)(C).**

**SECTION 18. ORS 197.360 and 197.365 are added to and made a part of ORS chapter 197A.**

**SECTION 19.** ORS 197.360 is amended to read:

197.360. (1) [*As used in this section:*]

[*(a) "Expedited land division" means a division of land*] **If requested by the applicant, a local government shall approve a partition or subdivision made** under ORS 92.010 to 92.192, 92.205 to 92.245 or 92.830 to 92.845 [*by a local government that*] **as an expedited land division under ORS 197.365 if the division**:

[*(A)*] **(a)** Includes only land that is zoned for residential uses and is within an urban growth boundary.

[*(B)*] **(b)** Is solely for the purposes of residential use, including recreational or open space uses accessory to residential use.

[*(C)*] **(c)** Does not provide for dwellings or accessory buildings to be located on land that is specifically mapped and designated in the comprehensive plan and land use regulations for full or partial protection of natural features under the statewide planning goals that protect:

[*(i)*] **(A)** Open spaces, scenic and historic areas and natural resources;

[*(ii)*] **(B)** The Willamette River Greenway;

[*(iii)*] **(C)** Estuarine resources;

[*(iv)*] **(D)** Coastal shorelands; and

[*(v)*] **(E)** Beaches and dunes.

[*(D)*] **(d)** Satisfies minimum street or other right-of-way connectivity standards established by acknowledged land use regulations or, if such standards are not contained in the applicable regulations, as required by statewide planning goals or rules.

[*(E)*] **(e)** Will result in development that either:

[*(i)*] **(A)** Creates enough lots or parcels to allow building residential units at 80 percent or more of the maximum net density permitted by the zoning designation of the site; or

[*(ii)*] **(B)** Will be sold or rented to households with incomes below 120 percent of the median family income for the county in which the project is built.

[*(b) "Expedited land division" includes land divisions that create three or fewer parcels under ORS 92.010 to 92.192 and meet the criteria set forth in paragraph (a) of this subsection.*]

[*(2) An expedited land division as described in this section is not a land use decision or a limited land use decision under ORS 197.015 or a permit under ORS 215.402 or 227.160.*]

[*(3)*] **(2)** [*The provisions of ORS 197.360 to 197.380 apply*] **ORS 197.365 applies** to all elements of a local government comprehensive plan and land use regulations applicable to a land division, including any planned unit development standards and any procedures designed to regulate:

(a) The physical characteristics of permitted uses;

(b) The dimensions of the lots or parcels to be created; or

(c) Transportation, sewer, water, drainage and other facilities or services necessary for the proposed development, including but not limited to right-of-way standards, facility dimensions and on-site and off-site improvements.

[*(4)*] **(3)** An application [*for an expedited land division submitted to a local government shall*] **under this section must** describe the manner in which the proposed division complies with each of the provisions of subsection (1) of this section.

**SECTION 20.** ORS 197.365 is amended to read:

197.365. [*Unless the applicant requests to use the procedure set forth in a comprehensive plan and land use regulations, a local government shall use the following procedure for an expedited land division, as described in ORS 197.360, or a middle housing land division under ORS 92.031:*]

[*(1)(a) If the application for a land division is incomplete, the local government shall notify the applicant of exactly what information is missing within 21 days of receipt of the application and allow the applicant to submit the missing information. For purposes of computation of time under this section, the application shall be deemed complete on the date the applicant submits the requested information or refuses in writing to submit it.*]

[*(b) If the application was complete when first submitted or the applicant submits the requested additional information within 180 days of the date the application was first submitted, approval or denial of the application shall be based upon the standards and criteria that were applicable at the time the application was first submitted.*]

[*(2) The local government shall provide written notice of the receipt of the completed application for a land division to any state agency, local government or special district responsible for providing public facilities or services to the development and to owners of property within 100 feet of the entire contiguous site for which the application is made. The notification list shall be compiled from the most recent property tax assessment roll. For purposes of appeal to the referee under ORS 197.375, this requirement shall be deemed met when the local government can provide an affidavit or other certification that such notice was given. Notice shall also be provided to any neighborhood or community planning organization recognized by the governing body and whose boundaries include the site.*]

[*(3) The notice required under subsection (2) of this section shall:*]

[*(a) State:*]

[*(A) The deadline for submitting written comments;*]

[*(B) That issues that may provide the basis for an appeal to the referee must be raised in writing prior to the expiration of the comment period; and*]

[*(C) That issues must be raised with sufficient specificity to enable the local government to respond to the issue.*]

[*(b) Set forth, by commonly used citation, the applicable criteria for the decision.*]

[*(c) Set forth the street address or other easily understood geographical reference to the subject property.*]

[*(d) State the place, date and time that comments are due.*]

[*(e) State a time and place where copies of all evidence submitted by the applicant will be available for review.*]

[*(f) Include the name and telephone number of a local government contact person.*]

[*(g) Briefly summarize the local decision-making process for the land division decision being made.*]

[*(4) After notice under subsections (2) and (3) of this section, the local government shall:*]

[*(a) Provide a 14-day period for submission of written comments prior to the decision.*]

**Notwithstanding any other requirement applicable to a land use decision under ORS chapter 197 or 197A, for an application that is reviewed as an expedited land division based on the request of the applicant:**

**(1) A decision is not subject to the requirements of ORS 197.797.**

**(2) A local government:**

[*(b)*] **(a) Shall** make a decision to approve or deny the application within 63 days of receiving a completed application **as described in ORS 215.246 or 227.178**, based on whether [*it*] **the application** satisfies the substantive requirements of the applicable land use regulations. An approval may include conditions to ensure that the application meets the applicable land use regulations. [*For applications subject to this section, the local government:*]

[*(A)*] **(b)** [*Shall*] **May** not hold a hearing on the application[*; and*] **or allow any third party to intervene to oppose the application.**

[*(B)*] **(c)** Shall issue a written determination of compliance or noncompliance with applicable land use regulations that includes a summary statement explaining the determination. The summary statement may be in any form reasonably intended to communicate the local government's basis for the determination. **The determination must include an explanation of the applicant's right to appeal the determination under ORS 197.830 to 197.855.**

[*(c) Provide notice of the decision to the applicant and to those who received notice under subsection (2) of this section within 63 days of the date of a completed application. The notice of decision shall include:*]

[*(A) The summary statement described in paragraph (b)(B) of this subsection; and*]

[*(B) An explanation of appeal rights under ORS 197.375.*]

**(d) Shall provide notice of the decision to the applicant but may not require that notice be given to any other person.**

**(e) May assess an application fee calculated to recover the estimated full cost of processing an application based on the estimated average cost of such applications. Within one year of establishing a fee under this section, the city or county shall review and revise the fee, if necessary, to reflect actual experience in processing expedited land decisions.**

**(3) Only the applicant may appeal an expedited land division made under this section.**

**SECTION 21. ORS 92.377, 197.370, 197.375, 197.380, 197.726 and 197.727 are repealed.**

## RULEMAKING

**SECTION 22. (1) On or before January 1, 2028, the Land Conservation and Development Commission shall adopt rules that must include:**

**(a) Prohibiting or restricting siting and design standards that prevent or discourage, or have the effect of preventing or discouraging, the siting of middle housing that is manufactured, site-built or prefabricated;**

**(b) Establishing parameters on unreasonable cost or delay for siting and design standards for accessory dwelling units and single room occupancies under standards allowed under ORS 197A.425 and 197A.430;**

**(c) Regulating cottage clusters for the purposes of incentivizing the provision of smaller, less expensive housing, shared community amenities and other public benefits and including regulations that implement the term "small footprint or floor area" as used within the definition of cottage clusters in ORS 197A.420;**

**(d) Amending siting and design parameters for middle housing types;**

**(e) Amending permissible discretionary criteria applied by local government in evaluating housing under ORS 197A.400 (3);**

**(f) Developing model system development charges for residential development types for optional adoption or incorporation by local governments; and**

**(g) Establishing procedures to estimate the reasonable zoned housing capacity of an area as part of an inventory of buildable lands or housing capacity under ORS 197A.270, 197A.280 and 197A.350.**

**(2) In adopting rules under this section, the commission shall:**

**(a) Emphasize improving the efficiency of the development process with a focus on increasing housing production, availability and affordability, especially that of middle housing, accessory dwelling units and single room occupancies.**

**(b) To the extent practicable, implement recommendations in the reports produced under section 5 (1) to (3), chapter 110, Oregon Laws 2024.**

**(c) Implement the principles in ORS 197A.025.**

**(d) Adopt operative and applicable dates for the rules, subject to section 3, chapter 639, Oregon Laws 2019.**

**(e) Provide a report on or before July 1, 2028, to the interim committees of the Legislative Assembly relating to land use, in the manner provided in ORS 192.245, on the feasibility and advisability of providing safe harbor protections for cities that use the commission's model system development charges under subsection (1)(f) of this section or otherwise incentivizing the use of the models.**

## CONFORMING AMENDMENTS

**SECTION 23.** ORS 34.020 is amended to read:

34.020. Except for a proceeding resulting in a land use decision or limited land use decision as defined in ORS 197.015, for which review is provided in ORS 197.830 to 197.845, [*or an expedited land division as described in ORS 197.360, for which review is provided in ORS 197.375 (8),*] any party to any process or proceeding before or by any inferior court, officer, or tribunal may have the decision or determination thereof reviewed for errors, as provided in ORS 34.010 to 34.100, and not otherwise. Upon a review, the court may review any intermediate order involving the merits and necessarily affecting the decision or determination sought to be reviewed.

**SECTION 24.** ORS 34.102 is amended to read:

34.102. (1) As used in this section, "municipal corporation" means a county, city, district or other municipal corporation or public corporation organized for a public purpose, including a cooperative body formed between municipal corporations.

(2) Except for a proceeding resulting in a land use decision or limited land use decision as defined in ORS 197.015, for which review is provided in ORS 197.830 to 197.845, [*or an expedited land division as described in ORS 197.360, for which review is provided in ORS 197.375 (8),*] the decisions of the governing body of a municipal corporation acting in a judicial or quasi-judicial capacity and made in the transaction of municipal corporation business shall be reviewed only as provided in ORS 34.010 to 34.100, and not otherwise.

(3) A petition for writ of review filed in the circuit court and requesting review of a land use decision or limited land use decision as defined in ORS 197.015 of a municipal corporation shall be transferred to the Land Use Board of Appeals and treated as a notice of intent to appeal if the petition was filed within the time allowed for filing a notice of intent to appeal pursuant to ORS

197.830. If the petition was not filed within the time allowed by ORS 197.830, the court shall dismiss the petition.

(4) A notice of intent to appeal filed with the Land Use Board of Appeals pursuant to ORS 197.830 and requesting review of a decision of a municipal corporation made in the transaction of municipal corporation business that is not reviewable as a land use decision or limited land use decision as defined in ORS 197.015 shall be transferred to the circuit court and treated as a petition for writ of review. If the notice was not filed with the board within the time allowed for filing a petition for writ of review pursuant to ORS 34.010 to 34.100, the court shall dismiss the petition.

(5) In any case in which the Land Use Board of Appeals or circuit court to which a petition or notice is transferred under subsection (3) or (4) of this section disputes whether it has authority to review the decision with which the petition or notice is concerned, the board or court before which the matter is pending shall refer the question of whether the board or court has authority to review to the Court of Appeals, which shall decide the question in a summary manner.

**SECTION 25.** ORS 92.325, as amended by section 11, chapter 102, Oregon Laws 2024, is amended to read:

92.325. A person may not sell or lease any subdivided lands or series partitioned lands without having complied with all the applicable provisions of ORS 92.305 to 92.495 except that:

(1) ORS 92.305 to 92.495 do not apply to the sale or leasing of:

(a) Apartments or similar space within an apartment building;

(b) Cemetery lots, parcels or units in Oregon;

(c) Subdivided lands and series partitioned lands in Oregon that are not in unit ownership or being developed as unit ownerships created under ORS chapter 100, to be used for residential purposes and that qualify under ORS 92.337;

(d) Property submitted to the provisions of ORS chapter 100;

(e) Subdivided lands and series partitioned lands in Oregon expressly zoned for and limited in use to nonresidential industrial or nonresidential commercial purposes;

(f) Lands in this state sold by lots or parcels of not less than 160 acres each;

(g) Timeshares regulated or otherwise exempt under ORS 94.803 and 94.807 to 94.945;

(h) Mobile home or manufactured dwelling parks, as defined in ORS 446.003, located in Oregon;

(i) Planned community subdivision of manufactured dwellings or mobile homes created under ORS 92.830 to 92.845;

(j) Lots or parcels created [*from an expedited land division*] under ORS 197.360; or

(k) Lots or parcels created from a middle housing land division under ORS 92.031 **or 92.044 (1)(c)(C)**.

(2) The subdivider or series partitioner of subdivided and series partitioned lands in a city or county which, at the time tentative approval of a subdivision plat and each partition map for those lands is given under ORS 92.040 or an ordinance adopted under ORS 92.046, has a comprehensive plan and implementing ordinances that have been acknowledged under ORS 197.251 must only comply with ORS 92.425, 92.427, 92.430, 92.433, 92.460 and 92.485 in the sale or leasing of such lands.

**SECTION 26.** ORS 184.633 is amended to read:

184.633. (1) Subject to policy direction by the Oregon Transportation Commission, the Director of Transportation shall:

(a) Be the administrative head of the Department of Transportation;

(b) Have power, within applicable budgetary limitations, and in accordance with ORS chapter 240, to hire, assign, reassign and coordinate personnel of the department and prescribe their duties and fix their compensation, subject to the State Personnel Relations Law;

(c) Administer the laws of the state concerning transportation;

(d) Intervene, as authorized by the commission, pursuant to the rules of practice and procedure, in the proceedings of state and federal agencies which may substantially affect the interest of the consumers and providers of transportation within Oregon; and

(e) Construct, coordinate and promote an integrated transportation system in cooperation with any city, county, district, port or private entity, as defined in ORS 367.802.

