



Kent Taylor Civic Hall  
Council Chambers  
200 NE Second Street  
McMinnville, OR 97128

## City Council Meeting Agenda

Tuesday, October 12, 2021

7:00 p.m. – City Council Regular Meeting

**EXECUTIVE SESSION – to immediately follow the Regular City Council Meeting (CLOSED TO THE PUBLIC)**

**REVISED 10/08/2021**

Welcome! Based on continued public health concerns, **Civic Hall will be closed to the public.** Until improvements of COVID cases in Yamhill County improve **meetings will be held via Zoom and live broadcast ONLY.**

The public is strongly encouraged to relay concerns and comments to the Council in one of three ways:

- Email at any time up to 12 p.m. the day of the meeting to [Claudia.Cisneros@mcminnvilleoregon.gov](mailto:Claudia.Cisneros@mcminnvilleoregon.gov);
- If appearing via telephone only please sign up prior to the meeting by emailing the City Recorder at [Claudia.Cisneros@mcminnvilleoregon.gov](mailto:Claudia.Cisneros@mcminnvilleoregon.gov) as the chat function is not available when calling in zoom;
- Join the zoom meeting; send a chat directly to City Recorder, Claudia Cisneros, to request to speak and use the raise hand feature in zoom to request to speak, once your turn is up we will announce your name and unmute your mic. **You will need to provide your First and Last name, Address, contact information (email or phone)**

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You can live broadcast the City Council Meeting on cable channels Xfinity 11 and 331,  
Frontier 29 or webstream here:

[www.mcm11.org/live](http://www.mcm11.org/live)

### **CITY COUNCIL REGULAR MEETING:**

You may join online via Zoom Meeting:

<https://mcminnvilleoregon.zoom.us/j/89346106834?pwd=MGQyRi8wcVZbZlhQ3hVTFFxazVaQT09>

Zoom ID: 893 4610 6834

Zoom Password: 116037

Or you can call in and listen via zoom: 1-253- 215- 8782

ID: 893 4610 6834

## **7:00 PM – REGULAR COUNCIL MEETING – VIA ZOOM & LIVE BROADCAST ONLY**

1. CALL TO ORDER & ROLL CALL
2. PLEDGE OF ALLEGIANCE
3. INVITATION TO COMMUNITY MEMBERS FOR PUBLIC COMMENT – *The Mayor will announce that any interested audience members are invited to provide comments. Anyone may speak on any topic other than: a matter in litigation, a quasi-judicial land use matter; or a matter scheduled for public hearing at some future date. The Mayor may limit comments to 3 minutes per person for a total of 30 minutes. The Mayor will read comments emailed to City Recorded and then any citizen participating via Zoom.*
4. PRESENTATION
  - a. McMinnville Downtown Association (MDA) Annual Presentation
5. ADVICE/ INFORMATION ITEMS
  - a. Reports from Councilors on Committee & Board Assignments

b. Department Head Reports

1. Crime Response Unit (CRU) – August 2021 Team Update for City Council (in packet)
2. McMinnville Economic Development Partnership (MEDP) Annual Report (in packet)

6. CONSENT AGENDA

- a. Consider Resolution No. 2021-52: A Resolution authorizing the City Manager to enter into a Goods and Services Contract with Green Sweep Asphalt Service, LLC for street sweeping services.
- b. Consider the Minutes of the June 23, 2020 City Council Regular Meeting.
- c. Consider the Minutes of the June 30, 2020 City Council Special Work Session Meeting.
- d. Consider Resolution No. 2021-53: A Resolution approving the award of a Professional Services Contract to Jacobs Engineering Group Inc. for the Solids Capacity Improvement Project 30% Schematic Design, Project 2019-10.

7. CONSIDER A REQUEST TO PERMIT A WAIVER OF THE NOISE ORDINANCE FROM MCMINNVILLE HIGH SCHOOL FOR OCTOBER 22<sup>nd</sup>, 2021. **(Added on 10/08/2021)**

8. ADJOURNMENT OF REGULAR MEETING

**EXECUTIVE SESSION – IMMEDIATELY FOLLOW THE CITY COUNCIL REGULAR MEETING - VIA ZOOM (NOT OPEN TO THE PUBLIC)**

1. CALL TO ORDER
2. **Executive Session pursuant to ORS 192.660(2)(a):** To consider the employment of a public officer, employee, staff member or individual agent.
3. ADJOURNMENT



# McMinnville Downtown Association

Annual Report 2021





# Mission Statement

*The McMinnville Downtown Association works to promote and enhance our historic downtown as the economic, social, and cultural heart of the community.*

# Values Statement

**INTEGRITY:** We work to do the right thing by making decisions through a consistent and transparent process.

**SUSTAINABLE:** We strive toward a balanced, responsible funding model and organizational stability.

**COMMUNICATIVE:** We actively foster collaborative and open dialogue to strengthen relationships with members.

**WELCOMING AND FRIENDLY:** We cultivate an inclusive and safe environment that is respectful to our stakeholders, visitors and staff.

**PURPOSEFUL:** We are intentional in making decisions that take into consideration the needs and concerns of our members.



# MDA Staff

**Executive Director:**

*Dave Rucklos*

**Operations & Programs  
Coordinator:**

*Chloe Dreher*

# Board of Directors

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President: Heather Miller

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Vice President: Dani Chisholm

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Secretary: Casee Clark

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Treasurer: Brooke Anderson

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Directors: Ricardo Antunez, Katie D'Aboy, Kate Gowell, Gerry Hunter, Peter Kircher, Chelsey Nichol, Tona Miller, Kent Taylor

**Four  
Pillars of  
Main  
Street**

Economic Vitality

Promotion

Organization

Design



# Design Committee

*supports a community's transformation by enhancing the physical and visual assets that set the commercial district apart*

Passageway Lighting Project

Rose Marie Mural

Façade Grant Collaboration & Assistance

Ben Franklin Glasses Repair

Twinkle Light Repair

Kiosk Lighting & Message Center

Sidewalk Art for Dine Out(Side)

Hanging Basket Replacement (Spring & Summer)

# Promotion Committee

positions the downtown or commercial district as the center of the community and hub of economic activity, while creating a positive image that showcases a community's unique characteristics

12 Weeks of  
Christmas

\$\_\_\_\_\_ in dollars  
spent downtown

Dine Out(Side)  
Marketing





Internal & External Policy Review



Annual Budget



Yearly Calendar



Committee Responsibilities and Expectations



Sustainable Funding to match the growing needs of our district

Membership Fee Revamp  
Corporate Sponsors

Organization Committee involves creating a strong foundation for a sustainable revitalization effort, including cultivating partnerships, community involvement, and resources for the district.

# Economic Vitality

focuses on capital, incentives, and other economic and financial tools to assist new and existing businesses, catalyze property development, and create a supportive environment for entrepreneurs and innovators that drive local economies

Record breaking Farmer's Market vendors

Modified UFO Festival

Dine Out(Side): Collaboration with Visit McMinnville & City of McMinnville

Third Street Streetscape Planning

Oregon Main Street Revitalization Grant Preparation

# Annual Awards

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**Best COVID Pivot**

McMinnville Public Library

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**Outstanding Customer Service**

Third Street Books

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**Outstanding Building Improvement**

Two Dogs Taphouse

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**Outstanding Marketing & Promotion**

Pura Vida Cocina

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**Rose Marie Volunteer of the Year**

Rose Marie Caughran

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**Outstanding Partnership**

City of McMinnville & Visit McMinnville

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**Business of the Year**

Harvest Fresh



ENTER TO WIN A RELAXING GETAWAY TO HISTORIC DOWNTOWN ASTORIA. EAT, DRINK, EXPLORE AND UNWIND WITH OVERNIGHT ACCOMMODATIONS AT THE CANNERY PIER HOTEL AND SPA. ENJOY LOCAL BEERS, MUSEUM TOURS AND A DELICIOUS DINNER ON THE WATER.

**JUST \$20 PER ENTRY!**

BEAT THE HEAT

*Summer Raffle*

# Summer Raffle

We participated in an exchange with the downtown association of Astoria for a weekend away. This fundraiser was very successful for us and will also garner attention within Astoria for future visitors to McMinnville. We are excited to continue with raffle fundraisers with other small communities in our region!

MAC  
GIFT CARD BUCKS

PUT YOUR \$  
WHERE  
YOUR ❤️ IS



# Gift Card Sales

\$29,130 since last  
October





2  
0  
2  
1

# Event Highlights





**\$10,056 in  
Double Up Food  
Bucks facilitated  
in partnership  
with the Oregon  
Farmers Market  
Fund!**







# First Federal Internship Program

**Sarah Mainwairing**

Linfield University

Sarah is a native of Seattle and is entering her Senior year at Linfield as a Management major. Sarah's time was focused on facilitating and promoting the Double Up Food Bucks program.

The MDA was very excited to be chosen by First Federal for their internship program this year, allowing a fully funded internship position to support the market.



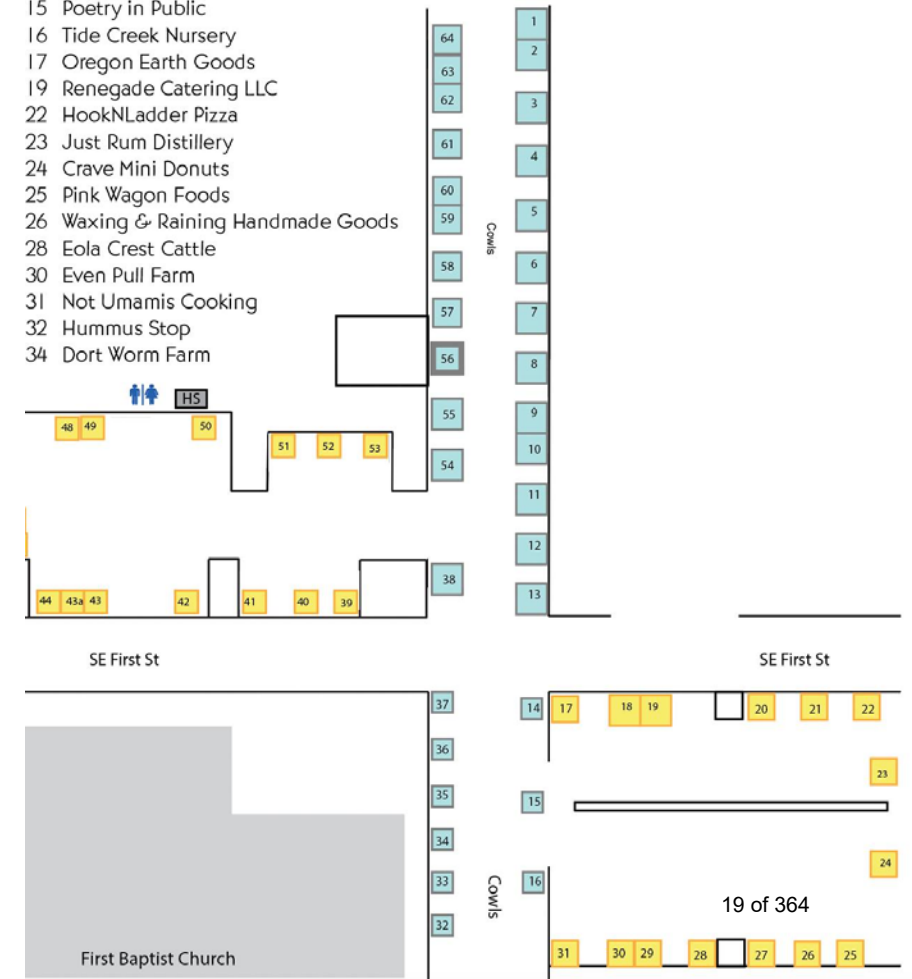


July 22, 2021

# Record Breaking Vendors!

- Thanks to First Baptist Church we were able to keep our expanded market footprint which allowed us even more vendors!
- 91% Vendor Retention
- 40 New Vendors!

2 Guerrero Produce	35&36 Sweet Oregon Berry	51 Straightaway
3 bide a wee farm	37 Mrs. Sew & Sew	52 Plum Tummy Gardens
4 FreeWildShe	38 Crème Soaps	53 Blind Coffee Roasters
6 Stephens Farm	39 Lucys Tropical Juice	54 Whole Circle Farms
7 Chatanika Farms	40 La Casa Del Taco	55 Bearded Oregon
8 Alchemist's Jam	41 Blue Raeven Farmstand	56 Market Information
9 4 Hearts Kombucha	42 29 Kettle Confectionery	57 Briar Rose Creamery
10 The Rose Confectionery	43-44 Bernards Farm	58 Two Sisters Bakery
11 Brandywine Fisheries LLC	45&46 Baird Family Orchards	59&60 Saint Joseph Acres
12 Red Fox Bakery	48&49 Kona-Ice of Yamhill	61 3 mile lane co
13 Argo Farms llc	50 Yang's Fresh Bloomer and Products	62&64 Pablo Munoz Farms
3A Hoss Soss		
14 Bodhi Bakery		
15 Poetry in Public		
16 Tide Creek Nursery		
17 Oregon Earth Goods		
19 Renegade Catering LLC		
22 HookNLadder Pizza		
23 Just Rum Distillery		
24 Crave Mini Donuts		
25 Pink Wagon Foods		
26 Waxing & Raining Handmade Goods		
28 Eola Crest Cattle		
30 Even Pull Farm		
31 Not Umamis Cooking		
32 Hummus Stop		
34 Dort Worm Farm		





## Success Story!

One of our Farmer's Market vendors, Alchemist Jam, opened a brick-and-mortar location on Ford Street in the heart of downtown! Jennifer and Danny have been familiar faces at the market for years and we couldn't be more excited for them to now have a permanent downtown location for both retail and jam production!





MCMINNVILLE

# DINE OUT(SIDE)

McMINNVILLE DOWNTOWN ASSOCIATION



WEEKENDS MAY-SEPT | RESERVE YOUR TABLE

# 2021 PARTICIPANT

# \$6,000 in Sponsorships!

US Foods -  
\$3,000

Willamette  
Valley Medical  
Center - \$1,500

Recology Western  
Oregon - \$1,500

Travel Oregon  
Grant  
\$47,345

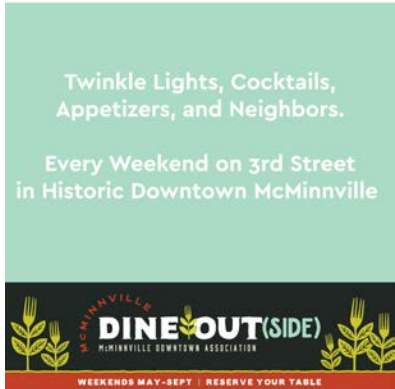
BONUS:  
\$17,755 in-kind  
contributions  
from Visit  
McMinnville  
and our Twinkle  
Light  
Replacement  
Fund

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Street Banner Graphics	\$4,788
Portable Stages	\$3,467
Utility Cart	\$3,999
Overhead Banners	\$1,350
Lamppost Banners	\$3,600
Banner Design	\$1,356
Twinkle Light Replacement (Thank you Ice Storm 2021)	\$12,000
Passageway Lighting	\$16,000



# Promotional Materials







# Outcomes

Downtown establishments reported record breaking sales throughout the summer

Successful coordination with Cruising McMinnville

Multiple opportunities for folks to enjoy live music in the streets





## The Aliens have finally landed!

- Vendor Fair  
Income: \$4,490
- MDA Booth Sales:  
\$1,100
- FUN: Exponential

# Other Ongoing Efforts

Clean streets

Dog waste bags

Tree/branch monitoring

Business support

Kiosk upkeep & maintenance

Seasonal pressure-washing

Key partnerships

Grant & funding assistance for property owners





# Holiday Promotions





# Spooky Season

Scarecrow on a  
Lamppost  
Spooky Coloring  
Contest



## Holiday Retail Promotion

- We are again encouraging folks to begin shopping early and often throughout the season

## How to PLAY

### *Shop*

AT PARTICIPATING DOWNTOWN  
RETAILERS. SPENT \$25+

### *Scratch*

SCRATCH THE SILVER CIRCLE  
TO REVEAL YOUR PRIZE

### *Win*

PRESENT YOUR WINNING  
TICKET TO REDEEM YOUR PRIZE

# Downtown Scratch-It

- Encourage downtown shopping with the chance to win prizes!
- 2020 Promotion Results:
  - We collected 8,865 tickets which represents a minimum value of \$221,625 in sales downtown (at participating businesses)

# Continued Board Priorities



Board Retreat (October 2021)



Streetscape Committee



Communications with key stakeholders



Evaluation of income streams and plans for increased sustainable revenue





Questions???



To: Chief Scales  
From: Sgt Desmond and Capt. Jaasko  
Date: 9/28/2020  
Re: Crime Response Unit (CRU) – August 2021 Team Update for City Council

### **Directed Traffic Enforcement**

CRU conducted a directed traffic enforcement operation on SE 1<sup>st</sup> Street near SE Irvine Street. The directed enforcement was based on a citizen complaint of vehicles speeding and not yielding to pedestrians in the area. A total of six warnings and six citations were issued during the operation. CRU made contact with the complainant before and after the detail. See attached email.

The following day, CRU set up a “ghost car” in the same area, as a speed enforcement deterrent.

Based on Citizen Crime Report (CCR) requesting speed enforcement in the area of NW Michelbook Lane and NW 11th Street, CRU conducted directed speed enforcement in the area and issued seven warnings. This is an on-going enforcement area base on multiple citizen complaints.

### **Gang related shootings:**

On 08/17/21 and 08/18/21, there were shots fired calls at a residence located at 655 NE Burnett Road. The initial investigation indicated that the shooting was gang related. In both cases there was only property damage (rounds struck parked vehicles and a nearby residence). CRU became the primary investigative unit of the shootings. They, along with patrol and detective, were able to canvas a large portion of the neighborhood. They are also working with other agencies where investigative leads have indicated possible ties to those cities. They are actively working both cases and have identified suspects in both shootings. These investigations are ongoing. The ability to assign CRU to these cases alleviated both patrol and detectives and freed them up to respond to calls for service and assigned persons crimes.

**Transient/Camping Ordinance Enforcement:**

Following the new requirement to provide transients with a 72-hour notice of trespassing/illegal camping and local transient resources, CRU has been making transient contacts and posting camps at the beginning and end of their workweek. This allows CRU to readdress the same transients/camps (after the required 72-hour notice) at the end of one workweek or the beginning of the next. All of these contacts have been complaint driven.

CRU made contact with transient campers and warned them for prohibited camping in the areas of: SW 2<sup>nd</sup> Street/SW Edmunston Street (in the Cozine Creek area) at the request of McMinnville Public Works and Code Enforcement, near A & E Security (based on a business owners' complaint) and in the wooded area near the SE Davis Street dip.

During the first week of August, CRU tagged 12 illegally parked vehicles, warned two campers for prohibited camping and towed 5 vehicles near 12<sup>th</sup> and Cowsls. This enforcement activity is a result of multiple citizen complaint and a request from parking enforcement for assistance. Of note, the PD continues to field calls and tag RV's based on citizen complaints, however, due to Judge Noble's decision on 8/19/21 we are not towing vehicles that are tagged but subsequently move before they are towed although City Ordinance states otherwise.

**Downtown/3<sup>rd</sup> Street Issues:**

CRU has been working with the McMinnville Downtown Association and Executive Director Dave Rucklos regarding criminal activity in downtown area. Specific issues identified were illegal drug sales, graffiti, and other suspicious activity.

CRU met with Dave and are planning to set up surveillance camera in the area. The suspects involved in dealing controlled substances, to transients in the area, were identified and CRU is planning an operation that will address the situation.

**Linfield Parties/Nuisance Houses:**

During the past several decades, patrol has responded to numerous complaints/calls regarding loud parties involving Linfield students, at residences in and around SE Jack Ave. This area is known to a mix of single-family residents and rental residences that are rented to Linfield students. This has been an ongoing issue causing major frustration for the homeowners in the area. In July 2021, Linfield Security staff requested that MPD advise the college of any off-campus parties and/or uncooperative students, to allow the college to address them internally. In early September 2021, CRU will be contacting the residents in the above noted area, to warn students and to advise the other residents in the area to report incidents to CRU for follow up. CRU will address the issues and provide information directly back to Linfield staff.



*McMinnville*

ECONOMIC DEVELOPMENT  
PARTNERSHIP

# ANNUAL REPORT 2021

OCTOBER 2020-SEPTEMBER 2021





**OUR MISSION IS TO ADVANCE STRATEGIES THAT RESPOND TO THE NEEDS OF MCMINNVILLE'S TRADED-SECTOR BUSINESSES.**

MEDP was founded in 2006 by local leaders and individuals invested in the economic success of our community. This public-private partnership has continued to support our local businesses adapt and thrive over the past fifteen years. As you will see on the following pages, there is a buzz about McMinnville; business leads have increased, and overall economic activity is flourishing. Our organization looks forward to helping our community thoughtfully sustain that growth and momentum in the years to come.

**ECONOMIC INSIGHTS FROM OUR BOARD**

"At McMinnville Water & Light we are always thinking 20-30 years to the future or farther. Infrastructure and planning are the backbone for all economic development and without these elements, success is slow-moving. As an organization, we need to be responsive to the needs of the community, similarly, MEDP needs to, and does, respond to the needs of the Business Community."

-John Dietz, McMinnville Water and Light

"I am excited to see all of the economic development agencies and business leaders working together to continue to build on McMinnville's success and economy. With the implementation of MAC-Town 2032 and the leadership provided by the McMinnville Economic Vitality Leadership Council, we have the opportunity to build multiple legacy projects for the community in terms of the next chapter of economic development projects, job creation, and business vitality.

MEDP is thrilled to support the Third Street Improvement Project and the McMinnville Innovation Center, and we suspect you will be hearing a lot more about these projects in the coming years."

- Heather Richards, City of McMinnville

"MEDP has continued to carry on the success of its founding partners in assisting existing and new businesses, which overall creates a diverse employment base for McMinnville and the region. The stability of McMinnville's economy has and continues to benefit from decades of hard work from stakeholders and business partners affiliated with the organization."

-Kelly McDonald, The Granary District

"Bringing businesses to McMinnville often entails a large capital investment, we at MEDP assist businesses with a variety of funding sources to make that happen.

Our community is the ultimate recipient of a company's capital investment by providing living-wage jobs that benefit individuals and the overall economy."

-Teresa Smith, McMinnville Industrial Promotions

"MEDP is dedicated to the success and growth of our local business climate. We continue to see an increased interest in McMinnville, and we will remain focused on expanding and diversifying the economic base, bringing new investments, new businesses, and new opportunities to our community."

-Mike Morris, McMinnville Area Chamber of Commerce





## IT TAKES A VILLAGE

It feels like only moments ago we were compiling the data from 2019/2020, and here we are a year later. Quite a bit has changed around our office in that time. Scott Cooper, our former Executive Director, migrated south this spring, and our Board of Directors confidently placed Heather Hadley Blank at the helm to help steer us through the interim. We are so lucky to have her organizational insights and commitment to our community! The MEDP staff (Heather and Tayler) have embraced this interim period and continued our regularly scheduled programs, welcoming new project leads, supporting existing business needs, and working tirelessly to ensure that McMinnville stays at the economic heart of Yamhill County. As we reflect on the past year, we are so thankful for our "village" of economic vitality leaders, our sustaining funding partners, our investor circle, and all of the entities that are doing this work right alongside us.

Our organization is one of many within our community that is tasked with helping to maintain economic vitality. It's right there in the title, "McMinnville Economic Development Partnership". Economic development isn't just one thing, and it's not just the job of one organization. Economic development is job creation, business expansion, infrastructure, entrepreneurship, education, growth, sustainability, resiliency, and so much more. Economic development is a collaboration driven within our community by industry leaders, elected officials, and engaged citizens. It is vitality. It is vibrancy. It is innovation. It is looking towards the future while preserving the efforts of past generations. It is thinking outside the box. Economic development is what gives each individual community, and especially McMinnville, that certain *je ne sais quoi*.

One goal that is, and always will be, at the center of what we do is working to ensure that McMinnville is the epicenter of economic industry through the creation and retention of living-wage jobs. We are dedicated to introducing others to everything McMinnville has to offer and helping our community thrive.

The opportunities and highlights that have happened over the past year are too numerous to mention by name in one report. We can't capture the work ethic and excitement of our summer Internship Coordinator on the page. You can't see the celebratory dances that happen at our desks when we hear about businesses finding the space or resources they need to succeed locally. A brief paragraph about the Innovation Center concept doesn't begin to scratch the surface of the ideas, planning, and conversations that have gone on behind the scenes. Just know, that we are here, working tirelessly towards the goal of ensuring the economic success of the community.

We are looking forward to another year of collaborations, business projects, exciting developments, expansions, innovation, and more. Come and have a seat at our table, we cannot wait to partner with you.



# MEDP'S STRATEGIC GOALS



These goals are a guide to support our mission as well as the efforts of the City of McMinnville's MAC-Town 2032 Economic Development Strategic Plan.

Our targeted industries include; Advanced Manufacturing, Aerospace, Agribusiness, Food and Beverage Production, Research and Development, Technology, and beyond.



Research has shown that when the existing business community functions effectively it can be responsible for as much as 80% of new employment in the community.



One of the most important goals for a city should be to develop and grow its workforce from within. The number one hurdle our companies are facing is a lack of skilled workers entering the workforce.



We want to attract businesses into the community that will offer higher-density living wage jobs and will enable our current businesses to thrive.



To succeed in a global economy, cities and regions must provide necessary support to create a strong innovation environment. New business formation or creation is now seen as a necessity of modern economic development.

## BY THE NUMBERS \*



### BUSINESS CONSULTATIONS

<u>2020</u>	<u>2021</u>
55	<b>178</b>



### INTERNSHIP APPLICATIONS

<u>2020</u>	<u>2021</u>
126	<b>153</b>



### NEW BUSINESS LEADS

<u>2020</u>	<u>2021</u>
26	<b>58</b>



### STARTUP CONSULTATIONS

<u>2020</u>	<u>2021</u>
11	<b>43</b>

### RESOURCE PARTNER COLLABORATIONS

<u>2020</u>	<u>2021</u>
276	<b>770</b>

### PROFESSIONAL DEVELOPMENT ENGAGEMENTS

<u>2020</u>	<u>2021</u>
80	<b>106</b>

### SITE SELECTOR OUTREACH

<u>2020</u>	<u>2021</u>
20	<b>1,477</b>

### ENTREPRENEUR FOCUSED PROGRAMING

<u>2020</u>	<u>2021</u>
7	<b>21</b>

### COMPANY CONNECTIONS

<u>2020</u>	<u>2021</u>
108	<b>672</b>

### WORKFORCE CONNECTIONS

<u>2020</u>	<u>2021</u>
95	<b>1,336</b>

### SITE SPECIFIC MARKETING

<u>2020</u>	<u>2021</u>
60	<b>127</b>

### RESOURCE CONNECTIONS

<u>2020</u>	<u>2021</u>
54	<b>290</b>

*\*Numbers are based on documented statistics and conservative estimates for MEDP projects from Oct. 2020-Sept. 2021*

# BUSINESS RETENTION & EXPANSION HIGHLIGHTS



## ARQ



This undergarment company is growing by leaps and bounds. Headquartered here in McMinnville, ARQ grew the company from \$1M to \$7.5M in the span of one year.

## Buildable

Successfully collaborated with MEDP, OMEP, and SEDCOR to receive a HIOP grant through Business Oregon to help further develop an open-source ERP concept and deliver it to businesses around the state.

They are growing their team for expanded services here in McMinnville.

## Chapul Farms



Starting Pilot "Tainable" a 4,000 sq. ft. Research and Development facility in McMinnville to study Black Soldier Fly Larvae Conversion. Their mission is to increase biodiversity within agriculture, leveraging insects as a gateway to beneficial microbial ecosystems that are essential to regenerative farming.

## Bierly Brewing

Expanded gluten-free offerings and moved to a new location on 3rd Street in March 2021.

## Cart-Away Concrete Systems Inc.

Opened Cart-Away Supply adding on bulk landscape material and short-load ready-mix concrete.

## Casteel Custom Bottling



Broke ground on new site in October 2020, now open in new 20,000 sq. ft. facility.

## First Federal



Finished construction on new headquarters in downtown McMinnville  
Opened July 2021.

## Foreland Beer



Opened in the former Allegory Brewing location on 4th street in November 2020.



# BUSINESS RETENTION & EXPANSION HIGHLIGHTS CONT.

## Harper Voit

Broke ground on a new winery facility in the Industrial District in April 2021.

## Innova NW



Broke ground on their new site off Alpha Drive in April 2021.

## NW Rapid

This Additive Manufacturing Company (3d printing) expanded into a new 6,500 sq. ft. space on the NWUAV Campus in July 2021.

## Organic Valley



MEDP has been working with the city, regional, and state resource partners to help support the retention of this mainstay business in our community.

## Ultimate RB

Invested in infrastructure and facility improvements including equipment automation, upgraded break room and employee areas as well as improving accessibility and safety to entire property.

## Hello Care

A full circle success story. The winners of the "Pitch Fest" at our 2020 Startup Bootcamp. This in-home care company has grown to 40 employees and is actively recruiting more as well as expanding its services.

## Meggitt



Thanks to continued commitment from McMinnville Industrial Promotions the Meggitt facility is getting facade upgrades.

## NWUAV



Featuring UAV engineering, machining, wiring, engine manufacturing, testing, and now UAV hydrogen fuel cell manufacturing, the NWUAV campus is a unique UAV tech and manufacturing hub in McMinnville.

## UniqueWire

Local digital forensics company partnered with Rimkus Consulting Group, Inc. to expand to over 85 offices nationwide with corporate headquarters located here in McMinnville.

# WORKFORCE DEVELOPMENT HIGHLIGHTS

## McMINNVILLE WORKS & CAREER BOUND 2021

10 Interns hired in our community

7 Host Companies

- Evergreen Aviation & Space Museum
- HBF International
- MEDP
- Solid Form Fabrication
- Swedemom Center of Giving
- Unique Wire
- Yamhill County Fair Grounds

90+ Networking, mentoring, informational interviews, & professional development connections with local business and industry.



### Career Path Videos

MEDP worked with local industry partners, Cellar Ridge Construction, Solid Form and Ultimate RB, to develop career path videos featuring skilled trades to help educate the emerging workforce about available local career opportunities.

### Oregon WORKS

Modeled after our own successful McMinnville WORKS program, Oregon WORKS received a gold medal in the *Innovation Programs and Initiatives* category from the International Economic Development Council.

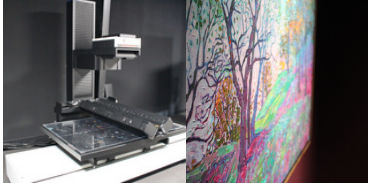


**At MEDP we work with industry partners to support the needs of our employers and make connections to empower our emerging workforce.**

- Built Oregon
- Chemeketa Apprenticeship Program
- Chemeketa Small Business Development Center
- Chemeketa Workforce Solutions Team
- CTEC Salem-Keizer
- Express Employment Professionals
- George Fox Career Center
- Grand Ronde Tribal Employment
- Kinesis
- Linfield Career Center
- Linfield Wine Studies Career Experience Programming
- McMinnville Community Foundation
- McMinnville School District
- McMinnville High School Success Center and Pathways Program
- MECOP-OSU
- Oregon Connections
- PNW College & University Career Centers
- Rising Together
- SEDCOR
- Willamette Workforce Partnership
- Willamette Career Academy
- Unidos
- University of Oregon Career Development
- Yamhill County Schools and Career Pathway Programs

# BUSINESS ATTRACTION HIGHLIGHTS

## Erin Hanson Gallery



Art gallery, 3d printing facility, state-of-the-art scanning, canvas stretching, and production all take place at this innovative 18,000 sq. ft facility in the Industrial District. Opened April 2021.

## Granary Row



Nearing completion after breaking ground off Lafayette Ave in October 2020.

## Colvin Court



Road extension in October 2020, facilitated by MIP opened up more property access in McMinnville Industrial District.

## Mecanica Scientific Services

Opened a location in McMinnville, September 2021. They offer crash reconstruction, event data recording, accident analysis, and related EDR research.



- We work with Business Oregon, the state recruitment agency to promote our available properties to Industries looking to expand and relocate.
- We maintain an "Available Properties" section of our website with industrial and commercial properties for sale or lease in McMinnville.
- Targeted Site Selector outreach with property highlights and information.
- *Sights on Sites* promotions on social media and in our monthly newsletter.
- Maintain relationships with local realtors and landowners with available sites so we can connect interested parties and help facilitate conversations.





# INNOVATION DEVELOPMENT HIGHLIGHTS



## Innovation Center Planning

One of the Priority Projects identified by the MAC-Town 2032 Strategic Plan and the Economic Vitality Leadership Council.

An innovation center is a focused campus-style site that supports innovative industrial research and development and provides Class A office space for corporate development, for both new and growing companies in McMinnville.

This will be a place for collaboration, shared resources, and targeted investments that will create a super-charged entrepreneurial environment that will increase high-density living wage jobs on McMinnville's largest available employment site off of Highway 18.

## Alt Coworking



McMinnville's first coworking space opened its doors in August 2021.



We partner with Launch Mid-Valley to support entrepreneurial growth in the community. The following events and opportunities are a sampling of the work we do together.

## Coffee Club for Startups



Monthly networking group specifically geared towards entrepreneurs and new businesses.

## Ag Tech Pubtalk



Entrepreneurs in the Ag/Tech industry gathered to learn about regenerative farming, ERPNext, and the NW Ag Innovation Hub.

## Boss Ladies Pubtalk



Women entrepreneurs shared their stories of success, struggles, and what they learned along the way.

# MARKETING HIGHLIGHTS

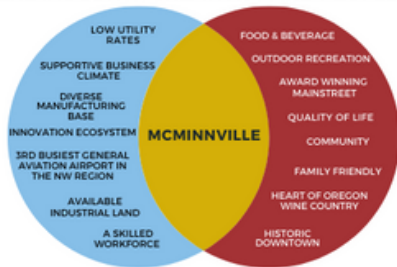
We re-designed our e-newsletter and overall look this year bringing you fresh, bold graphics, job opportunities, property highlights, information on grants, available resources, and business stories.



We worked on several creative marketing campaigns promoting McMinnville as an ideal place to live and grow!

- Technology Association of Oregon (TAO) is featuring various McMinnville companies in a "Tech Terroir" article in their e-publication Techlandia.
- Meet the Maker campaign and blog highlights the faces behind the scenes of our traded sector industries.
- Cultivated a Site Selector email list, and distributed over 1,400 direct e-mails marketing McMinnville site opportunities.
- Grew social media following by **661** over the year bringing the total to 4,766 followers.
- Made in Yamhill County feature article on why McMinnville is the perfect place to start and grow any type of company ranging from a startup to a large enterprise.
- Our #MacDevWeek video and marketing campaign won a **gold medal** in the *Innovation in Economic Development Week* category from the International Economic Development Council.

WHERE INDUSTRY, CREATIVITY AND PEOPLE THRIVE



McMinnville | ECONOMIC DEVELOPMENT PARTNERSHIP



We are using our platforms to tell the story of McMinnville businesses, available resources, and what it is like to live, work and play in our community.

## Social Media

Over the year we posted **977** times and made over **249,620** impressions.

### Impressions



**72,110**



**87,591**



**30,708**



**59,211**

## MEDP SPARK e-Newsletter Stats



Total Subscribers: 1,231  
Yearly Reach: 17,885

# OUR SUSTAINING PARTNERS



The City of McMinnville delivers high-quality services in collaboration with partners for a prosperous, safe, and livable community. This mission is executed through the lenses of **Stewardship, Equity, Courage, and Accountability**. The City has established a strategic plan ([MAC-Town 2032](#)) that will guide its priorities and actions over the next several years.

The City's strategic priorities include civic leadership, community safety, and resiliency, economic prosperity, engagement and inclusion, growth and development, housing opportunities, as well as strengthening the City's ability to prioritize and deliver municipal services with discipline and focus.



McMinnville Industrial Promotions (MIP) has been devoted to supporting the industrial growth and stability of our community for over 60 years. This group of dedicated local leaders purchase, develop, own, sell, and lease industrial properties in McMinnville, and they have been a key partner in attracting new industries and businesses.

The volunteer board of directors freely shares their expertise and insight on behalf of a strong and more stable economic climate for all. Perhaps best known for their "9 in '69" campaign, where they single-handedly recruited nine new industries to McMinnville, including Cascade Steel Rolling Mills and Skyline Mobile Homes.

Their recent projects include the road extension of Colvin Court in the Industrial District, improved access to their 26-acre parcel, facade upgrades at Meggitt, and also have several parcels of industrial land available for sale, lease, and development.



McMinnville was the first city in Oregon to operate a municipally owned water and electric light plant. In 1888, we became the first city in the Pacific Northwest to supply electricity to every building. In 1905, the McMinnville Water & Light (MW&L) Commission was created and began making decisions that impact us still today. For example, in 1925 the commission adopted a resolution that laid out the steps to create a watershed that would protect the city's water supply from contamination.

"At McMinnville Water & Light we are always thinking 20-30 years to the future or farther. As a utility municipality, we need to be responsive to the needs of the community. We've had leaders in place for over 130 years who have had the foresight to look to the future, and that has helped ensure that our community has reliable, low-cost, water and electric service. We also pride ourselves on serving the community and that means having excellent customer service." -John Dietz General Manager McMinnville Water & Light.



# MEDP PARTNERS AND INVESTOR CIRCLE

## FOUNDING PARTNERS



## INVESTORS



# McMINNVILLE AT A GLANCE

“McMinnville is old enough to be substantial. Young enough to be ambitious. Big enough to be industrious, and small enough to be friendly.”

1900s Campaign for McMinnville



Population:  
**35,123**



Median Age:  
**37**



Labor Force:  
**16,689**

1 million w/in a 45 minute drive



Total Employees:  
**14,733**



Median Family Income:  
**\$59,976**



Total Establishments:  
**1,587**



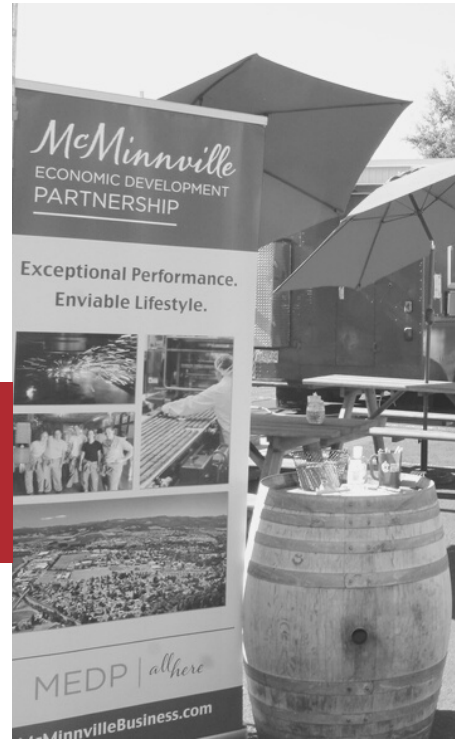
\*Source: Zoomprospector.com and Business Oregon





"MEDP has been such a great resource and support for our growing business and everyone there is so kind and responsive! "

-Abigail Quist, Owner at ARQ



"Being headquartered in McMinnville is not an accident, we choose to do business here because of the amazing quality of life. Having a company based in this community has been a huge asset when recruiting new hires, because people are excited to live and work in McMinnville. We are thrilled to be established here and eager for the opportunity to grow an Oregon-based company."

-Brian Feucht, Chief Executive Officer at Unique Wire





# McMINNVILLE, OR

A place where industry, creativity and people thrive.



*McMinnville*

ECONOMIC DEVELOPMENT  
PARTNERSHIP

 [MCMINNVILLEBUSINESS.COM](http://MCMINNVILLEBUSINESS.COM)  [INFO@MCMINNVILLEBUSINESS.COM](mailto:INFO@MCMINNVILLEBUSINESS.COM)  503.474.6814



[MCMINNVILLEBUSINESS](https://www.facebook.com/MCMINNVILLEBUSINESS)



[MCMINNVILLEBUSINESS](https://www.instagram.com/MCMINNVILLEBUSINESS)



[MEDP](https://www.linkedin.com/company/MEDP)



[MCMINNVILLEEDP](https://twitter.com/MCMINNVILLEEDP)

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## STAFF REPORT

**DATE:** October 1, 2021  
**TO:** Jeff Towery, City Manager  
**FROM:** Amanda Guile-Hinman, City Attorney  
Dale Marshall, Street Maintenance Supervisor  
**SUBJECT:** Street Sweeping Contract

---

### **Report in Brief:**

Staff seeks authority to enter into a one-year contract with Green Sweep Asphalt Service, LLC to provide street sweeping services throughout the city. The procurement of the services is based on a cooperative agreement by the City of Tigard.

### **Background:**

Prior to FY2013, the City performed all residential street sweeping in-house. Due to repair costs on the City's aging sweeper, an analysis was done comparing purchasing a new sweeper and keeping this service in-house or contracting to an outside vendor. Contracting was determined to be the more viable option. The City did a formal procurement for street sweeping service, with Water Truck Services (WTS) being the low quote. In January 2014, WTS began sweeping residential streets, bike lanes, highways, and Park parking lots in McMinnville. This contract was renewed through FY2020. In May 2017, WTS began doing business as NRC.

In October 2019 NRC informed the City that it would be terminating all street sweeping operations as of November 15, 2019. This left McMinnville, along with many other municipalities in the metro area, without a street sweeping contractor. At that time, the City used City Sweepers, a local sweeping contractor that currently has the city's downtown sweeping contract, to perform emergency sweeping.

Staff contacted several other sweeping companies to discuss sweeping services. Local vendors did not have the capacity to meet the residential sweeping scope of work. Another

larger vendor was interested, but due to COVID illnesses was unable to provide services. In October 2020, the city informally contracted with Green Sweep Asphalt Service, LLC (Green Sweep) for street sweeping services through the City of Tigard's Intergovernmental Cooperative Purchasing agreement. This agreement is for residential street, bike lane and highway street sweeping, and debris disposal and hauling. Debris is hauled to Coffin Butte Landfill in Corvallis.

**Discussion:**

The City needs to formalize its agreement with Green Sweep to continue to receive street sweeping services. Green Sweep has performed well during the informal contracting period, and based on its operational capacity to continue to perform services, staff recommend that a formal agreement be executed.

Since the City of Tigard created a cooperative agreement when it undertook a formal procurement process for its street sweeping services, the City of McMinnville can enter into an agreement with Green Sweep under the same terms and conditions, as allowed under ORS 279A.215 and related Oregon Administrative Rules.

**Attachments:**

- Resolution No. 2021-52
- Exhibit 1 to Resolution No. 2021-52, Goods and Services Contract
- City of Tigard Request for Proposals, City of Tigard Notice of Request for Proposals, and City of Tigard Contract with Green Sweep and Contract Extension

**Fiscal Impact:**

Street sweeping services are estimated to cost \$240,000 for FY2022.

**Recommendation:**

Staff recommends the Council approve Resolution No. 2021-52 authorizing the City Manager to execute a Goods and Services Contract with Green Sweep Asphalt Service, LLC.



## RESOLUTION NO. 2021 - 52

A Resolution authorizing the City Manager to enter into a Goods and Services Contract with Green Sweep Asphalt Service, LLC for street sweeping services.

### RECITALS:

**Whereas**, prior to FY2013, the City of McMinnville (City) performed all residential street sweeping in-house, but due to repair costs on the City's aging sweeper, the City determined that contracting with a vendor for such services was a more viable option; and

**Whereas**, in January 2014, Water Truck Services (WTS) began sweeping residential streets, bike lanes, highways, and Park parking lots in McMinnville. This contract was renewed through FY2020. In May 2017, WTS began doing business as NRC; and

**Whereas**, in October 2019 NRC informed the City that it would be terminating all street sweeping operations as of November 15, 2019; and

**Whereas**, the City has not entered into a long-term contract for street sweeping services since NRC terminated its street sweeping operations; and

**Whereas**, Green Sweep Asphalt Service, LLC (Green Sweep) contracts with several cities in Oregon to provide street sweeping services and the City of McMinnville has had an informal agreement with Green Sweep to provide street sweeping services; and

**Whereas**, the City of Tigard undertook a formal procurement process for street sweeping services that included the requisite requirements for a cooperative procurement agreement; and

**Whereas**, Tigard's procurement meets the requirements of ORS 279A.215 and related Oregon Administrative Rules so that the City may enter into a goods and services contract with Green Sweep under the same terms and conditions as Tigard's contract.

**NOW, THEREFORE, BE IT RESOLVED BY THE COMMON COUNCIL OF THE CITY OF McMinnville, OREGON, as follows:**

1. The City Manager is hereby authorized and directed to execute a Goods and Services Contract with Green Sweep Asphalt Service, LLC, in substantially similar form to Exhibit 1 attached hereto and incorporated by reference herein, for a total amount not to exceed \$240,000 for fiscal year 2022.
2. This resolution shall take effect immediately upon passage and shall continue in full force and effect until revoked or replaced.

Adopted by the Common Council of the City of McMinnville at a regular meeting held the 12th day of October, 2021 by the following votes:

Ayes: \_\_\_\_\_

Nays: \_\_\_\_\_

Approved this 12th day of October 2021.

\_\_\_\_\_  
MAYOR

Approved as to form:

Attest:

\_\_\_\_\_  
City Attorney

\_\_\_\_\_  
City Recorder

Exhibits:

- Exhibit 1: Goods and Services Contract - Street Sweeping Services

**CITY OF McMinnville**  
**GOODS AND SERVICES CONTRACT**

This Goods and Services Contract (“Contract”) for Street Sweeping Services Project (“Project”) is made and entered into on this \_\_\_\_\_ day of \_\_\_\_\_ 2021 (“Effective Date”) by and between the **City of McMinnville**, a municipal corporation of the State of Oregon (hereinafter referred to as the “City”), and **Green Sweep Asphalt Service, LLC**, a(n) Oregon limited liability company (hereinafter referred to as “Contractor”).

**RECITALS**

WHEREAS, the City requires services which Contractor is capable of providing, under terms and conditions hereinafter described; and

WHEREAS, Contractor represents that Contractor is qualified to perform the services described herein on the basis of specialized experience and technical expertise; and

WHEREAS, Contractor is prepared to provide such services, as the City does hereinafter require; and

WHEREAS, procurement is authorized pursuant to ORS 279A.215 and related Oregon Administrative Rules through the City of Tigard’s cooperative procurement process for street sweeping services (“Tigard Contract”).

NOW, THEREFORE, in consideration of these mutual promises and the terms and conditions set forth herein, the parties agree as follows:

**AGREEMENT**

**Section 1. Contract Documents and Scope of Work**

1.1. Tigard Contract. The terms and conditions of the City of Tigard’s Agreement for Services Related to Street Sweeping Services dated June 18, 2020, as amended (“Tigard Contract”), are hereby incorporated as part of this Contract. Any references in the Tigard Contract to the City of Tigard hereby refer to the City of McMinnville for purposes of this Contract.

1.2. Scope of Work. Contractor will perform the street sweeping services, as more particularly described in the Scope of Work for the Project, attached hereto as **Exhibit A** and incorporated by reference herein (the “Work”).

**Section 2. Term**

The term of this Contract shall be from the Effective Date until all Work required to be performed hereunder is completed and accepted, or no later than June 30, 2022, whichever occurs first, unless earlier terminated in accordance herewith or an extension of time is agreed to, in writing,



by the City. Contractor shall diligently perform the Work according to the requirements identified in the Scope of Work.

### **Section 3. Contract Sum/Project Scope**

3.1. Except as otherwise set forth in this **Section 3**, the City agrees to pay Contractor unit pricing as set forth in **Exhibit B**, attached hereto and incorporated by reference herein, for performance of the Work (“Contract Sum”). Any compensation in excess of the Contract Sum will require an express written Change Order between the City and Contractor.

3.2. Contractor will be paid for Work upon completion of the Work and within thirty (30) days of receipt of an itemized invoice, unless the City disputes such invoice. In that instance, the undisputed portion of the invoice will be paid by the City within the above timeframe. The City will set forth its reasons for the disputed claim amount and make good faith efforts to resolve the invoice dispute with Contractor as promptly as is reasonably possible.

### **Section 4. City’s Rights and Responsibilities**

4.1. The City will designate a Project Manager to facilitate day-to-day communication between Contractor and the City, including timely receipt and processing of invoices, requests for information, and general coordination of City staff to support the Project.

4.2. Award of this Contract is subject to budget appropriation. Funds are approved for Fiscal Year 2021-22. If not completed within this fiscal year, funds may not be appropriated for the next fiscal year. The City also reserves the right to terminate this Contract early.

### **Section 5. Project Managers**

The City’s Project Manager is Dale Marshall. Contractor’s Project Manager is Jennifer Akerill.

### **Section 6. Notices**

Any notice required or permitted under this Contract shall be in writing and shall be given when actually delivered in person or forty-eight (48) hours after having been deposited in the United States mail as certified or registered mail, addressed to the addresses set forth below, or to such other address as one party may indicate by written notice to the other party.

To City: City of McMinnville  
Attn: Dale Marshall, Street Maintenance Supervisor  
230 NE Second Street  
McMinnville, OR 97128

To Contractor: Green Sweep Asphalt Service, LLC  
Attn: Jennifer Akerill  
12312 NE 99<sup>th</sup> Street  
Vancouver, WA 98682

## **Section 7. Miscellaneous Provisions**

7.1. Integration. This Contract, including all exhibits attached hereto, contains the entire and integrated agreement between the parties and supersedes all prior written or oral discussions, representations, or agreements. In case of conflict among these documents, the provisions of this Contract shall control.

7.2. Legal Effect and Assignment. This Contract shall be binding upon and inure to the benefit of the parties hereto and their respective heirs, personal representatives, successors, and assigns. This Contract may be enforced by an action at law or in equity.

7.3. No Assignment. Contractor may not assign this Contract, nor delegate the performance of any obligations hereunder, unless agreed to in advance and in writing by the City.

7.4. Adherence to Law. This Contract shall be subject to, and Contractor shall adhere to, all applicable federal, state, and local laws (including the McMinnville Code and Public Works Standards), including but not limited to laws, rules, regulations, and policies concerning employer and employee relationships, workers compensation, and minimum and prevailing wage requirements. Any certificates, licenses, or permits that Contractor is required by law to obtain or maintain in order to perform the Work described in this Contract shall be obtained and maintained throughout the term of this Contract.

7.5. Governing Law. This Contract shall be construed in accordance with and governed by the laws of the State of Oregon, regardless of any conflicts of laws. All contractual provisions required by ORS Chapters 279A, 279B, 279C, and related Oregon Administrative Rules to be included in public agreements are hereby incorporated by reference and shall become a part of this Contract as if fully set forth herein.

7.6. Jurisdiction. Venue for any dispute will be in Yamhill County Circuit Court.

7.7. Legal Action/Attorney Fees. If a suit, action, or other proceeding of any nature whatsoever (including any proceeding under the U.S. Bankruptcy Code) is instituted in connection with any controversy arising out of this Contract or to interpret or enforce any rights or obligations hereunder, the prevailing party shall be entitled to recover attorney, paralegal, accountant, and other expert fees and all other fees, costs, and expenses actually incurred and reasonably necessary in connection therewith, as determined by the court or body at trial or on

any appeal or review, in addition to all other amounts provided by law. If the City is required to seek legal assistance to enforce any term of this Contract, such fees shall include all of the above fees, whether or not a proceeding is initiated. Payment of all such fees shall also apply to any administrative proceeding, trial, and/or any appeal or petition for review.

7.8. Nonwaiver. Failure by either party at any time to require performance by the other party of any of the provisions of this Contract shall in no way affect the party's rights hereunder to enforce the same, nor shall any waiver by the party of the breach hereof be held to be a waiver of any succeeding breach or a waiver of this nonwaiver clause.

7.9. Severability. If any provision of this Contract is found to be void or unenforceable to any extent, it is the intent of the parties that the rest of the Contract shall remain in full force and effect, to the greatest extent allowed by law.

7.10. Modification. This Contract may not be modified except by written instrument executed by Contractor and the City.

7.11. Time of the Essence. Time is expressly made of the essence in the performance of this Contract.

7.12. Calculation of Time. Except where the reference is to business days, all periods of time referred to herein shall include Saturdays, Sundays, and legal holidays in the State of Oregon, except that if the last day of any period falls on any Saturday, Sunday, or legal holiday observed by the City, the period shall be extended to include the next day which is not a Saturday, Sunday, or legal holiday. Where the reference is to business days, periods of time referred to herein shall exclude Saturdays, Sundays, and legal holidays observed by the City. Whenever a time period is set forth in days in this Contract, the first day from which the designated period of time begins to run shall not be included.

7.13. Headings. Any titles of the sections of this Contract are inserted for convenience of reference only and shall be disregarded in construing or interpreting any of its provisions.

7.14. Number, Gender and Captions. In construing this Contract, it is understood that, if the context so requires, the singular pronoun shall be taken to mean and include the plural, the masculine, the feminine and the neuter, and that, generally, all grammatical changes shall be made, assumed, and implied to individuals and/or corporations and partnerships. All captions and paragraph headings used herein are intended solely for convenience of reference and shall in no way limit any of the provisions of this Contract.

7.15. Good Faith and Reasonableness. The parties intend that the obligations of good faith and fair dealing apply to this Contract generally and that no negative inferences be drawn by the absence of an explicit obligation to be reasonable in any portion of this Contract. The obligation to be reasonable shall only be negated if arbitrariness is clearly and explicitly permitted as to the specific item in question, such as in the case of where this Contract gives the City "sole discretion" or the City is allowed to make a decision in its "sole judgment."



7.16. Other Necessary Acts. Each party shall execute and deliver to the other all such further instruments and documents as may be reasonably necessary to carry out this Contract in order to provide and secure to the other parties the full and complete enjoyment of rights and privileges hereunder.

7.17. Interpretation. As a further condition of this Contract, the City and Contractor acknowledge that this Contract shall be deemed and construed to have been prepared mutually by each party and it shall be expressly agreed that any uncertainty or ambiguity existing therein shall not be construed against any party. In the event that any party shall take an action, whether judicial or otherwise, to enforce or interpret any of the terms of the contract, the prevailing party shall be entitled to recover from the other party all expenses which it may reasonably incur in taking such action, including attorney fees and costs, whether incurred in a court of law or otherwise.

7.18. Entire Agreement. This Contract, all documents attached to this Contract, and all Contract Documents and laws and regulations incorporated by reference herein represent the entire agreement between the parties.

7.19. Counterparts. This Contract may be executed in one or more counterparts, each of which shall constitute an original Contract but all of which together shall constitute one and the same instrument.

7.20. Authority. Each party signing on behalf of Contractor and the City hereby warrants actual authority to bind their respective party.

The Contractor and the City hereby agree to all provisions of this Contract.

**CONTRACTOR:**

**CITY:**

GREEN SWEEP ASPHALT SERVICE, LLC

CITY OF MCMINNVILLE

By: \_\_\_\_\_

By: \_\_\_\_\_

Print Name: \_\_\_\_\_

Print Name: \_\_\_\_\_

As Its: \_\_\_\_\_

As Its: \_\_\_\_\_

Employer I.D. No. \_\_\_\_\_

APPROVED AS TO FORM:

\_\_\_\_\_  
Amanda Guile-Hinman, City Attorney  
City of McMinnville, Oregon

# EXHIBIT A

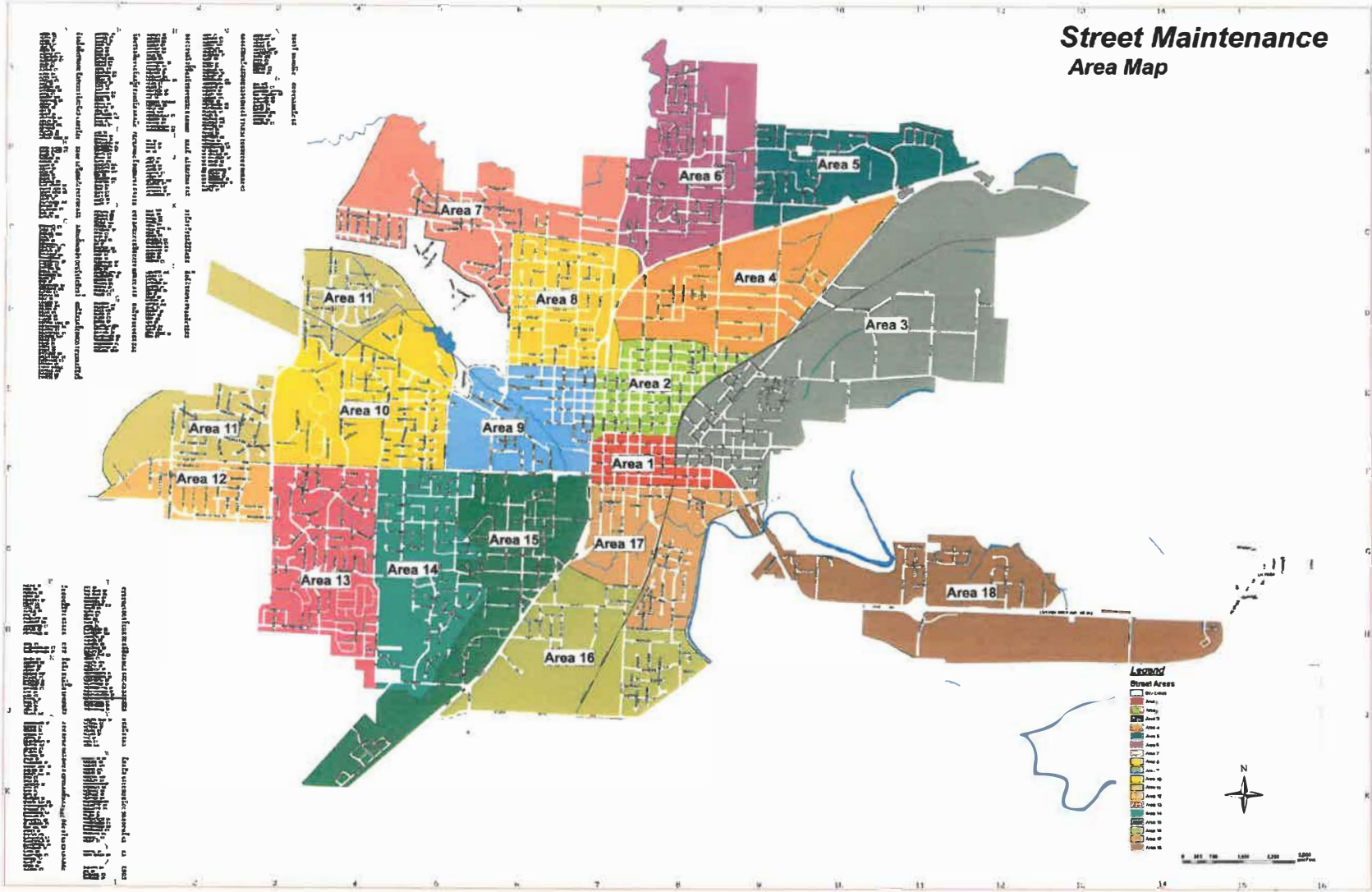
## Street Sweeping Routes/Schedule Information

The Street Maintenance Department has broken the city into 18 service areas plus the state highways. These service areas were originally based off when we were performing street sweeping in house. For street sweeping purposes bike lanes have been taken out of the areas and done more frequently. Area 1 (Downtown) is swept on a separate contract and is not part of this proposal.

Each service area is swept 7 times per year between January and October, roughly every 6 weeks. Highways and bike lanes are swept monthly (12 times per year). From mid-October through December sweeping is done in conjunction with the city's leaf pick up program. The leaf pick-up program divides the city into 3 sections, northwest, southwest and east and leaves are picked up 4 times in each section. Our goal is to sweep each section 3 times during leaf season, with a limit of 400 hours total during this time.

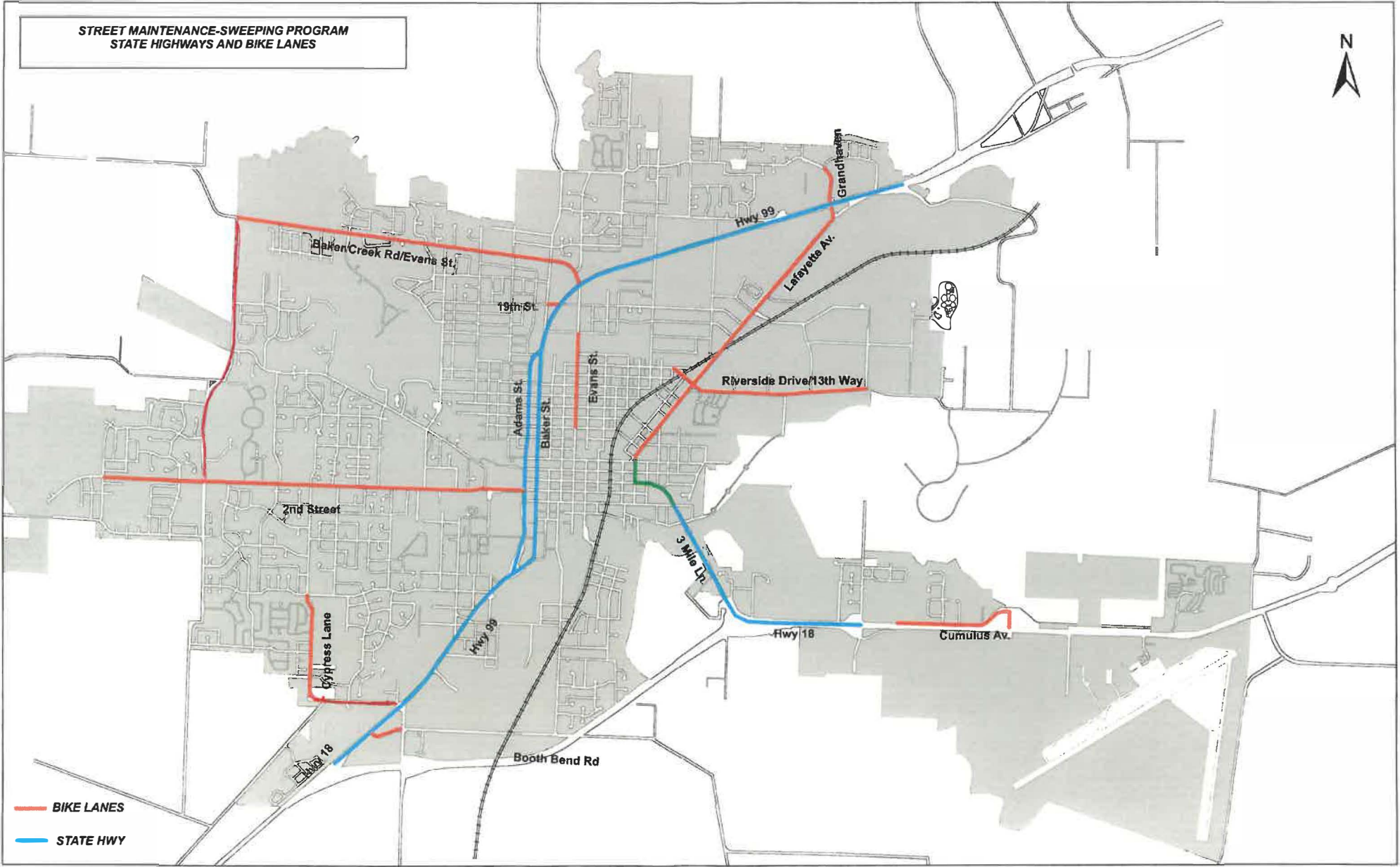
Attached is a map of the street maintenance service areas and the 2021 residential sweeping schedule.

# Street Maintenance Area Map





**STREET MAINTENANCE-SWEEPING PROGRAM  
STATE HIGHWAYS AND BIKE LANES**



2021		SWEEPING AREA																			
		2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	Highway		
Garbage Day		Mon	M/Tu	Tue	Thu	Thu	Thu	Tue	M/Tu	M/W	W/TH	Wed	Wed	Tu/W	Fri	Fri	Tu/F	M/Tu			
DATE	January	12		11	4	6	18	13	20	19	25	26				27	28		7	15	
	February	16	10	22	9	14	23	24	26				2	1	8			17	4	12	
	March	30	25	29	22	23		8		2	1	8	16	15	17	9	10	24	4	12	
	April		29				5		7	6	12	13	27	19	21	20	26	28	9	15	
	May	5		10	3	4	11	17	19	20	18	24				25	26		7	13	
	June	17	16	21	14	15	22	23	30	29	28		1	7	8			2	4	10	
	July	20	29	28	19	27		26				12	13	15	14	6	7	21	2	9	
	August		26		30	31	3		11	10	2	9	23	16	15	17	18	25	5	13	
	September	7		8			14	13	15	16	20	21	28			22	27	29	2	10	
	October		6												4	5				1	8
	November	LEAF PROGRAM - SWEEPING COORDINATED WITH LEAF PICK UP SCHEDULE																	5	12	
	December	LEAF PROGRAM - SWEEPING COORDINATED WITH LEAF PICK UP SCHEDULE																	3	10	

SWEEPING PROGRAM INFORMATION

- Please check maps below to find area in which you live. Chart above shows when area will be swept.
- Area 1 (Downtown) - Swept weekly on Wednesday nights
- If a scheduled sweep falls on a holiday or weather conditions prevent sweeping we will sweep on the next available work day
- To help ensure street sweepers are able to do a thorough job, please help us by moving vehicles, boats, campers, garbage cans, recycle containers and other objects into your driveway when your section is due to be swept.
- Obstacles like shopping carts, landscape materials and basketball hoops that protrude past the curb also keep us from cleaning thoroughly.
- Please keep street trees, hedges and vegetation trimmed to 13 feet above the street surface or behind the curb, so the street sweeper can fit under or around them.
- If you have any questions about this schedule or street sweeping operations in general, please call McMinnville Public Works at 503-434-7316.

## EXHIBIT B

### Estimated Cost - Residential Sweeping

Service Area	Mileage per sweep	Frequency	Total Miles Swept	Estimated MPH	Estimated Hours	Cost per Hour	Total Cost
Area 2	13.91	7	97.4	1.6	60.87	\$ 125.00	\$ 7,608.81
Area 3	12.42	7	86.9	1.6	54.32	\$ 125.00	\$ 6,789.54
Area 4	9.72	7	68.1	1.6	42.54	\$ 125.00	\$ 5,316.91
Area 5	9.42	7	65.9	1.6	41.20	\$ 125.00	\$ 5,149.95
Area 6	15.92	7	111.5	1.6	69.67	\$ 125.00	\$ 8,708.36
Area 7	12.40	7	86.8	1.6	54.26	\$ 125.00	\$ 6,782.49
Area 8	16.75	7	117.3	1.6	73.30	\$ 125.00	\$ 9,162.02
Area 9	9.80	7	68.6	1.6	42.87	\$ 125.00	\$ 5,358.96
Area 10	13.82	7	96.7	1.6	60.46	\$ 125.00	\$ 7,558.06
Area 11	10.45	7	73.2	1.6	45.73	\$ 125.00	\$ 5,716.09
Area 12	9.27	7	64.9	1.6	40.55	\$ 125.00	\$ 5,068.54
Area 13	13.60	7	95.2	1.6	59.52	\$ 125.00	\$ 7,439.99
Area 14	13.13	7	91.9	1.6	57.45	\$ 125.00	\$ 7,181.67
Area 15	10.05	7	70.4	1.6	43.98	\$ 125.00	\$ 5,496.92
Area 16	11.35	7	79.4	1.6	49.65	\$ 125.00	\$ 6,206.62
Area 17	10.27	7	71.9	1.6	44.91	\$ 125.00	\$ 5,613.75
Area 18	11.15	7	78.1	1.6	48.79	\$ 125.00	\$ 6,098.48

**Total Cost - Residential Street Sweeping** **\$ 111,257.16**

**Highways**      **18.51**      **12**      **222.12**      **1.3**      **170.86154**      **\$ 125.00**      **\$ 21,357.69**

**Bike Lanes**      **20.55**      **12**      **246.6**      **1.6**      **154.125**      **\$ 125.00**      **\$ 19,265.63**

### Estimated Cost - Leaf Pick up Program

Service Area	Mileage per sweep	Frequency	Total Miles Swept	Estimated MPH	Estimated Hours	Cost per Hour	Total Cost
Area 2	13.91	3	41.7	1.5	27.83	\$ 125.00	\$ 3,478.31
Area 3	12.42	3	37.2	1.5	24.83	\$ 125.00	\$ 3,103.79
Area 4	9.72	3	29.2	1.5	19.44	\$ 125.00	\$ 2,430.59
Area 5	9.42	3	28.3	1.5	18.83	\$ 125.00	\$ 2,354.26
Area 6	15.92	3	47.8	1.5	31.85	\$ 125.00	\$ 3,980.97
Area 7	12.40	3	37.2	1.5	24.80	\$ 125.00	\$ 3,100.57
Area 8	16.75	3	50.3	1.5	33.51	\$ 125.00	\$ 4,188.35
Area 9	9.80	3	29.4	1.5	19.60	\$ 125.00	\$ 2,449.81
Area 10	13.82	3	41.5	1.5	27.64	\$ 125.00	\$ 3,455.11
Area 11	10.45	3	31.4	1.5	20.90	\$ 125.00	\$ 2,613.07
Area 12	9.27	3	27.8	1.5	18.54	\$ 125.00	\$ 2,317.05
Area 13	13.60	3	40.8	1.5	27.21	\$ 125.00	\$ 3,401.14
Area 14	13.13	3	39.4	1.5	26.26	\$ 125.00	\$ 3,283.05
Area 15	10.05	3	30.2	1.5	20.10	\$ 125.00	\$ 2,512.88
Area 16	11.35	3	34.0	1.5	22.70	\$ 125.00	\$ 2,837.31
Area 17	10.27	3	30.8	1.5	20.53	\$ 125.00	\$ 2,566.29
Area 18	11.15	3	33.5	1.5	22.30	\$ 125.00	\$ 2,787.88

**Total Cost - Leaf Pick up Program Sweeping** **\$ 50,860.42**

## Debris Disposal Costs

	Landfill Trips	Quantity per Unit	Total Quantity	Cost per Unit	Total Cost
Green Sweep Hauling (per hour)	40	3.6	144	\$ 115.00	\$ 16,560.00
Coffin Butte Disposal Fee (per ton)	40	10.25	410	\$ 45.00	\$ 18,450.00
Coffin Butte Environmental Fee (per trip)	40	1	40	\$ 18.00	\$ 720.00
Coffin Butte Administration Fee (per month)	12	1	12	\$ 5.25	\$ 63.00
<b>Total Disposal Cost</b>					<b>\$ 35,793.00</b>

**Estimated Cost - Residential Sweeping** \$ 111,257.16

**Estimated Cost - Highway Sweeping** \$ 21,357.69

**Estimated Cost - Bike Lanes Sweeping** \$ 19,265.63

**Estimated Cost - Leaf Pick up Program Sweeping** \$ 50,860.42

**Estimated Cost - Debris Disposal** \$ 35,793.00

**Estimated Sweeping and Disposal Cost** \$ 238,533.90





## City of Tigard

FINANCE AND INFORMATION SERVICES

# Request for Proposal (RFP)

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## STREET SWEEPING SERVICES

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**Proposals Due:** Tuesday, April 28, 2020 - 2:00 p.m. local time

**Submit Proposals To:** City of Tigard – Contracts & Purchasing Office  
Attn: Jamie Greenberg, Purchasing Specialist  
13125 SW Hall Blvd.  
Tigard, Oregon 97223

**Direct Questions To:** Joe Barrett, Public Works Business Manager  
Phone: (503) 718-2477  
Email: [joseph@tigard-or.gov](mailto:joseph@tigard-or.gov)

**PUBLIC NOTICE  
REQUEST FOR PROPOSAL  
STREET SWEEPING SERVICES**

The City of Tigard is seeking sealed proposals from qualified firms to provide street sweeping services for the City's Public Works and Central Services Departments. Proposals will be received until 2:00 p.m. local time, Tuesday, April 28, 2020, at Tigard City Hall's Utility Billing Counter at 13125 SW Hall Blvd., Tigard, Oregon 97223.

No proposal will be considered unless fully completed in a manner provided in the RFP packet. Facsimile and electronic (email) proposals will not be accepted nor will any proposal be accepted after the stated due date and time. Any proposal received after the closing time will be returned to the submitting firm unopened after a contract has been awarded for the required services.

RFP packets may be downloaded from [www.tigard-or.gov/bids](http://www.tigard-or.gov/bids) or obtained in person at Tigard City Hall's Utility Billing Counter located at 13125 SW Hall Blvd., Tigard, Oregon 97223.

Proposers are required to certify non-discrimination in employment practices, and identify resident status as defined in ORS 279A.120. Pre-qualification of proposers is not required. All proposers are required to comply with the provisions of Oregon Revised Statutes and Local Contract Review Board (LCRB) Policy.

The City may reject any proposal not in compliance with all prescribed public bidding procedures and requirements and may reject for good cause any or all proposals upon a finding of the City if it is in the public interest to do so.

PUBLISHED: Daily Journal of Commerce  
DATE: Monday, March 30, 2020

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**SECTION 1  
INTRODUCTION**

The City of Tigard is seeking sealed proposals from qualified firms to provide street sweeping for the City's Public Works and Central Services departments. Proposals will be received until 2:00 p.m. local time, Tuesday, April 28, 2020, at Tigard City Hall's Utility Billing Counter at 13125 SW Hall Blvd., Tigard, Oregon 97223.

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The City may reject any proposal not in compliance with all prescribed public bidding procedures and requirements and may reject for good cause any or all proposals upon a finding of the City if it is in the public interest to do so.

**SECTION 2  
PROPOSER'S SPECIAL INSTRUCTIONS**

**A. PROPOSED TIMELINES**

<u>Monday, March 30, 2020</u>	Advertisement and Release of Proposals
<u>Tuesday, April 28, 2020 – 2:00 p.m.</u>	Deadline for Submission of Proposals
<u>Tuesday, May 26, 2020</u>	Award of Contract by LCRB
<u>Monday, June, 1, 2020</u>	Commencement of Services

**NOTE:** The City reserves the right to modify this schedule at the City's discretion

**B. GENERAL**

By submitting a proposal, the Proposer certifies that the Proposal has been arrived at independently and has been submitted without any collusion designed to limit competition.

**C. PROPOSAL SUBMITTAL**

The Proposal and all amendments must be signed and submitted no later than 2:00 p.m., Tuesday, April 28, 2020, to the address below. Each proposal must be submitted in a sealed envelope and designated with proposal title. To assure that your proposal receives priority treatment, please mark as follows.

**RFP – Street Sweeping Services**

City of Tigard – Utility Billing Counter  
Attn: Jamie Greenberg, Purchasing Specialist  
13125 SW Hall Blvd.  
Tigard, Oregon 97223

Proposer shall put their name and address on the outside of the envelope. It is the Proposer's responsibility to ensure that proposals are received prior to the stated closing time. The City shall not be responsible for the proper identification and handling of any proposals submitted incorrectly. Late proposals, late modification or late withdrawals shall not be considered accepted after the stated bid



opening date and time and shall be returned unopened. Facsimile and electronic (email) proposals will not be accepted.

**D. PROTEST OF SCOPE OF WORK OR TERMS**

A Proposer who believes any details in the scope of work or terms detailed in the proposal packet and sample contract are unnecessarily restrictive or limit competition may submit a protest in writing, to the Purchasing Office. A protest may be submitted via email. Any such protest shall include the reasons for the protest and shall detail any proposed changes to the scope of work or terms. The Purchasing Office shall respond to any protest and, if necessary, shall issue any appropriate revisions, substitutions, or clarification via addenda to all interested Proposers.

To be considered, protests must be received at least five (5) days before the proposal closing date. The City shall not consider any protest against award due to the content of proposal scope of work or contract terms submitted after the established protest deadline. All protests should be directed to the attention of Jamie Greenberg, Purchasing Specialist, and be marked as follows:

**RFP Specification/Term Protest**

City of Tigard – Contracts and Purchasing Office  
Attn: Jamie Greenberg, Purchasing Specialist  
13125 SW Hall Blvd.  
Tigard, Oregon 97223  
[contractspurchasing@tigard-or.gov](mailto:contractspurchasing@tigard-or.gov)

If a protest is received in accordance with section above, the proposal opening date may be extended if necessary to allow consideration of the protest and issuance of any necessary addenda to the proposal documents.

**E. PROPOSAL SUBMISSION AND SIGNING**

All requested forms and attachments (Signature Page, Acknowledgment Addendum, Statement of Proposal, etc.) must be submitted with the Proposal and in the required format. The submission and signing of a proposal shall indicate the intention of the firm to adhere to the provisions described in this RFP.

**F. COST OF PREPARING A PROPOSAL**

The RFP does not commit the City to paying any costs incurred by Proposer in the submission or presentation of a proposal, or in making the necessary studies for the preparation thereof.

**G. INTERPRETATIONS AND ADDENDA**

All questions regarding this project proposal shall be directed to Jamie Greenberg, Purchasing Specialist. If necessary, interpretations or clarifications in response to such questions will be made by issuance of an "Addendum" to all prospective Proposers within a reasonable time prior to proposal closing, but in no case less than 72 hours before the proposal closing. If an addendum is necessary after that time, the City, at its discretion, can extend the closing date.

Any Addendum issued, as a result of any change in the RFP, must be acknowledged by submitting the "Acknowledgment of Addendum" with proposal. Only questions answered by formal written addenda will be binding. Oral and other interpretations or clarifications will be without legal effect.

**H. BUSINESS LICENSE/FEDERAL TAX ID REQUIRED**

The City of Tigard Business License is required. Chapter 5.4 of the Tigard Municipal Code states any

business doing business in the City of Tigard shall pay a City of Tigard Business License. Successful Contractor will be required to present a copy of their City of Tigard Business License at the time of contract execution. Successful Contractor shall also complete a W-9 form for the City at the time of contract execution.

**I. CITY'S PROJECT MANAGER**

The City's Project Manager for this work will be Rob Block, Wastewater/Storm Operations Supervisor, who can be reached by phone at (503) 718-2607 or by email at [rob@tigard-or.gov](mailto:rob@tigard-or.gov).

**J. PROPOSAL VALIDITY PERIOD**

Each proposal shall be irrevocable for a period of ninety (90) days from the Proposal Opening Date.

**K. FORM OF CONTRACT**

A copy of the City's standard general services agreement, which the City expects the successful firm or individual to execute, is included as "Attachment C". The contract will incorporate the terms and conditions from this RFP document and the successful proposer's response documents. Firms taking exception to any of the contract terms shall submit a protest or request for change in accordance with Section 2.D "Protest of Scope of Work or Terms" or their exceptions will be deemed immaterial and waived.

**L. TERM OF CONTRACT**

The term of the contract shall be a period of one (1) year with the mutual option to renew for up to four (4) additional one-year periods. The total term of the contract cannot exceed five (5) years.

**M. TERMINATION**

The contract may be terminated by mutual consent of both parties or by the City at its discretion with a 30 days' written notice. If the agreement is so terminated, Contractor shall be paid in accordance with the terms of the agreement.

**N. INTERGOVERNMENTAL COOPERATIVE PURCHASING**

The bidder submitting this proposal agrees to extend identical prices and services under the same terms and conditions to all public agencies in the region. Quantities stated in this solicitation reflect the City of Tigard usage only.

Each participating agency shall execute its own contract with the lowest responsible/responsive bidder for its requirements. Any bidder(s), by written notification included with their bid, may decline to extend the prices and terms of this solicitation to any and/or all other public agencies.

**O. NON-COLLUSION**

Proposer certifies that this proposal had been arrived at independently and has been submitted without collusion designed to limit independent bidding or competition.

**P. PUBLIC RECORD**

All bid material submitted by bidder shall become the property of the City and is public record unless otherwise specified. A bid that contains any information that is considered trade secret under ORS 192.501(2) should be segregated and clearly identified as such. This information will be kept confidential and shall not be disclosed except in accordance with the Oregon Public Records Law, ORS 192. The above restrictions may not include cost or price information, which must be open to the public.