(2) In addition to duties otherwise required by law, the director shall prescribe regulations for the government of the department, the conduct of its employees, the assignment and performance of its business and the custody, use and preservation of its records, papers and property in a manner consistent with applicable law.

(3) The director may delegate to any of the employees of the department the exercise or discharge in the director's name of any power, duty or function of whatever character, vested in or imposed by law upon the director, including powers, duties or functions delegated to the director by the commission pursuant to ORS 184.635. The official act of any such person so acting in the director's name and by the authority of the director shall be considered to be an official act of the director.

(4) The director shall have authority to require a fidelity bond of any officer or employee of the department who has charge of, handles or has access to any state money or property, and who is not otherwise required by law to give a bond. The amounts of the bond shall be fixed by the director, except as otherwise provided by law, and the sureties shall be approved by the director. The department shall pay the premiums on the bonds.

(5)(a) Subject to local government requirements and the provisions of ORS 197.830 to 197.845, the director may participate in and seek review of a land use decision or limited land use decision as defined in ORS 197.015[*, or an expedited land division as defined in ORS 197.360*]. The director shall report to the commission on each case in which the department participates and on the positions taken by the director in each case.

(b) If a meeting of the commission is scheduled prior to the close of the period for seeking review of a land use decision[*, expedited land division*] or limited land use decision, the director shall obtain formal approval from the commission prior to seeking review of the decision. However, if the land use decision[*, expedited land division*] or limited land use decision becomes final less than 15 days before a meeting of the commission, the director shall proceed as provided in paragraph (c) of this subsection. If the director requests approval from the commission, the applicant and the affected local government shall be notified in writing that the director is seeking commission approval. The director, the applicant and the affected local government shall be given reasonable time to address the commission regarding the director's request for approval to seek review. No other testimony shall be taken by the commission.

(c) If a meeting of the commission is not scheduled prior to the close of the period for seeking review of a land use decision[*, expedited land division*] or limited land use decision, at the next commission meeting the director shall report to the commission on each case for which the department has sought review. The director shall request formal approval to proceed with each appeal. The applicant and the affected local government shall be notified of the commission meeting in writing by the director. The director, the applicant and the affected local government shall be given reasonable time to address the commission regarding the director's request for approval to proceed with the appeal. No other testimony shall be taken by the commission. If the commission does not formally approve an appeal, the director shall file a motion with the appropriate tribunal to dismiss the appeal.

(d) A decision by the commission under this subsection is not subject to appeal.

(e) For purposes of this subsection, "applicant" means a person seeking approval of [*a permit, as defined in ORS 215.402 or 227.160, expedited land division or limited land use decision*] **an application as defined in ORS 215.427 or 227.178**.

(6) The director may intervene in an appeal of a land use decision brought by another person in the manner provided for an appeal by the director under subsection (5) of this section.

**SECTION 27.** ORS 197.015, as amended by section 44, chapter 110, Oregon Laws 2024, is amended to read:

197.015. As used in ORS chapters 195, 196, 197 and 197A, unless the context requires otherwise:

(1) "Acknowledgment" means a commission order that certifies that a comprehensive plan and land use regulations, land use regulation or plan or regulation amendment complies with the goals or certifies that Metro land use planning goals and objectives, Metro regional framework plan,

amendments to Metro planning goals and objectives or amendments to the Metro regional framework plan comply with the goals.

(2) "Board" means the Land Use Board of Appeals.

(3) "Carport" means a stationary structure consisting of a roof with its supports and not more than one wall, or storage cabinet substituting for a wall, and used for sheltering a motor vehicle.

(4) "Commission" means the Land Conservation and Development Commission.

(5) "Comprehensive plan" means a generalized, coordinated land use map and policy statement of the governing body of a local government that interrelates all functional and natural systems and activities relating to the use of lands, including but not limited to sewer and water systems, transportation systems, educational facilities, recreational facilities, and natural resources and air and water quality management programs. "Comprehensive" means all-inclusive, both in terms of the geographic area covered and functional and natural activities and systems occurring in the area covered by the plan. "General nature" means a summary of policies and proposals in broad categories and does not necessarily indicate specific locations of any area, activity or use. A plan is "coordinated" when the needs of all levels of governments, semipublic and private agencies and the citizens of Oregon have been considered and accommodated as much as possible. "Land" includes water, both surface and subsurface, and the air.

(6) "Department" means the Department of Land Conservation and Development.

(7) "Director" means the Director of the Department of Land Conservation and Development.

(8) "Goals" means the mandatory statewide land use planning standards adopted by the commission pursuant to ORS chapters 195, 196, 197 and 197A.

(9) "Guidelines" means suggested approaches designed to aid cities and counties in preparation, adoption and implementation of comprehensive plans in compliance with goals and to aid state agencies and special districts in the preparation, adoption and implementation of plans, programs and regulations in compliance with goals. Guidelines are advisory and do not limit state agencies, cities, counties and special districts to a single approach.

(10) "Land use decision":

(a) Includes:

(A) A final decision or determination made by a local government or special district that concerns the adoption, amendment or application of:

(i) The goals;

(ii) A comprehensive plan provision;

(iii) A land use regulation; or

(iv) A new land use regulation;

(B) A final decision or determination of a state agency other than the commission with respect to which the agency is required to apply the goals; [*or*]

(C) A decision of a county planning commission made under ORS 433.763; **or**

**(D) An expedited land division under ORS 197.365;**

(b) Does not include a decision of a local government:

(A) That is made under land use standards that do not require interpretation or the exercise of policy or legal judgment;

(B) That approves or denies a building permit issued under clear and objective land use standards;

(C) That is a limited land use decision;

(D) That determines final engineering design, construction, operation, maintenance, repair or preservation of a transportation facility that is otherwise authorized by and consistent with the comprehensive plan and land use regulations;

[*(E) That is an expedited land division as described in ORS 197.360;*]

[*(F)*] **(E)** That approves, pursuant to ORS 480.450 (7), the siting, installation, maintenance or removal of a liquefied petroleum gas container or receptacle regulated exclusively by the State Fire Marshal under ORS 480.410 to 480.460;

[*(G)*] **(F)** That approves or denies approval of a final subdivision or partition plat or that determines whether a final subdivision or partition plat substantially conforms to the tentative subdivision or partition plan; or

[*(H)*] **(G)** That a proposed state agency action subject to ORS 197.180 (1) is compatible with the acknowledged comprehensive plan and land use regulations implementing the plan, if:

(i) The local government has already made a land use decision authorizing a use or activity that encompasses the proposed state agency action;

(ii) The use or activity that would be authorized, funded or undertaken by the proposed state agency action is allowed without review under the acknowledged comprehensive plan and land use regulations implementing the plan; or

(iii) The use or activity that would be authorized, funded or undertaken by the proposed state agency action requires a future land use review under the acknowledged comprehensive plan and land use regulations implementing the plan;

(c) Does not include a decision by a school district to close a school;

(d) Does not include, except as provided in ORS 215.213 (13)(c) or 215.283 (6)(c), authorization of an outdoor mass gathering as defined in ORS 433.735, or other gathering of fewer than 3,000 persons that is not anticipated to continue for more than 120 hours in any three-month period; and

(e) Does not include:

(A) A writ of mandamus issued by a circuit court in accordance with ORS 215.429 or 227.179;

(B) Any local decision or action taken on an application subject to ORS 215.427 or 227.178 after a petition for a writ of mandamus has been filed under ORS 215.429 or 227.179; or

(C) A state agency action subject to ORS 197.180 (1), if:

(i) The local government with land use jurisdiction over a use or activity that would be authorized, funded or undertaken by the state agency as a result of the state agency action has already made a land use decision approving the use or activity; or

(ii) A use or activity that would be authorized, funded or undertaken by the state agency as a result of the state agency action is allowed without review under the acknowledged comprehensive plan and land use regulations implementing the plan.

(11) "Land use regulation" means any local government zoning ordinance, land division ordinance adopted under ORS 92.044 or 92.046 or similar general ordinance establishing standards for implementing a comprehensive plan.

(12)(a) "Limited land use decision" means a final decision or determination made by a local government pertaining to a site within an urban growth boundary that concerns:

(A) The approval or denial of a tentative subdivision or partition plan, as described in ORS 92.040 (1).

(B) The approval or denial of an application based on discretionary standards designed to regulate the physical characteristics of a use permitted outright, including but not limited to site review and design review.

(C) The approval or denial of an application for a replat.

(D) The approval or denial of an application for a property line adjustment.

(E) The approval or denial of an application for an extension, alteration or expansion of a nonconforming use.

(b) "Limited land use decision" does not mean a final decision made by a local government pertaining to a site within an urban growth boundary that concerns approval or denial of a final subdivision or partition plat or that determines whether a final subdivision or partition plat substantially conforms to the tentative subdivision or partition plan.

(13) "Local government" means any city, county or Metro or an association of local governments performing land use planning functions under ORS 195.025.

(14) "Metro" means a metropolitan service district organized under ORS chapter 268.

(15) "Metro planning goals and objectives" means the land use goals and objectives that Metro may adopt under ORS 268.380 (1)(a). The goals and objectives do not constitute a comprehensive plan.

(16) "Metro regional framework plan" means the regional framework plan required by the 1992 Metro Charter or its separate components. Neither the regional framework plan nor its individual components constitute a comprehensive plan.

(17) "New land use regulation" means a land use regulation other than an amendment to an acknowledged land use regulation adopted by a local government that already has a comprehensive plan and land regulations acknowledged under ORS 197.251.

(18) "Person" means any individual, partnership, corporation, association, governmental subdivision or agency or public or private organization of any kind. The Land Conservation and Development Commission or its designee is considered a person for purposes of appeal under ORS chapters 195, 197 and 197A.

(19) "Special district" means any unit of local government, other than a city, county, Metro or an association of local governments performing land use planning functions under ORS 195.025, authorized and regulated by statute and includes but is not limited to water control districts, domestic water associations and water cooperatives, irrigation districts, port districts, regional air quality control authorities, fire districts, school districts, hospital districts, mass transit districts and sanitary districts.

(20) "Urban growth boundary" means an acknowledged urban growth boundary contained in a city or county comprehensive plan or adopted by Metro under ORS 268.390 (3).

(21) "Urban unincorporated community" means an area designated in a county's acknowledged comprehensive plan as an urban unincorporated community after December 5, 1994.

(22) "Voluntary association of local governments" means a regional planning agency in this state officially designated by the Governor pursuant to the federal Office of Management and Budget Circular A-95 as a regional clearinghouse.

(23) "Wetlands" means those areas that are inundated or saturated by surface or ground water at a frequency and duration that are sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

**SECTION 28.** ORS 197.090 is amended to read:

197.090. (1) Subject to policies adopted by the Land Conservation and Development Commission, the Director of the Department of Land Conservation and Development shall:

(a) Be the administrative head of the Department of Land Conservation and Development.

(b) Coordinate the activities of the department in its land conservation and development functions with such functions of federal agencies, other state agencies, local governments and special districts.

(c) Appoint, reappoint, assign and reassign all subordinate officers and employees of the department, prescribe their duties and fix their compensation, subject to the State Personnel Relations Law.

(d) Represent this state before any agency of this state, any other state or the United States with respect to land conservation and development within this state.

(2)(a) Subject to local government requirements and the provisions of ORS 197.830 to 197.845, the director may participate in and seek review of:

(A) A land use decision[*, expedited land division*] or limited land use decision involving the goals or involving an acknowledged comprehensive plan and land use regulations implementing the plan; or

(B) Any other matter within the statutory authority of the department or commission under ORS chapters 195, 196, 197 and 197A.

(b) The director shall report to the commission on each case in which the department participates and on the positions taken by the director in each case.

(c) If a meeting of the commission is scheduled prior to the close of the period for seeking review of a land use decision[*, expedited land division*] or limited land use decision, the director shall obtain formal approval from the commission prior to seeking review of the decision. However, if the land use decision[*, expedited land division*] or limited land use decision becomes final less than 15 days before a meeting of the commission, the director shall proceed as provided in paragraph (d) of

this subsection. If the director requests approval from the commission, the applicant and the affected local government shall be notified in writing that the director is seeking commission approval. The director, the applicant and the affected local government shall be given reasonable time to address the commission regarding the director's request for approval to seek review. The parties shall limit their testimony to the factors established under subsection (3) of this section. No other testimony shall be taken by the commission.

(d) If a meeting of the commission is not scheduled prior to the close of the period for seeking review of a land use decision[*, expedited land division*] or limited land use decision, at the next commission meeting the director shall report to the commission on each case for which the department has sought review. The director shall request formal approval to proceed with each appeal. The applicant and the affected local government shall be notified of the commission meeting in writing by the director. The director, the applicant and the affected local government shall be given reasonable time to address the commission regarding the director's request for approval to proceed with the appeal. The parties shall limit their testimony to the factors established under subsection (3) of this section. No other testimony shall be taken by the commission. If the commission does not formally approve an appeal, the director shall file a motion with the appropriate tribunal to dismiss the appeal.

(e) A decision by the commission under this subsection is not subject to appeal.

(f) For purposes of this subsection, "applicant" means a person seeking approval of a permit, as defined in ORS 215.402 or 227.160, [*expedited land division*] or limited land use decision.

(3) The commission by rule shall adopt a set of factors for the commission to consider when determining whether to appeal or intervene in the appeal of a land use decision[*, expedited land division*] or limited land use decision that involves the application of the goals, acknowledged comprehensive plan, land use regulation or other matter within the authority of the department or commission under ORS chapters 195, 196, 197 and 197A.

(4) The director may intervene in an appeal of a land use decision[*, expedited land division*] or limited land use decision brought by another person in the manner provided for an appeal by the director under subsection (2)(c) and (d) of this section.

**SECTION 29.** ORS 197.200 is amended to read:

197.200. (1) A local government may convene a land use proceeding to adopt a refinement plan for a neighborhood or community within its jurisdiction and inside the urban growth boundary as provided in this section.