**SECTION 3**  
**BACKGROUND**

The City of Tigard was incorporated in 1961 and today is a clean, livable, and affordable community. Tigard is located in southeast Washington County, 15 minutes from downtown Portland. Tigard's population estimate for 2018 is 54,758 residents. As a community, Tigard strives to blend the amenities of a modern City with the friendliness and community spirit of a small town.

**SECTION 4**  
**SCOPE AND SCHEDULE OF WORK**

The Contractor shall provide street sweeping and removal of debris as required for approximately 320 sweeping miles of Tigard streets (curb miles). Whether or not an actual curb exists, the term "street" shall include the paved area between the normal curb lines of the roadway. Islands that separate directional traffic and contain a curb shall be considered in the "curb sweeps," and shall be swept in the same manner as a normal street curb. Street sweeping shall normally consist of a single pass over a given area with a regenerative air or vacuum sweeper. Sweeping shall be performed in the same direction as the traffic flow at all times. As new streets are constructed and/or accepted by the City, a list of these streets will be provided to the Contractor, and then included in the regular monthly schedule.

**A. CONTRACTOR'S REPRESENTATIVE**

Before starting work, the Contractor shall designate an authorized representative in writing, who shall have complete authority to represent and to act for the Contractor in all directions given by the City's Project Manager or designee. The Contractor or the authorized representative shall give efficient supervision to the work, using the best skill and personal attention to the prosecution of the work.

Upon written request by the City's Project Manager, the Contractor shall promptly remove incompetent, careless or negligent employees or agents from performing work under this Contract. Failure to comply with such request is sufficient grounds for termination of the Contract.

**B. CONTRACTOR'S WORK SCHEDULE**

All City streets shall be swept once per month. The Contractor's sweeping shall be approved by the City's Project Manager or designee. Street sweeping on business and high traffic main boulevards will be performed between the hours of 4:00 a.m. and 7:00 a.m., and residential areas shall be swept between the hours of 7:00 a.m. and 7:00 p.m.

If the work performed does not correspond to the work schedule, the Contractor shall submit a revised schedule when requested by the City's Project Manager or designee.

**C. DESIGNATED CITY PARKING LOTS TO BE DETAILED AND SWEEPED**

The Contractor shall detail and sweep the following City parking lots once a month. The City shall compensate the Contractor for detail and sweeps performed under this paragraph at the monthly rate specified in the proposal.

- Tigard City Hall, Permit Center and Police Dept., 13125 SW Hall Boulevard. (78,000 sq. ft.)
  - Niche Building, 8720 SW Burnham Street (17,800 sq. ft.)
- Public Works Building, 8777 SW Burnham Street
  - Front parking lot-(26,800 sq. ft.)
  - Back parking lot-(37,117 sq. ft.)
- Tigard Senior Center, 8815 SW O'Mara Street (34,600 sq. ft.)

- Tigard Public Library, 13500 SW Hall Boulevard (48,900 sq. ft.)
- Summerlake Park, 11450 SW Winterlake Drive (8,700 sq. ft.)
- Cook Park, 17005 SW 92nd Avenue
  - West parking lot — north of baseball fields to the west of 92nd (44,300 sq. ft.)
  - East parking lot — north and east of restroom facility to the east of 92nd (99,000 sq. ft.)
  - Park interior below gate — including street, parking offshoots, and other parking areas/lots (124,000 sq. ft.)

**D. SWEEPING DEBRIS**

The term "sweeping debris" shall include, but is not limited to, all dirt, rocks, sand, gravel, sticks, leaves, paper, cans, and other miscellaneous items which are normally picked up by a street sweeper. The term "sweeping debris" shall not include large items that cannot be picked up by a mechanical sweeper or would otherwise damage the sweeper.

**E. DEBRIS REMOVAL**

Contractor must possess a roll-off truck. Roll-off truck shall have a minimum payload capacity of 12.5 tons.

Contractor shall not dump debris on the ground. Contractor may provide their own drop boxes and their own transport equipment to haul debris or the Contractor must use the local designated City waste disposal franchise to haul debris. Drop box minimum capacity shall be no less than 11.5 cubic yards.

Contractor shall make prior arrangements with the City's Public Works Department for the placement of all drop boxes to be used for the dumping of street sweeping debris. Contractor shall provide reflective cones or other highly visible devices to mark drop boxes at their location.

The Contractor is required to have a back-up means of handling sweeping debris in a case of primary equipment failure.

**F. HANDLING AND DISPOSAL OF DEBRIS**

Contractor must meet all applicable debris disposal requirements of the Oregon Department of Environmental Quality and other federal, state, or local agencies. It shall be the Contractor's sole responsibility to ensure that all guidelines are followed. Sweeping debris under this contract may not be used, added, blended, or modified in any way to make a product, or as to risk contaminating a product that will be given, sold, or make its way for public use. For this reason, recycling centers will generally be considered unacceptable for the processing of sweeping debris.

The City's preference is that the Contractor shall have an operating screening plant using a one inch (1") or finer screen and equipment on impermeable surface with sand-oil-water separator for the processing of material prior to final disposal.

**1. Clean Water Services Treatment Facility**

With the exception of sweeping debris that is predominantly comprised of leaves or from hazardous material sweeps (road accidents or other), all materials shall be taken to the Clean Water Services Debris Treatment Facility located at 3990 NE 33<sup>rd</sup> Avenue, Hillsboro, Oregon 97124. The City will be billed directly by Clean Water Services for disposal at this location, the contractor will incur not disposal fee at this location. The only cost to the Contractor will be for travel time and fuel. Prior to the start of services under this contract, the City's Project Manager and Contractor staff shall review the process for disposal at this site.



For material not meeting the criteria for disposal at the Clean Water Services site, specifically leaves and hazardous materials, Contractor shall use DEQ-approved disposal site or transfer station for disposal. Debris wastes shall be disposed of as dirt fill after testing to identify any possible contamination and only after plastics, papers and other trash and solid wastes have been removed using a one inch (1") or finer screen system.

At no point shall sweeping debris under this contract be used, added, blended, or modified in any way to make a product, or as to risk contaminating a product that will be given, sold or make its way for public use. For this reason, recycling centers will generally be considered unacceptable for the processing of sweeping debris.

Any exemptions to these specifications must be approved in writing by the City, local Department of Environmental Quality (DEQ), and/or permitting authorities.

Contractor shall include in their proposal a detailed description of:

- Who is managing the process of the debris
- How the debris is being handled
- Where the debris is being disposed
- A description of equipment used

Waste processing facilities may be subject to inspection prior to contract award.

#### **G. WASTE SITES**

The Contractor shall operate waste storage sites in such a manner as to meet all safety and health requirements of State and local agencies. Site operations or the result of such operations which create a nuisance problem, or which result in damage to public and private properties will not be permitted.

The Contractor will be responsible for obtaining the necessary permits for dumping at waste sites provided by the Contractor.

#### **H. SOLID WASTE PERMIT**

If the Contractor is not set up to process sweeping debris and proposes to process sweeping debris through a sub-contractor before final disposal, sub-contractor shall provide the cost and proof of an appropriate solid waste permit for the processing facility.

#### **I. SWEEPING SCHEDULE**

The Contractor shall establish and submit for approval a regular schedule of performance that will include sweeping all streets and parking lots once each month in approximately the same order. However, the City, at its sole discretion, may increase or decrease sweeping frequency or alter the sweeping schedule as it deems necessary. Once established, the Contractor shall adhere to the approved schedule.

#### **J. CONTRACTOR'S EQUIPMENT**

All equipment must be performance worthy by visual and operational inspection. Contractor shall provide both air sweepers and mechanical sweepers with suitable back-up for each type of sweeper. Air sweepers shall be used for the storm water management program and mechanical sweepers, followed by an air sweeper for rock spills, road sand, windstorms and heavy debris. The City's preference is that the primary sweeper not be more than four (4) years old and shall be a regenerative air or vacuum sweeper and the back-up sweeper not be more than six (6) years old. Sweepers shall have no less than 24,000 lbs. G.V.W. and must be equipped with an adequate water spray system for dust control.

Machines must be maintained in good working condition throughout the life of this Contract with Contractor demonstrating evidence of an adequate service center to ensure scheduled routine maintenance and proper adjustment for sweepers. Machines shall be fully operational during all sweeps.

Contractor must keep a sufficient supply of spare brooms and parts to ensure continuous operation. Worn brushes and brooms shall be replaced and adjusted to ensure maximum efficiency. The determination of when a brush or broom shall be replaced shall be based on the effectiveness of all brushes and brooms.

All equipment must be properly registered and insured in accordance with State and local laws. Contractor must show proof of ownership or a signed lease for sufficient machinery to adequately perform services as agreed in this contract. A list of machines to be used must accompany a firm's proposal. Please provide this list in the Equipment Detail Form included as Attachment D of this packet.

All units shall be clearly and prominently marked with the Contractor's name and unit number and have a radio or paging equipment for contact with their office.

The sweepers shall be self-propelled, pickup sweepers with revolving gutter brushes on both sides, in-head broom, a sprinkler system and a high lift storage hopper with a minimum capacity of three (3) cubic yards or as approved by the City's Project Manager or designee. Sweepers shall be capable of removing sweeping debris as described in Section 4.D.

Sweeping equipment shall be equipped with adequate warning devices and lights for safe operation and shall meet all vehicle operating requirements of the State of Oregon, Motor Vehicles Division.

Sweeping equipment shall be equipped with a speed-monitoring device. In conjunction with the Contractor's monthly statement, Contractor shall submit a Tac-o-graph report showing the speed and miles swept on each sweeper used for work under this contract.

Failure to comply with these requirements shall be just cause for termination of contract.

#### **K. EQUIPMENT PERFORMANCE**

The sweepers used shall be capable of picking up all debris from a street in a single pass, without leaving a trail of debris behind and shall be capable of dust abatement. Sweepers shall be driven at not less than three (3) miles per hour and not more than five (5) miles per hour to assure all debris is picked up and to remain in compliance with regulations from Clean Water Services. All equipment used shall be in good mechanical condition and shall not leak oil or other fluids onto the pavement during operations. If the City deems a piece of equipment unsuitable, the Contractor will be instructed to make the appropriate repairs or remove it from the work site.

#### **L. WATER USE**

The City will provide water at hydrants for the filling of water spray systems on the sweepers. Contractor shall use a Chapman Valve when filling water tanks from hydrants. The Contractor shall maintain a water use record and make it available to the City upon request.

#### **M. INSPECTIONS**

Inspections will be performed on a regular basis as well as spot checks in response to citizen complaints. Any deficiencies found will be reported to the Contractor for immediate correction.

#### **N. CHANGED CONDITIONS**

Contractor shall notify the City's Project Manager or the assigned designee in writing promptly upon their discovery and before they are disturbed of the following work site conditions ("changed conditions"):

1. Unknown physical conditions of an unusual nature differing materially from those ordinarily encountered and generally recognized as inherent of the character in the work being performed;
2. Conditions affecting the cost of the work which would not have been disclosed by reasonable examination of the site.

The City's Project Manager or the assigned designee will promptly investigate such conditions when notified. If the City's Project Manager or the assigned designee determines that the conditions are changed conditions and that they will materially increase or decrease the costs of any portion of the work, the City's Project Manager or the assigned designee will issue a change order to adjust the compensation for that portion of the work. If the City's Project Manager or the assigned designee determines that the conditions do not justify an adjustment in compensation, the Contractor will be so advised in writing.

#### **O. RESPONSIBILITY OF THE CONTRACTOR**

The Contractor shall do all the work and furnish all labor, materials, supervision, inspections, equipment, tools and machines necessary for the performance and completion of the project in accordance with the Contract within the specified time.

Contractor shall employ only competent, skillful persons to do the work. Contractor shall keep competent, supervisory personnel to monitor work performed under the Contract. Contractor shall give efficient supervision to the work using the highest level of skill and attention.

Contractor shall provide adequate supervision and staff to ensure continuity in sweeping operations as set forth in this contract and maintain a direct line of communication with the City's Project Manager or designee.

Contractor shall provide a telephone answering service toll free from 7:30 a.m. to 4:30 p.m. Monday through Friday except on Federal holidays. The answering service shall have the capability of contacting sweepers by radio or paging equipment and relaying instructions from the City. Contractor shall also provide a 24-hour phone number to be used for emergency purposes.

The Contractor shall notify the City of any obstructions in the roadways, or other reasons why sweeping could not be performed over a specific area, such as tree limbs or landscaping, disabled vehicles, construction equipment and material and other similar items. The report shall be made verbally or by fax to the City's Project Manager or the assigned designee within four (4) hours of the scheduled sweeping. The City will then take appropriate action to mitigate the obstruction.

Contractor shall notify City's Project Manager of what section of the City is being swept daily. Notification can be done via e-mail, text, or phone message.

#### **P. NOTIFICATIONS RELATIVE TO CONTRACTOR'S ACTIVITIES**

At the request of the City, Contractor may be required to notify all agencies and utilities affected by the operations so as to properly coordinate and expedite the work in such a manner as to cause the least amount of conflict and interference. Notification shall include, but not be limited to, the time of commencement and completion of work, names of streets or locations of alleys to be closed, and a schedule of operations and routes of detours where possible. Damages or claims resulting from improper or insufficient notification of the affected agencies shall be the responsibility of Contractor.

**Q. PROTECTION OF PROPERTY**

Contractor shall protect all public and private property insofar as it may be endangered by operations and take every reasonable precaution to avoid damage to such property.

Contractor's site-parked mobile equipment, operable machinery, and hazardous parts subject to mischief shall be kept locked or otherwise made inoperable whenever left unattended.

Wastes shall not be buried or burned on the site or disposed of into storm drains, sanitary sewers, streams or waterways. All wastes shall be removed from the site and disposed of in accordance with local ordinances and State and Federal anti-pollution laws.

Contractor shall restore and bear the cost of any public or private improvement, facility, or structure within the right of way, which is damaged, either directly or indirectly, by an act, omission or neglect in the execution of the work and which is not designated for removal. Contractor shall be responsible for any injury, loss or damage to any presently existing improvements on the premises caused by the Contractor or the Contractor's employees, agents or subcontractors, and in the event of such injury, loss or damage shall promptly make such repairs or replacements as required by the City without additional cost to the City.

Contractor shall protect all designated trees and planted areas within the right of way or easements and shall exercise care and conduct operations to minimize damages to other planted areas.

**R. DUST CONTROL, WATER AND AIR POLLUTION**

During all phases of the work, and when directed, Contractor shall take precautions to abate dust nuisance by cleaning up, sweeping, sprinkling with water, or other means as necessary to accomplish the suppression of dust. During the term of the Contract, Contractor's operations shall conform to applicable laws and regulations of the Oregon Department of Environmental Quality, and other agencies of the State and Federal government, as well as local ordinances designed to prevent, control and abate water and air pollution.

**S. INSPECTION**

If any work is found unsatisfactory, or the City finds that all certificates, bills, forms, and documents have not been properly submitted, the City's Project Manager or the assigned designee will give the Contractor the necessary instructions to perform the work satisfactorily and to properly submit bills, forms and documents, and the Contractor shall immediately comply with such instructions.

**T. NEW STREETS**

The City may add additional streets during the term of the project for street sweeping services. When new streets are required to be swept, the City shall provide a map to the Contractor showing the location and total miles of the new streets to be swept. New streets will be billed at the contracted Regular Sweep per mile charge (Attachment B).

**U. REPORTING**

In conjunction with the Contractor's monthly statement, the Contractor shall submit to the City a Tac-o-graph report showing the speed and miles swept on each sweeper used for work under this Contract. The Contractor shall also provide the City with details on the tonnage amount for the month's debris. The Contractor, by signing the subsequent contract, shall further agree to provide the City with any other report that the City deems necessary with particular attention given to any information that is requested by or required by Clean Water Services.



## V. SPECIAL SWEEPS

At times, the City may require special sweeps that are outside the regular monthly sweeps. Special sweeps may include, but not necessarily limited to, the following:

- Automobile accidents
- Material spills on the roadway
- Construction zone cleanup
- Snow fall and subsequent sweep of sand on the roadway

The City will not consider a heavy leaf fall event to be the cause of a special sweep. The City expects the Contractor to factor leaf fall into their regular monthly sweep and understand that the months that contain leaf falls may take more time and effort on the Contractor's part to clean the streets. A Contractor's per mile price for the regular monthly sweep should incorporate the leaf fall season with the understanding that in the summer months it will likely not take as long to sweep the City.

## SECTION 5 PROPOSAL CONTENT AND FORMAT

### A. FORMAT

To provide a degree of consistency in review of the written proposals, firms are requested to prepare their proposals in the standard format specified below.

#### 1. Title Page

Proposer should identify the RFP Title, name and title of contact person, address, telephone number, fax number, email address and date of submission.

#### 2. Transmittal Letter

The transmittal letter should be not more than two (2) pages long and should include as a minimum the following:

- a. A brief statement of the Proposer's understanding of the project and services to be performed;
- b. A positive commitment to perform the services within the time period specified, starting and completing the project within the deadlines stated in this RFP; and the names of persons authorized to represent the Proposer, their title, address and telephone number (if different from the individual who signs the transmittal letter.)

#### 3. Table of Contents

The table of contents should include a clear and complete identification by section and page number of the materials submitted.

#### 4. Firm and Team Qualifications

- a. Background of the firm. This should include a brief history of the firm and types of services the firm is qualified to perform.
- b. Qualifications of the firm in performing this type of work. This should include examples of related experience and references for similar studies and projects.
- c. Proposers must identify the anticipated members of their firm that will be assigned to meet the City's needs. Proposers should identify individuals and subcontractors who will

provide the services, their experience, and their individual qualifications. Pertinent resumes of assigned personnel should be included.

**5. Project Understanding and Approach**

Proposers should provide the City with information regarding their understanding of the City's needs with regards to the Scope and Schedule of Work. Proposers should demonstrate a general understanding of the needs of a municipality in the State of Oregon from a street sweeping firm. As part of their service understanding documentation, Proposer's should address their availability to meet the City's needs.

**6. Cost Structure**

The proposed fee structure should include the complete breakout for the Contractor's costs to provide all the services under the subsequent contract.

**B. ADDITIONAL SERVICES**

Provide a brief description of any other services that your firm could provide the City and an approximation of the hourly charge for each service of this type. Such services would be contracted for on an "as needed" basis, to be provided and billed for separately.

**C. ADDITIONAL INFORMATION**

Please provide any other information you feel would help the Selection Committee evaluate your firm for this project.

**D. REFERENCES**

Contractor must demonstrate successful past performance of the firm's ability to provide services as set forth in this specification. Contractors must detail three (3) references to document experience. References must be detailed in Attachment B "Statement of Proposal"

**E. DISPUTES**

Should any doubt or difference of opinion arise between the City and a Proposer as to the items to be furnished hereunder or the interpretation of the provisions of this RFP, the decision of the City shall be final and binding upon all parties.

**F. CITY PERSONNEL**

No Officer, agent, consultant or employee of the City shall be permitted any interest in the contract.

**SECTION 6  
PROPOSAL EVALUATION PROCEDURES**

**A. SELECTION AND EVALUATION PROCESS**

A Selection Committee assembled by the City will review the written proposals. Proposals will be evaluated to determine which ones best meet the needs of the City. After meeting the mandatory requirements, the proposals will be evaluated on both their technical and fee aspects. The Selection Committee will select the Proposer which best meets the City's needs based upon its evaluation of a firm's proposal. Proposals will be evaluated in accordance with the following:

- |   |                         |
|---|-------------------------|
| <b>1. <u>Completed Proposal submitted on time</u></b>                       | <b><u>Pass/Fail</u></b> |
| <b>2. <u>An original plus one electronic copy on portable USB drive</u></b> | <b><u>Pass/Fail</u></b> |
| <b>3. <u>Transmittal letter</u></b>   | <b><u>Pass/Fail</u></b> |
| <b>4. <u>Firm and team qualifications</u></b>                               | <b><u>40 points</u></b> |

5.	<u>Project understanding and approach</u>	<u>30 points</u>
6.	<u>Cost structure</u>	<u>30 points</u>
<b><u>TOTAL EVALUATION POINTS</u></b>		<b><u>100 POINTS</u></b>

**B. PRESENTATION/INTERVIEW**

At the option of the City, the top scoring proposers (based on the criteria points) may be asked to make a presentation of their proposal. This will provide an opportunity to clarify or elaborate on the proposal, but will not, in any way provide an opportunity to change any fee amount originally proposed. The City’s Project Manager will schedule the time and location of these presentations and notify the selected firms. If the City elects to conduct a presentation/interview process, 25 criteria points will be assigned to the process and will be added to the participating Proposers’ total points.

**C. INVESTIGATION OF REFERENCES**

The City reserves the right to investigate references and the past performance of any Proposer with respect to its successful performance of similar projects, compliance with specifications and contractual obligations, its completion or delivery of a project on schedule and its lawful payment of employees and workers.

**D. CLARIFICATION OF PROPOSALS**

The City reserves the right to obtain clarification of any point in regard to a proposal or to obtain additional information necessary to properly evaluate or particular proposal. Failure of a Proposer to respond to such a request for additional information or clarification could result in rejection of their proposal.

**E. RESERVATION IN EVALUATION**

The Selection Committee reserves the right to either: (a) request “Best and Final Offers” from the two finalist firms and award to the lowest priced or (b) to reassess the proposals and award to the vendor determined to best meet the overall needs of the City.

**F. INTENT OF AWARD**

Upon review of the proposals submitted, the City may negotiate a scope of work and a general services agreement with one firm or may select one or more firms for further consideration.

**G. PROTEST OF AWARD**

In accordance with Tigard Public Contracting Rule 30.135, any adversely affected Proposer has seven (7) calendar days from the date of the written notice of award to file a written protest.

**H. PROPOSAL REJECTION**

The City reserves the right to:

1. Reject any or all proposals not in compliance with all public procedures and requirements;
2. Reject any proposal not meeting the specifications set forth herein;
3. Waive any or all irregularities in proposals submitted;
4. In the event two or more proposals shall be for the same amount for the same work, the City shall follow the provisions of LCRB 30.095 and Section 137-095 of the Oregon Attorney General’s Model Public Contract Manual;
5. Reject all proposals;
6. Award any or all parts of any proposal; and
7. Request references and other data to determine responsiveness.

**SECTION 7**  
**PROPOSAL CERTIFICATIONS**

\*\*\*\*\*

**Non-discrimination Clause**

The Contractor agrees not to discriminate against any client, employee or applicant for employment or for services, because of race, color, religion, sex, national origin, handicap or age with regard to, but not limited to, the following: employment upgrading, demotion or transfer; recruitment or recruitment advertising; layoffs or termination; rates of pay or other forms of compensation; selection for training; rendition of services. It is further understood that any contractor who is in violation of this clause shall be barred from receiving awards of any purchase order from the City, unless a satisfactory showing is made that discriminatory practices have terminated and that a recurrence of such acts is unlikely.

Agreed by: \_\_\_\_\_

Firm Name: \_\_\_\_\_

Address: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

\*\*\*\*\*

**Resident Certificate**

Please Check One:

**Resident Vendor:** Vendor has paid unemployment taxes and income taxes in this state during the last twelve calendar months immediately preceding the submission of this proposal.

**Or**

**Non-resident Vendor:** Vendor does not qualify under requirement stated above.  
(Please specify your state of residence: \_\_\_\_\_)

Officer's signature: \_\_\_\_\_

Type or print officer's name: \_\_\_\_\_



**SECTION 8**  
**SIGNATURE PAGE**

The undersigned proposes to perform all work as listed in the Specification section, for the price(s) stated; and that all articles supplied under any resultant contract will conform to the specifications herein,

The undersigned agrees to be bound by all applicable laws and regulations, the accompanying specifications and by City policies and regulations.

The undersigned, by submitting a proposal, represents that:

- A) The Proposer has read and understands the specifications.
- B) Failure to comply with the specifications or any terms of the Request for Proposal may disqualify the Proposer as being non-responsive.

The undersigned certifies that the proposal has been arrived at independently and has been submitted without any collusion designed to limit competition.

The undersigned certifies that all addenda to the specifications has been received and duly considered and that all costs associated with all addenda have been included in this proposal:

Addenda: No. \_\_\_\_\_ through No. \_\_\_\_\_ inclusive.

We therefore offer and make this proposal to furnish services at the price(s) indicated herein in fulfillment of the attached requirements and specifications of the City.

Name of firm: \_\_\_\_\_

Address: \_\_\_\_\_

Telephone Number: \_\_\_\_\_ Email: \_\_\_\_\_

By: \_\_\_\_\_ Date: \_\_\_\_\_

(Signature of Authorized Official. If partnership, signature of one partner.)

Typed Name/Title: \_\_\_\_\_

If corporation, attest: \_\_\_\_\_

(Corporate Officer)

Corporation

Partnership

Individual

Federal Tax Identification Number (TIN): \_\_\_\_\_

**ATTACHMENT A  
CITY OF TIGARD, OREGON  
ACKNOWLEDGMENT OF ADDENDA**

Project Title: Street Sweeping Services

Close: Tuesday, April 28, 2020 - 2:00 p.m.

I/WE HAVE RECEIVED THE FOLLOWING ADDENDA (*If none received, write "None Received"*):

1. \_\_\_\_\_ 3. \_\_\_\_\_

2. \_\_\_\_\_ 4. \_\_\_\_\_

\_\_\_\_\_  
Date

\_\_\_\_\_  
Signature of Proposer

\_\_\_\_\_  
Title

\_\_\_\_\_  
Corporate Name

**ATTACHMENT B  
CITY OF TIGARD, OREGON  
STATEMENT OF PROPOSAL**

Name of Consultant: \_\_\_\_\_

Mailing Address: \_\_\_\_\_

\_\_\_\_\_

Contact Person: \_\_\_\_\_

Telephone: \_\_\_\_\_ Fax: \_\_\_\_\_ Email: \_\_\_\_\_

accepts all the terms and conditions contained in the City of Tigard's Request for Proposal for Street Sweeping Services and the attached general services agreement (Attachment C):

\_\_\_\_\_  
Signature of authorized representative

\_\_\_\_\_  
Date

\_\_\_\_\_  
Type or print name of authorized representative

\_\_\_\_\_  
Telephone Number

\_\_\_\_\_  
Type or print name of person(s) authorized to negotiate contracts

\_\_\_\_\_  
Telephone Number

**REFERENCES**

\_\_\_\_\_  
Reference #1

\_\_\_\_\_  
Telephone Number

\_\_\_\_\_  
Project Title

\_\_\_\_\_  
Contact Individual

\_\_\_\_\_  
Reference #2

\_\_\_\_\_  
Telephone Number

\_\_\_\_\_  
Project Title

\_\_\_\_\_  
Contact Individual

\_\_\_\_\_  
Reference #3

\_\_\_\_\_  
Telephone Number

\_\_\_\_\_  
Project Title

\_\_\_\_\_  
Contact Individual

**ATTACHMENT C**  
**AGREEMENT FOR SERVICES RELATED TO**  
**STREET SWEEPING**

**THIS AGREEMENT** made and entered into this \_\_\_\_\_ of \_\_\_\_\_, \_\_\_\_\_ by and between the City of Tigard, a municipal corporation of the State of Oregon, hereinafter called “City”, and \_\_\_\_\_, hereinafter called “Contractor”, collectively known as the “Parties.”

**RECITALS**

**WHEREAS**, Contractor has submitted a bid or proposal to City to provide specific services; and

**WHEREAS**, Contractor is in the business of providing specific services and is aware of the purposes for which City requires the services; and

**WHEREAS**, City and Contractor wish to enter into a contract under which City shall purchase the services described in Contractor’s bid or proposal;

**THEREFORE**, The Parties agree as follows:

**1. SERVICES TO BE PROVIDED**

Contractor agrees to provide services related to street sweeping as detailed in Exhibit A – Scope of Services and by this reference made a part hereof.

**2. EFFECTIVE DATE AND DURATION**

This Agreement is effective upon the date of execution and expires on \_\_\_\_\_, unless otherwise terminated or extended. The Parties may agree on four (4) additional one (1) year extensions to the Agreement. At no point can this Agreement exceed five (5) years. All work under this Agreement must be completed prior to the expiration of this Agreement.

**3. COMPENSATION**

The City agrees to pay Contractor in accordance with the fee schedule outlined in Exhibit A. The total amount paid to the Contractor by the City may not exceed \_\_\_\_\_ /100 Dollars (\$ \_\_\_\_\_). Payments made to Contractor will be based upon the following applicable terms:

- A.** Payment by City to Contractor for performance of services under this Agreement includes all expenses incurred by Contractor, with the exception of expenses, if any, identified in this Agreement as separately reimbursable.
- B.** Payment will be made in installments based on Contractor’s invoice, subject to the approval of the City Manager, or designee, and not more frequently than monthly. Unless otherwise agreed, payment will be made only for work actually completed as of the date of invoice.
- C.** Payment by City releases City from any further obligation for payment to Contractor for services performed or expenses incurred as of the date of the invoice. Payment may not be considered acceptance or approval of any work or waiver of any defects therein.
- D.** Contractor must make payments promptly, as due, to all persons supplying labor or materials for the performance of the work provided for in this Agreement.
- E.** Contractor may not permit any lien or claim to be filed or prosecuted against the City on any account of any labor or material furnished.



- F. Contractor will pay to the Department of Revenue all sums withheld from employees pursuant to ORS 316.167.
- G. Contractor will pay all contributions or amounts due the Industrial Accident Fund from the contractor or any subcontractor.
- H. If Contractor fails, neglects, or refuses to make prompt payment of any claim for labor or services furnished to Contractor or a subcontractor by any person as such claim becomes due, City's Finance Director may pay such claim and charge the amount of the payment against funds due or to become due the Contractor. The payment of the claim in this manner does not relieve Contractor or their surety from obligation with respect to any unpaid claims.
- I. Contractor will promptly, as due, make payment to any person, co-partnership, association, or corporation, furnishing medical, surgical, and hospital care or other needed care and attention, incident to sickness or injury, to the employees of Contractor, of all sums that Contractor agrees to pay for the services and all moneys and sums that Contractor collected or deducted from the wages of employees pursuant to any law, contract, or agreement for the purpose of providing or paying for services.
- J. Contractor and its employees, if any, are not active members of the Oregon Public Employees Retirement System and are not employed for a total of 600 hours or more in the calendar year by any public employer participating in the Retirement System.
- K. Contractor must obtain, prior to the execution of any performance under this Agreement, a City of Tigard Business License. The Tigard Business License is based on a calendar year with a December 31st expiration date. New businesses operating in Tigard after June 30th of the current year will pay a pro-rated fee through the end of the calendar year.
- L. The City certifies that sufficient funds are available and authorized for this Agreement during the current fiscal year. Funding during future fiscal years is subject to budget approval by Tigard's City Council.

4. **ASSIGNMENT/DELEGATION**

Neither party may assign, sublet or transfer any interest in or duty under this Agreement without the written consent of the other and no assignment has any force or effect unless and until the other party has consented. If City agrees to assignment of tasks to a subcontract, Contractor is fully responsible for the acts or omissions of any subcontractors and of all persons employed by them. Neither the approval by City of any subcontractor nor anything contained herein creates any contractual relation between the subcontractor and City. The provisions of this Agreement are binding upon and will inure to the benefit of the parties to the Agreement and their respective successors and assigns.

5. **SUBMITTING BILLS AND MAKING PAYMENTS**

All notices and bills shall be made in writing and may be given by personal delivery, mail or e-mail. Payments may be made by personal delivery, or mail. The following addresses shall be used to transmit notices, bills, payments, and other information:

CITY OF TIGARD	
Attn:	Attn:
Address: 13125 SW Hall Blvd. Tigard, Oregon 97223	Address:
Phone: (503) 718-	Phone:
Email:	Email:

**6. TERMINATION**

There will be no penalty for early termination. If City terminates the contract pursuant to this paragraph, it shall pay Contractor for services rendered prorated to the date of termination.

**7. ACCESS TO RECORDS**

City shall have access to such books, documents, papers and records of Contractor as are directly pertinent to this Agreement for the purpose of making audit, examination, excerpts and transcripts.

**8. FORCE MAJEURE**

Neither City nor Contractor will be considered in default because of any delays in completion and responsibilities hereunder due to causes beyond the control and without fault or negligence on the part of the parties so disabled, including but not restricted to, an act of God or of a public enemy, civil unrest, volcano, earthquake, fire, flood, epidemic, quarantine restriction, area-wide strike, freight embargo, unusually severe weather or delay of subcontractor or supplies due to such cause; provided that the parties so disabled will within ten (10) days from the beginning of such delay, notify the other party in writing of the cause of delay and its probable extent. Such notification will not be the basis for a claim for additional compensation. Each party will, however, make all reasonable efforts to remove or eliminate such a cause of delay or default and will, upon cessation of the cause, diligently pursue performance of its obligation under the Agreement.

**9. NON-DISCRIMINATION**

Contractor will comply with all federal, state, and local laws, codes, regulations, and ordinances applicable to the provision of services under this Agreement, including, without limitation:

**A.** Title VI of the Civil Rights Act of 1964;

**B.** Section V of the Rehabilitation Act of 1973;

**C.** The Americans with Disabilities Act of 1990, as amended by the ADA Amendments Act (ADAAA) of 2008 (Pub L No 101 - 336); and

ORS 659A.142, including all amendments of and regulations and administrative rules, and all other applicable requirements of federal and state civil rights and rehabilitation statutes, rules and regulations.

**10. INDEMNITY**

Contractor agrees to and defend, indemnify and hold harmless City, City's officers, employees, agents and representatives from and against all liability, claims, costs, demands, judgments, penalties, and causes of action of any kind or character, or other costs or expenses incidental to the investigation and defense thereof, of whatever nature, resulting from or arising out of the activities of the Contractor or its subcontractors, agents, or employees in performance of this contract, except, however, that the

foregoing shall not apply to liability that arises out of the City's, its officers, employees, agents and representatives sole negligence. If any aspect of this indemnity shall be found to be illegal or invalid for any reason whatsoever, such illegality or invalidity shall not affect the remainder of this indemnification.

**11. INSURANCE**

Contractor shall maintain insurance acceptable to City in full force and effect throughout the term of this contract. Such insurance shall cover risks arising directly or indirectly out of Contractor's activities or work hereunder.

The policy or policies of insurance maintained by the Contractor shall provide at least the following limits and coverages:

**A. Commercial General Liability Insurance**

Contractor shall obtain, at contractor's expense, and keep in effect during the term of this contract, Comprehensive General Liability Insurance covering Bodily Injury and Property Damage on an "occurrence" form (CG 2010 1185 or equivalent). This coverage shall include Contractual Liability insurance for the indemnity provided under this contract. The following insurance will be carried:

<u>Coverage</u>	<u>Limit</u>
General Aggregate	3,000,000
Products-Completed Operations Aggregate	2,000,000
Personal & Advertising Injury	1,000,000
Each Occurrence	2,000,000
Fire Damage (any one fire)	50,000

**B. Commercial Automobile Insurance**

Contractor shall also obtain, at contractor's expense, and keep in effect during the term of the contract, Commercial Automobile Liability coverage including coverage for all owned, hired, and non-owned vehicles on an "occurrence" form. The Combined Single Limit per occurrence shall not be less than \$2,000,000.

If Contractor uses a personally-owned vehicle for business use under this contract, the Contractor shall obtain, at Contractor's expense, and keep in effect during the term of the contract, business automobile liability coverage for all owned vehicles on an "occurrence" form. The Combined Single Limit per occurrence shall not be less than \$2,000,000.

**C. Workers' Compensation Insurance**

The contractor, its Subcontractors, if any, and all employers providing work, labor, or materials under this Contract that are subject employers under the Oregon Workers' Compensation Law shall comply with ORS 656.017, which requires them to provide workers' compensation coverage that satisfies Oregon law for all their subject workers. Out-of-state employers must provide Oregon workers' compensation coverage for their workers who work at a single location within Oregon for more than 30 days in a calendar year. Contractors who perform work without the assistance or labor of any employee need not obtain workers' compensation coverage. All non-exempt employers shall provide Employer's Liability Insurance with coverage limits of not less than \$1,000,000 each accident.

**D. Additional Insured Provision**

All policies aforementioned, other than Workers' Compensation and Professional Liability, shall include the City its officers, employees, agents and representatives as additional insureds with respect to this contract.

**E. Insurance Carrier Rating**

Coverages provided by the Contractor must be underwritten by an insurance company deemed acceptable by the City. All policies of insurance must be written by companies having an A.M. Best rating of "A-VII" or better, or equivalent. The City reserves the right to reject all or any insurance carrier(s) with an unacceptable financial rating.

**F. Self-Insurance**

The City understands that some Contractors may self-insure for business risks and the City will consider whether such self-insurance is acceptable if it meets the minimum insurance requirements for the type of coverage required. If the Contractor is self-insured for commercial general liability or automobile liability insurance the Contractor must provide evidence of such self-insurance. The Contractor must provide a Certificate of Insurance showing evidence of the coverage amounts on a form acceptable to the City. The City reserves the right in its sole discretion to determine whether self-insurance is adequate.

**G. Certificates of Insurance**

As evidence of the insurance coverage required by the contract, the Contractor shall furnish a Certificate of Insurance to the City. No contract shall be effective until the required Certificates of Insurance have been received and approved by the City. The certificate will specify and document all provisions within this contract and include a copy of Additional Insured Endorsement. A renewal certificate will be sent to the below address prior to coverage expiration.

**H. Primary Coverage Clarification**

The parties agree that Contractor's coverage shall be primary to the extent permitted by law. The parties further agree that other insurance maintained by the City is excess and not contributory insurance with the insurance required in this section.

**I. Cross-Liability Clause**

A cross-liability clause or separation of insureds clause will be included in all general liability, professional liability, pollution and errors and omissions policies required by this contract.

A certificate in form satisfactory to the City certifying to the issuance of such insurance will be forwarded to:

City of Tigard  
Attn: Contracts and Purchasing Office  
13125 SW Hall Blvd.  
Tigard, Oregon 97223

At the discretion of the City, a copy of each insurance policy, certified as a true copy by an authorized representative of the issuing insurance company may be required to be forwarded to the above address.

Such policies or certificates must be delivered prior to commencement of the work. The procuring of such required insurance shall not be construed to limit contractor's liability hereunder. Notwithstanding



said insurance, Contractor shall be obligated for the total amount of any damage, injury, or loss caused by negligence or neglect connected with this contract.

12. **ATTORNEY'S FEES**

In the event an action, suit or proceeding, including appeal, is brought for failure to observe any of the terms of this Agreement, each party is responsible for that party's own attorney fees, expenses, costs and disbursements for the action, suit, proceeding, or appeal.

13. **COMPLIANCE WITH STATE AND FEDERAL LAWS/RULES**

Contractor will comply with all applicable federal, state and local laws, rules and regulations applicable to the work in this Agreement.

14. **CHOICE OF LAW, VENUE**

The provisions of this Agreement are governed by Oregon Law. Venue will be the State of Oregon Circuit Court in Washington County or the US District Court for Oregon, Portland.

15. **CITY OF TIGARD BUSINESS LICENSE**

Contractor is to obtain, prior to the execution of any performance under this Agreement, a City of Tigard Business License. The Tigard Business License is based on a calendar year with a December 31st expiration date. New businesses operating in Tigard after June 30th of the current year will pay a pro-rated fee through the end of the calendar year.

16. **CONFLICT BETWEEN TERMS**

In the event of a conflict between the terms of this Agreement and Contractor's proposal, this Agreement will control. In the event of conflict between a provision in the main body of the Agreement and a provision in the Exhibits, the provision in the main body of the Agreement will control. In the event of an inconsistency between Exhibit A and Exhibit B, Exhibit A will control.

17. **SEVERABILITY**

In the event any provision or portion of this Agreement is held to be unenforceable or invalid by any court of competent jurisdiction, the validity of the remaining terms and provisions will not be impaired unless the illegal or unenforceable provision affects a significant right or responsibility, in which case the adversely affected party may request renegotiation of the Agreement and, if negotiations fail, may terminate the Agreement.

18. **REPRESENTATIONS AND WARRANTIES**

Contractor represents and warrants to the City that:

- A. Contractor has the power and authority to enter into and perform this Agreement.
- B. This Agreement, when executed and delivered, is a valid and binding obligation of Contractor, enforceable in accordance with its terms.
- C. Contractor (to the best of Contractor's knowledge, after due inquiry), for a period of no fewer than six calendar years (or since the firm's inception if less than that) preceding the effective date of this Agreement, faithfully has complied with:
  - 1) All tax laws of this state, including but not limited to ORS 305.620 and ORS chapters 316, 317, and 318;
  - 2) Any tax provisions imposed by a political subdivision of this state that applied to Contractor,

to Contractor's property, operations, receipts, or income, or to Contractor's performance of or compensation for any work performed by Contractor;

- 3) Any tax provisions imposed by a political subdivision of this state that applied to Contractor, or to goods, services, or property, whether tangible or intangible, provided by Contractor; and
- 4) Any rules, regulations, charter provisions, or ordinances that implemented or enforced any of the foregoing tax laws or provisions.

D. Any intellectual property rights or such delivered to the City under this Agreement, and Contractor's services rendered in the performance of Contractor's obligations under this Agreement, shall be provided to the City free and clear of any and all restrictions on or conditions of use, transfer, modification, or assignment, and shall be free and clear of any and all liens, claims, mortgages, security interests, liabilities, charges, and encumbrances of any kind.

E. All goods will be guaranteed and warranted for a period of twelve (12) months from the date of installation, including parts and labor except damage caused by misuse, vandalism or act(s) of God

**19. COMPLIANCE WITH TAX LAWS**

Contractor represents and warrants that Contractor is, to the best of the undersigned's knowledge, not in violation of any Oregon tax laws including but not limited to ORS 305.620 and ORS Chapters 316, 317, and 318. Contractor's failure to comply with the tax laws of this state or a political subdivision of this state before the Contractor executed this Agreement or during the term of this Agreement is a default for which the City may terminate this Agreement and seek damages and other relief available under the terms of this Agreement or applicable law.

**IN WITNESS WHEREOF**, City has caused this Agreement to be executed by its duly authorized undersigned officer and Contractor has executed this Agreement on the date hereinabove first written.

*CITY OF TIGARD*

\_\_\_\_\_  
By: Authorized City Representative

\_\_\_\_\_  
By: Authorized Contractor Representative

\_\_\_\_\_  
Date

\_\_\_\_\_  
Date

**EXHIBIT A**  
**SCOPE OF SERVICES**

**CITY OF TIGARD, OREGON - CONTRACT SUMMARY FORM**

*(THIS FORM MUST ACCOMPANY EVERY CONTRACT)*

Contract Title: Street Sweeping – Residential/Parking Number: C200099

Contractor: Green Sweep Asphalt Service Contract Total: \$325,000/annual est

Contract Overview: Contractor will provide street sweeping services

Initial Risk Level:  Extreme  High  Moderate  Low

Risk Reduction Steps: Base level of insurance requirement in place.

Risk Comments: \_\_\_\_\_

Risk Signature: \_\_\_\_\_

Contract Manager: Rob Block Ext: 2607 Department: Storm

Type:  Personal Svc  Professional Svc  Architectural Agr  Public Imp  General Svc  
 Other: \_\_\_\_\_ Start Date: 06/15/2020 End Date: 06/30/2020

Quotes/Bids/Proposal:	<b>FIRM</b>	<b>AMOUNT/SCORE</b>
	<u>Green Sweep</u>	<u>86 / 86 / 75</u>
	<u>NW Slurry Solutions</u>	<u>75 / 77 / 65</u>
	_____	_____
	_____	_____

Account String:	<b>Fund-Division-Account</b>	<b>Work Order – Activity Type</b>	<b>Amount</b>
<b>FY 21</b>	<u>510-6700-54001</u>		<u>\$319,000</u>
<b>FY 21</b>	<u>200-6200-54001</u>		<u>\$6,000</u>
<b>FY</b> _____	_____		_____
<b>FY</b> _____	_____		_____
<b>FY</b> _____	_____		_____

**Approvals -** LCRB Date: Per Emergency Dec signed 3-17-2020

Department Comments: Joe filled out form

Department Signature: \_\_\_\_\_

Purchasing Comments: OK

Purchasing Signature: \_\_\_\_\_

City Manager Comments: \_\_\_\_\_

City Manager Signature: *Mary Jo*

*After securing all required approvals, forward original copy to the Contracting and Purchasing Office along with a completed Contract Checklist.*



**CITY OF TIGARD, OREGON**  
**AGREEMENT FOR SERVICES RELATED TO**  
**STREET SWEEPING SERVICES**

**THIS AGREEMENT** made and entered into this 18<sup>th</sup> day of June, 2020 by and between the City of Tigard, a municipal corporation of the State of Oregon, hereinafter called "City", and Green Sweep Asphalt Service, hereinafter called "Contractor", collectively known as the "Parties."

**RECITALS**

**WHEREAS**, Contractor has submitted a bid or proposal to City to provide specific services; and

**WHEREAS**, Contractor is in the business of providing specific services and is aware of the purposes for which City requires the services; and

**WHEREAS**, City and Contractor wish to enter into a contract under which City shall purchase the services described in Contractor's bid or proposal;

**THEREFORE**, The Parties agree as follows:

**1. SERVICES TO BE PROVIDED**

Contractor agrees to provide services related to street sweeping as detailed in Exhibit A – Scope of Services and by this reference made a part hereof.

**2. EFFECTIVE DATE AND DURATION**

Contractor shall initiate services upon receipt of City's notice to proceed, together with an executed copy of this Agreement. This Agreement shall become effective upon the date of execution and shall expire, unless otherwise terminated or extended, on June 30, 2021. The Parties may mutually agree on up to four (4) additional one (1) year extensions to this Agreement. At no point shall the duration of this Agreement exceed five (5) years. All services shall be completed prior to the expiration of this Agreement.

**3. COMPENSATION**

City agrees to pay Contractor in agreement with the pricing detailed in Exhibit B. It is estimated the annual amount of this contract shall not exceed Three Hundred Twenty-Five Thousand and No/100 dollars (\$325,000.00) for performance of those services described herein, which payment shall be based upon the following applicable terms:

**A.** Payment will be made in installments based on Contractor's invoice, subject to the approval by the City, and not more frequently than monthly. Payment shall be made only for work actually completed as of the date of invoice.

**B.** Payment by City shall release City from any further obligation for payment to Contractor, for services performed or expenses incurred as of the date of the invoice. Payment shall not be considered acceptance or approval of any work or waiver of any defects therein.

**C.** Contractor shall make payments promptly, as due, to all persons supplying labor or materials for the prosecution of this work.

- D. Contractor shall not permit any lien or claim to be filed or prosecuted against the City on any account of any labor or material furnished.
- E. Contractor shall pay to the Department of Revenue all sums withheld from employees pursuant to ORS 316.167.
- F. If Contractor fails, neglects or refuses to make prompt payment of any claim for labor or services furnished to Contractor or a subcontractor by any person as such claim becomes due, City may pay such claim and charge the amount of the payment against funds due or to become due the Contractor. The payment of the claim in this manner shall not relieve Contractor or their surety from obligation with respect to any unpaid claims.
- G. Contractor shall pay employees at least time and a half pay for all overtime worked in excess of 40 hours in any one work week except for individuals under the contract who are excluded under ORS 653.010 to 653.261 or under 29 USC sections 201 to 209 from receiving overtime.
- H. Contractor shall promptly, as due, make payment to any person, co-partnership, association or corporation, furnishing medical, surgical, hospital care or other needed care and attention incident to sickness or injury to the employees of Contractor or all sums which Contractor agrees to pay for such services and all moneys and sums which Contractor collected or deducted from the wages of employees pursuant to any law, contract or agreement for the purpose of providing or paying for such service.
- I. The City certifies that sufficient funds are available and authorized for expenditure to finance costs of this contract during the current fiscal year. Appropriations for future fiscal years shall be subject to budget approval by the City Council.

4. **ASSIGNMENT/DELEGATION**

Neither party shall assign or transfer any interest in or duty under this Agreement without the written consent of the other and any attempted assignment or transfer without the written consent of the other party shall be invalid.

5. **SUBMITTING BILLS AND MAKING PAYMENTS**

All notices and bills shall be made in writing and may be given by personal delivery, mail or fax. Payments may be made by personal delivery, mail, or electronic transfer. The following addresses shall be used to transmit notices, bills, payments, and other information:

CITY OF TIGARD	GREEN SWEEP ASPHALT SERVICE
Attn: Rob Block, WW/Storm Super.	Attn: Jennifer Akerill
Address: 13125 SW Hall Blvd. Tigard, Oregon 97223	Address: PO Box 6038 Vancouver, Washington 98668
Phone: (503) 718-2607	Phone: (360) 772-0899
Email: <a href="mailto:rob@tigard-or.gov">rob@tigard-or.gov</a>	Email: <a href="mailto:greensweepasphaltservice@gmail.com">greensweepasphaltservice@gmail.com</a>

6. **TERMINATION**

The parties agree that any decision by either party to terminate this Agreement before the 30<sup>th</sup> day of June, 2021 shall be accompanied by thirty (30) days written notice to the other party prior to the date termination would take effect. There shall be no penalty for early termination. If City terminates the contract pursuant to this paragraph, it shall pay Contractor for services rendered prorated to the date of termination.

7. **ACCESS TO RECORDS**

City shall have access to such books, documents, papers and records of Contractor as are directly pertinent to this Agreement for the purpose of making audit, examination, excerpts and transcripts.

8. **FORCE MAJEURE**

Neither City nor Contractor shall be considered in default because of any delays in completion and responsibilities hereunder due to causes beyond the control and without fault or negligence on the part of the parties so disenabled, including but not restricted to, natural disaster, war, civil unrest, volcano, earthquake, fire, flood, epidemic, quarantine restriction, area-wide strike, freight embargo, unusually severe weather or delay of subcontractor or supplies due to such cause; provided that the parties so disenabled shall within ten (10) days from the beginning of such delay, notify the other party in writing of the cause of delay and its probable extent. Such notification shall not be the basis for a claim for additional compensation. Each party shall, however, make all reasonable efforts to remove or eliminate such a cause of delay or default and shall, upon cessation of the cause, diligently pursue performance of its obligation under the Agreement.

9. **NON-DISCRIMINATION**

Contractor agrees to comply with all applicable requirements of federal and state civil rights and rehabilitation statues, rules, and regulations. Contractor also shall comply with the Americans with Disabilities Act of 1990, ORS 659A.142, and all regulations and administrative rules established pursuant to those laws.

10. **INDEMNITY**

Contractor agrees to and shall defend, indemnify and hold harmless City, City's officers, employees, agents and representatives from and against all liability, claims, costs, demands, judgments, penalties, and causes of action of any kind or character, or other costs or expenses incidental to the investigation and defense thereof, of whatever nature, resulting from or arising out of the activities of the Contractor or its subcontractors, agents, or employees in performance of this contract, except, however, that the foregoing shall not apply to liability that arises out of the City's, its officers, employees, agents and representatives sole negligence. If any aspect of this indemnity shall be found to be illegal or invalid for any reason whatsoever, such illegality or invalidity shall not affect the remainder of this indemnification.

11. **INSURANCE**

Contractor shall maintain insurance acceptable to City in full force and effect throughout the term of this contract. Such insurance shall cover risks arising directly or indirectly out of Contractor's activities or work hereunder.

The policy or policies of insurance maintained by the Contractor shall provide at least the following limits and coverages:

**A. Commercial General Liability Insurance**

Contractor shall obtain, at contractor's expense, and keep in effect during the term of this contract, Comprehensive General Liability Insurance covering Bodily Injury and Property Damage on an "occurrence" form (CG 2010 1185 or equivalent). This coverage shall include Contractual Liability insurance for the indemnity provided under this contract. The following insurance will be carried:

<u>Coverage</u>	<u>Limit</u>
General Aggregate	3,000,000
Products-Completed Operations Aggregate	2,000,000
Personal & Advertising Injury	1,000,000
Each Occurrence	2,000,000
Fire Damage (any one fire)	50,000

**B. Commercial Automobile Insurance**

Contractor shall also obtain, at contractor's expense, and keep in effect during the term of the contract, Commercial Automobile Liability coverage including coverage for all owned, hired, and non-owned vehicles on an "occurrence" form. The Combined Single Limit per occurrence shall not be less than \$2,000,000.

If Contractor uses a personally-owned vehicle for business use under this contract, the Contractor shall obtain, at Contractor's expense, and keep in effect during the term of the contract, business automobile liability coverage for all owned vehicles on an "occurrence" form. The Combined Single Limit per occurrence shall not be less than \$2,000,000.

**C. Workers' Compensation Insurance**

The contractor, its Subcontractors, if any, and all employers providing work, labor, or materials under this Contract that are subject employers under the Oregon Workers' Compensation Law shall comply with ORS 656.017, which requires them to provide workers' compensation coverage that satisfies Oregon law for all their subject workers. Out-of-state employers must provide Oregon workers' compensation coverage for their workers who work at a single location within Oregon for more than 30 days in a calendar year. Contractors who perform work without the assistance or labor of any employee need not obtain workers' compensation coverage. All non-exempt employers shall provide Employer's Liability Insurance with coverage limits of not less than \$1,000,000 each accident.

**D. Additional Insured Provision**

All policies aforementioned, other than Workers' Compensation and Professional Liability, shall include the City its officers, employees, agents and representatives as additional insureds with respect to this contract.



**E. Insurance Carrier Rating**

Coverages provided by the Contractor must be underwritten by an insurance company deemed acceptable by the City. All policies of insurance must be written by companies having an A.M. Best rating of "A-VII" or better, or equivalent. The City reserves the right to reject all or any insurance carrier(s) with an unacceptable financial rating.

**F. Self-Insurance**

The City understands that some Contractors may self-insure for business risks and the City will consider whether such self-insurance is acceptable if it meets the minimum insurance requirements for the type of coverage required. If the Contractor is self-insured for commercial general liability or automobile liability insurance the Contractor must provide evidence of such self-insurance. The Contractor must provide a Certificate of Insurance showing evidence of the coverage amounts on a form acceptable to the City. The City reserves the right in its sole discretion to determine whether self-insurance is adequate.

**G. Certificates of Insurance**

As evidence of the insurance coverage required by the contract, the Contractor shall furnish a Certificate of Insurance to the City. No contract shall be effective until the required Certificates of Insurance have been received and approved by the City. The certificate will specify and document all provisions within this contract and include a copy of Additional Insured Endorsement. A renewal certificate will be sent to the below address prior to coverage expiration.

**H. Independent Contractor Status**

The service or services to be rendered under this contract are those of an independent contractor. Contractor is not an officer, employee or agent of the City as those terms are used in ORS 30.265.

**I. Primary Coverage Clarification**

The parties agree that Contractor's coverage shall be primary to the extent permitted by law. The parties further agree that other insurance maintained by the City is excess and not contributory insurance with the insurance required in this section.

**J. Cross-Liability Clause**

A cross-liability clause or separation of insureds clause will be included in all general liability, professional liability, pollution and errors and omissions policies required by this contract.

A certificate in form satisfactory to the City certifying to the issuance of such insurance will be forwarded to:

City of Tigard  
Attn: Contracts and Purchasing Office  
13125 SW Hall Blvd.  
Tigard, Oregon 97223

At the discretion of the City, a copy of each insurance policy, certified as a true copy by an authorized representative of the issuing insurance company may be required to be forwarded to the above address.

Such policies or certificates must be delivered prior to commencement of the work. The procuring of such required insurance shall not be construed to limit contractor's liability hereunder. Notwithstanding said insurance, Contractor shall be obligated for the total amount of any damage, injury, or loss caused by negligence or neglect connected with this contract.

12. **ATTORNEY'S FEES**

In case suit or action is instituted to enforce the provisions of this contract, the parties agree that the losing party shall pay such sum as the court may adjudge reasonable attorney fees and court costs, including witness fees (expert and non-expert), attorney's fees and court costs on appeal.

13. **COMPLIANCE WITH STATE AND FEDERAL LAWS/RULES**

Contractor shall comply with all applicable federal, state and local laws, rules and regulations, including, but not limited to, the requirements concerning working hours, overtime, medical care, workers compensation insurance, health care payments, payments to employees and subcontractors and income tax withholding contained in ORS Chapters 279A, 279B, and 279C, the provisions of which are hereby made a part of this agreement.

14. **CHOICE OF LAW, VENUE**

The provisions of this Agreement are governed by Oregon Law. Venue will be the State of Oregon Circuit Court in Washington County or the US District Court for Oregon, Portland.

15. **CITY OF TIGARD BUSINESS LICENSE**

Contractor shall obtain, prior to the execution of any performance under this Agreement, a City of Tigard Business License. The Tigard Business License is based on a calendar year with a December 31st expiration date. New businesses operating in Tigard after June 30th of the current year will pay a pro-rated fee through the end of the calendar year.

16. **CONFLICT BETWEEN TERMS**

It is further expressly agreed by and between the parties hereto that should there be any conflict between the terms of this instrument in the proposal of the contract, this instrument shall control and nothing herein shall be considered as an acceptance of the terms of proposal conflicting herewith.

17. **SEVERABILITY**

In the event any provision or portion of this Agreement is held to be unenforceable or invalid by any court of competent jurisdiction, the validity of the remaining terms and provisions shall not be affected to the extent that it did not materially affect the intent of the parties when they entered into the agreement.

18. **REPRESENTATIONS AND WARRANTIES**

Contractor represents and warrants to the City that:

- A. Contractor has the power and authority to enter into and perform this Agreement.

- B. This Agreement, when executed and delivered, is a valid and binding obligation of Contractor, enforceable in accordance with its terms.
- C. Contractor (to the best of Contractor's knowledge, after due inquiry), for a period of no fewer than six calendar years (or since the firm's inception if less than that) preceding the effective date of this Agreement, faithfully has complied with:
  - 1) All tax laws of this state, including but not limited to ORS 305.620 and ORS chapters 316, 317, and 318;
  - 2) Any tax provisions imposed by a political subdivision of this state that applied to Contractor, to Contractor's property, operations, receipts, or income, or to Contractor's performance of or compensation for any work performed by Contractor;
  - 3) Any tax provisions imposed by a political subdivision of this state that applied to Contractor, or to goods, services, or property, whether tangible or intangible, provided by Contractor; and
  - 4) Any rules, regulations, charter provisions, or ordinances that implemented or enforced any of the foregoing tax laws or provisions.
- D. Any intellectual property rights or such delivered to the City under this Agreement, and Contractor's services rendered in the performance of Contractor's obligations under this Agreement, shall be provided to the City free and clear of any and all restrictions on or conditions of use, transfer, modification, or assignment, and shall be free and clear of any and all liens, claims, mortgages, security interests, liabilities, charges, and encumbrances of any kind.

**19. COMPLIANCE WITH TAX LAWS**

- A. Contractor must, throughout the duration of this Agreement and any extensions, comply with all tax laws of this state and all applicable tax laws of any political subdivision of the State of Oregon. For the purposes of this Section, "tax laws" includes all the provisions described in subsection 25.C. 1) through 4) of this Agreement.
- B. Any violation of subsection A of this section shall constitute a material breach of this Agreement. Further, any violation of Contractor's warranty, in subsection 25.C of this Agreement, that the Contractor has complied with the tax laws of the State of Oregon and the applicable tax laws of any political subdivision of this state also shall constitute a material breach of this Agreement. Any violation shall entitle the City to terminate this Agreement, to pursue and recover any and all damages that arise from the breach and the termination of this Agreement, and to pursue any or all of the remedies available under this Agreement, at law, or in equity, including but not limited to:
  - 1) Termination of this Agreement, in whole or in part;
  - 2) Exercise of the right of setoff, and withholding of amounts otherwise due and owing to Contractor, in an amount equal to State's setoff right, without penalty; and
  - 3) Initiation of an action or proceeding for damages, specific performance, declaratory or injunctive relief. The City shall be entitled to recover any and all damages

suffered as the result of Contractor 's breach of this Agreement, including but not limited to direct, indirect, incidental and consequential damages, costs of cure, and costs incurred in securing a replacement Contractor.

These remedies are cumulative to the extent the remedies are not inconsistent, and the City may pursue any remedy or remedies singly, collectively, successively, or in any order whatsoever.

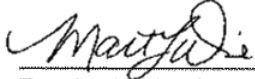
**20. COMPLETE AGREEMENT**

This Agreement, including the exhibits, is intended both as a final expression of the Agreement between the Parties and as a complete and exclusive statement of the terms. In the event of an inconsistency between a provision in the main body of the Agreement and a provision in the Exhibits, the provision in the main body of the Agreement shall control. In the event of an inconsistency between Exhibit A and Exhibit B, Exhibit A shall control.

No waiver, consent, modification, or change of terms of this Agreement shall bind either party unless in writing and signed by both parties. Such waiver, consent, modification, or change if made, shall be effective only in specific instances and for the specific purpose given. There are no understandings, agreements, or representations, oral or written, not specified herein regarding this Agreement. Contractor, by the signature of its authorized representative, hereby acknowledges that he/she has read this Agreement, understands it and agrees to be bound by its terms and conditions.

**IN WITNESS WHEREOF**, City has caused this Agreement to be executed by its duly authorized undersigned officer and Contractor has executed this Agreement on the date hereinabove first written Awarded by Tigard's Local Contract Review Board via emergency declaration signed on March 17, 2020.

**CITY OF TIGARD**



By: Authorized City Representative

6/23/2020

Date

**GREEN SWEEP ASPHALT SERVICE**



By: Authorized Contractor Representative

6-19-2020

Date



**EXHIBIT A**  
**SCOPE OF SERVICES**

The Contractor shall provide street sweeping and removal of debris as required for approximately 320 sweeping miles of Tigard streets (curb miles). Whether or not an actual curb exists, the term "street" shall include the paved area between the normal curb lines of the roadway. Islands that separate directional traffic and contain a curb shall be considered in the "curb sweeps," and shall be swept in the same manner as a normal street curb. Street sweeping shall normally consist of a single pass over a given area with a regenerative air or vacuum sweeper. Sweeping shall be performed in the same direction as the traffic flow at all times. As new streets are constructed and/or accepted by the City, a list of these streets will be provided to the Contractor, and then included in the regular monthly schedule.

**A. CONTRACTOR'S REPRESENTATIVE**

Before starting work, the Contractor shall designate an authorized representative in writing, who shall have complete authority to represent and to act for the Contractor in all directions given by the City's Project Manager or designee. The Contractor or the authorized representative shall give efficient supervision to the work, using the best skill and personal attention to the prosecution of the work.

Upon written request by the City's Project Manager, the Contractor shall promptly remove incompetent, careless or negligent employees or agents from performing work under this Contract. Failure to comply with such request is sufficient grounds for termination of the Contract.

**B. CONTRACTOR'S WORK SCHEDULE**

All City streets shall be swept once per month. The Contractor's sweeping shall be approved by the City's Project Manager or designee. Street sweeping on business and high traffic main boulevards will be performed between the hours of 4:00 a.m. and 7:00 a.m., and residential areas shall be swept between the hours of 7:00 a.m. and 7:00 p.m.

If the work performed does not correspond to the work schedule, the Contractor shall submit a revised schedule when requested by the City's Project Manager or designee.

**C. DESIGNATED CITY PARKING LOTS TO BE DETAILED AND SWEEPED**

The Contractor shall detail and sweep the following City parking lots once a month. The City shall compensate the Contractor for detail and sweeps performed under this paragraph at the monthly rate specified in the proposal.

- Tigard City Hall, Permit Center and Police Dept., 13125 SW Hall Boulevard. (78,000 sq. ft.)
  - Niche Building, 8720 SW Burnham Street (17,800 sq. ft.)
- Public Works Building, 8777 SW Burnham Street
  - Front parking lot-(26,800 sq. ft.)
  - Back parking lot-(37,117 sq. ft.)
- Tigard Senior Center, 8815 SW O'Mara Street (34,600 sq. ft.)
- Tigard Public Library, 13500 SW Hall Boulevard (48,900 sq. ft.)
- Summerlake Park, 11450 SW Winterlake Drive (8,700 sq. ft.)
- Cook Park, 17005 SW 92nd Avenue

- West parking lot — north of baseball fields to the west of 92nd (44,300 sq. ft.)
- East parking lot — north and east of restroom facility to the east of 92nd (99,000 sq. ft.)
- Park interior below gate — including street, parking offshoots, and other parking areas/lots (124,000 sq. ft.)

**D. SWEEPING DEBRIS**

The term "sweeping debris" shall include, but is not limited to, all dirt, rocks, sand, gravel, sticks, leaves, paper, cans, and other miscellaneous items which are normally picked up by a street sweeper. The term "sweeping debris" shall not include large items that cannot be picked up by a mechanical sweeper or would otherwise damage the sweeper.

**E. DEBRIS REMOVAL**

Contractor must possess a roll-off truck. Roll-off truck shall have a minimum payload capacity of 12.5 tons.

Contractor shall not dump debris on the ground. Contractor may provide their own drop boxes and their own transport equipment to haul debris or the Contractor must use the local designated City waste disposal franchise to haul debris. Drop box minimum capacity shall be no less than 11.5 cubic yards.

Contractor shall make prior arrangements with the City's Public Works Department for the placement of all drop boxes to be used for the dumping of street sweeping debris. Contractor shall provide reflective cones or other highly visible devices to mark drop boxes at their location.

The Contractor is required to have a back-up means of handling sweeping debris in a case of primary equipment failure.

**F. HANDLING AND DISPOSAL OF DEBRIS**

Contractor must meet all applicable debris disposal requirements of the Oregon Department of Environmental Quality and other federal, state, or local agencies. It shall be the Contractor's sole responsibility to ensure that all guidelines are followed. Sweeping debris under this contract may not be used, added, blended, or modified in any way to make a product, or as to risk contaminating a product that will be given, sold, or make its way for public use. For this reason, recycling centers will generally be considered unacceptable for the processing of sweeping debris.

The City's preference is that the Contractor shall have an operating screening plant using a one inch (1") or finer screen and equipment on impermeable surface with sand-oil-water separator for the processing of material prior to final disposal.

**A. Clean Water Services Treatment Facility**

With the exception of sweeping debris that is predominantly comprised of leaves or from hazardous material sweeps (road accidents or other), all materials shall be taken to the Clean Water Services Debris Treatment Facility located at 3990 NE 33<sup>rd</sup> Avenue, Hillsboro, Oregon 97124. The City will be billed directly by Clean Water Services for disposal at this location, the contractor will incur not disposal fee at this location. The only cost to the Contractor will be for travel time and fuel. Prior to the start of services under this contract,

the City's Project Manager and Contractor staff shall review the process for disposal at this site.

For material not meeting the criteria for disposal at the Clean Water Services site, specifically leaves and hazardous materials, Contractor shall use DEQ-approved disposal site or transfer station for disposal. Debris wastes shall be disposed of as dirt fill after testing to identify any possible contamination and only after plastics, papers and other trash and solid wastes have been removed using a one inch (1") or finer screen system.

At no point shall sweeping debris under this contract be used, added, blended, or modified in any way to make a product, or as to risk contaminating a product that will be given, sold or make its way for public use. For this reason, recycling centers will generally be considered unacceptable for the processing of sweeping debris.

Any exemptions to these specifications must be approved in writing by the City, local Department of Environmental Quality (DEQ), and/or permitting authorities.

Contractor shall include in their proposal a detailed description of:

- Who is managing the process of the debris
- How the debris is being handled
- Where the debris is being disposed
- A description of equipment used

Waste processing facilities may be subject to inspection prior to contract award.

#### **G. WASTE SITES**

The Contractor shall operate waste storage sites in such a manner as to meet all safety and health requirements of State and local agencies. Site operations or the result of such operations which create a nuisance problem, or which result in damage to public and private properties will not be permitted.

The Contractor will be responsible for obtaining the necessary permits for dumping at waste sites provided by the Contractor.

#### **H. SOLID WASTE PERMIT**

If the Contractor is not set up to process sweeping debris and proposes to process sweeping debris through a sub-contractor before final disposal, sub-contractor shall provide the cost and proof of an appropriate solid waste permit for the processing facility.

#### **I. SWEEPING SCHEDULE**

The Contractor shall establish and submit for approval a regular schedule of performance that will include sweeping all streets and parking lots once each month in approximately the same order. However, the City, at its sole discretion, may increase or decrease sweeping frequency or alter the sweeping schedule as it deems necessary. Once established, the Contractor shall adhere to the approved schedule.

**J. CONTRACTOR'S EQUIPMENT**

All equipment must be performance worthy by visual and operational inspection. Contractor shall provide both air sweepers and mechanical sweepers with suitable back-up for each type of sweeper. Air sweepers shall be used for the storm water management program and mechanical sweepers, followed by an air sweeper for rock spills, road sand, windstorms and heavy debris. The City's preference is that the primary sweeper not be more than four (4) years old and shall be a regenerative air or vacuum sweeper and the back-up sweeper not be more than six (6) years old. Sweepers shall have no less than 24,000 lbs. G.V.W. and must be equipped with an adequate water spray system for dust control.

Machines must be maintained in good working condition throughout the life of this Contract with Contractor demonstrating evidence of an adequate service center to ensure scheduled routine maintenance and proper adjustment for sweepers. Machines shall be fully operational during all sweeps.

Contractor must keep a sufficient supply of spare brooms and parts to ensure continuous operation. Worn brushes and brooms shall be replaced and adjusted to ensure maximum efficiency. The determination of when a brush or broom shall be replaced shall be based on the effectiveness of all brushes and brooms.

All equipment must be properly registered and insured in accordance with State and local laws. Contractor must show proof of ownership or a signed lease for sufficient machinery to adequately perform services as agreed in this contract. A list of machines to be used must accompany a firm's proposal. Please provide this list in the Equipment Detail Form included as Attachment D of this packet.

All units shall be clearly and prominently marked with the Contractor's name and unit number and have a radio or paging equipment for contact with their office.

The sweepers shall be self-propelled, pickup sweepers with revolving gutter brushes on both sides, in-head broom, a sprinkler system and a high lift storage hopper with a minimum capacity of three (3) cubic yards or as approved by the City's Project Manager or designee. Sweepers shall be capable of removing sweeping debris as described in Section 4.D.

Sweeping equipment shall be equipped with adequate warning devices and lights for safe operation and shall meet all vehicle operating requirements of the State of Oregon, Motor Vehicles Division.

Sweeping equipment shall be equipped with a speed-monitoring device. In conjunction with the Contractor's monthly statement, Contractor shall submit a Tac-o-graph report showing the speed and miles swept on each sweeper used for work under this contract.

Failure to comply with these requirements shall be just cause for termination of contract.

**K. EQUIPMENT PERFORMANCE**

The sweepers used shall be capable of picking up all debris from a street in a single pass, without leaving a trail of debris behind and shall be capable of dust abatement. Sweepers shall be driven at not less than three (3) miles per hour and not more than five (5) miles per hour to assure all



debris is picked up and to remain in compliance with regulations from Clean Water Services. All equipment used shall be in good mechanical condition and shall not leak oil or other fluids onto the pavement during operations. If the City deems a piece of equipment unsuitable, the Contractor will be instructed to make the appropriate repairs or remove it from the work site.

**L. WATER USE**

The City will provide water at hydrants for the filling of water spray systems on the sweepers. Contractor shall use a Chapman Valve when filling water tanks from hydrants. The Contractor shall maintain a water use record and make it available to the City upon request.

**M. INSPECTIONS**

Inspections will be performed on a regular basis as well as spot checks in response to citizen complaints. Any deficiencies found will be reported to the Contractor for immediate correction.

**N. CHANGED CONDITIONS**

Contractor shall notify the City's Project Manager or the assigned designee in writing promptly upon their discovery and before they are disturbed of the following work site conditions ("changed conditions"):

1. Unknown physical conditions of an unusual nature differing materially from those ordinarily encountered and generally recognized as inherent of the character in the work being performed;
2. Conditions affecting the cost of the work which would not have been disclosed by reasonable examination of the site.

The City's Project Manager or the assigned designee will promptly investigate such conditions when notified. If the City's Project Manager or the assigned designee determines that the conditions are changed conditions and that they will materially increase or decrease the costs of any portion of the work, the City's Project Manager or the assigned designee will issue a change order to adjust the compensation for that portion of the work. If the City's Project Manager or the assigned designee determines that the conditions do not justify an adjustment in compensation, the Contractor will be so advised in writing.

**O. RESPONSIBILITY OF THE CONTRACTOR**

The Contractor shall do all the work and furnish all labor, materials, supervision, inspections, equipment, tools and machines necessary for the performance and completion of the project in accordance with the Contract within the specified time.

Contractor shall employ only competent, skillful persons to do the work. Contractor shall keep competent, supervisory personnel to monitor work performed under the Contract. Contractor shall give efficient supervision to the work using the highest level of skill and attention.

Contractor shall provide adequate supervision and staff to ensure continuity in sweeping operations as set forth in this contract and maintain a direct line of communication with the City's Project Manager or designee.

Contractor shall provide a telephone answering service toll free from 7:30 a.m. to 4:30 p.m. Monday through Friday except on Federal holidays. The answering service shall have the

capability of contacting sweepers by radio or paging equipment and relaying instructions from the City. Contractor shall also provide a 24-hour phone number to be used for emergency purposes.

The Contractor shall notify the City of any obstructions in the roadways, or other reasons why sweeping could not be performed over a specific area, such as tree limbs or landscaping, disabled vehicles, construction equipment and material and other similar items. The report shall be made verbally or by fax to the City's Project Manager or the assigned designee within four (4) hours of the scheduled sweeping. The City will then take appropriate action to mitigate the obstruction.

Contractor shall notify City's Project Manager of what section of the City is being swept daily. Notification can be done via e-mail, text, or phone message.

**P. NOTIFICATIONS RELATIVE TO CONTRACTOR'S ACTIVITIES**

At the request of the City, Contractor may be required to notify all agencies and utilities affected by the operations so as to properly coordinate and expedite the work in such a manner as to cause the least amount of conflict and interference. Notification shall include, but not be limited to, the time of commencement and completion of work, names of streets or locations of alleys to be closed, and a schedule of operations and routes of detours where possible. Damages or claims resulting from improper or insufficient notification of the affected agencies shall be the responsibility of Contractor.

**Q. PROTECTION OF PROPERTY**

Contractor shall protect all public and private property insofar as it may be endangered by operations and take every reasonable precaution to avoid damage to such property.

Contractor's site-parked mobile equipment, operable machinery, and hazardous parts subject to mischief shall be kept locked or otherwise made inoperable whenever left unattended.

Wastes shall not be buried or burned on the site or disposed of into storm drains, sanitary sewers, streams or waterways. All wastes shall be removed from the site and disposed of in accordance with local ordinances and State and Federal anti-pollution laws.

Contractor shall restore and bear the cost of any public or private improvement, facility, or structure within the right of way, which is damaged, either directly or indirectly, by an act, omission or neglect in the execution of the work and which is not designated for removal. Contractor shall be responsible for any injury, loss or damage to any presently existing improvements on the premises caused by the Contractor or the Contractor's employees, agents or subcontractors, and in the event of such injury, loss or damage shall promptly make such repairs or replacements as required by the City without additional cost to the City.

Contractor shall protect all designated trees and planted areas within the right of way or easements and shall exercise care and conduct operations to minimize damages to other planted areas.

**R. DUST CONTROL, WATER AND AIR POLLUTION**

During all phases of the work, and when directed, Contractor shall take precautions to abate dust nuisance by cleaning up, sweeping, sprinkling with water, or other means as necessary to

accomplish the suppression of dust. During the term of the Contract, Contractor's operations shall conform to applicable laws and regulations of the Oregon Department of Environmental Quality, and other agencies of the State and Federal government, as well as local ordinances designed to prevent, control and abate water and air pollution.

**S. INSPECTION**

If any work is found unsatisfactory, or the City finds that all certificates, bills, forms, and documents have not been properly submitted, the City's Project Manager or the assigned designee will give the Contractor the necessary instructions to perform the work satisfactorily and to properly submit bills, forms and documents, and the Contractor shall immediately comply with such instructions.

**T. NEW STREETS**

The City may add additional streets during the term of the project for street sweeping services. When new streets are required to be swept, the City shall provide a map to the Contractor showing the location and total miles of the new streets to be swept. New streets will be billed at the contracted Regular Sweep per mile charge (Attachment B).

**U. REPORTING**

In conjunction with the Contractor's monthly statement, the Contractor shall submit to the City a Tac-o-graph report showing the speed and miles swept on each sweeper used for work under this Contract. The Contractor shall also provide the City with details on the tonnage amount for the month's debris. The Contractor, by signing the subsequent contract, shall further agree to provide the City with any other report that the City deems necessary with particular attention given to any information that is requested by or required by Clean Water Services.

**V. SPECIAL SWEEPS**

At times, the City may require special sweeps that are outside the regular monthly sweeps. Special sweeps may include, but not necessarily limited to, the following:

- Automobile accidents
- Material spills on the roadway
- Construction zone cleanup
- Snow fall and subsequent sweep of sand on the roadway

The City will not consider a heavy leaf fall event to be the cause of a special sweep. The City expects the Contractor to factor leaf fall into their regular monthly sweep and understand that the months that contain leaf falls may take more time and effort on the Contractor's part to clean the streets. A Contractor's per mile price for the regular monthly sweep should incorporate the leaf fall season with the understanding that in the summer months it will likely not take as long to sweep the City.

**EXHIBIT B**  
**CONTRACTOR'S PROPOSAL**

**COST STRUCTURE**

1. Standard street sweeping including designated parking lots regenerative air sweeper \$125/hr.  
Estimated hours = 2,275 for an estimated annual total of \$284,375.00.
2. b. Debris hauling \$115/hr. Estimated hours = 286 for an estimated annual total of \$32,890.00.
3. Emergency sweeping \$165/hr.
4. Non-CWS debris disposal \$115/hr. hauling plus cost of disposal + 10%
5. Additional Services: (pricing available upon request due to page limits of proposal)  
environmental spill response, pressure washing hardscapes, leaf removal, storm system  
maintenance including bioswales, asphalt repair and patching, sealcoat and crack sealing, striping  
and specialty striping, snow removal and deicing





City of Tigard

June 9, 2021

Green Sweep Asphalt Service  
Attn: Jennifer Akerill  
PO Box 6038  
Vancouver, WA 98668

REF.: Street Sweeping Services  
Period: **July 1, 2021 through June 30, 2022**

**CONTRACT NOTICE OF AWARD – RENEWAL**  
**Contract # C200099**

Dear Jennifer Akerill,

The City of Tigard has determined that your company has performed in accordance with the requirements of our Agreement. Therefore, the City of Tigard, pursuant to the renewal/extension clause contained in the terms and conditions of the Agreement, desires to exercise its **first (1)** one-year extension to the Contract effective from **July 1, 2021 through June 30, 2022**. This renewal period shall be governed by the specifications, pricing, and the terms and conditions set forth per the above referenced Contract.

**Please acknowledge acceptance of this renewal by signing this document in the space provided below and returning it to me within ten (10) days. You may keep a copy for your records.**

The City looks forward to doing business with Green Sweep Asphalt Service.

Sincerely,

Toni Riccardi  
Purchasing Specialist  
503-718-2518  
tonir@tigard-or.gov

I/We hereby acknowledge acceptance of this Contract renewal, and agree to be bound by all requirements, terms, and conditions as set forth in the above referenced Contract.

Company: Green Sweep Asphalt serv Signed: [Signature] SR  
Date: 7-20-21 Printed: Jennifer Akerill SR

CITY OF McMinnville  
MINUTES OF CITY COUNCIL MEETING  
Held via Zoom Video Conference and at the Kent L. Taylor Civic Hall on Gormley Plaza  
McMinnville, Oregon

Tuesday, June 23, 2020 at 7:00 p.m.