(2) A refinement plan is more detailed than a comprehensive plan and applies to a specific geographic area. A refinement plan shall:

(a) Establish efficient density ranges, including a minimum and a maximum density for residential land uses;

(b) Establish minimum and maximum floor area ratios or site coverage requirements for nonresidential uses;

(c) Be based on a planning process meeting statewide planning goals; and

(d) Include land use regulations to implement the plan.

(3) A refinement plan and associated land use regulations adopted prior to September 9, 1995, may qualify as a refinement plan if the local government holds a public hearing to gather public comment and decides to adopt the plan as a refinement plan under this section.

(4) A local government shall apply the procedures for expedited land divisions described in ORS [*197.360 to 197.380*] **197.365** to all applications for land division and site or design review located in any area subject to an acknowledged refinement plan. The review shall include:

(a) All elements of a local government comprehensive plan and land use regulations that must be applied in order to approve or deny any such application; and

(b) Any planned unit development standards and any procedures designed to regulate:

(A) The physical characteristics of permitted uses;

(B) The dimensions of the lots **or parcels** to be created; or

(C) Transportation, sewer, water, drainage and other facilities or services necessary for the proposed development.

[*(5) Any decision made on a refinement plan described in subsection (3) of this section shall be appealed only as provided for appeals of expedited land division decisions in ORS 197.375.*]

[*(6)*] **(5)** Refinement plans and implementing ordinances may be adopted through the post-acknowledgment or periodic review process.

**SECTION 30.** ORS 197.245 is amended to read:

197.245. The Land Conservation and Development Commission may periodically amend the initial goals and guidelines adopted under ORS 197.240 and adopt new goals and guidelines. The adoption of amendments to or of new goals shall be done in the manner provided in ORS 197.235 and 197.240 and shall specify with particularity those goal provisions that are applicable to land use decisions[*, expedited land divisions*] and limited land use decisions before plan revision. The commission shall establish the effective date for application of a new or amended goal. Absent a compelling reason, the commission shall not require a comprehensive plan, new or amended land use regulation, land use decision[*, expedited land division*] or limited land use decision to be consistent with a new or amended goal until one year after the date of adoption.

**NOTE:** Section 31 was deleted by amendment. Subsequent sections were not renumbered.

**SECTION 32.** ORS 197.724 is amended to read:

197.724. (1) An applicant for a new industrial use or the expansion of an existing industrial use located within a regionally significant industrial area may request that an application for a land use permit be reviewed as an application for an expedited industrial land use permit under this section if the proposed use does not require:

(a) An exception taken under ORS 197.732 to a statewide land use planning goal;

(b) A change to the acknowledged comprehensive plan or land use regulations of the local government within whose land use jurisdiction the new or expanded industrial use would occur; or

(c) A federal environmental impact statement under the National Environmental Policy Act.

(2) If the applicant makes a request that complies with subsection (1) of this section, the local government shall review the applications for land use permits for the proposed industrial use by applying the standards and criteria that otherwise apply to the review and by using the procedures set forth for review of an expedited land division in ORS 197.365 [*and 197.370*].

**SECTION 33.** ORS 197.794 is amended to read:

197.794. (1) As used in this section, "railroad company" has the meaning given that term in ORS 824.200.

(2) If a railroad-highway crossing provides or will provide the only access to land that is the subject of an application for a land use decision[*,*] **or** a limited land use decision [*or an expedited land division*], the applicant must indicate that fact in the application submitted to the decision maker.

(3) The decision maker shall provide notice to the Department of Transportation and the railroad company whenever the decision maker receives the information described under subsection (2) of this section.

**SECTION 34.** ORS 197.796 is amended to read:

197.796. (1) An applicant [*for a land use decision, limited land use decision or expedited land division or for a permit*] under ORS 215.427 or 227.178 may accept a condition of approval imposed under ORS 215.416 or 227.175 and file a challenge to the condition under this section. Acceptance by an applicant [*for a land use decision, limited land use decision, expedited land division or permit*] under ORS 215.427 or 227.178 of a condition of approval imposed under ORS 215.416 or 227.175 does not constitute a waiver of the right to challenge the condition of approval. Acceptance of a condition may include but is not limited to paying a fee, performing an act or providing satisfactory evidence of arrangements to pay the fee or to ensure compliance with the condition.

(2) Any action for damages under this section shall be filed in the circuit court of the county in which the application was submitted within 180 days of the date of the decision.

(3)(a) A challenge filed pursuant to this section may not be dismissed on the basis that the applicant did not request a variance to the condition of approval or any other available form of reconsideration of the challenged condition. However, an applicant shall comply with ORS 197.797 (1) prior to appealing to the Land Use Board of Appeals or bringing an action for damages in circuit court and must exhaust all local appeals provided in the local comprehensive plan and land use regulations before proceeding under this section.

(b) In addition to the requirements of ORS 197.797 (5), at the commencement of the initial public hearing, a statement shall be made to the applicant that the failure of the applicant to raise constitutional or other issues relating to proposed conditions of approval with sufficient specificity to allow the local government or its designee to respond to the issue precludes an action for damages in circuit court.

(c) An applicant is not required to raise an issue under this subsection unless the condition of approval is stated with sufficient specificity to enable the applicant to respond to the condition prior to the close of the final local hearing.

(4) In any challenge to a condition of approval that is subject to the Takings Clause of the Fifth Amendment to the United States Constitution, the local government shall have the burden of demonstrating compliance with the constitutional requirements for imposing the condition.

(5) In a proceeding in circuit court under this section, the court shall award costs and reasonable attorney fees to a prevailing party. Notwithstanding ORS 197.830 (15), in a proceeding before the Land Use Board of Appeals under this section, the board shall award costs and reasonable attorney fees to a prevailing party.

(6) This section applies to appeals by the applicant of a condition of approval and claims filed in state court seeking damages for the unlawful imposition of conditions of approval [*in a land use decision, limited land use decision, expedited land division or permit*] **of an application made** under ORS 215.427 or 227.178.

**SECTION 35.** ORS 197.825 is amended to read:

197.825. (1) Except as provided in ORS 197.320 and subsections (2) and (3) of this section, the Land Use Board of Appeals shall have exclusive jurisdiction to review any land use decision or limited land use decision of a local government, special district or a state agency in the manner provided in ORS 197.830 to 197.845.

(2) The jurisdiction of the board:

(a) Is limited to those cases in which the petitioner has exhausted all remedies available by right before petitioning the board for review;

(b) Is subject to the provisions of ORS 197.850 relating to judicial review by the Court of Appeals;

(c) Does not include a local government decision that is:

(A) Submitted to the Department of Land Conservation and Development for acknowledgment under ORS 197.251, 197.626 or 197.628 to 197.651 or a matter arising out of a local government decision submitted to the department for acknowledgment, unless the Director of the Department of Land Conservation and Development, in the director's sole discretion, transfers the matter to the board; or

(B) Subject to the review authority of the department under ORS 197.412, 197.445, 197.450 or 197.455 or a matter related to a local government decision subject to the review authority of the department under ORS 197.412, 197.445, 197.450 or 197.455;

(d) Does not include those land use decisions of a state agency over which the Court of Appeals has jurisdiction for initial judicial review under ORS 183.400, 183.482 or other statutory provisions;

(e) Does not include any rules, programs, decisions, determinations or activities carried out under ORS 527.610 to 527.770, 527.990 (1) and 527.992; **and**

(f) Is subject to ORS 196.115 for any county land use decision that may be reviewed by the Columbia River Gorge Commission pursuant to sections 10(c) or 15(a)(2) of the Columbia River Gorge National Scenic Area Act, P.L. 99-663[*; and*]**.**

[*(g) Does not include review of expedited land divisions under ORS 197.360.*]

(3) Notwithstanding subsection (1) of this section, the circuit courts of this state retain jurisdiction:

(a) To grant declaratory, injunctive or mandatory relief in proceedings arising from decisions described in ORS 197.015 (10)(b) or proceedings brought to enforce the provisions of an adopted comprehensive plan or land use regulations; and

(b) To enforce orders of the board in appropriate proceedings brought by the board or a party to the board proceeding resulting in the order.

**SECTION 36.** ORS 197.830 is amended to read:

197.830. (1) Review of land use decisions or limited land use decisions under ORS 197.830 to 197.845 shall be commenced by filing a notice of intent to appeal with the Land Use Board of Appeals.

(2) Except as provided in ORS 197.620, a person may petition the board for review of a land use decision or limited land use decision if the person:

(a) Filed a notice of intent to appeal the decision as provided in subsection (1) of this section; and

(b) Appeared before the local government, special district or state agency orally or in writing.

(3) If a local government makes a land use decision without providing a hearing, except as provided under ORS **197.365 (2),** 215.416 (11) or 227.175 (10), or the local government makes a land use decision that is different from the proposal described in the notice of hearing to such a degree that the notice of the proposed action did not reasonably describe the local government's final actions, a person adversely affected by the decision may appeal the decision to the board under this section:

(a) Within 21 days of actual notice where notice is required; or

(b) Within 21 days of the date a person knew or should have known of the decision where no notice is required.

(4) If a local government makes a land use decision without a hearing pursuant to ORS 215.416 (11) or 227.175 (10):

(a) A person who was not provided notice of the decision as required under ORS 215.416 (11)(c) or 227.175 (10)(c) may appeal the decision to the board under this section within 21 days of receiving actual notice of the decision.

(b) A person who is not entitled to notice under ORS 215.416 (11)(c) or 227.175 (10)(c) but who is adversely affected or aggrieved by the decision may appeal the decision to the board under this section within 21 days after the expiration of the period for filing a local appeal of the decision established by the local government under ORS 215.416 (11)(a) or 227.175 (10)(a).

(c) A person who receives notice of a decision made without a hearing under ORS 215.416 (11) or 227.175 (10) may appeal the decision to the board under this section within 21 days of receiving actual notice of the nature of the decision, if the notice of the decision did not reasonably describe the nature of the decision.

(d) Except as provided in paragraph (c) of this subsection, a person who receives notice of a decision made without a hearing under ORS **197.365 (2),** 215.416 (11) or 227.175 (10) may not appeal the decision to the board under this section.

(5) If a local government makes a limited land use decision which is different from the proposal described in the notice to such a degree that the notice of the proposed action did not reasonably describe the local government's final actions, a person adversely affected by the decision may appeal the decision to the board under this section:

(a) Within 21 days of actual notice where notice is required; or

(b) Within 21 days of the date a person knew or should have known of the decision where no notice is required.

(6) The appeal periods described in subsections (3), (4) and (5) of this section:

(a) May not exceed three years after the date of the decision, except as provided in paragraph (b) of this subsection.

(b) May not exceed 10 years after the date of the decision if notice of a hearing or an administrative decision made pursuant to ORS 197.195 or 197.797 is required but has not been provided.

(7)(a) Within 21 days after a notice of intent to appeal has been filed with the board under subsection (1) of this section, any person described in paragraph (b) of this subsection may intervene in and be made a party to the review proceeding by filing a motion to intervene and by paying a filing fee of $100.

(b) Persons who may intervene in and be made a party to the review proceedings, as set forth in subsection (1) of this section, are:

(A) The applicant who initiated the action before the local government, special district or state agency; or

(B) Persons who appeared before the local government, special district or state agency, orally or in writing.

(c) Failure to comply with the deadline or to pay the filing fee set forth in paragraph (a) of this subsection shall result in denial of a motion to intervene.

(8) If a state agency whose order, rule, ruling, policy or other action is at issue is not a party to the proceeding, it may file a brief with the board as if it were a party. The brief shall be due on the same date the respondent's brief is due and shall be accompanied by a filing fee of $100.

(9) A notice of intent to appeal a land use decision or limited land use decision shall be filed not later than 21 days after the date the decision sought to be reviewed becomes final. A notice of intent to appeal plan and land use regulation amendments processed pursuant to ORS 197.610 to 197.625 shall be filed not later than 21 days after notice of the decision sought to be reviewed is mailed or otherwise submitted to parties entitled to notice under ORS 197.615. Failure to include a statement identifying when, how and to whom notice was provided under ORS 197.615 does not render the notice defective. Copies of the notice of intent to appeal shall be served upon the local government, special district or state agency and the applicant of record, if any, in the local government, special district or state agency proceeding. The notice shall be served and filed in the form and manner prescribed by rule of the board and shall be accompanied by a filing fee of $300. If a petition for review is not filed with the board as required in subsections (10) and (11) of this section, the board shall award the filing fee to the local government, special district or state agency.

(10)(a) Within 21 days after service of the notice of intent to appeal, the local government, special district or state agency shall transmit to the board the original or a certified copy of the entire record of the proceeding under review. By stipulation of all parties to the review proceeding the record may be shortened. The board may require or permit subsequent corrections to the record; however, the board shall issue an order on a motion objecting to the record within 60 days of receiving the motion. If the board denies a petitioner's objection to the record, the board may establish a new deadline for the petition for review to be filed that may not be less than 14 days from the later of the original deadline for the brief or the date of denial of the petitioner's record objection.

(b) Within 10 days after service of a notice of intent to appeal, the board shall provide notice to the petitioner and the respondent of their option to enter into mediation pursuant to ORS 197.860. Any person moving to intervene shall be provided such notice within seven days after a motion to intervene is filed. The notice required by this paragraph shall be accompanied by a statement that mediation information or assistance may be obtained from the Department of Land Conservation and Development.

(11) A petition for review of the land use decision or limited land use decision and supporting brief shall be filed with the board as required by the board under subsection (13) of this section.

(12) The petition shall include a copy of the decision sought to be reviewed and shall state:

(a) The facts that establish that the petitioner has standing.

(b) The date of the decision.

(c) The issues the petitioner seeks to have reviewed.

(13)(a) The board shall adopt rules establishing deadlines for filing petitions and briefs and for oral argument.

(b) The local government or state agency may withdraw its decision for purposes of reconsideration at any time:

(A) Subsequent to the filing of a notice of intent; and

(B) Prior to:

(i) The date set for filing the record; or

(ii) On appeal of a decision under ORS 197.610 to 197.625 or relating to the development of a residential structure, the filing of the respondent's brief.