Presiding: Scott Hill, Mayor

Recording Secretary: Claudia Cisneros

Councilors:	<u>Present</u>	<u>Absent</u>
	Adam Garvin	
	Remy Drabkin	
	Kellie Menke, Council President	
	Wendy Stassens	
	Zack Geary	
	Sal Peralta	

Also present were City Manager Jeff Towery, City Recorder Claudia Cisneros, City Attorney Walt Gowell, Planning Director Heather Richards, Senior Planner Chuck Darnell, Fire Chief Rich Leipfert, Community Development Director Mike Bisset, Police Chief Matt Scales, Human Resources Director Kylie Bayer, Finance Director Jennifer Cuellar, Information Technology Director Scott Burke, Parks and Recreation Director Susan Muir, Public Works Superintendent David Renshaw, Library Director Jenny Berg, Community Center Manager Katie Noyd, Library Technician Assistant Kirsten Dennis, Engineering Technician and Inspector Larry Sherwood, Wastewater Services Manager Leland Koester, Senior Accountant Ronda Gretzon, Youth and Adult Sports Manager Steve Ganzer, Jodie DeJonge, News Register, and Jerry Eichten, McMinnville Community Media.

1. CALL TO ORDER: Mayor Hill called the meeting to order at 7:05 p.m. and welcomed all in attendance in person and via Zoom.
2. PROCLAMATION
- 2.a. Park and Recreation Month

Parks and Recreation Director Muir read an email from a McMinnville resident who expressed appreciation for the Parks and Recreation Department. She then shared a PowerPoint presentation about the benefits of park programs.

Mayor Hill read the proclamation declaring July 2020 as Park and Recreation Month.

3. Community Center Manager Noyd discussed ways to have fun this summer. INVITATION TO CITIZENS FOR PUBLIC COMMENT: Mayor Hill invited the public to comment.

Margaret Cross, McMinnville resident, requested the Council write a letter to the Board of County Commissioners stating McMinnville's position that Riverbend landfill should be closed.

Dean Klaus, McMinnville resident, discussed the police budget and need to continue supporting officers in the budget. He gave examples of instances with homeless on Dustin's Court and times where a social worker would not be prepared to deal with the situations.

Chris Anderson, McMinnville resident, discussed the need for police reform. He asked the Council to look at restructuring the funding in the police budget so money could be diverted to training and education for social workers.

4. PRESENTATIONS

4.a. McMinnville Annual Historic Preservation Awards

Senior Planner Darnell gave a presentation on the preservation awards. The purpose of the awards was to acknowledge and honor preservation efforts that had been undertaken in McMinnville. The nominations were reviewed and selected by the HLC. Two projects were selected: the Jameson/Taylor Dale building and the Primisys building.

Mayor Hill presented the preservation awards.

Shaun Kajiwara and Katie Jackson, property owners of the Taylor Dale building, thanked the City for this honor. They also recognized all of those who had contributed to the success of the restoration.

Ernie Munch, consultant, discussed all of the professionals and staff who had worked on the project. He shared how they found a beam with the initials of the couple who built the original building. Some of the beam was put in the new building and some of the pieces that were cut off were made into paperweights. He gave one to Senior Planner Darnell and Building Official Ramsing.

Senior Planner Darnell said the owners of the Primisys building were not able to attend the meeting tonight, but wanted to let the Council know they appreciated the acknowledgement.

4.b. Visit McMinnville Contract and Annual Work Plan

City Manager Towery discussed the primary changes to the Visit McMinnville contract. This was a five year contract with the opportunity for renewal. At some point there would need to be a community conversation about future uses of the Transient Lodging Tax beyond marketing and promotion. Given the current economic reality, it was not clear when that would happen. They were encouraging Visit McMinnville to build a more consistent reserve and to continue to present annual work plans and budgets to the Council for review and approval.

Councilor Geary discussed the proposed changes. He clarified if there were legislative changes they would automatically be incorporated into this agreement. He asked about the procedure if they wanted to change the TLT revenue percentage.

City Attorney Gowell said in the new contract the 70% was locked in for three years and after that it could be 50-70% if the City had undertaken the initiative to implement newly authorized legislation. If the City wanted to use TLT funds for some other purpose, they would have to let Visit McMinnville know and Visit McMinnville could make a proposal to implement the new initiative.

Councilor Peralta asked about the time period for the contract. City Attorney Gowell said it was a five year contract with 2 two year automatic renewals unless either party gave six months prior notice.

Jeff Knapp, Executive Director of Visit McMinnville, discussed why tourism mattered to McMinnville. Visitation, travel spending, employment, and tax revenue had increased every year since 2015. There were 257,000 overnight person trips to McMinnville in 2019. Travel spending in McMinnville in 2019 was \$38.9 million. Leisure and hospitality was the fourth largest employment sector in Yamhill County. He showed graphs of visitor spending across regions from 2015 to 2019, McMinnville visitor spending by industry from 2015 to 2019, Yamhill County employment by industry, McMinnville earnings generated by travel spending from 2015 to 2019, and McMinnville local tax revenue from 2015 to 2019. He discussed the FY21 budget and plan assumptions. There needed to be flexibility in the plan with monthly and quarterly review. There would be a serious decrease in revenue, they would have to do more work, not less, and there was a loss of marketing dollars and support from key partners. The total projected income for FY21 was \$476,000. The budget would be allocated as follows: \$348,600 to marketing, \$91,041 to destination development, and \$108,449 to general administration. They would average \$16,000 per month for discretionary marketing expenses. He explained the plans for economic development, destination development, and destination marketing.

The Council complimented him for Visit McMinnville's performance over the last five years and appreciated the flexibility in the budget and adjustments in their marketing efforts.



There was discussion regarding equity and inclusion in the materials created by Visit McMinnville, collecting data to find the most effective ways to reach a diversity of groups, putting on an event that highlighted the City's cultural diversity, and DEI training.

Mr. Knapp said they were committed to representing the community in the most honest way possible.

*Councilor Garvin MOVED to adopt Resolution No. 2020-44, approving a contract with Visit McMinnville, Inc. for Transient Lodging Tax Services and to approve Visit McMinnville's Business Plan; SECONDED by Council President Menke. Motion PASSED 6-0 by the following vote:*

*Aye – Councilors Drabkin, Garvin, Geary, Stassens, Peralta, and Menke  
Nay – None*

5. ADVICE/ INFORMATION ITEMS

5.a. Reports from Councilors on Committees & Board Assignments

Councilor Geary reported on the McMinnville Community Media Board meeting.

Council President Menke reported on the Landscape Review Committee meeting.

Councilor Peralta reported on the Council of Governments Budget Committee meeting and hiring of a new Executive Director. He received a significant amount of email about police reform. He explained changes being reviewed at the state legislature.

Councilor Stassens reported on the upcoming MURAC meeting and Level 10 meetings.

Councilor Drabkin reported on the upcoming McMinnville Affordable Housing Task Force meeting, motel program through YCAP, HB 4001 which might provide funding for a navigation center, and Regional Leadership Town Hall.

Councilor Garvin said YCOM adopted their budget last week.

Mayor Hill discussed funding for Phase 2 of the Bypass, Helping Hands program through McMinnville Water & Light, League of Oregon Cities policy committees, and Regional Leadership meeting.

Councilor Peralta suggested credentialed members of the press be given access to the encrypted police feed.

Police Chief Scales said the *News Register* had asked for the encryption code. There were concerns from other law enforcement agencies that had their encryption codes leaked. He thought there should be a more robust discussion about the reasons behind encryption.

5.b.

#### Department Head Reports

Police Chief Scales gave an update on the new radio system that had rolled out last week. They were in the process of having the Police Department Policy Manual available to the public on the website. He discussed community policing engagements and policy initiatives they had undertaken. He had engaged in a number of conversations with the community regarding DEI. He had also looked into forming a multicultural advisory council to listen to concerns and work on ways to improve and solve issues. He then discussed the police reforms being discussed at the state legislature.

Councilor Geary suggested holding a Work Session on forming the advisory council.

Finance Director Cuellar said the City's reserve policy needed to be reviewed and revised. She thought the Audit Committee and Municipal Advisor could help with this work. Findings and proposals would be brought back to the Council for future action.

There was discussion regarding the higher reserves of the past which led to deferred building maintenance and hiring freezes and how they were trying to address those issues now even though it meant a lower reserve.

There was consensus for staff to move forward as suggested.

Finance Director Cuellar reviewed the annual Insurance Programs Stewardship Report. City County Insurance would continue to offer property/liability, auto, mechanical breakdown, and workers compensation. There was a cost increase of 9%. There was a secondary airport liability insurance package through a different provider and this year they added a cyber security policy. Municipal Court was continuing to conduct virtual court.

Park and Recreation Director Muir gave an update of the park facilities that had reopened.

Planning Director Richards said she had sent Council the Riverbend landfill public hearing notice. She would be happy to work with the Council on drafting a letter. Regarding the business assistance from the Council of Governments, McMinnville businesses were eligible for those funds.

Human Resources Director Bayer would schedule a Work Session on DEI. She was exploring options for training for the whole City. They were hiring back some park and recreation employees who left at the beginning of Covid. There was a new intern at City Hall.

Library Director Berg said the Library was now open. Home delivery would still continue.

Fire Chief Leipfert said ESCI consultants would be holding stakeholder meetings next week.

City Attorney Gowell thanked the Council and staff for allowing him to be their interim attorney.

City Manager Towery discussed the continuing community conversations regarding Black Lives Matter, systemic racism, and bias.

6. CONSENT AGENDA

a. Consider Resolution No. 2020-35: A Resolution providing for and approving a form of contract by and between the City of McMinnville, Oregon and the McMinnville Rural Fire Protection District.

b. Consider Resolution No. 2020-37: A Resolution declaring the City's election to receive certain state shared revenues.

c. Consider Resolution No. 2020-38: A Resolution certifying provision of municipal services by the City of McMinnville as required by ORS 221.760.

d. Consider Resolution No. 2020-39: A Resolution extending the City of McMinnville's workers compensation coverage to the City of McMinnville volunteers.

e. Consider Resolution No. 2020-43: A Resolution for City of McMinnville, Oregon Extending the City's Declaration of State of Emergency Expressed in Resolution 2020-18 and Resolution 2020-28.

*Council President Menke MOVED to adopt the consent agenda as presented; SECONDED by Councilor Garvin. Motion PASSED unanimously.*

7. RESOLUTIONS

7.a. Consider Resolution No. 2020-36: A Resolution providing for certain increases to the Fire Department fee schedule that allows the Fire Department to recover costs for fire and EMS services allowed within City ordinance, and the International Fire Code as adopted by the State of Oregon.

Fire Chief Leipfert said this resolution would increase EMS charges by 1.75% for cost of living and make adjustments to the fee schedule by transitioning the fire code violation fees to match the civil code violation fees and adding permits that had not been in the schedule before and after hour fees for inspections. He noted there was a typo on the EMS fees.

Councilor Geary asked about storage unit inspections. Fire Marshal McDermott said storage units were rented by individuals which gave them a right to privacy. They were not able to inspect them.

Councilor Garvin asked if this would be full cost recovery. Fire Chief Leipfert said it was full cost recovery on hours spent for the activities. The penalties were based on the severity of the life safety hazard.

*Council President Menke MOVED to adopt Resolution No. 2020-36, providing for certain increases to the Fire Department fee schedule that allows the Fire Department to recover costs for fire and EMS services allowed within City ordinance, and the International Fire Code as adopted by the State of Oregon; SECONDED by Councilor Drabkin. Motion PASSED 6-0 by the following vote:*

*Aye – Councilors Drabkin, Garvin, Geary, Stassens, Peralta, and Menke  
Nay – None*

7.b. Consider Resolution No. 2020-40: A Resolution making supplemental budget contingency transfer of appropriation authority for fiscal year 2019-2020 (Airport Maintenance Fund).

7.c. Consider Resolution No. 2020-41: A Resolution making supplemental budget contingency transfer of appropriation authority for fiscal year 2019-2020 (Transient Lodging Tax Fund).

Finance Director Cuellar said these were two final budget adjustments from the current fiscal year that was closing on June 30. One was to move \$80,000 out of Contingency to the Airport Maintenance Fund. This was due to timing of a purchase. The other was also a Contingency transfer to the Transient Lodging Tax Fund due to an accounting change.

*Council President Menke MOVED to adopt Resolution No. 2020-40, making supplemental budget contingency transfer of appropriation authority for fiscal year 2019-2020 (Airport Maintenance Fund); SECONDED by Councilor Stassens. Motion PASSED 6-0 by the following vote:*

*Aye – Councilors Drabkin, Garvin, Geary, Stassens, Peralta, and Menke  
Nay – None*

*Council President Menke MOVED to adopt Resolution No. 2020-41, making supplemental budget contingency transfer of appropriation authority for*

*fiscal year 2019-2020 (Transient Lodging Tax Fund); SECONDED by Councilor Stassens. Motion PASSED 6-0 by the following vote:*

*Aye – Councilors Drabkin, Garvin, Geary, Stassens, Peralta, and Menke  
Nay – None*

- 7.d. Consider Resolution No. 2020-42: A Resolution adopting the budget for fiscal year beginning July 1, 2020; making the appropriations; imposing the property taxes; and categorizing the property taxes.

Finance Director Cuellar said this would adopt the FY 20-21 budget. Some changes had taken place between the budget that was approved by the Budget Committee and the one that was before Council tonight. These changes included: a reduction in program costs for every fund that had payroll, a reduction in costs for all funds that paid transfers for support services, funds for Covid-19 small business support program, funds for capital improvement projects that had been scheduled to be completed by June 30 but were delayed, increase due to the new collective bargaining agreement with the Police Department, error found in the Parks and Recreation Department for a project to be moved to the next fiscal year, a potential library grant that was not awarded, and update to the Transient Lodging Tax forecast that reduced the fund. The net impact of all the changes was small additions to unappropriated ending fund balances across the City and the increase in the General Fund was \$656.

City Manager Towery said there would be a mid-year budget review in December. Staff would also be reviewing their revenues and expenditures monthly and this review would be provided to the Council. Staff would also create a vacancy review process for any vacancies throughout the year for positions supported by the General Fund. They would also be continuing work on the core services project.

There was discussion regarding the purpose of the monthly review of the revenues and expenditures, staff capacity, and sending the reports to the Budget Committee.

Councilor Drabkin acknowledged the public feedback they had received about the police budget. The Council and City staff were addressing police reform, but they did not currently have alternative plans in place to defund the police at this time. The budget was being adopted with all of these things in mind and there was intent to continue to review the issues.

There was consensus to discuss this item in a future Work Session.

*Councilor Stassens MOVED to adopt Resolution No. 2020-42, adopting the budget for fiscal year beginning July 1, 2020; making the appropriations; imposing the property taxes; and categorizing the property taxes;*



*SECONDED by Council President Menke. Motion PASSED 5-1 by the following vote:*

*Aye – Councilors Drabkin, Garvin, Stassens, Peralta, and Menke  
Nay – Councilor Geary*

8. ADJOURNMENT: Mayor Hill adjourned the meeting at 10:02 p.m.

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Claudia Cisneros, City Recorder

DRAFT

CITY OF McMinnville  
MINUTES OF CITY COUNCIL SPECIAL WORK SESSION  
Held via Zoom Video Conference and at the Kent L. Taylor Civic Hall on Gormley Plaza  
McMinnville, Oregon

Tuesday, June 30, 2020 at 4:00 p.m.

Presiding: Scott Hill, Mayor

Recording Secretary: Claudia Cisneros

Councilors:	<u>Present</u>	<u>Absent</u>
	Adam Garvin	Wendy Stassens
	Zack Geary	
	Kellie Menke, Council President	
	Sal Peralta	
	Remy Drabkin	

Also present were City Manager Jeff Towery, City Recorder Claudia Cisneros, Fire Chief Rich Leipfert, Fire Marshal Debbie McDermott, Operations Chief Amy Hannifan, Parks and Recreation Director Susan Muir, Finance Director Jennifer Cuellar, Planning Director Heather Richards, Human Resources Manager Kylie Bayer, Information Technology Director Scott Burke, and member of the News Media Phil Guzzo.

1. CALL TO ORDER: Mayor Hill called the special meeting to order at 4:10 p.m.

2. DISCUSSION – Fire District Feasibility Consultant

Fire Chief Leipfert introduced the consultant team.

Rich Buchanan, Project Manager, reviewed the feasibility report contents, data collection, ESCI team, developing the final report, mapping, survey results, site visit schedule, and future opportunities for cooperative efforts.

Sheldon Gilbert, CEO of Emergency Services Consulting International, discussed the options for moving forward.

There was discussion regarding the costs and savings of the options, comparing volunteer fire departments and paid fire departments, participation of volunteers, timing of the phases, how staff was in favor of the consolidation, strategic visioning process with policymakers, who would be leading the process and what the process should be, addressing current staffing level needs, recouping costs to cover rural fire districts, not putting concerns on hold, looking at multiple contract models for fair representation of all the entities, participation of the other entities and how it would impact McMinnville, benefits of districting to address current issues, and next steps.

3. ADJOURNMENT: Mayor Hill adjourned the Work Session at 5:34 p.m.

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Claudia Cisneros, City Recorder



**City of McMinnville**  
**Public Works Department**  
231 NE Fifth Street  
McMinnville, OR 97128  
(503) 434-7313  
[www.mcminnvilleoregon.gov](http://www.mcminnvilleoregon.gov)

## STAFF REPORT

**DATE:** October 12, 2021  
**TO:** Jeff Towery, City Manager  
**FROM:** Leland Koester, Wastewater Services Manager  
**SUBJECT:** WRF Solids Treatment Capacity Improvement Project, 30% Schematic Design

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### Report in Brief:

This action is the consideration of a resolution to award a Professional Services Contract to Jacobs (formerly CH2MHill) for the 30% Schematic Design of the Water Reclamation Facility Solids Treatment Capacity Improvement Project, Project 2019-10.

### Background:

In the fall of 2019, the City advertised a formal request for proposals for a consultant to develop a design for the WRF Biosolids Storage Tank and Grit System Expansion Project, based on recommendations from the 2009 Wastewater Master Plan. The City selected Jacobs. In the spring of 2020, the City approved resolution 2019-10 approving a Professional services contract with Jacobs for the first phase of the project, which was the preliminary design phase of the project. This phase of the project was completed in the spring of 2021, resulting in a Project Definition Report. The preliminary design included a comprehensive review of the WRF's solid's handling process, including grit system, screenings, digesters, and biosolids storage capacity. The evaluation concluded that only building another biosolids storage tank would not resolve digester capacity issues, could result in a stranded asset in the future, and would be more costly than previously thought due to geotechnical concerns. Therefore, the City worked with Jacobs to evaluate alternatives to address our needs.

- Expansion of our existing ATAD digesters with existing technology and add a new biosolids storage tank
- Install Generation 2 ATAD digesters and repurpose existing ATAD digesters
- Convert to the Lystek process
- Generation 2 ATAD digesters and biosolids dewatering
- Lystek process and biosolids dewatering

After evaluating the different alternatives, we determined that the best solution was to implement Generation 2 ATAD digesters now as Phase I and when needed add the dewatering features in Phase II.

**Discussion:**

The city has negotiated the type of services, work scope, project team, sub-consultants, fee schedule for the next phase of the project. Termed “Solids Treatment Capacity Improvement Project 30% Schematic Design,” this Phase 2 of the project will consist of designing:

- Addition of two autothermal thermophilic aerobic digesters (ATADs) based on the Thermal Process Systems Thermaer™ process.
- Conversion of the three existing ATAD tanks to Thermal Process Systems SNDR™ process with consideration for constructing a new tank for the SNDR process, rather than retrofit of the existing tanks.
- Construction of an ATAD Support Building to house the equipment associated with the ATAD and SNDR processes.
- Replacement of the existing odor control system.
- Improvements to the existing decant system at the Biosolids Storage Tank.
- Accommodating a future project to implement dewatering and cake storage.
- Replacement of the Headworks PLC.

Upon completion of the 30% Schematic Design, future detailed design and construction phases are anticipated. Jacobs Scope and Fee Proposal for the 30% Schematic Design is included as Attachment 2 & 3 for the Council's reference.

The estimate for this scope of work is \$ 414,504.

**Attachments:**

1. Resolution 2021-53
2. Jacob's scope of work
3. Cost estimate
4. Project Definition Report

**Fiscal Impact:**

Funds for the design work are included in the adopted FY22 Wastewater Capital Fund (77).

**Recommendation:**

Staff recommends that the City Council adopt the attached resolution approving a Professional Services Contract with Jacobs for the 30% Schematic Design phase of the WRF Solids Treatment Capacity Improvement Project, Project 2019-10.

## RESOLUTION NO. 2021 - 53

A Resolution approving the award of a Professional Services Contract to Jacobs Engineering Group Inc. for the Solids Capacity Improvement Project 30% Schematic Design, Project 2019-10.

### RECITALS:

**Whereas**, in 2019, the City undertook a formal procurement process to request proposals (RFP) for the Water Reclamation Facility Biosolids Storage Tank and Grit System Expansion (“Project”); and

**Whereas**, Jacobs Engineering Group Inc. (“Jacobs”) was the successful proposer and the City executed a Professional Services Contract on April 7, 2020 for the first phase of the project during which Jacobs agreed to develop a Project Definition, but with the understanding that later phases described in the RFP, would be separately contracted as the Project advanced; and

**Whereas**, on January 29, 2021 the City received the WRF Biosolids Storage Tank and Grit System Expansion Project 2019-10, Project Definition Report (Phase 1); and

**Whereas**, this report listed the process and evaluations that took place and the final recommendations for moving forward with the 30% Schematic Design; and

**Whereas**, the City has negotiated the type of services, work scope, project team, sub-consultants, fee, and schedule with Jacobs for Phase 2 of the Project. Future detailed design and construction phases are anticipated; and

**Whereas**, the estimate for this scope of work is \$ 414,504; and

**Whereas**, project funding is included in the adopted FY 22 Wastewater Capital Fund (77) budget for the professional services of the biosolids storage tank and grit system expansion design.

**NOW, THEREFORE, BE IT RESOLVED BY THE COMMON COUNCIL OF THE CITY OF MCMINNVILLE, OREGON, as follows:**

1. That entry into a Professional Services Contract with Jacobs for Phase 2 of the Water Reclamation Facility (WRF) Solids Capacity Improvement Project 30% Schematic Design, Project 2019-10, in the amount of \$ 414,504 is hereby approved.
2. The City Manager is hereby authorized and directed to execute the contract with Jacobs.
3. That this resolution shall take effect immediately upon passage and shall continue in full force and effect until revoked or replaced.



Adopted by the Common Council of the City of McMinnville at a regular meeting held the 12th day of October 2021 by the following votes:

Ayes: \_\_\_\_\_

Nays: \_\_\_\_\_

Approved this 12<sup>th</sup> day of October 2021.

\_\_\_\_\_  
MAYOR

Approved as to form:

Attest:

\_\_\_\_\_  
City Attorney

\_\_\_\_\_  
City Recorder

# **Exhibit A**

## **Agreement for Professional Services for the City of McMinnville Water Reclamation Facility (WRF) Solids Treatment Capacity Improvements Project Project 2019-10**

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### **PROJECT DESCRIPTION**

McMinnville's Water Reclamation Facilities Plan (2009, CH2M HILL/West Yost) recommended expanding the WRF in conjunction with reducing collection system infiltration and inflow (I&I) to address future wastewater treatment needs. Related to the solids treatment and headworks processes, the Facilities Plan included: construction of a 1-MG biosolids storage tank and mixer; construction of a dewatering process and dry biosolids storage; upgrade of odor control; expansion of grit removal; modification of the influent screens; and, addition of thermal drying. Since the Facilities Plan: the City has deferred some of the recommended projects; population growth, thus flows and lows, have not increased as projected; and, technologies have changed.

The Project Definition Report for the Biosolids Storage Tank and Grit System Expansion recommended implementation of the Solids Treatment Capacity Improvements Project, including the following major components:

- Addition of two autothermal thermophilic aerobic digesters (ATADs) based on the Thermal Process Systems Thermaer™ process.
- Conversion of the three existing ATAD tanks to Thermal Process Systems SNDR™ process with consideration for constructing a new tank for the SNDR process, rather than retrofit of the existing tanks.
- Construction of an ATAD Support Building to house the equipment associated with the ATAD and SNDR processes.
- Replacement of the existing odor control system.
- Improvements to the existing decant system at the Biosolids Storage Tank.
- Accommodating a future project to implement dewatering and cake storage.
- Replacement of the Headworks PLC.

The scope described herein is based on delivery of a 30% Schematic Design of these recommended elements from the Project Definition Report for the Biosolids Storage Tank and Grit System Expansion. The Work is proposed on a Time & Materials basis with a not-to-exceed budget of \$414,504.

## **BASIS OF DESIGN SCOPE AND FEE DEVELOPMENT**

The following key assumptions were made in the compilation of this scope of work and the estimation of the level of effort:

1. The Schematic Design phase work on this project will last 6 months from authorization to proceed and be completed in calendar year 2022.
2. No additional workshops or deliverables are included beyond those identified in the Work Approach.
3. The design will be based on the federal, state, and local codes and standards in effect on the effective date of the authorization to proceed. Any changes in these codes may necessitate a change in scope.

### **City-Provided Services**

1. City will provide to Consultant all data in City's possession relating to Consultant's services on the Project. Consultant will reasonably rely upon the accuracy, timeliness, and completeness of the information provided by the City.
2. City will make its facilities accessible to Consultant as required for Consultant's performance of its services and will provide labor and safety equipment as required by Consultant for such access. City will perform, at no cost to Consultant, such tests of equipment, machinery, pipelines, and other components of City's facilities as may be required in connection.
3. City will give prompt notice to Consultant whenever City observes or becomes aware of any development that affects the scope or timing of Consultant's services, or of any defect in the work of Consultant.
4. The City will examine information submitted by Consultant and render in writing or otherwise provide decisions in a timely manner.
5. The City will furnish required information and approvals in a timely manner.
6. The City will provide a utility locate service to mark existing utilities, if necessary.
7. The City will develop any required permit applications, supporting information, and required reports and pay all permit processing fees.

## **WORK APPROACH**

The project design work will be carried out using a phased design delivery approach to assure a logical and progressive completion of the design work. Only the Schematic Design phase is included herein, and future design phases will be provided by Amendment. A specific list of work products and deliverables are identified in the tasks below. Design review workshops will be conducted with the City's personnel, key individuals from the Consultant's project team and others as needed; the design review workshops will be conducted at critical design milestones as identified in the following section.

Task 1: Project Management

- Task 2: Schematic Design
- Task 3: Geotechnical Assessment
- Task 4: Quality Management
- Task 5: Estimate of Probable Construction Cost
- Task 6: Additional Services

## **Task 1 - Project Management**

The purpose the Project Management task is to establish and monitor compliance with project budget and schedule.

### **Task 1.1: Progress Meetings and Updates**

The Consultant's project manager will talk or email with the City's project manager weekly to review project progress and discuss upcoming work activities. The Consultant's project manager will provide monthly email summaries of work completed, upcoming activities and unresolved issues. All in-person meetings and workshops will be held at the WRF unless noted otherwise. When possible, meetings will be conducted over video conference.

### **Task 1.2: Project Management Plan**

The Project Management Plan includes project instructions and a project health and safety plan for the Consultant's team. The plan developed in the Project Definition phase will be used for the Schematic Design phase.

### **Task 1.3: Invoicing, Cost and Schedule Control**

The Consultant's project manager will manage, administer, coordinate, and integrate work of the Consultant's team as required to deliver the project within budget and on schedule. The Consultant's project manager will prepare and submit to the City's project manager on a monthly basis, a brief cost and schedule status report and updated summary project schedule showing actual versus projected. The report shall include a narrative description of progress to-date, actual costs for each major task, estimates of percent complete, and potential cost variances.

*Deliverables: Monthly status reports and invoices.*

## **Task 2 – Schematic Design**

The purpose of this task is to use the data and guidelines developed in the Project Definition Report, develop and evaluate alternative design concepts, and agree upon a single design concept. The end product from this task will be a Schematic Design Report, including technical memoranda and preliminary drawings, which will provide sufficient information for City and agency review and design team coordination and review. Six (6) memoranda are anticipated.

The Schematic Design Report memoranda and drawings will be based on the discipline-specific activities identified in the following subtasks.

### **Task 2.1: Civil and Site Development**

Schematic design work will include the following activities.

- Confirm adequacy of topographical and boundary mapping and evaluate permitting and zoning constraints.
- Develop site layout. This will include:
  - Determine structure size, location, and orientation.
  - Layout roadways/truck access corridors and define maneuvering requirements
  - Size and locate parking areas.
  - Determine emergency vehicle access requirements.
  - Locate and size storm water management facilities.
  - Locate utility and piping corridors (horizontal and vertical).
- Set preliminary finished floor levels for new structures. Establish preliminary finished grades; overall major surfaces, road profiles, etc. Iterate preliminary surfaces and structures to optimize earthwork if necessary.

### **Task 2.2: Architectural**

Schematic design work for architectural will include the following activities:

- Perform a code review of existing facilities that require retrofit/rehabilitation to identify areas where the facilities do not meet current codes. Develop a plan to bring existing facilities into code compliance where necessary.
- Establish preliminary room sizes. Identify the adjacencies and functional requirements of each space. Establish architectural theme for exterior of building. Select interior and exterior construction materials for each building. Select roof type, slope, and roof support system for each building.
- Assign code classification to each building. Meet with local code official to review code classifications.
- Compile list of chemicals and amounts to be used. Coordinate with other disciplines (mechanical and electrical) to resolve code compliance issues specific to these disciplines.
- Prepare preliminary building layouts.

### **Task 2.3: Structural**

Schematic design for structural will include the following activities.



- Coordinate with architectural and process disciplines on the selection of building concepts.
- Develop a building foundation and structure concept based on schematic building layout and based on coordination with geotechnical engineer.

#### **Task 2.4: Process-Mechanical**

Schematic design for process will include the following:

- Finalize size/capacity of all unit treatment processes and ancillary systems.
- Review capacity of impacted existing processes and equipment to remain in service where appropriate. Assign capacity to existing processes.
- Select and size all major process equipment including pumps. Prepare sizing calculations. Establish level of redundancy required for all process equipment.
- Prepare equipment list with sizing for major equipment. Coordinate with the City on preferences for equipment manufacturers.
- Prepare preliminary equipment arrangements.
- Review capacity and condition of impacted existing equipment to remain in service.
- Prepare process flow diagrams (PFDs) to represent the portion of the WRF process included in the project.
- Finalize solids mass balance to represent the portion of the WRF process included in the project.
- Develop process narratives.
- Design concerning “plant-wide” utility systems such as basin drainage, water, and in-plant waste collection/disposal will be limited to extensions and/or changes in existing piping.

#### **Task 2.5: Building Services**

Schematic design for HVAC and plumbing will include the following.

- Select type of ventilation system to be used in process buildings.
- Select type of heating system to be used.
- Coordinate with the architectural discipline to establish design R-values for all exterior walls.
- Coordinate with local fire marshal and architect to determine requirements for sprinklers and fire protection.

- Determine overall potable water requirements for the project. Confirm adequate quantity and pressure can be obtained from the local potable water supply utility.

### **Task 2.6: Instrumentation and Control (I&C)**

Schematic design work for the instrumentation and control will include the following activities.

- Prepare a process and instrumentation diagram (P&ID) for each treatment process, including: process configuration, flow streams, valve and gate locations (manual and powered), chemical additions points/types, process equipment location/type including packaged control panels and adjustable-speed drives, flow meters and other process control devices.
- Develop equipment/instrument tag numbering, naming, and abbreviation conventions.
- Prepare written operational description of each major process.
- Develop overall control philosophy including local control approach, control system, level of automation, supervisory control.
- Develop preliminary strategy for Headworks PLC replacement.

### **Task 2.7: Electrical**

Schematic design work for electrical will include the following.

- Prepare preliminary overall one-line diagram for proposed facilities.
- Prepare preliminary load calculations.
- Size electrical rooms.
- Determine number of electrical feeds to be provided to facility.
- Determine redundancy requirements for power supplies and power distribution.
- Establish preferred voltages for power distribution and utilization equipment.
- Develop preliminary schedule of hazardous and corrosive locations.

### **Task 2.8: Workshops**

Consultant will conduct two interactive workshops with the Owner's personnel, one to kickoff the phase and a second to review the work product at the end of the phase. Each workshop will be 3 hours. Consultant's project manager, design manager, and discipline lead engineers will attend. Workshops will be held at the WRF unless the City prefers video conference. When possible, discipline lead engineers will participate by video conference.

Note: Due to COVID-19 travel restrictions in Oregon, in-person meetings may not be possible.

***Deliverables:** Schematic Design Technical Memorandums, preliminary drawings, and workshop agenda and minutes. For memoranda and drawings, (5) hard copies of the deliverable shall be provided in addition to electronic version. Consultant will submit deliverables for City review 2 weeks prior to review meeting.*

### **Task 3 – Geotechnical**

CH2M completed a boring and site-specific ground motion site response analysis in 2013. The site-specific assessment was performed using the 2002 release of seismic data from USGS and ASCE 7-05. For the proposed new structures, this assessment must be updated to reflect the 2014 release of USGS information and seismic design requirements of ASCE 7-16. ASCE 7-16 requires liquefaction assessment to be completed for the full peak ground acceleration (PGA) associated with the 2,475-year return period seismic event. It also places limitations on the maximum magnitude of allowable lateral movement and differential settlement beneath new facilities as a function of the seismic risk category of each structure. The previously developed evaluation must be updated to evaluate the more recent ASCE requirements for liquefaction and lateral spread.

Based on work performed during the Project Definition phase, Consultant determined that there is enough subsurface information to develop an understanding of the subsurface layers and general soil conditions present at the site. However, additional information is recommended to reduce uncertainty in the geotechnical analyses. Previously completed borings were advanced to more than 200 feet depth without encountering bedrock or even dense soil or gravel. The uncertainty in the depth to bedrock or dense materials beneath the site leads to uncertainty in the site-specific seismic analyses that will be required and necessitates that a sensitivity analyses be completed for the work to evaluate the impacts of variable bedrock depth.

#### **Task 3.1: Geophysical Survey**

Jacobs recommends that a geophysical survey be completed as part of the project as the data will be valuable in completing the seismic analyses, and the ability to focus the analyses with the understanding of bedrock depth and the reduced uncertainty will likely result in a cost savings that is greater than the cost of the study. An allowance of \$20,000 is provided for geophysical survey, including field work and repackaging of the previous Geotechnical Data Report to include the updated information.

#### **Task 3.2: Site Specific Seismic Analyses**

The site-specific seismic analyses will include the selection of seismic shaking records from similar fault sources to those present in Oregon. The records will be scaled to represent the types of seismic hazard ground motion shaking that could occur at the project site during the design-level seismic event. A numerical modelling software program will be used to evaluate the ground response to the seismic shaking records in accordance with building

code requirements. The results of the modelling will be used to evaluate the magnitude of site liquefaction and potential for lateral movement and settlement.

***Task 3 Deliverables:***

- *Repackaged Geotechnical Data Report and Site Specific Seismic Analysis*

**Task 4 – Quality Management**

The Consultant will carry out a quality assurance program (QAP). The purpose of this QAP is to monitor the quality of the Project through the use of internal quality assurance/quality control (QA/QC) reviews as described herein. The Consultant will manage multidiscipline internal QA/QC review activities with the senior review team. A QC review will be performed on process and cost calculations. A formal QC review will be performed prior to the City’s review of the draft Project Definition Report.

A Quality Management Plan (QMP) will be prepared for the project to serve as a guide for all phases of the project. Key features of the QMP will include:

- A single point of contact responsible for all quality management.
- Independent quality review performed by discipline-specific quality reviewers to provide critical analysis without bias.
- Procedures for engineers; detailed checks of reports, calculations, drawings, design details and specifications.

Audits by QA personnel will be conducted to verify conformance with the approved QMP and confirm that required checking and review functions are completed.

Design quality review documentation will demonstrate that quality review process is complete and review comments are acceptably addressed as a component of the overall records management system. The following documentation will be prepared, collected and properly stored in the project records system:

- Quality review forms used during internal quality reviews and issue tracking forms used to document those issues.
- Design review forms used by the City to document review comments
- Project checklists or milestone checklists, signed by the reviewer and the appropriate project staff
- Review-related correspondence with City staff and other external agencies or entities
- Audit correspondence, including results and corrective action documentation

The level of effort for this task includes preparation of the QMP and QC reviews for the Schematic Design phase.

***Task 5 Deliverables: Written documentation of QC reviews.***

## **Task 5 – Estimate of Probable Construction Cost**

Based on Schematic Design Phase documents, Consultant will prepare an Estimate of Probable Construction Cost. This cost estimate will be prepared based on the Schematic Design Report, scale-up or scale-down factors, and cost data from other projects. It is intended that the estimate will include sufficient contingency to cover expected cost impacts that will be identified as the design evolves.

The estimate provided above will be based on the judgment and experience of the Consultant and shall not be construed as a guarantee of cost. In addition, predictions of economic feasibility, operating efficiency, costs and such other matters developed during designs, are forecasts based upon the judgment and experience of the Consultant and shall not constitute a guarantee of the final project cost.

In providing opinions of cost, financial analyses, economic feasibility projections, and schedules for the Project, Consultant has no control over cost or price of labor and materials; unknown or latent conditions of existing equipment or structures that may affect operation or maintenance costs; competitive bidding procedures and market conditions; time or quality of performance by operating personnel or third parties; and other economic and operational factors that may materially affect the ultimate Project cost or schedule. Therefore, Consultant makes no warranty that City's actual Project costs, financial aspects, economic feasibility, or schedules will not vary from Consultant's opinions, analyses, projections, or estimates.

*Task 6 Deliverable: AACE Class 4 estimate of probable construction cost to be included in the Project Definition Report Executive Summary.*

## **Task 6 – Additional Services Allowance**

The City may elect to request the following services from Consultant during the course of the project. The scope, schedule and fee for each additional service will be negotiated and approved by the City prior to Consultant beginning the associated work. Additional services could include but are not limited to the items listed below. Note that the allowance provided would not fully fund the listed items.

- Upgrade or modifications of any existing building or structures including a feasibility study to make sure the proposed modifications can be implemented cost-effectively.
- Power system analyses for existing facilities. The City is addressing the existing emergency electrical power supply system with others. No additional secondary or emergency power source will be provided as part of the project.
- Modification or expansion of the I&C system or software for the existing processes, except where noted previously.
- Multiple construction contracts, phases or schedules.



- Studies, including wetlands mitigation, archaeological investigations, site history investigations, hazardous wastes, corrosion of existing piping, asbestos presence and similar study efforts.
- Legal, easement or plat surveys.
- Additional alternative plant site layouts.
- Evaluation of any structural problems associated with any existing plant facilities.
- Electrical and building code review of existing, unrelated processes to identify areas where the facilities do not meet current codes.
- Pre-purchase of selected equipment.
- Location/verification of existing below ground utilities.
- 3-D renderings and services to support local public interest efforts.
- Preparation, submittal, negotiations and comment responses and changes associated with obtaining regulatory agency permits. Drawings and specifications to be provided as part of the contract documents will be provided to the Consultant upon request for modification or annotation by the Consultant for use in permit application packages.
- Site work, including road repaving, in areas outside those needed for the new facilities.
- Additional topographic survey. Existing survey information will be used for the design of the new and modified facilities.
- Additional geotechnical borings or laboratory tests. The foundation design of the new facilities will be based on boring and site-specific ground motion site response analysis in 2013.

Estimated Level of Effort  
 McMinnville WRF Solids Treatment Capacity Improvements Project  
 Schematic Design Phase

Task No.	Task/Subtask	Koch PM \$ 234	Herman DM \$ 274	Oerke Process (Solids) \$ 295	Reistad Process (Solids) \$ 230	Leaf Process (Modeling) \$ 273	Greeley Process \$ 175	Junior Eng \$ 124	Heidari Geotech \$ 188	Cowden Odor \$ 295	Cotten Geotech \$ 283	Firth Structural \$ 242	Gray Arch \$ 134	Hoffmann Planning \$ 179	Chandler Civil \$ 156	Cutz Mech \$ 110	Cummings IC \$ 125	Valenzuela Electrical \$ 114	Jones Cost \$ 253	DDL Cowan \$ 177
1.0	Project Management	\$ 6,074	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	Task Hours	26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.0	Schematic Design	\$ 21,960	\$ 25,746	\$ 5,900	\$ 6,428	\$ 1,090	\$ 29,100	\$ -	\$ 1,128	\$ 11,210	\$ 3,961	\$ 15,027	\$ 4,296	\$ 2,866	\$ 11,517	\$ 14,093	\$ 17,794	\$ 8,420	\$ -	\$ 11,322
	Task Hours	94	94	20	28	4	166	0	6	38	14	62	32	16	74	128	142	74	0	64
3.0	Geotechnical	\$ 934	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 13,349	\$ 23,690	\$ -	\$ 15,560	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	Task Hours	4	0	0	0	0	0	108	126	0	55	0	0	0	0	0	0	0	0	0
4.0	Quality Management	\$ 934	\$ 1,096	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	Task Hours	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5.0	Cost Estimate	\$ 934	\$ 548	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 15,162	\$ -
	Task Hours	4	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	60	0
6.0	Additional Services	\$ 11,214	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	Task Hours	48	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>TOTAL</b>																				
	<b>Cost</b>	\$ 42,052	\$ 27,389	\$ 5,900	\$ 6,428	\$ 1,090	\$ 29,100	\$ 13,349	\$ 24,818	\$ 11,210	\$ 19,521	\$ 15,027	\$ 4,296	\$ 2,866	\$ 11,517	\$ 14,093	\$ 17,794	\$ 8,420	\$ 15,162	\$ 11,322
	<b>Hours</b>	180	100	20	28	4	166	108	132	38	69	62	32	16	74	128	142	74	60	64

										Subconsultants		
Task No.	Task/Subtask	CAD \$ 124	Massie QC Mgr \$ 295	QC Team (10) QC \$ 295	Bates/Hurt Project Controls \$ 135	Admin Riddle \$ 101	Jacobs Labor Hours Total	Jacobs Labor \$ Total	Mileage and Additional Expenses	Total Jacobs Labor and Expenses	Total Sub Labor	
1.0	Project Management	\$ -	\$ -	\$ -	\$ 1,621	\$ -		\$ 7,695	\$ 500	\$ 8,195	\$ -	
	Task Hours	0	0	0	12	0	38					
2.0	Schematic Design	\$ 78,610	\$ -	\$ -	\$ -	\$ 7,642		\$ 278,110	\$ 500	\$ 278,610	\$ 6,000	
	Task Hours	636	0	0	0	76	1768					
3.0	Geotechnical	\$ 494	\$ -	\$ -	\$ -	\$ 2,413		\$ 56,441	\$ 0	\$ 56,441	\$ 10,000	
	Task Hours	4	0	0	0	24	321					
4.0	Quality Management	\$ -	\$ 1,770	\$ 23,600	\$ -	\$ -		\$ 27,400	\$ 0	\$ 27,400	\$ -	
	Task Hours	0	6	80	0	0	94					
5.0	Cost Estimate	\$ -	\$ -	\$ -	\$ -	\$ -		\$ 16,644	\$ 0	\$ 16,644	\$ -	
	Task Hours	0	0	0	0	0	66					
6.0	Additional Services	\$ -	\$ -	\$ -	\$ -	\$ -		\$ 11,214	\$ 0	\$ 11,214	\$ -	
	Task Hours	0	0	0	0	0	48					
<b>TOTAL</b>							2335	\$ 397,504	\$ 1,000	\$ 398,504	\$ 6,000	
	<b>Cost</b>	\$ 79,105	\$ 1,770	\$ 23,600	\$ 1,621	\$ 10,055						
	<b>Hours</b>	640	6	80	12	100						
										\$ 398,504	\$ 16,000	
										138 of 364		\$ 414,504



**McMinnville Water Reclamation Facility  
Biosolids Storage Tank and Grit System Expansion Project 2019-10**

**Project Definition Report**

Final

March 2021



## Executive Summary

### Introduction

The McMinnville Water Reclamation Facility (WRF) consists of preliminary, secondary, and tertiary treatment and solids processing facilities. To accommodate population and flow and load growth, the 2009 City of McMinnville Water Reclamation Facilities Plan (2009 Facilities Plan) (West Yost Associates and CH2M HILL, 2009) developed recommendations that resulted in a Capital Improvements Plan that included these projects:

- Replacement of influent screens: The screens have an estimated 20-year life. The 2009 Facilities Plan recommended replacement in 2016; however, the City has had to make only minor repairs such as replacing broken teeth.
- Addition of a second grit vortex tank: The second vortex grit chamber was recommended to accommodate increased peak hour flow and provide redundancy in the summer.
- Implementation of solids alternative "SM2 ATAD Treatment and Dewatering Stabilization": This alternative called for continued use of the autothermal thermophilic aerobic digestion (ATAD) process up to the capacity of the existing process and construction of a parallel process including dewatering, sludge stabilization, and storage for treatment of additional sludge volume. The Capital Improvements Plan recommended staged implementation of an additional biosolids storage tank, dewatering and cake storage, followed by a parallel sludge stabilization process. Upgrades to the biofilter system were also included.
- Improvements to infiltration and inflow (I/I): Based on 2009 Facilities Plan recommendations, the City significantly decreased I/I, reducing peak flows to the WRF and delaying the need for a costly WRF expansion.

Based on the 2009 Facilities Plan recommendations, the City advertised the Biosolids Storage Tank and Grit System Expansion Project 2019-10. The project definition phase focused on evaluating current and future WRF conditions, considered the Facilities Plan recommendations, and developed a series of memoranda that recommend WRF improvements. Those memoranda are included in this Project Definition Report.

### Existing Conditions

#### Influent Flows

The I/I improvements were intended to maintain the peak hour flow at 32 million gallons per day (mgd). Although updated peak hour flow projections are substantially higher than 32 mgd using the Oregon Department of Environmental Quality statistical method, it is anticipated that due to capital improvements in the collection system, hydraulic modeling of the collection system will establish that the peak hour flow is close to 32 mgd; however, that modeling is outside the scope of this study.

#### Solids Handling

The current biosolids product at the WRF is liquid Class A biosolids that are land applied locally. Liquid biosolids are stored in the biosolids storage tank from approximately October through April and are hauled by a third-party contractor from May through September. The existing ATAD process is approaching its treatment capacity. Additionally, while biosolids are stored in the biosolids storage tank, liquid must be decanted to allow additional storage of produced biosolids during the storage period of the

year. The limited ATAD solids processing capacity and biosolids storage capacity show the WRF solids treatment process requires improvements.

### **Odor Control**

The existing odor control system is at the end of its service life. The existing fans and biofilter support structure show signs of severe damage, and the biofilter media is due for replacement.

### **PFAS**

Per- and poly-fluoroalkyl substances (PFAS), including perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS), comprise a broad group of substances or chemicals that have been manufactured and used by a variety of industries since 1940. While treated wastewater and biosolids are not sources of PFAS, wastewater treatment plants receive PFAS through receipt of consumer product discharge, industrial discharge, landfill leachate, and human bodily excretion. The United States is now expanding its focus on wastewater (along with recycled water), biosolids, and landfill leachate. In many aspects, the United States is focused on research, data collection, and gathering an understanding of impacts from output of wastewater utilities, mainly water, biosolids, and air emissions.

To understand the prevalence of PFAS compounds in the WRF treatment process, a sampling study was developed. The PFAS concentrations measured in wastewater influent and digester influent samples at the WRF were relatively low. The increased concentrations in wastewater effluent and biosolids samples are likely the result of the conversion of "precursor" to "terminal" compounds, primarily due to the aerobic treatment processes. The higher values do not indicate that the treatment process is increasing the concentration of concerning compounds; rather, the values indicate the treatment process is accelerating the conversion process of "precursor" to "terminal" compounds.

The City may wish to investigate any point sources of "precursor" compounds to the wastewater collection system; however, because the City does not have major industrial contributors and does not treat landfill leachate, it is likely that the "precursor" contribution is more distributed, potentially resulting from household sewer discharges.

Current understanding of the risks associated with low levels of PFAS in biosolids is limited; however, the beneficial aspects of biosolids land application are well understood. The City should continue to monitor the industry understanding of PFAS, the regulatory environment, and PFAS concentrations at the WRF.

## **Recommendations**

### **Screening and Grit Removal**

The hydraulic capacity of the WRF and long-term plan should be evaluated in the next facilities planning effort. However, the existing grit removal system can be bypassed for maintenance so redundancy is not critical. No work at the headworks is recommended as part of this project. The City should consider:

- Working directly with Parkson to procure a rebuild of the screens with the same components.
- Coordinating investment in the headworks screens with the screens at the raw sewage pump station flow diversion structure.
- Adding Optiflow baffles to the grit system. Due to the unique hydraulics, however, it is unknown whether the cost of this improvement would be justified by any increase in performance. Additionally, regardless of performance increase, it is expected that cleaning grit from the Orbal outer ring could never be completely eliminated, and the periodic cost of cleaning grit from the Orbal outer rings does not justify the expense of expanding or replacing the existing process.



## Offsite Biosolids End-Use Alternatives

One critical consideration related to improvement alternatives is the WRF's current limitation of producing a single biosolids product with a single end use. The WRF desires flexibility to adjust the end use should an issue arise with local land application of the liquid Class A biosolids. Offsite end uses/disposal alternatives were evaluated with the following products/end uses short-listed: current liquid product with local land application (baseline), low-odor liquid product with local land application, dewatered product with local land application, compost product with direct distribution to consumer, and dried product with direct distribution to consumer.

City staff prepared an agricultural survey questionnaire to gather feedback from the farmers who currently receive or have previously received WRF biosolids. The survey focused on the farmers' experiences with the current biosolids land application program and their interest in possible changes to the program. Seven farmers completed the survey. The results reflect a successful and rather low-cost liquid biosolids land application program where the majority of the farmers are satisfied. The City can reduce one of the biggest farmer and neighbor concerns by implementing a biosolids stabilization process that further reduces odor in the biosolids product.

## Biosolids Treatment Alternatives

The existing ATAD process is approaching its treatment capacity. While biosolids are stored in the biosolids storage tank, liquid must be decanted to allow additional storage of produced biosolids during the storage period of the year. The limited ATAD solids processing capacity and biosolids storage capacity show the WRF solids treatment process requires improvements.

For the short-listed biosolids products, non-monetary criteria were developed, weighted against each other, and then used to score the biosolids treatment alternatives. Conceptual capital, annual, and net present value costs were developed for the short-listed biosolids treatment alternatives, resulting in a cost and non-monetary ranking comparison for the short-listed biosolids treatment alternatives. This evaluation resulted in the recommendation of Alternative 3B – addition of second generation ATAD tanks, a new equipment support building, retrofit of the existing ATADs for storage nitrification-denitrification reactor (SNDR), addition of a biosolids dewatering building, and addition of cake storage. Alternative 3B provides the City increased solids processing capacity, improves the capacity of the existing liquid biosolids storage tank, and implements dewatering and cake storage. One additional advantage of Alternative 3B is its "phaseability."

While Alternative 3B can accommodate long-term WRF needs, the first phase should address additional solids processing capacity and liquid biosolids storage capacity. Because of the still strong demand for the WRF liquid biosolids product, there is not currently a driver to construct dewatering and cake storage. The following components are recommended for inclusion in the project:

- Two new second generation ATAD tanks
- ATAD support building to house the ATAD package equipment
- SNDR reactor(s), either retrofit of the existing ATADs or construction of a new SNDR tank
- Pumping and piping modifications associated with the above facilities
- Improvements to the decant operation at the existing biosolids storage tank
- Substantial replacement of the existing odor control system, including fans and biofilter

Alternative 3B uses the existing ATAD reactors for SNDR, consistent with the 2009 Facilities Plan goal of continuing to use existing treatment capacity. The SNDR stage is a less aggressive environment than the ATAD stage, prolonging the service life of the existing steel reactors. As the design phase progresses, the cost of retrofitting the existing ATADs for SNDR should be compared with the cost of constructing a new,

standalone SNDR tank. The cost of constructing the new basin may be comparable to the retrofit, and eliminating the retrofit would simplify constructability and likely provide an SNDR process with a longer service life.

One critical factor affecting the recommended alternative and eventual site layout is the challenging geotechnical conditions at the WRF site. Any new structures would require costly foundations or ground improvements to meet current code requirements.

The recommendation to pursue Alternative 3B was reviewed with the Oregon Department of Environmental Quality, and they provided a letter in support of this approach.

## Project Delivery and Cost

### Estimated Construction Cost

The Project Definition Report defines the near-term and long-term project components required to improve the capacity of the existing solids treatment and odor control processes. The cost estimate detail shown below accounts for only the improvements recommended for implementation in the current project. In addition to the construction cost estimate, 25 percent additional budget has been included for professional services to result in a total project cost.

#### Summary of Project Cost Estimate

Item	Estimated Cost (\$)
ATAD Tanks	1,185,000
Equipment Support Building	4,175,000
SNDR and Headworks Retrofit	225,000
Biosolids Storage Tank Improvements	75,000
Odor Control System	431,000
Process Mechanical Installation (20% allowance applied to equipment)	590,000
Process Mechanical Piping (10% allowance applied to equipment)	270,000
Civil/Yard Piping (5% allowance)	259,000
Electrical (8% allowance)	415,000
Instrumentation and Controls (10% allowance)	519,000
<b>Subtotal (before markups)</b>	<b>8,660,000</b>
Contractor Overhead (10%)	910,000
Contractor Profit (5%)	500,000
Mobilization, Bonds, Insurance (5%)	430,000
Contingency (25%)	2,630,000
Escalation to Midpoint of Construction (8%)	1,071,000
<b>Total Construction Cost</b>	<b>14,201,000</b>
Professional Services (25% allowance)	3,550,000
<b>Total Project Cost</b>	<b>17,751,000</b>

## Contracting Method and Equipment Procurement

Several contracting options are available to the City to implement construction of the improvements. These include conventional design-bid-build, construction manager-general contractor and design-build, each option having specific advantages and disadvantages. Conventional design-bid-build is recommended for the current project.

For equipment procurement, typical open bid, sole-source, and pre-qualification have been used successfully for work at the WRF in the past several years. The ATAD equipment by Thermal Process Systems is the largest equipment package and is recommended to be sole-sourced. In subsequent design phases, thorough justification would be developed to support this recommendation, including evidence of fair pricing to the City.

## Schedule, Sequencing, and Constraints

As the design phase progresses, Jacobs will work with the City to develop a schedule and set of construction constraints that minimize the impact of construction activities on WRF operations. With a construction period start target of spring 2022, it is anticipated that substantial completion will be achieved in fall 2023. A suggested preliminary construction sequence is as follows:

- Spring/Summer 2022
  - Mobilize
  - Major equipment submittals
  - Site work
  - Begin foundation improvements
- Fall/Winter 2022/2023
  - Yard piping
  - Major concrete work
  - Begin mechanical installation
- Spring/Summer 2023
  - Major mechanical work
  - Electrical/instrumentation and control work fall/winter
- Fall 2023
  - Commissioning and startup

## Project Budget

The Capital Improvements Plan (CIP) in the 2009 Facilities Plan accounted for the following projects: 1-million-gallon biosolids storage tank in 2010–2012; dewatering facility, cake storage, and odor control in 2014–2016; and dryer in 2021–2023. None of those projects have been executed. The City's current CIP now includes \$6.0 million for the 1-million-gallon biosolids storage tank in fiscal year (FY)19-22; \$10.4 million for the dewatering facility and cake storage in FY25-28; \$0.59 million for odor control in FY25-28; and \$16.1 million for a dryer in FY26-29. Additionally, the CIP includes \$2.8 million for the grit system expansion in FY19-22 and \$4.0 million for the filtration system expansion in FY23-26. These projects result in a total of \$40 million in the current CIP.

Recent studies at the WRF, including the memoranda enclosed in this report, recommend projects that deviate from the 2009 recommendations. These changes can be attributed to lower than projected population growth, reductions in peak flows due to I/I improvements, and advances in technology. For example, the grit system expansion and filter system expansion would be triggered by increased peak

flows, but those increases have not occurred. In terms of the solids treatment process, improvements in ATAD technology and recent experience with dryer operation resulted in updated treatment process recommendations to achieve the same goals as developed in the 2009 Facilities Plan at a lower life-cycle cost.

Although implementing the above changes is expected to result in an additional \$8.0 million in near-term project costs (FY19-24), the recommendations are expected to save the City almost \$11.0 million in project cost over the next 10 years (through FY30). This includes the assumption that the second phase of the recommended solids treatment project (dewatering and cake storage) is implemented within the next 10 years (assumed FY30) at a cost of \$11.3 million. If the project cost exceeds the City's budget, the City could consider additional phasing alternatives to implement Alternative 3B. Rather than executing Alternative 3B in two phases, the SNDR retrofit could become a separate project phase or be included in the current phase as a bid alternative. The SNDR retrofit is estimated to be \$2.8 million of the total project cost.

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## Acronyms and Abbreviations

°C	degrees Celsius
µg/kg	micrograms per kilogram
AAF	average annual flow
ACH	air changes per hour
ADWF	average dry weather flow
ASCE	American Society of Civil Engineers
ASF	average summer flow
ATAD	autothermal thermophilic aerobic digestion
AWWF	average wet weather flow
BOD <sub>5</sub>	5-day biochemical oxygen demand
BS	biosolids
BSST	biosolids storage tank
cfm	cubic feet per minute
CIP	Capital Improvements Plan
D/T	dilutions-to-threshold
DEQ	Oregon Department of Environmental Quality
DI	digester influent
DMDS	dimethyl disulfide
DMS	dimethyl sulfide
EBGRT	empty bed gas residence time
EGLE	Michigan Department of Environment, Great Lakes, and Energy
EPA	U.S. Environmental Protection Agency
EPDM	ethylene propylene diene terpolymer
fpm	feet per minute
FRP	fiberglass reinforced plastic
FTE	full-time-equivalent
FY	fiscal year
g	gram
gal	gallon
gpcd	gallons per capita per day
gpd	gallons per day

H <sub>2</sub> S	hydrogen sulfide
hp	horsepower
HRT	hydraulic retention time
I/I	infiltration and inflow
IBC	International Building Code
lbs/day	pounds per day
M	million
MCE	maximum considered earthquake
MCRT	mean cell residence time
MDDWF	maximum day dry weather flow
MDWWF	maximum day wet weather flow
MG	million gallon(s)
mg/L	milligrams per liter
mgd	million gallons per day
MM	methyl mercaptan
MMDWF	maximum month dry weather flow
MMWWF	maximum month wet weather flow
MPN	most probable number
MWDWF	maximum week dry weather flow
N/A	not applicable
NFPA	National Fire Protection Association
ng/L	nanograms per liter
NH <sub>3</sub>	ammonia
NOAA	National Oceanic and Atmospheric Administration
NSHMP	National Seismic Hazard Maps
O&M	operations and maintenance
OSHA	Occupational and Safety Health Administration
OSSC	Oregon Structural Specialty Code
PDAF	peak daily average flow
PFAS	per- and poly-fluoroalkyl substances
PFBS	perfluorobutanesulfonic acid
PFHxA	perfluorohexanoic acid
PFHxS	perfluorohexane sulfonic acid



PFOA	perfluorooctanoic acid
PFOS	perfluorooctane sulfonate
PFRP	process to further reduce pathogens
PGA	peak ground acceleration
PHF	peak hour flow
PLC	programmable logic controller
ppbv	parts per billion by volume
ppd	pounds per day
ppm	parts per million
ppmv	parts per million by volume
PSRP	process to significantly reduce pathogens
RSPS	raw sewage pump station
SEI	Structural Engineering Institute
SNDR	storage nitrification denitrification reactor
SOUR	specific oxygen uptake rate
SRT	solids retention time
TBD	to be determined
TS	total solids
TSS	total suspended solids
UHS	uniform hazard spectrum
USGS	U.S. Geological Survey
VAR	vector attraction reduction
VS	volatile solids
VSR	volatile solids reduction
VSS	volatile suspended solids
WAS	waste activated sludge
WC	water column
WRF	Water Reclamation Facility
WWTP	wastewater treatment plant

**Memorandum 1**  
**Evaluation of Existing Conditions**



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**Subject:** Evaluation of Existing Conditions

**Project Name:** McMinnville Water Reclamation Facility Biosolids Storage Tank and Grit System Expansion

**Prepared For:** City of McMinnville

**Prepared By:** Jacobs Engineering Group

**Date:** January 29, 2021

**Project Number:** D3373900

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## 1. Confirmation of Present and Future Wastewater Flows and Loads

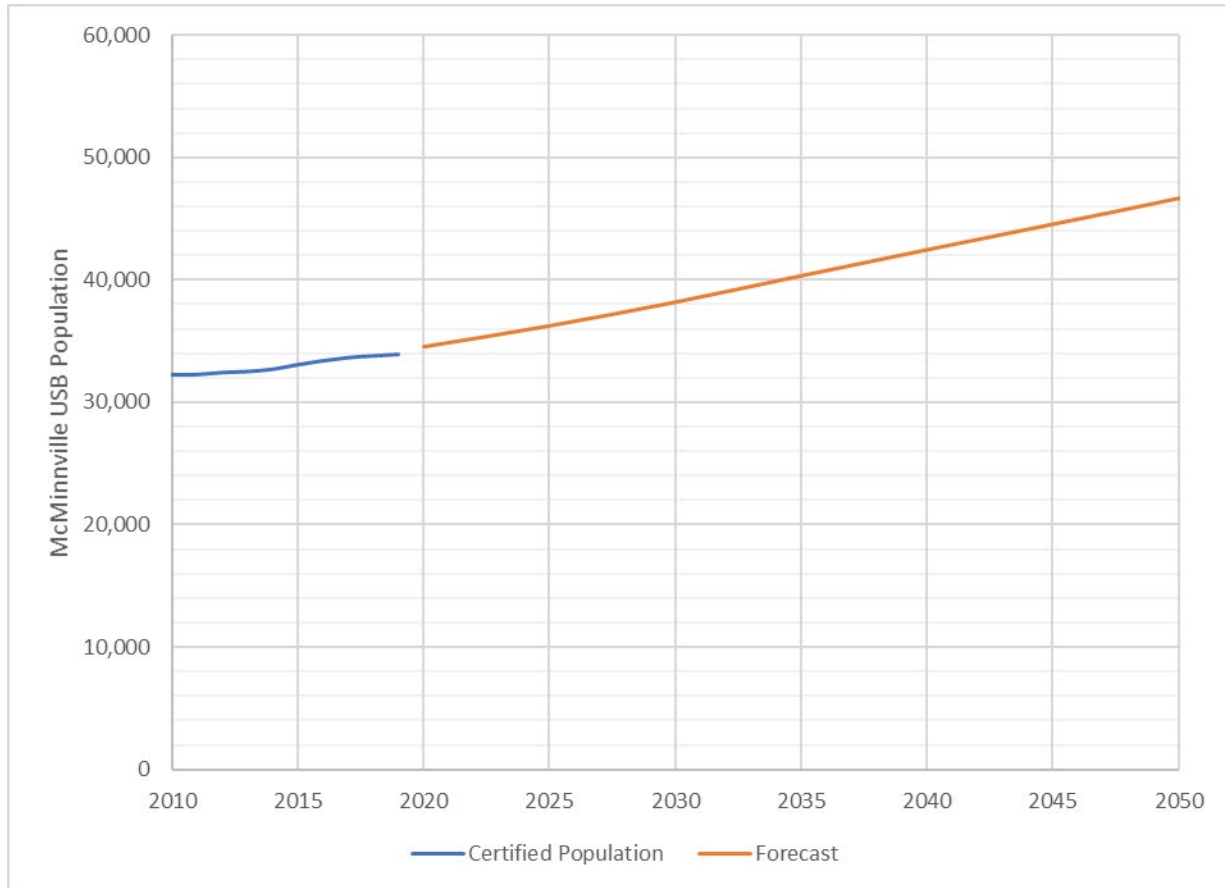
Operations personnel at the Water Reclamation Facility (WRF) regularly monitor influent and effluent parameters. This memorandum summarizes and analyzes recent influent data to estimate current wastewater flows and loads. Unit flow and loading rates were then developed and used along with population projections to prepare flow and load projections for future conditions. The flow and load projections serve as the basis for assessing the adequacy of the existing treatment systems and sizing new treatment facilities.

### 1.1 Population Projections

Past and future populations of McMinnville, Oregon, are based on data from the Portland State University Population Research Center (<https://www.pdx.edu/prc/>). Estimated and forecasted populations are summarized in Table 1-1 and illustrated on Figure 1-1.

**Table 1-1. Population History and Projections for McMinnville, Oregon**

Year	Population	Notes
2010	32,240	Certified Estimates
2011	32,270	
2012	32,435	
2013	32,510	
2014	32,705	
2015	33,080	
2016	33,405	
2017	33,665	
2018	33,810	
2019	33,930	
2020	34,564	
2025	36,268	
2030	38,195	
2035	40,339	
2040	42,457	
2045	44,539	
2050	46,653	



**Figure 1-1. Population History and Projections for McMinnville, Oregon**

## 1.2 Existing Flows

The analysis of historical flow and load data forms the basis of developing wastewater flow projections. The following assessment of current flow conditions for the WRF is based on operating data from January 2008 through December 2019.

### 1.2.1 Wastewater Flows

Because wastewater flows are variable seasonally and in response to precipitation, various flow conditions are important in sizing and evaluating wastewater treatment plants.

**Definitions.** The flow rate and related parameters discussed in this section are defined as follows:

- Average Summer Flow (ASF). The average daily flow over the 3-month summer period, July through September.
- Average Dry Weather Flow (ADWF). The average of daily flows over the 6-month dry weather season, from May 1 through October 31.
- Average Annual Flow (AAF). The average daily influent flow at the treatment plant. AAF is calculated as the average of ADWF and Average Wet Weather Flow (AWWF).
- Average Wet Weather Flow (AWWF). The average flow at the plant during the wet weather season (November 1 through April 30) during a year with average rainfall.



- Maximum Month Dry Weather Flow (MMDWF). The monthly average flow corresponding to the wettest dry weather month of high groundwater (May) with a 10 percent probability of occurrence in any given year. The recurrence interval of this flow is 10 years.
- Maximum Month Wet Weather Flow (MMWWF). The anticipated monthly average flow corresponding to the wettest wet weather month of high groundwater (January) with a 20 percent probability of occurrence in any given year. The recurrence interval of this flow is 5 years.
- Maximum Week Wet Weather Flow (MWWWF). The weekly wet weather average flow with a 20 percent probability of occurrence in a given year.
- Maximum Week Dry Weather Flow (MWDWF). The weekly dry weather average flow is the flow with a recurrence probability of 1.92 percent in a given year.
- Maximum Day Dry Weather Flow (MDDWF). The anticipated daily flow corresponding to a 1 in-10 year recurrence interval during the dry season (May through October).
- Maximum Day Wet Weather Flow (MDWWF). The anticipated daily flow resulting from a 24-hour storm with a 1-in 5-year recurrence interval during a period of high groundwater and saturated soils.
- Peak Hour Flow (PHF). The peak flow sustained for 1 hour during the 24-hour, 5-year return frequency storm at a time when groundwater levels are high and soils are already saturated by previous storms.

### 1.2.2 Rainfall Records

Rainfall has a large effect on flow rates during the wet weather season. Oregon Department of Environmental Quality (DEQ) flow analysis guidelines incorporate rainfall records into the recommended statistical analysis. Daily rainfall records from the National Oceanic and Atmospheric Administration (NOAA) were collected for all weather stations in the 97128 zip code. Design precipitation rates were calculated from all available data from 1920 through 2019.

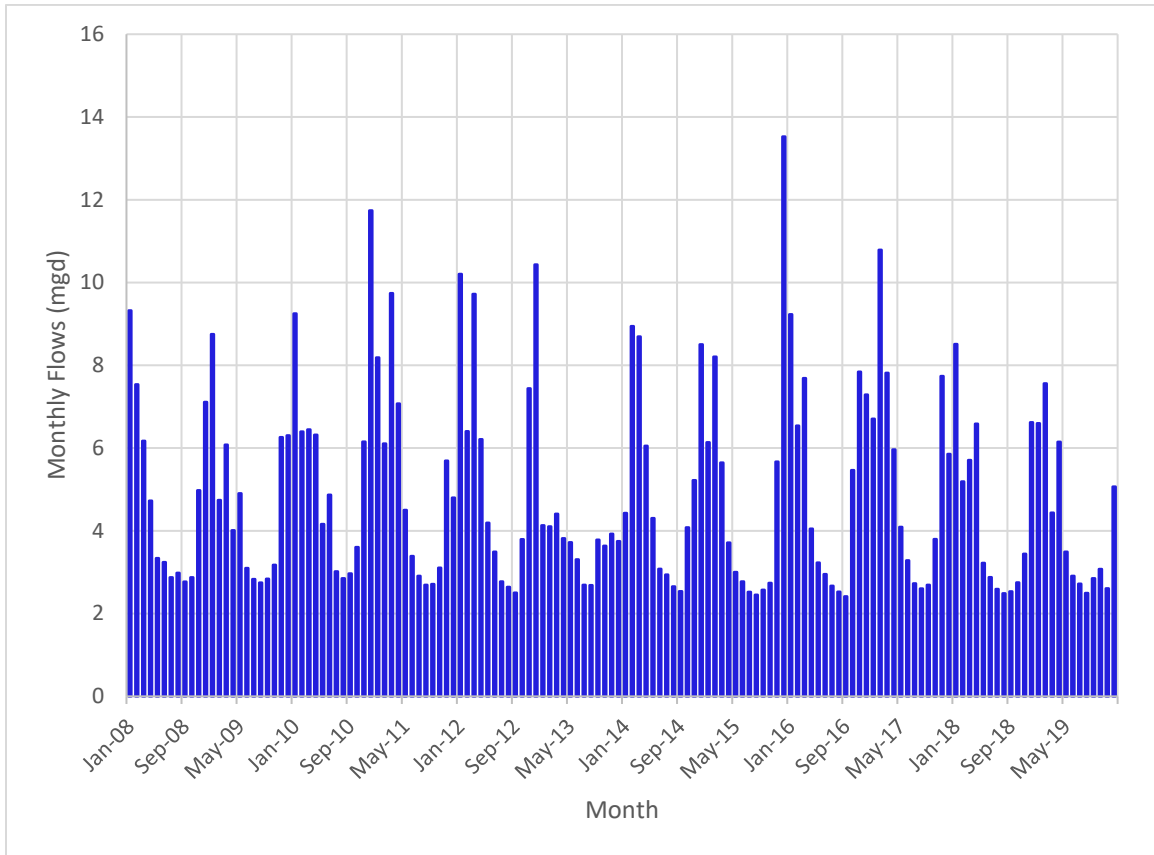
### 1.2.3 Flow Records and Measurement

When analyzing the flow monitoring records, it is important to identify any limitations or inconsistencies in the data or flow measurement equipment. For the WRF, the following factors must be considered when reviewing historical flow records:

- Raw sewage enters the WRF via the raw sewage pump station, which has a reported capacity of approximately 32 million gallons per day (mgd). During peak flow events, wastewater backs up in the collection system due to capacity limitations.
- Extensive improvements have been made to the collection system in recent years. Per the 2009 City of McMinnville Water Reclamation Facilities Plan (2009 Facilities Plan) (West Yost Associates and CH2M HILL, 2009), these upgrades were intended to limit peak flow to 32 mgd.

### 1.2.4 Flow Analysis

The current flow conditions for the WRF were established through analysis of historical influent flow records. Figure 1-2 presents the monthly average flow for the WRF during the period of record.



**Figure 1-2. Average Monthly Plant Influent Flows**

**Average Summer Flow.** Table 1-2 presents the average summer flows (July to September) for the period 2008 to 2019. Based on this period of record, the average summer flow is estimated at 2.7 mgd (Table 1-2).

**Table 1-2. Average Summer Flow**

Year	Average Summer Flow (July - September) (mgd)
2008	2.88
2009	2.80
2010	2.94
2011	2.77
2012	2.64
2013	3.05
2014	2.71
2015	2.52
2016	2.54
2017	2.67
2018	2.54
2019	2.69
Average	2.7

**Average Dry Weather/Wet Weather Flows.** The ADWF is the average flow during the dry weather season months of May through October. Table 1-3 presents the seasonal summary of rainfall and influent plant flows for the period January 2008 through December 2019. The seasonal values shown in the table indicate that the influent flows are highly dependent upon rainfall because infiltration and inflow (I/I) sources significantly contribute to the total wastewater flow. Therefore, to accurately estimate average plant flows, it is necessary to use flow periods that are in the range of mean climatological conditions experienced in the WRF service area. The NOAA climatological data indicate that the dry weather season mean rainfall for McMinnville is about 9 inches. Based on slightly above average rainfall conditions during the period of record, ADWF for the WRF is estimated at 3.1 mgd (Figure 1-3), indicating a downward trend in ADWF.

The AWWF is the average flow during the wet weather months of November through April during a year with average wet season rainfall and is determined based on the relationship developed between total rainfall and average influent flow for the wet season (Figure 1-4). The NOAA climatological data indicate that the wet weather season mean rainfall for McMinnville is about 34 inches. Based on slightly above average rainfall conditions during the period of record, AWWF for the WRF is estimated at 6.7 mgd (Figure 1-4). The relatively large difference between the ADWF and AWWF indicates that the seasonal variations in wastewater flow are caused by rainfall-dependent I/I.

The AAF is estimated by averaging the ADWF and AWWF for the period of record. For the WRF, the AAF is estimated at 4.9 mgd.

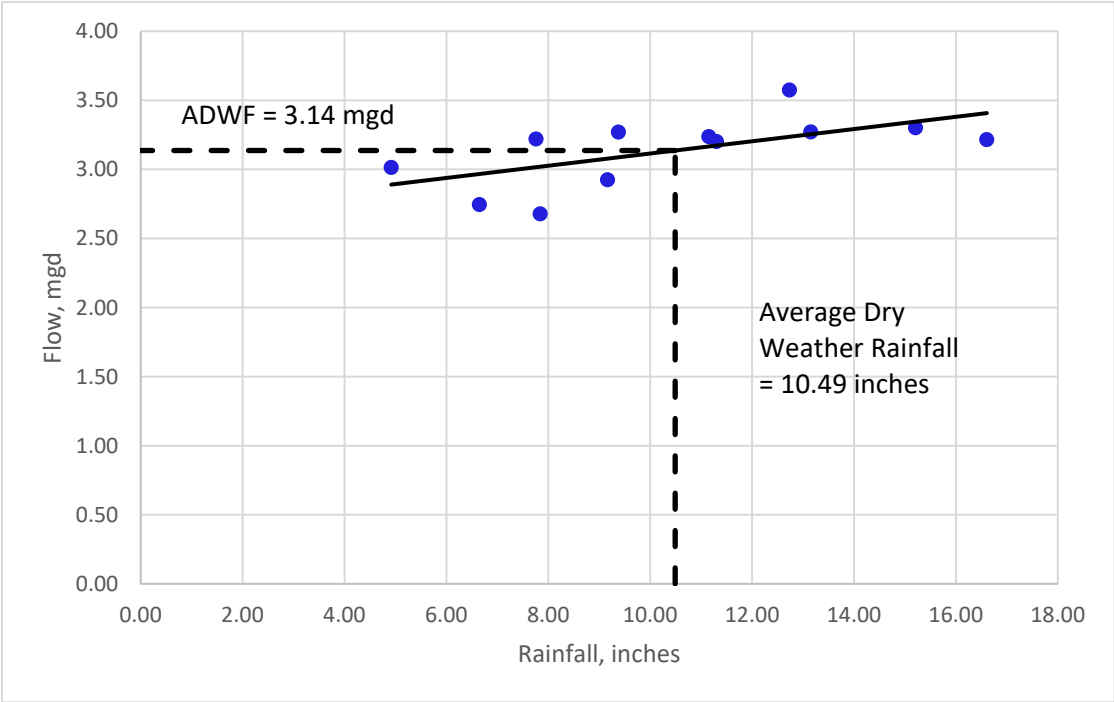
**Table 1-3. Summary of Wet and Dry Season Rainfall and Influent Flow**

Year	Dry Season <sup>a</sup>		Wet Season <sup>b</sup>	
	Rainfall (inches)	Average Plant Influent Flow (mgd)	Rainfall (inches)	Average Plant Influent Flow (mgd)
2008	4.92	3.01	30.24	6.65
2009	9.38	3.27	26.24	6.06
2010	12.74	3.57	40.77	7.75
2011	7.76	3.22	34.68	6.95
2012	11.15	3.24	44.59	8.44
2013	15.21	3.30	14.41	4.02
2014	13.15	3.27	39.73	6.95
2015	7.84	2.68	47.67	7.16
2016	16.61	3.21	44.28	7.12
2017	11.30	3.20	50.92	7.43
2018	6.65	2.74	34.77	6.03
2019	9.16	2.92	26.42	5.38
Averages	10.49	3.14	36.23	6.66

Notes:

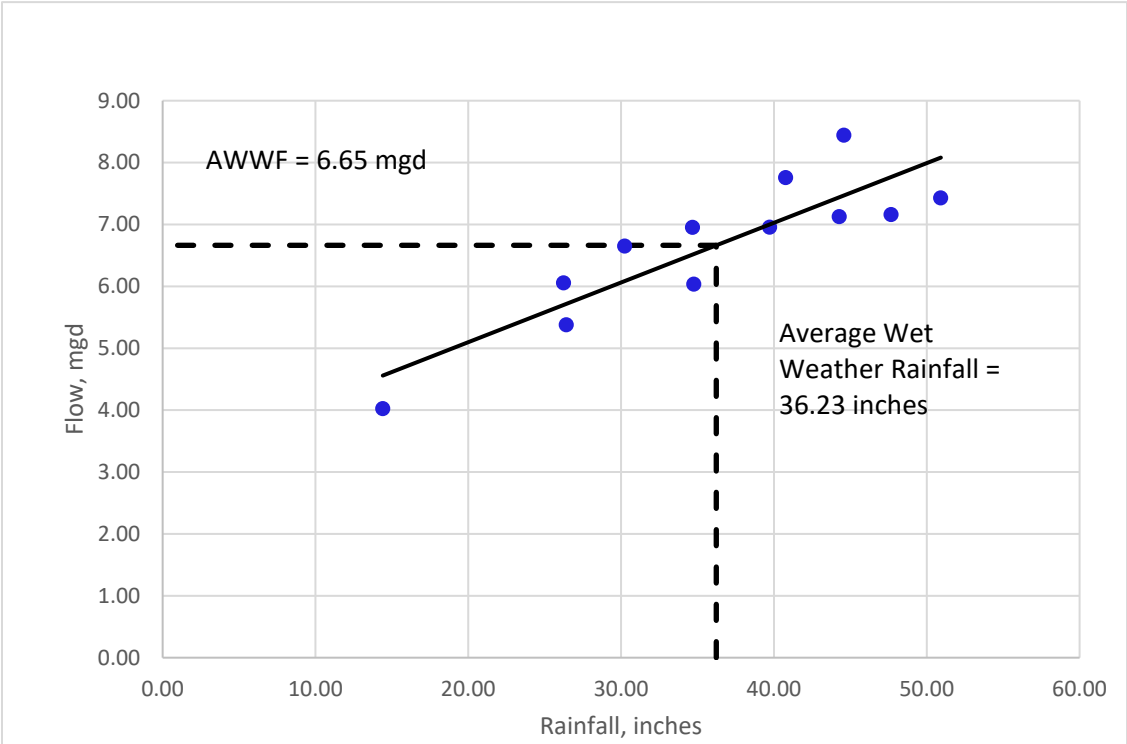
<sup>a</sup> Dry season is May through October. Long-term average dry weather rainfall = 9.11 inches per year.

<sup>b</sup> Wet season is November through April. Long-term average wet weather rainfall = 34.14 inches per year.