(c) If a local government or state agency withdraws an order for purposes of reconsideration, it shall, within such time as the board may allow, affirm, modify or reverse its decision. If the petitioner is dissatisfied with the local government or agency action after withdrawal for purposes of reconsideration, the petitioner may refile the notice of intent and the review shall proceed upon the revised order. An amended notice of intent is not required if the local government or state agency, on reconsideration, affirms the order or modifies the order with only minor changes.

(14) The board shall issue a final order within 77 days after the date of transmittal of the record. If the order is not issued within 77 days the applicant may apply in Marion County or the circuit court of the county where the application was filed for a writ of mandamus to compel the board to issue a final order.

(15) Upon entry of its final order, the board:

(a) May, in its discretion, award costs to the prevailing party including the cost of preparation of the record if the prevailing party is the local government, special district or state agency whose decision is under review.

(b) Shall award reasonable attorney fees and expenses to the prevailing party against any other party who the board finds presented a position or filed any motion without probable cause to believe the position or motion was well-founded in law or on factually supported information.

(c) Shall award costs and attorney fees to a party as provided in ORS 197.843.

(16) Orders issued under this section may be enforced in appropriate judicial proceedings.

(17)(a) The board shall provide for the publication of its orders that are of general public interest in the form it deems best adapted for public convenience. The publications shall constitute the official reports of the board.

(b) Any moneys collected or received from sales by the board shall be paid into the Board Publications Account established by ORS 197.832.

(18) Except for any sums collected for publication of board opinions, all fees collected by the board under this section that are not awarded as costs shall be paid over to the State Treasurer to be credited to the General Fund.

(19) The board shall track and report on its website:

(a) The number of reviews commenced, as described in subsection (1) of this section, the number of reviews commenced for which a petition is filed under subsection (2) of this section and, in relation to each of those numbers, the rate at which the reviews result in a decision of the board to uphold, reverse or remand the land use decision or limited land use decision. The board shall track and report reviews under this paragraph in categories established by the board.

(b) A list of petitioners, the number of reviews commenced and the rate at which the petitioner's reviews have resulted in decisions of the board to uphold, reverse or remand the land use decision or limited land use decision.

(c) A list of respondents, the number of reviews involving each respondent and the rate at which reviews involving the respondent have resulted in decisions of the board to uphold, reverse or remand the land use decision or limited land use decision. Additionally, when a respondent is the local government that made the land use decision or limited land use decision, the board shall track whether the local government appears before the board.

(d) A list of reviews, and a brief summary of the circumstances in each review, under which the board exercises its discretion to require a losing party to pay the attorney fees of the prevailing party.

**SECTION 37.** ORS 197A.465 is amended to read:

197A.465. (1) As used in this section:

(a) "Affordable housing" means housing that is affordable to households with incomes equal to or higher than 80 percent of the median family income for the county in which the housing is built.

(b) "Multifamily structure" means a structure that contains three or more housing units sharing at least one wall, floor or ceiling surface in common with another unit within the same structure.

(2) Except as provided in subsection (3) of this section, a metropolitan service district may not adopt a land use regulation or functional plan provision, or impose as a condition for approving [*a permit*] **an application** under ORS 215.427 or 227.178 a requirement, that has the effect of establishing the sales or rental price for a housing unit or residential building lot or parcel, or that requires a housing unit or residential building lot or parcel to be designated for sale or rent to a particular class or group of purchasers or renters.

(3) The provisions of subsection (2) of this section do not limit the authority of a metropolitan service district to:

(a) Adopt or enforce a use regulation, provision or requirement creating or implementing an incentive, contract commitment, density bonus or other voluntary regulation, provision or requirement designed to increase the supply of moderate or lower cost housing units; or

(b) Enter into an affordable housing covenant as provided in ORS 456.270 to 456.295.

(4) Notwithstanding ORS 91.225, a city or county may adopt a land use regulation or functional plan provision, or impose as a condition for approving [*a permit*] **an application** under ORS 215.427 or 227.178 a requirement, that has the effect of establishing the sales or rental price for a new multifamily structure, or that requires a new multifamily structure to be designated for sale or rent as affordable housing.

(5) A regulation, provision or requirement adopted or imposed under subsection (4) of this section:

(a) May not require more than 20 percent of housing units within a multifamily structure to be sold or rented as affordable housing.

(b) May apply only to multifamily structures containing at least 20 housing units.

(c) Must provide developers the option to pay an in-lieu fee, in an amount determined by the city or county, in exchange for providing the requisite number of housing units within the multifamily structure to be sold or rented at below-market rates.

(d) Must require the city or county to offer a developer of multifamily structures, other than a developer that elects to pay an in-lieu fee pursuant to paragraph (c) of this subsection, at least one of the following incentives:

(A) Whole or partial fee waivers or reductions.

(B) Whole or partial waivers of system development charges or impact fees set by the city or county.

(C) Finance-based incentives.

(D) Full or partial exemption from ad valorem property taxes on the terms described in this subparagraph. For purposes of any statute granting a full or partial exemption from ad valorem property taxes that uses a definition of "low income" to mean income at or below 60 percent of the area median income and for which the multifamily structure is otherwise eligible, the city or county shall allow the multifamily structure of the developer to qualify using a definition of "low income" to mean income at or below 80 percent of the area median income.

(e) Does not apply to a CCRC, as defined in ORS 101.020, that executes and records a covenant with the applicable city or county in which the CCRC agrees to operate all units within its structure as a CCRC. Units within a CCRC that are offered or converted into residential units that are for sale or rent and are not subject to ORS chapter 101 must comply with regulations, provisions or requirements adopted by the city or county that are consistent with those applicable to a new multifamily structure under subsection (3) or (4) of this section.

(6) A regulation, provision or requirement adopted or imposed under subsection (4) of this section may offer developers one or more of the following incentives:

(a) Density adjustments.

(b) Expedited service for local permitting processes.

(c) Modification of height, floor area or other site-specific requirements.

(d) Other incentives as determined by the city or county.

(7) Subsection (4) of this section does not restrict the authority of a city or county to offer developers voluntary incentives, including incentives to:

(a) Increase the number of affordable housing units in a development.

(b) Decrease the sale or rental price of affordable housing units in a development.

(c) Build affordable housing units that are affordable to households with incomes equal to or lower than 80 percent of the median family income for the county in which the housing is built.

(8)(a) A city or county that adopts or imposes a regulation, provision or requirement described in subsection (4) of this section may not apply the regulation, provision or requirement to any multifamily structure for which an application for a permit, as defined in ORS 215.402 or 227.160, has been submitted as provided in ORS 215.416 or 227.178 (3), or, if such a permit is not required, a building permit application has been submitted to the city or county prior to the effective date of the regulation, provision or requirement.

(b) If a multifamily structure described in paragraph (a) of this subsection has not been completed within the period required by the permit issued by the city or county, the developer of the multifamily structure shall resubmit an application for a permit, as defined in ORS 215.402 or 227.160, as provided in ORS 215.416 or 227.178 (3), or, if such a permit is not required, a building permit application under the regulation, provision or requirement adopted by the city or county under subsection (4) of this section.

(9)(a) A city or county that adopts or imposes a regulation, provision or requirement under subsection (4) of this section shall adopt and apply only clear and objective standards, conditions and procedures regulating the development of affordable housing units within its jurisdiction. The standards, conditions and procedures may not have the effect, either individually or cumulatively, of discouraging development of affordable housing units through unreasonable cost or delay.

(b) Paragraph (a) of this subsection does not apply to:

(A) An application or permit for residential development in an area identified in a formally adopted central city plan, or a regional center as defined by Metro, in a city with a population of 500,000 or more.

(B) An application or permit for residential development in historic areas designated for protection under a land use planning goal protecting historic areas.

(c) In addition to an approval process for affordable housing based on clear and objective standards, conditions and procedures as provided in paragraph (a) of this subsection, a city or county may adopt and apply an alternative approval process for applications and permits for residential development based on approval criteria regulating, in whole or in part, appearance or aesthetics that are not clear and objective if:

(A) The developer retains the option of proceeding under the approval process that meets the requirements of paragraph (a) of this subsection;

(B) The approval criteria for the alternative approval process comply with applicable statewide land use planning goals and rules; and

(C) The approval criteria for the alternative approval process authorize a density at or above the density level authorized in the zone under the approval process provided in paragraph (a) of this subsection.

(10) If a regulation, provision or requirement adopted or imposed by a city or county under subsection (4) of this section requires that a percentage of housing units in a new multifamily structure be designated as affordable housing, any incentives offered under subsection (5)(d) or (6) of this section shall be related in a manner determined by the city or county to the required percentage of affordable housing units.

**SECTION 38.** ORS 197A.470 is amended to read:

197A.470. (1) As used in this section:

(a) "Affordable housing" means housing that is affordable to households with incomes equal to or less than 60 percent of the median family income for the county in which the development is built or for the state, whichever is greater, that is subject to an affordable housing covenant, as provided in ORS 456.270 to 456.295, that maintains the affordability for a period of not less than 60 years from the date of the certificate of occupancy.

(b) "Multifamily residential building" means a building in which three or more residential units each have space for eating, living and sleeping and permanent provisions for cooking and sanitation.

(2) [*Notwithstanding ORS 215.427 (1) or 227.178 (1),*] A city with a population greater than 5,000 or a county with a population greater than 25,000 shall take final action on an application qualifying under subsection (3) of this section[*, including resolution of all local appeals under ORS 215.422 or 227.180,*] within 100 days after the application is deemed complete **as provided in ORS 215.427 or 227.178**.

(3) An application qualifies for final action within the timeline described in subsection (2) of this section if:

(a) The application is submitted to the city or the county under ORS 215.416 or 227.175;

(b) The application is for development of a multifamily residential building containing five or more residential units within the urban growth boundary; and

(c) At least 50 percent of the residential units included in the development will be sold or rented as affordable housing.

(4) A city or a county shall take final action within the time allowed under ORS 215.427 or 227.178 on any application [*for a permit, limited land use decision or zone change*] that does not qualify for review and decision under subsection (3) of this section, including resolution of all appeals under ORS 215.422 or 227.180, as provided by ORS 215.427 and 215.435 or by ORS 227.178 and 227.181.

(5) With respect to property within an urban growth boundary owned by a nonprofit corporation organized as a religious corporation, a local government:

(a) May apply only restrictions or conditions of approval to the development of affordable housing that are, notwithstanding ORS 197A.400 (2) or statewide land use planning goals relating to protections for historic areas:

(A) Clear and objective as described in ORS 197A.400 (1); or

(B) Discretionary standards related to health, safety, habitability or infrastructure.

(b) Shall approve the development of affordable housing on property not zoned for housing if:

(A) The property is not zoned for industrial uses; and

(B) The property is contiguous to property zoned to allow residential uses.

(6) Affordable housing allowed under subsection (5)(b) of this section may be subject only to the restrictions applicable to the contiguously zoned residential property as limited by subsection (5)(a) of this section and without requiring that the property be rezoned for residential uses. If there is more than one contiguous residential property, the zoning of the property with the greatest density applies.

**SECTION 39.** ORS 215.402 is amended to read:

215.402. As used in ORS 215.402 to 215.438 and 215.700 to 215.780 unless the context requires otherwise:

(1) "Contested case" means a proceeding in which the legal rights, duties or privileges of specific parties under general rules or policies provided under ORS 215.010 to 215.311, 215.317, 215.327, 215.402 to 215.438 and 215.700 to 215.780, or any ordinance, rule or regulation adopted pursuant thereto, are required to be determined only after a hearing at which specific parties are entitled to appear and be heard.

(2) "Hearing" means a quasi-judicial hearing, authorized or required by the ordinances and regulations of a county adopted pursuant to ORS 215.010 to 215.311, 215.317, 215.327, 215.402 to 215.438 and 215.700 to 215.780:

(a) To determine in accordance with such ordinances and regulations if a permit shall be granted or denied; or

(b) To determine a contested case.

(3) "Hearings officer" means a planning and zoning hearings officer appointed or designated by the governing body of a county under ORS 215.406.

(4) "Permit" means discretionary approval of a proposed development of land under ORS 215.010 to 215.311, 215.317, 215.327 and 215.402 to 215.438 and 215.700 to 215.780 or county legislation or regulation adopted pursuant thereto. "Permit" does not include:

(a) A limited land use decision as defined in ORS 197.015;

(b) A decision which determines the appropriate zoning classification for a particular use by applying criteria or performance standards defining the uses permitted within the zone, and the determination applies only to land within an urban growth boundary;

(c) A decision which determines final engineering design, construction, operation, maintenance, repair or preservation of a transportation facility which is otherwise authorized by and consistent with the comprehensive plan and land use regulations; or

(d) An expedited land division, as described in ORS [*197.360*] **197.365**.

**SECTION 40.** ORS 215.416 is amended to read:

215.416. (1) When required or authorized by the ordinances, rules and regulations of a county, an owner of land may apply in writing to such persons as the governing body designates, for a permit, in the manner prescribed by the governing body. The governing body shall establish fees charged for processing permits at an amount no more than the actual or average cost of providing that service.

(2) The governing body shall establish a consolidated procedure by which an applicant may apply at one time for all permits or zone changes needed for a development project. The consolidated procedure shall be subject to the time limitations set out in ORS 215.427. The consolidated procedure shall be available for use at the option of the applicant no later than the time of the first periodic review of the comprehensive plan and land use regulations.

(3) Except as provided in subsection (11) of this section, the hearings officer shall hold at least one public hearing on the application.

(4)(a) A county may not approve an application if the proposed use of land is found to be in conflict with the comprehensive plan of the county and other applicable land use regulation or ordinance provisions. The approval may include such conditions as are authorized by statute or county legislation.

(b)(A) A county may not deny an application for a housing development located within the urban growth boundary if the development complies with clear and objective standards, including but not limited to clear and objective design standards contained in the county comprehensive plan or land use regulations.

(B) This paragraph does not apply to:

(i) Applications or permits for residential development in areas described in ORS 197A.400 (2); or

(ii) Applications or permits reviewed under an alternative approval process adopted under ORS 197A.400 (3).