● Observed Influent Flow      — Trendline

Figure 1-3. Average Dry Weather Flows



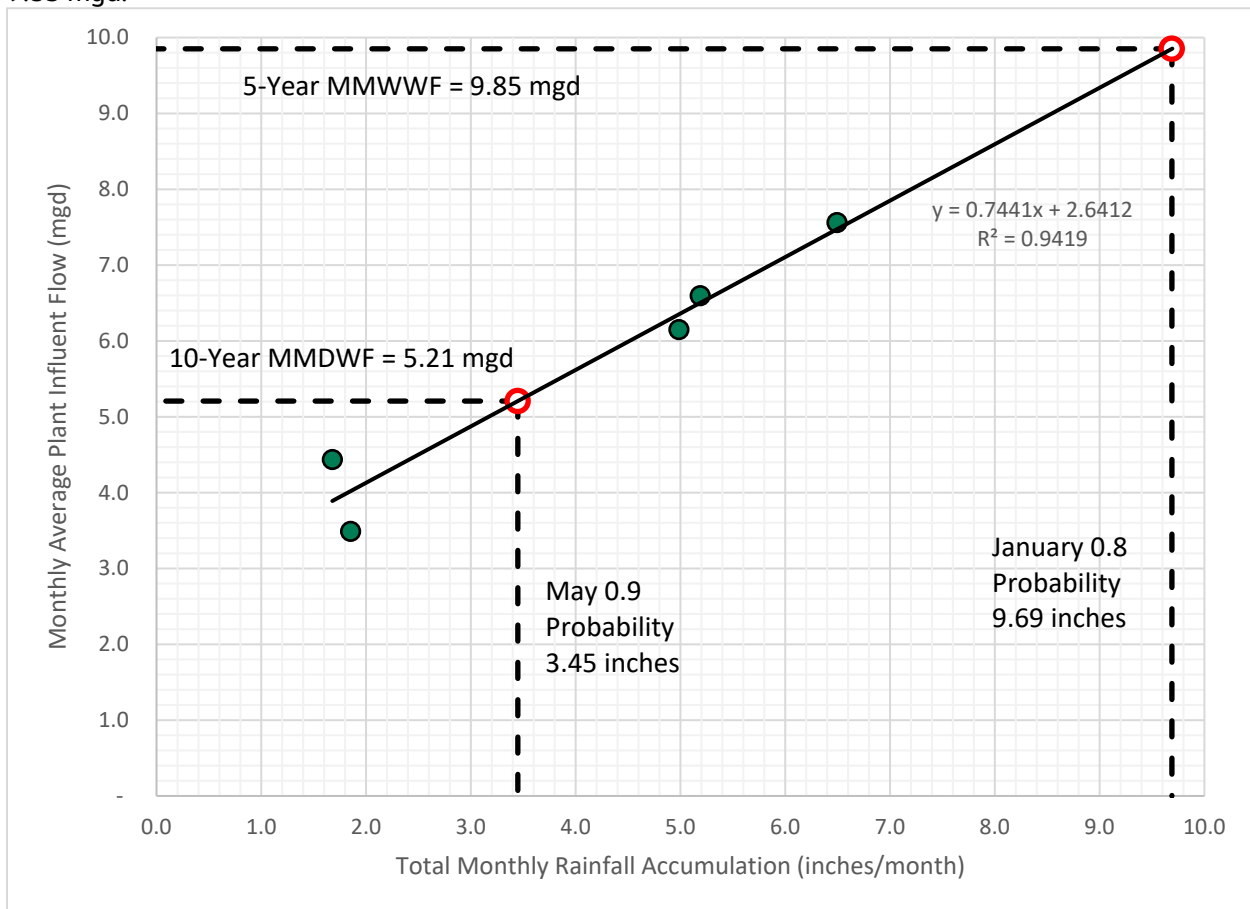
● Observed Influent Flow      — Trendline

Figure 1-4. Average Wet Weather Flows

**Maximum Month Flows.** The DEQ methodology for estimating maximum month flows includes plotting monthly average plant flow for the months of January through May of the most recent year against the corresponding monthly rainfall and developing a linear relationship between flow and rainfall as shown on Figure 1-5.

The MMDWF is defined as the flow that would be expected to occur when rainfall is at the 1- in 10-year probability level for the wettest month of the dry weather season. October is the wettest dry weather month for the area, but the average May rainfall is used for this analysis because groundwater levels are higher in the spring. For McMinnville, the 1- in 10-year May rainfall is 3.45 inches based on the NOAA climatological data. By approximating a linear relationship between the monthly average influent flow and rainfall, the MMDWF is estimated at 5.2 mgd.

Similarly, the MMWWF is defined as the flow expected to occur when rainfall is at the 1- in 5-year high rainfall for the month of January (9.69 inches). As shown on Figure 1-5, the MMWWF is estimated at 9.85 mgd.

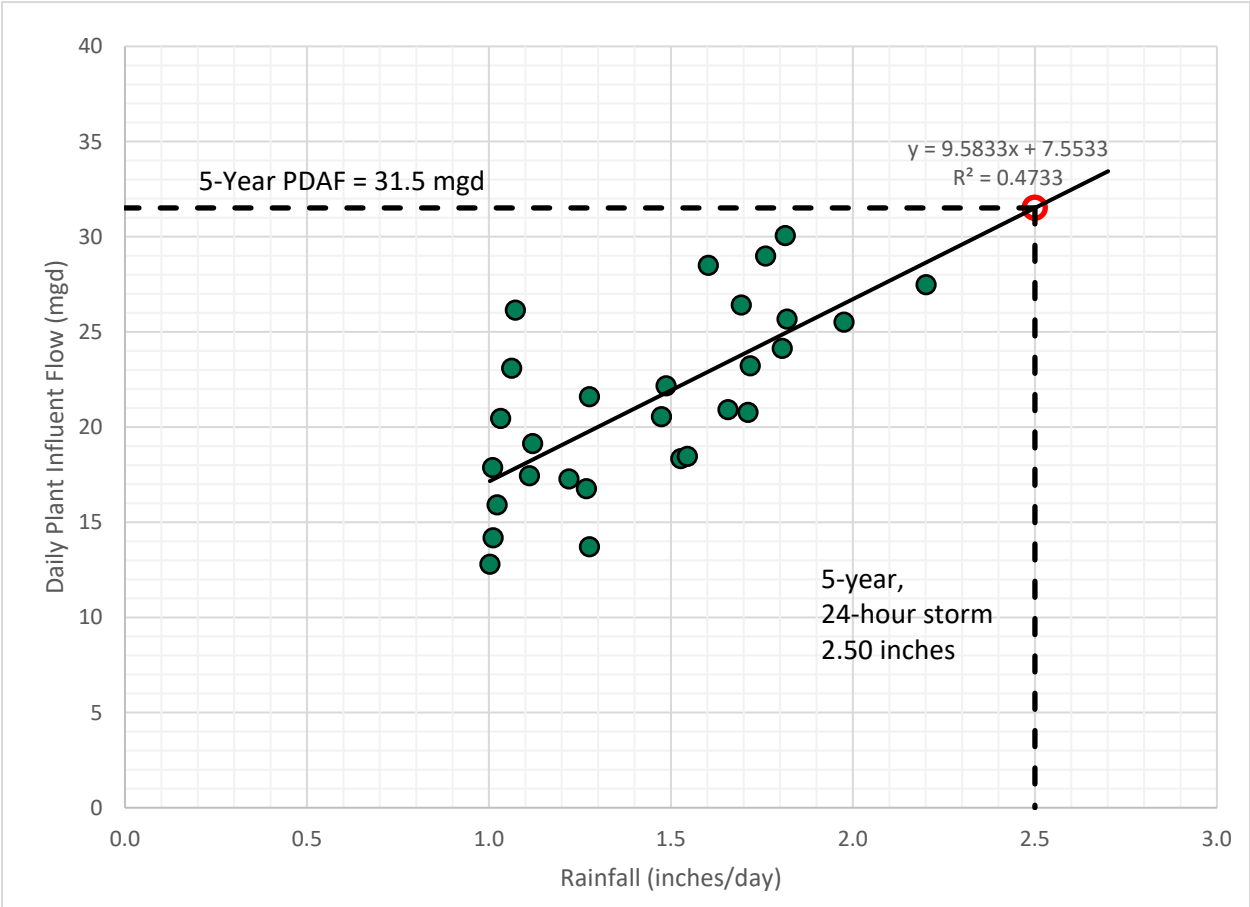


- Observed Influent Flow
- Trendline
- Projected Flow

**Figure 1-5. Maximum Month Flows**

**Peak Flows.** The MDWWF flow is defined as the daily average flow rate that occurs during the 1- in 5-year, 24-hour storm event. For the WRF service area, the 1- in 5-year, 24-hour storm corresponds to 2.5 inches of rain (calculated from NOAA data). According to the DEQ methodology, the MDWWF is estimated based on the linear relationship that exists between the daily average plant influent flow data during significant wet season storm events and daily rainfall. As shown on Figure 1-6, only those days with more than

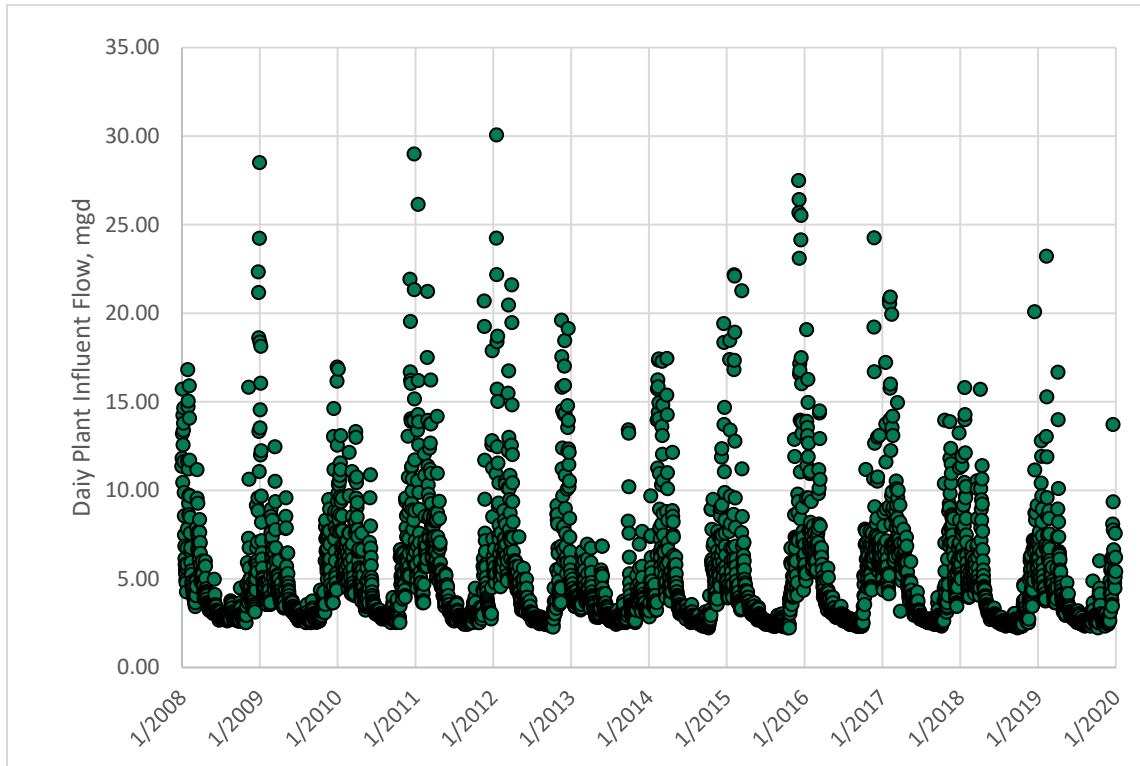
1.0 inch of recorded rainfall and with at least 1.5 inches of cumulative rainfall in the previous 4 days were considered; this assures that the soils were saturated and I/I contributions were significant. By approximating a linear relationship between the daily plant influent flow and rainfall, the MDWWF is estimated at 31.5 mgd; however, this calculated value may be conservative because the highest daily flow observed in the 2008–2019 period was 30.06 mgd and peak flows may be lower in recent years due to I/I improvements, as illustrated on Figure 1-7.



● Observed Influent Flow    — Trendline    ○ Projected Flow

Figure 1-6. Daily Plant Flow During High Rainfall Events



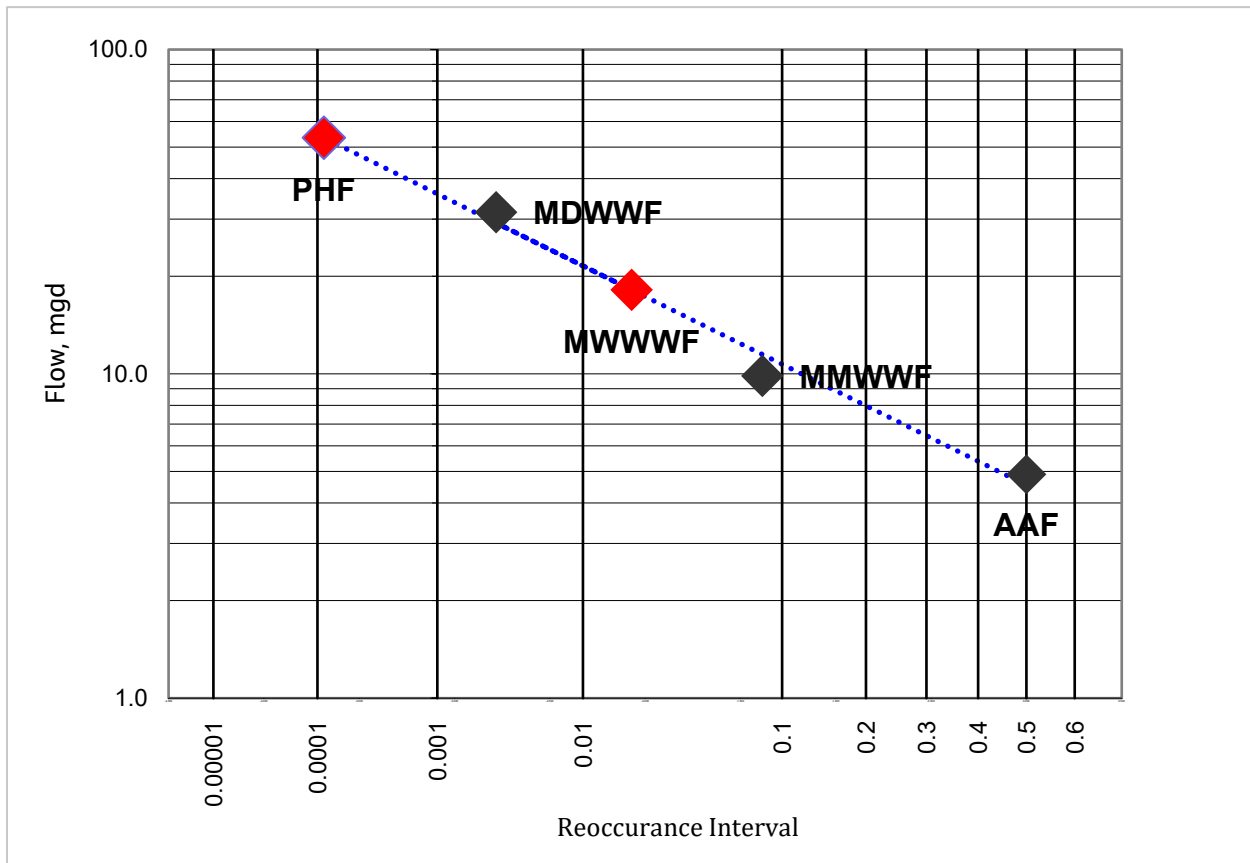


**Figure 1-7. Daily Plant Flow, 2008–2019**

DEQ guidelines prescribe using a probability methodology to estimate the remaining peak flow conditions. This analytical technique assumes that the AAF, MMWWF, MWWWF, MDWWF, and PHF will occur during a 1- in-5-year high rainfall year such that the recurrence probabilities associated with each of the flows are as follows:

- AAF is exceeded half the time (50 percent probability).
- MMWWF is exceeded for 1 month (8.3 percent probability).
- MWWWF is exceeded for 1 week (1.92 percent probability).
- MDWWF is exceeded on 1 day (0.27 percent probability).
- PHF is exceeded for 1 hour (0.011 percent probability).

The resulting flow values are plotted on Figure 1-8 according to their probability. Based on this method, the PHF is estimated at 53 mgd; however, the City of McMinnville has been making extensive improvements to reduce I/I, and peak hourly flow observed from 2015–2019 was only 33.3 mgd. The DEQ method is overly conservative in this case, and an alternative method was used to determine PHF for this study. The average observed peak hour peaking factor on daily flows above 20 mgd was 1.27 for 2015–2019. Applying this peaking factor to the MDWWF estimates a peak hour flow of 40.0 mgd, which will be used for this study. The upcoming Facilities Plan Update will refine the peak hour flow based on collection system modeling, which is outside the scope of this project.



**Figure 1-8. Probability Analysis**

The MWWWF can also be estimated based on a probability analysis of historical flow rates. Maximum 7-day average flows from 2008 to 2019 were sorted by year. The 80th percentile maximum week within this set is 20.0 mgd, which is in reasonable agreement with the 18.1 mgd value estimated using the method prescribed by DEQ as presented on Figure 1-8. An MWWWF of 20 mgd will therefore be used for further analysis.

The MWDWF and the MDDWF are also estimated based on a probability analysis. For the MWDWF, the maximum 7-day average plant flows for the months May through October were sorted by year. The MWDWF is estimated as 6.38 mgd.

Similarly, the MDDWF is estimated by sorting May through October maximum daily average plant flows by year and selecting the value with 10 percent chance of exceedance. the MDDWF is estimated at 13.8 mgd. Table 1-4 summarizes the current wastewater flows derived from this analysis.

Table 1-4. Current Wastewater Flows

Flow Parameter	1996–2007 Flows (2009 Facilities Plan) (mgd)	2008–2019 Flows (Current) (mgd)
ASF	2.9	2.7
ADWF	3.3	3.1
AAF	5.4	4.9
AWWF	7.5	6.7
MMDWF	6.1	5.2
MMWWF	12.0	9.9
MWWWF	20.0	20.0
MWDWF	7.2	6.4
MDDWF	14.4	13.8
MDWWF	32.0	31.5
PHF	56.0	40.0

### 1.3 Current Wastewater Loads

Wastewater loading data are important for determining the sizing of certain treatment processes. The wastewater loading components of principal interest are the 5-day biochemical oxygen demand (BOD<sub>5</sub>) and total suspended solids (TSS) of the raw sewage. BOD<sub>5</sub> is a measure of the amount of oxygen required to biologically oxidize the organic material in the wastewater over a specific time period. A 5-day BOD test is conventionally used for domestic wastewater testing. TSS is a measure of the particulate material suspended in the wastewater. The loading parameters of interest are the annual average loading, maximum month loading, maximum week loading, and peak day loading for BOD<sub>5</sub> and TSS.

The primary nutrients of interest at a wastewater treatment facility are nitrogen and phosphorus. In domestic wastewater, nitrogen is primarily in the form of ammonia, while the majority of the phosphorus is in the form of soluble phosphate. Nutrients are necessary for the growth of microorganisms and aquatic plant life; however, many effluent-receiving waters have excessive algal growth that is caused in part by high nitrogen and phosphorus levels. Nutrient concentrations in the raw wastewater must be sufficient to support the growth of microorganisms in the biological treatment process; however, most wastewaters contain more of these constituents than needed to support the process and the excess would pass through to the effluent unless specific nutrient reduction measures are taken in the design and operation of the facilities. Many treatment facilities therefore incorporate treatment processes that remove nutrients prior to effluent discharge.

#### 1.3.1 Load Analysis

Historical data from the 2008–2019 plant data provide the basis for characterizing loadings.

**BOD<sub>5</sub> and TSS Loading Analysis.** Daily BOD<sub>5</sub> and TSS concentrations for the period January 2008 to December 2019 are presented on Figures 1-9 and 1-10, respectively. Figures 1-11 and 1-12 illustrate the seasonal variation in BOD<sub>5</sub> and TSS loading. The outlying data points were reviewed and eliminated as deemed appropriate. The average annual wastewater loading was calculated at 7,500 pounds per day (ppd) of BOD<sub>5</sub> and 7,800 ppd of TSS, as illustrated on Figures 1-13 and 1-14, respectively, using the data from the recent 5-year period of 2015 through 2019.

A more focused loading analysis was conducted on the data collected in the recent 5-year period of 2015 through 2019 for the maximum month, maximum week, and peak day loading conditions. These more recent data are more representative of the existing sanitary characteristics within the WRF service area and account for the results of source control efforts that have been undertaken in recent years. The maximum month loads were determined by averaging the recorded values for each month and then selecting the month with the highest average. Maximum week loads were estimated by averaging at least two successive readings taken in a 7-day period. Peak day loads were estimated by reviewing the highest recorded values. A summary of the resulting loading conditions for this period is shown in Table 1-5.

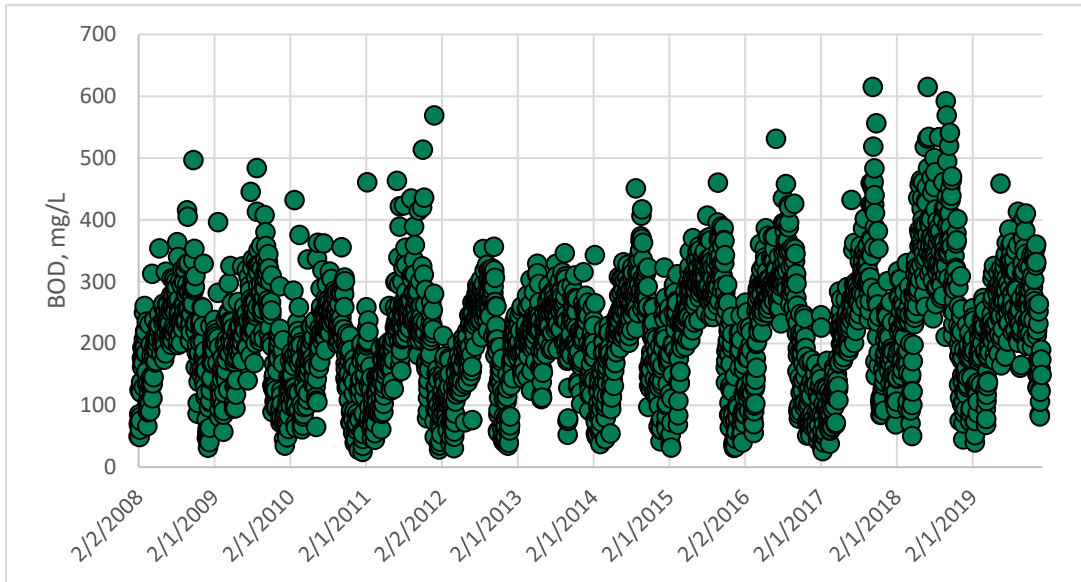


Figure 1-9. BOD<sub>5</sub> Concentrations: 2008–2019

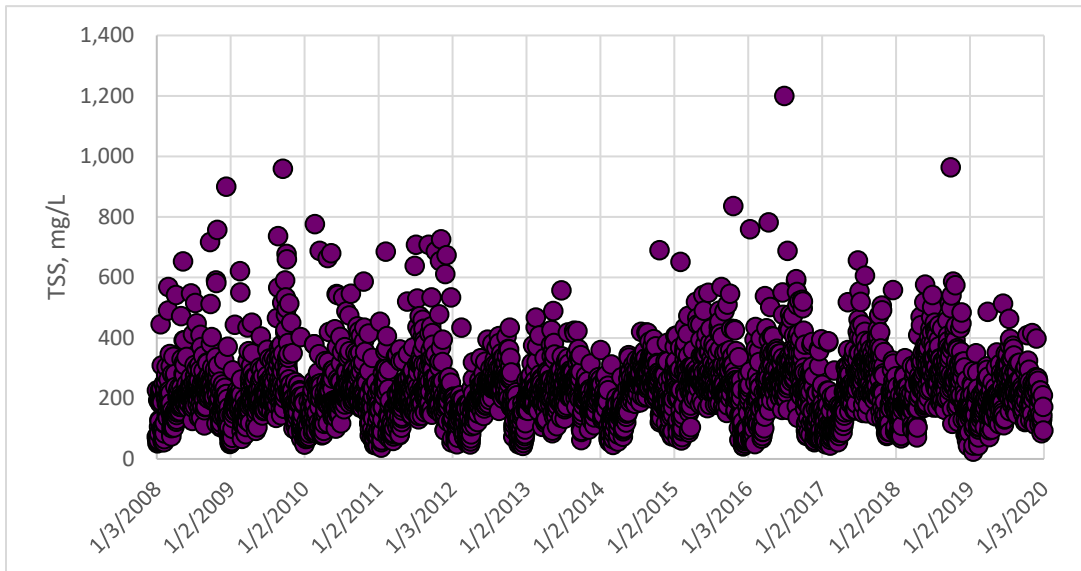


Figure 1-10. TSS Concentrations: 2008–2019

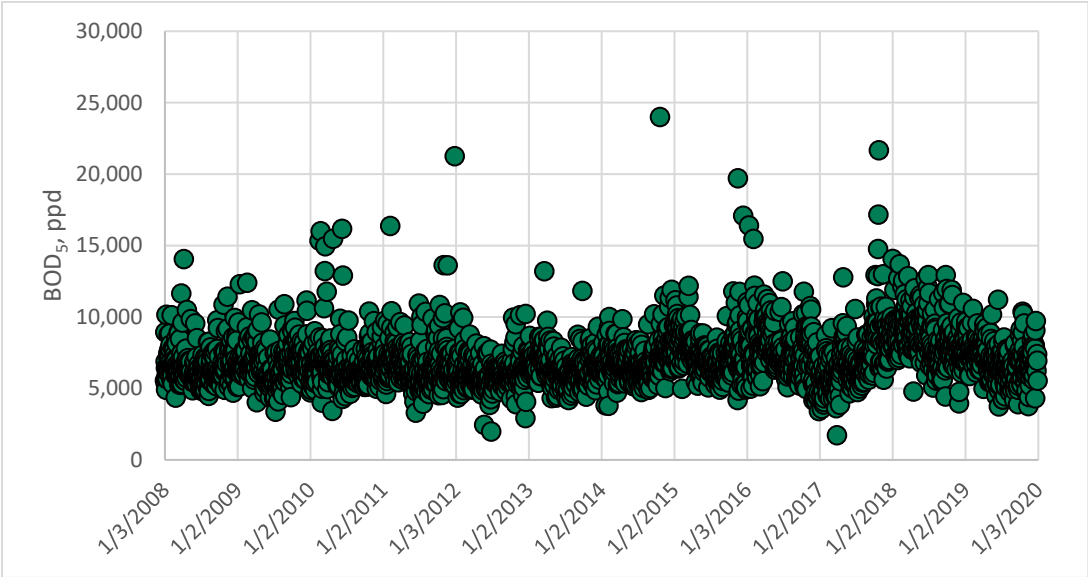


Figure 1-11. Daily Plant BOD<sub>5</sub> Loading: 2008–2019

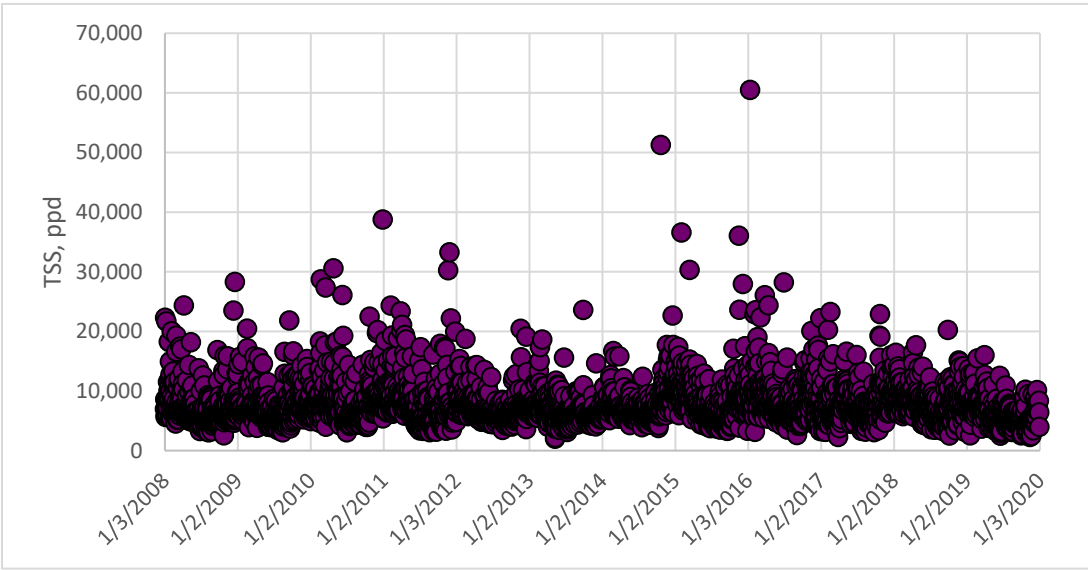


Figure 1-12. Daily Plant TSS Loading: 2008–2019

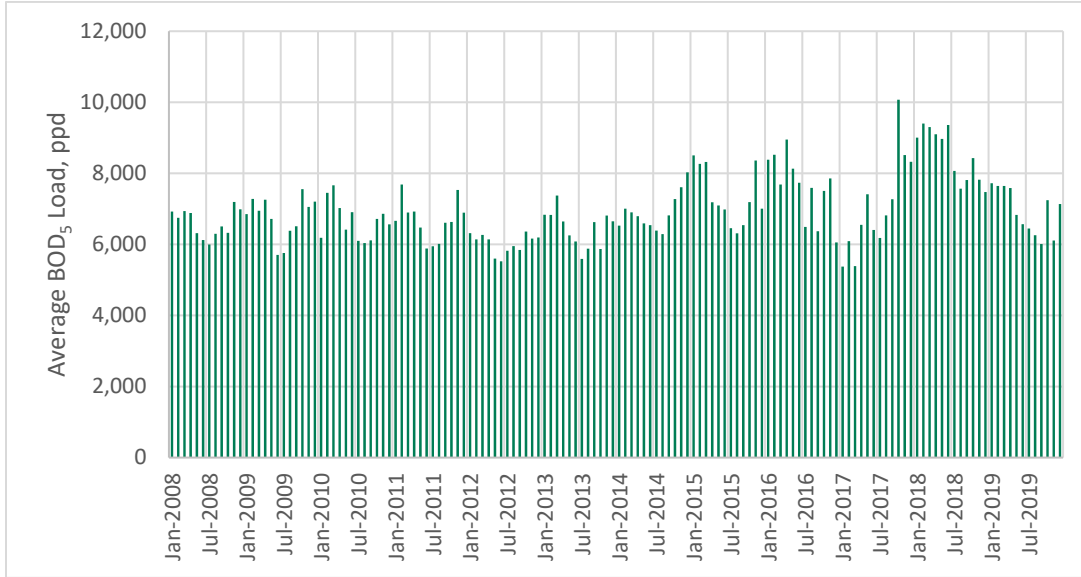


Figure 1-13. Average Monthly BOD<sub>5</sub> Load

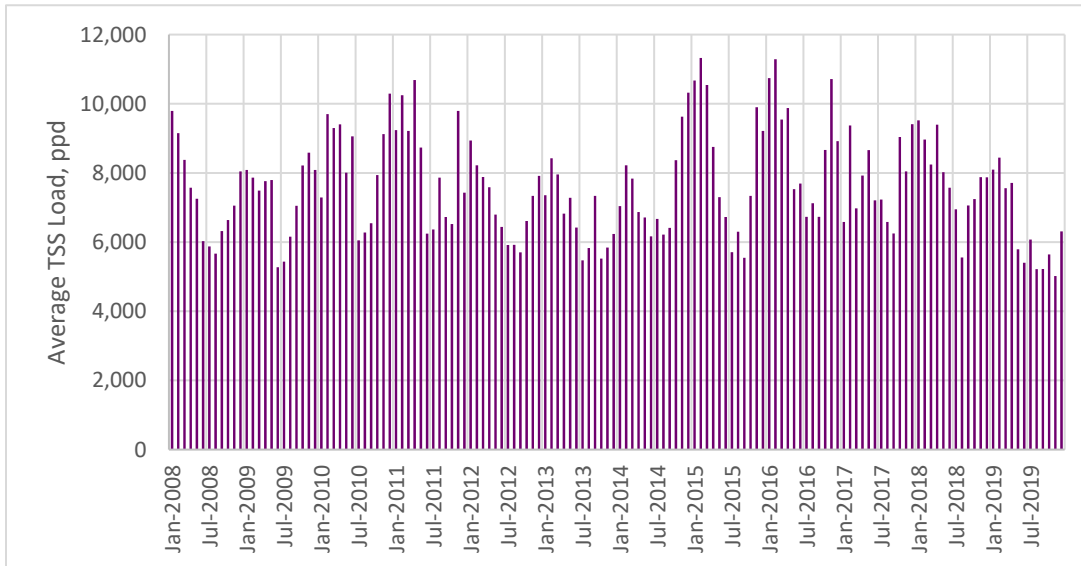


Figure 1-14. Average Monthly TSS Load

Table 1-5. Plant Loading Summary

Parameter	2015-2019 (Current)		2003-2007 (2009 Facilities Plan)	
	BOD <sub>5</sub> Load (lbs/day)	TSS Load (lbs/day)	BOD <sub>5</sub> Load (lbs/day)	TSS Load (lbs/day)
Annual Average	7,500	7,800	6,100	7,600
Maximum Month	8,900	10,000	8,200	11,300
Maximum Week	11,300	14,000	11,600	14,400
Peak Day	16,600	31,300	16,800	33,600



**Nutrient Loading Analysis.** Nutrients of primary concern at a wastewater treatment facility are nitrogen and phosphorus. Nitrogen data are required to evaluate the treatability of sewage by biological processes because they are vital for protein synthesis. Typically, nitrogen in raw sewage is primarily in the form of ammonia, with concentrations ranging from 10 to 30 mg/L. The majority of phosphorus in raw sewage is in soluble form, with typical concentrations between 4 to 8 mg/L. The WRF samples influent wastewater for ammonia and total phosphorus. The influent concentrations for ammonia and total phosphorus are presented on Figures 1-15 and 1-16, respectively.

Daily plant loading data for ammonia and total phosphorus from January 2008 through December 2019 are presented on Figures 1-17 and 1-18, respectively. The nutrient loading summary is presented in Table 1-6.

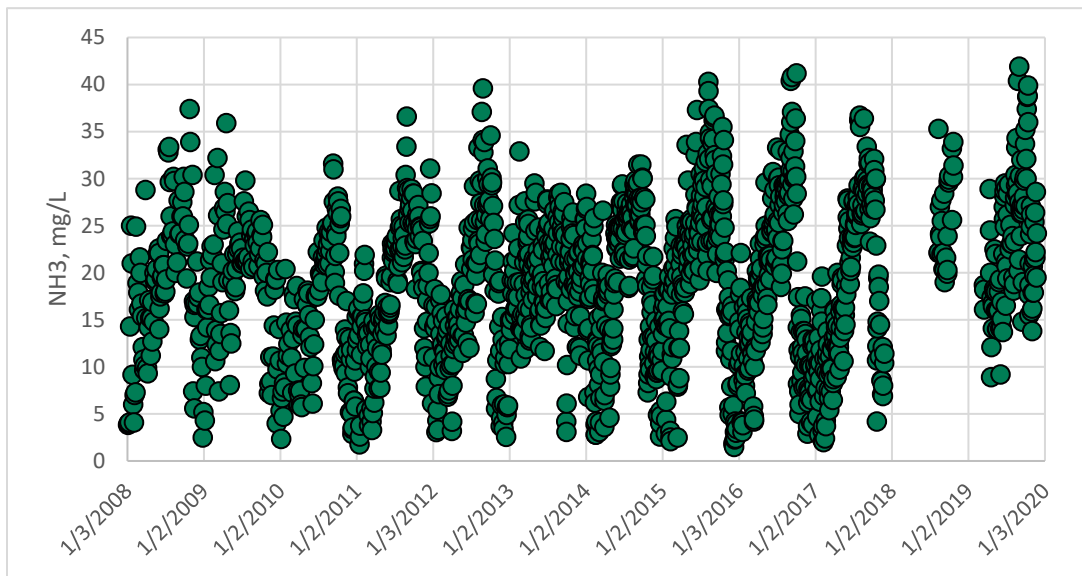


Figure 1-15. Ammonia Concentrations: 2008–2019

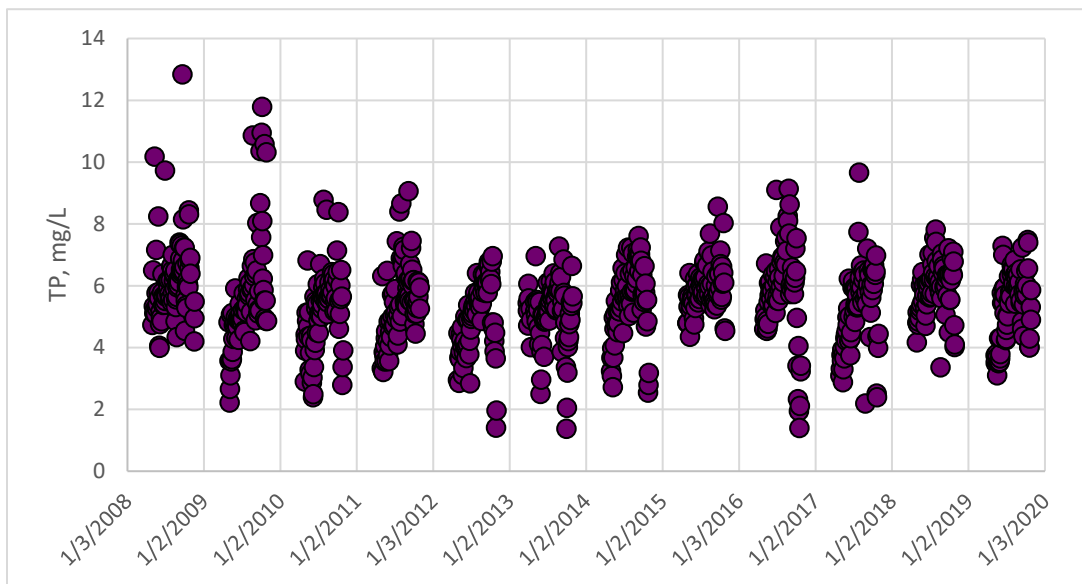


Figure 1-16. Total Phosphorus Concentrations: 2008–2019

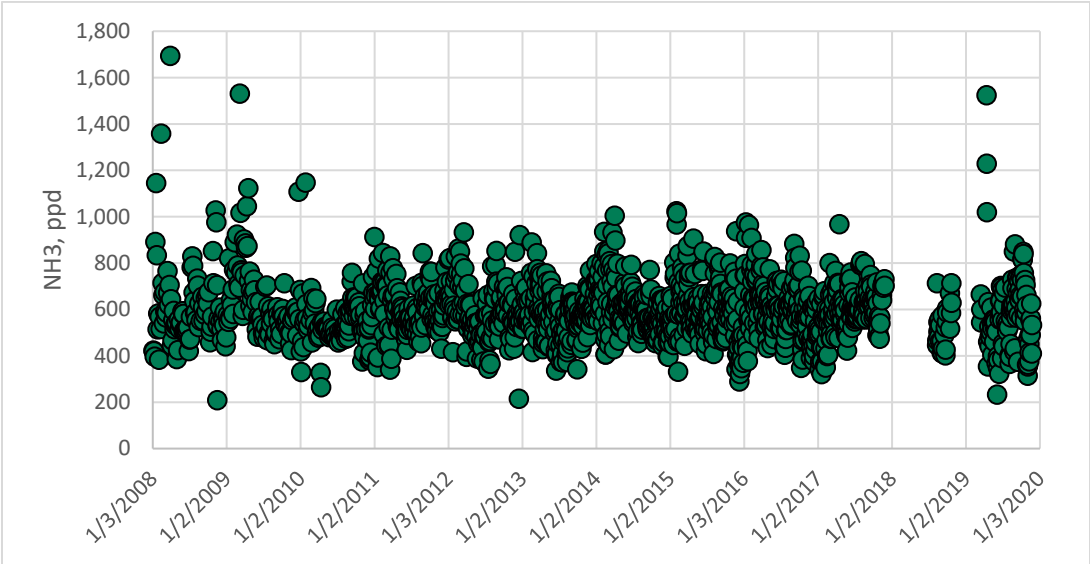


Figure 1-17. Daily Plant Ammonia Loading: 2008–2019

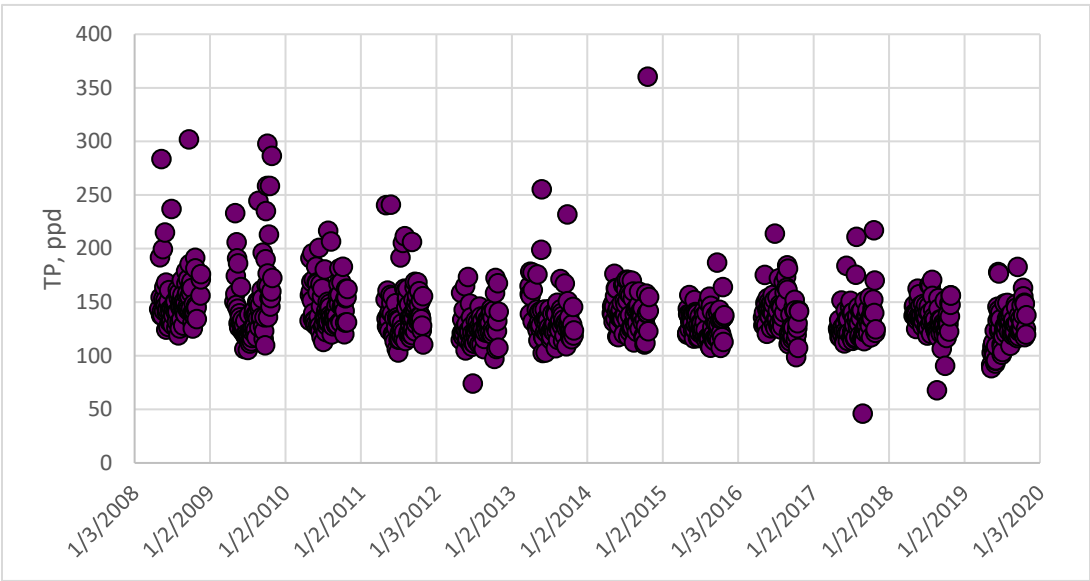


Figure 1-18. Daily Plant Total Phosphorus Loading: 2008–2019

Table 1-6. Nutrient Loading Summary

Parameter	2015–2019 (Current)		2003–2007 (2009 Facilities Plan)	
	NH <sub>3</sub> -N Load (lbs/day)	T-P Load (lbs/day)	NH <sub>3</sub> -N Load (lbs/day)	T-P Load (lbs/day)
Annual Average	580	130	490	180
Maximum Month	670	140	760	270
Maximum Week	960	160	980	290
Peak Day	1,040	190	1,190	450

## 1.4 Flow and Load Projections

The flow and load projections are based on current flows and loads and anticipated community population growth. The 2009 Facilities Plan identified the buildout population as 44,055, which is approximately equal to the 2045 population forecast from the Portland State University Population Research Center (2020).

### 1.4.1 Projected Wastewater Flows

Future sanitary flow growth was determined by multiplying the projected population increase by a unit per capita wastewater generation rate. The 2009 Facilities Plan included a separate projection of commercial/industrial sanitary flows; in this study, it is assumed that the growth of residential, commercial, and industrial sanitary flows are all proportional to population growth.

During the period 2015 to 2019, the ADWF wastewater production rate was 88 gallons per capita per day (gpcd). It was assumed that new population growth will contribute 100 gpcd. This is a conservative assumption because the per capita wastewater generation rate has been decreasing over time, as illustrated in Table 1-7.

**Table 1-7. Per Capita Wastewater Generation**

Year	Population	ADWF (mgd)	gpcd
2010	32,240	3.58	111
2011	32,270	3.22	100
2012	32,435	3.23	100
2013	32,510	3.30	102
2014	32,705	3.27	100
2015	33,080	2.68	81
2016	33,405	3.21	96
2017	33,665	3.20	95
2018	33,810	2.74	81
2019	33,930	2.92	86
Average, 2010-2014		3.32	102
Average, 2015-2019		2.95	88
Average, Total		3.13	95

Other projected average and dry weather build-out flow rates were estimated by applying peaking factors developed through evaluation of existing conditions to the projected build-out ADWF determined in Table 1-8. This basic flow projection technique was used for ASF, AAF, AWWF, MMDWF, MWDWF, MDDWF, and PHF.

**Table 1-8. Projected Wastewater Flows**

Year	2020	2025	2030	2035	2040	2045	2009 Facilities Plan Buildout
<b>Population</b>	34,564	36,268	38,195	40,339	42,457	44,539	44,055
ASF	2.6	2.8	3.0	3.2	3.3	3.5	5.6
ADWF	3.0	3.2	3.4	3.6	3.8	4.0	6.1
AAF	4.8	5.0	5.3	5.7	6.0	6.3	10.0
AWWF	6.5	6.8	7.2	7.7	8.1	8.6	14.0
MMDWF	5.1	5.3	5.7	6.0	6.4	6.7	11.4
MMWWF	9.6	10.1	10.7	11.4	12.0	12.7	20.0
MWWWF	19.4	20.5	21.8	23.1	24.5	25.8	29.0
MWDWF	6.2	6.5	6.9	7.4	7.8	8.2	13.3
MDDWF	13.4	14.1	15.0	15.9	16.9	17.8	26.0
MDWWF	30.6	32.3	34.2	36.4	38.5	40.6	41.0
PHF	38.9	41.0	43.5	46.2	48.9	51.6	63.0

#### 1.4.2 Projected Wastewater Loads

The future average sanitary waste load generated in the WRF service area is expected to grow at approximately the same rate as the population. This analysis assumes that the wastewater per capita loading contribution will remain the same between existing and build-out conditions. Load projections derived from this analysis are shown in Table 1-9.

Table 1-9. Projected Wastewater Loads

Wastewater Loading Parameter	Historic Loads	Projected Loads						2009 Facilities Plan Projection (build-out)
	2015-2019	2020	2025	2030	2035	2040	2045 (build-out)	
Population	33,578	34,564	36,268	38,195	40,339	42,457	44,539	44,055
<b><i>BOD<sub>5</sub> Loads, ppd</i></b>								
AA	7,487	7,707	8,087	8,516	8,994	9,467	9,931	11,500
MM	8,930	9,192	9,645	10,158	10,728	11,291	11,845	15,500
MW	11,262	11,592	12,164	12,810	13,529	14,240	14,938	21,900
PD	16,608	17,096	17,939	18,892	19,952	21,000	22,030	31,700
<b><i>TSS Loads, ppd</i></b>								
AA	7,820	8,050	8,447	8,896	9,395	9,888	10,373	14,400
MM	9,995	10,289	10,796	11,370	12,008	12,639	13,258	21,300
MW	13,983	14,394	15,103	15,906	16,798	17,681	18,547	27,200
PD	31,325	32,245	33,834	35,633	37,632	39,608	41,550	63,500
<b><i>Ammonia Loads, ppd</i></b>								
AA	580	597	627	660	697	734	769	930
MM	667	686	720	758	801	843	884	1,550
MW	959	987	1,036	1,091	1,152	1,212	1,272	1,850
PD	1,040	1,071	1,124	1,183	1,250	1,315	1,380	2,250
<b><i>Total Phosphorus Loads, ppd</i></b>								
AA	133	137	144	151	160	168	176	340
MM	142	147	154	162	171	180	189	510
MW	163	168	176	185	196	206	216	550
PD	194	200	210	221	234	246	258	850

## 2. Review Operating and Solids Production Data

Waste activated sludge (WAS) from the secondary treatment Orbal process is thickened on gravity belt thickeners (GBTs) and sent to autothermal thermophilic aerobic digestion (ATAD) for processing. During the summer season, tertiary clarifier and tertiary filter waste are recycled to the headworks, and those solids are then thickened with the WAS. Approximately December through April each year the biosolids storage tank is decanted back to the headworks because of storage capacity limitations, and that decant includes a substantial solids load.

The Orbal process was observed to typically produce 1.0 pound of WAS solids per pound of plant influent BOD. However, when the biosolids storage tank decants to the headworks, those recycled solids are added to the quantity of WAS generated. This impact of the decant on WAS sent to the digester is illustrated on Figure 2-1.

WAS is thickened by gravity belt thickeners to an average of 4.75 percent solids.

The ATAD process was designed for a minimum 8-day total digestion detention time and has 203,000 gallons total volume. The observed detention time was less than 8 days in March 2014, and the minimum detention time has been approached frequently during periods in which the biosolids storage tank decants. Figure 2-2 illustrates the impact of the decant on the ATAD detention time.

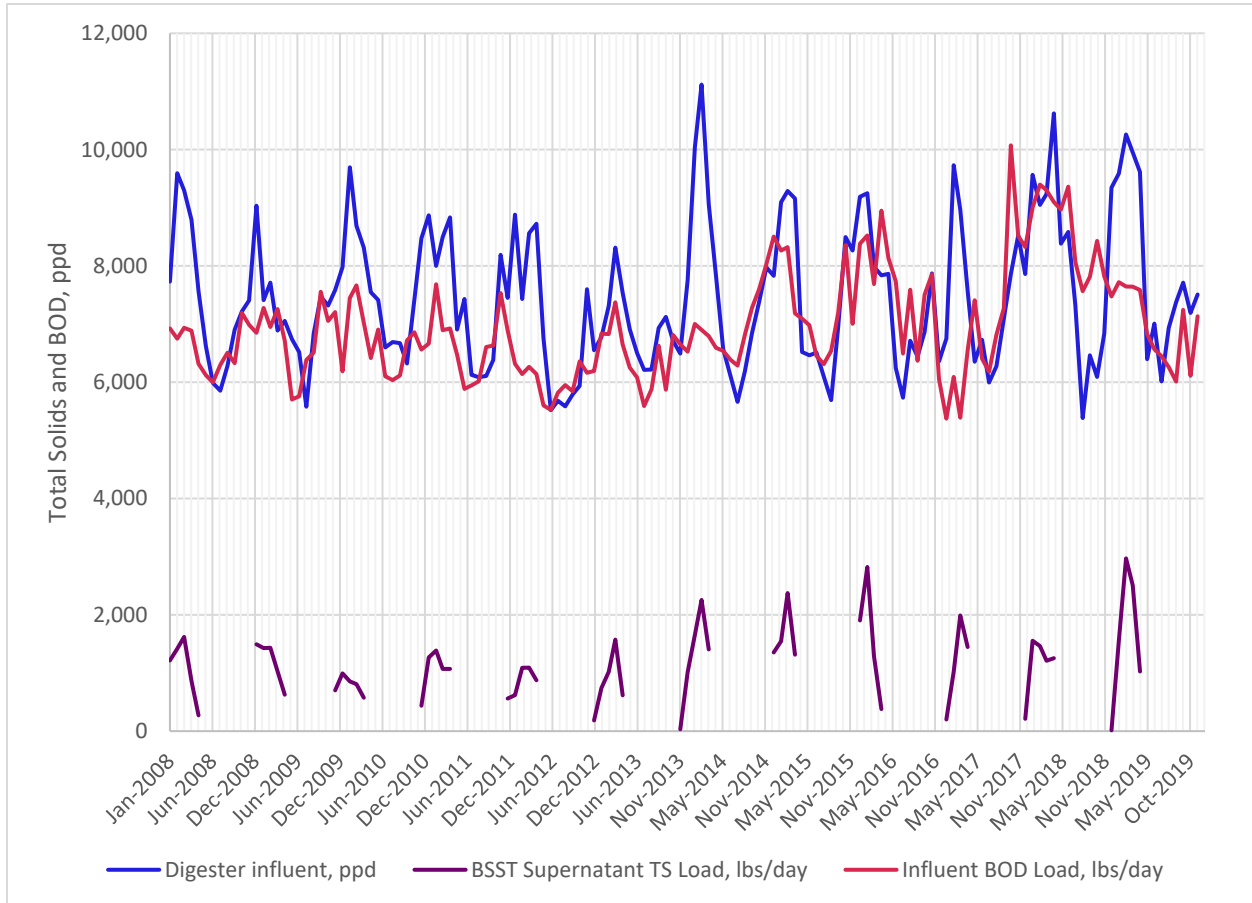


Figure 2-1. Monthly Solids Production and Biosolids Decent Recycle Load



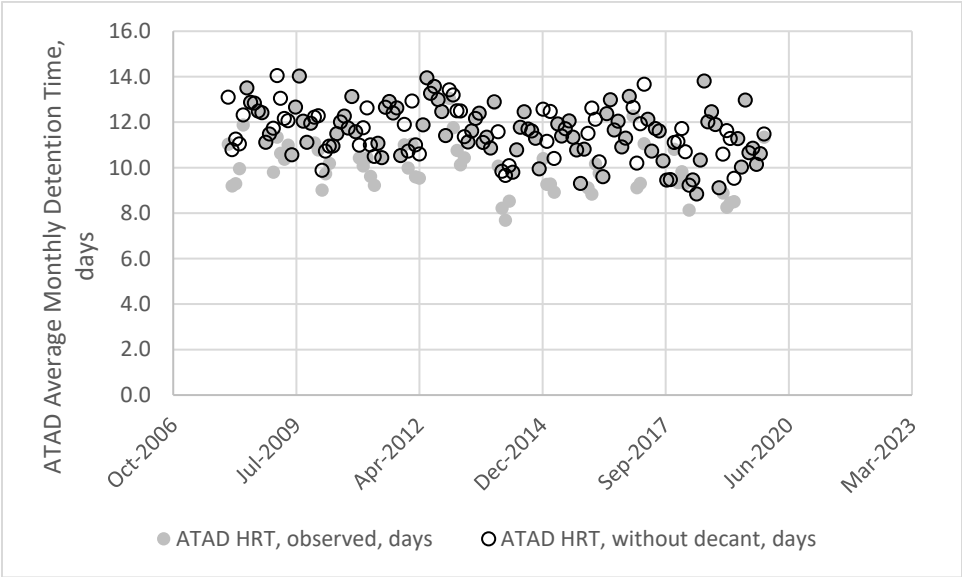


Figure 2-2. ATAD Detention Time

Solids loading from 2015 through 2019 is summarized in Table 2-1. During maximum month conditions, solids from the decant recycle may contribute as much as 10 percent of the thickened WAS sent to the ATAD. The projections in Table 2-1 include continued application of the decant recycle. Reduction or elimination of the ATAD recycle will reduce the projected solids production. Table 2-2 summarizes the existing solids processing capacity. The ATAD process is approximately at its hydraulic capacity during maximum month conditions (with decant) and it is at capacity for volatile solids loading. Biosolids storage is at capacity, necessitating the decant.

**Table 2-1. Solids Loading Projections, Including Decant Recycle**

	Observed Solids Loads						Population-Based Projections	
	2015	2016	2017	2018	2019	2015-2019	2020	2045
Population	33,080	33,405	33,665	33,810	33,930	33,578	34,564	44,539
Average WAS and Chemical Sludge, TS ppd	7,519	7,322	7,433	8,066	7,968	7,661	7,886	10,162
Average WAS and Chemical Sludge, VS ppd	5,761	5,502	5,681	6,322	6,198	5,893	6,066	7,816
Average WAS and Chemical Sludge, gpd	98,589	93,872	119,133	99,646	121,183	106,484	109,611	141,243
Maximum Month WAS and Chemical Sludge, TS ppd	9,288	9,190	9,733	10,623	10,260	9,819	10,107	13,024
Maximum Month WAS and Chemical Sludge, VS ppd	7,165	6,720	6,585	8,212	7,789	7,294	7,508	9,675
Maximum Month WAS and Chemical Sludge, gpd	125,482	128,784	166,616	125,080	134,516	136,096	140,091	180,520
Annual Average Thickened Sludge, gpd	19,354	18,530	19,221	20,047	20,312	19,493	20,065	25,855
Maximum Month Thickened Sludge, gpd	22,781	22,296	22,286	24,976	24,588	23,386	24,072	31,019
Average Annual Digested Sludge, ppd	4,763	4,975	4,994	5,253	5,146	5,026	5,174	6,667
Average Annual Digested Sludge, gpd	17,402	18,120	18,699	19,422	19,448	18,618	19,165	24,696
Maximum Month Digested Sludge, ppd	6,370	6,099	6,300	6,444	6,476	6,338	6,524	8,407
Average Annual Decant Solids Recycle, ppd	543	525	402	451	665	517	532	686
Maximum Month Decant Solids Recycle, ppd	2,375	2,823	1,989	1,554	2,971	2,342	2,411	3,107

Notes:

gpd = gallons per day

ppd = pounds per day

TS = total solids

VS = volatile solids

**Table 2-2. Existing Solids Processing Capacity**

Unit Process	Design Parameter	Design Criteria	Capacity
Gravity Belt Thickener	gpm/meter of belt width	200 <sup>a</sup>	288,000 gpd <sup>c</sup>
ATAD Digestion	hydraulic retention time	8 days <sup>b</sup>	25,400 gpd
ATAD Digestion	Volatile suspended solids volumetric loading	230 lb/thousand cubic feet <sup>d</sup>	6,200 ppd
Biosolids Storage	hydraulic retention time	210 days <sup>b</sup>	13,500 gpd

Notes:

<sup>a</sup> Based on current operation.

<sup>b</sup> From design drawings (CH2M HILL, 1993).

<sup>c</sup> Based on one shift per day, 7 days per week operation. Actual daily operation time is assumed to be 6 hours.

<sup>d</sup> From Wastewater Engineering, 4th Edition (Metcalf & Eddy, 2003).

### 3. WRF Capacity

The WRF capacity is based on the reliability classification as defined in the Oregon DEQ Wastewater Facility Planning Guide. The WRF is generally required have hydraulic capacity for peak hour flow and treatment capacity for maximum day flow.

#### 3.1.1 Headworks

Headworks must be sized for peak hourly flow. A minimum of two screens and one grit unit are required. The existing headworks is nominally sized for 32.3 mgd peak flow.

Current peak hour flows reach the headworks nominal capacity. Further review of the screen and grit removal equipment is required to determine whether modifications are required to treat projected flows.

#### 3.1.2 Solids Treatment

Solids treatment capacity is not directly addressed by the Oregon DEQ Wastewater Facility Planning Guide, but solids treatment processes should be sized for a maximum month loading condition.

The two gravity belt thickeners each have a 400 gpm capacity. From 2008–2019, the WAS flow averaged 74 gpm on a 24/7 basis, which translates to 296 gpm on a 7-hour per day basis (current GBT operating schedule), so there is ample thickening capacity with one unit in operation.

The ATAD process is designed for an 8-day solids retention time and is limited to a 5 percent influent sludge concentration, which allows a WAS load of up to 10,600 ppd total solids during a maximum month condition. This quantity of solids is approximately equivalent to a plant influent load of 10,600 ppd BOD<sub>5</sub>, excluding any impact from recycled solids in the biosolids storage tank decant. This maximum month BOD<sub>5</sub> load is projected to be exceeded by 2035. With the decant, the ATAD facility is operating at capacity.

### 4. Review Record Drawings and Investigate Facilities

Due to the COVID 19 pandemic, an in-person site visit was not possible. The following were reviewed to develop an understanding of the current WRF operating condition:

- 2009 Facilities Plan
- 1995 Water Reclamation Facility Record Drawings
- Condition assessment provided by WRF operators

- Plant data
- Site photos

In addition to the condition assessment items developed in the 2009 Facilities Plan, the additional conditions shown below were identified as relevant to the project.

#### Headworks Screens

- Rag buildup in the WRF has increased recently, so screens may be less effective.
- Screens are becoming worn.
- Grit builds up in screen channels.
- Compactor does not wash as well as it used to.

#### Grit Removal

- Channel dimension may be off by 1 foot. (Note that this issue was not described more specifically and could not be confirmed.)
- Appears to work better at high flows.

#### ATAD Process

- Mixers cannot handle influent solids greater than 5 percent.
- Foam system needs work.

#### Biosolids Storage Tank

- Reaches capacity before hauling season.
- Decant recycles solids back into WRF.
- Mixing system is ineffective.
- Solids have odor.

#### Odor Control System

- Leaks present in the ductwork.
- Severe corrosion at the odorous air ran bases.
- Biofilter media may need to be replaced.

## 5. Review of Per- and Poly-Fluoroalkyl Substances Sample Results

### 5.1 Introduction

Per- and polyfluoroalkyl substances (PFAS), including perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS), comprise a broad group of substances or chemicals that have been manufactured and used by a variety of industries since 1940. The unique properties of these manmade compounds resulted in durable chemicals and materials with properties that include oil, water, temperature, chemical and fire resistance, as well as electrical insulating. Common applications of PFAS include water- and stain-repellent materials, coatings and paints, and firefighting products. It is estimated that there are more than the 4,000 PFAS compounds in existence.

While treated wastewater and biosolids are not sources of PFAS, wastewater treatment plants receive PFAS through receipt of consumer product discharge, industrial discharge, landfill leachate, and human bodily excretion. The strength of the carbon-fluorine bond within the PFAS molecules causes these compounds to resist treatment in commonly used wastewater treatment and biosolids management processes;

therefore, monitoring for PFAS is appropriate to understanding the transport and migration of these compounds within the wastewater and residuals management process.

The United States is now expanding its focus on wastewater (along with recycled water), biosolids, and landfill leachate. In many aspects, the United States is focused on research, data collection, and gathering an understanding of impacts from output of wastewater utilities, mainly water, biosolids, and air emissions. The U.S. Environmental Protection Agency (EPA) has committed to address the following items under its PFAS Management Plan:

- Develop and validate methods for other water matrices (nonpotable water and wastewater), solids (soils and biosolids), and air (ambient, stack emission, and off-gases).
- Evaluate wastewater discharges under National Pollutant Discharge Elimination System permits.
- Reduce PFAS releases into ambient waters. Determine if available data and research support the development of Clean Water Act Section 304(a) ambient water quality criteria for human health for PFAS. When adopted by states and tribes as water quality standards, criteria can be used to set permit limits on discharges to a waterbody.
- Develop biosolids risk assessment for PFOA and PFOS in biosolids to better understand the implications of PFOA and PFOS in biosolids to determine if there are any potential risks.

Biosolids have been the focus of much concern with respect to PFAS contamination and use of biosolids in agricultural applications. The two primary concerns over biosolids applications containing PFAS are (1) percolation and subsequent transport to groundwater aquifers, and (2) uptake from soils into crops and livestock. Additionally, the EPA is contemplating Comprehensive Environmental Response, Compensation, and Liability Act hazardous waste designation for PFAS compounds. The impact of these developments on future biosolids land application viability is unclear.

There are currently no EPA regulations or guidance values related to PFAS in biosolids; however, eight states have established soils value to be protective of groundwater (Table 5-1).

**Table 5-1. State Soil Guidance Values Protective of Groundwater October 2020**

State	Date	PFOA (µg/kg)	PFOS (µg/kg)	PFBS (µg/kg)
Alaska	2017	1.7	3	N/A
Florida	2019	2	7	N/A
Maine	2018	9.5	21	7000
Massachusetts	2019	0.72	2	N/A
Michigan	2016	350	0.22	N/A
Nebraska	2018	0.6	0.78	N/A
North Carolina	2018	17	N/A	910
Texas	2017	1.5	25	53

Note:

N/A = not applicable

PFBS = perfluorobutanesulfonic acid

Source: Interstate Technology Regulatory Council, 2020

Maine is only state that has established biosolids specific screening values. In 2019, biosolids spread on agricultural land was potentially linked to high levels of PFAS in milk via crop uptake and animal grazing, which prompted the Maine Department of Environmental Protection to establish biosolids screening values (Maine Department of Environmental Protection, 2019):

- 2.5 µg/kg (PFOA)
- 5.2 µg/kg (PFOS)
- 1900 µg/kg (PFBS)

Some states have engaged in large evaluation programs to assess potential impacts from biosolids-applied sites on groundwater. Vermont assessed 34 application sites and found that groundwater at seven sites exceed the state-specific groundwater values for PFAS (VTDigger, 2020).

Non-regulatory driven actions have also been recently observed. Although there are data gaps regarding fate and transport of PFAS in the human food chain through crop uptake, companies such as Whole Foods, Dole, Heinz, and Del Monte will not buy crops grown on land with applied biosolids. Farmers refusing biosolids due to concerns of PFAS has also recently occurred in several locations throughout the United States. In 2019, Marinette, Wisconsin, and Pima County, Arizona, stopped distributing biosolids due to agency directive (without established biosolids criteria), concerns of industrial wastewater receipt, and/or general concerns from the agricultural community (ABC News, 2019; Wisconsin Department of Natural Resources, 2019; University of Arizona, 2020). Subsequently, Pima County, in collaboration with the University of Arizona, Jacobs, and the National Science Foundation, embarked on a large case study that concluded that the agricultural lands studied exhibited minimal migration of PFAS from the surface to the lower depths of soil after more than 20 years of application. This supported that the deep groundwater supply was at minimal risk of PFAS contamination in the arid climate studied. Pima County has resumed land application of biosolids.

## 5.2 Sample Study

To understand the prevalence of PFAS compounds in the McMinnville WRF treatment process, a sampling study was developed. Samples were collected from the liquid and biosolids processes:

- **Wastewater Samples:** wastewater samples were collected between July 6 and July 10, 2020. Three sets of “paired” wastewater data were obtained, meaning that each set of grab samples was offset by the treatment hydraulic resident time. The paired data were collected from the wastewater treatment plant influent (aeration chamber splitter box influent) and effluent (tertiary filtration effluent). Samples were analyzed for PFAS using Modified EPA Method 537.1.
- **Biosolids Samples:** three grab samples of digester influent were collected (July 11, 13 and 15, 2020), and three grab samples of digested biosolids were collected (July 6, 8, and 10, 2020) were obtained and analyzed for PFAS using Modified EPA Method 537.1.

## 5.3 Sample Results

### 5.3.1 Wastewater

Wastewater samples are presented in Attachment 1; key PFAS parameters are summarized in Table 5-2.



**Table 5-2. Wastewater Treatment Sample Results**

Sample (ng/L)	Location	PFHxA	PFOA	PFBS	PFHxS	PFOS	Sum
7/6 Inf	Influent	ND	1.3	2.0	1.3	3.2	7.8
7/8 Eff	Effluent	15	4.4	2.7	ND	3.3	26.4
7/7 Inf	Influent	ND	2.3	3.3	ND	3.2	8.8
7/9 Eff	Effluent	20	4.2	3.1	ND	2.9	30.2
7/8 Inf	Influent	ND	2.0	1.6	ND	4.4	8.0
7/10 Eff	Effluent	17	4.6	2.9	1.3	2.9	28.7

**Notes:**

Inf = influent

Eff = effluent

ND = no data

ng/L = nanograms per liter

PFHxA = perfluorohexanoic acid

PFHxS = perfluorohexane sulfonic acid

The wastewater data show detected PFAS from ND to 20 ng/L. The average and maximum detected influent PFAS was 2.0 ng/L and 5.8 ng/L, respectively; these are considered relatively low values in wastewater influent. It is common to observe detectable concentrations due to the following:

- Human excretion
- Domestic discharges of consumer products
- Landfill leachate, although the WRF does not treat landfill leachate

These relatively low values also suggest that the WRF does not receive significant industrial contribution.

It can also be observed that the effluent values of individual PFAS (5.4 ng/L average and 20 ng/L maximum) are greater than the influent. This is readily apparent in the sum of the five PFAS presented in **Table 5-2**. The average sum of the three influent samples is 8.2 ng/L, and the average sum of the three effluent samples is 28.4 ng/L (a factor of 3.5 increase). This is a common observation due to conversion of PFAS “precursor” compounds to “terminal” compounds. The conversion may occur abiotically (that is, aeration) or biotically (through aerobic bacterial population). These PFAS compounds are termed “terminal” because once they are formed, they are not further converted or removed through conventional treatment processes. The majority of “precursor” PFAS compounds are not measured through current analytical methods, whereas the “terminal” PFAS are included in the analytical method shown in **Table 5-2**.

The sample set also includes one effluent duplicate analysis, which demonstrates agreement between the two samples (Attachment 1).

### 5.3.2 Biosolids

The digester influent and digested biosolids samples are presented in Attachment 1, and key PFAS parameters are summarized in **Table 5-3**.

**Table 5-3. Solids Treatment Sample Results**

Sample (µg/Kg)	Location	PFHxA	PFOA	PFOS	Total
7/11 DI	Digester Inf	ND	2.3	10	12.3
7/6 BS	Biosolids	35	20	38	93
7/13 DI	Digester Inf	ND	ND	9.1	9.1
7/8 BS	Biosolids	62	37	56	155
7/15 DI	Digester Inf	ND	2.4	9.2	11.6
7/10 BS	Biosolids	33	15	45	93
Average	Digester Inf	ND	1.6	9.4	11.0
	Biosolids	43	24	46	114

Notes:

BS = biosolids

DI = digester Influent

Of the five "terminal" PFAS measured across the wastewater treatment plant, PFBS and PFHxS were not detected in the sludge and thus not included in Table 5-3. Similar to the observation across the wastewater treatment process, PFAS concentrations also increased across the digestion process. The average sum of the three digester influent samples is 11.0 µg/kg, and the average sum of the three biosolids samples is 114 µg/kg (a factor of 9.5 increase). It is likely that the large increase observed across the biosolids treatment process is an additive function of both increase in % solids in the resulting biosolids, as well as some additional aerobic precursor conversion due to the long retention time in the aerobic digesters.

**Table 5-4** compares the resulting average biosolids concentrations measured under this program to the available state-specific guidance values for soils and biosolids.

**Table 5-4. Comparison to Published Soil and Biosolids Guidance Values**

Entity	(µg/Kg) (ppb)		
	PFOA	PFOS	PFBS
State values	0.6-350	0.22-25	53-910
Maine (Biosolids Specific Screening)	2.5	5.2	1900
Average Value for McMinnville Study	24	46	ND

\* Current states: AK, MI, NE, NC, TX.

Note that that soil values indicated in Table 5-4 are based on in-place concentrations. As such, biosolids application rates need to be factored in for a relevant comparison. These values cannot be compared directly to the measured concentrations but are provided to indicate that some state have PFAS soil guidance values and regulations in place.

However, the screening values that Maine established for biosolids are also protective of shallow groundwater supplies but derived based on assumed agricultural field application rates. It can be seen that the average values obtained during this study exceed the values established in Maine by approximately a factor of 10 for both PFOA and PFOS.

Another available data set for comparison is the data provided by the Michigan Department of Environment, Great Lakes, and Energy (EGLE) (Figure 5-1) (EGLE, 2020). These data provide biosolids

PFOS values from 41 wastewater treatment plants (WWTPs). Through EGLE's industrial pretreatment program, 7 of the 41 WWTPs were identified as "industrially impacted." The non-industrially impacted facility PFOS values ranged from approximately 2 µg/kg to 80 µg/kg.

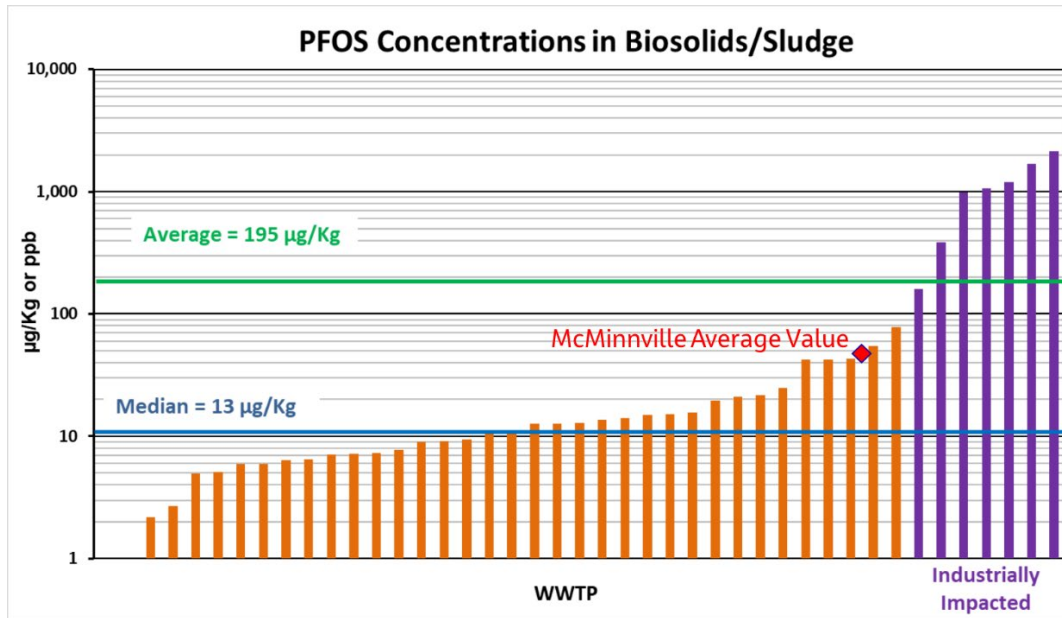


Figure 5-1. Michigan State-wide PFOS Biosolids Screening Data

In comparison, the average PFOS value from McMinnville was 46 µg/kg, supporting that the plant is likely not impacted by industrial PFAS discharges. Moreover, this value is close to the arithmetical average biosolids concentration of non-industrially impacted biosolids.

## 5.4 Conclusions and Recommendations

The PFAS concentrations measured in wastewater influent and digester influent samples at the McMinnville WRF were relatively low. The increased concentrations in wastewater effluent and biosolids samples are likely the result of conversion of "precursor" to "terminal" compounds, primarily due to the aerobic treatment processes. The higher values do not indicate that the treatment process is increasing the concentration of concerning compounds; rather, the values indicate the treatment process is accelerating the conversion process of "precursor" to "terminal" compounds.

The City may wish to investigate any point sources of "precursor" compounds to the wastewater collection system; however, because the City does not have major industrial contributors and does not treat landfill leachate, it is likely that the "precursor" contribution is more distributed, potentially resulting from household sewer discharges.

Current understanding of the risks associated with low levels of PFAS in biosolids is limited; however, the beneficial aspects of biosolids land application are well understood. The City should continue to monitor the industry understanding of PFAS, the regulatory environment, and PFAS concentrations at the WRF.

## 6. References

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**Attachment 1**  
**City of McMinnville Sample Set**

ATTACHMENT 1

Sample	Date Collected	PFBS	PFHxS	PFOS	PFHxA	PFOA	PFOSA	NMPFOA	MEPFOSOH	NMPFOAAA	NEPFOSAA	6:2 FTS	8:2 FTS	10:2 FTS	Sum Pre	Sum Term	PFOA + PFOS
INF 51348	7/6/2020	2	1.3	3.2	ND	1.3	ND	ND	1.6	ND	ND	0.91	0.39	ND	2.9	7.8	4.5
EFF 51369	7/8/2020	2.7	ND	3.3	16	4.4	0.59	ND	ND	ND	0.6	ND	ND	ND	1.2	26.4	7.7
INF 51359	7/7/2020	3.3	ND	3.2	ND	2.3	ND	ND	0.61	ND	ND	ND	0.19	ND	0.8	8.8	5.5
EFF 51378	7/9/2020	3.1	ND	2.9	20	4.2	ND	ND	ND	ND	ND	ND	ND	ND	0.0	30.2	7.1
INF 51371	7/8/2020	1.6	ND	4.4	ND	2	ND	ND	5.8	ND	ND	0.72	0.5	ND	7.0	8.0	6.4
EFF 51394	7/10/2020	2.9	1.3	2.9	17	4.6	0.53	ND	ND	ND	ND	ND	ND	ND	0.5	28.7	7.5
EFF 51395 (DUP)	7/10/2020	2.9	ND	3.2	16	4.7	0.63	ND	ND	ND	ND	ND	ND	ND	0.6	26.8	7.9
DIG INF 51400	7/11/2020	ND	ND	10	ND	2.3	2.4	1.3	1.1	14	5.1	ND	1.5	1.9	27.3	12.3	12.3
DIG INF 51410	7/13/2020	ND	ND	9.1	ND	ND	2.1	2.2	ND	15	ND	ND	1.3	1.8	22.4	9.1	9.1
DIG INF 51425	7/15/2020	ND	ND	9.2	ND	2.4	2.1	ND	1	17	4.2	ND	1.5	1.6	27.4	11.6	11.6
Average				9.4		2.4											
BIOSOLIDS 51347	7/6/2020	ND	ND	38	35	20	9.1	ND	6.1	55	23	ND	7.4	ND	101	93	58
BIOSOLIDS 51368	7/8/2020	ND	ND	56	62	37	ND	ND	ND	ND	ND	ND	13	ND	13.0	155	93
BIOSOLIDS 51393	7/10/2020	ND	ND	45	33	15	9.3	ND	5.3	35	18	9.1	8.8	3.3	88.8	93	60
Average				46.3	43.3	24.0											

Sample Units:

Influent      ng/L  
 Effluent      ng/L  
 Dig. Effluent   ng/g  
 Biosolids      ng/g



**Memorandum 2**  
**Evaluation of Offsite Biosolids End Use/Disposal Alternatives**



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**Subject:** Evaluation of Offsite Biosolids End Use/Disposal Alternatives

**Project Name:** McMinnville Water Reclamation Facility Biosolids Storage Tank and Grit System Expansion

**Prepared For:** City of McMinnville

**Prepared By:** Jacobs Engineering Group

**Date:** January 29, 2021

**Project Number:** D3373900

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## 1. Introduction

The Water Reclamation Facility (WRF) currently produces a liquid Class A biosolids product via a first generation autothermal thermophilic aerobic digestion (ATAD) biosolids stabilization process. Biosolids are land applied locally. Liquid biosolids are stored in the biosolids storage tank from approximately October through April and are hauled by a third party contractor from May through September, weather permitting. While biosolids are stored in the biosolids storage tank, liquid must be decanted to allow storage of produced biosolids.

As documented in the 2009 City of McMinnville Water Reclamation Facilities Plan (2009 Facilities Plan) (West Yost Associates and CH2M HILL, 2009), a limitation of the current WRF biosolids management program is the production of a single biosolids product with a single end use. The WRF desires flexibility to adjust the end use should an issue arise with local land application of the liquid Class A biosolids. Offsite end use/disposal alternatives were evaluated to inform the necessary improvements, modifications, and additions to the existing WRF solids processing facilities.

This evaluation also included conducting a survey of farmers accepting the current biosolids product to solicit feedback on the current product and alternative biosolids products.

Non-monetary criteria were developed, weighted against each other, and then used to score the range of potential biosolids products and end uses.

## 2. Class A Versus Class B Biosolids or Sludge

The classification of the sludge (Class A versus Class B) is dependent on the stabilization technology used and affects the biosolids end use options available for the City.

The use and disposal of biosolids is regulated by the U.S. Environmental Protection Agency (EPA) Title 40, *Code of Federal Regulations*, Part 503 (Part 503) and the Oregon Department of Environmental Quality

(DEQ). Part 503 establishes requirements for the final use or disposal of biosolids when they are applied to land, placed on a surface disposal site, or fired in a biosolids incinerator. (Note that incineration is disallowed by EPA Region 10, which includes Oregon). The Oregon DEQ follows similar biosolids regulatory requirements as summarized in Part 503 regulations. Classifying treated biosolids as Class A or Class B refers to the degree of pathogen reduction.

A Class A product can be applied to a lawn or home garden, can be sold to the public, or can be applied at reclamation sites with public access. Production of a Class A product must have less than 1,000 most probable number (MPN) of fecal coliform per gram (g) of total solids (TS) and must meet one of six pathogen reduction alternatives listed in Part 503. The three Class A pathogen reduction alternatives that would be most applicable to the WRF are as follows:

- Meet one of the four time-temperature regimes (that is, maintain the sludge at a certain temperature for a certain amount of time).
- Conduct comprehensive monitoring of enteric viruses and helminth ova.
- Apply one of the approved or equivalent Processes to Further Reduce Pathogens (PFRP), which include ATAD, thermal drying, or composting. The ATAD PFRP definition is to maintain a mean cell residence time (MCRT) of 8 to 12 days and a temperature between 45 degrees Celsius (°C) and 65°C.

A Class B product can be applied to agricultural land or used for alternative daily cover in landfills (if allowed by the landfill operator). Class B dewatered cake must be processed to reduce pathogens by one of the following three pathogen reduction alternatives as listed in Part 503:

- Maintain less than 2,000,000 MPN/g TS of fecal coliform.
- Apply an equivalent process to Process to Significantly Reduce Pathogens (PSRP).