(c) A county may not condition an application for a housing development on a reduction in density if:

(A) The density applied for is at or below the authorized density level under the local land use regulations; and

(B) At least 75 percent of the floor area applied for is reserved for housing.

(d) A county may not condition an application for a housing development on a reduction in height if:

(A) The height applied for is at or below the authorized height level under the local land use regulations;

(B) At least 75 percent of the floor area applied for is reserved for housing; and

(C) Reducing the height has the effect of reducing the authorized density level under local land use regulations.

(e) Notwithstanding paragraphs (c) and (d) of this subsection, a county may condition an application for a housing development on a reduction in density or height only if the reduction is necessary to resolve a health, safety or habitability issue or to comply with a protective measure adopted pursuant to a statewide land use planning goal. Notwithstanding ORS 197.350, the county must adopt findings supported by substantial evidence demonstrating the necessity of the reduction.

(f) As used in this subsection:

(A) "Authorized density level" means the maximum number of lots or dwelling units or the maximum floor area ratio that is permitted under local land use regulations.

(B) "Authorized height level" means the maximum height of a structure that is permitted under local land use regulations.

(C) "Habitability" means being in compliance with the applicable provisions of the state building code under ORS chapter 455 and the rules adopted thereunder.

(5) Hearings under this section shall be held only after notice to the applicant and also notice to other persons as otherwise provided by law and shall otherwise be conducted in conformance with the provisions of ORS 197.797.

(6) Notice of a public hearing on an application submitted under this section shall be provided to the owner of an airport defined by the Oregon Department of Aviation as a "public use airport" if:

(a) The name and address of the airport owner has been provided by the Oregon Department of Aviation to the county planning authority; and

(b) The property subject to the land use hearing is:

(A) Within 5,000 feet of the side or end of a runway of an airport determined by the Oregon Department of Aviation to be a "visual airport"; or

(B) Within 10,000 feet of the side or end of the runway of an airport determined by the Oregon Department of Aviation to be an "instrument airport."

(7) Notwithstanding the provisions of subsection (6) of this section, notice of a land use hearing need not be provided as set forth in subsection (6) of this section if the zoning permit would only allow a structure less than 35 feet in height and the property is located outside the runway "approach surface" as defined by the Oregon Department of Aviation.

(8)(a) Approval or denial of a permit application [*shall*] **must** be based on standards and criteria [*which shall be*] **that are** set forth in the zoning ordinance or other appropriate ordinance or regulation of the county and which shall relate approval or denial of a permit application to the zoning ordinance and comprehensive plan for the area in which the proposed use of land would occur and to the zoning ordinance and comprehensive plan for the county as a whole.

(b) When an ordinance establishing approval standards is required under ORS [*197A.200 and*] 197A.400 to provide only clear and objective standards, the standards must be clear and objective on the face of the ordinance.

(9) Approval or denial of a permit [*or expedited land division shall*] **must** be based upon and accompanied by a brief statement that explains the criteria and standards considered relevant to the decision, states the facts relied upon in rendering the decision and explains the justification for the decision based on the criteria, standards and facts set forth.

(10) Written notice of the approval or denial [*shall*] **must** be given to all parties to the proceeding.

(11)(a)(A) The hearings officer or such other person as the governing body designates may approve or deny an application for a permit without a hearing if the hearings officer or other designated person gives notice of the decision and provides an opportunity for any person who is adversely affected or aggrieved, or who is entitled to notice under paragraph (c) of this subsection, to file an appeal.

(B) Written notice of the decision shall be mailed to those persons described in paragraph (c) of this subsection.

(C) Notice under this subsection shall comply with ORS 197.797 (3)(a), (c), (g) and (h) and shall describe the nature of the decision. In addition, the notice shall state that any person who is ad-

versely affected or aggrieved or who is entitled to written notice under paragraph (c) of this subsection may appeal the decision by filing a written appeal in the manner and within the time period provided in the county's land use regulations. A county may not establish an appeal period that is less than 12 days from the date the written notice of decision required by this subsection was mailed. The notice shall state that the decision will not become final until the period for filing a local appeal has expired. The notice also shall state that a person who is mailed written notice of the decision cannot appeal the decision directly to the Land Use Board of Appeals under ORS 197.830.

(D) An appeal from a hearings officer's decision made without hearing under this subsection shall be to the planning commission or governing body of the county. An appeal from such other person as the governing body designates shall be to a hearings officer, the planning commission or the governing body. In either case, the appeal shall be to a de novo hearing.

(E) The de novo hearing required by subparagraph (D) of this paragraph shall be the initial evidentiary hearing required under ORS 197.797 as the basis for an appeal to the Land Use Board of Appeals. At the de novo hearing:

(i) The applicant and other parties shall have the same opportunity to present testimony, arguments and evidence as they would have had in a hearing under subsection (3) of this section before the decision;

(ii) The presentation of testimony, arguments and evidence shall not be limited to issues raised in a notice of appeal; and

(iii) The decision maker shall consider all relevant testimony, arguments and evidence that are accepted at the hearing.

(b) If a local government provides only a notice of the opportunity to request a hearing, the local government may charge a fee for the initial hearing. The maximum fee for an initial hearing shall be the cost to the local government of preparing for and conducting the appeal, or $250, whichever is less. If an appellant prevails at the hearing or upon subsequent appeal, the fee for the initial hearing shall be refunded. The fee allowed in this paragraph shall not apply to appeals made by neighborhood or community organizations recognized by the governing body and whose boundaries include the site.

(c)(A) Notice of a decision under paragraph (a) of this subsection shall be provided to the applicant and to the owners of record of property on the most recent property tax assessment roll where such property is located:

(i) Within 100 feet of the property that is the subject of the notice when the subject property is wholly or in part within an urban growth boundary;

(ii) Within 250 feet of the property that is the subject of the notice when the subject property is outside an urban growth boundary and not within a farm or forest zone; or

(iii) Within 750 feet of the property that is the subject of the notice when the subject property is within a farm or forest zone.

(B) Notice shall also be provided to any neighborhood or community organization recognized by the governing body and whose boundaries include the site.

(C) At the discretion of the applicant, the local government also shall provide notice to the Department of Land Conservation and Development.

(12) A decision described in ORS 215.402 (4)(b) shall:

(a) Be entered in a registry available to the public setting forth:

(A) The street address or other easily understood geographic reference to the subject property;

(B) The date of the decision; and

(C) A description of the decision made.

(b) Be subject to the jurisdiction of the Land Use Board of Appeals in the same manner as a limited land use decision.

(c) Be subject to the appeal period described in ORS 197.830 (5)(b).

(13) At the option of the applicant, the local government shall provide notice of the decision described in ORS 215.402 (4)(b) in the manner required by ORS 197.797 (2), in which case an appeal

to the board shall be filed within 21 days of the decision. The notice shall include an explanation of appeal rights.

(14) Notwithstanding the requirements of this section, a limited land use decision shall be subject to the requirements set forth in ORS 197.195 and 197.828.

**SECTION 41.** ORS 215.429 is amended to read:

215.429. (1) [*Except when an applicant requests an extension under ORS 215.427,*] If the governing body of the county or its designee does not take final action on an application [*for a permit, limited land use decision or zone change within 120 days or 150 days, as appropriate, after the application is deemed complete,*] **within the period allowed under ORS 215.427,** the applicant may file a petition for a writ of mandamus under ORS 34.130 in the circuit court of the county where the application was submitted to compel the governing body or its designee to issue the approval.

(2) The governing body shall retain jurisdiction to make a land use decision on the application until a petition for a writ of mandamus is filed. Upon filing a petition under ORS 34.130, jurisdiction for all decisions regarding the application, including settlement, shall be with the circuit court.

(3) A person who files a petition for a writ of mandamus under this section shall provide written notice of the filing to all persons who would be entitled to notice under ORS 197.797 and to any person who participated orally or in writing in any evidentiary hearing on the application held prior to the filing of the petition. The notice shall be mailed or hand delivered on the same day the petition is filed.

(4) If the governing body does not take final action on an application within [*120 days or 150 days, as appropriate, of the date the application is deemed complete,*] **the period allowed under ORS 215.427,** the applicant may elect to proceed with the application according to the applicable provisions of the county comprehensive plan and land use regulations or to file a petition for a writ of mandamus under this section. If the applicant elects to proceed according to the local plan and regulations, the applicant may not file a petition for a writ of mandamus within 14 days after the governing body makes a preliminary decision, provided a final written decision is issued within 14 days of the preliminary decision.

(5) The court shall issue a peremptory writ unless the governing body or any intervenor shows that the approval would violate a substantive provision of the county comprehensive plan or land use regulations as those terms are defined in ORS 197.015. The writ may specify conditions of approval that would otherwise be allowed by the county comprehensive plan or land use regulations.

**SECTION 42.** ORS 223.299 is amended to read:

223.299. As used in ORS 223.297 to 223.316:

(1)(a) "Capital improvement" means facilities or assets used for the following:

(A) Water supply, treatment and distribution;

(B) Waste water collection, transmission, treatment and disposal;

(C) Drainage and flood control;

(D) Transportation; or

(E) Parks and recreation.

(b) "Capital improvement" does not include costs of the operation or routine maintenance of capital improvements.

(2) "Improvement fee" means a fee for costs associated with capital improvements to be constructed.

(3) "Reimbursement fee" means a fee for costs associated with capital improvements already constructed, or under construction when the fee is established, for which the local government determines that capacity exists.

(4)(a) "System development charge" means a reimbursement fee, an improvement fee or a combination thereof assessed or collected at the time of increased usage of a capital improvement or issuance of a development permit, building permit or connection to the capital improvement. "System development charge" includes that portion of a sewer or water system connection charge that is greater than the amount necessary to reimburse the local government for its average cost of inspecting and installing connections with water and sewer facilities.

(b) "System development charge" does not include any fees assessed or collected as part of a local improvement district or a charge in lieu of a local improvement district assessment, or the cost of complying with requirements or conditions imposed upon a land use decision[*, expedited land division*] or limited land use decision.

**SECTION 43.** ORS 227.160 is amended to read:

227.160. As used in ORS 227.160 to 227.186:

(1) "Hearings officer" means a planning and zoning hearings officer appointed or designated by a city council under ORS 227.165.

(2) "Permit" means discretionary approval of a proposed development of land, under ORS 227.215 or city legislation or regulation. "Permit" does not include:

(a) A limited land use decision as defined in ORS 197.015;

(b) A decision which determines the appropriate zoning classification for a particular use by applying criteria or performance standards defining the uses permitted within the zone, and the determination applies only to land within an urban growth boundary;

(c) A decision which determines final engineering design, construction, operation, maintenance, repair or preservation of a transportation facility which is otherwise authorized by and consistent with the comprehensive plan and land use regulations; or

(d) An expedited land division, as described in ORS [*197.360*] **197.365**.

**SECTION 44.** ORS 227.173 is amended to read:

227.173. [*(1) Approval or denial of a discretionary permit application shall be based on standards and criteria, which shall be set forth in the development ordinance and which shall relate approval or denial of a discretionary permit application to the development ordinance and to the comprehensive plan for the area in which the development would occur and to the development ordinance and comprehensive plan for the city as a whole.*]

**(1) Approval or denial of a discretionary permit application must be based on standards and criteria that are set forth in the development ordinance and that relate approval or denial of a discretionary permit application to the development ordinance and the comprehensive plan for the area in which the development would occur and to the development ordinance and comprehensive plan for the city as a whole.**

(2) When an ordinance establishing approval standards is required under ORS [*197A.200 and*] 197A.400 to provide only clear and objective standards, the standards must be clear and objective on the face of the ordinance.

(3) Approval or denial of a permit application [*or expedited land division shall be*] **must be** based upon and accompanied by a brief statement that explains the criteria and standards considered relevant to the decision, states the facts relied upon in rendering the decision and explains the justification for the decision based on the criteria, standards and facts set forth.

(4) Written notice of the approval or denial [*shall*] **must** be given to all parties to the proceeding.

**SECTION 44a.** ORS 227.175, as amended by section 5, chapter 111, Oregon Laws 2024, is amended to read:

227.175. (1) When required or authorized by a city, an owner of land may apply in writing to the hearings officer, or such other person as the city council designates, for a permit or zone change, upon such forms and in such a manner as the city council prescribes. The governing body shall establish fees charged for processing permits at an amount no more than the actual or average cost of providing that service.

(2) The governing body of the city shall establish a consolidated procedure by which an applicant may apply at one time for all permits or zone changes needed for a development project. The consolidated procedure is subject to the time limitations set out in ORS 227.178. The consolidated procedure shall be available for use at the option of the applicant no later than the time of the first periodic review of the comprehensive plan and land use regulations.

(3) Except as provided in subsection (10) of this section, the hearings officer shall hold at least one public hearing on the application.

(4)(a) A city may not approve an application unless the proposed development of land would be in compliance with the comprehensive plan for the city and other applicable land use regulation or ordinance provisions, including an ordinance described in ORS 197A.400 [*(1)(c)*] **(1)(b)(C)**. The approval may include such conditions as are authorized by ORS 227.215 or any city legislation.

(b)(A) A city may not deny an application for a housing development located within the urban growth boundary if the development complies with clear and objective standards, including clear and objective design standards contained in the city comprehensive plan or land use regulations.

(B) This paragraph does not apply to:

(i) Applications or permits for residential development in areas described in ORS 197A.400 (2); or

(ii) Applications or permits reviewed under an alternative approval process adopted under ORS 197A.400 (3).

(c) A city may not condition an application for a housing development on a reduction in density if:

(A) The density applied for is at or below the authorized density level under the local land use regulations; and

(B) At least 75 percent of the floor area applied for is reserved for housing.

(d) A city may not condition an application for a housing development on a reduction in height if:

(A) The height applied for is at or below the authorized height level under the local land use regulations;

(B) At least 75 percent of the floor area applied for is reserved for housing; and

(C) Reducing the height has the effect of reducing the authorized density level under local land use regulations.