The only option for a sludge that does not meet Class B requirements (a sub-Class B product) is to dispose of the product in a landfill. Sub-Class B material may also be referred to in this document as “unstabilized.”

Whether a product is classified as Class A or Class B, the product must be processed to reduce vector attraction (otherwise known as vector attraction reduction, or VAR) by one of 12 options listed in Part 503. The four VAR options that would be most applicable to the WRF are as follows:

- Minimum of 38 percent volatile solids reduction (VSR). This is the percentage of VSR considered achievable for an ATAD digester with an MCRT between 8 and 12 days and a temperature between 45°C and 65°C.
- Specific oxygen uptake rate (SOUR) is less than 1.5 milligrams of oxygen per hour per gram of TS at 20°C.
- Injection below land surface with sufficient soil coverage such that no sludge is present on the surface 1 hour after injection for Class B biosolids.
- Incorporation into the soil within 6 hours after application to the land.

Waste activated sludge (WAS) from the secondary treatment Orbal process is thickened on gravity belt thickeners and sent to the ATAD for digestion. The ATAD facilities were designed to provide the MCRT of 8 days at a temperature of 60°C to meet Class A because they meet the fecal coliform pathogen reduction requirement and the minimum 38 percent volatile solids reduction requirement.

Currently, most agencies in Oregon and across the United States typically produce a Class B dewatered cake. However, Class A products, such as those produced by the ATAD are being used as fertilizer/soil conditioner on local agricultural land. A Class A biosolids product produced by composting or thermal drying has been successfully used as a soil conditioner and amendment on parks and golf courses throughout the United States. A Class A product is subject to less stringent regulatory monitoring and record-keeping requirements than a Class B product. Only Class A biosolids management options are considered in this evaluation.

### **3. Farmer Survey Results**

#### **3.1 Introduction**

City staff prepared an Agricultural Survey Questionnaire with sixteen questions to gather feedback from the farmers that currently receive or previously received WRF biosolids. The survey focused on the farmer's experience with the current biosolids land application program and their interest in possible changes to the program. The surveys were sent on June 5, 2020, to 12 farmers and requested response (email, fax, or mailed) by June 15, 2020. City staff followed up with phone calls on the missing surveys. Seven completed surveys were received (see Attachment 1).

#### **3.2 Results**

Overall, the seven farmers were satisfied with the current liquid biosolids land application program, with an average score of 4.7 out of 5 (with four farmers scoring the current program a 5 and two farmers scoring the current program a 4). The greatest benefits of applying liquid biosolids to their agricultural land (survey question 2) were the fertilizer value, organic material, and moisture. The greatest concerns with applying liquid biosolids to their agricultural land (survey question 3) were product odor, soil compaction, and the inconsistent availability of the biosolids. One farmer was concerned about potential contamination of their land with microplastics, antibiotics, and other "manmade" compounds not destroyed by WRF sludge stabilization that could have long-term impacts on their land. When asked if there is anything that the WRF could do to improve the biosolids applied to land (survey question 4), two farmers stated, "bring us more of it," and one requested additional testing for potential contaminants that could be present in the biosolids material.

When asked what is the most likely cause to stop the farmers from accepting biosolids (survey question 5), the farmers stated neighbor complaints because of biosolids odor and excess rain that would contribute to soil compaction caused by the biosolids land application vehicles when the soil is soft and muddy, especially during the winter months. The farmers generally stated that a less odorous biosolids product would be more beneficial and reduce complaints from neighbors.

The crops that currently receive the biosolids (survey question 11) are hay, tall fescue grass, grass seed, clover, and pasture land. The constituents/characteristics in the biosolids that are most important (survey question 12) are nitrogen, phosphorus, potassium, general soil conditioning, and late summer irrigation. The majority of the farmers would use commercial fertilizer or animal manure if the WRF could no longer provide any form of biosolids.

Table 3-1 summarizes the key agricultural survey questionnaire results.

Table 3-1. Summary of Key Agricultural Survey Results

Key Survey Questions	Farmers' Responses (1-5 with 5 Being the Highest Satisfaction)							Average
	2	7	9	17	20	21	22	
1. Satisfied with current biosolids program?	4	5	5	5	—	5	4	4.7
6. Interest if at minimal cost?	No	Yes	Yes	Yes	Yes	Yes	No	
7. Does odor impact which field get biosolids?	Yes	Yes	No	No	No	Yes	Yes	
8. Would a less odorous product be beneficial?	No	Yes	No	No	No	Yes	Yes	
9. Size of farm (acres)	200	83	70+	60	48-60	80-150	60-80	
10. Additional acreage?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
13A. Interest in dewatered biosolids product?	Yes	Yes	Yes	Yes	No	No	No	
13B. Would dewatered product change timing of application?	No	No	No	—	—	—	—	
13C. Would dewatered product require you to buy additional equipment and have storage bunker?	Yes	—	No	Yes	—	—	—	
14A. Interest in compost?	Yes	Yes	Yes	Yes	No	No	No	
14B. Would compost product change timing of application?	No	No	No	Yes/No	—	—	—	
14C. Would compost product require you to purchase additional equipment and have storage bunker?	Yes	—	No	—	—	—	—	
15A. Interest in dried product?	Yes	Yes	Yes	Yes	No	Yes	No	
15B. Would dried product change timing of application?	Yes	No	No	Yes/No	—	No	—	
15C. Would dried product require you to purchase additional equipment and have storage bunker?	No	—	No	Yes	—	Yes	—	

### 3.3 Summary

Overall, the seven farmers that returned the surveys were satisfied with the current liquid biosolids land application program. The identified benefits of applying liquid biosolids to their agricultural land were the fertilizer value, organic matter, and moisture. Concerns with applying liquid biosolids to their agricultural land included product odor (neighbors complaining), soil compaction, and the inconsistent availability of biosolids.

Crops that currently receive biosolids are hay, tall fescue grass, grass seed, clover, and pasture land. The constituents/characteristics in the biosolids that are most important are nitrogen, phosphorus, potassium, general soil conditioning, and late summer irrigation. The majority of the farmers would use commercial fertilizer or animal manure if the WRF could no longer provide any form of biosolids.

Five out of the seven farmers would be interested in biosolids even if they had to pay a minimal cost. Four of the seven farmers would be interested in dewatered biosolids; however, dewatered biosolids would have significantly lower moisture and fertilizer content compared to liquid biosolids. Four of the seven farmers were interested in receiving compost, and five of the seven farmers were interested in receiving dried biosolids.

The survey results reflect a successful and rather low-cost liquid biosolids land application program where the majority of the farmers are satisfied. In addition, the one-way haul distance is within a 12-mile proximity to the WRF. The farmers perceive the positive benefits of biosolids application, including fertilizer value, organic matter, and moisture. The City can reduce one of the biggest farmer and neighbor concerns by implementing a biosolids stabilization process that further reduces odor in the biosolids product.

## 4. Evaluation of Biosolids Products and End Uses

### 4.1 Alternatives Considered

The eight alternative biosolids end use options identified as appropriate for the quantity and quality of biosolids from the WRF anticipated at future 2045 conditions are as follows and further described in succeeding sections:

1. **Alternative 1:** Liquid local Land Application–Baseline. Local land application of Class A liquid biosolids within a 12-mile one-way proximity to the WRF. This alternative assumes an 8-day hydraulic retention time (HRT) in the first generation ATAD process tanks that is the current design basis.
2. **Alternative 2:** Low Odor Liquid Land Application. Alternative 2 is similar to Alternative 1 but assumes a longer 12-day HRT in second generation ATAD process tanks with better mixing and process control and a 6- to 9-day HRT in a storage nitrification denitrification reactor (SNDR) or use of the Lystek chemical hydrolysis process to produce a lower odor Class A biosolids product that will be locally land applied within a 12-mile one-way proximity to the WRF. A more detailed explanation of the differences between first and second generation ATAD are in Memorandum 3, Evaluation of Biosolids Treatment Alternatives.
3. **Alternative 3:** Dewatered Local Land Application. Alternative 3 is similar to Alternative 2 but includes dewatering facilities to produce a dewatered Class A biosolids product that will be locally land applied within a 12-mile one-way proximity to the WRF.



4. **Alternative 4:** Dewatered Long-Distance Land Application. Alternative 4 is similar to Alternative 3 but assumes that the dewatered Class A biosolids product would be applied in eastern Oregon, approximately 240 miles from the WRF.
5. **Alternative 5:** Dewatered Lime Pasteurized Long-Distance Land Application. Alternative 5 is similar to Alternative 4 but will use lime pasteurization to produce a Class A dewatered product that would be applied in eastern Oregon approximately 240 miles from the WRF.
6. **Alternative 6:** Dewatered Landfill. Alternative 6 is similar to Alternative 3, in that it includes dewatering facilities, but a Class B dewatered biosolids product would be disposed of at a solid waste landfill located approximately 40 miles from the WRF. It assumes dewatering of the liquid biosolids produced in Alternative 1 and use of the existing ATAD facilities. This alternative assumes an 8-day HRT in the existing first generation ATAD process tanks that is the current design basis.
7. **Alternative 7:** Dried and Distribution Direct to Consumer. Alternative 7 includes the dewatering and drying of the liquid biosolids produced in Alternative 1 and use of the existing ATAD facilities. This alternative assumes an 8-day HRT in the first generation ATAD process tanks that is the current design basis. The dried Class A pellet product would be marketed and distributed directly to consumers in the area.
8. **Alternative 8:** Compost and Distribution Direct to Consumer. Alternative 8 includes the dewatering and composting of the liquid biosolids produced in Alternative 1 and use of the existing ATAD facilities. This alternative assumes an 8-day HRT in the first generation ATAD process tanks that is the current design basis. The composted Class A product would be marketed and distributed directly to consumers in the area.

## 4.2 McMinnville Offsite Biosolids Reuse/Disposal Alternatives Analysis

A comparison of the weighted benefit scores and unit costs is used to identify the alternative that provides the best value for the City. The cost-benefit analysis involves the following steps, which are discussed further in the following sections:

- Identify and define non-monetary criteria.
- Establish appropriate weighting factors to apply to each non-monetary criterion.
- Score each of the retained end use alternatives relative to each non-monetary criterion.
- Apply the scores to the weighting factors to generate total non-monetary weighted benefit scores.
- Compare the total non-monetary weighted benefit scores to typical unit costs (\$/dry ton).

## 4.3 Non-monetary Criteria and Definitions

Fourteen non-monetary criteria and definitions were provided to the City for review and were approved for use in evaluating the offsite biosolids reuse/disposal alternatives. The list of non-monetary criteria and definitions are shown in Table 4-1. The criteria largely reflect the priorities identified in the 2009 Facilities Plan with minor updates.

**Table 4-1. Non-monetary Criteria Definitions**

Criterion	Definition
Criteria from 2009 Facilities Plan	
Ease of Meeting Regulatory Requirements	Shorter time, less effort, and fewer documents required to meet current pollutant limits, pathogen limits, and vector attraction reduction regulations (EPA and DEQ) given a higher rating.
Agricultural Practices	Keeping the local Yamhill County agricultural practices that retain local acreage for beneficial reuse given a higher rating.
Public Acceptance	Maintaining a consistent, high-quality biosolids product, current application methods, aesthetics, and truck traffic that is acceptable to the farmer and the public given a higher rating.
Odor	Producing less odor at the WRF site and at the land application sites, with less potential for public complaints, especially neighbors of land application sites, given a higher rating.
Fuel Cost	Lower diesel fuel cost for hauling of biosolids a shorter distance given a higher rating.
Ease of Operations and Maintenance (O&M) – Complexity	Alternatives that include less equipment from thickening to end use/disposal, that are simpler to operate, more flexible, reliable and maintainable given a higher rating.
VSR	Alternatives with higher VSR and subsequently lower biosolids volumes to be transported given a higher rating.
Sustainability	Higher beneficial use of the end product to support long-term ecological balance given a higher rating.
Flexibility of End Use	Alternatives that allow for multiple end uses of the biosolids (local and long-distance land application, landfill, direct beneficial reuse by the customer, etc.) given a higher rating.
Implementation	Alternatives that are more easily implementable (reasonable capital cost, lower WRF onsite land requirements, and easier to sequence construction to minimize plant disruptions) given a higher rating.
Additional Criteria Included	
Maximizes City's Operational Control of End Product Use and Cost of Biosolids Reuse/Disposal	More control by City to minimize potential issues with future acceptance of City's biosolids, contractor's bankruptcy, and cost of biosolids reuse/disposal given a higher rating.
Minimize City's Long-Term Legal Risk	Alternatives with less risk for City to be held responsible for legal issues relating to biosolids quality, transport, and/or application given higher rating assuming that the regulations are met.
Safety & Health	Processes with less, noise, chemical, and safety hazard exposures to plant staff given a higher rating.
Impacts of Recycle Streams	Processes with fewer negative impacts to the liquids treatment process given a higher rating.

City staff (represented by Leland Koester) determined the weighting factors for the fourteen biosolids reuse/disposal non-monetary criteria by deciding which criterion was more important for each set of two criteria, also known as a head-to-head decision process. The head-to-head results and the resulting weighting factors selected by City staff are shown on Table 4-2. City staff agreed that the weighting factors for each criterion resulting from the head-to-head decision process accurately reflected the staff's feeling of importance for each criterion. For example, minimizing the City's long-term legal risk and safety and health are the most important non-monetary factors to the City.

Table 4-2. Head-to-head Weighting of Non-monetary Criteria

Head-to-Head Weighting of Non-Monetary Criteria (USED)

	A. Ease of Meeting Regulatory Requirements	B. Agricultural Practices	C. Public Acceptance	D. Odor	E. Fuel Cost	F. Ease of O&M Complexity	G. Volatile Solids Reduction (VSR)	H. Sustainability	I. Flexibility of End Use	J. Implementation	K. Maximizes City's Control	L. Minimizes Legal Risk	M. Safety and Health	N. Impacts of Recycle Streams	Number of Times Picked	Percentage of Total (Weighting Factor)
A. Ease of Meeting Regulatory Requirements	A														8	7.6%
B. Agricultural Practices	A	B													8	7.6%
C. Public Acceptance	C	C	C												8	7.6%
D. Odor	D	B	C	D											8	7.6%
E. Fuel Cost	A	B	C	D	E										1	1.0%
F. Ease of O&M Complexity	F	B	F	F	F	F									8	7.6%
G. Volatile Solids Reduction (VSR)	G	G	G	G	G	G	G								9	8.6%
H. Sustainability	A	B	C	D	H	F	G	H							2	1.9%
I. Flexibility of End Use	I	B	C	D	I	I	I	I	I						8	7.6%
J. Implementation	A	B	J	D	J	F	G	J	I	J					4	3.8%
K. Maximizes City's Control	A	K	K	D	K	K	K	K	K	K	K				10	9.5%
L. Minimizes Legal Risk	A	L	L	L	L	L	L	L	L	L	L	L			12	11.4%
M. Safety and Health	M	M	M	M	M	M	M	M	M	M	M	M	M		14	13.3%
N. Impacts of Recycle Streams	A	B	C	D	N	F	N	N	I	N	K	L	M	N	5	4.8%

TOTAL: 105 100.0%

### 4.4 Scoring of Alternatives

Prior to the meeting, Dave Oerke/Jacobs preliminarily scored each of the eight biosolids product alternatives relative to the 14 non-monetary criteria. During the workshop, Mr. Oerke talked through his scoring and reasoning. Leland Koester (as voice for the City) and Brett Reistad provided feedback and some of Mr. Oerke's scores were adjusted (see Table 4-3).

**Table 4-3. Raw Non-Monetary Scores for Biosolids Reuse/Disposal Alternatives**

		A. Ease of Meeting Regulatory Requirements	B. Agricultural Practices	C. Public Acceptance	D. Odor	E. Fuel Cost	F. Ease of O&M Complexity	G. Volatile Solids Reduction (VSR)	H. Sustainability	I. Flexibility of End Use	J. Implementation	K. Maximizes City's Control	L. Minimizes Legal Risk	M. Safety and Health	N. Impacts of Recycle Streams
<b>Benefit Scores</b>															
1	Liquid Local Land App. - Baseline	4	5	3	2	3	4	3	3	1	5	4	3	3	4
2	Low Odor Liquid Land App	4	5	4	4	4	4	4	3	1	4	4	4	4	5
3	Dewatered Local Land App.	3	4	3	3	4	3	3	3	3	4	4	4	4	2
4	Dewatered Long-Distance Land App	3	3	3	3	2	3	3	2	3	3	3	2	4	2
5	Dewatered Lime Long-Distance Land App	2	3	2	2	1	3	3	2	3	3	3	2	2	2
6	Dewatered Landfill	5	1	1	1	4	3	2	1	2	4	3	3	4	2
7	Dried and Dist. Direct to Consumer	4	2	4	4	5	1	4	4	4	1	4	3	1	1
8	Compost and Dist. Direct to Consumer	3	2	5	2	4	2	4	5	5	2	4	3	2	3
<b>Comments:</b>															
	Min	2	1	1	1	1	1	2	1	1	1	3	2	1	1
	Max	5	5	5	4	5	4	4	5	5	5	4	4	4	5
	Spread	3	4	4	3	4	3	2	4	4	4	1	2	3	4
	Scale	5	5	5	5	5	5	5	5	5	5	5	5	5	5
<b>Alternative Scoring Rank Scale (each number can be used more than once):</b>															
5 Significantly Greater Benefits															
4 Greater Benefits															
3 Neutral or Equal Benefits															
2 Less Benefits															
1 Significantly Less Benefits															

The total non-monetary weighted benefit scores were developed by multiplying the raw non-monetary scores by the weighting factors presented on Figure 4-1. The total non-monetary weighted benefits scores for the retained biosolids reuse/disposal alternatives are summarized and illustrated on Figure 4-1.

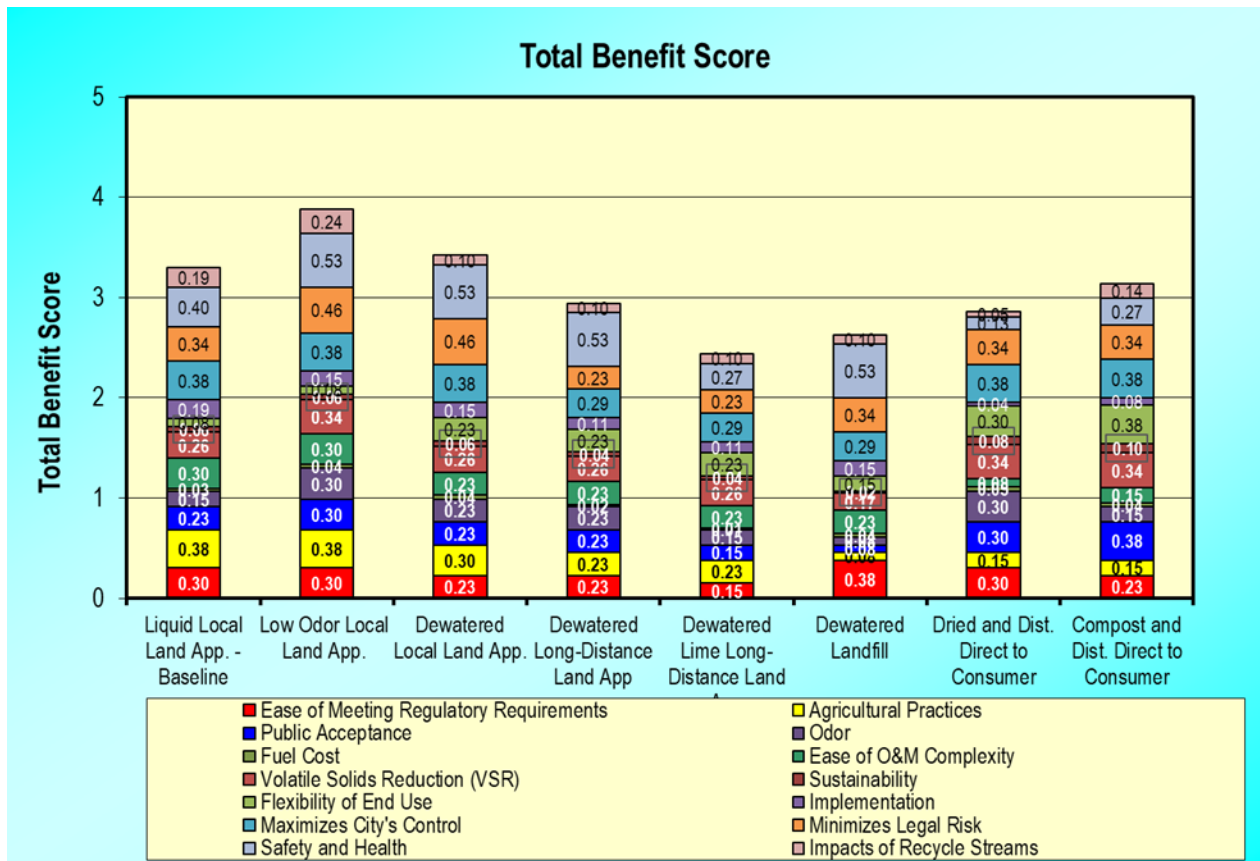


Figure 4-1. Total Benefit Score for the Biosolids Reuse/Disposal Alternatives

As shown on Figure 4-1, the low odor (using second generation ATAD or Lystek process) local liquid land application process has the highest total weighted non-monetary benefit score (3.9), and dewatered local land application has the next highest total weighted non-monetary score (3.5). The low odor local liquid land application had the best benefit score because it had high scores for agricultural practices, sustainability, odor, VSR, and public acceptance. The dewatered lime-pasteurized long-distance alternative had the lowest total weighted non-monetary benefit score (2.4) because it scored neutral to significantly fewer benefits for each non-monetary criterion.

#### 4.5 Benefit to Cost Comparison

Typical unit costs for just the offsite reuse and disposal activities of the biosolids product for the biosolids reuse/disposal alternatives, based on typical cost in Oregon, are summarized in Table 4-4. These costs do not include onsite (at the WRF) operations and maintenance costs associated with solids processing.

**Table 4-4. Offsite Unit Cost for Reuse and Disposal of the Biosolids Product for the Alternatives**

Biosolids Reuse/Disposal Alternative	Average Unit Cost (\$) Per Dry Ton
1. Liquid Local Land Application – Baseline	204
2. Low Odor Local Liquid Land Application	204
3. Dewatered Local Land Application	185
4. Dewatered Long-Distance Land Application	280
5. Dewatered Lime Long-Distance Land Application	320
6. Dewatered Landfill	275
7. Dried and Distribution Direct to Consumer	100
8. Compost and Distribution Direct to Consumer	75

## 5. Recommendations

The total weighted non-monetary benefit scores and typical unit costs for each retained option are compared in the cost-benefit chart shown on Figure 5-1. This cost-benefit chart demonstrates that five of the alternatives (with the highest benefit score and the least offsite biosolids reuse/disposal unit cost – shown to the top and left of the chart) should be retained for further analysis. The following five biosolids reuse/disposal alternatives that will be retained for further analysis are:

1. Liquid Local Land Application – Baseline
2. Low Odor Local Liquid Land Application
3. Dewatered Local Land Application
4. Dried and Distribution Direct to Consumer
5. Compost and Distribution Direct to Consumer

Those biosolids reuse/disposal alternatives with higher offsite biosolids reuse/disposal unit costs and lower benefits (shown lower and to the right on the chart) that will not be analyzed further are:

1. Dewatered Long-Distance Land Application
2. Dewatered Lime Long-Distance Land Application
3. Dewatered Landfill



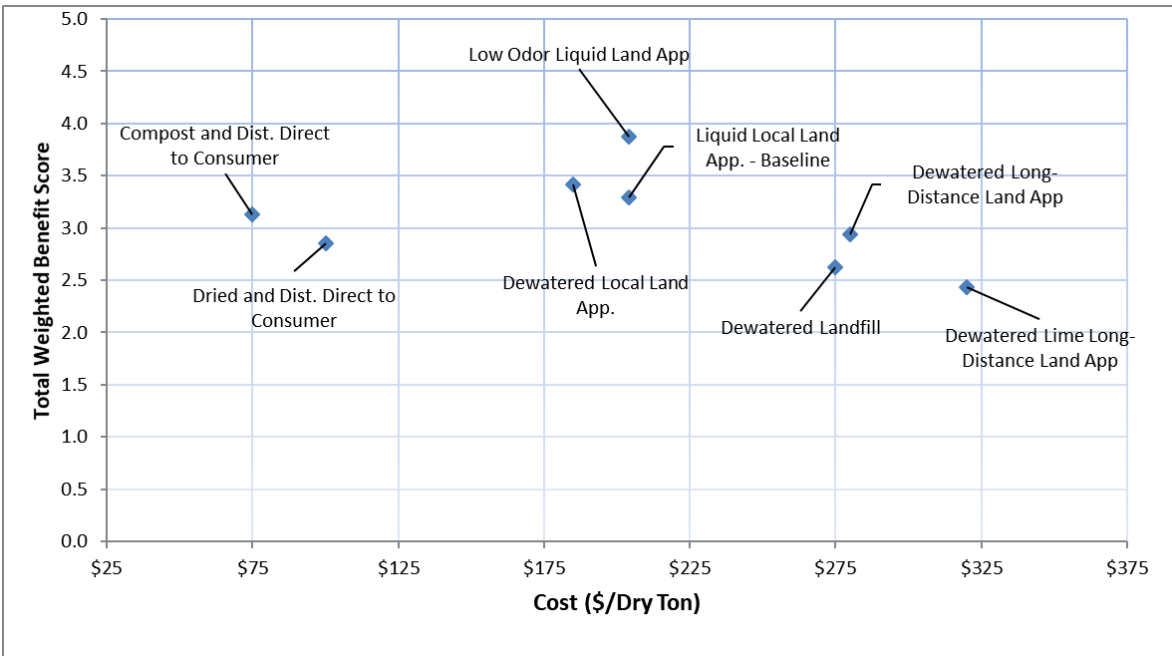


Figure 5-1. Total Weighted Benefit Score Versus Offsite Unit Cost for the Biosolids Reuse/Disposal Alternatives

# **Attachment 1 Completed Surveys**

## Agricultural Survey Questions

The City of McMinnville is evaluating their Biosolids Program and is requesting your feedback on your experience with the current program and your interest in possible changes to its program.

Please return the completed survey by the end of the day on **Monday, June 15, 2020.**

Completed surveys may be returned by:

- ~ emailing it to [leland.koester@mcminnvilleoregon.gov](mailto:leland.koester@mcminnvilleoregon.gov)
- ~ faxing it to (503) 434-7438 or
- ~ mailing it to 3500 NE Clearwater Drive, McMinnville Oregon 97128

If you have any questions, please call (503) 434-7313. Thank you for your time and participation.

1. Have you been satisfied with McMinnville's biosolids Program in the past?  
Please rank 1-5 with 5 being the highest satisfaction.

4

2. What is the biggest benefit to applying liquid biosolids from McMinnville's Water Reclamation Facility (WRF) to your agricultural land?

The biosolids provide needed nitrogen for the grass fields.

3. What is your biggest concern with applying liquid biosolids from the WRF to your land?

If the ground gets to wet due to precipitation which causes compaction of the soil.

4. Is there anything that the WRF could do to improve the liquid biosolids we apply to your land?

Not that I can think of at this time.

5. What would be the most likely cause for you to stop accepting liquid biosolids from the WRF?

If we had early falls with alot of rain.

6. If McMinnville's WRF could no longer deliver liquid biosolids for free, would you still be interested if the cost was minimal?  Yes  No

7. Does the odor of the liquid biosolids impact which fields you can apply the WRF biosolids to?  Yes  No

8. Would a less odorous product be beneficial? If Yes, in what way?  Yes  No

9. How many acres do you currently apply the WRF biosolids to?

200

10. If additional biosolids were available, do you have additional acreage to apply it to?  Yes  No

11. Which of your crops currently receive the WRF biosolids?

Grass and clover fields

12. What constituents/characteristics are most important:

Nitrogen  Phosphorus  Potassium  General Soil Conditioning  Late Summer Irrigation

Other: \_\_\_\_\_

13. If the WRF produced a dewatered cake product, would you still be interested in receiving it?  Yes  No

If yes, would this require you to change the timing of when the biosolids was applied?  Yes  No

If yes, would this require you to purchase additional equipment for biosolids application and receiving/temp storage area (bunker)?  Yes  No

14. If the WRF produced a biosolids Compost product, would you still be interested in receiving it?  Yes  No

If yes, would this require you to change the timing of when the biosolids was applied?  Yes  No

If yes, would this require you to purchase additional equipment for biosolids application and receiving/temp storage area (bunker)?  Yes  No

15. If the WRF produced a dried granular product, would you still be interested in receiving it?  Yes  No

If yes, would this require you to change the timing of when the biosolids was applied?  Yes  No

If yes, would this require you to purchase additional equipment for biosolids application and receiving/temp storage area (bunker)?  Yes  No

16. If the WRF could no longer provide any form of biosolids, what other product(s) would you use?

Commercial fertilizer

## Agricultural Survey Questions

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If you have any questions, please call (503) 434-7313. Thank you for your time and participation.

1. Have you been satisfied with McMinnville's biosolids Program in the past?  
Please rank 1-5 with 5 being the highest satisfaction. 5
2. What is the biggest benefit to applying liquid biosolids from McMinnville's Water Reclamation Facility (WRF) to your agricultural land?

moisture for the Grass

3. What is your biggest concern with applying liquid biosolids from the WRF to your land?

NONE

4. Is there anything that the WRF could do to improve the liquid biosolids we apply to your land?

NO

5. What would be the most likely cause for you to stop accepting liquid biosolids from the WRF?

Neighbors Complaining

6. If McMinnville's WRF could no longer deliver liquid biosolids for free, would you still be interested if the cost was minimal?  Yes  No
7. Does the odor of the liquid biosolids impact which fields you can apply the WRF biosolids to?  Yes  No
8. Would a less odorous product be beneficial? If Yes, in what way?  Yes  No

Less Smell to put up with

9. How many acres do you currently apply the WRF biosolids to?

83 ACRES

10. If additional biosolids were available, do you have additional acreage to apply it to?  Yes  No

11. Which of your crops currently receive the WRF biosolids?

TALL Fescue

12. What constituents/characteristics are most important:

Nitrogen  Phosphorus  Potassium  General Soil Conditioning  Late Summer Irrigation

Other: \_\_\_\_\_

13. If the WRF produced a dewatered cake product, would you still be interested in receiving it?  Yes  No

If yes, would this require you to change the timing of when the biosolids was applied?  Yes  No

If yes, would this require you to purchase additional equipment for biosolids application and receiving/temp storage area (bunker)?  Yes  No

14. If the WRF produced a biosolids Compost product, would you still be interested in receiving it?  Yes  No

If yes, would this require you to change the timing of when the biosolids was applied?  Yes  No

If yes, would this require you to purchase additional equipment for biosolids application and receiving/temp storage area (bunker)?  Yes  No

15. If the WRF produced a dried granular product, would you still be interested in receiving it?  Yes  No

If yes, would this require you to change the timing of when the biosolids was applied?  Yes  No

If yes, would this require you to purchase additional equipment for biosolids application and receiving/temp storage area (bunker)?  Yes  No

16. If the WRF could no longer provide any form of biosolids, what other product(s) would you use?

Probably Nothing



## Agricultural Survey Questions

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If you have any questions, please call (503) 434-7313. Thank you for your time and participation.

1. Have you been satisfied with McMinnville's biosolids Program in the past?  
Please rank 1-5 with 5 being the highest satisfaction.

5

2. What is the biggest benefit to applying liquid biosolids from McMinnville's Water Reclamation Facility (WRF) to your agricultural land?

Slow release, well-balanced fertilizer.

3. What is your biggest concern with applying liquid biosolids from the WRF to your land?

No concerns at all, and have discussed with neighbors who now understand and agree with use of biosolids.

4. Is there anything that the WRF could do to improve the liquid biosolids we apply to your land?

Bring us more of it!

5. What would be the most likely cause for you to stop accepting liquid biosolids from the WRF?

My own death, though my wife would continue it.

6. If McMinnville's WRF could no longer deliver liquid biosolids for free, would you still be interested if the cost was minimal?  Yes  No

7. Does the odor of the liquid biosolids impact which fields you can apply the WRF biosolids to?  Yes  No

8. Would a less odorous product be beneficial? If Yes, in what way?  Yes  No

It would be fine, but not at all necessary.

9. How many acres do you currently apply the WRF biosolids to?

70+

10. If additional biosolids where available, do you have additional acreage to apply it to?  Yes  No

11. Which of your crops currently receive the WRF biosolids?

All for grass hay.

12. What constituents/characteristics are most important:

Nitrogen  Phosphorus  Potassium  General Soil Conditioning  Late Summer Irrigation

Other: \_\_\_\_\_

13. If the WRF produced a dewatered cake product, would you still be interested in receiving it?  Yes  No

If yes, would this require you to change the timing of when the biosolids was applied?  Yes  No

If yes, would this require you to purchase additional equipment for biosolids application and receiving/temp storage area (bunker)?  Yes  No

14. If the WRF produced a biosolids Compost product, would you still be interested in receiving it?  Yes  No

If yes, would this require you to change the timing of when the biosolids was applied?  Yes  No

If yes, would this require you to purchase additional equipment for biosolids application and receiving/temp storage area (bunker)?  Yes  No

15. If the WRF produced a dried granular product, would you still be interested in receiving it?  Yes  No

If yes, would this require you to change the timing of when the biosolids was applied?  Yes  No

If yes, would this require you to purchase additional equipment for biosolids application and receiving/temp storage area (bunker)?  Yes  No

16. If the WRF could no longer provide any form of biosolids, what other product(s) would you use?

Have to resort to commercial fertilizer every other year, plus lime every 5 years.

### Agricultural Survey Questions

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If you have any questions, please call (503) 434-7313. Thank you for your time and participation.

1. Have you been satisfied with McMinnville's biosolids Program in the past?  
Please rank 1-5 with 5 being the highest satisfaction.

5

2. What is the biggest benefit to applying liquid biosolids from McMinnville's Water Reclamation Facility (WRF) to your agricultural land?

Lessens the cost of commercial fertilizer in the fields that are accessible to the City.

3. What is your biggest concern with applying liquid biosolids from the WRF to your land?

I have no concerns! We put animal manure on our fields every year.

4. Is there anything that the WRF could do to improve the liquid biosolids we apply to your land?

Not that I am aware of.

5. What would be the most likely cause for you to stop accepting liquid biosolids from the WRF?

No reason to stop.

6. If McMinnville's WRF could no longer deliver liquid biosolids for free, would you still be interested if the cost was minimal?  Yes  No

7. Does the odor of the liquid biosolids impact which fields you can apply the WRF biosolids to?  Yes  No

8. Would a less odorous product be beneficial? If Yes, in what way?  Yes  No

9. How many acres do you currently apply the WRF biosolids to?

60

10. If additional biosolids where available, do you have additional acreage to apply it to?  Yes  No

11. Which of your crops currently receive the WRF biosolids?

Hay ground and pasture

12. What constituents/characteristics are most important:

Nitrogen  Phosphorus  Potassium  General Soil Conditioning  Late Summer Irrigation

Other: \_\_\_\_\_

13. If the WRF produced a dewatered cake product, would you still be interested in receiving it?  Yes  No

If yes, would this require you to change the timing of when the biosolids was applied?  Yes  No

If yes, would this require you to purchase additional equipment for biosolids application and receiving/temp storage area (bunker)?  Yes  No

14. If the WRF produced a biosolids Compost product, would you still be interested in receiving it?  Yes  No

If yes, would this require you to change the timing of when the biosolids was applied?  Yes  No

If yes, would this require you to purchase additional equipment for biosolids application and receiving/temp storage area (bunker)?  Yes  No

15. If the WRF produced a dried granular product, would you still be interested in receiving it?  Yes  No

If yes, would this require you to change the timing of when the biosolids was applied?  Yes  No

If yes, would this require you to purchase additional equipment for biosolids application and receiving/temp storage area (bunker)?  Yes  No

16. If the WRF could no longer provide any form of biosolids, what other product(s) would you use?

Our own limited manure supply, and commercial granulated fertilizer.

## Agricultural Survey Questions

The City of McMinnville is evaluating their Biosolids Program and is requesting your feedback on your experience with the current program and your interest in possible changes to its program.

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If you have any questions, please call (503) 434-7313. Thank you for your time and participation.

1. Have you been satisfied with McMinnville's biosolids Program in the past?  
Please rank 1-5 with 5 being the highest satisfaction. \_\_\_\_\_
2. What is the biggest benefit to applying liquid biosolids from McMinnville's Water Reclamation Facility (WRF) to your agricultural land?

Plant nutrients , improved soil condition

3. What is your biggest concern with applying liquid biosolids from the WRF to your land?

Whether or not it would work out, sometimes we could get an application, sometimes we didn't, we couldn't count on it availability.

4. Is there anything that the WRF could do to improve the liquid biosolids we apply to your land?

No complaint

5. What would be the most likely cause for you to stop accepting liquid biosolids from the WRF?

N/A

6. If McMinnville's WRF could no longer deliver liquid biosolids for free, would you still be interested if the cost was minimal?  Yes  No
7. Does the odor of the liquid biosolids impact which fields you can apply the WRF biosolids to?  Yes  No
8. Would a less odorous product be beneficial? If Yes, in what way?  Yes  No

9. How many acres do you currently apply the WRF biosolids to? \_\_\_\_\_

48-60

10. If additional biosolids where available, do you have additional acreage to apply it to?  Yes  No

11. Which of your crops currently receive the WRF biosolids?

Hay crops

12. What constituents/characteristics are most important:

Nitrogen  Phosphorus  Potassium  General Soil Conditioning  Late Summer Irrigation

Other: \_\_\_\_\_

13. If the WRF produced a dewatered cake product, would you still be interested in receiving it?  Yes  No

If yes, would this require you to change the timing of when the biosolids was applied?  Yes  No

If yes, would this require you to purchase additional equipment for biosolids application and receiving/temp storage area (bunker)?  Yes  No

14. If the WRF produced a biosolids Compost product, would you still be interested in receiving it?  Yes  No

If yes, would this require you to change the timing of when the biosolids was applied?  Yes  No

If yes, would this require you to purchase additional equipment for biosolids application and receiving/temp storage area (bunker)?  Yes  No

15. If the WRF produced a dried granular product, would you still be interested in receiving it?  Yes  No

If yes, would this require you to change the timing of when the biosolids was applied?  Yes  No

If yes, would this require you to purchase additional equipment for biosolids application and receiving/temp storage area (bunker)?  Yes  No

16. If the WRF could no longer provide any form of biosolids, what other product(s) would you use?

The summer application of liquid worked well for us, but it has not been available for us for several years, due to scheduling as we can only accept post harvest application and we have not been offered any for a while so we have been using conventional fertilizer.



## Agricultural Survey Questions

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If you have any questions, please call (503) 434-7313. Thank you for your time and participation.

1. Have you been satisfied with McMinnville's biosolids Program in the past?  
Please rank 1-5 with 5 being the highest satisfaction.

5

2. What is the biggest benefit to applying liquid biosolids from McMinnville's Water Reclamation Facility (WRF) to your agricultural land?

Fertilization

3. What is your biggest concern with applying liquid biosolids from the WRF to your land?

None really - not getting as much as we want to cover more acres

4. Is there anything that the WRF could do to improve the liquid biosolids we apply to your land?

Have more of it

5. What would be the most likely cause for you to stop accepting liquid biosolids from the WRF?

Neighbors complaining - so far this has never happened in this many years

6. If McMinnville's WRF could no longer deliver liquid biosolids for free, would you still be interested if the cost was minimal?  Yes  No  
→ few dollars per acre ~~but~~ no more

7. Does the odor of the liquid biosolids impact which fields you can apply the WRF biosolids to?  Yes  No

8. Would a less odorous product be beneficial? If Yes, in what way?  Yes  No

people less likely to complain

9. How many acres do you currently apply the WRF biosolids to? as much as they will give us which is typically 80-150 acres



10. If additional biosolids were available, do you have additional acreage to apply it to?  Yes  No

11. Which of your crops currently receive the WRF biosolids?

Grass Seed

12. What constituents/characteristics are most important:

Nitrogen  Phosphorus  Potassium  General Soil Conditioning  Late Summer Irrigation

Other: thin light material so when we apply chemicals our weed control is good

13. If the WRF produced a dewatered cake product, would you still be interested in receiving it?  Yes  No

If yes, would this require you to change the timing of when the biosolids was applied?  Yes  No

If yes, would this require you to purchase additional equipment for biosolids application and receiving/temp storage area (bunker)?  Yes  No

14. If the WRF produced a biosolids Compost product, would you still be interested in receiving it?  Yes  No

If yes, would this require you to change the timing of when the biosolids was applied?  Yes  No

If yes, would this require you to purchase additional equipment for biosolids application and receiving/temp storage area (bunker)?  Yes  No

15. If the WRF produced a dried granular product, would you still be interested in receiving it?  Yes  No

If yes, would this require you to change the timing of when the biosolids was applied?  Yes  No

If yes, would this require you to purchase additional equipment for biosolids application and receiving/temp storage area (bunker)?  Yes  No

16. If the WRF could no longer provide any form of biosolids, what other product(s) would you use?

Commercial fertilizer

## Agricultural Survey Questions

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1. Have you been satisfied with McMinnville's biosolids Program in the past?  
Please rank 1-5 with 5 being the highest satisfaction. \_\_\_\_\_ 4
2. What is the biggest benefit to applying liquid biosolids from McMinnville's Water Reclamation Facility (WRF) to your agricultural land?

Potassium, PH level of the liquid, Organic material, nitrogen for the grass in late summer

3. What is your biggest concern with applying liquid biosolids from the WRF to your land?

Contamination of the land with micro plastics, antibiotics and other man made ingredients not destroyed in the digestive and heat process that could have long term problems not immediately recognized. The trucks are to large sometimes for the early spring application.

4. Is there anything that the WRF could do to improve the liquid biosolids we apply to your land?

Increase testing of additional potential hazards possibly present in the material

5. What would be the most likely cause for you to stop accepting liquid biosolids from the WRF?

Continued unknown potential hazardous ingredients in the product that creates concern of long term negative effects on our land, change in our crop rotation, reduction of class level of the biosolid

6. If McMinnville's WRF could no longer deliver liquid biosolids for free, would you still be interested if the cost was minimal?  Yes  No

7. Does the odor of the liquid biosolids impact which fields you can apply the WRF biosolids to?  Yes  No

8. Would a less odorous product be beneficial? If Yes, in what way?  Yes  No

Would allow application in locations that minimize the objections by surrounding population

9. How many acres do you currently apply the WRF biosolids to? \_\_\_\_\_ 60-80



10. If additional biosolids where available, do you have additional acreage to apply it to?  Yes  No

11. Which of your crops currently receive the WRF biosolids?

clover and grass seed

12. What constituents/characteristics are most important:

Nitrogen  Phosphorus  Potassium  General Soil Conditioning  Late Summer Irrigation

Other: \_\_\_\_\_

13. If the WRF produced a dewatered cake product, would you still be interested in receiving it?  Yes  No

If yes, would this require you to change the timing of when the biosolids was applied?  Yes  No

If yes, would this require you to purchase additional equipment for biosolids application and receiving/temp storage area (bunker)?  Yes  No

14. If the WRF produced a biosolids Compost product, would you still be interested in receiving it?  Yes  No

If yes, would this require you to change the timing of when the biosolids was applied?  Yes  No

If yes, would this require you to purchase additional equipment for biosolids application and receiving/temp storage area (bunker)?  Yes  No

15. If the WRF produced a dried granular product, would you still be interested in receiving it?  Yes  No

If yes, would this require you to change the timing of when the biosolids was applied?  Yes  No

If yes, would this require you to purchase additional equipment for biosolids application and receiving/temp storage area (bunker)?  Yes  No

16. If the WRF could no longer provide any form of biosolids, what other product(s) would you use?

Commercial nutrients

**Memorandum 3**  
**Evaluation of Biosolids Treatment Alternatives**



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**Subject:** Evaluation of Biosolids Treatment Alternatives

**Project Name:** McMinnville Water Reclamation Facility Biosolids Storage Tank and Grit System Expansion

**Prepared For:** City of McMinnville

**Prepared By:** Jacobs Engineering Group

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## 1. Introduction

The current biosolids product at the Water Reclamation Facility (WRF) is liquid Class A biosolids that are land applied locally. Liquid biosolids are stored in the biosolids storage tank from approximately October through April and are hauled by a third-party contractor from May through September. The 2009 City of McMinnville Water Reclamation Facilities Plan (2009 Facilities Plan) (West Yost Associates and CH2M HILL, 2009) anticipated that the WRF solids treatment system would reach capacity due to increased influent loads resulting from growth of the City. The 2009 Facilities Plan recommended Alternative "SM2 ATAD Treatment and Dewatering Stabilization." This alternative called for continued use of the autothermal thermophilic aerobic digestion (ATAD) process up to the capacity of the existing process, construction of a parallel process including dewatering, sludge stabilization, and storage for treatment of additional sludge volume. The resulting Capital Improvements Plan recommended staged implementation of an additional biosolids storage tank, dewatering and cake storage, followed by a parallel sludge stabilization process.

As indicated in Memorandum 1, Evaluation of Existing Conditions, the existing ATAD process is approaching its treatment capacity. Additionally, while biosolids are stored in the biosolids storage tank, liquid must be decanted to allow additional storage of produced biosolids during the storage period of the year. The limited ATAD solids processing capacity and biosolids storage capacity show the WRF solids treatment process requires improvements. Based on input from the City, solids treatment processes were evaluated to either expand the existing ATAD process or replace the existing ATAD process, versus solids treatment processes that would operate in parallel that is, together) with the existing ATAD process. The City prefers to operate only a single solids treatment process versus two parallel solids treatment processes.

One critical consideration related to improvement alternatives is the WRF's current limitation of producing a single biosolids product with a single end use. The WRF desires flexibility to adjust the end use should an issue arise with local land application of the liquid Class A biosolids. Offsite end uses/disposal alternatives were evaluated with the following products/end uses short-listed: current liquid product with local land



application (baseline), low-odor liquid product with local land application, dewatered product with local land application, compost product with direct distribution to consumer, and dried product with direct distribution to consumer. Reference Memorandum 2, Evaluation of Offsite Biosolids End Use/Disposal Alternatives.

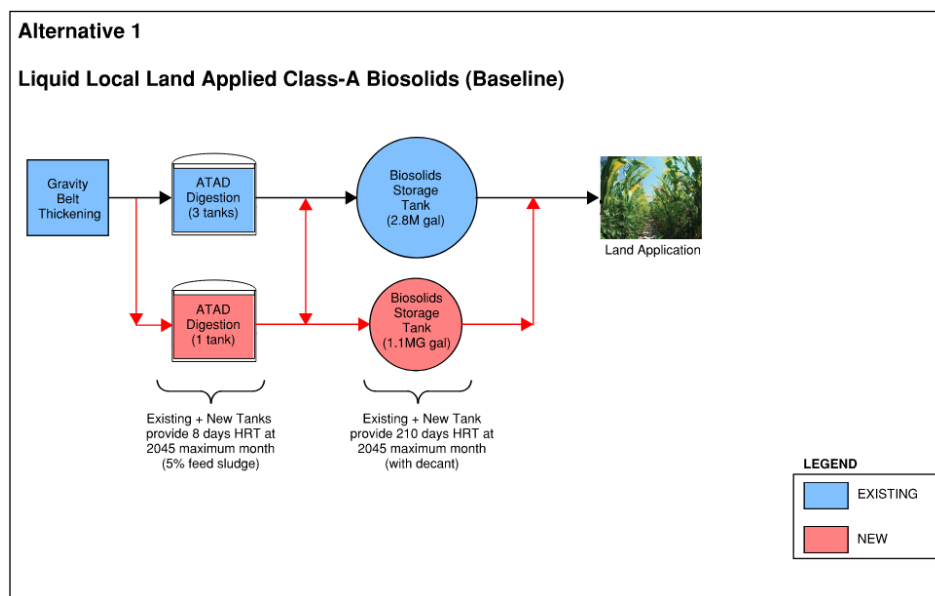
This memorandum describes the evaluation of treatment alternatives producing the short-listed biosolids products. Non-monetary criteria were developed, weighted against each other, and then used to score the biosolids treatment alternatives. Conceptual capital, annual, and net present value costs were developed for the short-listed biosolids treatment alternatives, resulting in a cost and non-monetary ranking comparison for the short-listed biosolids treatment alternatives.

## 2. Evaluation of Biosolids Treatment Alternatives

### 2.1 Alternatives Considered

Biosolids treatment alternatives considered in the evaluation are described below with process flow diagrams included for each and included for reference in Attachment 1.

#### Alternative 1 – Liquid Local Land Applied Class A Biosolids (Baseline)

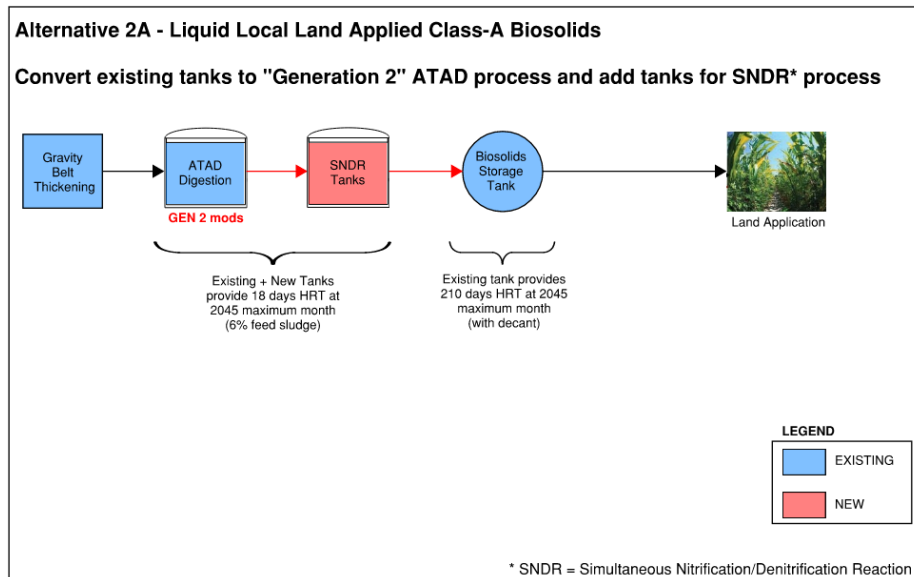


- Retains and expands the existing autothermal thermophilic aerobic digestion (ATAD) solids process:
  - Upgrade the existing mixing systems.
  - Add motor-operated valves to automate tank feeding process.
- Add tankage and equipment to provide processing capacity equal to year 2045 maximum month solids production.
- Tanks would provide overall solids retention time (SRT) of 8 days at maximum month sludge production at 5 percent sludge feed solids concentration:
  - Requires a new 67,000-gallon ATAD tank to match the existing tanks.
  - Has a 35-foot diameter by 13-foot depth.

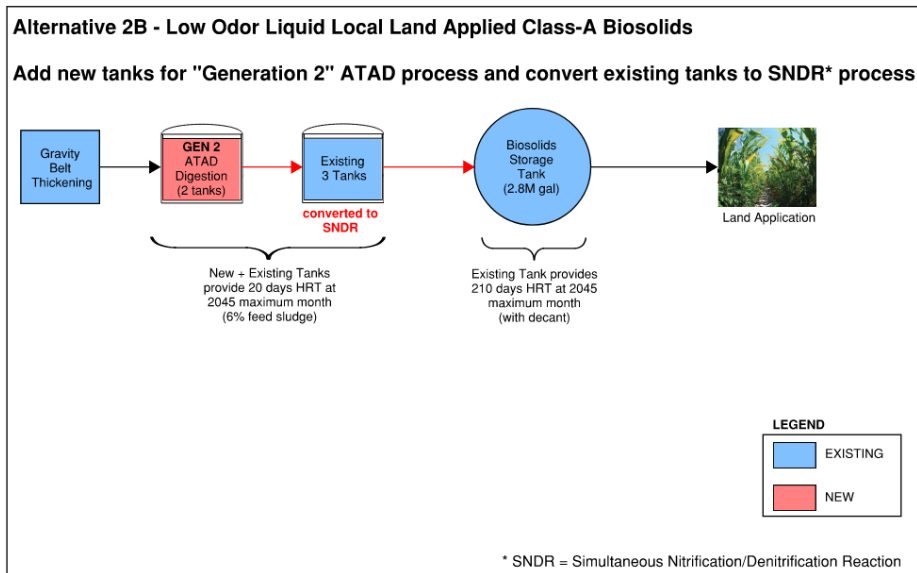
- Add a 1.1-million-gallon biosolids storage tank to provide additional storage capacity as well as redundancy to the existing biosolids storage tank:
  - 210-day SRT combined between existing and new tank with decant in use.
- Based on “Generation 1” ATAD process, biosolids will be odorous, similar to the currently produced biosolids product.

Alternative 2 – Low Odor Liquid Local Land Applied Class A Biosolids

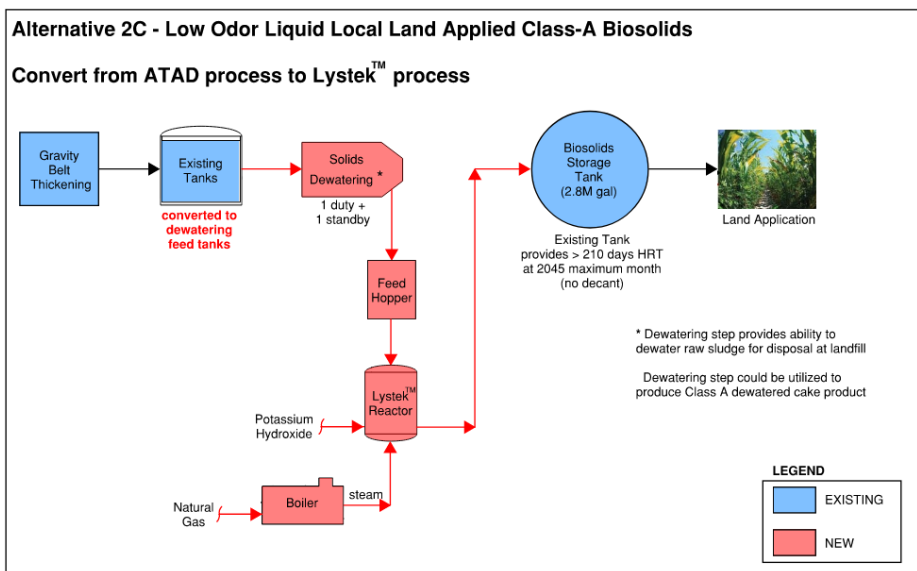
- 2A – Convert existing ATAD tanks to “Generation 2” ATAD process and add tank(s) for simultaneous nitrification/denitrification reaction (SNDR).



- New and retrofitted tanks would provide overall SRT of 18 days at maximum month sludge production at 6 percent sludge feed solids concentration.
- New and retrofitted tanks are fitted with jet mixing/aeration system to handle 6 percent feed solids concentration.
- Existing biosolids storage tank provides 210-day SRT with decant in use, based on thicker sludge feed concentration.
- 2B – Add tank(s) for “Generation 2” ATAD process and convert existing tanks to SNDR tanks.



- New and retrofitted tanks would provide overall SRT of 20 days at maximum month sludge production at 6 percent sludge feed solids concentration.
  - New and retrofitted tanks are fitted with jet mixing/aeration system to handle 6 percent feed solids concentration.
  - Existing biosolids storage tank provides 210-day SRT with decant in use, based on thicker sludge feed concentration.
- 2C – Convert from ATAD process to Lystek process.

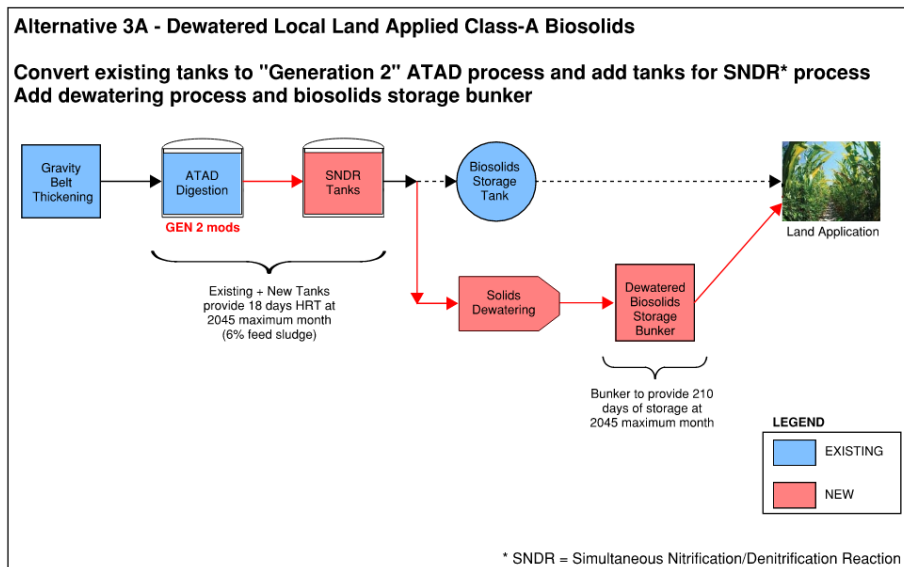


- Reuse existing ATAD tanks as dewatering feed tanks.
- Add pre-dewatering centrifuges and Lystek process in a new building.
- Lystek process uses high shear mixing, steam, and potassium hydroxide to thermally/chemically hydrolyze the solids, producing a high solids concentration liquid Class A biosolids.

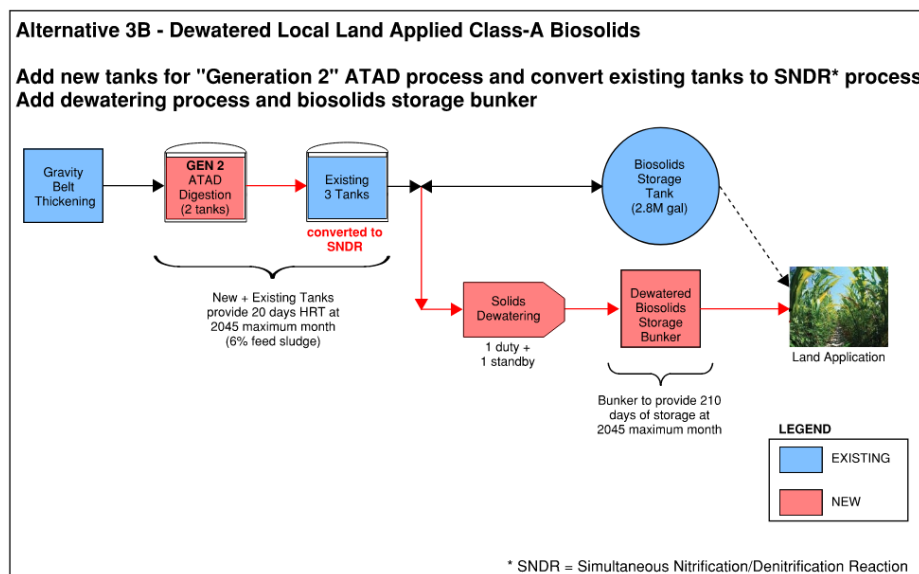
- Approximate 15 percent solids biosolids are produced that are homogenous and pumpable with lower than normal thixotropic properties facilitating pumping.
- Existing biosolids storage tank provides significantly greater than 210-day SRT, with no decant, based on the 15 percent solids concentration biosolids product.

Alternative 3 – Dewatered Local Land Applied Class A Biosolids

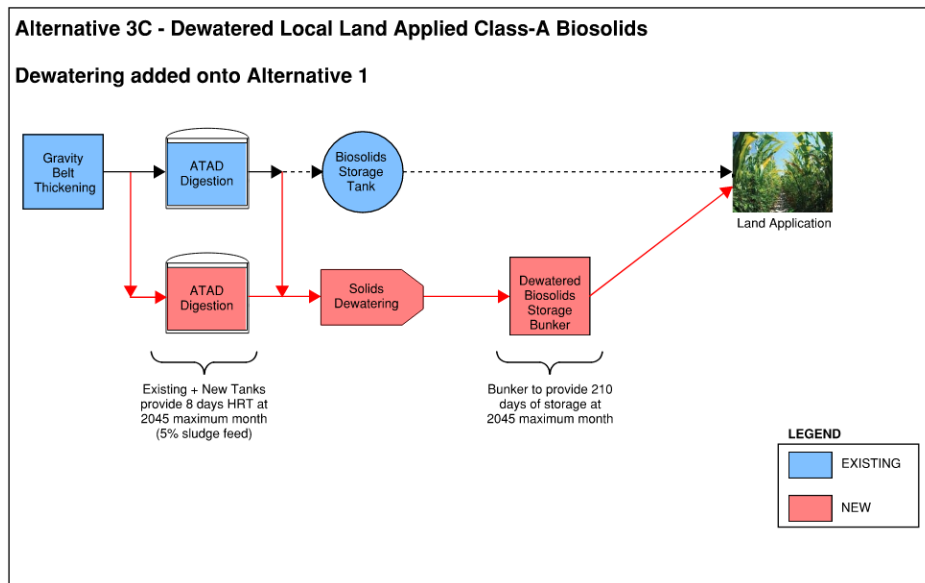
- 3A – Alternative 2A with added biosolids dewatering in a new building, dewatered cake storage bunker (7 months), and retaining liquid product with storage in the existing biosolids storage tank until full.



- 3B – Alternative 2B with added biosolids dewatering in a new building and dewatered cake storage bunker (7 months)

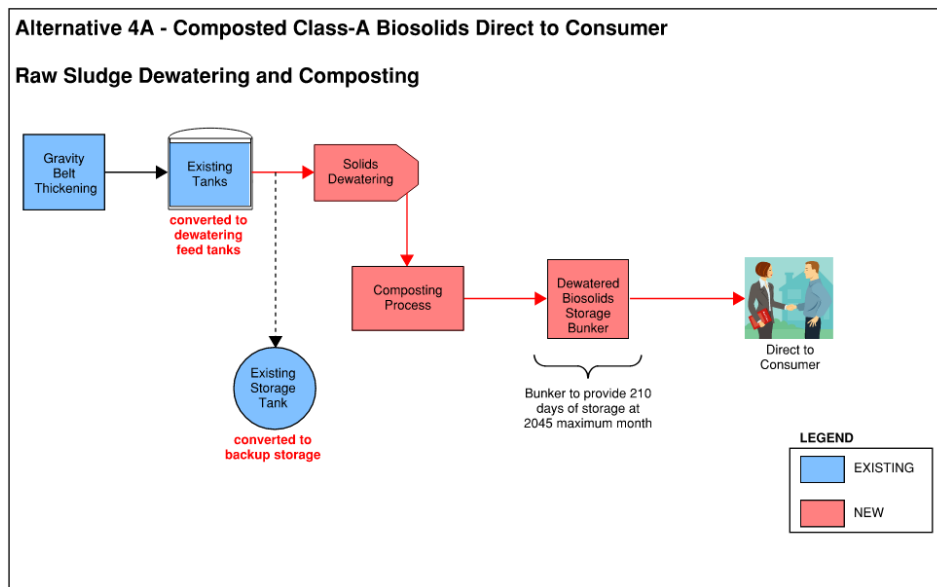


- 3C – Alternative 1 with added biosolids dewatering and storage bunker in a new building and dewatered cake storage bunker (7 months). No additional biosolids storage tank required.



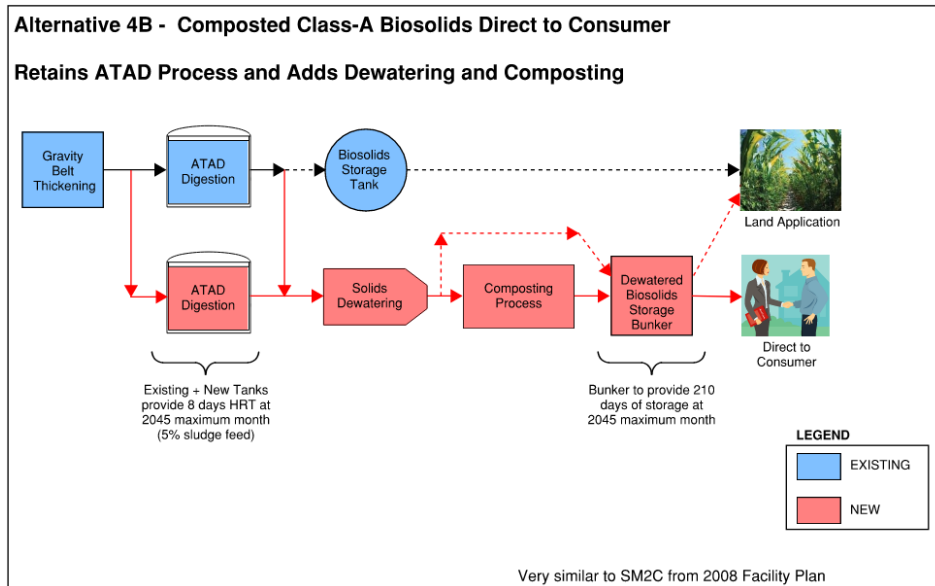
**Alternative 4 – Composted Class A Biosolids**

- 4A – Raw sludge dewatering, cake handling, and composting facility.



- Existing ATAD tanks converted to dewatering feed tanks.
- Existing biosolids storage tank reused for backup liquid storage.
- Add dewatering centrifuges and composting process.
- Add composted biosolids storage bunker to provide 210 days of storage.

- 4B – ATAD process with dewatering, cake handling, and composting facility.

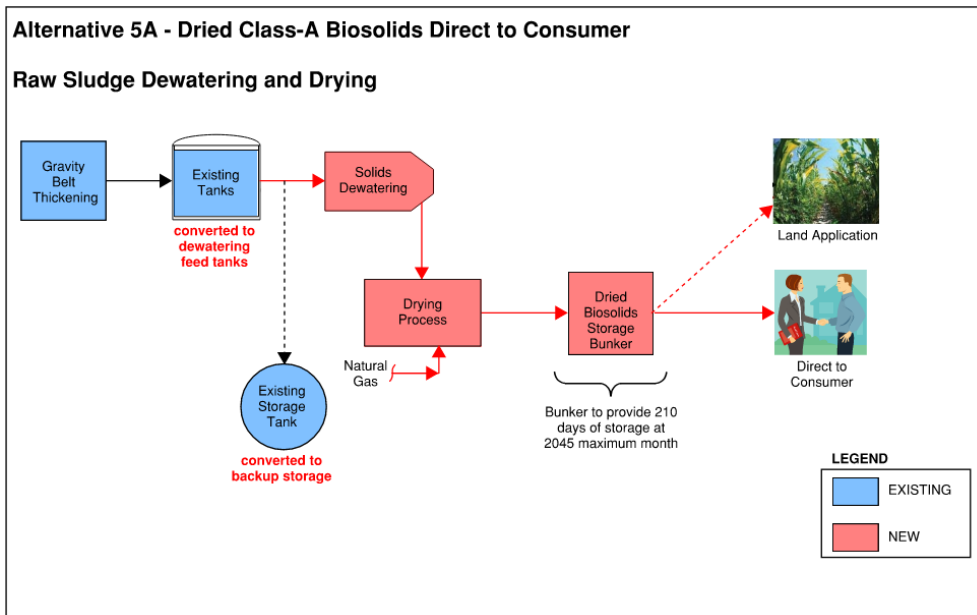


- Existing ATAD tanks retained.
- Add new ATAD tank(s) to provide 8-day SRT at 2045 maximum month flows.
- Existing biosolids storage tank reused for backup liquid storage.
- Add dewatering centrifuges and composting process.
- Add composted biosolids storage bunker to provide 210 days of storage.
- This option very similar to Alternative SM2C from the 2009 Facilities Plan.

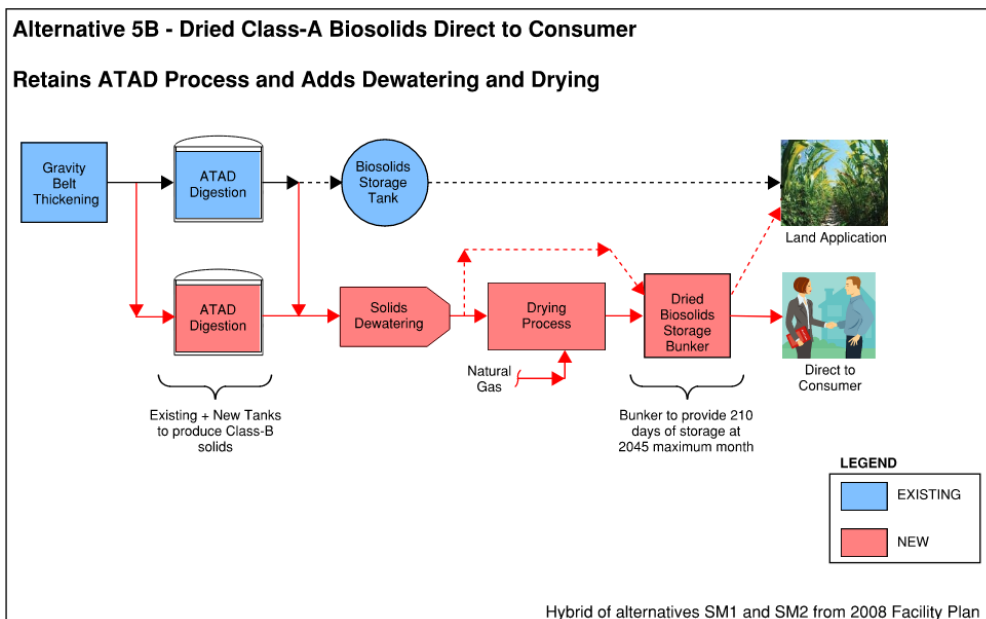
#### Alternative 5 – Dried Class A Biosolids

- 5A – Raw sludge dewatering, drying, storage and truck loading facility.



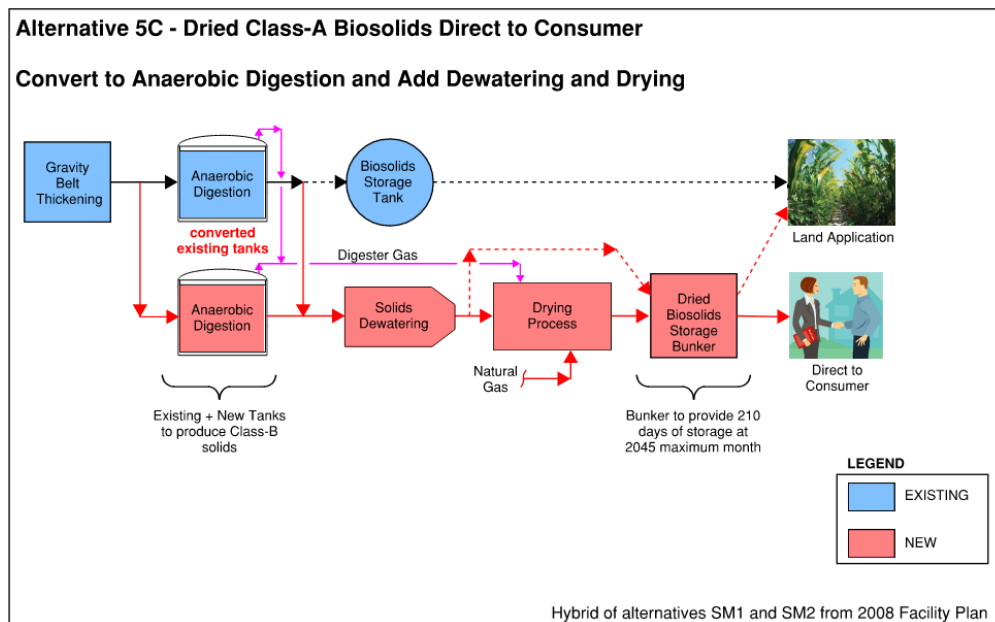


- Existing ATAD tanks reused as dewatering feed tanks.
- Existing biosolids storage tank reused for backup liquid storage.
- Add dewatering centrifuges and natural gas-fired drying process.
- Add dried biosolids storage bunker to provide 210 days of storage.
- 5B – ATAD process with dewatering, drying, storage, and truck loading facility.

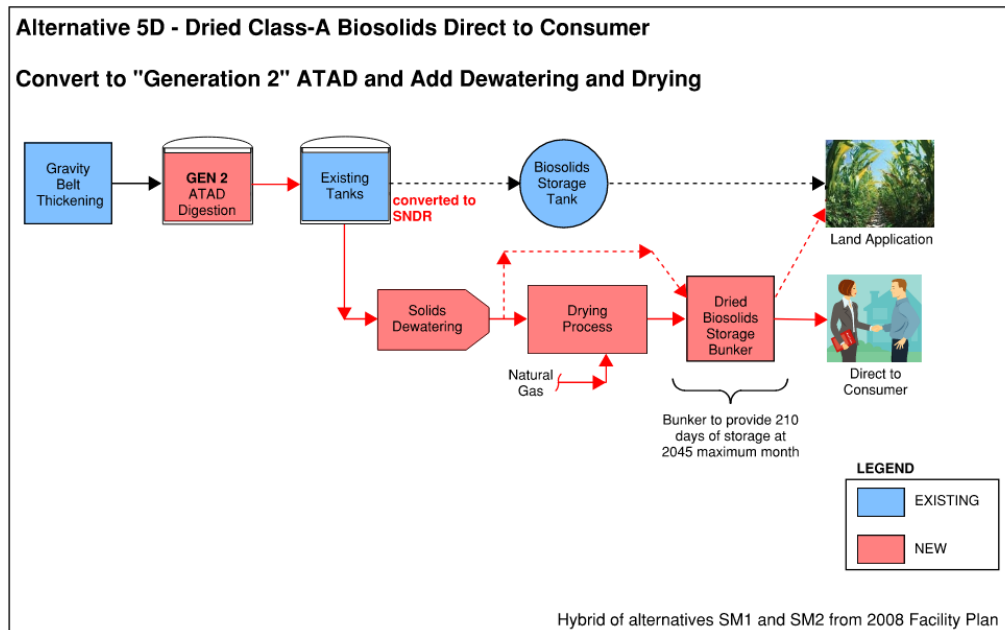


- Existing ATAD tanks retained.
- Add new ATAD tank(s) to produce Class B biosolids. (Since the subsequent drying process would provide a Class A product, the new ATAD tank(s) would only need to produce a Class B product.)

- Existing biosolids storage tank reused for backup liquid storage.
  - Add dewatering centrifuges and natural gas-fired drying process.
  - Add dried biosolids storage bunker to provide 210 days of storage.
  - This option is a hybrid of Alternatives SM1 and SM2 from the 2009 Facilities Plan.
- 5C – Anaerobic digestion with dewatering, drying, storage, and truck loading facility.



- Convert existing ATAD tanks to anaerobic digesters.
  - Add new anaerobic digesters to produce Class B biosolids.
  - Existing biosolids storage tank reused for backup liquid storage.
  - Add dewatering centrifuges and digester gas/natural gas-fired drying process.
  - Add dried biosolids storage bunker to provide 210 days of storage.
  - This option is a hybrid of Alternatives SM1 and SM2 from the 2009 Facilities Plan.
- 5D – Generation 2 ATAD process with dewatering, drying, storage, and truck loading facility.



- Add new tanks for Generation 2 ATAD process.
- Convert existing tanks to SNDR function.
- Existing biosolids storage tank reused for backup liquid storage.
- Add dewatering centrifuges and natural gas-fired drying process
- Add dried biosolids storage bunker to provide 210 days of storage.
- This option is a hybrid of Alternatives SM1 and SM2 from the 2009 Facilities Plan.

## 2.2 Preliminary Screening of Alternatives

The alternatives were reviewed with the City and resulted in the following decisions:

- **Three alternatives were carried forward that produce Class A liquid products for local land application:**
  - Alternative 1 – Expand the existing ATAD process (baseline) and add new biosolids storage tank.
  - Alternative 2B – Convert to Generation 2 ATAD process, adding new tanks for ATAD and retrofitting the existing ATAD tanks to serve the SNDR function.
  - Alternative 2C – Convert to the Lystek process, which includes dewatering raw sludge ahead of the Lystek process; retrofit existing ATAD tanks to serve as dewatering feed tank and processed biosolids tank.
- **One alternative was carried forward that produces a Class A dewatered product for local land application:**
  - Alternative 3B – Convert to Generation 2 ATAD process (Alternative 2B) and add dewatering in a new building and dewatered biosolids storage.
- **The following alternatives were eliminated:**

- Alternative 2A – Convert to Generation 2 ATAD process, retrofitting the existing ATAD tanks, adding a new ATAD tank, and adding a new tank for SNDR function.
  - Eliminated due to higher cost and being more difficult to implement compared to Alternative 2B due to required phased construction.
- Alternative 3A – Dewatering added to Alternative 2A.
  - Eliminated because Alternative 2A was eliminated.
- Alternative 3C – Dewatering added to Alternative 1.
  - Eliminated because this alternative would entail significant costs without improving the odor profile of the biosolids product, with risk of losing local land application.
- Alternative 4A – Raw sludge dewatering and composting.
  - Eliminated due to odor risks and because composting of raw municipal wastewater sludge has historically not been accepted by the public.
- Alternative 4B – ATAD process with dewatering and composting facility.
  - Eliminated due to negative feedback from the local yard waste composting facility, Recology, regarding odor and marketing risks for a combined yard waste/Class A municipal biosolids compost product.
- Alternatives 5A, 5B, 5C, and 5D for producing dried Class A biosolids.
  - Eliminated for various reasons but overall due to high energy consumption, high capital cost, and high labor commitment to this mechanically intense process.
  - Although drying was eliminated as a standalone alternative, drying could be added to the eventually selected alternative if long-distance land application became required.

## 2.3 Monetary Evaluation

Four alternatives were carried forward for life cycle monetary evaluation. For each alternative, preliminary equipment selections and quotations were developed and preliminary facility layouts were developed so that facility construction costs could be estimated. Preliminary site plans were developed and are included in Attachment 2. Note that the layouts are conceptual and intended to capture the general shape and footprint for each alternative. The actual site layout for the selected alternative will be developed in the next design phase.

The cost estimating approach included allowance factors, equipment factors, and other parametric models. The estimate should be considered a Class 5 estimate, with an expected accuracy range of -20 percent to -50 percent lower and +30 percent to +100 percent higher than reported. Cost estimates are judged sufficient for comparison of alternatives but should not be relied upon for project budgeting purposes.

Equipment sizing and facility layouts were developed based on the 2020 to 2045 solids loading projections presented in Memorandum 1, Evaluation of Existing Conditions. Operations and maintenance (O&M) costs were estimated based on the solids loading projections and the present worth costs calculated for the 25-year period. O&M costs are separated into "onsite" costs associated with processing of the biosolids and "offsite" costs associated with hauling of the biosolids to the land application site.

Monetary evaluation summary sheets are included in Attachment 3.

### 2.3.1 Cost Assumptions

The following cost assumptions were used in the monetary evaluation:

- Allowance of \$225 per square foot of facility footprint included for ground improvements to mitigate ground deformations:
  - Applied to new tanks, buildings, and biosolids storage tanks
  - Not applied to new dewatered biosolids storage bunkers
  - Not applied to new biofilter pad
- Present worth factor based on:
  - 2.0 percent discount rate
  - 2.5 percent inflation rate
  - 25-year evaluation period
- No salvage value at the end of the evaluation period
- Operations labor of 0.5 full-time-equivalent (FTE) for liquid biosolids product alternatives and 0.75 FTE for dewatered biosolids product alternatives
- Maintenance labor of 0.5 FTE for liquid biosolids product alternatives and 0.75 FTE for dewatered biosolids product alternatives
- O&M hourly burdened rate of \$50 per hour
- Equipment maintenance cost included as 3 percent of equipment cost per year
- Electricity cost of \$0.06 per kilowatt-hour
- Natural gas cost of \$0.60 per therm
- Polymer cost of \$2.00 per active pound
- Potassium hydroxide cost of \$0.325 per pound based on full tanker delivery quotation from NorthStar Chemical
- Liquid haul cost based on \$200,000 annual cost to haul 5.3 million gallons in 2020
- Dewatered haul cost based on 36,000-pound capacity per truck and \$250 per truck trip

### 2.3.2 Monetary Evaluation Summary

During the progress updates, the City requested that a dewatered product alternative based on the Lystek process be included. This alternative is labelled as Alternative 3D and includes the addition of dewatering centrifuges, cake conveyance, and dewatered biosolids storage bunker.