(e) Notwithstanding paragraphs (c) and (d) of this subsection, a city may condition an application for a housing development on a reduction in density or height only if the reduction is necessary to resolve a health, safety or habitability issue or to comply with a protective measure adopted pursuant to a statewide land use planning goal. Notwithstanding ORS 197.350, the city must adopt findings supported by substantial evidence demonstrating the necessity of the reduction.

(f) As used in this subsection:

(A) "Authorized density level" means the maximum number of lots or dwelling units or the maximum floor area ratio that is permitted under local land use regulations.

(B) "Authorized height level" means the maximum height of a structure that is permitted under local land use regulations.

(C) "Habitability" means being in compliance with the applicable provisions of the state building code under ORS chapter 455 and the rules adopted thereunder.

(5) Hearings under this section may be held only after notice to the applicant and other interested persons and shall otherwise be conducted in conformance with the provisions of ORS 197.797.

(6) Notice of a public hearing on a zone use application shall be provided to the owner of an airport, defined by the Oregon Department of Aviation as a "public use airport" if:

(a) The name and address of the airport owner has been provided by the Oregon Department of Aviation to the city planning authority; and

(b) The property subject to the zone use hearing is:

(A) Within 5,000 feet of the side or end of a runway of an airport determined by the Oregon Department of Aviation to be a "visual airport"; or

(B) Within 10,000 feet of the side or end of the runway of an airport determined by the Oregon Department of Aviation to be an "instrument airport."

(7) Notwithstanding the provisions of subsection (6) of this section, notice of a zone use hearing need only be provided as set forth in subsection (6) of this section if the permit or zone change would only allow a structure less than 35 feet in height and the property is located outside of the runway "approach surface" as defined by the Oregon Department of Aviation.

(8) If an application would change the zone of property that includes all or part of a mobile home or manufactured dwelling park as defined in ORS 446.003, the governing body shall give written notice by first class mail to each existing mailing address for tenants of the mobile home or manufactured dwelling park at least 20 days but not more than 40 days before the date of the first hearing on the application. The governing body may require an applicant for such a zone change to pay the costs of such notice.

(9) The failure of a tenant or an airport owner to receive a notice which was mailed does not invalidate any zone change.

(10)(a)(A) The hearings officer or such other person as the governing body designates may approve or deny an application for a permit without a hearing if the hearings officer or other designated person gives notice of the decision and provides an opportunity for any person who is adversely affected or aggrieved, or who is entitled to notice under paragraph (c) of this subsection, to file an appeal.

(B) Written notice of the decision shall be mailed to those persons described in paragraph (c) of this subsection.

(C) Notice under this subsection shall comply with ORS 197.797 (3)(a), (c), (g) and (h) and shall describe the nature of the decision. In addition, the notice shall state that any person who is adversely affected or aggrieved or who is entitled to written notice under paragraph (c) of this subsection may appeal the decision by filing a written appeal in the manner and within the time period provided in the city's land use regulations. A city may not establish an appeal period that is less than 12 days from the date the written notice of decision required by this subsection was mailed. The notice shall state that the decision will not become final until the period for filing a local appeal has expired. The notice also shall state that a person who is mailed written notice of the decision cannot appeal the decision directly to the Land Use Board of Appeals under ORS 197.830.

(D) An appeal from a hearings officer's decision made without hearing under this subsection shall be to the planning commission or governing body of the city. An appeal from such other person as the governing body designates shall be to a hearings officer, the planning commission or the governing body. In either case, the appeal shall be to a de novo hearing.

(E) The de novo hearing required by subparagraph (D) of this paragraph shall be the initial evidentiary hearing required under ORS 197.797 as the basis for an appeal to the Land Use Board of Appeals. At the de novo hearing:

(i) The applicant and other parties shall have the same opportunity to present testimony, arguments and evidence as they would have had in a hearing under subsection (3) of this section before the decision;

(ii) The presentation of testimony, arguments and evidence may not be limited to issues raised in a notice of appeal; and

(iii) The decision maker shall consider all relevant testimony, arguments and evidence that are accepted at the hearing.

(b) If a local government provides only a notice of the opportunity to request a hearing, the local government may charge a fee for the initial hearing. The maximum fee for an initial hearing shall be the cost to the local government of preparing for and conducting the appeal, or $250, whichever is less. If an appellant prevails at the hearing or upon subsequent appeal, the fee for the initial hearing shall be refunded. The fee allowed in this paragraph does not apply to appeals made by neighborhood or community organizations recognized by the governing body and whose boundaries include the site.

(c)(A) Notice of a decision under paragraph (a) of this subsection shall be provided to the applicant and to the owners of record of property on the most recent property tax assessment roll where such property is located:

(i) Within 100 feet of the property that is the subject of the notice when the subject property is wholly or in part within an urban growth boundary;

(ii) Within 250 feet of the property that is the subject of the notice when the subject property is outside an urban growth boundary and not within a farm or forest zone; or

(iii) Within 750 feet of the property that is the subject of the notice when the subject property is within a farm or forest zone.

(B) Notice shall also be provided to any neighborhood or community organization recognized by the governing body and whose boundaries include the site.

(C) At the discretion of the applicant, the local government also shall provide notice to the Department of Land Conservation and Development.

(11) A decision described in ORS 227.160 (2)(b) shall:

(a) Be entered in a registry available to the public setting forth:

(A) The street address or other easily understood geographic reference to the subject property;

(B) The date of the decision; and

(C) A description of the decision made.

(b) Be subject to the jurisdiction of the Land Use Board of Appeals in the same manner as a limited land use decision.

(c) Be subject to the appeal period described in ORS 197.830 (5)(b).

(12) At the option of the applicant, the local government shall provide notice of the decision described in ORS 227.160 (2)(b) in the manner required by ORS 197.797 (2), in which case an appeal to the board shall be filed within 21 days of the decision. The notice shall include an explanation of appeal rights.

(13) Notwithstanding other requirements of this section, limited land use decisions are subject to the requirements set forth in ORS 197.195 and 197.828.

**SECTION 44b. The amendments to ORS 227.175 by section 44a of this 2025 Act become operative on July 1, 2025.**

**SECTION 45.** ORS 227.179 is amended to read:

227.179. (1) [*Except when an applicant requests an extension under ORS 227.178 (5),*] If the governing body of a city or its designee does not take final action on an application [*for a permit, limited land use decision or zone change within 120 days after the application is deemed complete*] **within the period allowed under ORS 227.178**, the applicant may file a petition for a writ of mandamus under ORS 34.130 in the circuit court of the county where the application was submitted to compel the governing body or its designee to issue the approval.

(2) The governing body shall retain jurisdiction to make a land use decision on the application until a petition for a writ of mandamus is filed. Upon filing a petition under ORS 34.130, jurisdiction for all decisions regarding the application, including settlement, shall be with the circuit court.

(3) A person who files a petition for a writ of mandamus under this section shall provide written notice of the filing to all persons who would be entitled to notice under ORS 197.797 and to any person who participated orally or in writing in any evidentiary hearing on the application held prior to the filing of the petition. The notice shall be mailed or hand delivered on the same day the petition is filed.

(4) If the governing body does not take final action on an application within [*120 days of the date the application is deemed complete*] **the period allowed under ORS 227.178**, the applicant may elect to proceed with the application according to the applicable provisions of the local comprehensive plan and land use regulations or to file a petition for a writ of mandamus under this section. If the applicant elects to proceed according to the local plan and regulations, the applicant may not file a petition for a writ of mandamus within 14 days after the governing body makes a preliminary decision, provided a final written decision is issued within 14 days of the preliminary decision.

(5) The court shall issue a peremptory writ unless the governing body or any intervenor shows that the approval would violate a substantive provision of the local comprehensive plan or land use regulations as those terms are defined in ORS 197.015. The writ may specify conditions of approval that would otherwise be allowed by the local comprehensive plan or land use regulations.

**SECTION 46.** ORS 227.184 is amended to read:

227.184. (1) A person whose application [*for a permit*] is denied by the governing body of a city or its designee under ORS 227.178 may submit to the city a supplemental application for any or all

other uses allowed under the city's comprehensive plan and land use regulations in the zone that was the subject of the denied application.

(2) The governing body of a city or its designee shall take final action on a supplemental application submitted under this section, including resolution of all appeals, within 240 days after the application is deemed complete. Except that 240 days shall substitute for 120 days, all other applicable provisions of ORS 227.178 shall apply to a supplemental application submitted under this section.

(3) A supplemental application submitted under this section shall include a request for any rezoning or zoning variance that may be required to issue a permit under the city's comprehensive plan and land use regulations.

(4) The governing body of a city or its designee shall adopt specific findings describing the reasons for approving or denying:

(a) A use for which approval is sought under this section; and

(b) A rezoning or variance requested in the application.

**SECTION 47.** ORS 421.649 is amended to read:

421.649. (1) The Department of Corrections shall obtain public services necessary for the construction and operation of a women's correctional facility and intake center complex in the manner provided under ORS 421.628 (4) to (15).

(2) Regardless of the territorial limits of the public body providing public services to the complex, and notwithstanding any other law, upon request or application from the department, the public body shall provide any public service necessary for the construction and operation of the complex. During the pendency of any mediation, arbitration or judicial review proceeding under this section, the public body shall provide any public service necessary for the continued construction and operation of the complex, as requested by the department.

(3) The existence of a public service provided to the complex [*shall*] **may** not be a consideration in support of or in opposition to an application for a land use decision[,] **or** limited land use decision [*or expedited land division*] under ORS chapter 197, 197A, 215 or 227.

**SECTION 48.** ORS 476.394 is amended to read:

476.394. (1) The minimum defensible space requirements established by the State Fire Marshal pursuant to ORS 476.392 may not be used as criteria to approve or deny:

(a) An amendment to a local government's acknowledged comprehensive plan or land use regulations.

(b) A permit, as defined in ORS 215.402 or 227.160.

(c) A limited land use decision, as defined in ORS 197.015.

(d) An expedited land division, as [*defined in ORS 197.360*] **described in ORS 197.365**.

(2) Notwithstanding subsection (1) of this section, a local government may:

(a) Amend the acknowledged comprehensive plan or land use regulations of the local government to include the requirements; and

(b) Use the requirements that are included in the amended acknowledged comprehensive plan or land use regulations as a criterion for a land use decision.

**SECTION 48a. Notwithstanding section 48 of this 2025 Act (amending ORS 476.394), if Senate Bill 83 becomes law, ORS 476.394 is repealed by section 1, chapter ___, Oregon Laws 2025 (Enrolled Senate Bill 83).**

**SECTION 49.** Section 1, chapter 110, Oregon Laws 2024, is amended to read:

**Sec. 1.** (1) The Department of Land Conservation and Development and the Department of Consumer and Business Services shall enter into an interagency agreement to establish and administer the Housing Accountability and Production Office.

(2) The Housing Accountability and Production Office shall:

(a) Provide technical assistance, including assistance through grants, to local governments to:

(A) Comply with housing laws;

(B) Reduce permitting and land use barriers to housing production; and

(C) Support reliable and effective implementation of local procedures and standards relating to the approval of residential development projects.

(b) Serve as a resource, which includes providing responses to requests for technical assistance with complying with housing laws, to:

(A) Local governments, as defined in ORS 174.116; and

(B) Applicants for land use and building permits for residential development who are experiencing permitting and land use barriers related to housing production.

(c) Investigate and respond to complaints of violations of housing laws under section 2**, chapter 110, Oregon Laws 2024** [*of this 2024 Act*].

(d) Establish best practices related to model codes, typical drawings and specifications as described in ORS 455.062, procedures and practices by which local governments may comply with housing laws.

(e) Provide optional mediation of active disputes relating to housing laws between a local government and applicants for land use and building permits for residential development, including mediation under ORS 197.860.

(f) Coordinate agencies that are involved in the housing development process, including, but not limited to, the Department of Land Conservation and Development, Department of Consumer and Business Services, Housing and Community Services Department and Oregon Business Development Department, to enable the agencies to support local governments and applicants for land use and building permits for residential development by identifying state agency technical and financial resources that can address identified housing development and feasibility barriers.

(g) Establish policy and funding priorities for state agency resources and programs for the purpose of addressing barriers to housing production, including, but not limited to, making recommendations for moneys needed for the purposes of section 35**, chapter 110, Oregon Laws 2024** [*of this 2024 Act*].

(3) The Land Conservation and Development Commission and the Department of Consumer and Business Services shall coordinate in adopting, amending or repealing rules for:

(a) Carrying out the respective responsibilities of the departments and the office under sections 1 to 5**, chapter 110, Oregon Laws 2024** [*of this 2024 Act*].

(b) Model codes, development plans, procedures and practices by which local governments may comply with housing laws.

(c) Establishing standards by which complaints are investigated and pursued.

(4) The office shall prioritize assisting local governments in voluntarily undertaking changes to come into compliance with housing laws.

(5) As used in sections 1 to 5**, chapter 110, Oregon Laws 2024** [*of this 2024 Act*]:

(a) "Housing law" means ORS chapter 197A and ORS 92.010 to 92.192, 92.830 to 92.845, 197.360**, 197.365** [*to 197.380*], 197.475 to 197.493, 197.505 to 197.540, 197.660 to 197.670, 197.748, 215.402 to 215.438, 227.160 to 227.186, 455.148, 455.150, 455.152, 455.153, 455.156, 455.157, 455.165, 455.170, 455.175, 455.180, 455.185 to 455.198, 455.200, 455.202 to 455.208, 455.210, 455.220, 455.465 and 455.467 and administrative rules implementing those laws, to the extent that the law or rule imposes a mandatory duty on a local government or its officers, employees or agents and the application of the law or rule applies to residential development or pertains to a permit for a residential use or a division of land for residential purposes.

(b) "Residential" includes mixed-use residential development.

## APPROPRIATIONS

**SECTION 50. Notwithstanding any other provision of law, the General Fund appropriation made to the Department of Land Conservation and Development by section 1 (1), chapter ___, Oregon Laws 2025 (Enrolled Senate Bill 5528), for the biennium beginning July 1, 2025, for the planning program, is increased by $2,391,599 to support rulemaking and other work related to the development of middle housing.**

**SECTION 51.** **Notwithstanding any other provision of law, the General Fund appropriation made to the Department of Land Conservation and Development by section 1 (2), chapter ___, Oregon Laws 2025 (Enrolled Senate Bill 5528), for the biennium beginning July 1, 2025, for grant programs, is increased by $1,500,000 for technical assistance grants related to middle housing.**

## UNIT CAPTIONS

**SECTION 52.** **The unit captions used in this 2025 Act are provided only for the convenience of the reader and do not become part of the statutory law of this state or express any legislative intent in the enactment of this 2025 Act.**

## EMERGENCY CLAUSE

**SECTION 53.** **This 2025 Act being necessary for the immediate preservation of the public peace, health and safety, an emergency is declared to exist, and this 2025 Act takes effect on its passage.**

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**Passed by House June 18, 2025**

**Repassed by House June 26, 2025**

.....
Timothy G. Sekerak, Chief Clerk of House

.....
Julie Fahey, Speaker of House

**Passed by Senate June 24, 2025**

.....
Rob Wagner, President of Senate

**Received by Governor:**

.....M.,....., 2025

**Approved:**

.....M.,....., 2025

.....
Tina Kotek, Governor

**Filed in Office of Secretary of State:**

.....M.,....., 2025

.....
Tobias Read, Secretary of State

**197A.018 Definition of "needed housing."** (1) As used in ORS chapter 197A, and except as provided in subsection (2) of this section:

(a) "Needed housing" means housing by affordability level, as described in ORS 184.453 (4), type, characteristics and location that is necessary to accommodate the city's allocated housing need over the 20-year planning period in effect when the city's housing capacity is determined.

(b) "Needed housing" includes the following housing types:

(A) Detached single-family housing, middle housing types as described in ORS 197A.420 and multifamily housing that is owned or rented;

(B) Government assisted housing;

(C) Mobile home or manufactured dwelling parks as provided in ORS 197.475 to 197.493;

(D) Manufactured homes on individual lots planned and zoned for single-family residential use that are in addition to lots within designated manufactured dwelling subdivisions;

(E) Housing for agricultural workers;

(F) Housing for individuals with a variety of disabilities, related to mobility or communications that require accessibility features;

(G) Housing for older persons, as defined in ORS 659A.421;

(H) Housing for college or university students, if relevant to the region; and

(I) Single room occupancies as defined in ORS 197A.430.

(2) Subsection (1)(b)(A) and (D) of this section does not apply to:

(a) A city with a population of less than 2,500.

(b) A county with a population of less than 15,000.

(3) At the time that a city is required to inventory its buildable lands under ORS 197A.270, 197A.280 or 197A.335 (1), the city shall determine its needed housing under this section.

(4) In determining needed housing the city must demonstrate that the projected housing types, characteristics and locations are:

(a) Attainable for the allocated housing need by income, including consideration of publicly supported housing;

(b) Appropriately responsive to current and projected market trends; and

(c) Responsive to the factors in ORS 197A.100 (2)(b) to (d). [2023 c.13 §23; 2023 c.223 §19]

**197A.420 Duplexes; middle housing.** (1) As used in this section:

(a) "City" or "city with a population of 25,000 or greater" includes, regardless of size, any city within Tillamook County and the communities of Barview/Twin Rocks/Watseco, Cloverdale, Hebo, Neahkahnie, Neskowin, Netarts, Oceanside and Pacific City/Woods.

(b) "Cottage clusters" means groupings of no fewer than four detached housing units per acre with a footprint of less than 900 square feet each and that include a common courtyard.

(c) "Middle housing" means:

(A) Duplexes;

(B) Triplexes;

(C) Quadplexes;

(D) Cottage clusters; and

(E) Townhouses.

(d) "Townhouses" means a dwelling unit constructed in a row of two or more attached units, where each dwelling unit is located on an individual lot or parcel and shares at least one common wall with an adjacent unit.

(2) Except as provided in subsection (4) of this section, each city with a population of 25,000 or greater and each county or city within a metropolitan service district shall allow the development of:

(a) All middle housing types in areas zoned for residential use that allow for the development of detached single-family dwellings; and

(b) A duplex on each lot or parcel zoned for residential use that allows for the development of detached single-family dwellings.

(3) Except as provided in subsection (4) of this section, each city not within a metropolitan service district with a population of 2,500 or greater and less than 25,000 shall allow the development of a duplex on each lot or parcel zoned for residential use that allows for the development of detached single-family dwellings. Nothing in this subsection prohibits a local government from allowing middle housing types in addition to duplexes.

(4)(a) Except within Tillamook County, this section does not apply to:

(A) Cities with a population of 1,000 or fewer, except inside of Tillamook County;

(B) Lands not within an urban growth boundary;

(C) Lands that are not incorporated and also lack sufficient urban services, as defined in ORS 195.065; or

(D) Lands that are not incorporated and are zoned under an interim zoning designation that maintains the land's potential for planned urban development.

(b) This section does not apply to lands that are not zoned for residential use, including lands zoned primarily for commercial, industrial, agricultural or public uses.

(5) Local governments may regulate siting and design of middle housing required to be permitted under this section, provided that the regulations do not, individually or cumulatively, discourage the development of all middle housing types permitted in the area through unreasonable costs or delay. Local governments may regulate middle housing to comply with protective measures adopted pursuant to statewide land use planning goals.

(6) This section does not prohibit local governments from permitting:

(a) Single-family dwellings in areas zoned to allow for single-family dwellings; or

(b) Middle housing in areas not required under this section.

(7) A local government that amends its comprehensive plan or land use regulations relating to allowing additional middle housing is not required to consider whether the amendments significantly affect an existing or planned transportation facility. [Formerly 197.758]

# Department of Early Learning and Care

## Chapter 414

### Division 305
### CERTIFIED CHILD CARE CENTERS

**414-305-0920**
**Outdoor Play Areas**

(1) A certified child care center must provide an outdoor play area that children can reach safely.
(2) If an outdoor play area is not connected to or in direct control of the certified child care center, such as a public park or school, the center must have a written plan, approved by CCLD, that describes how the center will maintain the safety of the children in care. The written plan must include the following:
(a) Distance the alternate outdoor play area is located from the center;
(b) Detailed description of how the children, including infants and toddlers, will reach the alternate area;
(c) Neighborhood and outdoor play area circumstances, hazards, and risks;
(d) Availability of appropriate equipment with fall zones and protective surfacing;
(e) Verification that parents have been made aware that their children will be using an alternate outside play area and its location;
(f) Safeguards the center will be taking in order to ensure children are properly supervised while traveling to and from and while using the space;
(g) Nature of other activities and persons who may be sharing the space;
(h) Availability of restroom facilities; and
(i) Ability to obtain assistance if needed when injury or illness occurs.
(3) A certified child care center must keep outdoor play areas free of litter, animal waste, solid waste and refuse, ditches, or other conditions presenting a potential hazard.
(4) The outdoor play areas used by children not yet attending kindergarten must be enclosed by a building, wall or fence that is intended to prevent children from exiting and discourages climbing.
(a) The wall or fence must begin at ground level, be at least 4 feet high, and maintained in a stable, secure, and upright condition. Centers with certification in effect on July 15, 2001, must comply with a barrier at least 3 feet high until such time as the existing barrier is replaced.
(b) The openings in the fence and gates must be no larger than 3½ inches. Centers with certification if effect on January 1, 2024, must comply with no more than 4 inches of open spacing in fences until the existing fence is replaced.
(c) Barriers such as plastic contractor's fencing may be used on a temporary basis to prevent children from accessing an immediate hazard. If this type of fencing is used, it must be supported with wood or metal fence posts.
(5) A certified child care center must ensure that use zones in which a child falling or exiting from play equipment are:
(a) A minimum of 6 feet of clearance from walkways, buildings and the external perimeter of equipment;
(b) Free of obstacles, other than the equipment itself, that a child could run into or fall on;
(c) Arranged to prevent hazards from conflicting activities;
(d) Extended at least 6 feet in all directions from the equipment perimeter unless the fall potential in that direction is minimal, such as play equipment with guardrails or barriers or the sides of swings;
(e) Allowing for single-axis swings that move forward and backward, to extend a minimum distance of twice the vertical distance from the pivot point to the protective surface to the front and rear of the swing midpoint;
(f) Allowing for bucket swings and swings secured by a bar or strap and used by 2-year-olds or younger, with the use zone extending at least 6 feet forward and backward from the swing midpoint;
(g) Allowing for multi-axis swings, such as tire swings that move in a circle, to extend 6 feet plus the distance of the height of the top of the swing set to the bottom on the swing's seat in every direction from the midpoint. At least a 30-inch clearance between a fully extended tire swing seat and the support structure is required.
(6) A certified child care center must always maintain protective surfacing in use zones under and around all outdoor equipment of 18 inches or higher. Acceptable materials include wood mulch, double shredded bark mulch, shredded or recycled rubber, uniform wood chips, sand, pea gravel, rubber mats or poured in place rubber manufactured for such use. Hog fuel is not permitted.
(a) Rubber mats and poured in place rubber must:
(A) Be tested to ASTM F1292;
(B) Be installed and maintained according to manufacturer's specifications; and
(C) Not have rips, tears, loose seams, or other conditions that may pose a hazard.
(b) Loose-fill materials must:
(A) Have a minimum depth of 9 inches if using loose-fill material other than shredded/recycled rubber or 6 inches if using

shredded/recycled rubber;
(B) Remain loose at the required depth by replacing, leveling, or raking the material; and
(C) Not be installed over concrete or asphalt.
(7) A certified child care center must securely anchor any non-portable piece of climbing or swinging equipment according to manufacturer's instructions.
(8) A certified child care center must provide a shaded area accessible to children in the outdoor play areas. Shade may be provided by trees, buildings, or shade structures.
(9) The play equipment is arranged to allow for an open, continuous, uninterrupted, and unobstructed area.
(10) Trampolines, other than rebounders, are prohibited. Rebounders are permitted only when used according to manufacturer's instructions.
(11) Inflatable equipment such as: bounce houses, moon walkers, and giant slides, etc., are permitted when used according to manufacturer's instructions. Staff must be physically positioned to respond if needed.
(12) A certified child care center must provide outdoor gross motor equipment that addresses a variety of skills (for example, climbing, balancing, throwing, catching, pedaling, and steering).
(13) A certified child care center must ensure each child, while on the premises, using a bicycle, tricycle, balance bike, scooter, skateboard, roller or in-line skates, wears a well-fitting helmet, whether indoors or outdoors.

**Statutory/Other Authority:** ORS 329A.260
**Statutes/Other Implemented:** ORS 329A.260
**History:**
DELC 45-2024, minor correction filed 04/12/2024, effective 04/12/2024
ELD 10-2023, adopt filed 06/28/2023, effective 01/01/2024

# City of Newport
## Planning Commission Regular Session Minutes
## July 14, 2025

**LOCATION:** CITY COUNCIL CHAMBERS, NEWPORT CITY HALL 169 SW COAST HIGHWAY NEWPORT
**Time Start:** 7:00 P.M. **Time End:** 7:10 P.M.

### ATTENDANCE LOG/ROLLCALL

| COMMISSIONER/ ADVISORY MEMBER | STAFF |
|---|---|
| Chair Bill Branigan | Derrick Tokos, Community Development Director |
| Commissioner Bob Berman | Sherri Marineau, Community Development Dept. |
| Commissioner Jim Hanselman | |
| Commissioner Gary East | **PUBLIC** |
| Commissioner Braulio Escobar (absent, excused) | |
| Commissioner John Updike | |
| Commissioner Robert Bare | |
| | |

| AGENDA ITEM | ACTIONS |
|---|---|
| **REGULAR MEETING** | |
| **CALL TO ORDER AND ROLL CALL**<br>a. Roll Call | None. |
| **APPROVAL OF THE MINUTES**<br>a. Meeting minutes of Work Session Meeting on June 23, 2025.<br>b. Meeting minutes of Regular Session Meeting on June 23, 2025. | Motion by Berman, seconded by East, to approve the work session meeting minutes of June 23, 2025 as written. MOTION carried unanimously with Branigan, Berman, Hanselman, East, Updike, and Bare all voting in favor.<br><br>Motion by Berman, seconded by East, to approve the regular session meeting minutes of June 23, 2025 as written. MOTION carried unanimously with Branigan, Berman, Hanselman, East, Updike, and Bare all voting in favor. |
| **CITIZEN/PUBLIC COMMENT** | None. |
| **ACTION ITEMS**<br>**Initiate Legislative Process for Draft Zoning Ordinance Housekeeping Amendments.** | Motion was made by Berman, seconded by Updike, to initiate the legislative process for the draft Zoning Ordinance housekeeping amendments. MOTION carried unanimously with Branigan, Berman, Hanselman, East, Updike, and Bare all voting in favor. |

| | |
|---|---|
| **Initiate Legislative Process to Amend the Wastewater Section of the Comprehensive Plan.** | Motion was made by Berman, seconded by Bare, to initiate the legislative process to amend the Wastewater Section of the Comprehensive Plan. MOTION carried unanimously with Branigan, Berman, Hanselman, East, Updike, and Bare all voting in favor. |
| **DIRECTORS COMMENTS** | Tokos reported that a public hearing on the geologic hazards reports will be held at the next City Council meeting.<br><br>The City received the Wyndhaven Phase 3 plan on June 30th. Developers are utilizing the provision for market-rate developments with over 20 units, which allows the City to cover plan review and inspection fees using Affordable Housing Excise Tax funds.<br><br>OSU will be dredging the 40th Street pond in August, and the City has entered into a reimbursement agreement to provide funding that supports removing additional material during the process. This item is scheduled to be presented to the City Council at their upcoming meeting. In addition, the City is working with ODOT on signalization at 40th Street, though progress has been slow due to staffing reductions at ODOT. |

Submitted by: Sherri Marineau

Sherri Marineau, Executive Assistant

**Derrick Tokos**

**From:** DLCD Plan Amendments <plan.amendments@dlcd.oregon.gov>
**Sent:** Wednesday, July 16, 2025 4:23 PM
**To:** Derrick Tokos
**Subject:** Confirmation of PAPA Online submittal to DLCD

**Newport**

Your notice of a proposed change to a comprehensive plan or land use regulation has been received by the Oregon Department of Land Conservation and Development.
Local File #: 3-Z-25
DLCD File #: 004-25
Proposal Received: 7/16/2025
First Evidentiary Hearing: 8/25/2025
Final Hearing Date: 10/6/2025
Submitted by: dtokos

If you have any questions about this notice, please reply or send an email to plan.amendments@dlcd.oregon.gov.