Table 2-1 summarizes the monetary evaluation.

Alternative 1 continues the existing "Generation 1" ATAD process and has the lowest total present worth cost of the alternatives. Alternative 1 has the lowest project cost at \$13.6 million, lowest onsite O&M cost, but the highest offsite O&M cost. Alternative 1 has the lowest total present worth cost at \$25.2 million. Significant cost for ground improvements is included given the relatively large footprint of the biosolids storage tank compared to the smaller footprint of support buildings in other alternatives.

Alternative 2B converts to the “Generation 2” ATAD process to produce a low odor liquid biosolids product. Project cost for Alternative 2B is \$15.5 million, slightly above Alternative 1. Project cost is driven by the new ATAD tanks and support building. Project cost is near Alternative 1 due to Alternative 2B avoiding the cost of a new biosolids storage tank based on an average raw sludge feed concentration of 6 percent dry solids to ATAD. Alternative 2B has a similar total O&M cost to Alternative 1 with higher onsite O&M costs but lower offsite O&M costs. Alternative 2B total present worth cost is the second lowest of the five alternatives at \$27.6 million.

Alternative 2C converts to the Lystek process to produce a high solids, low odor liquid biosolids product. Alternative 2C project cost is in the middle of the five alternatives at \$17.8 million, driven by the relatively small process building footprint and no biosolids storage tank. Due to the dewatering step prior to the Lystek process, there is a substantial reduction in the volume of the biosolids product (approximately 15 percent solids content), and no additional biosolids storage tank is required to meet the storage criteria. The reduction in volume also significantly reduces the offsite O&M cost, which is one half the offsite O&M cost of Alternative 1. However, due to the cost for dewatering polymer and natural gas for steam and potassium hydroxide for the Lystek process, Alternative 2C has a significantly higher onsite O&M cost. Alternative 2C total present worth cost is in the middle of the five alternatives at \$33.3 million.

Alternative 3B adds dewatering, cake conveyance, and cake bunker storage onto the Generation 2 ATAD process of Alternative 2B. Due to the cake storage, a new biosolids storage tank is not needed. Project cost for Alternative 3B is the second highest of the five alternatives at \$25.3 million. Project cost is driven by the new ATAD tanks and support building and the dewatering building and cake storage bunkers. Onsite O&M costs are significantly higher than Alternatives 1 and 2B due to dewatering polymer and the extra O&M labor for the dewatering process. However, Alternative 3B has the lowest offsite O&M cost due to hauling dewatered product instead of a liquid product. Alternative 3B total present worth cost is the second highest at \$38.9 million.

Alternative 3D adds dewatering, cake conveyance, and cake bunker storage onto the Lystek process of Alternative 2C. Alternative 3D has the highest project cost at \$27.0 million. Alternative 3D also has the highest onsite O&M cost, driven by the Lystek and dewatering chemical usage and the extra O&M labor for the dewatering process. Alternative 3D total present worth cost is the highest at \$46.7 million.



Table 2-1. Biosolids Treatment Alternatives Monetary Evaluation Summary

	Alternative 1 Expand Existing ATAD	Alternative 2B Generation 2 ATAD	Alternative 2C Lystek™ Process	Alternative 3B Gen 2 ATAD + Dewatering	Alternative 3D Lystek™ + Dewatering
<b>PROJECT COSTS</b>					
New Facilities and Equipment	\$4,580,000	\$4,710,000	\$5,130,000	\$7,780,000	\$8,030,000
Construction Markups	\$1,780,000	\$2,580,000	\$3,250,000	\$4,080,000	\$4,650,000
Contractor Markups and Contingency	\$4,060,000	\$4,640,000	\$5,340,000	\$7,570,000	\$8,070,000
<b>TOTAL CONSTRUCTION COSTS</b>	<b>\$10,420,000</b>	<b>\$11,930,000</b>	<b>\$13,720,000</b>	<b>\$19,430,000</b>	<b>\$20,750,000</b>
Non-Construction Costs	\$3,130,000	\$3,580,000	\$4,120,000	\$5,830,000	\$6,230,000
<b>TOTAL PROJECT COST</b>	<b>\$13,550,000</b>	<b>\$15,510,000</b>	<b>\$17,840,000</b>	<b>\$25,260,000</b>	<b>\$26,980,000</b>
<b>ONSITE ANNUAL O&amp;M ITEMS</b>					
Operations Labor	\$52,000	\$52,000	\$52,000	\$78,000	\$78,000
Maintenance Labor	\$52,000	\$52,000	\$52,000	\$78,000	\$78,000
Equipment Maintenance <sup>a</sup>	\$62,000	\$71,000	\$104,000	\$136,000	\$133,000
Electrical Cost	\$39,000	\$92,000	\$37,000	\$98,000	\$38,000
Natural Gas Cost	\$0	\$0	\$14,000	\$0	\$14,000
Dewatering Polymer Cost	\$0	\$0	\$83,000	\$54,000	\$189,000
Potassium Hydroxide Cost	\$0	\$0	\$124,000	\$0	\$124,000
Total of Annual O&M Items	\$205,000	\$267,000	\$466,000	\$444,000	\$654,000
<b>TOTAL PRESENT WORTH OF ONSITE ANNUAL O&amp;M ITEMS <sup>b</sup></b>	<b>\$5,470,000</b>	<b>\$7,130,000</b>	<b>\$12,440,000</b>	<b>\$11,860,000</b>	<b>\$17,460,000</b>
<b>OFFSITE ANNUAL O&amp;M ITEMS</b>					
Biosolids Hauling & Disposal	\$233,000	\$186,000	\$114,000	\$66,000	\$85,000
<b>PRESENT WORTH OF OFFSITE O&amp;M ITEMS <sup>b</sup></b>	<b>\$6,220,000</b>	<b>\$4,970,000</b>	<b>\$3,040,000</b>	<b>\$1,760,000</b>	<b>\$2,270,000</b>
Salvage Value <sup>c</sup>	\$0	\$0	\$0	\$0	\$0
<b>TOTAL PRESENT WORTH</b>	<b>\$25,240,000</b>	<b>\$27,610,000</b>	<b>\$33,320,000</b>	<b>\$38,880,000</b>	<b>\$46,710,000</b>

Notes:

<sup>a</sup> 3 percent of equipment cost per year.<sup>b</sup> Present worth factor applied to annual O&M costs based on discount rate, inflation rate, and evaluation period.<sup>c</sup> Assumes no salvage value at the end of the evaluation period.

## 2.4 Non-monetary Criteria

The biosolids treatment alternatives were evaluated against one another based on non-monetary criteria. Non-monetary criteria match those used in the 2009 Facilities Plan plus two additional criteria added based on a workshop with the City. Prior to scoring the alternatives, the non-monetary criteria were compared or "force-ranked" against one another, resulting in a weighting factor for each criterion. Table 2-2 lists the non-monetary criteria and their definitions and weighting factors. Local safety/health/odor/noise generation, expandability for future needs, and equipment reliability were determined to carry the highest weighting factors.

**Table 2-2. Biosolids Treatment Alternatives Non-Monetary Evaluation Criteria**

Criteria	Definition	Weighting Factor
Equipment Reliability	This criterion is used to evaluate the reliability of the onsite solids processing facilities and equipment. It encompasses issues such as equipment reliability, planned downtime, and consistent operation of equipment. For this analysis, reliability is defined as the tendency for minimal failure resulting in downtime.	17.1%
Level of Operational Complexity	This criterion applies to the overall complexity for operation of the solids processing equipment for WRF staff. It includes the amount of training needed to operate the equipment and the number and complexity of mechanical equipment.	14.3%
Level of Maintenance Complexity	This criterion addresses the complexity of maintenance (that is, the number of parts involved and the number of specialized equipment and steps needed to perform the work) to keep the equipment process running properly and efficiently. It includes regular preventative maintenance, as well as unscheduled emergency efforts.	11.4%
Footprint/Onsite Land Requirements	This criterion addresses the overall footprint and onsite land requirements for the solids processing facilities. Larger facility footprints will require more expensive foundations. Land also represents a lost opportunity for future WRF expansion. The larger the footprint, the lower the score.	5.7%
Sustainability	This qualitative criterion is used to evaluate the overall sustainability of the solids processing alternatives with regard to energy consumption, carbon footprint, and production of greenhouse gases (GHG), including polymer delivery and biosolids hauling.	2.9%
Local Safety/Health/Odor Generation/Noise	This criterion is a measure of the local operating environment in the solids processing area (that is, how much odor and noise generation is anticipated – worker exposure). It is assumed that foul air will be captured and processed through odor treatment.	20.0%
Expandability or "Phase-Ability" for Future Needs	The ability to implement the initial solids processing facilities with the flexibility to phase or expand the facilities in the future. The more "phaseable" the alternative, the higher the score.	20.0%
Resiliency	This criterion is a measure of how resilient the alternative is with respect to large seismic events (that is, will the solids processing system be serviceable after a large seismic event). The more an alternative will be serviceable, the higher the score.	8.6%

## 2.5 Scoring of Alternatives for Non-monetary Criteria

The next part of the non-monetary evaluation involved comparing each biosolids treatment alternative against one another with a scale of 1 to 5. Scores/ranking were defined as follows:

- 5 – significantly greater benefits
- 4 – greater benefits
- 3 – neutral or equal benefits
- 2 – fewer benefits
- 1 – significantly fewer benefits

Table 2-3 shows the relative scores that each alternative received for each criterion and notes that contributed to the scoring. Alternative 3D is missing from the table because the alternative did not exist when the non-monetary evaluation was performed.

Table 2-3. Biosolids Treatment Alternatives Non-Monetary Evaluation Criteria

Criteria	Alt 1 Expand Existing ATAD	Alt 2B Gen 2 ATAD	Alt 2C Lystek Process	Alt 3B Gen 2 ATAD + Dewatering	Notes
Equipment Reliability	2	4	3	4	Gen 2 ATAD includes only pumps and blowers. Existing ATAD is old and near the end of its service life. Lystek equipment is in the middle with low pressure steam and chemical and dewatering equipment.
Level of Operational Complexity	4	3	1	2	Existing ATAD has operator familiarity and ease of operation. Gen 2 ATAD is similar but more complex. Gen 2 ATAD + Dewatering is more complex with added centrifuges. Lystek is the most complex, with steam and chemical systems and is generally new to the plant.
Level of Maintenance Complexity	3	4	2	3	Existing ATAD and Gen 2 ATAD are similar and have the least maintenance. Gen 2 ATAD + Dewatering scored next highest due to centrifuge equipment. Lystek scored lowest due to the dewatering equipment, steam boiler, and chemical addition.
Footprint/Onsite Land Requirements	2	2	5	2	Lystek has the best ranking given its small footprint compared to the other alternatives.
Sustainability	4	3	3	3	Existing ATAD has the least amount of energy consumption. Other alternatives are similar with regard to sustainability.
Local Safety/Health/Odor Generation/Noise	2	3	2	4	Gen 2 ATAD + Dewatering should be safer with fewer truck trips and low odor. Gen 2 ATAD is in the middle. Existing ATAD has the most truck trips and most odor. Lystek has chemical system and associated chemical deliveries.
Expandability or "Phase-Ability" for Future Needs	2	4	2	5	Gen 2 ATAD and Gen 2 ATAD + Dewatering seen as most phaseable, aided by increased volatile solids destruction of Gen 2 ATAD. Expanding existing ATAD and Lystek not phaseable.
Resiliency	1	3	3	4	Gen 2 ATAD + Dewatering includes all new structures. Gen 2 ATAD and Lystek use less resilient existing biosolids storage tank. Existing ATAD the least resilient based on all existing tankage.

The score for each alternative was calculated by multiplying the score for each criterion by the associated weighting factor. For example, Alternative 2B received a score of 4 for the expandability for future needs criterion multiplied by the criterion’s weighting factor of 20 percent, resulting in a criterion weighted score of 0.80. For each alternative, the weighted scores for each criterion were summed to give the total weighted benefit score of the alternative, as shown on Figure 2-1. Alternatives 2B and 3B received similar total weighted benefit scores that are significantly higher than Alternatives 1 and 2C.

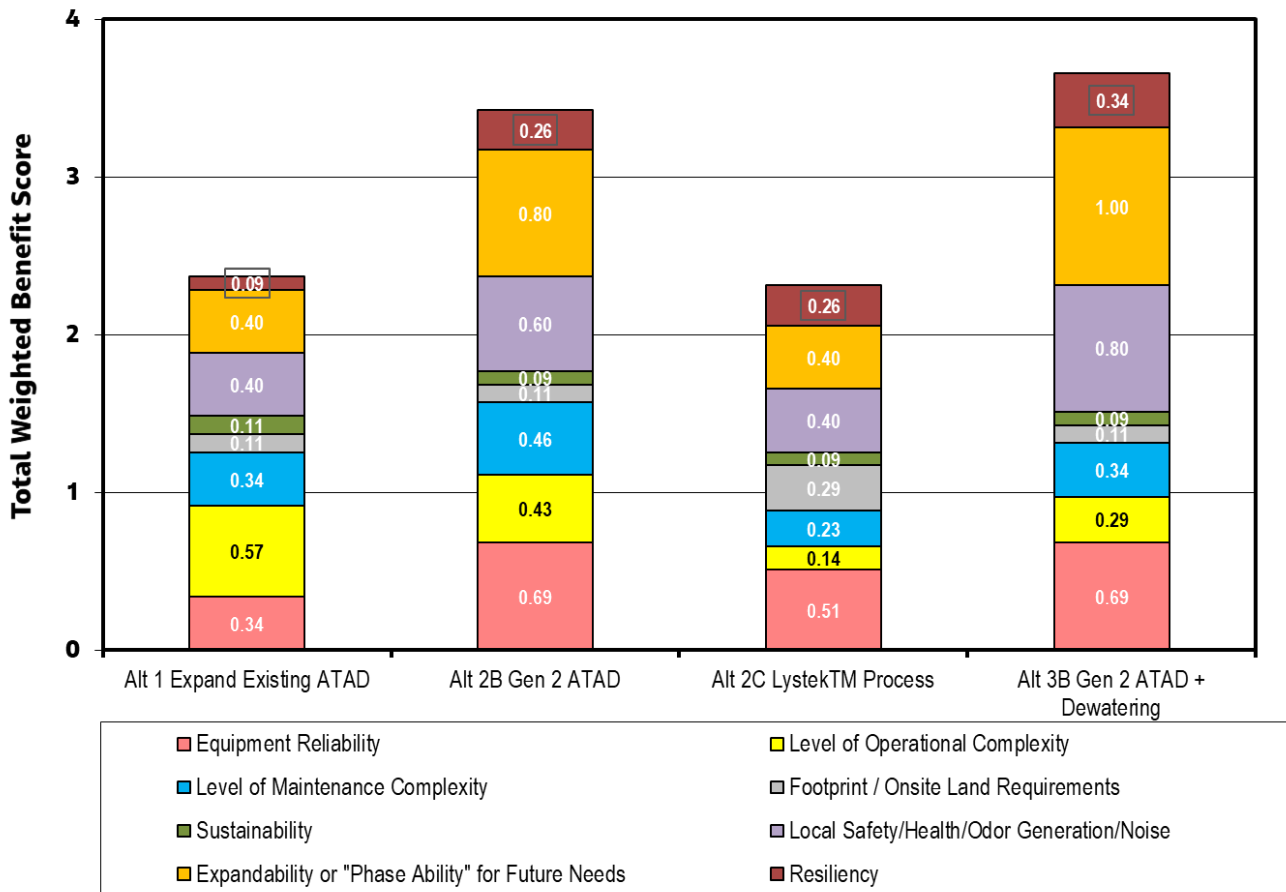


Figure 2-1. Biosolids Treatment Alternatives Non-monetary Scoring Results

### 3. Recommendation

Alternative 3B is recommended based on the following:

- Alternative 3B produces a low-odor Class A biosolids product to facilitate continuing the current local land application program.
- Alternative 3B provides the WRF the flexibility to produce a liquid and/or dewatered biosolids product.
- Alternative 3B has the highest total weighted benefit score from the non-monetary evaluation, driven by the following advantages:

- Better “phase-ability” because the dewatering building and dewatered biosolids bunkers could be deferred until the flexibility of the dewatered product is desired.
- Lower O&M complexity.
- Better onsite safety/health and odor/noise generation.
- Although Alternative 3B has the second highest total present worth cost of the alternatives, the dewatering building and biosolids storage bunker can be deferred, reducing the initial phase project cost to that of Alternative 2B, which is the second lowest cost alternative. (The next lowest cost is the baseline Alternative 1, which requires additional biosolids storage capacity and produces an odorous biosolids product.)
- Alternative 3B (and 2B) continues the current Class A ATAD process that has been successful at the WRF for 25 years, and the process is familiar to plant staff and Oregon Department of Environmental Quality.
- Alternative 3B (and 2B) improves the ATAD process with the capability to handle thicker feed sludge, resulting in less biosolids volume, thus eliminating the need to construct additional biosolids storage capacity.
- Alternative 3B (and 2B) reduces the ammonia content of biosolids storage tank decant, thus reducing the impact of decant on the secondary treatment process.

Alternative 3B (and 2B) uses the existing ATAD reactors for SNDR, consistent with the 2009 Facilities Plan goal of continuing to use existing treatment capacity. The SNDR stage is a less aggressive environment than the ATAD stage, prolonging the service life of the existing steel reactors. As the design phase progresses, the cost of retrofitting the existing ATADs for SNDR should be compared with the cost of constructing a new, standalone SNDR tank. The cost of constructing the new basin may be comparable to the retrofit, and eliminating the retrofit would simplify constructability and would likely provide an SNDR process with a longer service life.

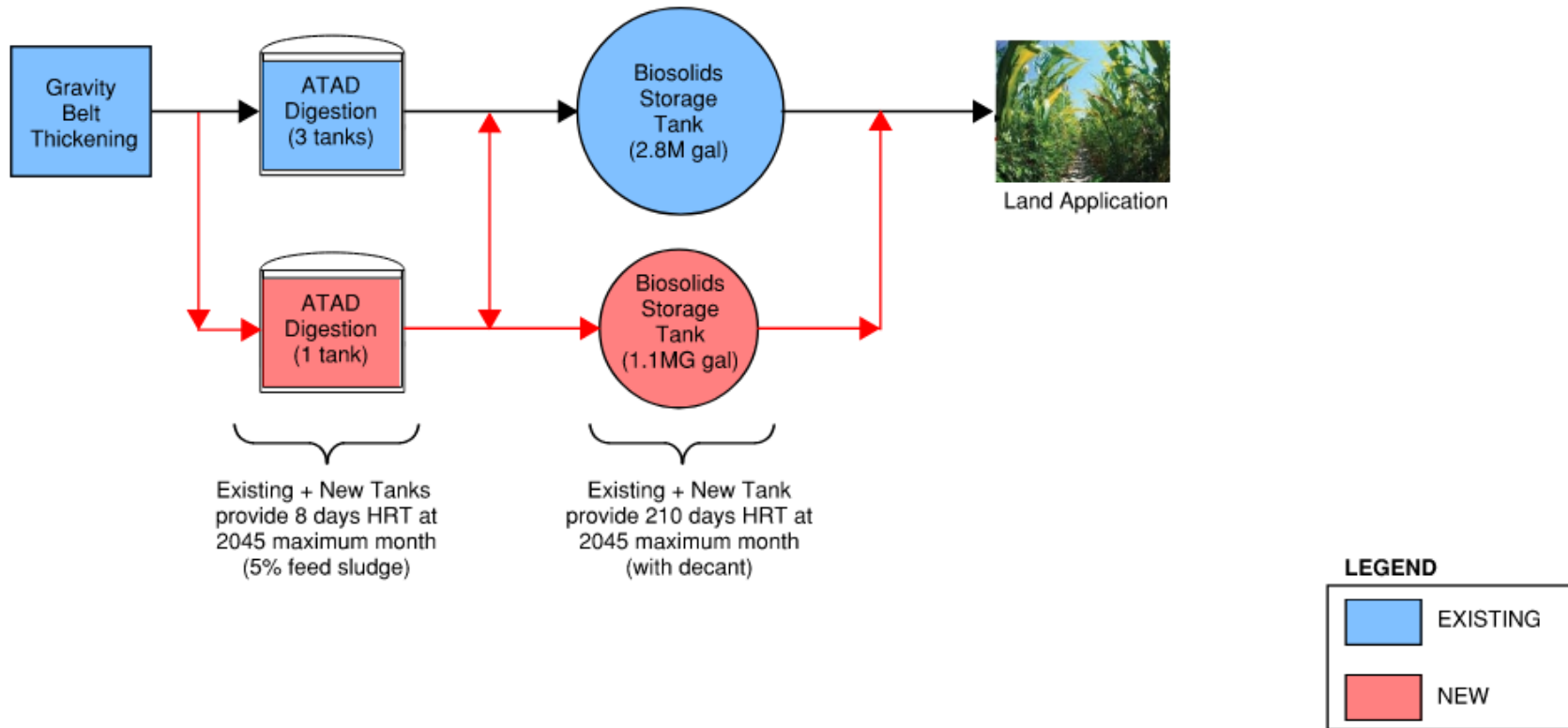
The recommendation to pursue Alternative 3B was reviewed with the Oregon Department of Environmental Quality, who provided a letter in support of this approach.



**Attachment 1**  
**Process Flow Diagrams of**  
**Solids Processing Alternatives**

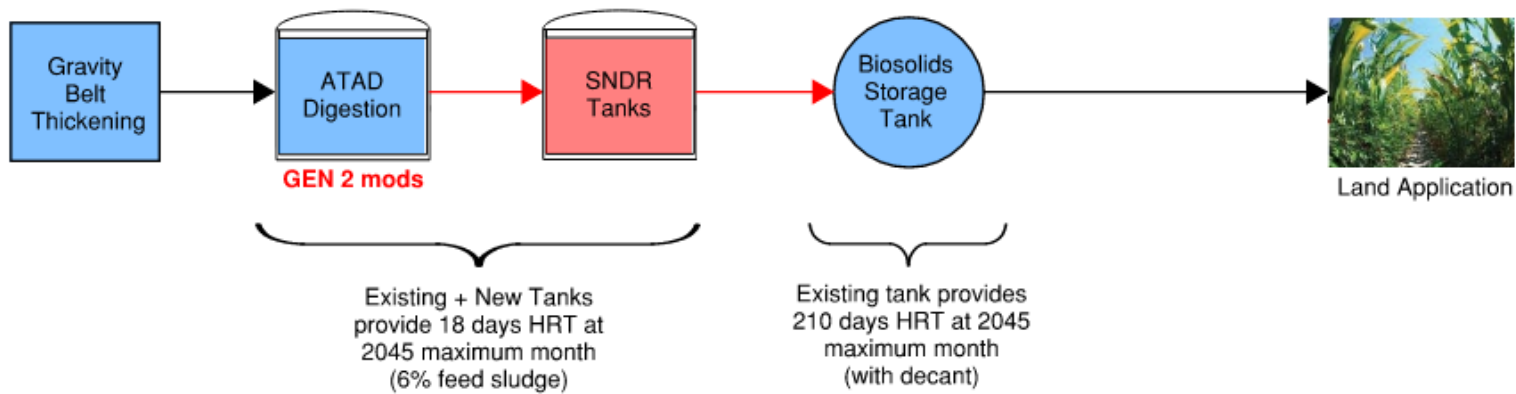
## Alternative 1

### Liquid Local Land Applied Class-A Biosolids (Baseline)



## Alternative 2A - Liquid Local Land Applied Class-A Biosolids

Convert existing tanks to "Generation 2" ATAD process and add tanks for SNDR\* process



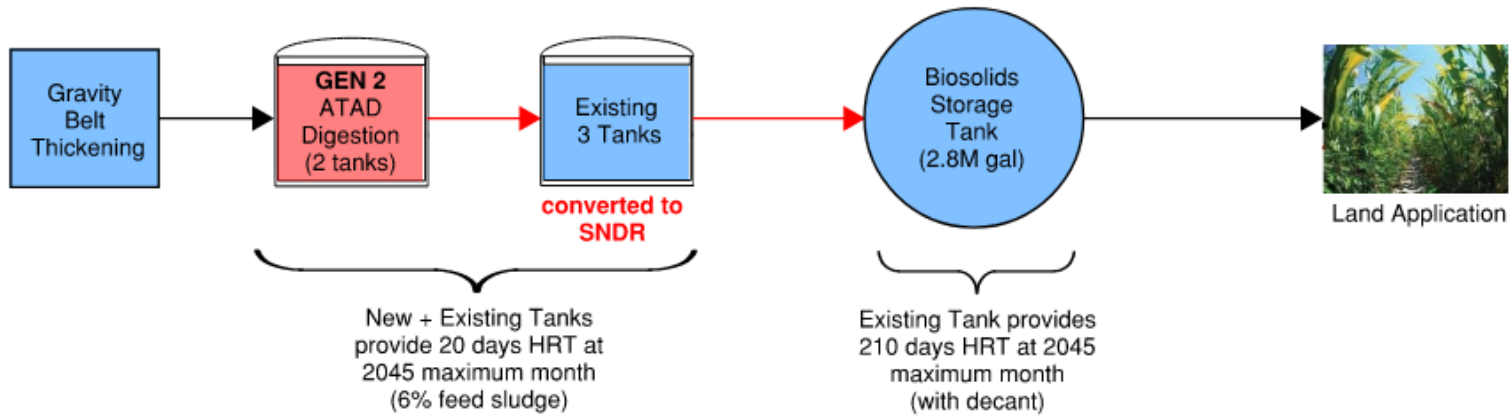
### LEGEND



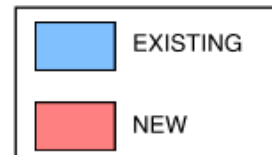
\* SNDR = Simultaneous Nitrification/Denitrification Reaction

## Alternative 2B - Low Odor Liquid Local Land Applied Class-A Biosolids

Add new tanks for "Generation 2" ATAD process and convert existing tanks to SNDR\* process



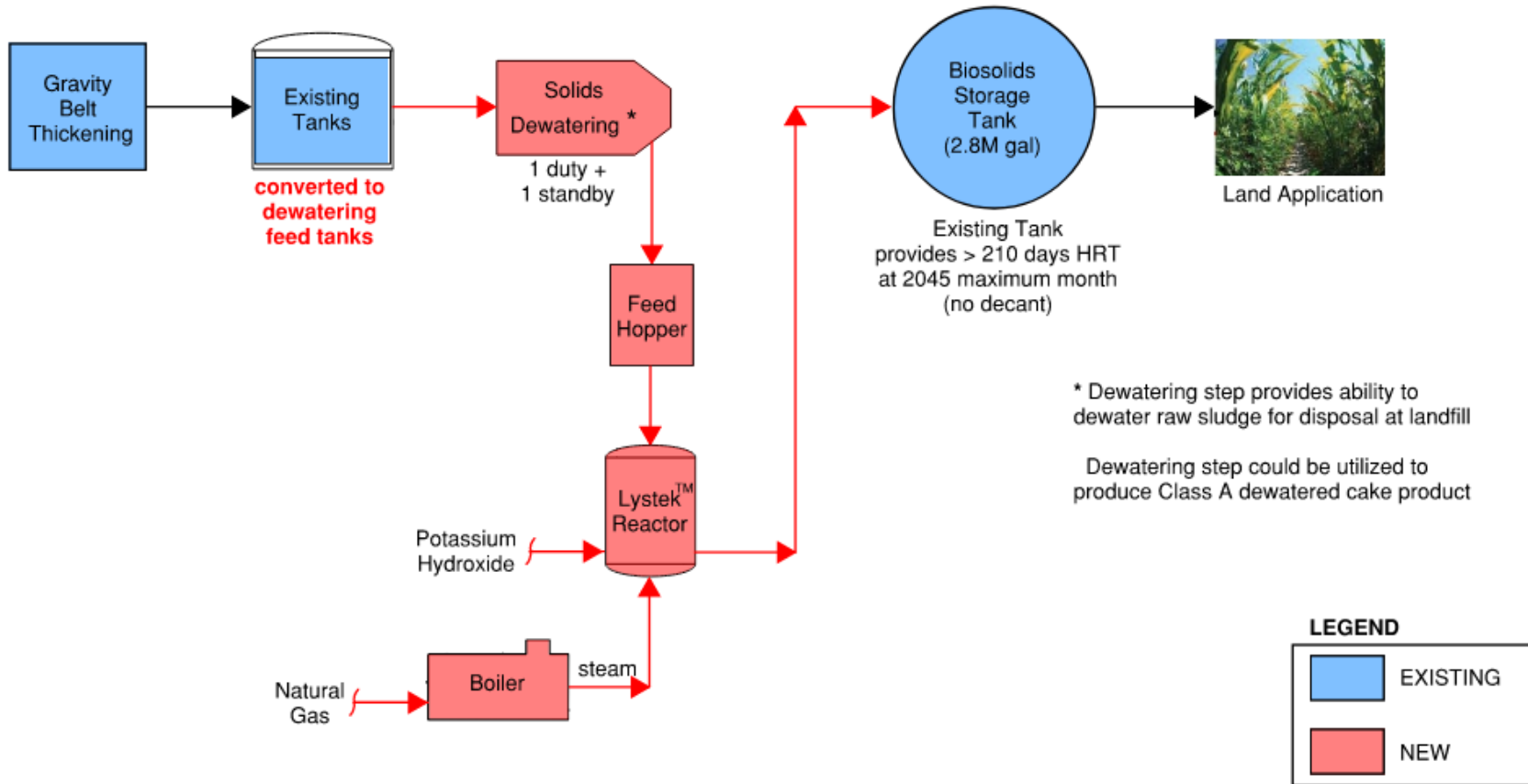
### LEGEND



\* SNDR = Simultaneous Nitrification/Denitrification Reaction

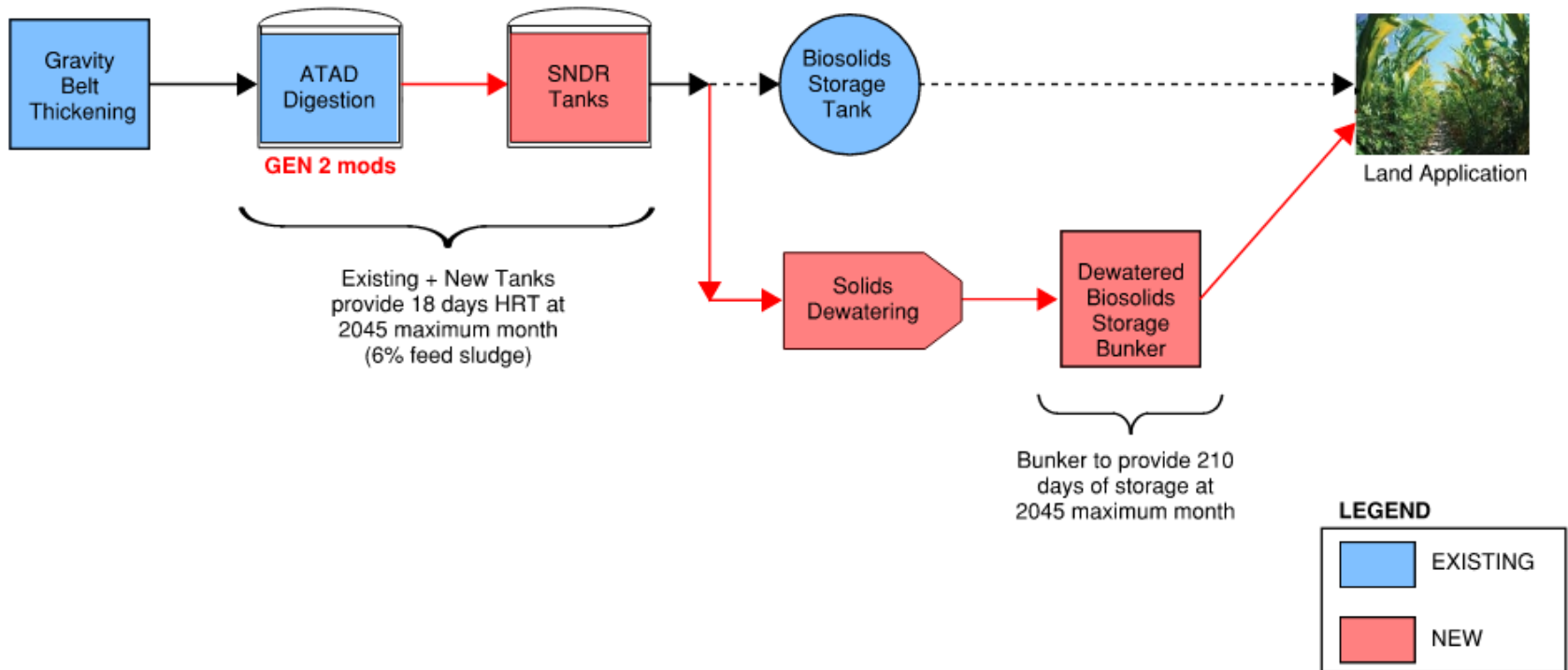
## Alternative 2C - Low Odor Liquid Local Land Applied Class-A Biosolids

### Convert from ATAD process to Lystek™ process



## Alternative 3A - Dewatered Local Land Applied Class-A Biosolids

Convert existing tanks to "Generation 2" ATAD process and add tanks for SNDR\* process  
 Add dewatering process and biosolids storage bunker

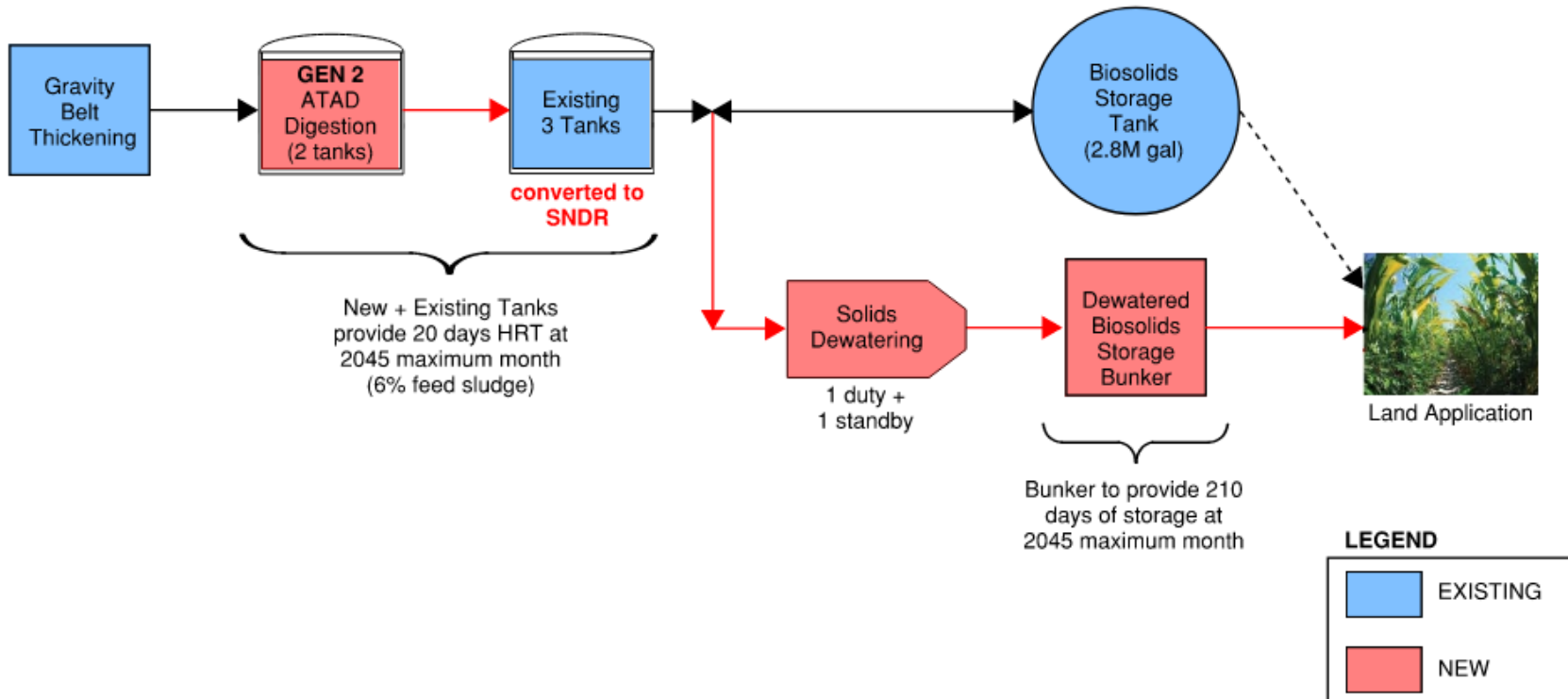


\* SNDR = Simultaneous Nitrification/Denitrification Reaction



## Alternative 3B - Dewatered Local Land Applied Class-A Biosolids

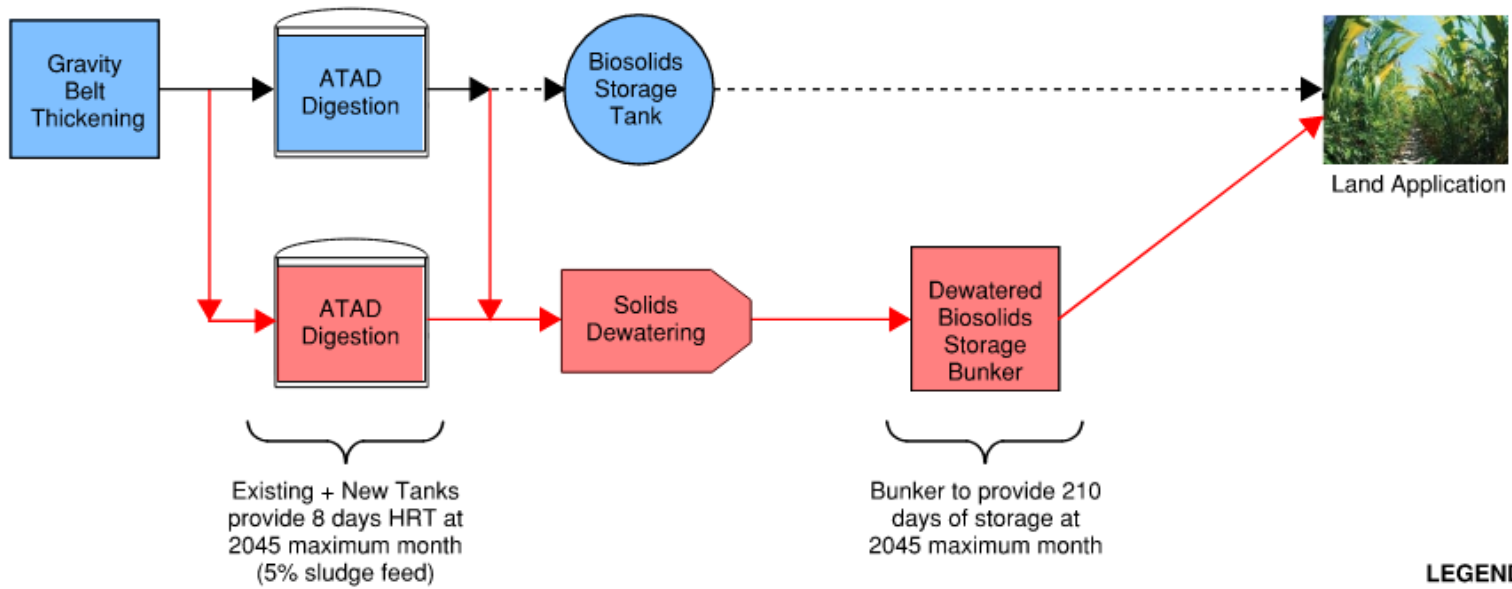
Add new tanks for "Generation 2" ATAD process and convert existing tanks to SNDR\* process  
 Add dewatering process and biosolids storage bunker



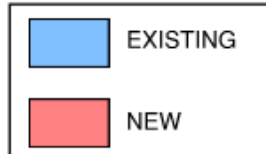
\* SNDR = Simultaneous Nitrification/Denitrification Reaction

# Alternative 3C - Dewatered Local Land Applied Class-A Biosolids

## Dewatering added onto Alternative 1

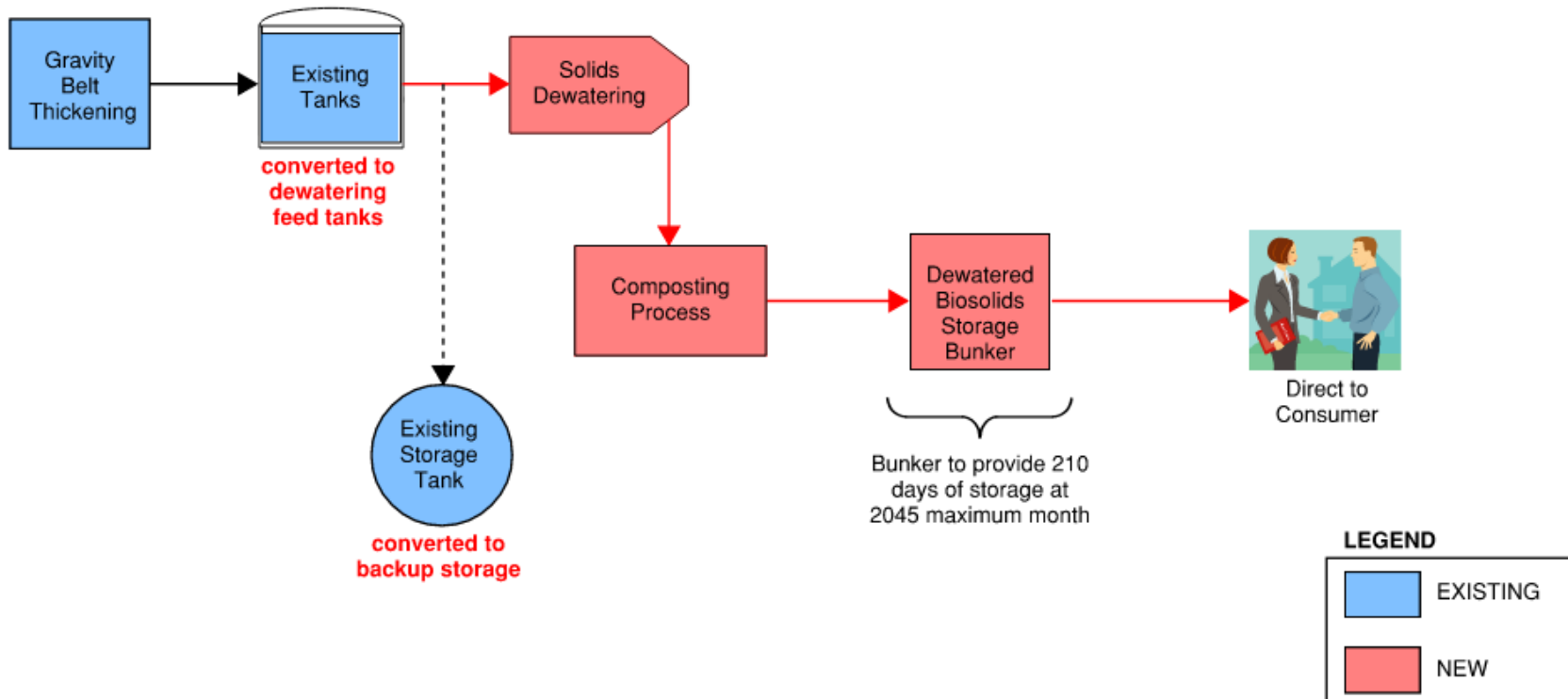


### LEGEND



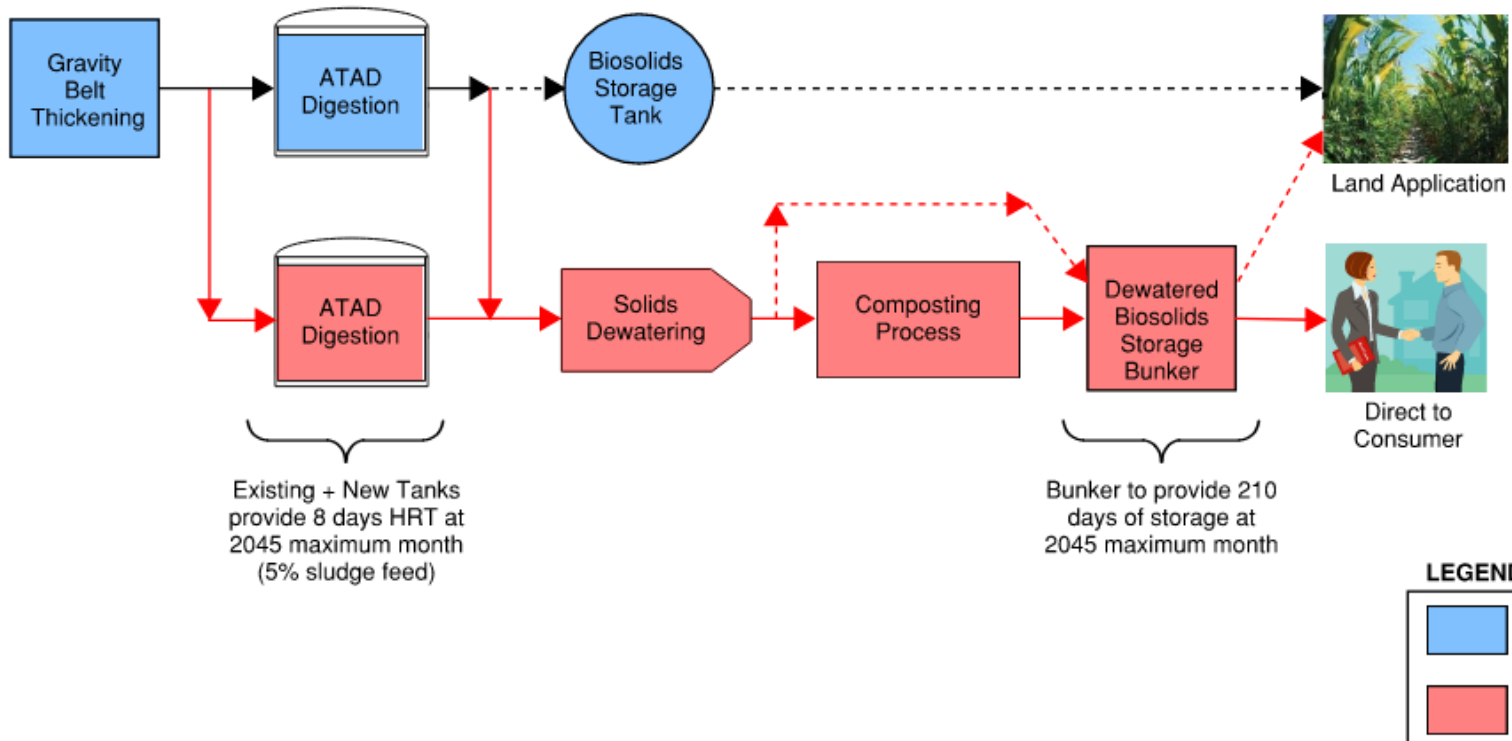
## Alternative 4A - Composted Class-A Biosolids Direct to Consumer

### Raw Sludge Dewatering and Composting



## Alternative 4B - Composted Class-A Biosolids Direct to Consumer

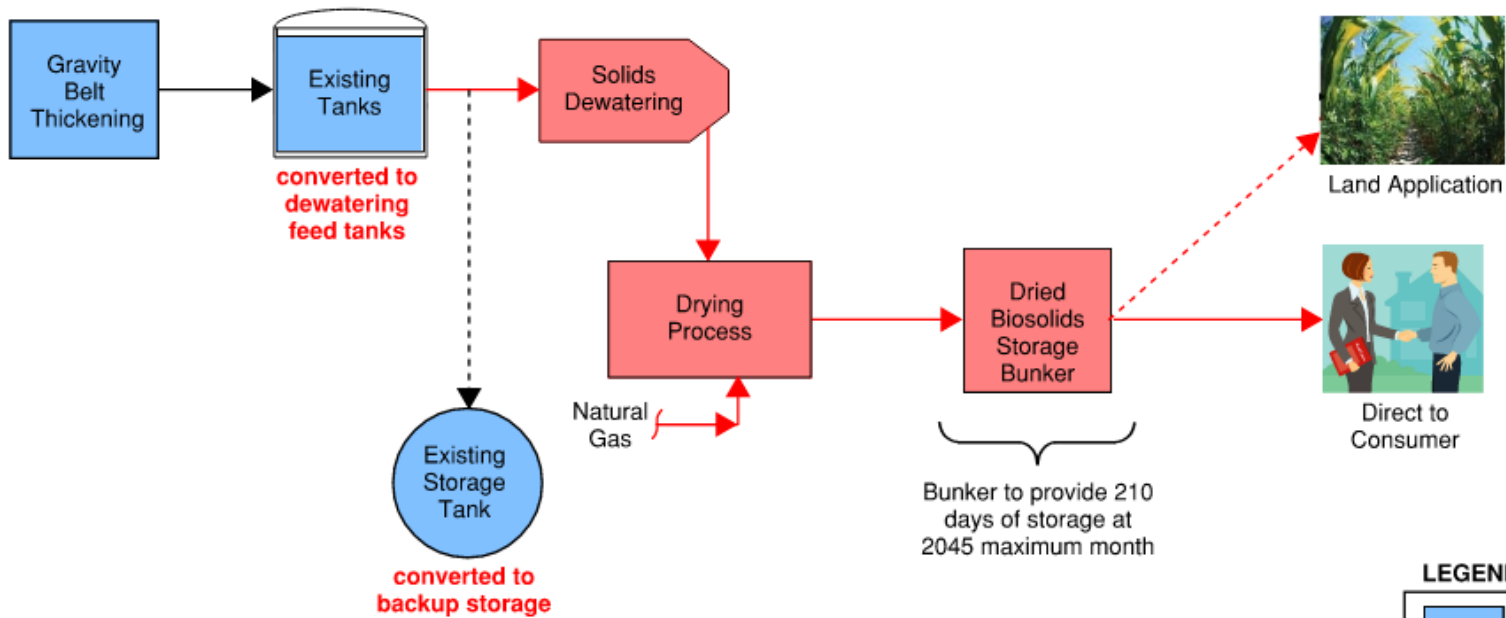
### Retains ATAD Process and Adds Dewatering and Composting



Very similar to SM2C from 2008 Facility Plan

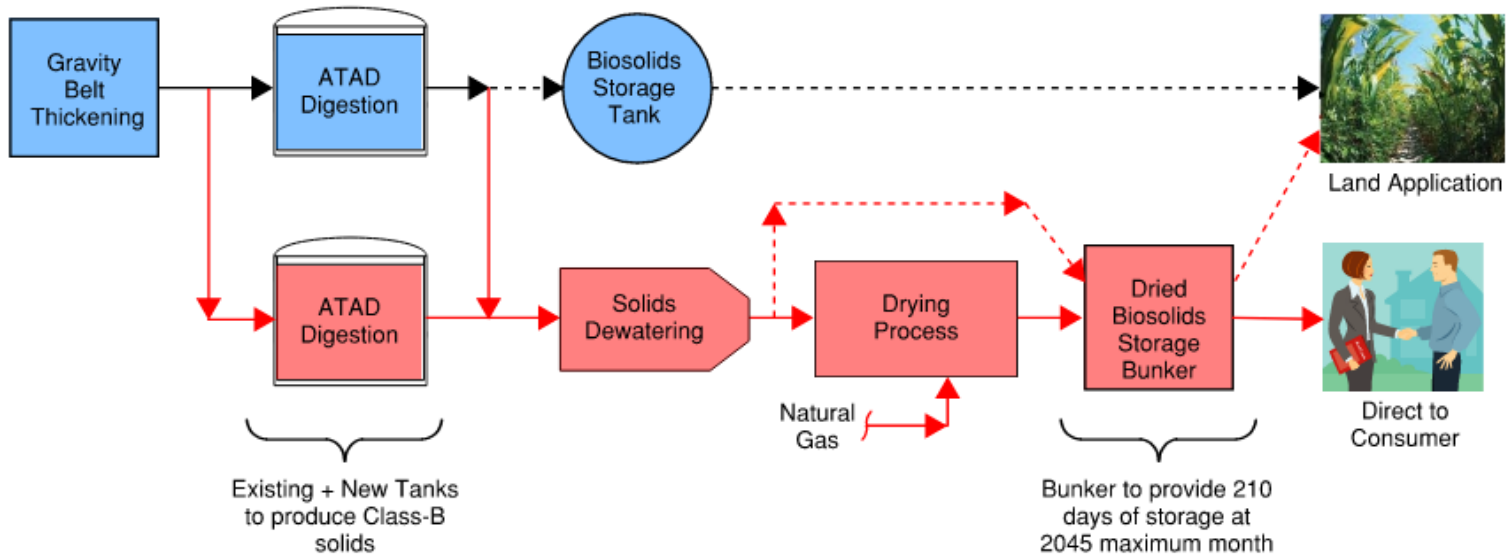
# Alternative 5A - Dried Class-A Biosolids Direct to Consumer

## Raw Sludge Dewatering and Drying



## Alternative 5B - Dried Class-A Biosolids Direct to Consumer

### Retains ATAD Process and Adds Dewatering and Drying



#### LEGEND

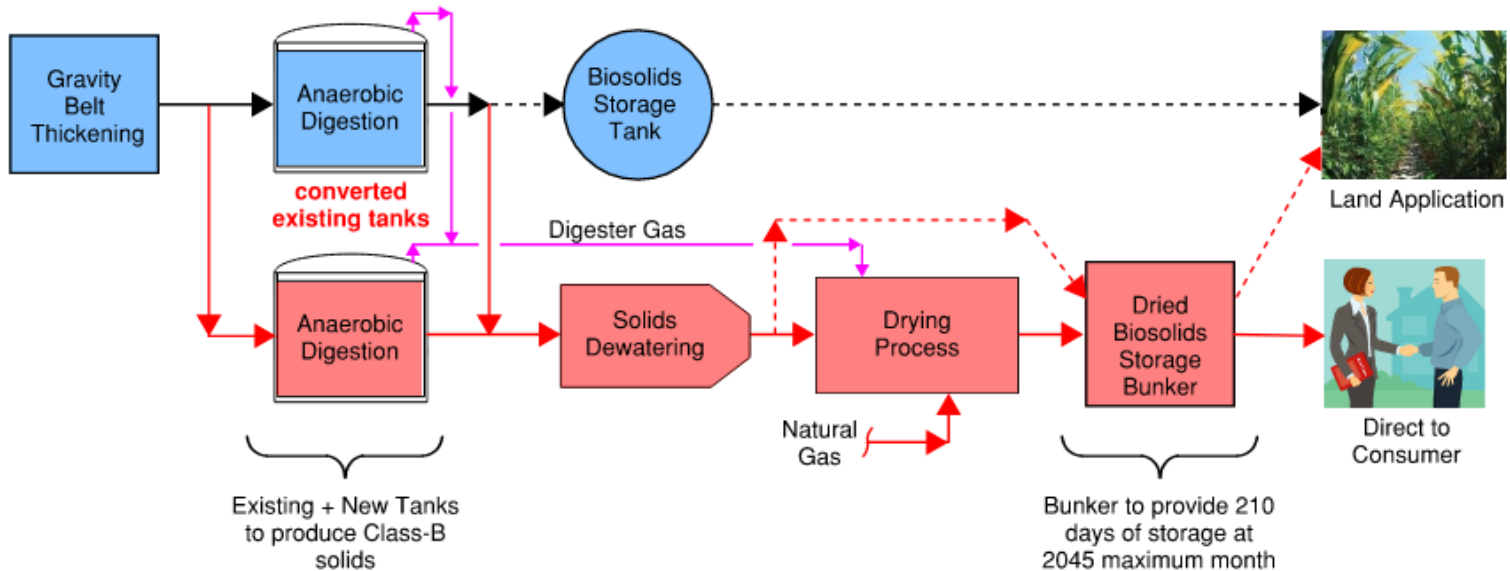


Hybrid of alternatives SM1 and SM2 from 2008 Facility Plan



## Alternative 5C - Dried Class-A Biosolids Direct to Consumer

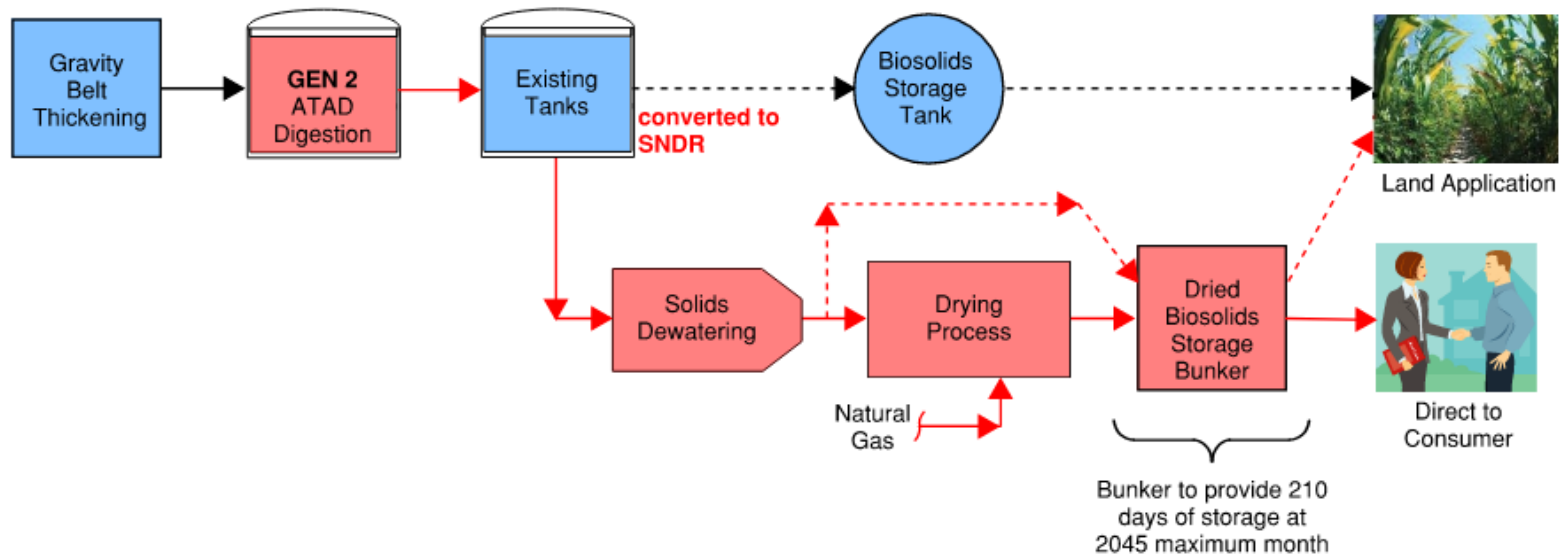
### Convert to Anaerobic Digestion and Add Dewatering and Drying



Hybrid of alternatives SM1 and SM2 from 2008 Facility Plan

## Alternative 5D - Dried Class-A Biosolids Direct to Consumer

### Convert to "Generation 2" ATAD and Add Dewatering and Drying



Bunker to provide 210 days of storage at 2045 maximum month

#### LEGEND



Hybrid of alternatives SM1 and SM2 from 2008 Facility Plan

**Attachment 2**  
**Preliminary Site Plans of Retained**  
**Solids Processing Alternatives**

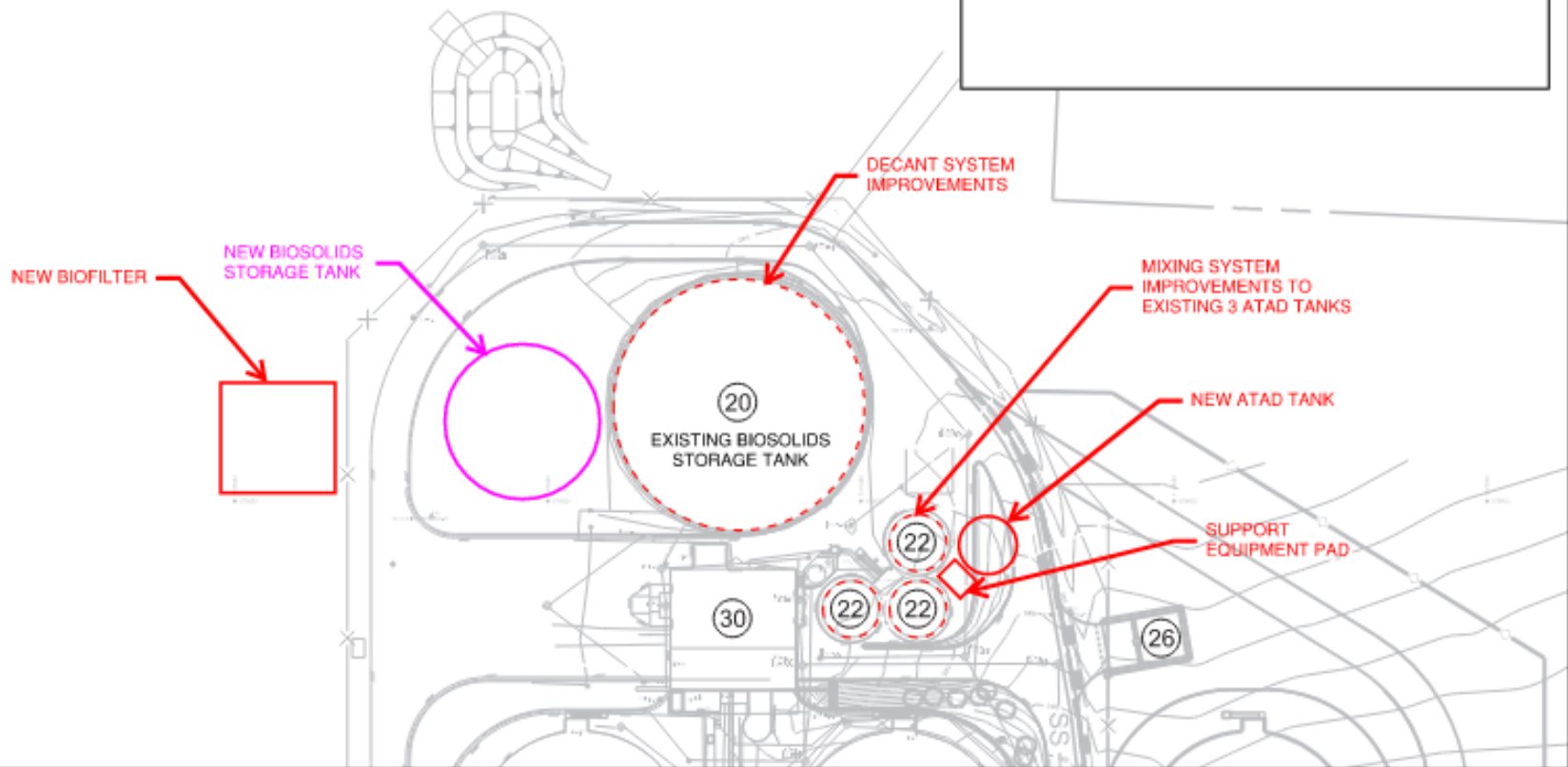
## Alternative 1 - Expand Existing ATAD

### Liquid Local Land Applied Class-A Biosolids (Baseline)

#### LEGEND

Red = Phase 1

Magenta = Phase 2

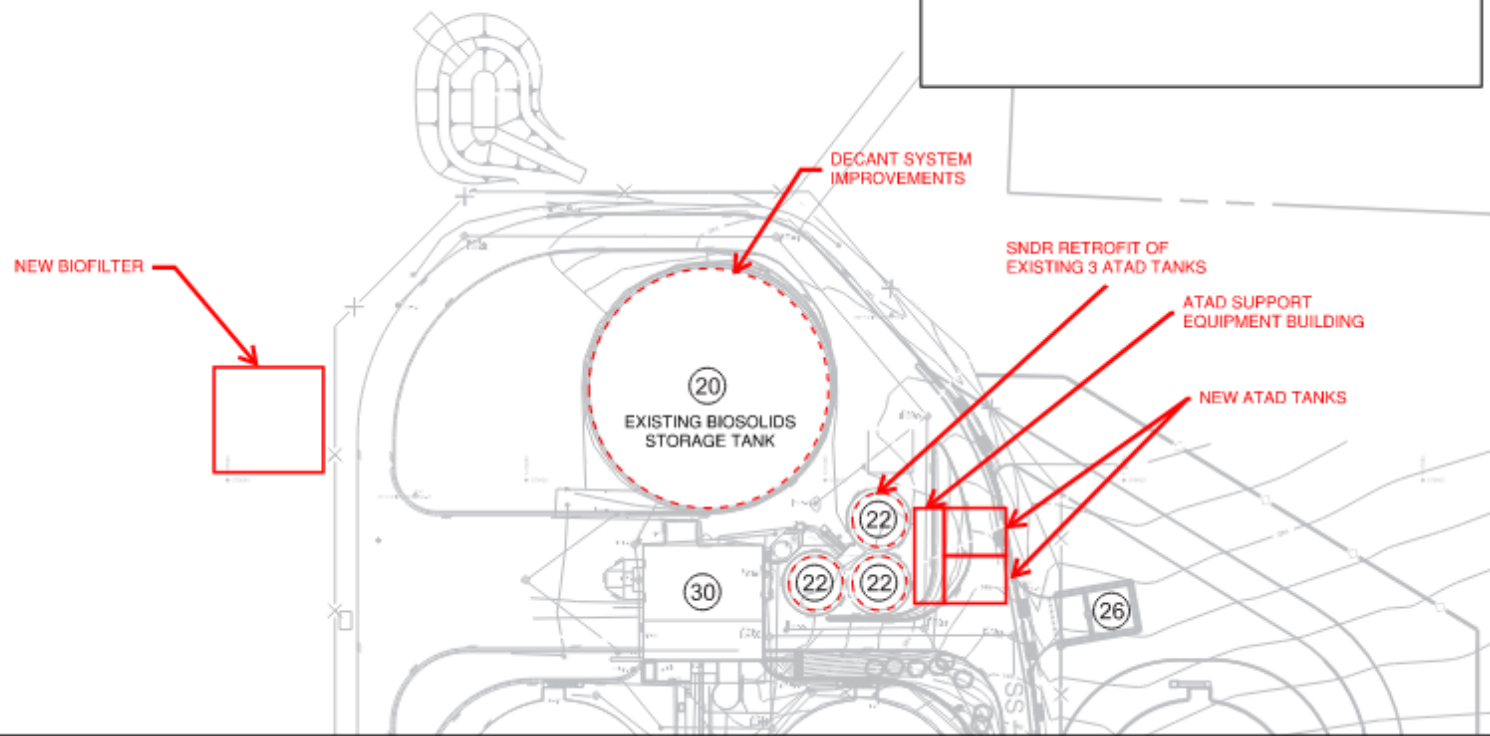


## Alternative 2B - Generation 2 ATAD

### Low Odor Liquid Local Land Applied Class-A Biosolids

#### LEGEND

Red = Phase 1

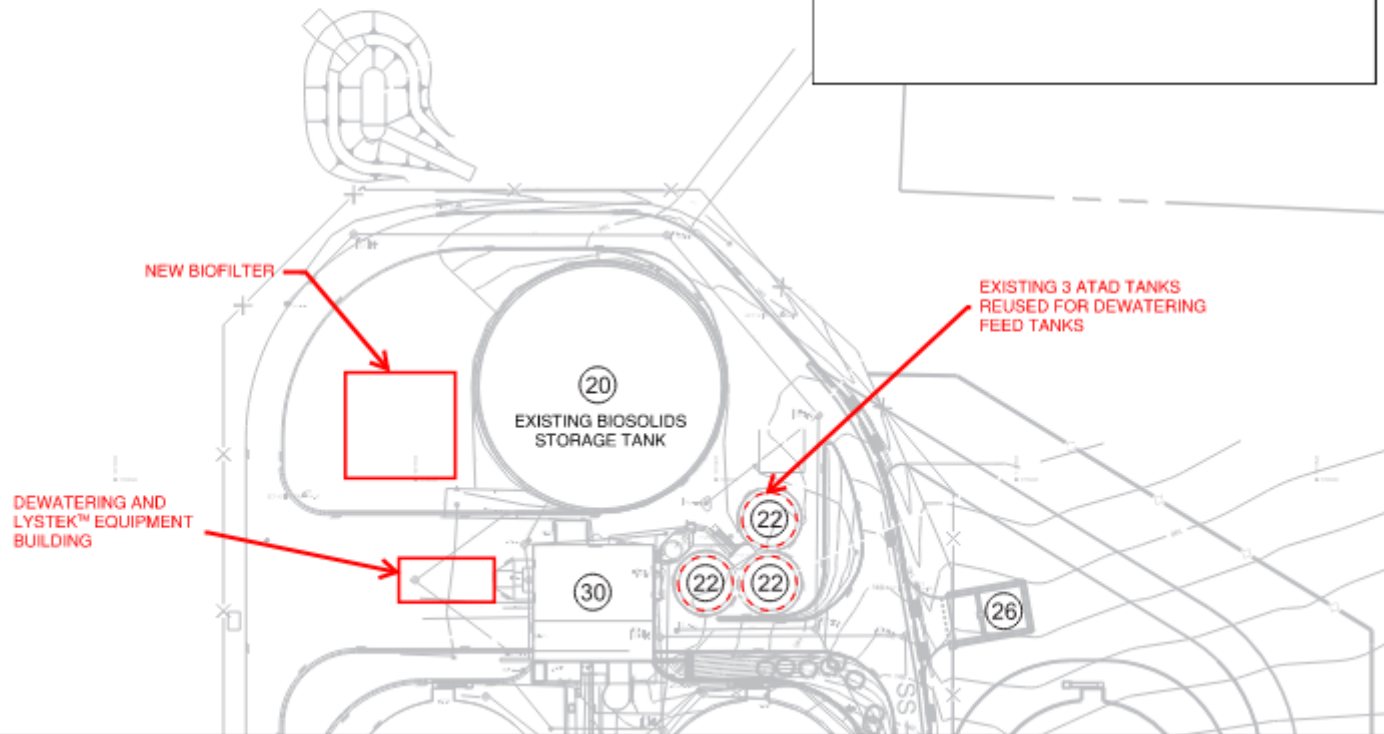


## Alternative 2C - Lystek™

### Low Odor Liquid Local Land Applied Class-A Biosolids

#### LEGEND

Red = Phase 1



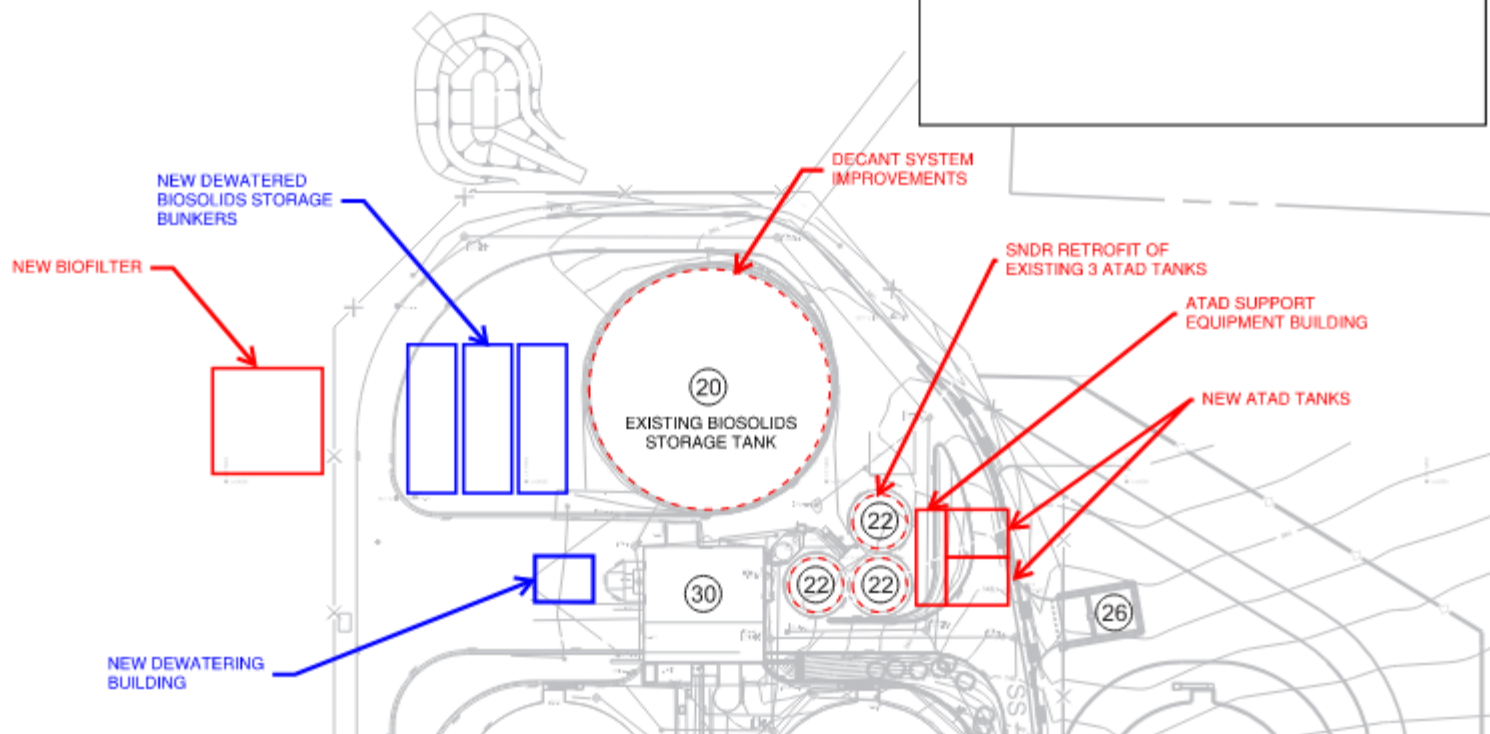


## Alternative 3B - Generation 2 ATAD + Dewatering

### Low Odor Dewatered Local Land Applied Class-A Biosolids

#### LEGEND

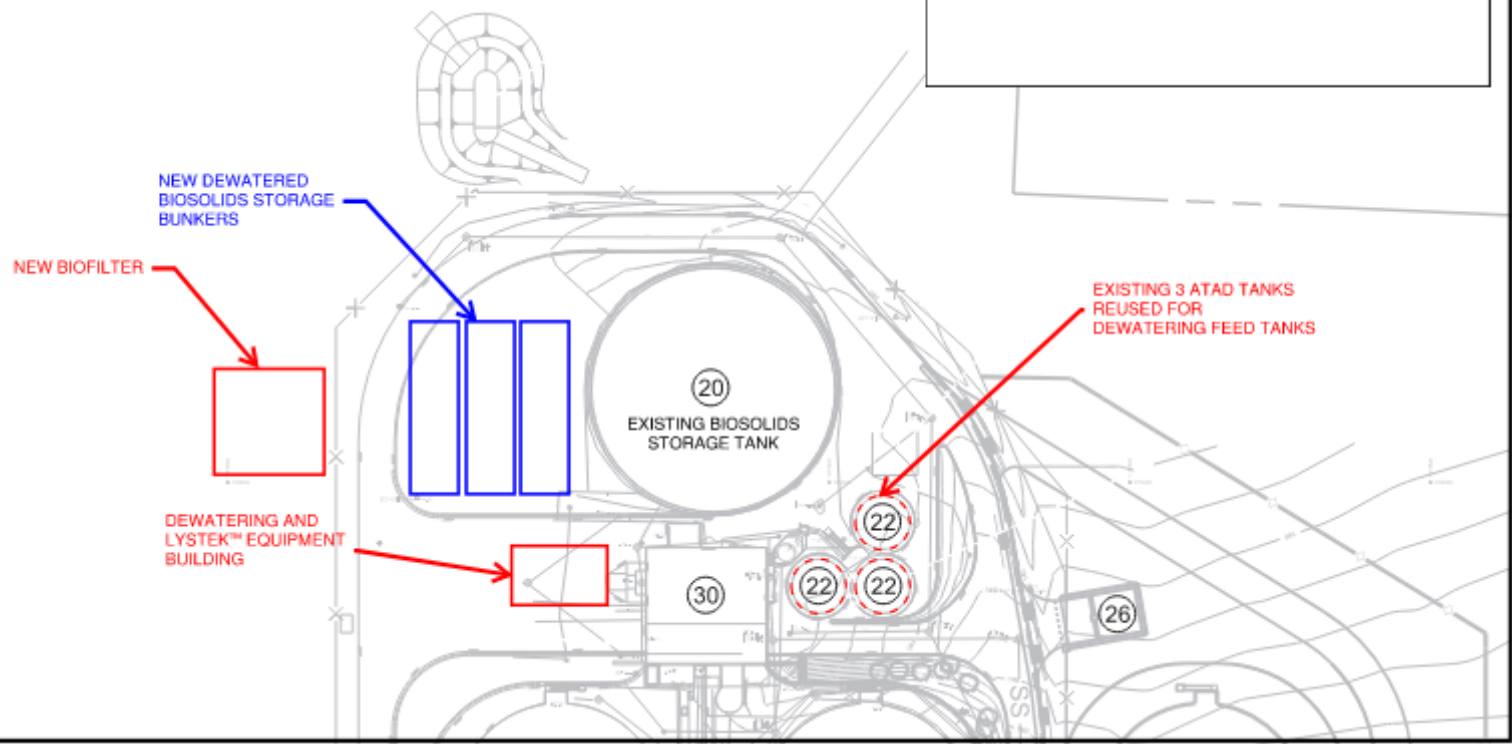
Red = Phase 1  
Blue = Phase 2



# Alternative 3D - Lystek™ + Dewatering

## Low Odor Dewatered Local Land Applied Class-A Biosolids

**LEGEND**  
Red = Phase 1  
Blue = Phase 2



**Attachment 3**  
**Monetary Evaluation of Solids**  
**Processing Alternatives**

<b>McMinnville WRF - Biosolids Treatment Alternatives Evaluation</b>		
<b>Monetary Evaluation</b>		
October 2020		
		<b>Alternative 1</b>
		<b>Expand Existing ATAD</b>
<b>PROJECT COSTS</b>		
<b>New Facilities and Equipment</b>		
	ATAD tank, to match existing tanks	
	Ground improvements	\$216,475
	Tank construction	\$234,267
	Mixing equipment	\$150,000
	Aeration equipment	\$150,000
	Transfer pumps	\$100,000
	<b>Equipment Support Pad</b>	
	Ground improvements	\$67,500
	Pad construction	\$26,667
	<b>Existing Biosolids Storage Tank</b>	
	Decant improvements allowance	\$75,000
	<b>Biosolids Storage Tank (1.1 MG)</b>	
	Ground improvements	\$1,767,146
	Tank construction	\$1,448,623
	Mixing equipment	\$100,000
	Aeration equipment	\$100,000
	<b>Biofilter</b>	
	Ground Improvments	\$0
	Pad Construction	\$111,111
	Media	\$37,037
	<b>TOTAL of New Facilities and Equipment</b>	<b>\$4,580,000</b>
	<b>Construction Markups</b>	
	20% Process mechanical installation	\$120,000
	25% Mechanical process piping	\$150,000
	5% Yard piping	\$229,000
	10% Site civil	\$458,000
	10% Electrical allowance	\$458,000
	8% Instrumentation allowance	\$366,400
	<b>TOTAL of Construction Markups</b>	<b>\$1,780,000</b>
	<b>SUBTOTAL</b>	<b>\$6,360,000</b>

<b>Contractor Markups and Contingency</b>		
5%	Mob/Bonds/Permits/Insurance	\$320,000
	<b>SUBTOTAL</b>	\$6,680,000
10%	Contractors Overheads	\$670,000
	<b>SUBTOTAL</b>	\$7,350,000
5%	Contractors Profits	\$370,000
	<b>SUBTOTAL</b>	\$7,720,000
35%	Contingency	\$2,700,000
<b>TOTAL CONSTRUCTION COST</b>		<b>\$10,420,000</b>
<b>Non-Construction Costs</b>		
30%	Engineering, Legal, Admin	\$3,130,000
<b>TOTAL PROJECT COST</b>		<b>\$13,550,000</b>
<b>ONSITE ANNUAL O&amp;M ITEMS</b>		
	Operations Labor	\$52,000
	Maintenance Labor	\$52,000
	Equipment Maintenance <sup>a</sup>	\$62,000
	Electrical Cost	\$39,000
	Natural Gas Cost	\$0
	Dewatering Polymer Cost	\$0
	Potassium Hydroxide Cost	\$0
	Total of Annual O&M Items	\$205,000
<b>TOTAL PRESENT WORTH OF ONSITE ANNUAL O&amp;M ITEMS <sup>b</sup></b>		<b>\$5,470,000</b>
<b>OFFSITE ANNUAL O&amp;M ITEMS</b>		
	Biosolids Hauling & Land Application	\$233,000
<b>PRESENT WORTH OF OFFSITE ANNUAL O&amp;M ITEMS <sup>b</sup></b>		<b>\$6,220,000</b>
<b>Salvage Value <sup>c</sup></b>		<b>\$0</b>
<b>TOTAL PRESENT WORTH - Alternative 1</b>		<b>\$25,240,000</b>
<b>Basis of Evaluation</b>		
	<sup>a</sup> 3% of equipment cost per year	
	<sup>b</sup> Present Worth Factor (PWF) derived by Discount Rate, Inflation Rate, and Period:	
	Discount Rate:	2.0%
	Inflation Rate:	2.5%
	Net Present Worth Discount Factor (PWF) =	-0.5%
	Evaluation Period (years):	25
	Present Worth Factor (PWF):	$PWF = [(1+i)^n - 1] / [(1+i)^n \times i]$
		PWF = 26.70
	<sup>c</sup> Assumes no salvage value at end of 25-year period.	