**CITY OF NEWPORT**

**NOTICE OF A PUBLIC HEARING.**

The Newport Planning Commission will hold a public hearing on Monday, August 25, 2025, at 7:00 p.m. in the City Hall Council Chambers to review and make a recommendation to the Newport City Council on File No. 3-Z-25, which includes housekeeping amendments to Newport Municipal Code (NMC) Chapter 14 and changes required as part of HB 2138 (2025). Pursuant to Newport Municipal Code (NMC) Section 14.36.010, the Commission must find that the change is required by public necessity and the general welfare of the community in order for it to make a recommendation to the City Council that the amendments be adopted. Testimony and evidence must be directed toward the request above or other criteria, including criteria within the Comprehensive Plan and its implementing ordinances, which the person believes to apply to the decision. Failure to raise an issue with sufficient specificity to afford the city and the parties an opportunity to respond to that issue precludes an appeal, including to the Land Use Board of Appeals, based on that issue. Testimony may be submitted in written or oral form. Oral testimony and written testimony will be taken during the course of the public hearing. The hearing may include a report by staff, testimony from the applicant and proponents, testimony from opponents, rebuttal by the applicant, and questions and deliberation by the Planning Commission. Written testimony sent to the Community Development (Planning) Department, City Hall, 169 SW Coast Hwy, Newport, OR 97365, must be received by 3:00 p.m. the day of the hearing to be included as part of the hearing or must be personally presented during testimony at the public hearing. The proposed code amendments, additional material for the amendments, and any other material in the file may be reviewed or a copy purchased at the Newport Community Development Department (address above). Contact Derrick Tokos, Community Development Director, (541) 574-0626, d.tokos@newportoregon.gov (address above).

***(FOR PUBLICATION ONCE ON WEDNESDAY, August 13, 2025)***

standard time, as established by ORS 187.110, AT THE OLIVE STREET ENTRANCE TO THE LINCOLN COUNTY COURTHOUSE, 225 W OLIVE STREET, NEWPORT, OR 97365, sell at public auction to the highest bidder in the form of cash equivalent (certified funds or cashier's check) the interest in the above-described real property which the grantor had or had power to convey at the time it executed the Deed of Trust, together with any interest which the grantor or his successors in interest acquired after the execution of the Deed of Trust, to satisfy the foregoing obligations thereby secured and the costs and expenses of sale, including a reasonable charge by the trustee. Notice is further given that any person named in ORS 86.778 has the right to have the foreclosure proceeding dismissed and the Deed of Trust reinstated by payment to the beneficiary of the entire amount then due (other than the portion of principal that would not then be due had no default occurred), together with the costs, trustee's and attorneys' fees, and curing any other default complained of in the Notice of Default by tendering the performance required under the Deed of Trust at any time not later than five days before the date last set for sale. Without limiting the trustee's disclaimer of representations or warranties, Oregon law requires the trustee to state in this notice that some residential property sold at a trustee's sale may have been used in manufacturing methamphetamines, the chemical components of which are known to be toxic. Prospective purchasers of residential property should be aware of this potential danger before deciding to place a bid for this property at the trustee's sale. In construing this notice, the masculine gender includes the feminine and the neuter, the singular includes plural, the word "grantor" includes any successor in interest to the grantor as well as any other persons owing an obligation, the performance of which is secured by the Deed of Trust, the words "trustee" and ' beneficiary" include their respective successors in interest, if any. Dated: 7/18/2025 CLEAR RECON CORP 1915 NE Stucki Avenue, Suite 400 Hillsboro, OR 97006 Phone: 858-750-7777 866-931-0036 By: Name: Hamsa Uchi Authorized Signatory of Trustee. A13 A20 A27 S3

**NOTICE OF A PUBLIC HEARING. LCL25-0364**

The City of Newport Planning Commission will hold a public hearing on Monday, August 25, 2025, at 7:00 p.m. in the City Hall Council Chambers to review and make a recommendation to the Newport City Council on a Comprehensive Plan text amendment (File No. 2-CP-25). The proposed legislative amendments are to the "Wastewater Facilities" and "Goals and Policies" sections of the "Public Facilities" element of the Newport Comprehensive Plan. Amendments incorporate the final "Wastewater Treatment Master Plan. (mailing address above).

**LCL25-0365 CITY OF NEWPORT NOTICE OF A PUBLIC HEARING.**

The Newport Planning Commission will hold a public hearing on Monday, August 25, 2025, at 7:00 p.m. in the City Hall Council Chambers to review and make a recommendation to the Newport City Council on File No. 3-Z-25, which includes housekeeping amendments to Newport Municipal Code (NMC) Chapter 14 and changes required as part of HB 2138 (2025). Pursuant to Newport Municipal Code (NMC) Section 14.36.010, the Commission must find that the change is required by public necessity and the general welfare of the community in order for it to make a recommendation to the City Council that the amendments be adopted. Testimony and evidence must be directed toward the request above or other criteria, including criteria within the Comprehensive Plan and its implementing ordinances, which the person believes to apply to the decision. Failure to raise an issue with sufficient specificity to afford the city and the parties an opportunity to respond to that issue precludes an appeal, including to the Land Use Board of Appeals, based on that issue. Testimony may be submitted in written or oral form. Oral testimony and written testimony will be taken during the course of the public hearing. The hearing may include a report by staff, testimony from the applicant and proponents, testimony from opponents, rebuttal by the applicant, and questions and deliberation by the Planning Commission. Written testimony sent to the Community Development (Planning) Department, City Hall, 169 SW Coast Hwy, Newport, OR 97365, must be received by 3:00 p.m. the day of the hearing to be included as part of the hearing or must be personally presented during testimony at the public hearing. The proposed code amendments, additional material for the amendments, and any other material in the file may be reviewed or a copy purchased at the Newport Community Development Department (address above). Contact Derrick Tokos, Community Development Director, (541) 574-0626, d.tokos@newportoregon.gov (address above).

**LCL25-0368 ON AUGUST 24TH, 2025, AT 12:00PM**

A public sale of the contents of 1 abandoned storage unit will be held at Seal Rock Stor & Lock a self-storage facility located at 10645 NW Pacific Coast Hwy, Seal Rock, OR 97376 - managed by Dolphin Real Estate LLC. Said contents shall be sold by a public auction and in "AS IS" condition (there is no warranty relating to title, possession, quiet enjoyment or the like) to the highest bidder, said auction to be conducted on site at 12:00PM on August 24th, 2025, at 10645 SW Pacific Coast Hwy, Seal Rock, OR 97367. The owner of the abandoned personal property that will be sold

er Quinton, who has been appointed and has qualified as the personal representative of the estate as of July 25, 2025. All persons having claims against the estate are hereby required to present the same, with proper vouchers, within four months after the date of first publication of this notice, as stated below, to the personal representative at: Heather Quinton, 1102 7th Street, Lafayette, OR 97127 or they may be barred. All persons whose rights may be affected by the proceedings in this estate may obtain additional information from the records of the courts, the personal representative or the attorney for the personal representative. Date first published: August 13, 2025. /S/ Jeffrey C. Pridgeon, Attorney for Personal Representative, Heather Quinton.

**LCL25-0371 A REGULAR MEETING OF THE BOARD OF DIRECTORS OF CENTRAL LINCOLN PUD**

Will be held at 9:00 a.m. on Wednesday August 20, 2025 at 2129 N. Coast Hwy. Newport, Oregon. To review the meeting agenda, please go to clpud.org. Customers interested in attending the meeting virtually can email info@clpud.org to make a request.

**LCL25-0372 ADVERTISEMENT FOR BIDS CITY OF TOLEDO TOLEDO, OREGON SE STURDEVANT ROAD WATERLINE REPLACEMENT PROJECT**

General Notice The City of Toledo (Owner) is requesting Bids for the construction of the following Project: SE Sturdevant Road Waterline Replacement Project Bids for the construction of the Project will be received at the Toledo City Hall located at 206 N Main St. Toledo, OR 97391, until September 16th, 2025 at 2:00 PM local time. Bids may also be mailed to the following address: Brian Lorimor, Public Works Director, City of Toledo, PO Box 220, Toledo, OR 97391 pwdirector@cityoftoledo.org The envelope or body of the email shall plainly identify (1) the Project name, (2) the Bidder name, and (3) the Bidders contractor's license number. To ensure your bid is accepted in its entirety, please combine all documents into a single PDF file attached to your email. Bidders shall be responsible for calling the City of Toledo at 541-336-2247 EXTENSION 2070 before the proposal deadline to confirm the bid was received. Bids and all associated documents must be received by the City of Toledo by 2:00 PM. At that time the Bids received will be publicly opened and read. The Project includes the following Work: Install ~1,800 linear feet of 12" HDPE waterline along the southbound lane of SE Sturdevant Road. Plug and abandon ~1,800 LF of existing 6-inch asbestos cement line in place. Connect new service lines of varying sizes to existing adjacent mains. Reconnect eight (8) existing water meters and one

required but is recommended. Instructions to Bidders. For all further requirements regarding bid submittal, qualifications, procedures, and contract award, refer to the Instructions to Bidders that are included in the Bidding Documents. This Advertisement is issued by: Owner: City of Toledo, By: Brian Lorimor, Title: Public Works Director, Date: August 13th 2025, Lincoln County Leader, Newport, Lincoln County, Oregon] August 13th & 15th 2025, Daily Journal of Commerce, Portland, OR, August 13th 2025

**LCL25-0373 PURSUANT TO ORS CHAPTER 819**

Notice is hereby given that the following vehicle will be sold, for cash to the highest bidder, on

**LEGAL NOTICE TO INTERESTED PERSONS**

NOTICE IS HEREBY GIVEN that ANA G. ARIAS has been appointed Personal Representative ("PR") of the Estate of MARTHA A. CHRISTOPHERSON, Deceased, by the Lincoln County Circuit Court of the State of Oregon probate No. 25PB06799. All persons having claims against the Estate are required to present them, with proper vouchers, within four (4) months after the date of first publication of this notice to the PR at the address below or the claims may be barred. All persons whose rights may be affected by the proceedings may obtain additional information from the records of the Court, the PR or the attorneys for the PR. DATED and first

lcoln County Records, i- the City of Waldport, Lir lcoln County, Oregor Commonly known as 1575 SW Fairway Dr, Waldport, OR 97394 The current beneficiary is Nationstar Mortgage LLC pursuant to assignment of deed of trust recorded on 12/14/2023 as Inst No. 2023-08641 in the records of Lincoln, Oregon. The beneficiary has elected and directed successor trustee to sell the said real property to satisfy the obligations secured by said trust deed and notice has been recorded pursuant to Section 86.752(3) of Oregon Revised Statutes: the default for which the foreclosure is made is the grantor's failure to: Make the monthly payments commencing with the payment due on 07/01/2024 and continuing each month until this

8/13/2025

# Super Crosswo

**ACROSS**

1 Served in blazing liquor
7 Longtime executive of the Oakland Raiders
14 Utters words
20 Tulip relatives
21 Divider of musical measures
22 Began vigorously
23 Classic board game played by judges between trials?
25 Put in a box
26 Ending for priest
27 Gets frantic with fear
28 Oil rig part
30 Feel sore
31 Russian war vessel on which a classic board game is played?
35 Person knocking over a drink, e.g.
38 "— queen!" ("You go!")
39 Grandiosity
40 "Toodle-oo!"
41 Bauxite, e.g.
44 Publish anew
47 Neighbor of Mich. and Ill.
50 Review of a classic board game?
54 Quiver
56 Tangle up
57 Trifecta, e.g.
58 1/60 min.
60 Like some noisy little dogs
61 —OPs (CIA tactics)
62 Maple or oak
64 Morally rigid
68 60% of cinco
69 Classic board game that's popular with inhabitants of heaven?
73 Make whole again
75 San Francisco's region
76 Don of radio
77 Tennis match unit
80 First-string players
82 Springfield's Flanders
83 Singapore sling liquor
85 Havana resident, to Havanans
87 Infatuate
89 Classic board game played at a shindig?
93 Tennis court divider
94 Of atomic weapons
96 "... or — thought!"
97 Filly's father
98 Mexican 81-Down
99 "Combat!" actor Morrow
101 Captured with a rope
104 Classic board game you keep making people play even though they have no interest?
111 Appeal
112 Voting group
113 One causing fright
114 Ovid's "— Amatoria"
117 Regard highly
119 Shop dedicated to selling a classic board game?
123 Prickly plant
124 Snooty sort
125 "Everything's good here"
126 "Marty" star Borgnine
127 When a check to a landlord is due
128 "— what your country can do for you ..."

**DOWN**

1 Big ice sheet
2 They may be chapped
3 Toby brews
4 Space station until 2001
5 "C'mon, help me out here"
6 Will subject
7 Bubbling over
8 Knight's weapon
9 Containing smelting waste
10 TV title ET
11 Cruella De — ("101 Dalmatians" meanie)
12 Like purchases gotten via the program
13 Close using stitches
14 Cleaned with a broom
15 Ballpoint, e.g.
16 Put up tents
17 Sharp as —
18 Maker of GOLEAN cereals
19 Dutch genre painter Jan
24 Preludes
29 Janitors' tools
31 Actress Lively
32 Injure
33 "Got it now"