<b>McMinnville WRF - Biosolids Treatment Alternatives Evaluation</b>		
<b>Monetary Evaluation</b>		
October 2020		
		<b>Alternative 2B</b>
		<b>Generation 2 ATAD</b>
<b>PROJECT COSTS</b>		
<b>New Facilities and Equipment</b>		
2 New ATAD Tanks		
	Tank 1 Ground improvements	\$270,000
	Tank 1 construction	\$322,667
	Tank 2 Ground improvements	\$270,000
	Tank 2 construction	\$322,667
Support Equipment + Retrofit Existing Tanks for SNDR		
	Ground improvements	\$292,500
	Building construction	\$715,000
	Pumps, aeration blowers, instruments, controls	\$2,294,000
Existing Biosolids Storage Tank		
	Decant improvements allowance	\$75,000
Biofilter		
	Ground Improvments	\$0
	Pad Construction	\$111,111
	Media	\$37,037
<b>TOTAL of New Facilities and Equipment</b>		<b>\$4,710,000</b>
<b>Construction Markups</b>		
20%	Process mechanical installation	\$460,000
25%	Process mechanical piping	\$570,000
5%	Yard piping	\$235,500
10%	Site civil	\$471,000
10%	Electrical allowance	\$471,000
8%	Instrumentation allowance	\$376,800
<b>TOTAL of Construction Markups</b>		<b>\$2,580,000</b>
<b>SUBTOTAL</b>		<b>\$7,290,000</b>



<b>Contractor Markups and Contingency</b>		
5%	Mob/Bonds/Permits/Insurance	\$360,000
	<b>SUBTOTAL</b>	<b>\$7,650,000</b>
10%	Contractors Overheads	\$770,000
	<b>SUBTOTAL</b>	<b>\$8,420,000</b>
5%	Contractors Profits	\$420,000
	<b>SUBTOTAL</b>	<b>\$8,840,000</b>
35%	Contingency	\$3,090,000
	<b>TOTAL CONSTRUCTION COST</b>	<b>\$11,930,000</b>
<b>Non-Construction Costs</b>		
30%	Engineering, Legal, Admin	\$3,580,000
	<b>TOTAL PROJECT COST</b>	<b>\$15,510,000</b>
<b>ONSITE ANNUAL O&amp;M ITEMS</b>		
	Operations Labor	\$52,000
	Maintenance Labor	\$52,000
	Equipment Maintenance <sup>a</sup>	\$71,000
	Electrical Cost	\$92,000
	Natural Gas Cost	\$0
	Dewatering Polymer Cost	\$0
	Potassium Hydroxide Cost	\$0
	Total of Annual O&M Items	\$267,000
	<b>TOTAL PRESENT WORTH OF ONSITE ANNUAL O&amp;M ITEMS <sup>b</sup></b>	<b>\$7,130,000</b>
<b>OFFSITE ANNUAL O&amp;M ITEMS</b>		
	Biosolids Hauling & Land Application	\$186,000
	<b>PRESENT WORTH OF OFFSITE ANNUAL O&amp;M ITEMS <sup>b</sup></b>	<b>\$4,970,000</b>
<b>Salvage Value <sup>c</sup></b>		<b>\$0</b>
<b>TOTAL PRESENT WORTH - Alternative 2B</b>		<b>\$27,610,000</b>
<b>Basis of Evaluation</b>		
	<sup>a</sup> 3% of equipment cost per year	
	<sup>b</sup> Present Worth Factor (PWF) derived by Discount Rate, Inflation Rate, and Period:	
	Discount Rate:	2.0%
	Inflation Rate:	2.5%
	Net Present Worth Discount Factor (PWF) =	-0.5%
	Evaluation Period (years):	25
	Present Worth Factor (PWF):	$PWF = [(1+i)^n - 1] / [(1+i)^n \times i]$
		PWF = 26.70
	<sup>c</sup> Assumes no salvage value at end of 25-year period.	

<b>McMinnville WRF - Biosolids Treatment Alternatives Evaluation</b>		
<b>Monetary Evaluation</b>		
October 2020		
		<b>Alternative 2C</b>
		<b>Lystek™ Process</b>
<b>PROJECT COSTS</b>		
<b>New Facilities and Equipment</b>		
	Dewatering and Lystek™ Equipment Building	
	Ground improvements	\$438,750
	Building construction	\$1,072,500
	Dewatering centrifuge 1	\$350,000
	Dewatering centrifuge 2	\$350,000
	Screw conveyors	\$72,000
	Polymer system	\$130,000
	Centrate Pumps	\$40,000
	Lystek™ equipment system	\$2,525,000
	<b>Biofilter</b>	
	Ground Improvments	\$0
	Pad Construction	\$111,111
	Media	\$37,037
	<b>TOTAL of New Facilities and Equipment</b>	<b>\$5,130,000</b>
	<b>Construction Markups</b>	
	20% Process mechanical installation	\$690,000
	25% Process mechanical piping	\$870,000
	5% Yard piping	\$256,500
	10% Site civil	\$513,000
	10% Electrical allowance	\$513,000
	8% Instrumentation allowance	\$410,400
	<b>TOTAL of Construction Markups</b>	<b>\$3,250,000</b>
	<b>SUBTOTAL</b>	<b>\$8,380,000</b>

<b>Contractor Markups and Contingency</b>		
5%	Mob/Bonds/Permits/Insurance	\$420,000
	<i>SUBTOTAL</i>	\$8,800,000
10%	Contractors Overheads	\$880,000
	<i>SUBTOTAL</i>	\$9,680,000
5%	Contractors Profits	\$480,000
	<i>SUBTOTAL</i>	\$10,160,000
35%	Contingency	\$3,560,000
<b>TOTAL CONSTRUCTION COST</b>		<b>\$13,720,000</b>
<b>Non-Construction Costs</b>		
30%	Engineering, Legal, Admin	\$4,120,000
<b>TOTAL PROJECT COST</b>		<b>\$17,840,000</b>
<b>ONSITE ANNUAL O&amp;M ITEMS</b>		
	Operations Labor	\$52,000
	Maintenance Labor	\$52,000
	Equipment Maintenance <sup>a</sup>	\$104,000
	Electrical Cost	\$37,000
	Natural Gas Cost	\$14,000
	Dewatering Polymer Cost	\$83,000
	Potassium Hydroxide Cost	\$124,000
	Total of Annual O&M Items	\$466,000
<b>TOTAL PRESENT WORTH OF ONSITE ANNUAL O&amp;M ITEMS <sup>b</sup></b>		<b>\$12,440,000</b>
<b>OFFSITE ANNUAL O&amp;M ITEMS</b>		
	Biosolids Hauling & Land Application	\$114,000
<b>PRESENT WORTH OF OFFSITE ANNUAL O&amp;M ITEMS <sup>b</sup></b>		<b>\$3,040,000</b>
<b>Salvage Value <sup>c</sup></b>		<b>\$0</b>
<b>TOTAL PRESENT WORTH - Alternative 2C</b>		<b>\$33,320,000</b>

<b>Basis of Evaluation</b>	
<sup>a</sup>	3% of equipment cost per year
<sup>b</sup>	Present Worth Factor (PWF) derived by Discount Rate, Inflation Rate, and Period:
	Discount Rate: 2.0%
	Inflation Rate: 2.5%
	Net Present Worth Discount Factor (PWF) = -0.5%
	Evaluation Period (years): 25
	Present Worth Factor (PWF): $PWF = [(1+i)^n - 1] / [(1+i)^n \times i]$
	PWF = 26.70
<sup>c</sup>	Assumes no salvage value at end of 25-year period.

<b>McMinnville WRF - Biosolids Treatment Alternatives Evaluation</b>		
<b>Monetary Evaluation</b>		
October 2020		
		<b>Alternative 3B</b>
		<b>Gen 2 ATAD + Dewatering</b>
<b>PROJECT COSTS</b>		
<b>New Facilities and Equipment</b>		
2 New ATAD Tanks		
	Tank 1 Ground improvements	\$270,000
	Tank 1 construction	\$322,667
	Tank 2 Ground improvements	\$270,000
	Tank 2 construction	\$322,667
Support Equipment + Retrofit Existing Tanks for SNDR		
	Ground improvements	\$292,500
	Building construction	\$715,000
	Pumps, aeration blowers, instruments, controls	\$2,294,000
Dewatering Building		
	Ground improvements	\$270,000
	Building construction	\$525,000
	Dewatering centrifuge 1	\$300,000
	Dewatering centrifuge 2	\$300,000
	Screw conveyors	\$310,000
	Polymer system	\$130,000
	Centrate Pumps	\$40,000
Dewatered Biosolids Storage Bunkers		
	Ground improvements	\$0
	Bunker 1 construction	\$398,889
	Bunker 2 construction	\$398,889
	Bunker 3 construction	\$398,889
Existing Biosolids Storage Tank		
	Decant improvements allowance	\$75,000
Biofilter		
	Ground Improvements	\$0
	Pad Construction	\$111,111
	Media	\$37,037
<b>TOTAL of New Facilities and Equipment</b>		<b>\$7,780,000</b>
<b>Construction Markups</b>		
	20% Process mechanical installation	\$670,000
	25% Process mechanical piping	\$840,000
	5% Yard piping	\$389,000
	10% Site civil	\$778,000
	10% Electrical allowance	\$778,000
	8% Instrumentation allowance	\$622,400
<b>TOTAL of Construction Markups</b>		<b>\$4,080,000</b>
<b>SUBTOTAL</b>		<b>\$11,860,000</b>

<b>Contractor Markups and Contingency</b>		
5%	Mob/Bonds/Permits/Insurance	\$590,000
	<i>SUBTOTAL</i>	\$12,450,000
10%	Contractors Overheads	\$1,250,000
	<i>SUBTOTAL</i>	\$13,700,000
5%	Contractors Profits	\$690,000
	<i>SUBTOTAL</i>	\$14,390,000
35%	Contingency	\$5,040,000
<b>TOTAL CONSTRUCTION COST</b>		<b>\$19,430,000</b>
<b>Non-Construction Costs</b>		
30%	Engineering, Legal, Admin	\$5,830,000
<b>TOTAL PROJECT COST</b>		<b>\$25,260,000</b>
<b>ONSITE ANNUAL O&amp;M ITEMS</b>		
	Operations Labor	\$78,000
	Maintenance Labor	\$78,000
	Equipment Maintenance <sup>a</sup>	\$136,000
	Electrical Cost	\$98,000
	Natural Gas Cost	\$0
	Dewatering Polymer Cost	\$54,000
	Potassium Hydroxide Cost	\$0
	Total of Annual O&M Items	\$444,000
<b>TOTAL PRESENT WORTH OF ONSITE ANNUAL O&amp;M ITEMS <sup>b</sup></b>		<b>\$11,860,000</b>
<b>OFFSITE ANNUAL O&amp;M ITEMS</b>		
	Biosolids Hauling & Land Application	\$66,000
<b>PRESENT WORTH OF OFFSITE ANNUAL O&amp;M ITEMS <sup>b</sup></b>		<b>\$1,760,000</b>
<b>Salvage Value <sup>c</sup></b>		<b>\$0</b>
<b>TOTAL PRESENT WORTH - Alternative 3B</b>		<b>\$38,880,000</b>

<b>Basis of Evaluation</b>	
<sup>a</sup>	3% of equipment cost per year
<sup>b</sup>	Present Worth Factor (PWF) derived by Discount Rate, Inflation Rate, and Period:
	Discount Rate: 2.0%
	Inflation Rate: 2.5%
	Net Present Worth Discount Factor (PWF) = -0.5%
	Evaluation Period (years): 25
	Present Worth Factor (PWF): $PWF = \frac{[(1+i)^n - 1]}{[(1+i)^n \times i]}$
	PWF = 26.70
<sup>c</sup>	Assumes no salvage value at end of 25-year period.

<b>McMinnville WRF - Biosolids Treatment Alternatives Evaluation</b>		
<b>Monetary Evaluation</b>		
October 2020		
		<b>Alternative 3D</b>
		<b>Lystek™ Process + Dewatering</b>
<b>PROJECT COSTS</b>		
<b>New Facilities and Equipment</b>		
Dewatering and Lystek Equipment Building		
	Ground improvements	\$585,000
	Building construction	\$1,430,000
	Dewatering centrifuge 1 (pre-Lystek dewatering)	\$350,000
	Dewatering centrifuge 2 (shared standby)	\$400,000
	Dewatering centrifuge 3 (final dewatering)	\$400,000
	Screw conveyors	\$498,000
	Polymer systems	\$195,000
	Centrate Pumps	\$60,000
	Lystek equipment system	\$2,525,000
Dewatered Biosolids Storage Bunkers		
	Ground improvements	\$0
	Bunker 1 construction	\$480,500
	Bunker 2 construction	\$480,500
	Bunker 3 construction	\$480,500
Biofilter		
	Ground Improvments	\$0
	Pad Construction	\$111,111
	Media	\$37,037
<b>TOTAL of New Facilities and Equipment</b>		<b>\$8,030,000</b>
<b>Construction Markups</b>		
	20% Process mechanical installation	\$890,000
	25% Process mechanical piping	\$1,110,000
	5% Yard piping	\$401,500
	10% Site civil	\$803,000
	10% Electrical allowance	\$803,000
	8% Instrumentation allowance	\$642,400
<b>TOTAL of Construction Markups</b>		<b>\$4,650,000</b>
<b>SUBTOTAL</b>		<b>\$12,680,000</b>



<b>Contractor Markups and Contingency</b>		
5%	Mob/Bonds/Permits/Insurance	\$630,000
	<b>SUBTOTAL</b>	\$13,310,000
10%	Contractors Overheads	\$1,330,000
	<b>SUBTOTAL</b>	\$14,640,000
5%	Contractors Profits	\$730,000
	<b>SUBTOTAL</b>	\$15,370,000
35%	Contingency	\$5,380,000
	<b>TOTAL CONSTRUCTION COST</b>	<b>\$20,750,000</b>
<b>Non-Construction Costs</b>		
30%	Engineering, Legal, Admin	\$6,230,000
	<b>TOTAL PROJECT COST</b>	<b>\$26,980,000</b>
<b>ONSITE ANNUAL O&amp;M ITEMS</b>		
	Operations Labor	\$78,000
	Maintenance Labor	\$78,000
	Equipment Maintenance <sup>a</sup>	\$133,000
	Electrical Cost	\$38,000
	Natural Gas Cost	\$14,000
	Dewatering Polymer Cost	\$189,000
	Potassium Hydroxide Cost	\$124,000
	<b>Total of Annual O&amp;M Items</b>	<b>\$654,000</b>
	<b>TOTAL PRESENT WORTH OF ONSITE ANNUAL O&amp;M ITEMS <sup>b</sup></b>	<b>\$17,460,000</b>
<b>OFFSITE ANNUAL O&amp;M ITEMS</b>		
	Biosolids Hauling & Land Application	\$85,000
	<b>PRESENT WORTH OF OFFSITE ANNUAL O&amp;M ITEMS <sup>b</sup></b>	<b>\$2,270,000</b>
<b>Salvage Value <sup>c</sup></b>		<b>\$0</b>
<b>TOTAL PRESENT WORTH - Alternative 3D</b>		<b>\$46,710,000</b>

<b>Basis of Evaluation</b>	
<sup>a</sup>	3% of equipment cost per year
<sup>b</sup>	Present Worth Factor (PWF) derived by Discount Rate, Inflation Rate, and Period:
	Discount Rate: 2.0%
	Inflation Rate: 2.5%
	Net Present Worth Discount Factor (PWF) = -0.5%
	Evaluation Period (years): 25
	Present Worth Factor (PWF): $PWF = \frac{[(1+i)^n - 1]}{[(1+i)^n \times i]}$
	PWF = 26.70
<sup>c</sup>	Assumes no salvage value at end of 25-year period.

**Memorandum 4**  
**Screening and Grit Removal Evaluation**



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**Subject:** Screening and Grit Removal Evaluation

**Project Name:** McMinnville Water Reclamation Facility Biosolids Storage Tank and Grit System Expansion

**Prepared For:** City of McMinnville

**Prepared By:** Jacobs Engineering Group

**Date:** January 29, 2021

**Project Number:** D3373900

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## 1. Introduction

This memorandum documents the review of the condition and performance of the screening and grit removal processes at the Water Reclamation Facility (WRF). Options are evaluated for rehabilitation, improvement, or expansion of those processes.

WRF influent is pre-screened at the Raw Sewage Pump Station (RSPS) and then receives additional preliminary treatment at the headworks. The headworks was constructed and put into service in 1996 and sized for a peak hour flow of 32 million gallons per day (mgd) hydraulic and treatment capacity. The headworks includes mechanical self-cleaning screens and a vortex grit chamber. The 2009 City of McMinnville Water Reclamation Facilities Plan (2009 Facilities Plan) (West Yost Associates and CH2M HILL, 2009) included recommended improvements to the preliminary treatment processes to address capacity, age, and redundancy. This memorandum includes updates to those recommendations to address preliminary treatment performance deficiencies and deferred maintenance prior to the upcoming Facilities Plan Update.

## 2. Screening Evaluation

The headworks includes two automated, mechanically cleaned fine screens, each rated for 17 mgd. The process has no redundancy at peak flow or bypass, and the equipment is at the end of its expected life. The scope of this evaluation includes consideration of minor changes or replacement of the screens at the WRF, but it excludes major structural changes, changes or replacement of the process, or increased capacity.

### 2.1 2009 Facilities Plan Recommendations

The 2009 Facilities Plan recommended the addition of an automatic screen lifting system. The addition of a lifting system maintains the hydraulic capacity of the headworks by allowing the removal of a mechanically cleaned screen from the channel in the event of mechanical failure.

The WRF is designated a Class 1 facility as defined in the U.S. Environmental Protection Agency Technical Bulletin "Design Criteria for Mechanical, Electric, and Fluid System and Component Reliability" (EPA-430-99-74-001). This bulletin requires a backup bar screen and at least one bar screen that is designed to permit manual cleaning. The lifting system is intended to achieve Class 1 requirements by maintaining the hydraulic and treatment capacity of the screening system with one unit removed from the flow. There are one-half-inch bar screens upstream of the headworks at the flow diversion structure, so all flow would still receive some screening treatment in case a screen is removed at the headworks.

The screens have an estimated 20-year life, and the 2009 City of McMinnville Water Reclamation Facilities Plan (2009 Facilities Plan) (West Yost Associates and CH2M HILL, 2009) recommended replacement in 2016; however, the City has had to make only minor fixes such as replacing broken teeth.

## 2.2 Treatment Requirements

The fine screen system is required to convey the peak hour flow. The 2009 Facilities Plan identified collection system infiltration and inflow (I/I) improvements to maintain the peak hour flow at 32 mgd. Updated peak hour flow projections are substantially higher than 32 mgd using the Oregon Department of Environmental Quality (DEQ) statistical method, as discussed in Memorandum 1, Evaluation of Existing Conditions. However, it is anticipated that due to capital improvements in the collection system, hydraulic modeling of the collection system will establish that the peak hour flow is close to 32 mgd. That modeling is outside the scope of this study.

Screenings must be compacted and dewatered to meet a paint filter test for landfill disposal.

## 2.3 Existing Screening System

The headworks contains two covered screen channels with mechanically self-cleaning screens. Additional screening occurs upstream of the WRF at the Flow Diversion Structure at the RSPS.

### 2.3.1 Equipment

The existing WRF screen equipment is described in Table 2-1. The screen drive mechanism was upgraded around 2000 to increase the rate at which screenings are removed.

**Table 2-1. Existing Screening Equipment**

Description	Value
Screens	
Number	2
Type	Mechanical Self-Cleaning Bar
Manufacturer, Model	Parkson Aqua Guard AG-MN-A
Opening	6 millimeter
Motor Horsepower (hp)	0.75
Hydraulic Capacity, mgd each	17
Installed	1996
Screenings Press	
Number	2
Max Capacity, each, cubic feet/hour	60
Motor hp	3
Installed	1996

### 2.3.2 Condition

WRF staff reported that the screens are worn and that the plastic teeth must be replaced frequently, which is a substantial maintenance task.

The compactor backs up occasionally, and more rag buildup has been observed in downstream processes. It is not known whether this reflects a reduction in performance or a change in influent characteristics.

The downstream hydraulic conditions cause greater depth in the screen channels than required for screening, and the low velocities lead to the settling of grit in the screening channels.

## 2.4 Alternatives Considered

This evaluation focused on options to address the condition of the existing equipment. All options assumed the continued use of a Parkson Aqua Guard because conversion to another product would exceed the City's budget for the screen replacement, would likely require an update to the 2009 Facilities Plan, and would require DEQ approval. Parkson brochures are included in Attachment 1. Methods to increase redundancy, such as adding a bypass channel or a screen lifting device, were not considered because they require structural changes outside the scope of this project. Further, any major changes to the screening process should consider the combination of screening at the headworks and at the RSPS. Options considered include:

1. No changes
2. Rebuild existing equipment
  - a. Rebuild with same components
  - b. Rebuild with upgraded cleaning system
  - c. Rebuild and upgrade with perforated plate
3. Replace screens
  - a. Replace with same components
  - b. Replace with upgraded cleaning system
  - c. Replace and upgrade with perforated plate
4. Replace screenings press

### 2.4.1 Replacement vs. Rebuild

A screen replacement includes disposal and replacement of all screen components. A rebuild includes replacing only those components recommended by the manufacturer.

### 2.4.2 Cleaning System Upgrade

Parkson offers an improved screen cleaning system for the Aqua Guard called UltraClean. Improvements to the cleaning system would enhance screenings capture by eliminating or minimizing the carryover of debris, addressing concerns about the increased presence of rags in the WRF. The additional material captured would not represent a significant change in the quantity of material handled by the screenings press.

The UltraClean unit can be retrofitted onto existing screens by replacing the screen head including the drive shaft, motors, and control panel. The revised belt path alters the solids release point and uses a hybrid brush and dual spray bars.

### 2.4.3 Perforated Plate Upgrade

The Aqua Guard screens can be retrofitted with perforated plates. Perforated plates filter the water through small round holes in the filter element as opposed to larger rectangular slot openings. This upgrade would improve screenings capture, addressing concerns about increased presence of rags in the WRF. It is estimated that the perforated filtering element would capture 10 to 20 percent more material and should be considered in reviewing the screenings press. This upgrade would also eliminate the plastic teeth that are a maintenance concern.

Retrofit with perforated plates will also require replacing additional cleaning system components for compatibility. The hydraulic capacity of the screens will change, and more headloss will be required for a given flow due to a decrease in the open area.

### 2.4.4 Budgetary Cost

The budgetary cost of the options considered are listed in Table 2-2. These costs are not total project cost and cover only work done by Parkson and exclude some required work such as wiring or modifications to connected piping.

**Table 2-2. Budgetary Equipment Cost, per Unit**

Component	Rebuild	Replace
Same Screen Components	\$65,000	\$100,000
Cleaning System Upgrade	\$110,000	\$135,000
Perforated Plate Upgrade	\$120,000	\$155,000
Aqua Wash Press	–	\$65,000

## 2.5 Recommendations

- No work is recommended for the screens as part of this project. If required for maintenance purposes, the City can work directly with Parkson to procure a rebuild of the screens with the same components. However, any improvements to the screening system should wait until the upcoming Facilities Plan Update is complete.
- The hydraulic capacity required should be verified in the upcoming Facilities Plan Update.
- Investments to improve screen performance and redundancy should be coordinated between the screens at the headworks and the screens at the RSPS.

## 3. Grit Removal Evaluation

The headworks includes one grit chamber. The process has no redundancy but includes a bypass. The mechanical equipment is at the end of its expected life. The scope of this evaluation includes consideration of minor changes, replacement, or expansion of the grit removal process.

### 3.1 2009 Facilities Plan Recommendations

The 2009 Facilities Plan recommended construction of a second grit vortex tank adjacent to the existing tank to accommodate peak hour flow and provide redundancy in the summer.

Modifications to address hydraulic deficiencies were also recommended.



The grit removal equipment has an estimated 20-year life cycle, and the 2009 Facilities Plan recommended replacement in 2016.

### 3.2 Treatment Requirements

Oregon DEQ guidelines require the headworks to be hydraulically sized for peak hourly flow (32 mgd) and no redundancy is needed for grit removal units. Treatment capacity should be sized for peak average day flow with a 5-year storm.

There is no regulatory requirement for the grit removal performance. However, the wastewater industry characterizes performance by classifying grit into sand equivalent size ranges and then quantifying the percentage removal of grit in each sand equivalent size range. The trend in the wastewater treatment industry is to target removal of smaller and smaller grit to minimize accumulation in sensitive processes downstream. Depending on downstream processes, the target cutpoint can range from 100 to 150 microns. However, an oxidation ditch would be considered a non-sensitive unit process because minimal equipment is exposed to the wear of the grit, and it can tolerate a larger grit size in the wastewater.

Grit must be washed and dewatered to meet a paint filter test for landfill disposal.

The grit removal process should be optimized to perform well under the most common flows. Figures 3-1 and 3-2 illustrate the frequency of daily and hourly flow rates for the most recent 5-year period.

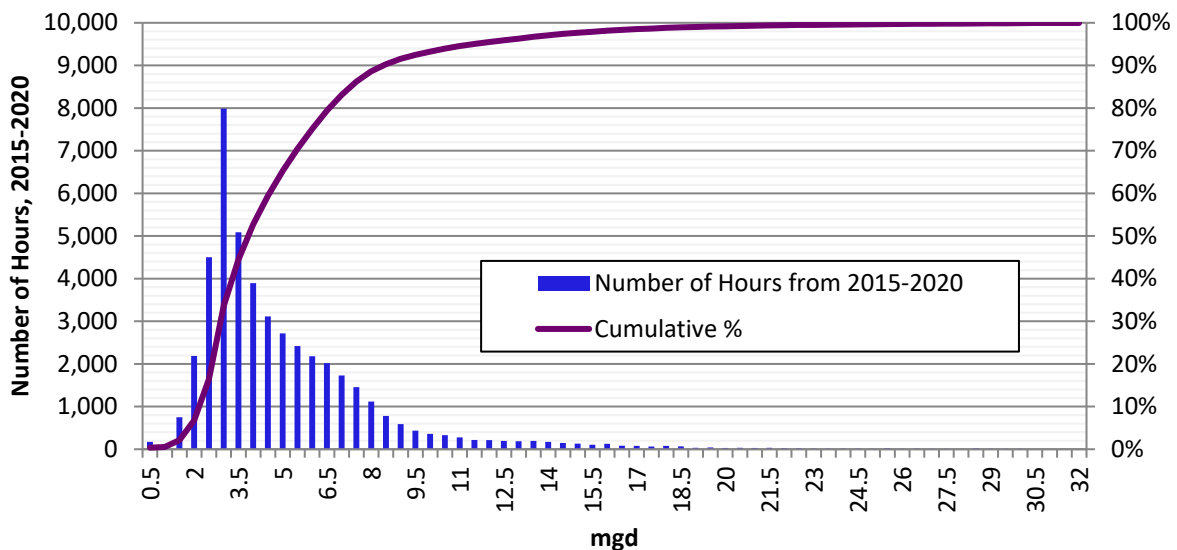


Figure 3-1. WRF Hourly Flow, 2015–2020

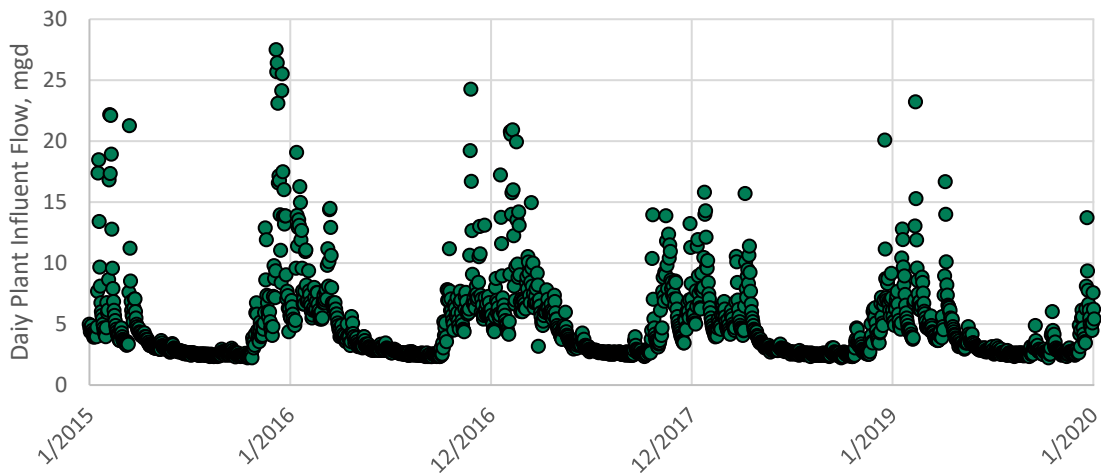


Figure 3-2. WRF Daily Flow, 2015–2020

### 3.3 Existing Grit System

The headworks contains one vortex grit tank and associated equipment.

#### 3.3.1 Equipment

The existing WRF grit removal equipment is summarized in Table 3-1.

Table 3-1. Existing Grit Removal Equipment

Description	Value
<b>Grit Basin</b>	
Number	1
Type	Vortex
Diameter, feet	16
Hydraulic Capacity, mgd	20
Manufacturer, Model	Smith & Loveless, 1st Generation Pista 270
Installed	1996
<b>Grit Pump</b>	
Number	1
Type	Recessed Impeller Centrifugal
Capacity, gallons per minute	200
Motor HP	5
Installed	1996
<b>Grit Washer</b>	
Number	1
Type	Cyclone Classifier
Motor HP	1
Installed	1996

### 3.3.2 Condition

The grit removal structure was not constructed in accordance with the manufacturer's current recommended design. The following issues have been identified:

1. Downstream weir elevation: The aeration basin influent flow splitter weir elevation is 162.85, causing the grit tank water depth to exceed 3.85 feet at all flows and reach up to 5.87 feet at 32 mgd. The recommended maximum depth is 3.5 feet. The excessive water depth results in lower velocities, which cause grit settling in the upstream screening channels and an inadequate vortex for grit removal within the grit tank; this severely impacts performance. Lowering the weirs or raising the invert of the grit process would be required to address this item.
2. Grit tank outlet weir width: The grit tank outlet is 8 feet wide instead of the recommended 7 feet. Smith & Loveless does not expect this item to significantly affect performance.
3. Grit tank outlet weir elevation: The height of the grit outlet was modified during construction. As-built drawings indicate the weir at elevation 161.00, which is the recommended 2 feet above the grit tank invert. This elevation should be confirmed, but no further modification is needed.
4. Grit tank floor elevation: The grit tank water depth is too deep, as described in Item 1 above. The floor would need to be raised or the flow split weirs lowered to address the depth.
5. Grit tank influent channel length: The grit tank influent channel and ramp were constructed as 24 feet long rather than the recommended 32.5 feet. No adjustment to the channel length can be made without replacing the structure. Smith & Loveless indicated that this item will not have a significant effect on performance.

The City has observed that the system performs better (that is, collects more grit) during periods of high flow. No testing has been done to establish whether this is the result of improved performance, resuspension and collection of grit from the screening channels, or increased influent grit load during high flow.

Less grit and rock has been collected since the City made I/I improvements to the collection system.

Grit that passes through the headworks tends to settle out in the outer ring of the Orbal process. Recent draining of Orbal 1 revealed approximately 40 cubic yards of grit after 6 years in service. The cleanup cost is expected to total approximately \$3,500. It is possible that some of this grit is media in the recycle stream from the tertiary filters.

### 3.4 Alternatives Considered

This evaluation considered options to address the treatment capacity, performance, and equipment age. Options considered include:

1. No changes.
2. Add a new, parallel grit removal train.
3. Replace the existing grit removal.
4. Modify the existing grit removal:
  - a. Add baffling.
  - b. Replace mechanical equipment.

### 3.4.1 Additional Vortex Grit Removal Tank

The 2009 Facilities Plan recommended the addition of a second vortex grit tank. This addition would provide a total treatment capacity greater than the peak hour flow and a firm treatment capacity at dry weather flows.

The new grit removal train would be another vortex type due to space limitations at the headworks, as illustrated on Figure 3-3. The new unit would be installed adjacent to the existing unit as a mirror image, fed from the north and discharging to the east; this would require extensive modifications to the channels between screening and grit removal to split the flow between two trains. The new grit tank discharge would then have to be routed around the grit process and into the aeration basin influent flow split box.

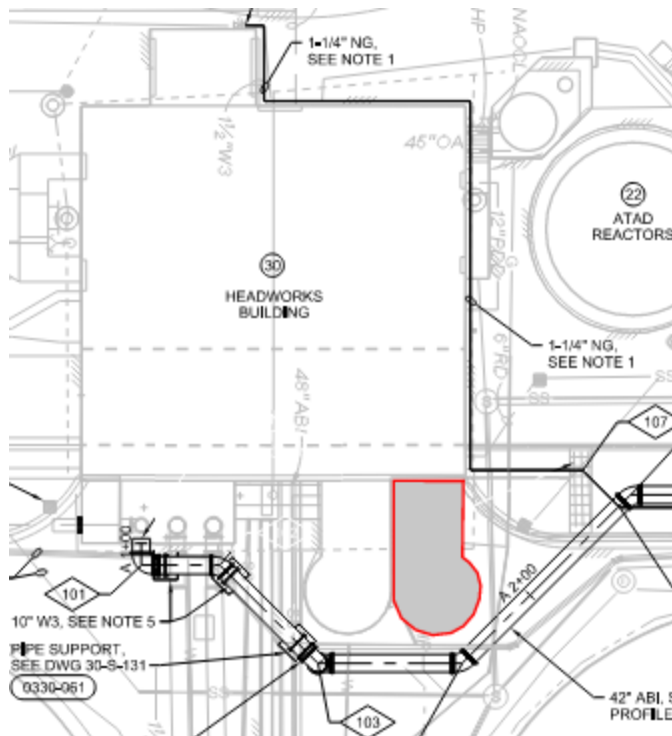


Figure 3-3. Location of Additional Grit Removal Train

Construction of this option would be difficult due to space limitation for both the structure and the required piping. Modifications to the existing headworks structure would also result in a large capital cost.

### 3.4.2 Replacement of Vortex Grit Removal Tank

Due to the hydraulic deficiencies of the existing vortex tank, replacing the process with aerated grit tanks or two Hydro International HeadCell units could address performance, capacity, and redundancy concerns. However, as previously identified in the 2009 Facilities Plan, there is insufficient space available to add two new grit removal units without replacing the headworks.

### 3.4.3 Retrofit with Baffling

Smith & Loveless offers the Optiflow Baffle (Figure 3-4) to improve the grit capture efficiency of the Pista-270. The baffle would be located at the outlet and oriented to retain grit longer, enhancing the

vortex to increase grit capture. An additional Optiflow Low Flow Baffle is also recommended in the inlet channel to increase velocity at lower flows, enhancing the vortex at the most frequent flows.

The cost of the equipment to improve the vortex tank baffling is \$15,000. Due to the abnormally deep operating depth of the existing vortex tank, it is unknown whether the baffling would result in substantially improved performance. A computational fluid dynamics model could validate expected performance gains, but this would be costly and still not provide certainty. Also, additional baffling will add headloss at peak flows, reducing the hydraulic capacity of the unit.

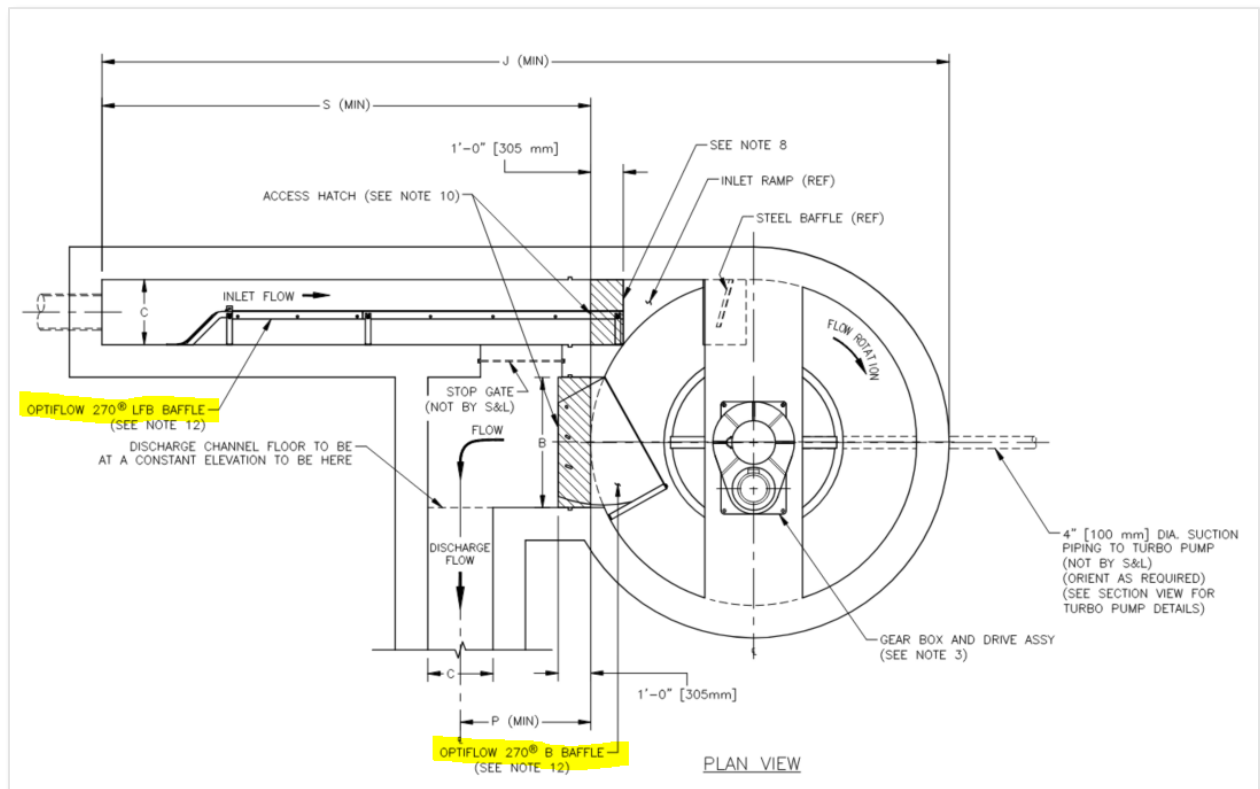


Figure 3-4. Smith & Loveless Optiflow Baffle

### 3.4.4 Replacement of Mechanical Components

The existing mechanical components of the grit removal process are at the end of their expected life cycle. The grit tank mechanism, grit pump, programmable logic controller, and Model 15 classifier with cyclone could be replaced to maintain the process at its current capacity for a budgetary equipment cost of \$207,500. The existing components can also be refurbished and kept as spares to increase process redundancy.

### **3.5 Recommendations**

No work at the grit removal process is recommended as part of this project. The maintenance costs incurred by periodically cleaning grit from the Orbal outer rings does not justify the expense of expanding or replacing the existing process.

The addition of Optiflow baffles may be considered, but due to the unique hydraulics, it is unknown whether the cost of this improvement would be justified by any increase in performance. Additionally, regardless of performance increase, it is expected that cleaning grit from the Orbal outer ring could never be completely eliminated.

Replacement of failing equipment may be covered as a maintenance activity and does not need to be included in this project.

## **4. Conclusions**

No work at the headworks is recommended as part of this project.

Peak hour flow will be verified in the Facilities Plan Update and will impact the requirements of the screening and grit removal processes.

The screens at the Flow Diversion Structure and the headworks should be reviewed together in the Facilities Plan Update to determine the optimal capital investment to meet the peak hour flow and provide redundancy.

## **5. References**

U.S. Environmental Protection Agency. 1974. Technical Bulletin "Design Criteria for Mechanical, Electric, and Fluid System and Component Reliability." (EPA-430-99-74-001).

West Yost Associates and CH2M HILL. 2009. City of McMinnville Water Reclamation Facilities Plan.

**Attachment 1**  
**Parkson Brochures**





# Quotation

**NUMBER:** B02010608 Rev 2

**DATE:** July 8, 2020

**TO:** City of McMinnville  
3500 NE Clearwater Drive  
McMinnville, OR 97128  
Attn: Leland Koester  
Tel: 503-434-7412  
E-Mail:  
leland.koester@ci.mcminnville.or.us

**REF.:** Project Name: McMinnville WWTP  
Project Location: McMinnville, OR  
Original Serial #: AG-1492  
Rebuild #: B02010608

Parkson Corporation proposes the reconditioning of your existing Aqua Guard® Continuous Self-Cleaning Bar/Filter Screen and is pleased to provide this **Rebuild/Retrofit Quotation** for the following:

## ITEM 1 AQUA GUARD SELF-CLEANING BAR/FILTER SCREEN

# Existing Units: 2  
Unit #: 1, 2  
Model: AG-MN-A

### 1.A Existing Equipment:

#### Description

Screen Width: 2 ft. 10 1/2 in.  
Solids Discharge Height: 12 ft.  
*[as measured from the bottom of the channel to the discharge point]*  
Screen Angle: 75 °  
Screen Opening: 6 mm  
Application / Industry: Municipal

#### Materials of Construction

Elements: high impact polycarbonate alloy  
Frame: 304 SS  
Conveyor Chain: 304/410  
Filter Element Shafts: 304 SS  
Side Plate: 304 SS

**1.B The following parts are recommended for replacement on one (1) unit:**

<b>AG-1492</b>		<b>B02010608</b>
<b>McMinnville, OR</b>		
<b>AG-MN-A 2' 10 1/2" x 12' DH, 75°,304SS, 6mm</b>		
<u>Item Description</u>	<u>Quantity</u>	
Screen Assembly	1	
Rotating Brush Assembly*	1	
Upper Guide Rails, AS/OH*	2	
Spacer, Upper Guide Rails*	6	
Guide Rails, AS/OH	2	
Lower Guide Rails	3	
Lower Guide Rail Mtg. Spacers	4	
Filler Plate, 304	2	
Seal, Discharge Pan, Neoprene	2	
Side Seal, Neoprene/brush	2	
Flange Bearing, Brush*	2	
Pillow Block, Take-up	2	
Flange Bearing, Drive shaft	1	
Bushing, *	1	
Bushing, *	1	
Sprocket, Brush *	1	
Sprocket, Drive shaft *	1	
#40 Chain with Master Link *	1	
Drive Tightener *	1	
Nameplates & Labels Set	1	
<b><u>Front Seal</u></b>		
brush set, 2"	1	
brush set, 3"	1	
Clips	10	
<b><u>Screen Assembly</u></b>		
Chain Link Assy., 304/410	204	
Filter Shaft, 304, solid	102	
Snap Ring, PH 15-7 Mo	204	
Filter Element, 6mm, Plastic	4182	
Side Plate, Phenolic	408	
Washer, Delrin	204	

**1.C The following parts are recommended for retrofitting to UltraClean per (1) unit:**

<b>UltraClean TM, 304ss</b>	
Upper Frame Weldment,	1
Top Bracket	1
Rotating UltraClean Brush and shaft	1
Drive Shaft	1
Drive Mtg. Bracket Components Brush & shaft	1
Drive Mtg. Bracket, Main	1
Rail, Discharge	2
Rear Cover, Upper, Lower and Fixed	1
Connecting Chute, (required to connect to RP)	1
Gasket Set	1
Spray Header	2
Nozzles	20
Solenoid Valve, ( 1") Pressure Gage, Ball Valve	1
Reducer and 1/2HP, Motor, Main	1
Reducer and 1/2HP, Motor, Brush	2
Sub Control Panel, NEMA 4X	1
Addition Screen Components	1

**1.D The following parts are recommended for retrofitting to Perf Screen per (1) unit:**

<b>Perf Conversion, 304ss</b>	
Upper Frame Components	1
Cover - Rear Chute	1
Rear Chute Mounting Bracket	1
Spray Bar with nozzles	2
Cover plate	1
Brush Drive Mounting Bracket	1
Bearing, Flange - Brush	2
Rotating Brush	1
Front Seal Brush Set	1
Perforated Plate	102
Reducer Main	1
Motor- Main, 1/2 HP, XP	1
Reducer - Rotating Brush	1
Motor - Rotating Brush, XP	1
Spray Nozzles	20
Local Control Panel	1



Note: 1- Items with an \* (shown in Section 1B above) are removed from scope for the UltraClean and the Perf Panel Options.

2- All electrical conduits, wire etc. and installations required to install the auxiliary NEMA 4X Control Panel, Solenoid Valve and Brush Motor are the responsibility of the owner.

3- NEMA 4X Control Panel to installed in a non-hazardous location

4- Owner is responsible to provide 3/4" pipe water line by the Bar Screen, for the connection to the spray system.

5- Power requirements are 120/1/60 for solenoid valve and 480/3/60 for the brush motor and local control panel.

6- (2) Spray headers will require a total of 10 gpm at 10 psi or 20 gpm at 40 psi, recommended 3/4" pipe.

**ITEM 2 OFFERINGS - BUDGET PRICE**

**2.A Parkson Certified On-site Rebuild (in-kind) with OEM Parts and Parkson Technicians.....\$64,446.00 USD (Per Unit)**

1. To ensure work site safety, Parkson is responsible for tilting the unit from the channel and resetting it once rebuild is complete.
2. Customer is responsible for thoroughly cleaning, pressure washing, disinfecting the unit prior to rebuild.
3. All parts listed in [1B] above.
4. Parts will be shipped F.O.B. Factory, freight included to jobsite.
5. Removal and reinstallation of the unit in the channel is included.
6. Work performed by Parkson authorized field technicians, who will test run equipment at completion of rebuild.
7. Taxes excluded.

**Rebuild / Start-Up Assistance - Included**

Parkson will furnish one certified crew as required to rebuild unit, provide start-up and operator training. Dates of service to be scheduled upon receipt of Buyer's written request.

Additional start-up service can be purchased for \$1,000 per day plus travel and living expenses.



**2.B Parkson Certified On-site Rebuild (in-kind with UltraClean upgrade) with OEM Parts & ParksonTechnicians.....\$109,435.00 USD (Per Unit)**

1. To ensure work site safety, Parkson is responsible for tilting the unit from the channel and resetting it once rebuild is complete.
2. Customer is responsible for thoroughly cleaning, pressure washing, disinfecting the unit prior to rebuild.
3. All parts listed in [1B and 1C] above.
4. Parts will be shipped F.O.B. Factory, freight included to jobsite.
5. Removal and reinstallation of the unit in the channel is included.
6. Work performed by Parkson authorized field technicians, who will test run equipment at completion of rebuild.
7. Taxes excluded.

**Rebuild / Start-Up Assistance - Included**

Parkson will furnish one certified crew as required to rebuild/retrofit unit, provide start-up and operator training. Dates of service to be scheduled upon receipt of Buyer's written request.

Additional start-up service can be purchased for \$1,000 per day plus travel and living expenses.

**2.C Parkson Certified On-site Rebuild (in-kind with perforated plate retrofit) with OEM Parts & ParksonTechnicians.....\$120,269.00 USD (Per Unit)**

1. To ensure work site safety, Parkson is responsible for tilting the unit from the channel and resetting it once rebuild is complete.
2. Customer is responsible for thoroughly cleaning, pressure washing, disinfecting the unit prior to rebuild.
3. All parts listed in [1B and 1D] above.
4. Parts will be shipped F.O.B. Factory, freight included to jobsite.
5. Removal and reinstallation of the unit in the channel is included.
6. Work performed by Parkson authorized field technicians, who will test run equipment at completion of rebuild.
7. Taxes excluded.

**Rebuild / Start-Up Assistance - Included**

Parkson will furnish one certified crew as required to rebuild/retrofit unit, provide start-up and operator training. Dates of service to be scheduled upon receipt of Buyer's written request.

Additional start-up service can be purchased for \$1,000 per day plus travel and living expenses.

- 2.D **New Unit Budget Price (Per Unit) .....\$100,000.00 USD (In-Kind)**
- 2.E **New Unit Budget Price (Per Unit) .....\$135,000.00 USD (Ultraclean)**
- 2.F **New Unit Budget Price (Per Unit) .....\$155,000.00 USD (Perforated Plate)**
- 2.G **New Unit Budget Price (Per Unit) .....\$65,000.00 USD (Aqua Wash Press)**

Please contact Parkson for a formal new unit quotation and purchase price.

**ITEM 3 OPTIONS FOR EXISTING UNITS(S) ONLY**

- 1. RP-200 Modification.....ADD..... \$18,335.00 **USD (Per Unit)**

**ITEM 4 SCHEDULE, VALIDITY, PAYMENT TERMS**

**4.A Schedule**

- Informational Package on the UltraClean and Perf Conversion will be made (6 weeks) after receipt of acceptable Purchase Order by Parkson and all questions are resolved.
- Parts availability: Fourteen (14) weeks following receipt of acceptable written Purchase Order.
- Field/on-site rebuild will be accomplished within 4-6 weeks after parts are delivered to customer, but in no event later than 90 days.
- Rebuild must be completed within 90 days after parts arrive on-site.

**4.B Validity:**

- 1.  Price is valid for thirty (30) calendar days from Quotation date, for shipment of Equipment within the timetable stated above.

**4.C Payment Terms:**

- 1.  90% net 30 days upon shipment of parts to site, 10% upon rebuild completion, not to exceed 90 days after shipment of parts should rebuild be delayed by other than Parkson. Payment terms for parts only without any factory labor or field service is 100% net 30 days from shipment.

**ITEM 5 WARRANTY, DRAWINGS & MANUALS**

**5.A Mechanical Warranty:**

- 1. As defined in Section XVI on the (see link under terms and conditions) Standard Conditions of Sale, Parkson offers a one (1) year mechanical warranty for all new parts installed on the Aqua Guard screen by an on-site certified rebuild.
- 2. Installation labor of parts or parts not ordered as part of a rebuild package have a 90-day warranty.

**5.B Drawings and Installation, Operation and Maintenance (IO&M) Manuals:**

- |                        |                         |
|------------------------|-------------------------|
| 1. Approval Drawings:  | Not required            |
| 2. Certified Drawings: | One (1) Electronic Copy |
| 3. IO&M Manuals:       | One (1) Electronic Copy |

**TERMS AND CONDITIONS:**

This Quotation is governed by and subject to Parkson's Standard Conditions of Sale, which are incorporated by reference and accessible at: <http://www.parkson.com/files/documents/AFM-terms.pdf>.

**PATENTS:**

The Equipment and/or process quoted herein may operate under one or more U.S. patents. The Purchase Price includes a one-time royalty payment (if any), which provides the Buyer with immunity to operate the Equipment specified in the Quotation under any applicable patents.

**CLARIFICATIONS AND EXCEPTIONS:**

Parkson is not in receipt of any plans and specifications. The equipment quoted above is based upon Parkson's current standards and may or may not comply with any specification that may exist. Parkson reserves the right to revise this quotation upon receipt of any plans and specifications.

**BUYER / OWNER RESPONSIBILITY UNLESS OTHERWISE STATED:**

**Getting the Unit ready for the Rebuild/Retrofit**

- Upon disassembly on-site, if any unforeseen parts or structural repairs are discovered, Parkson Corporation will notify the customer prior to commencement of any repairs which will be beyond the originally quoted scope. The costs for these items and any time extension will be added to the scope of work.
- Removal and installation of Aqua Guard unit in channel, includes and is not limited to:
  1. High pressure washing of the unit / removal of all solids. Additional charges and delays will occur if it is necessary for our crew / factory to send equipment out for cleaning and solids disposal.
  2. Disassembling from adjoining equipment / electrical / controls.
  3. Disconnecting shower water connections and water supply.
  4. Disconnecting controls / electrical connection and interconnecting wiring removal (including any of the following, but not limited to: E-stop button, solenoids, motors, interlock switches, wiring and conduit from each unit-mounted electrical device to a terminal box or control panel).
  5. Removing piping connections, platforms, gratings and railings unless stated otherwise.
  6. Removing any other auxiliary equipment or service not detailed above.
- Readiness of the equipment before requesting [rebuild or start-up] service. Non-readiness may result in additional charges.

**Getting the Site ready for the Rebuild/Retrofit (Personnel Safety is of utmost importance)**

- Provide a safe work area around the equipment.



1. If the rebuild is performed with the unit in the channel; customer/owner to cover the channel with minimum 3/4" plywood and ensure it is properly secured.
  2. If unit is tilted out of the channel customer/owner to supply a brace (spanning the channel) sufficient enough to support the weight of the unit while it is being rebuilt.
  3. Whenever possible, unit should be staged away a safe distance away from any currently utilized equipment and/or work areas.
- Provide proper ventilation inside the building
  - Unloading of parts when they arrive on site.
  - Care and storage of rebuild components upon receipt at customer site.
  - Delivered material needs to be stored at the same elevation and within 10 feet of the screen
  - Redirect channel flow.
  - Provide clean, dry channel.
  - Old parts weighing 50 lbs or more should be loaded on a customer supplied forklift (or equal) in order to place them in a customer supplied dumpster.

**Customer must Provide**

- At a minimum a forklift and possibly a crane / hoist.
- Manlift, ladders
- Dumpster for all old parts [on-site rebuild only].
- Hydraulic puller to remove gear assembly.
- Any other specialty tool which may be required.

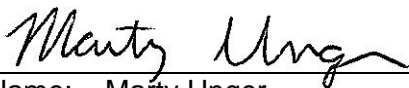
Please return one signed copy of this quotation and Purchase Order to Parkson Corporation at the address below. Refer to this quotation, date, and related correspondence.

**Issued By:** Carlos Robaina

**Accepted By:** (Herein called the Buyer)

**PARKSON CORPORATION**

1401 West Cypress Creek Road, Ste. 100  
Fort Lauderdale, FL 33309



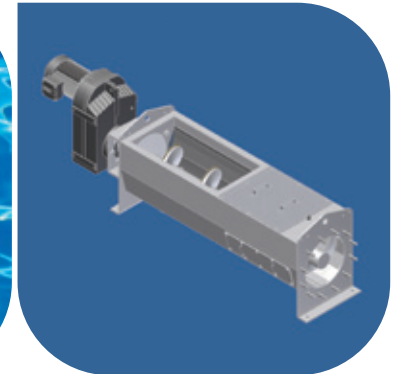
Name: Marty Unger  
Title: Regional Sales Manager  
Phone: 954 383-1757  
E-Mail: munger@parkson.com  
Fax: 954-252-3775  
Date: July 8, 2020

Title:  
Date:

Local Rep: Mike Reilly  
William H. Reilly & Company  
Phone: 503-223-6197  
Fax: 503-223-0845  
E-Mail:mreilly@whreilly.com



Aqua WashPress® receiving screenings from Aqua Guard® screen



# Aqua WashPress®

## Reduce odors and disposal costs

Organics and biosolids are commonly caught along with screened solids. If not removed, these elements retain water, inhibit drainage, emit odors and result in excessive disposal costs.

The solution is screenings washing, and the Aqua WashPress® (AWP) handles the job economically. The unit is the perfect complement to any screen, particularly if cost-effective screenings washing and compaction is your objective.

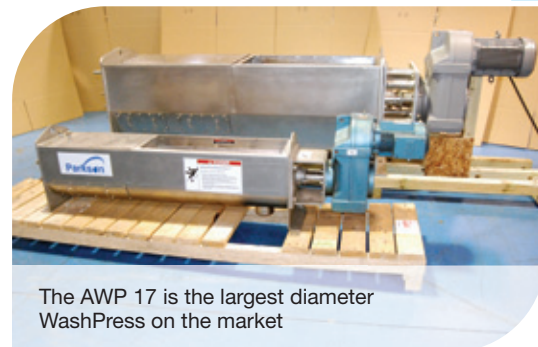
### Principle of Operation

The operation is simple. Screenings enter the press from a hopper and are conveyed by a slowly rotating screw to a wash zone where water is added to support the separation process. This is followed by compacting and dewatering in a press zone.

A stainless steel housing encompasses an inner cylinder where washing and compacting occurs. This design

completely encloses the screenings, prevents spills, contains odors and provides a hygienic work environment.

Following the wash section, the Aqua WashPress® dewater solids to reduce the volume and weight prior to disposal. The Aqua WashPress® delivers significant volume and weight reductions compared to unwashed and dewatered solids.



The AWP 17 is the largest diameter WashPress on the market



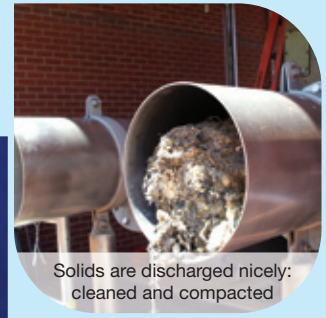
The organics, which are washed out of the screenings, are returned to the influent, where they can be treated as part of the normal plant process. The Aqua WashPress® is an effective way to improve plant processes and its compact size fits easily under a screen.

## Features

- Improves plant operation – washes organics from the screenings and returns them to the process where they belong; reduces odors caused by entrained organics
- Low maintenance – only one moving part, the screw drive; all wear parts are easy to replace without welding
- Economic to operate – a low horse-power motor drives the entire unit which only runs on demand
- Custom length/height of discharge piping
- Variable length inlet hopper
- Optional bagging device at discharge



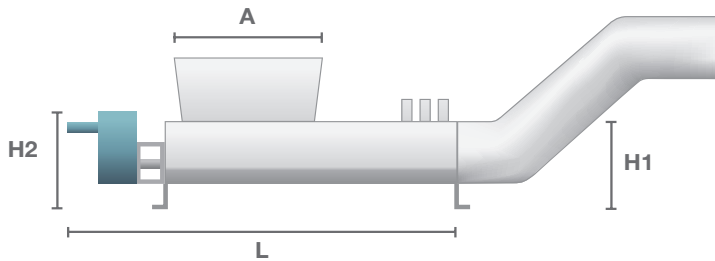
Drive assembly with reliable Eurodrive gearmotor and packing gland



Solids are discharged nicely: cleaned and compacted



Optional vertical bagger for solids disposal



Unit Model	8	10	12	17
Spiral Diameter	8"	10"	12"	17"
Height (H1)	18"	20"	20"	32.5"
Width	13.5"	17"	17"	23.5"
Gearmotor Height (H2)	26"	26"	26"	42"

AWP Models		Hopper Length "A"	Unit Length "L"	
			8, 10, 12	17
8,10,12	-1.0	1'3"	6'5"	
8,10,12	-1.5	1'9"	6'11"	
8,10,12	17 -2.0	2'3"	7'5"	9'8"
8,10,12	-2.5	2'9"	7'11"	
8,10,12	17 -3.0	3'3"	8'5"	10'8"
8,10,12	-3.5	3'9"	8'11"	
8,10,12	17 -4.0	4'3"	9'5"	11'8"
8,10,12	-4.5	4'9"	9'11"	
8,10,12	17 -5.0	5'3"	10'5"	12'8"



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## Aqua Guard<sup>®</sup> Element to Perforated Plate Screen Conversion Kit

Parkson is pleased to announce it now offers a retrofit product that allows for an extremely cost effective and simple conversion of an element style screen to a perforated plate style screen. The key to this new offering, which carries a full warranty, is that it utilizes virtually every existing component of the element screen. As a result, the hardware and time needed to create the transformation are minimized and in turn, the customer's return on investment is maximized.

For over three decades, Parkson has sold thousands of Aqua Guard element style screens. These screens have demonstrated tremendous durability, reliability and capture rate performance. In 2010, Parkson released the Aqua Guard<sup>®</sup> UltraClean<sup>™</sup> screen and conversion kits to offer the highest performing and most maintenance-friendly element screen on the market today.



Retrofitted screen with perforated plate screening surface and solids-carrying shelf.

While Parkson has seen incredible success with the element screening products, we've recognized through our strong customer relationships that solids characteristics, loading rates, and simply personal preferences at installation sites change. Thus, we have received numerous customer requests over the years to convert element screens to perforated plate screens. Until now, this conversion was viewed as too complex and costly to be worthwhile and customers were instructed to install new perforated plate screens

(preferably Aqua Guard® PF screens). Through a robust research and development effort, Parkson has successfully designed and thoroughly tested this new patent pending conversion kit.

Take advantage of this new technology offering from Parkson by calling us today! We are eager to provide you with a budget and additional details on how this element to perforated plate conversion will provide you the high performance, perforated plate screening capabilities you are looking for.



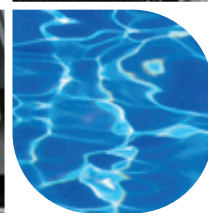
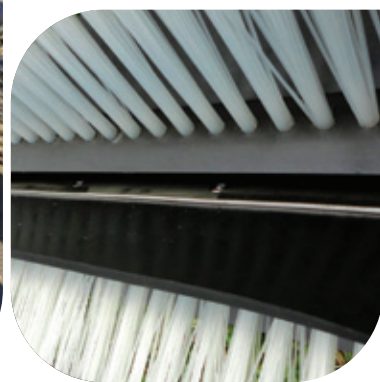
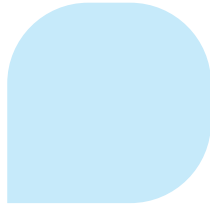
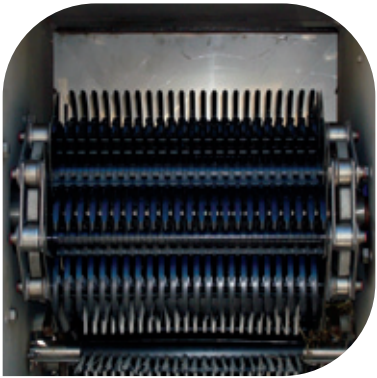
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AG-E2P





# Aqua Guard<sup>®</sup> MN UltraClean<sup>™</sup>

Continuous Self-Cleaning Bar/Filter Screen

## Rebuild & Retrofit

- Modular head replacement
- New brush position and belt path
- Dual optimally positioned spray bars
- Work performed on-site or at factory

# Designed with the operator in mind

The Aqua Guard® MN UltraClean™ screen was developed to increase the capture rate efficiency of the Aqua Guard® screen, improve the cleaning method and reduce maintenance. The main feature of the retrofit unit is an optimized belt path relocating the solids release point. In a side by side test the rebuilt unit scored over a 50% better capture rate than the original screen.

A new hybrid brush is optimally relocated for improved cleaning of the belt. Longer bristles penetrate deeper in between the elements in order to remove debris. The brush length along the shaft spans from rail to rail for better screen belt cleaning. A unique hybrid brush design prevents long rags, hair and threads from wrapping tightly around the brush core and shaft. The new brush needs far less maintenance, lasts longer and most importantly, improves the capture rate of the screen.

An independent brush drive enables the brush to rotate at an optimum speed in the opposite direction of the belt and at a faster speed for over 3.5 times more contacts with the elements per minute.

Dual spray bars, located before and after the brush assembly provide additional cleaning of the belt; one at the first solids release point (before the contact point of the brush and the belt) and a second at the second solids release point. Spray bars deliver water only when the belt is moving and one site noted that 10 psi was very effective and saved water too.

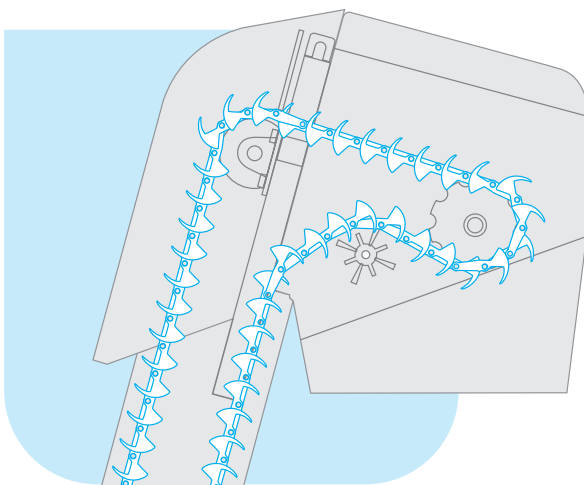


## Features

- Modular head replacement with:
  - New brush position and belt path
  - UltraClean brush design that resists “wrapping” and stays cleaner longer
  - Dual optimally positioned spray bars
- Wearable part replacement
- Parkson-certified engineering
- Work performed on-site or at factory by Parkson-certified labor
- Parkson-certified training upon completion

## Benefits

- Over 50% capture rate improvement in side by side test
- Operators agree: easier to maintain with fewer downstream issues
- Less frequent equipment maintenance
- Extends warranty to one-year for certified rebuilds
- Improves operational efficiency
- Avoids capital expense of new equipment
- Extends equipment life
- Lower operating costs





# Parkson Rebuild & Retrofit Options

## On-site with Parkson Technicians and OEM Parts

### Features

- Parkson-certified specialist will complete the rebuild or retrofit at the customer's facility, replacing all recommended wear parts
- Newly reconditioned unit(s) will be placed back in operation without having been physically removed from the customer's plant
- One-year warranty on the rebuilt equipment

### Advantages

- On-site solution
- Includes on-site start-up and training
- Parkson OEM parts are supplied

## Parkson-Certified Rebuild at Factory

### Features

- Hassle-free option allows the customer to send their equipment for rebuild or retrofit to the factory or Parkson-certified service center
- Unit is test run at the factory
- Includes on-site start-up and training
- One-year warranty on the rebuilt equipment

### Advantages

- Most complete rebuild & retrofit
- One-stop solution
- Parkson OEM parts are supplied

## Head Comparison

Before

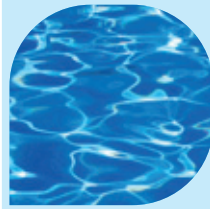


After



## Service Maintenance Program

The Parkson Aqua Guard Service Maintenance Program will provide the necessary preventative and periodic care to keep your Aqua Guard unit functioning optimally. Parkson offers quarterly and semi-annual programs.



## Aqua Guard Maintenance Schedule

### Maintenance Task

- Perform a general visual inspection
- Install parts and maintenance from general inspection
- Clean screen face and rotating brush
- Clean interior of bar screen
- Perform complete interior inspection
- Inspect condition of brush
- Inspect filter belt assembly
- Inspect and adjust screen belt tension
- Check all fasteners on the unit
- Inspect side seals
- Replenish shaft bearings grease
- Check the condition of the grease lines and fittings for wear
- Inspect bar screen drive system
- Check bar screen drive oil level
- Change oil in bar screen drive reducer, if necessary
- Check spare parts inventory
- Inspect overload mechanism
- Check operation of all electrical components
- Replenish screen motor bearing grease, if necessary
- Check and tighten all electrical connections in control panel
- Issue service maintenance inspection report upon completion



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**Memorandum 5**  
**Evaluation of Odor Control System**



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**Subject:** Evaluation of Odor Control System

**Project Name:** McMinnville Water Reclamation Facility Biosolids Storage Tank and Grit System Expansion

**Prepared For:** City of McMinnville

**Prepared By:** Jacobs Engineering Group

**Date:** January 29, 2021

**Project Number:** D3373900

---

## 1. Introduction

This memorandum provides an evaluation of odor control systems and related improvements for the upcoming project to be implemented at the McMinnville Water Reclamation Facility (WRF). This evaluation includes a description of the existing odor control system at the WRF as well as the proposed odor control improvements for serving the existing and new odor emitting sources.

The 2009 City of McMinnville Water Reclamation Facilities Plan (2009 Facilities Plan) (West Yost Associates and CH2M HILL, 2009) recommended replacement or expansion of the existing odor control system concurrent with construction of the recommended dewatering expansion, which was anticipated to be completed in the 2014 to 2016 period. This work was not implemented; therefore, the odor control system described in the 2009 Facilities Plan remains today.

## 2. Existing Odor Control System

The current odor control system at the WRF consists of the following system components:

- Two 16,000 cubic feet per minute (cfm) fiberglass reinforced plastic (FRP) 15-horsepower utility exhaust fans (one duty and one standby) located in the HVAC/Mechanical Room on the upper floor of the Headworks facility. Based on City feedback, both fans may be operated when all three existing autothermal thermophilic aerobic digestion (ATAD) units are online. The existing fans are showing signs of severe corrosion, particularly to the steel frames, and are nearing the end of their service life.
- Single mist tower sized for 16,000 cfm. Originally, this scrubber was operated as a chemical mist scrubber (Calvert system) for the removal of hydrogen sulfide (H<sub>2</sub>S) and other related compounds. The unit has since been converted to a water-only ammonia removal and humidification unit and consists of water spray nozzles, reactor vessel, and drain assembly. The high-pressure blower unit is not currently used.

- Ductwork network connecting the odor sources to the fans and connecting the fans to the mist tower and biofilter. While portions of the ductwork are in serviceable conditions, other portions leak.
- At-grade wood-chip biofilter with a 16,000 cfm design capacity and approximately 3,100 square feet in size. Biofilter media are changed out every 3 to 5 years due to media degradation and excessive fines. The existing concrete pad is at the end of its service life.

The existing odor control system serves the following odor emitting sources at the WRF:

- Three ATAD units
- Biosolids storage tank (BSST)
- Septage receiving wet well
- Thickening wet wells
- Grit removal channel
- Screening channels
- Aeration basin splitter box
- Headworks process space
- Screenings hopper
- Grit hopper

### 3. Proposed Odor Control System

The existing odor control system and associated system components were installed as part of the 1993 WRF construction. As noted, the various equipment components are at or beyond their expected useful life. As such, it is recommended that the odor control system be replaced in its entirety.

#### 3.1 Estimated Odor Loadings

First-generation ATAD odors can be difficult to remove due to high concentrations and the complexity of odorants generated. As such, these complex compounds can require contact times in typical organic media biofilter media of 75 seconds or longer before sufficient removal occurs (Riegert, 2009). Jacobs has investigated the expected odor characterization and loadings associated with the existing WRF sources as well as the future sources pertaining to second-generation ATAD technology. Based on feedback from facilities that have implemented second-generation ATAD systems, odor concentrations are expected to be significantly reduced.

Table 3-1 summarizes typical ATAD odors of concern with their specific odor threshold concentration.

**Table 3-1. ATAD Odors of Concern**

Abbreviation	Name	Descriptor	Odor Threshold (ppbv) <sup>1</sup>
H <sub>2</sub> S	hydrogen sulfide	Rotten egg	0.51
MM	methyl mercaptan	Rotten vegetables	0.077
DMS	dimethyl sulfide	Canned corn	3.0
DMDS	dimethyl disulfide	Rotten vegetables	0.22
NH <sub>3</sub>	ammonia	Pungent	1300

Notes:

<sup>1</sup> Based on Orange County Sanitation District 2018 Master Plan  
ppbv = parts per billion by volume

Sulfur compound analyses were conducted at two second-generation ATAD facilities and one first-generation ATAD facility for the purpose of understanding and quantifying the expected odor reduction associated with the second-generation ATAD process. Table 3-2 summarizes this comparison.

**Table 3-2. First-Generation ATAD versus Second Generation ATAD Odor Comparison**

Facility	Concentration, ppbv			
	H <sub>2</sub> S	MM	DMS	DMDS
2nd Generation ATAD Facility 1	88	71	474	596
2nd Generation ATAD Facility 2	130	184	1,274	8,232
1st Generation ATAD Facility	174	10,694	4,013	3,018

As shown in Table 3-2, second-generation ATAD can significantly reduce odor generation, especially when considering MM, a difficult odorant to remove.

Similarly, ammonia is expected to be significantly reduced with second-generation ATAD. Based on feedback from other second-generation ATAD retrofit facilities, the storage nitrification-denitrification reactor (SNDR) tank reduced the ammonia concentrations from 1,000 to 3,000 milligrams per liter (mg/L) for the first-generation ATAD system to approximately 50 mg/L.

Gas phase ammonia levels were predicted for the WRF's new ATAD system assuming a liquid-phase ammonia concentration of 50 mg/L. Considering Henry's Law and assuming equilibrium conditions, the maximum gas-phase concentration is expected to be approximately 47 parts per million by volume (ppmv).

## 3.2 Technology Description

The most common technology used for treating foul air from ATAD systems is biofiltration or a combination of biofiltration with other technology stages. This technology is described below.

### 3.2.1 Biofiltration

Biological gas treatment can be defined as the transformation of gaseous contaminants to less harmful or more valuable products through the action of microorganisms. Microorganisms, primarily bacteria but often fungi as well, are the catalyst of this process. The microorganisms reside in a biofilm that is attached to a substrate within a reactor vessel or container.

Biological gas treatment technologies, using organic, inert, or synthetic packing materials for gas-liquid contact and/or biofilm support, often require inoculation of microbial cultures. Sludge from wastewater treatment processes or existing gas treatment bioreactors is often used. The time required by the microbial population to reach the steady state ranges from a few weeks to several months because the process is dependent on many factors.

The mechanisms of biological gas treatment consist of a series of complex physical, chemical, and biological processes. Fundamental parameters affecting odor removal performance include absorption of the different contaminants, mass transfer, degradation kinetics in the biofilm, air flow, and water distribution.



Operating conditions such as pH, water, and nutrient supply and temperature directly affect performance. The pH usually needs to be maintained around neutral (pH 6 to 8), unless specific extremophile microorganisms are used, such as for the conversion of certain reduced sulfur contaminants (for example, H<sub>2</sub>S). Sudden pH fluctuations of more than 2 to 3 pH units generally lead to temporary reduced microbial activity.

The water supply method used in the reactor is important because water not only prevents the biofilm layer in the biological system from drying out, but also it removes degradation products such as sulfuric acid and salts. In addition, where treated plant effluent is available, this source of water can serve as a supply of nutrients for the microorganisms. To prevent microbe disinfection and subsequent die-off, any residual chlorine in the irrigation water supply should be maintained below 2 parts per million (ppm). Further, too much irrigation can also result in anaerobic zones, premature media decomposition, preferential airflow distribution, and an increased pressure drop.

Temperature is often important because a minimum temperature is a requirement of sufficient biological activity. A change in removal efficiency can occur at different temperatures because the mass-transfer parameters are somewhat temperature-sensitive, including solubility (decreases with temperature), diffusion (increases with temperature), and Henry's constant (increases with temperature).

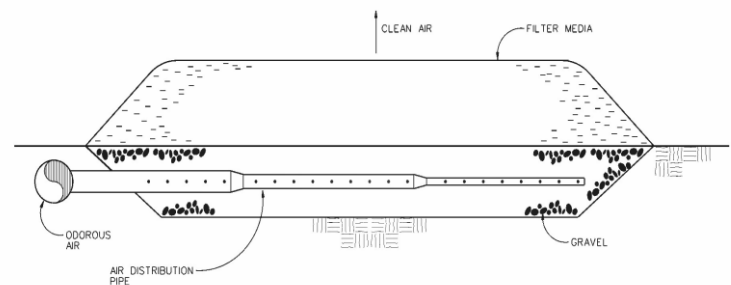
Biological odor treatment reactor at wastewater treatment plants often deals with many odorous contaminants, including contaminants with a very low odor threshold. For example, an odorous airstream containing a mixture of volatile reduced sulfur contaminants such as H<sub>2</sub>S, MMs, and DMDS. Although different microorganisms are known to be able to degrade volatile reduced sulfur contaminants, the treatment of an air stream containing mixtures of reduced sulfur contaminants can be challenging for two main reasons. First, the energy-yielding process of H<sub>2</sub>S oxidation is higher and thus preferred over the oxidation of other reduced sulfur contaminants. Second, the degradation of many of these sulfur contaminants is only possible with high efficiencies at neutral pH, while one of the degradation products from H<sub>2</sub>S oxidation is sulfuric acid, which reduces the pH. For this reason, different media stages are often implemented targeting specific odorant groupings.

In a typical open bed type biofilter, foul air is forced into the bottom of the biofilter bed and treated air is released from the surface. Figure 3-1 is a simplified schematic of a typical in-ground, open-vessel biofilter system.

Typically, an air plenum is provided below the media bed to provide uniform air distribution throughout the media bed. Different configurations have been implemented exhibiting varying degrees of success including:

- Perforated pipe in a gravel bed
- Rain collection boxes wrapped in a geotextile material
- Concrete floor with perforated engineered floor system
- Concrete floor with cattle slats

For efficient odor removal, the biofilter media must be moist. Moisture can be maintained through the use of spray nozzles, soaker hoses, air humidifiers, water scrubbers, or some combination of these.



**Figure 3-1. Simplified Biofilter Schematic**

Where a concrete floor is not provided, a geomembrane liner is typically installed to prevent environmental impacts due to the acidic leachate byproducts. The acidic leachate is typically routed to a process drain or other location if possible to ensure dilution effects limit corrosion potential.

### 3.3 Ventilation Criteria

Recommended ventilation rates for sizing odor control systems should comply with National Fire Protection Association (NFPA) 820 and Jacobs engineering design practice for similar type facilities. Ventilation rates should generally meet the following objectives:

- Provide adequate ventilation to protect maintenance personnel within occupied spaces per NFPA 820, "Fire Protection in Wastewater Treatment and Collection Facilities."
- Maintain a minimum negative pressure of 0.1-inch water column (WC) within wastewater holding tanks to contain odors under the following conditions:
  - Dynamic liquid level changes
  - Estimated crack openings in storage tank covers treated as sharp-edged orifices
- When a single access cover is removed, maintain sufficient velocities across the opening to prevent fugitive odors (minimum 50 feet per minute [fpm]).
- Provide adequate turnover rate and air scavenging within storage tanks to reduce corrosion resulting from H<sub>2</sub>S pockets.

Table 3-3 summarizes flow rates and sizing criteria for each odor source area.

**Table 3-3. Odor Source Ventilation Rate Summary**

Location	Air Flow (cfm)	Air (ACH)	Sizing Criteria Summary
ATAD Tanks (Existing to be converted to SNDR) (Three)	3,000 (1,000/tank)	>12 <sup>1</sup>	Flow rate necessary to: <ul style="list-style-type: none"> <li>▪ Maintain a negative 0.1-inch WC within tank(s) under normal operating conditions.</li> <li>▪ Comply with NFPA 820 ventilation requirements for reducing interior classification rating</li> <li>▪ Prevent pockets of corrosive H<sub>2</sub>S from accumulating by creating uniform scavenging velocities</li> <li>▪ Note this flow rate exceeds the current flow rate of 2200 cfm, which is believed to be insufficient due to corrosion issues with steel tank coating.</li> </ul>
BSST	1,000	>6 <sup>2</sup>	Flow rate necessary to: <ul style="list-style-type: none"> <li>▪ Maintain a negative 0.1-inch WC within tank under normal operating conditions</li> <li>▪ Maintain high capture velocity of &gt; 200 fpm across open access hatches</li> <li>▪ Prevent pockets of corrosive H<sub>2</sub>S from accumulating by creating adequate scavenging velocities (~25 fpm)</li> </ul>
Septage Receiving Wetwell	500	>12	Flow rate necessary to: <ul style="list-style-type: none"> <li>▪ Maintain a negative 0.1-inch WC within wet well under normal operating conditions</li> </ul>

**Table 3-3. Odor Source Ventilation Rate Summary**

Location	Air Flow (cfm)	Air (ACH)	Sizing Criteria Summary
			<ul style="list-style-type: none"> <li>▪ Comply with NFPA 820 ventilation requirements for reducing interior classification rating</li> <li>▪ Prevent pockets of corrosive H<sub>2</sub>S from accumulating by creating uniform scavenging velocities</li> </ul>
Thickening Wet Wells (Two)	3,600 (1,800/well) <sup>3</sup>	>6	<p>Flow rate necessary to:</p> <ul style="list-style-type: none"> <li>▪ Maintain a negative 0.1-inch WC within wet well under normal operating conditions assuming typical cover tightness</li> <li>▪ Comply with NFPA 820 ventilation requirements for reducing interior classification rating</li> <li>▪ Maintain high capture velocity of &gt; 200 fpm across open access hatches</li> <li>▪ Prevent pockets of corrosive H<sub>2</sub>S from accumulating by creating adequate scavenging velocities (~25 fpm)</li> </ul>
Grit Removal Channel	1,400	>12	<p>Flow rate necessary to:</p> <ul style="list-style-type: none"> <li>▪ Maintain a negative 0.1-inch WC within channel under normal operating conditions</li> <li>▪ Comply with NFPA 820 ventilation requirements for reducing interior classification rating</li> <li>▪ Prevent pockets of corrosive H<sub>2</sub>S from accumulating by creating uniform scavenging velocities (~25 fpm)</li> </ul>
Screening Channels	2,800	>12	<p>Flow rate necessary to:</p> <ul style="list-style-type: none"> <li>▪ Maintain a negative 0.1-inch WC within channel under normal operating conditions</li> <li>▪ Comply with NFPA 820 ventilation requirements for reducing interior classification rating</li> <li>▪ Prevent pockets of corrosive H<sub>2</sub>S from accumulating by creating uniform scavenging velocities (~25 fpm)</li> </ul>
Aeration Basin Splitter Box	500	>12	<p>Flow rate necessary to:</p> <ul style="list-style-type: none"> <li>▪ Maintain a negative 0.1-inch WC within splitter box under normal operating conditions</li> <li>▪ Comply with NFPA 820 ventilation requirements for reducing interior classification rating</li> <li>▪ Prevent pockets of corrosive H<sub>2</sub>S from accumulating by creating uniform scavenging velocities (~25 fpm)</li> </ul>
Headworks/Thickening Process Room	3,600 (exhaust) 11,000 (supply)	>12	<p>Flow rate necessary to:</p> <ul style="list-style-type: none"> <li>▪ Comply with NFPA 820 ventilation requirements for reducing interior classification rating</li> <li>▪ Prevent pockets of corrosive H<sub>2</sub>S from accumulating</li> </ul>
Screening/Grit Hoppers	400 (200 each)	>12	<p>Flow rate necessary to:</p> <ul style="list-style-type: none"> <li>▪ Maintain a negative 0.1-inch WC within hopper under normal operating conditions</li> <li>▪ Comply with NFPA 820 ventilation requirements</li> </ul>

**Table 3-3. Odor Source Ventilation Rate Summary**

Location	Air Flow (cfm)	Air (ACH)	Sizing Criteria Summary
			<ul style="list-style-type: none"> <li>▪ Prevent pockets of corrosive H<sub>2</sub>S from accumulating by creating uniform scavenging velocities (~25 fpm)</li> </ul>
New ATAD Basins	2,900 (1,450/tank)	>12 <sup>4</sup>	Flow rate necessary to: <ul style="list-style-type: none"> <li>▪ Maintain a negative 0.1-inch WC within basin under normal operating conditions</li> <li>▪ Outpace peak blower flows by at least 10 percent</li> <li>▪ Comply with NFPA 820 ventilation requirements</li> <li>▪ Prevent pockets of corrosive H<sub>2</sub>S from accumulating by creating uniform scavenging velocities (~25 fpm)</li> </ul>

Notes:

<sup>1</sup> Based on ATAD tank half full. Note that existing ATAD tanks are ventilated at 733 cfm per tank. Proposed ventilation per tank indicated herein exceeds this value. This higher ventilation rate is believed necessary to prevent further corrosion issues at the coated steel tanks.

<sup>2</sup> Based on BSST, approximately 98 percent full. BSST is full from about January through April. By end of summer, the BSST is nearly empty and gradually fills the rest of the year.

<sup>3</sup> The relatively high air flow rate is a result of using the wet wells as exhaust plenums to transfer air from the main process space, which is ventilated at > 12 ACH.

<sup>4</sup> Based on new ATAD basins with 6 feet of headspace.

ACH = air changes per hour

The overall air flow rate from all sources is 19,700 cfm. The odor control system will be sized for this capacity.

For the following reasons, it is recommended that the proposed fan size include the estimated foul air flows from the future dewatering building:

- The dewatering facility and future flows may occur before the expected life of the fan is reached. Note that additional biofilter media or a second small biofilter may be needed when the dewatering facility is constructed.
- Future flows are relatively small in comparison to the overall fan capacity.
- The incremental cost increase for oversizing the fan now is significantly less than the cost to replace the fan in the future.

### 3.4 Biofilter Media Selection

#### 3.4.1 Viable Media

Many types of biofilter media are available in the marketplace. Each media type has specific characteristics for the application, various materials, shapes, and cost. Three common types of media are considered for this project: long life engineered media (Biorem’s Biosorbens and ECS-Biopure), lava rock (GES Crater-Max), and wood chip media (mixture of hog fuel and bark nugget, available locally, and similar to existing media currently used at the WRF). Each media is evaluated based on technical criteria (performance, pressure drop, loading rate, application, and longevity) and cost criteria (capital and operating costs).

### 3.4.2 Long-Life Engineered Media

A wide variety of media mixtures fall under the long-life engineered media category; these include combinations of organic and inorganic (or inert) media components. These blends attempt to exploit the advantages of both types of media while minimizing the disadvantages. Inorganic materials include perlite, plastics, ceramics, vermiculite, and carbon. Because these materials are low in nutrients, they may require nutrient addition (small fertilizer fraction) and may need to be inoculated with a compost fraction to accelerate the development of the required biota.



Two reputable long-life engineered media suppliers include Biorem (Biosorbens, XLD) and ECS (Bio-pure). Both are engineered inorganic media exhibiting low pressure drop, high performance, rigidity, and hydrophilic characteristics. These media have a time-released coating of nutrient as well as buffering compounds added as part of the manufacturing process. The buffering ability of the media can be adjusted to suit different loadings for particular process areas. A layer of a less buffered media below a more highly buffered media may be used to remove most of the H<sub>2</sub>S first then allow the upper layer to operate at more neutral pH targeting the remaining odorous compounds. Both suppliers offer a 10-year media guarantee, with a possible 20-year guarantee.



Suppliers of long-life engineered media can provide the following odor removal guarantee:

- H<sub>2</sub>S: 99 percent removal or 100 ppbv discharge concentration, whichever is greater
- General Odor (dilutions-to-threshold [D/T]): 85 percent removal or 500 D/T discharge concentration, whichever is greater

Pressure drop across long-life engineered media is relatively low. The anticipated pressure drop at a loading rate of 9 fpm would be approximately 0.3 inch WC per foot of media at start-up. Over time, the pressure drop can increase due to biofilm buildup, but overall pressure drop is not expected to exceed 6 inches WC over the entire bed depth. The required design empty bed gas residence time (EBGRT) ranges between 15 and 60 seconds. Cost for the media is high at \$300 to \$400 per cubic yard. For this project at an EBGRT of 45 seconds, the required media volume would be 550 cubic yards with a media cost of \$165,000 to \$220,000, not including installation or markups.

Long-life engineered media have the following advantages:

- Excellent odor removal performance.
- Guaranteed media life of 10 to 20 years.
- Guaranteed performance.
- External nutrient source not required for coated media.
- Lower weed potential.
- Relatively stable head loss over time.
- Higher loading rate requires smaller footprint compared to other biofilter media.
- Moisture control not as critical as for organic media.
- Collected leachate is typically not odorous as with organic biofilters.
- Easy to rehydrate.

- Not prone to shrink and swell problems.

However, long-life engineered media have the following disadvantages:

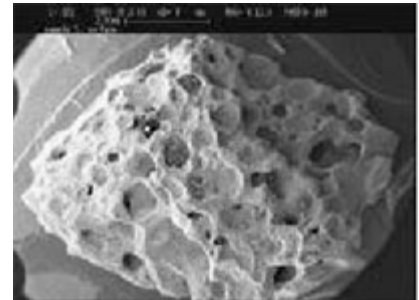
- First cost will be high due to high media unit costs (\$300 to \$400 per cubic yard).
- Engineered media have an upper limit for H<sub>2</sub>S loading (<10 ppm).
- Media replacement costs will be high due to high unit cost for media.
- Some uncoated media may require an external nutrient source.

### 3.4.3 Lava Rock

Lava rock is a unique type of mineral media. Due to its more porous surface structure, it tends to support more concentrated microbial colonies than other mineral media and can be considered a high rate media. In addition to the benefit of its large surface area, it is believed that lava rock at low pH releases iron ions to help oxidize H<sub>2</sub>S, thereby enhancing the removal of H<sub>2</sub>S considerably. The loading rate for lava rock biofilters can be as high as 12 cfm per square foot when treating primarily H<sub>2</sub>S. The required design EBGR ranges between 15 and 90 seconds.



The pressure drop through lava rock is generally similar to long-life engineered media. The design pressure drop through the media is typically about 0.2 inch to 0.5 inch WC per foot of bed depth, with only a slight increase over time; this is because the lava rock has surface opening for air to pass through, yet the interior of the rock is structurally sound. Therefore, pore plugging or media compaction, which often causes the pressure drop to increase over time, is eliminated.



For efficient odor removal, moisture and often nutrient must be supplied to the inorganic media. Plant effluent is often proposed to serve the purpose of irrigation and fertilization. In this case, care must be taken to ensure plant effluent characteristics meet the supplier's strict requirements (for example, residual-free chlorine levels cannot exceed 1 to 2 ppm to prevent inhibition of bacteria health and growth). Alternatively, commercial nutrient would be purchased and added into the system. Cost for the media is low at \$50 to 70 per cubic yard. At an EBGR of 60 seconds, this translates to \$37,000 to \$51,000 for media costs for this project, not including installation or markup.

Lava rock media have the following advantages:

- High loading rate can be achieved when treating primarily H<sub>2</sub>S.
- Media costs are relatively low.
- Consistent low pressure drop over time.
- Mechanically and chemically resistant in low pH sulfuric application .
- Long media life (guaranteed for 10 to 20 years).

However, lava rock media have the following disadvantages:

- Lava rock is better at removing H<sub>2</sub>S compared to other reduced sulfide compounds at moderate EBGR.
- A source of nutrient is often required if potable water is used to irrigate.



### 3.4.4 Wood Chip Media

In an organic wood chip biofilter, organic material such as wood chips, bark nugget, and compost are used as a medium to grow sulfur-consuming bacteria. The bacteria also use other odor compounds as a food source, including ammonia, amines, and various reduced sulfur compounds.

Maximum design flow rates for wood chip biofilters range from 3 to 5 cfm per square foot with an approximate 2 cfm minimum flow rate to avoid preferential channeling. By comparison, the City's existing biofilter has a loading rate of approximately 5.0 cfm per square foot, which is on the high end. A mixture of wood chips, bark nugget, and compost is typically provided to a depth of between 3 to 5 feet. The design head loss through the media is generally about 0.5 inch WC per foot of bed depth. To facilitate media replacement every 3 to 5 years, many organic biofilter designs allow for front end loader access by locating the inlet plenum below a concrete slab and providing flush-to-floor air distribution inlets, trench grates, or slotted precast concrete pier-mounted panels. The appropriate EBGRT for organic media is dependent upon the target odor and respective loading rate but will typically range between 45 to 90 seconds.



For efficient odor removal, the biofilter media must be moist. Moisture can be maintained through the use of spray nozzles, soaker hoses, air humidifiers, water scrubbers, or some combination of these. The H<sub>2</sub>S-consuming bacteria produce an acid byproduct that tends to lower the pH of the media; therefore, provisions are often made to maintain a pH above neutral; this may be accomplished by adding pelletized lime or other amendments to provide buffering capacity throughout the media. However, because of the potential for lowered pH, provisions should be made to collect and dispose of acidic leachate from the media.

The cost for the media is low at \$30 per cubic yard depending on availability from local suppliers. For this project at an EBGRT of 60 seconds, the required media volume would be 730 cubic yards, which equates to \$22,000 for media costs for this project not including installation or markup.

Organic biofilters have the following advantages:

- A wide range of odorous constituents may be removed.
- The system operations and maintenance is relatively simple.
- Media may be readily available and affordable, depending on local suppliers.
- Pressure drop through the media is relatively low compared to soil media.
- The control systems are either manual or relatively simple.

However, organic biofilters have the following disadvantages:

- Media requires frequent change-out (between 3 to 5 years), depending on media type and loading characteristics.
- Design should incorporate means to remove and replace media, which typically results in higher capital cost.
- If media gets dried out, it can become hydrophobic.



- Media will decompose over time, developing fines that create higher pressure drop. Therefore, means should be provided to accommodate the pressure increase over time with variable frequency drive fans to ensure air flow remains consistent.

### 3.5 Biofilter Media Evaluation

Both economic (cost) and non-economic (benefit) criteria were used to evaluate the three media described herein. Each media is evaluated based on technical criteria (pressure drop, loading rate/footprint, and longevity) and cost criteria (first cost and operating cost).

Table 3-4 summarizes the biofilter media first costs along with EBGR T expected for specific performance. Note that related costs such as biofilter infrastructure are not included.

**Table 3-4. Biofilter Media Unit Costs**

Media Type	Media Cost (\$/cubic yard)	EBGR T Required (seconds)	Total Media Required (cubic yards)	Total Media First Cost (\$)	Expected Service Life (years)
Long Life Engineered	400	45	550	220,000	10-20
Lava Rock	60	60	730	44,000	10
Wood Chip	30	60	730	22,000	3-5

Table 3-5 summarizes the rankings for the three media types. Three symbols are used to rank each criteria: "+" is most favorable, "0" is neutral, and "-" is least favorable.

**Table 3-5. Biofilter Media Ranking Comparison**

Criteria	Long-Life Engineered Media	Lava Rock Media	Wood Chip Media
First Cost	-	0	+
Operating Cost	+	+	- <sup>1</sup>
Pressure Drop	+	+	- <sup>2</sup>
Loading Rate/Footprint	+	+	0
Media Longevity	+ <sup>3</sup>	+ <sup>3</sup>	-

Notes:

- <sup>1</sup> Organic media operating costs are greater due to frequent media change-out and increased power draw due to media compaction and higher pressure drop over time.
- <sup>2</sup> Organic media experiences degradation and compaction over time, which results in an increase in pressure drop and difficulty maintaining consistent air flow,
- <sup>3</sup> Media guarantee is 10 years with a possible 20-year guarantee.

### 3.6 Biofilter Media Recommendation

As shown in Table 3-5, both the long-life engineered media and the lava rock media exhibit greater overall ranking when compared to the wood chip media. As such, for this project, in which complex odorant removal performance is considered critical, a two-stage approach is recommended as follows:

- Stage 1: Lava rock media at an EBGR T of 10 seconds
- Stage 2: Long-life engineered media at an EBGR T of 35 seconds

- Overall EBGR of 45 seconds

## 4. Recommended Design

### 4.1 Design Codes and Standards

The following codes and standards apply:

- NFPA 820: Standard for Fire Protection in Wastewater Treatment and Collection Facilities, 2012 Edition
- Occupational and Safety Health Administration (OSHA) Standards (Title 29 Code of Federal Regulations Part 1910)
- Air Moving and Conditioning Association
- Sheet Metal and Air Conditioning Contractors National Association
- 2019 Oregon Mechanical Specialty Code

### 4.2 Design Criteria

Table 4-1 summarizes the design criteria that have been established for the proposed WRF odor control system.

**Table 4-1. Odor Control Design Criteria**

Parameter	Value
Engineered Media In-ground Open Biofilter	
Minimum Odor Removal Rate, H <sub>2</sub> S	For inlet concentrations > 10 ppm, 99% removal For inlet concentrations < 10 ppm, outlet concentration < 100 parts per billion
Minimum Odor Removal Rate, D/T <sup>3</sup>	85% removal or 500 D/T, whichever is greater
Predicted Inlet H <sub>2</sub> S Concentration	5 ppmv (average); 10 ppmv (peak)
Predicted Inlet D/T	4,500 D/T (average); 9000 D/T (peak)
Predicted Inlet Reduced Sulfur Compounds	< 1 ppmv (cumulative)
Flow Rate	19,700 cfm
Process Served	Headworks and solids treatment sources
Number of Cells	One
Configuration	In-ground, open bed
Nominal Size	3,000 square feet
Media Types	Stage 1: Lava rock (14 inches deep) Stage 2: Engineered long-life media (49 inches deep)
Media Depth	63 inches
Weed Cover Depth	6 inches
Minimum Empty Bed Contact Time	>45 seconds
Media Replacement Period	10 to 20 years
Perimeter Wall Type	Cast-in-place concrete
Maximum Bed Loading Rate	7 cfm/square feet
Plenum Zone Depth and Material	1 foot, gravel
Air Distribution Type	Rain collection boxes with geotextile wrap
Media Pressure Drop, Maximum	6 inches WC
Primary Humidification Arrangement	See ammonia scrubber description

**Table 4-1. Odor Control Design Criteria**

Parameter	Value
Primary Humidification Water and Flow Rate	See ammonia knock-out vessel description
Secondary Humidification Type and Flow	Soaker hose or sprinkler, 10 gallons per minute (gpm)
<b>Operation</b>	
Primary Humidification	Continuous when fan is on
Secondary Humidification	Intermittent (automatic through use of irrigation timer control) <ul style="list-style-type: none"> <li>▪ 1,500 gallons per day</li> <li>▪ 10 gpm (maximum instantaneous flow)</li> </ul>
Drain	Via perforated drain pipe. Drain to nearby process basin or plant drain. Drainage pH will be acidic (as low as pH of 2)
<b>Odorous Air Fans</b>	
Number of Units	Two (one duty and one standby)
Type	FRP centrifugal
Capacity	22,750 cfm <sup>1</sup>
Static Pressure	10.0-inch WC
Motor Size	60-horsepower
Drive Type	Variable frequency drive
Motor Type	Totally enclosed, fan-cooled (Class 1, Division 2)
Accessories	Scroll drain, flanged inlet/outlet, bolted access door, shaft seal, and OSHA shaft and belt guard
<b>Ammonia Knock-Out Vessel</b>	
Existing Scrubber Vessel <sup>2</sup>	12-foot diameter by 35-foot height
Capacity	19,700 cfm
Entering Ammonia Concentration	17 ppmv
Leaving Ammonia Concentration	< 10 ppmv
Spray Water Flow Rate	1 to 2.5 gpm
Number of Spray Nozzles	TBD
Water Source	W3

**Notes:**

<sup>1</sup> Fans sized for future flows which include foul air from future Dewatering Building.

<sup>2</sup> A condition assessment should be conducted to ensure the existing scrubber vessel is able to be re-purposed as an ammonia knock-out vessel.

<sup>3</sup> Dilutions-to-Threshold (D/T) defined as the dilution of an odor sample that cannot be distinguished from odorless air by 50% of the members of an odor panel.

TBD = to be determined during 30% design phase

## 5. References

Orange County [California] Sanitation District 2018 Master Plan.

Riegert, Lawrence E. 2009. "Second-Generation ATAD Provides Solution to Upgrade at Constrained Site." In: Proceedings of the Water Environment Federation, Residuals and Biosolids Conference. January

West Yost Associates and CH2M HILL. 2009. City of McMinnville Water Reclamation Facilities Plan.

**Memorandum 6**  
**Review of Previous Geotechnical Studies**



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**Subject:** Review of Previous Geotechnical Studies

**Project Name:** McMinnville Water Reclamation Facility Biosolids Storage Tank and Grit System Expansion

**Prepared For:** City of McMinnville

**Prepared By:** Jacobs Engineering Group

**Date:** January 29, 2021

**Project Number:** D3373900

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## 1. Purpose

This memorandum has been developed to compare the seismic design requirements that were in effect during the design of the 2013 expansion of the City of McMinnville Water Reclamation Facility (WRF) to the code requirements that are currently in effect. The memorandum provides a basis to understand the types of geotechnical and seismic evaluations that would likely be required for the design of new structures at the WRF; it also provides an assessment of the types of seismic mitigation that could be required by current building codes.

## 2. Introduction to Seismic Design Codes

The WRF Expansion project that added a new Orbal aeration basin and secondary clarifier was designed in 2013 in general accordance with the 2010 Oregon Structural Specialty Code (OSSC), including applicable portions of the 2009 International Building Code (IBC) and the 2005 American Society of Civil Engineers (ASCE) Standard 7 (ASCE 7-05), *Minimum Design Loads for Building and Other Structures*. Of these, the primary code regulating seismic design of structures is the ASCE Standard 7. This document has historically been updated every 5 to 6 years, and it typically takes the State of Oregon several years to adopt each new version. The 2013 design was completed prior to the State of Oregon adoption of ASCE 7 10. The current version of the code adopted in Oregon is the 2016 version of ASCE Standard 7, or ASCE 7-16. The next version of the code will be ASCE 7-22, which is expected to be adopted in Oregon in late 2024 or 2025.

Modifications to the requirements for seismic evaluations have been made in each of the recent versions of ASCE Standard 7, with significant changes occurring within the ASCE 7-16 version. These changes have generally resulted in more stringent seismic evaluations and design conditions that have tended to improve seismic resiliency and safety while also increasing design and construction costs.

### 3. 2013 Geotechnical Evaluation

The 2013 *Water Reclamation Facility Expansion Geotechnical Report* (2013 Report) identified the presence of potentially liquefiable soils beneath the proposed aeration basin and secondary clarifier (CH2M HILL, 2013). The soils susceptible to liquefaction were identified to primarily be present between a depth of about 15 and 60 feet below the ground surface, with interbedded layers of soil being marginally susceptible to full liquefaction to depths exceeding 120 feet. The 2013 Report recommended that the proposed structures for the WRF Expansion Project be designed to withstand up to 18 inches of seismically induced total settlement, 9 inches of differential settlement, and as much as 20 to 30 inches of seismically induced lateral movement. Options to mitigate the seismic ground deformations were discussed in the 2013 Report.

#### 3.1 Comparison of ASCE 7-05 and 7-16 Site Ground Motions

The 2010 OSSC and ASCE 7-05 adopted the 2002 U.S. Geological Survey (USGS) National Seismic Hazard Maps (NSHMP) for seismic ground motions. Therefore, the 2013 Report was completed based on the site ground motions determined using the 2002 USGS web tools.

The 2019 OSSC is based on the 2018 IBC and the 2016 ASCE Standard 7 (ASCE 7-16). For future seismic evaluation, the site ground motions are required to be determined based on the 2014 USGS NSHMP study. The spectral accelerations based on USGS 2002 and 2014 are presented in Table 3-1 for comparison.

**Table 3-1. Spectral Accelerations for Uniform Hazard Ground Motions at Stiff Soil/Soft Rock Interface (Site Class B/C Boundary)**

Parameter	2,475-Year Value, g	
	USGS (2002)	USGS (2014)
Mapped peak ground acceleration (PGA)	0.34	0.47
Mapped Spectral Response Acceleration for Short Periods (SS)	0.85	1.02
Mapped Spectral Response Acceleration for 1 Second Period (S1)	0.38	0.40

g = acceleration due to gravity

The 2013 site-specific response analyses were the basis for liquefaction, post-seismic settlement, and seismically induced lateral spreading evaluations. Response spectra for both crustal earthquake sources and subduction zone earthquake sources, which were used for the site-specific response analyses were provided in Figures 5.8 and 5.9 of the 2013 Report. The mean of scaled crustal motions and the mean of subduction earthquake motions, shown as the solid dark lines on these figures (provided as Figure 3-1 and Figure 3-2 below) represent the response spectra used for design in 2013.

A uniform hazard spectrum (UHS) determined based on the current code requirements, which use the 2014 USGS NSHMP study, is plotted as a solid red line on Figures 3-1 and 3-2 to illustrate that the current approach results in higher spectral accelerations compared to those developed for the 2013 design. The current code allows for a more detailed site-specific seismic assessment that could reduce the design response spectra below what is shown for the USGS 2014 spectra. Even if a detailed site-specific seismic assessment is conducted, it is expected that the resulting response spectra will still be higher than the response spectra used for the 2013 design. The higher spectra accelerations mean that the design based on the current code would have to accommodate higher intensity shaking compared to what was used in



2013. The higher values are expected to result in greater loads that must be accommodated in the structural design and larger magnitudes of estimated post-seismic ground settlement and lateral spreading.

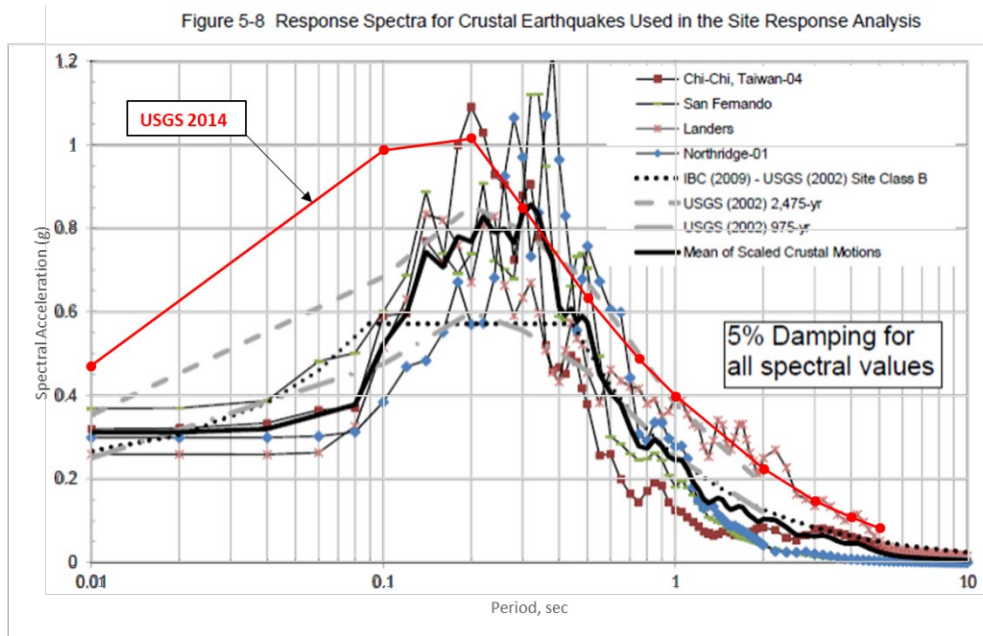


Figure 3-1. (Based on 2013 Report Figure 5-8)

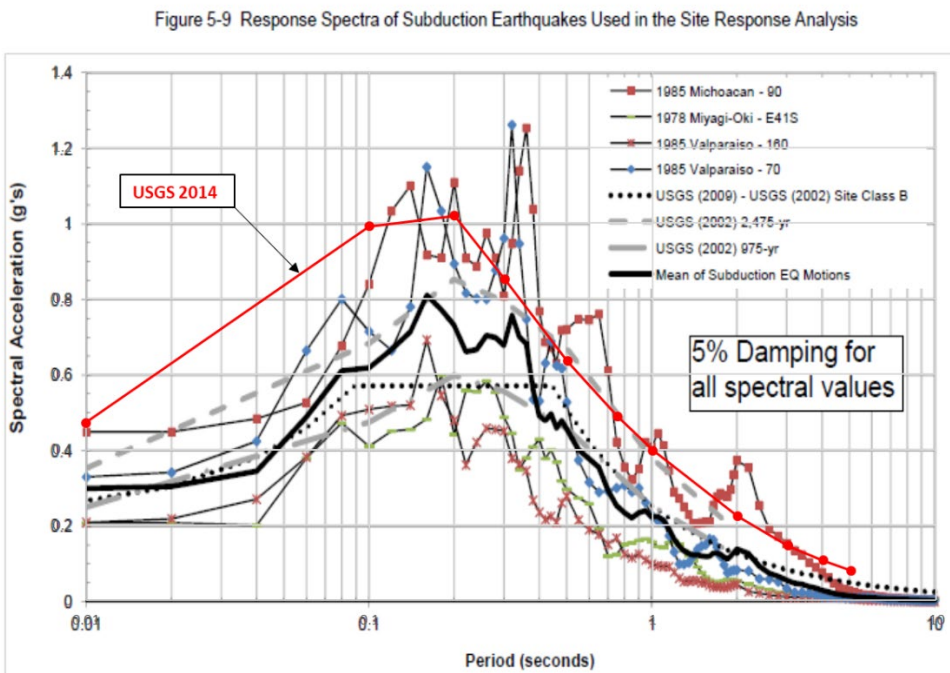


Figure 3-2. (Based on 2013 Report Figure 5-9)

### 3.2 ASCE 7-16 Seismic Design Criteria

The ASCE/Structural Engineering Institute (ASCE/SEI) 7-16 requires an evaluation of seismic design parameters for the Maximum Considered Earthquake (MCE) event. ASCE designates a seismic event with a 2 percent probability of exceedance in 50 years (2,475-year return period) as the MCE event. Past codes, including ASCE 7-05 and ASCE 7-10, required the assessment of liquefaction potential and associated consequences, including total settlement, differential settlement, lateral soil movement, reduction in soil bearing and lateral capacity, and downdrag on piles, but these older code versions did not require that the foundations be designed to mitigate these issues at sites with liquefiable soils. The lack of specific requirements allowed for considerable application of “engineering judgement” and resulted in a large range of approaches for dealing with the consequences of liquefaction, including the option for not implementing ground improvements, as was the case on the WRF expansion project.

The ASCE/SEI 7-16 code requires a more robust evaluation of liquefaction potential and consequences compared to past code versions. It also provides upper limits for seismically induced lateral movement and differential settlement for structures bearing on shallow foundations and requires that those facilities either be founded on deep foundations or that ground improvement be completed to limit the magnitudes of seismic movement.

ASCE/SEI 7-16 prohibits the use of shallow foundations where estimated lateral spread exceeds upper limits, as shown in the code’s Table 12.13-2 (shown as Table 3-2 below). For ASCE/SEI 7-16 Risk Category II, III and IV structures, the limiting values for lateral spreading are 18, 12, and 4 inches, respectively. Where estimated differential settlement exceeds the threshold values shown in Table 12.13-3 (shown as Table 3-3 below), ASCE 7-16 requires explicit design beyond the requirements of Section 12.13.9.2.1 to accommodate differential settlement. The limiting value of differential settlement varies depending on the structure type as shown in Table 12.13-3 where the variable “L” represents the distance between shallow foundations in feet and the allowable differential settlement is in inches.

#### Tables 3-2 and 3-3 (from ASCE 7-16 Tables 12.13-2 and 12.13-3)

**Table 12.13-2. Upper Limit on Lateral Spreading Horizontal Ground Displacement for Shallow Foundations Beyond Which Deep Foundations Are Required**

Risk Category	I or II	III	IV
Limit (in. (mm))	18 (455)	12 (305)	4 (100)

**Table 12.13-3. Differential Settlement Threshold**

Structure Type	Risk Category		
	I or II	III	IV
Single-story structures with concrete or masonry wall systems	0.0075L	0.005L	0.002L
Other single-story structures	0.015L	0.010L	0.002L
Multistory structures with concrete or masonry wall systems	0.005L	0.003L	0.002L
Other multistory structures	0.010L	0.006L	0.002L

## 4. Conclusion

The current seismic design codes are more stringent than those that were in effect during the 2013 design of the WRF Expansion Project. Based on an updated preliminary assessment conducted for the City of McMinnville WRF, the changes in the design code from ASCE 7-05 to ASCE 7-16 are expected to result in a prediction of greater seismically induced settlement and ground displacement than predicted during the 2013 design.

Depending on the seismic risk categories assigned to new facilities and their locations at the WRF site, it is likely that ground improvement would be required to limit ground deformations to acceptable levels. It may be possible to construct new structures on deep foundations, such as steel piles, but deep foundations often will not sufficiently limit the predicted lateral movement. Ground improvement methods exist that can limit seismic ground deformations and improve the seismic site classification to reduce the need for complex structural design. Ground improvement methods commonly used around the Pacific Northwest consist of mixing cementitious materials into the soil by either deep soil mixing or jet grouting, or by replacing some portion of the native soil with compacted aggregate piers. Aggregate piers are less costly, but given the high fines content within the native soils at the WRF, it is unlikely that aggregate piers would provide sufficient improvement to meet code limits.

It is Jacobs' experience that ground improvement completed using deep soil mixing or jet grouting will significantly increase the cost of construction. On recent water and wastewater treatment projects, the cost of this type of ground improvement has accounted for roughly 25 to 35 percent of total construction costs. For planning purposes, ground improvements of \$0.75 million to \$1.5 million per 5,000 square feet of structure area should be anticipated. A geotechnical evaluation would be needed to design new facilities at the WRF. The evaluation should include a complete assessment of ground deformations resulting from the design seismic event and would be based on the actual weight, footprint, location, and seismic performance needs of proposed project structures. The evaluation would include a variety of mitigation technologies to determine those that would be cost-effective to meet code and project-specific structural/utility requirements.

## 5. Recommended Approach

Subsurface data from previous geotechnical explorations were reviewed to determine whether further geotechnical explorations are necessary to complete design of the project. The review indicated that there is enough subsurface information to develop an understanding of the subsurface layers and general soil conditions present at the site; however, two areas were identified where obtaining additional information could be beneficial in reducing uncertainty in the geotechnical analyses:

- Previously completed borings were advanced to more than 200 feet depth without encountering bedrock or even dense soil or gravel. The uncertainty in the depth to bedrock or dense materials beneath the site leads to uncertainty in the required site-specific seismic analyses and necessitates that a sensitivity analysis be completed for the work to evaluate the impacts of variable bedrock depth. Completing a geophysical survey at the site could identify the depth to bedrock, which would reduce uncertainty in the seismic evaluation and allow for a more focused analysis. It is expected that a geophysical survey could be completed at a cost of \$8,000 to \$10,000 to provide this information.
- Samples collected from the 2013 geotechnical explorations were tested under cyclic loading to evaluate the effects of seismic loading on the soil. The testing results will be beneficial in conducting the required site-specific seismic evaluations. However, the building codes adopted in 2013 required an assessment of more moderate seismic loading than current codes. Because of this, the tests

completed in 2013 did not subject the soils to the higher magnitude of shaking that would be needed to provide an evaluation of soil response to current code-required loading. Completing geotechnical drilling at the site would provide an opportunity to collect soil samples that could be tested under cyclic loading meeting current guidelines. The cost of drilling a deep soil boring to collect samples would be on the order of \$20,000 to \$25,000, and the cost of cyclic soil tests could add another \$20,000 to the cost of the work.

Jacobs recommends that the geophysical survey be completed as part of the project because the data will be valuable in completing the seismic analyses, and the ability to focus the analyses with the understanding of bedrock depth and the reduced uncertainty will likely have a benefit, in terms of construction cost savings, that is greater than the cost of the study.

Jacobs recommends that the additional drilling and seismic soil testing not be included as part of the project. The site-specific seismic analyses can be completed using existing information and the soil modeled using existing and accepted constitutive models. Results of cyclic tests on soils collected from additional drilling could be used to better define the constitutive model, but the refinements are not expected to significantly alter the outcome of the seismic analyses. Therefore, the potential benefits of conducting the work, in terms of construction cost savings, may not be sufficient to offset the significant cost of completing the additional drilling and testing.

The site-specific seismic analyses will include the selection of seismic shaking records from similar fault sources to those present in Oregon. The records will be scaled to represent the types of seismic hazard ground motion shaking that could occur at the project site during the design-level seismic event. A numerical modelling software program will be used to evaluate the ground response to the seismic shaking records in accordance with building code requirements. The modelling results will be used to evaluate the magnitude of site liquefaction and potential for lateral movement and settlement.

It is possible that the understanding of the benefits of completing the additional drilling and seismic soil testing could change once the preliminary site-specific seismic analyses are complete. If a change in the understanding of the benefits of the additional work occurs, Jacobs will communicate the reasons for the change to the City, and a determination of the benefits and need to fund additional explorations and testing can be made at that time.

## 6. References

CH2M HILL. 2013. Water Reclamation Facility Expansion Geotechnical Report. Prepared for the City of McMinnville, Oregon. November.

**Memorandum 7  
Recommended Plan**



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**Subject:** Recommended Plan

**Project Name:** McMinnville Water Reclamation Facility Biosolids Storage Tank and Grit System Expansion

**Prepared For:** City of McMinnville

**Prepared By:** Jacobs Engineering Group

**Date:** January 29, 2021

**Project Number:** D3373900

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## 1. Introduction

Memorandum 3, Evaluation of Biosolids Treatment Alternatives, recommended the implementation of Alternative 3B – addition of second generation autothermal thermophilic aerobic digestion (ATAD) tanks, an equipment support building, retrofit of the existing ATADs for storage nitrification-denitrification reactor (SNDR), addition of a biosolids dewatering building, and the addition of cake storage. Memorandum 3 provided a full justification for the recommendation, but one of the primary advantages of Alternative 3B is the “phaseability” of this alternative. This memorandum provides details on the elements of Alternative 3B recommended for inclusion in the upcoming project.

## 2. Recommended Facilities

### 2.1 Phasing

Alternative 3B provides the City increased solids processing capacity, improves the capacity of the existing liquid biosolids storage tank, and implements dewatering and cake storage. However, as Memorandum 3 notes, Alternative 3B can be implemented in phases to provide facilities that meet City needs. Currently, those needs include additional solids processing capacity and liquid biosolids storage capacity. However, because there is still a strong demand for the Water Reclamation Facility (WRF) liquid biosolids product, there is not currently a driver to construct dewatering and cake storage.

The following components are recommended for inclusion in the project:

- Two new second generation ATAD tanks
- ATAD support building to house the ATAD package equipment
- SNDR reactor(s), either retrofit of the existing ATADs or construction of a new SNDR tank
- Pumping and piping modifications associated with the above facilities
- Improvements to the decant operation at the existing biosolids storage tank
- Substantial replacement of the existing odor control system, including fans and biofilter

## 2.2 Process Design Criteria

Memorandum 1, Evaluation of Existing Conditions, provides complete documentation of the existing and projected flows and loads to the WRF and to the solids treatment process. Attachment 1 provides a process flow diagram and table summarizing the WRF mass balance.

## 2.3 ATAD

The two new ATAD tanks will be based on the second generation, Thermal Process Systems' ThermAer design. Thickened sludge generated from the existing gravity belt thickeners will be pumped from the existing thickened sludge wet wells by thickened sludge pumps to the new ATAD tanks. Design criteria for the ATAD process are summarized in Table 2-1. Conceptual layout drawings showing the ATAD configuration are included in Attachment 2.

**Table 2-1. Design Criteria – ATAD**

Parameter	Units	Value
Quantity	Quantity	2
Volume (each)	Gallons	162,000
Tank type		Reinforced concrete, including cover
Tank Dimensions	Feet, length by width	48 x 24
Wall Height	Feet	24
Freeboard	Feet	6
Design Thickened Sludge Solids Loading	Pounds per day	13,024 (maximum month in 2045)
Design Thickened Sludge Hydraulic Loading	Gallons per day	26,000 (maximum month in 2045)
Solids Retention Time at Design Loading Rate	Days	12 (maximum month in 2045)
Design Thickened Sludge Feed Solids Content	% total solids	6 (average); 5-7 (range)
Volatile Solids Reduction (VSR)	%	60 total (54 expected in ATAD)

## 2.4 Support Building

The support building will house major mechanical equipment, electrical gear, and instrumentation associated with the ATAD and SNDR tanks. The two-story facility will contain the pumping equipment on the lower level and blower equipment on the upper level. Attachment 2 shows a conceptual layout for this facility, and Table 2-2 summarizes the associated major facility features. The major process equipment to be housed in the Support Building is shown in Table 2-3.



**Table 2-2. Design Criteria – Support Building**

Parameter	Units	Value
Building Footprint	Square feet	1,620 (preliminary)
Levels	Quantity	2
Building Height	Feet	34 (preliminary)
Materials		Reinforced concrete floors Reinforced concrete masonry unit walls Ethylene propylene diene terpolymer (EPDM) roof

**Table 2-3. Support Building Equipment List**

Component	Quantity	Horsepower (each)
ThermAer (ATAD) Jet Motive Pump	2	100
ThermAer (ATAD) Positive Displacement Blower	2	30
SNDR Jet Motive Pump	3	50
SNDR Positive Displacement Blower	3	10
Transfer Pump (from ATAD to SNDR)	2	15
Spare Positive Displacement Blower	1	30

## 2.5 SNDR

The second stage of the digestion process will be based on Thermal Process Systems' SNDR design. Transfer pumps will transfer the contents of the ATAD tanks to the SNDR tanks. Memorandum 3 describes conversion of the existing ATAD reactors to the SNDR function but also identifies the alternative of constructing a new SNDR tank instead of retrofitting the existing three tanks. Design criteria for the SNDR process are summarized in Table 2-4.

**Table 2-4. Design Criteria – SNDR**

Parameter	Units	Value
Quantity	Quantity	3 (existing, converted ATADs)
Volume (each)	Gallons	72,000
Tank type		Welded steel with coated interior and insulated exterior
Tank Dimensions	Diameter	35
Wall Height	Feet	13
Freeboard	Feet	3
Design Digested Sludge Hydraulic Loading	Gallons per day	26,000 (maximum month in 2045)
Solids Retention Time at Design Loading Rate	Days	8 (maximum month in 2045)
Biosolids Solids Content	% Total solids	3 (average); 2.5-3.5 (range)
VSR	%	60 total (6 expected in SNDR)

## 2.6 Pumping and Piping Modifications

The Headworks lower level contains the following pumping systems associated with the solids treatment process: thickened sludge transfer pumps, biosolids pumps, and ATAD transfer pumps, which pump from

ATADs to the Biosolids Storage Tank. Detailed impacts on these systems will be determined in the next design phase, but the following modifications are anticipated:

- Thickened sludge transfer pumps: The existing system contains two centrifugal and one progressing cavity pump. It is likely that the existing pumps will require replacement due to pumping higher solids concentration sludge, pumping a greater distance, and pumping to a taller ATAD. The City has expressed a preference for lobe-style pumps.
- Biosolids pumps: Minor piping changes are expected.
- ATAD transfer pumps: Minor piping changes are expected.

Yard piping tie-ins will be required to connect thickened sludge pump discharge to the new ATAD process and to connect the new ATAD effluent (digested biosolids) to the SNDR tanks (existing ATADs). The SNDR jet motive pumps and blowers, located in the support building, will require piping to the SNDR tanks. Additionally, duct work modifications will be required to connect the existing odor sources to the new odor control system.

## 2.7 Biosolids Storage Tank Decant Improvements

As described in Memorandum 1, Evaluation of Existing Conditions, the winter season supernatant decant from the Biosolids Storage Tank can contain a significant solids loading, recirculating those solids through the WRF process. The improved ATAD process increases VSR, but more importantly, allows for thicker sludge to be pumped from the gravity belt thickeners, reducing water content to digestions and the Biosolids Storage Tank. Although these features will decrease the WRF's reliance on decant, improvements will be implemented to mitigate the issue of solids carryover in the decant. Because the WRF has a single biosolids storage tank, there is limited opportunity for work inside the tank. Further, because the tank is pre-stressed concrete, decant improvements must be non-destructive. Incorporation of a telescoping valve will be explored in greater detail in the next phase.

## 2.8 Odor Control

The proposed odor control system upgrades are described in Memorandum 5, Evaluation of Odor Control System.

# 3. Process Control

## 3.1 Process Control Narrative

Waste activated sludge and chemical sludge will be thickened in the existing gravity belt thickeners to approximately 6 percent total solids. The gravity belt thickener thickening process is run on a batch basis, 8 hours per day. Thickened sludge transfer pumps will transfer thickened sludge daily to the ATAD tanks. The transfer will alternate tanks such that each tank is fed every other day. Before feeding the ATAD each day, ATAD sludge will be transferred to the SNDR tanks to make room for incoming thickened sludge. New transfer pumps will move sludge from ATADs to the SNDR. On a batch basis, digested sludge will be transferred from the SNDR step to the existing Biosolids Storage Tank via the existing ATAD transfer pumps.

Process control of the ATAD and SNDR processes will be by Thermal Process Systems control system. Within the ATAD and SNDR tanks, pumps and blowers mix and provide oxygen to the process. Both are equipped with variable frequency drives to vary the oxygen delivery capacity, providing increased oxygen

during high demand periods and decreased oxygen during low demand periods, conserving energy. Process control is based upon an oxidation-reduction potential probe signal.

### 3.2 Process Reliability and Redundancy

The ATAD process has been used at the WRF since 1995 and has proven to be a reliable means of achieving Class A biosolids. Thermal Process Systems' second generation ATAD process (Thermaer and SNDR) has refined operation of the process with more than 70 installations. The following process and equipment redundancy features will be included in the design:

- Thermaer tanks: Two tanks provided, sized for maximum month loading in 2045 and retention time of 12 days. Because the only equipment inside a tank is the header and nozzles, tank downtime should be minimal. If a tank does need to be taken offline, Class A could still be achieved with a single tank.
- SNDR tanks: Class A will be achieved leaving the Thermaer tanks. The SNDR step will achieve additional VSR, ammonia removal, and reduced odors. In other words, Class A can be achieved without the SNDR step.
- Biosolids storage: The existing Biosolids Storage Tank does not have redundancy. Conversion of the existing ATADs to SNDR means that the tanks can become an extension of the Biosolids Storage Tank and can provide approximately 3 weeks of storage if the existing Biosolids Storage Tank needs to go offline.
- Equipment redundancy:
  - Thermaer and SNDR jet motive pumps: a minimum of one pump per tank with spare belts. In detailed design, a pipe interconnection will be considered to allow either Thermaer pump to service either Thermaer tank and either SNDR pump to serve either SNDR tank.
  - Thermaer and SNDR blowers: one blower per tank will be provided with one additional installed spare that can serve any tank.
  - Transfer pumps: Two transfer pumps will be installed with one additional shelf spare provided.

## 4. Recommended Site Layout

### 4.1 Facility Layout

Attachment 3 shows a conceptual site layout of the proposed Alternative 3B facilities, including facilities proposed to be constructed in the current project and future facilities. The layout was developed with the following considerations:

- Biosolids hauling, chemical delivery, and grit/screenings truck traffic flow must be maintained.
- The new ATAD tanks should be located close to the existing ATAD tanks (to be converted to SNDR) to minimize sludge transfer pumping distance.
- The layout should accommodate a new standalone SNDR tank if the City chooses to not use the existing ATADs for the SNDR step.
- The new biofilter should be located near the biofilter fans to minimize duct work length.
- The new ATAD Support Building should be situated such that electrical duct banks and yard piping are easily routed to it.

- The future dewatering building should be situated near the cake storage bunkers to minimize the distance of cake conveyance. The cake storage bunkers should be situated to allow easy access from the existing plant roadway.
- As described below, the site layout should “substantially conform” to the layout approved by Yamhill County in 1992.

## 4.2 Piping and Utilities

In addition to the process piping modifications described previously, the following services will require tie-ins and/or rerouting as part of the project:

- Fire protection
- Storm sewer
- Plant drain
- No. 3 Plant effluent water
- Natural gas

## 4.3 Land Use and Permitting

The 1992 Site Plan approval document (SDR 10-92) by Yamhill County provided six conditions of approval. Similar to the expansion project completed in 2016, actions included in the currently proposed project at the WRF would “substantially conform” to the site plan approved at the site by Yamhill County in 1992. (Substantial conformance of future projects to the approved plan was one of the 1992 conditions.) A similar justification should be provided for the current project to obtain County land use clearance/ approval for the project.

The justification should include a narrative that describes how the project meets all six of the conditions of approval from the 1992 Site Plan approval document (SDR 10-92). This narrative will include a description of proposed project facilities and structures with figures showing how proposed facilities/structures are contained within the original approved project site geography and are “directly related to the primary utility use” and, as such, the proposed project substantially conforms to the overall site plan approved by Yamhill County in 1992. The narrative should include an existing site conditions sheet (to include all elements listed in County Code Section 1101.04(A), site plan sheets (to include all applicable elements listed in County Code Section 1101.04(B), and a landscape plan (to include all applicable elements listed in County Code Section 1010).

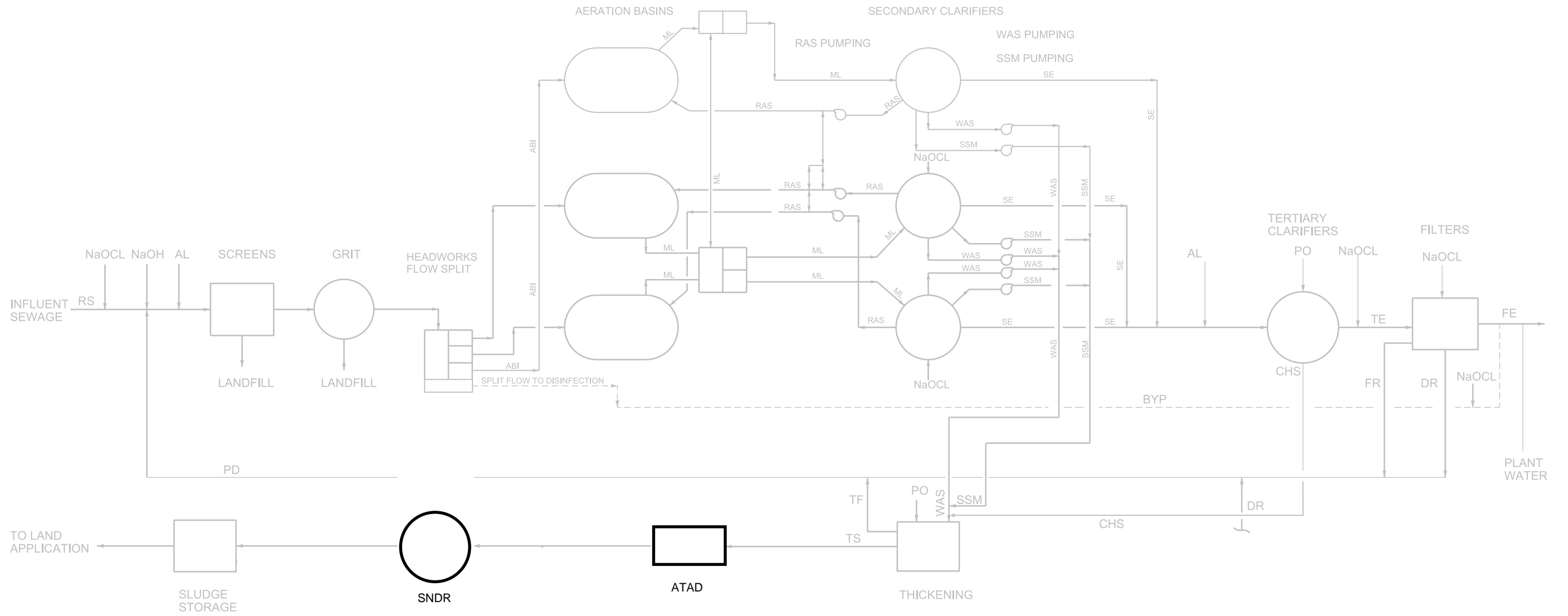
## 4.4 Lime Stabilization Footprint

The City's WRF Biosolids Management describes Oregon Department of Environmental Quality (DEQ) requirements for the City to maintain an “Implementation Plan for Emergency Lime Stabilization of Sludge.” The site plan included in Attachment 3 uses the portion of site allocated for the lime stabilization process. Because the ATAD process has proven effective since DEQ's requirement in 1993, it is assumed that the site allocation for lime stabilization is no longer required; however, this must be confirmed with DEQ.

## 4.5 Engineering Data Sheets

Attachment 4 includes architectural, building services (plumbing and HVAC), civil, electrical, instrumentation and control, mechanical, and structural data sheets. The data sheets are intended to highlight the project's major components, rather than provide a comprehensive detail of all issues related to the engineering discipline. Further details will be developed in the following design phases.

**Attachment 1  
Process Flow Diagram  
Table Summarizing WRF Mass Balance**



CONSTITUENT	RAW SEWAGE (RS)	PLANT DRAIN (PD)	BYPASS (BYP)	AERATION BASIN INFLUENT (ABI)	MIXED LIQUOR (ML)	SECONDARY EFFLUENT (SE)	TERTIARY EFFLUENT (TE)	FILTER EFFLUENT (FE)	PLANT EFFLUENT (PLE)	WASTE ACTIVATED SLUDGE (WAS)	THICKENED SLUDGE (TS)	ATAD EFFLUENT - BIOSOLIDS (B)	SNDR EFFLUENT - BIOSOLIDS (B)	CHEMICAL SLUDGE (CHS)	FILTER REJECT (FR)	THICKENING FILTRATE (TF)
FLOW (GALLONS PER DAY)	6,700,000	561,485	0	7,261,485	10,892,228	7,112,432	7,075,304	6,675,327	6,675,327	149,053	24,673	24,673	24,673	37,128	399,977	161,508
CARBONACEOUS BOD5 (POUNDS PER DAY)	11,845	248	0	12,093	96,218	330	99	52	52	3,781	3,811	1,010	241	231	47	201
TSS (POUNDS PER DAY)	13,258	890	0	14,148	299,250	890	297	59	59	11,766	12,355	6,572	5,920	1,239	239	650
TKN (POUNDS PER DAY)	1,238	42	0	1,280	13,208	145	113	101	101	515	517	453	377	32	12	30
NH3-N (POUNDS-N PER DAY)	884	0	0	885	6	4	4	4	4	0	0	103	64	0	0	0
NO3-N (POUNDS-N PER DAY)	0	4	0	4	73	48	47	45	45	1	0	123	85	0	3	1
TOTAL NITROGEN (POUNDS-N PER DAY)	1,238	45	0	1,284	13,281	192	160	145	145	516	518	576	461	32	15	31
TP (POUNDS-P PER DAY)	189	19	0	208	6,582	29	7	2	2	258	266	266	266	22	5	14

**NOTES:**

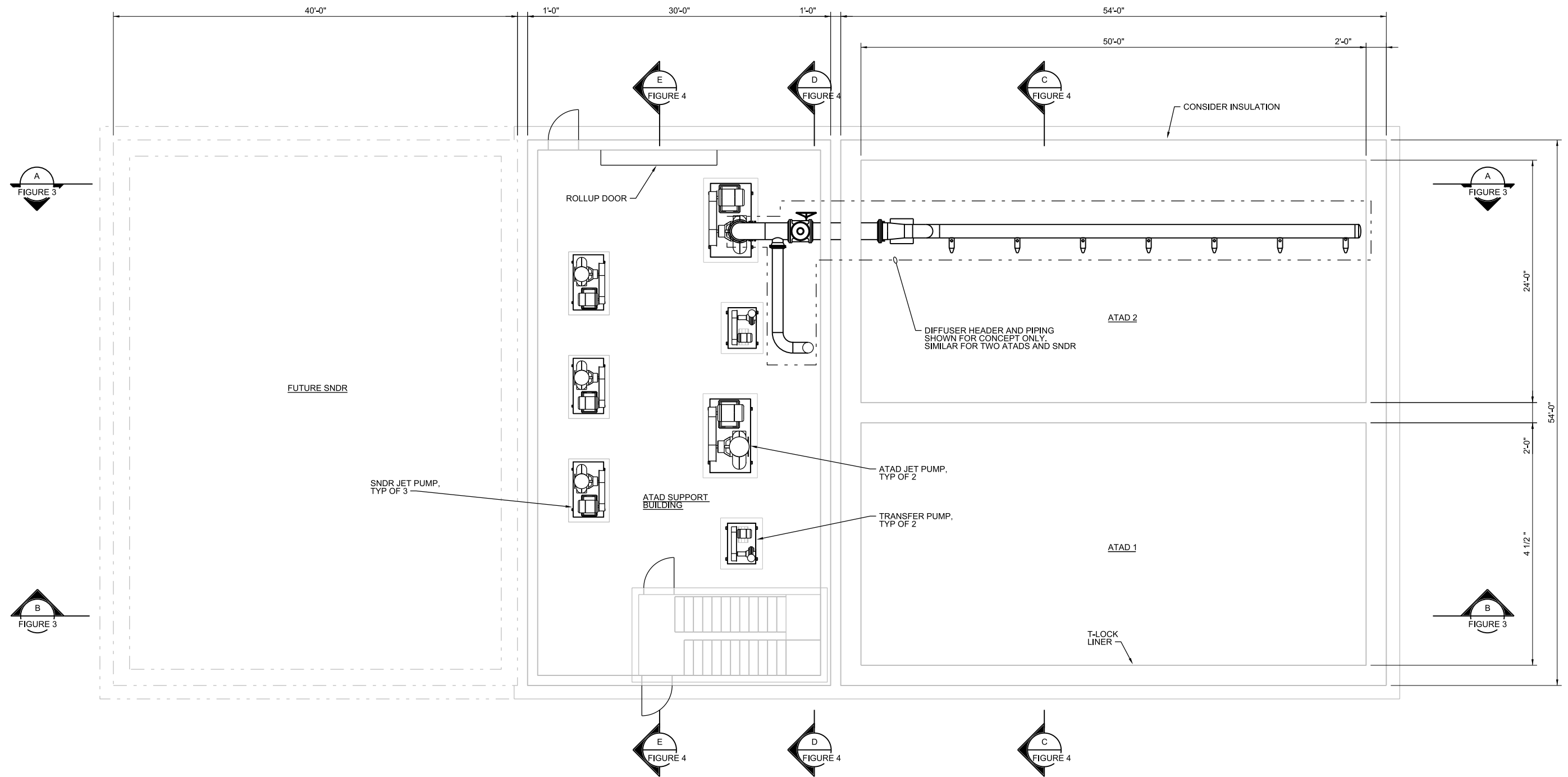
1. MASS BALANCE VALUES DERIVED FROM STEADY-STATE PROCESS MODEL. VALUES REPRESENT MAXIMUM MONTH DRY WEATHER FLOW AND MAXIMUM MONTH LOADS AT BUILDOUT CONDITIONS AND 16.4C

CITY OF MCMINNVILLE  
WATER RECLAMATION FACILITY  
MCMINNVILLE, OREGON

PROCESS FLOW DIAGRAM  
AND  
MASS BALANCE

# **Attachment 2 Conceptual Facility Layout**

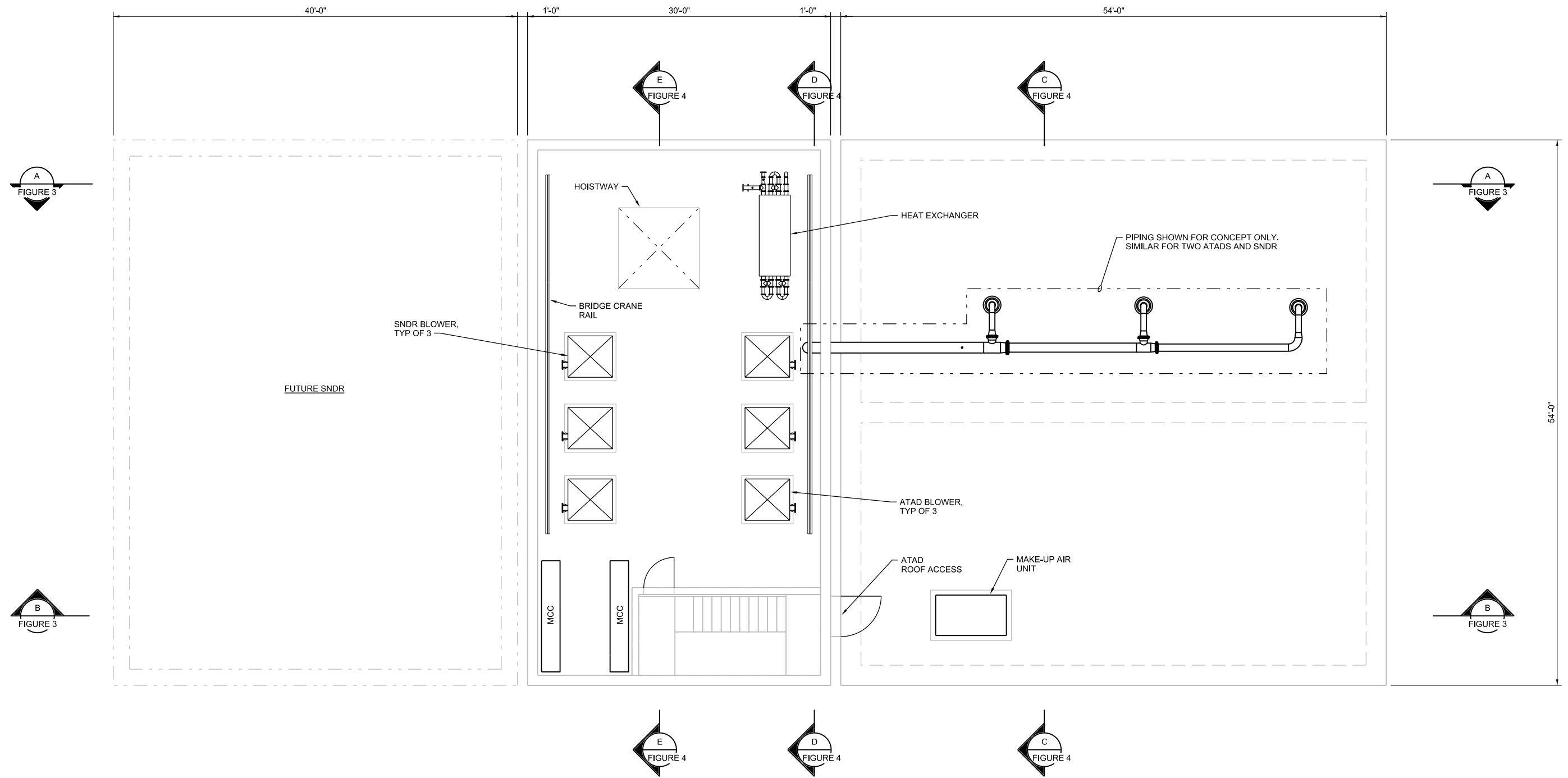





**GROUND FLOOR PLAN**  
 3/16"=1'-0"

CITY OF MCMINNVILLE  
 WATER RECLAMATION FACILITY  
 MCMINNVILLE, OREGON

FIGURE 1  
 ATAD FACILITY  
 MECHANICAL EQUIPMENT  
 GROUND FLOOR PLAN

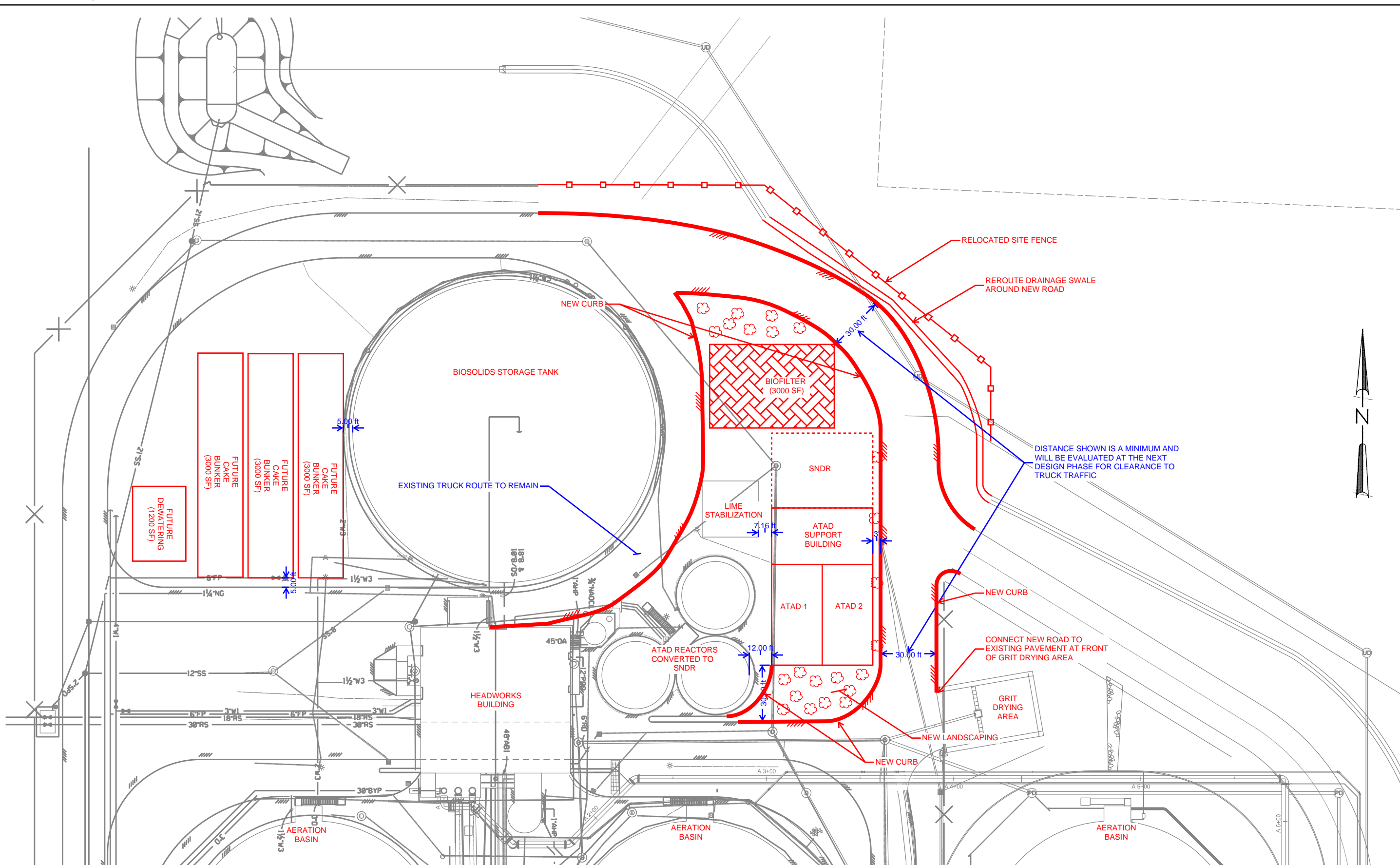



**FIRST FLOOR PLAN**  
 3/16"=1'-0"

CITY OF MCMINNVILLE  
 WATER RECLAMATION FACILITY  
 MCMINNVILLE, OREGON

FIGURE 2  
 ATAD FACILITY  
 MECHANICAL EQUIPMENT  
 FIRST FLOOR PLAN

**Attachment 3  
Conceptual Site Layout of the  
Proposed Alternative 3B Facilities**



CITY OF MCMINNVILLE  
 WATER RECLAMATION FACILITY  
 MCMINNVILLE, OREGON

CONCEPTUAL SITE LAYOUT

# **Attachment 4 Engineering Data Sheets**

# 1. ARCHITECTURAL DATA SHEET

## 1.1 Applicable Codes and Reference Documents

Class	In addition to Jacobs' adherence to industry guidelines, best practices, and applicable codes, the following code versions are specific to this project: <ul style="list-style-type: none"> <li>▪ Building Code: 2019 Oregon Structural Specialty Code</li> <li>▪ Fire/Life Safety: 2019 Oregon Fire Code</li> <li>▪ Energy Code: 2019 Oregon Zero Energy Ready Commercial Code with 2016 American Society of Heating, Refrigerating and Air-Conditioning Engineers 90.1 (Zone 4C)</li> </ul>
As-Builts	<ul style="list-style-type: none"> <li>▪ McMinnville Water Reclamation Facility, 1995</li> <li>▪ McMinnville Tertiary Treatment and Disinfection Project, 2016</li> </ul>
Previous Reports	<ul style="list-style-type: none"> <li>▪ McMinnville WRF Expansion Schematic Design Report, 2013</li> </ul>

## 1.2 Existing System Description

Description	Existing structures, including facilities originally constructed in 1995 and in the 2016 expansion, are consistent in form, color, and appearance. Although there is slight variation between building materials, the use of wall accents creates a cohesive theme throughout the site.
Major Components	<ul style="list-style-type: none"> <li>▪ Floors: Concrete foundation and floor slab.</li> <li>▪ Roof: Ethylene propylene diene terpolymer (EPDM) roofing membrane over cover board, rigid roof insulation, vapor retarder, and metal deck.</li> <li>▪ Walls: Load-bearing concrete masonry units (CMU) with 4-inch split-face veneer. 1995 WRF facilities included cast-in-place concrete with texturized (ribbed) concrete and brick veneer accents.</li> <li>▪ Doors and Frames: Fiberglass with vision pane glass. 1995 WRF facilities provided steel hollow metal doors and frames with galvanized coating, factory primer, and field painted.</li> <li>▪ Overhead Doors: Galvanized steel with polyvinylidene fluoride factory finish. Operation to be motorized.</li> <li>▪ Windows: Aluminum thermally broken frames with double-pane insulated glass having Low-E coating.</li> </ul>

## 1.3 Proposed Project

Description	Buildings will generally be designed to provide functional space appropriate for the processes and the equipment being housed. Space size will be determined by process function, equipment size, and operator needs for access, egress, and ease of equipment maintenance. Response to climate and local environment will be met by conformance to energy code requirements.  New structures will be designed with forms, details, materials, and colors consistent with the existing buildings
Changes to Existing	<ul style="list-style-type: none"> <li>▪ Architectural aspects of existing facilities will generally not be affected by this project.</li> </ul>
New Components	A new two-story building will house the following: electrical gear, pumps, blowers, instrumentation and piping, bridge crane and hoistway, and space for access to the

	<p>attached autothermal thermophilic aerobic digestion (ATAD) tanks. The facility will have the following features:</p> <ul style="list-style-type: none"> <li>▪ Floors: Concrete foundation and floor slab.</li> <li>▪ Roof: EPDM roofing membrane over cover board, rigid insulation, vapor retarder, and metal deck.</li> <li>▪ Walls: Load-bearing CMUs, air barrier with rigid insulation, and 4-inch split-face veneer.</li> </ul> <p>A brief Code Analysis for the Building is as follows:</p> <ul style="list-style-type: none"> <li>▪ Occupancy Group: F-2 (Factory/Industrial Low Hazard)</li> <li>▪ Construction Type IIB; non-combustible construction</li> <li>▪ Allowable Building Area: 23,000 square feet</li> <li>▪ Allowable Building Height: 55 feet</li> <li>▪ Allowable Number of Stories: Three</li> <li>▪ Non-sprinklered; portable fire extinguishers</li> <li>▪ Chemical Storage/Hazardous Materials: None</li> <li>▪ Plumbing Fixtures: Required plumbing fixtures (sink, toilet) are provided at the existing Headworks Building. This building is located more than 500 feet from the planned ATAD Support Building location. The distance can exceed 500 feet if approved through an exception to the Type 2 permitting process. City of McMinnville to obtain an approval for Exception 2902.3.3.</li> </ul>
<p>Unique Project Features</p>	<p>Location for foul air fans and HVAC units could affect building layout, and several possible locations have been discussed (see the Process-Mechanical Data Sheet for more information). Depending on chosen location and preferences, a canopy with metal wall panels could provide coverage for this equipment or an additional enclosed space (potentially adding a third floor) could be provided.</p> <p>In addition, type of equipment stored on the roof could influence the type of roof access to be provided. For mechanical equipment that requires frequent maintenance, an enclosed stairwell could be provided for ease of access. However, if no equipment is housed on the roof, or equipment requires minimum maintenance, an access ladder could be provided instead.</p>

#### 1.4 Items to be Addressed in the Next Phase

<p>Description</p>	<p>The Schematic Design Phase will advance project concepts to confirm project scope and finalize major discipline and facility concepts.</p>
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## 2. BUILDING SERVICES DATA SHEET

### 2.1 Applicable Codes and Reference Documents

Codes	<p>In addition to Jacobs' adherence to industry guidelines, best practices, and applicable codes, the following code versions are specific to this project:</p> <ul style="list-style-type: none"> <li>▪ 2019 Oregon Mechanical Specialty Code</li> <li>▪ 2017 Oregon Plumbing Specialty Code (with 2020 Amendments)</li> <li>▪ 2014 Oregon Energy Efficiency Specialty Code</li> <li>▪ 2019 Oregon Fire Code</li> <li>▪ 2020 National Fire Protection Association (NFPA) 820, Standard for Fire Protection in Wastewater Treatment and Collection Facilities</li> </ul>
As-Builts	<ul style="list-style-type: none"> <li>▪ McMinnville Water Reclamation Facility, 1995</li> <li>▪ McMinnville Tertiary Treatment and Disinfection Project, 2016</li> </ul>
Previous Reports	<ul style="list-style-type: none"> <li>▪ McMinnville WRF Expansion Schematic Design Report, 2013</li> </ul>

### 2.2 Existing System Description

Description	<ul style="list-style-type: none"> <li>▪ The existing ventilation system serving the HVAC/Mechanical Room in the Headworks facility consists of a roof-mounted supply fan, wall mounted relief louver, motorized dampers on supply inlet and relief outlet, distribution ductwork, and a natural gas-fired unit heater. The supply fan ventilates the space at approximately 18 air changes per hour. Air is relieved through the wall-mounted louver.</li> <li>▪ The existing ventilation system serving the Pump Room in the Headworks facility consists of a roof-mounted air handling unit and supply ductwork and a roof-mounted exhaust fan and return ductwork. The air handling unit and exhaust fan ventilate the space at approximately 12 air changes per hour through push-pull ventilation. The air handling unit is equipped with a natural gas direct-fired heating section.</li> </ul>
Major Components	<ul style="list-style-type: none"> <li>▪ Headworks – HVAC/Mechanical Room: Roof-mounted supply fan, ductwork, and wall-mounted relief louver</li> <li>▪ Headworks – Pump Room: Roof-mounted air handling unit with natural gas direct-fired heating section, roof-mounted exhaust fan, and supply and return ductwork</li> </ul>

### 2.3 Proposed Project

Description	<p>The proposed project includes the replacement of the two odor control fans installed in the HVAC/Mechanical Room at the Headworks facility. For NFPA 820 compliance, an exhaust fan will be added to the space for a push-pull ventilation configuration. Flow monitoring instrumentation will be included on both the supply and exhaust ductwork.</p> <p>The ATAD process scope may include modification of existing sludge pumps in the Headworks Pump Room. If determined to be necessary, the HVAC system serving this space will be modified for compliance with NFPA 820.</p> <p>The ATAD Support Building, housing equipment and piping to support the new ATAD process, will be provided with new HVAC systems for NFPA 820 compliance and space conditioning. Space temperature control during the cooling season will be accomplished via ventilation-only cooling. During the heating season, supply air will be</p>
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	<p>heated via a natural gas-fired burner. Ventilation will be provided to the Pump Room at a rate of six air changes per hour per the requirements of NFPA 820. It is not expected that potable or nonpotable water will be required at this facility. Plant service water and area drainage is covered in the Process-Mechanical Data Sheet. Fire sprinklers are not required for the building. Hydrant coverage will be provided and explored further in the next design phase.</p>
Changes to Existing	<ul style="list-style-type: none"> <li>▪ Headworks – HVAC/Mechanical Room: The existing HVAC system will be modified for NFPA 820 compliance, which includes the addition of an exhaust fan and flow monitoring instrumentation.</li> <li>▪ Headworks – Pump Room: The existing HVAC system will be modified for NFPA 820 compliance if modifications in this space are determined to be necessary.</li> </ul>
New Components	<ul style="list-style-type: none"> <li>▪ ATAD Support Building: HVAC equipment for heating and ventilation-cooling of the new equipment spaces. Ventilation will be in compliance with the requirements of NFPA 820 where applicable.</li> </ul>
Unique Project Features	<ul style="list-style-type: none"> <li>▪ Locating ATAD Support Building HVAC units external or internal to the facility is a consideration. Locating internal to facility will require larger footprint to accommodate equipment and clearance requirements. At this time, an exterior location is assumed.</li> <li>▪ Extending existing fire water line to new hydrant serving the ATAD Support Building.</li> </ul>

## 2.4 Items to be Addressed in the Next Phase

Description	<p>The Schematic Design Phase will advance project concepts to confirm project scope and finalize major discipline and facility concepts. This phase will include, but is not limited to, advancement of the following:</p> <ul style="list-style-type: none"> <li>▪ Detailed sizing and selection of HVAC equipment and systems, including duct distribution system, ventilation monitoring, and controls.</li> <li>▪ Determine any additional fire protection requirements for the ATAD Support Building beyond fire hydrant coverage.</li> <li>▪ Determine whether any action is required in the Pump Room at the Headworks facility with respect to upgrading the existing HVAC system for NFPA 820 compliance.</li> <li>▪ Determine any washdown or sink needs in the new ATAD Support Building.</li> <li>▪ Determine materials of construction of ductwork and equipment for corrosion resistance.</li> </ul>
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### 3. CIVIL AND YARD PIPING DATA SHEET

#### 3.1 Applicable Codes and Reference Documents

Codes	<p>In addition to Jacobs' adherence to industry guidelines, best practices, and applicable codes, the following code versions are specific to this project:</p> <ul style="list-style-type: none"> <li>▪ Oregon Standard Specifications for Construction, 2015</li> <li>▪ Oregon Department of Transportation Highway Division, 2011, Hydraulics Manual. Prepared by Engineering and Asset Management Unit, Geo-Environmental Section</li> <li>▪ City of McMinnville Standard Details, 2009</li> <li>▪ Department of Justice 2010 Americans with Disability Act Standards for Accessible Design</li> </ul>
As-Builts	<ul style="list-style-type: none"> <li>▪ McMinnville Water Reclamation Facility, 1995</li> <li>▪ McMinnville Tertiary Treatment and Disinfection Project, 2016</li> </ul>
Previous Reports	<ul style="list-style-type: none"> <li>▪ McMinnville WRF Expansion Project Schematic Design Report, 2013</li> </ul>

#### 3.2 Existing System Description

Description	Existing plant roads provide access for wastewater treatment plant maintenance vehicles, chemical hauling trucks (WB-50), and solids hauling trucks (WB-67). Existing yard piping provides service to the existing facilities and storm runoff collection and detention. The site is surrounded by a 6-foot-tall chain link security fence.
Major Components	<ul style="list-style-type: none"> <li>▪ Existing surfaces are asphalt paving with some permeable pavers</li> <li>▪ Existing treatment process-related yard piping</li> <li>▪ Existing stormwater piping, conveyance, and detention system</li> <li>▪ Datums are based on the 1993 drawings. Horizontal datum: Oregon State Plane, North Zone, NAD27, International Feet Coordinate System. Vertical datum: 1993 McMinnville WRF Drawings, finished floor elevation Headworks held at 142.00 feet.</li> </ul>

#### 3.3 Proposed Project

Description	Reroute plant access roads to provide access to the new facilities, yard piping for new facilities, and modifications to the storm system, and allow for future expansion.
Changes to Existing	<ul style="list-style-type: none"> <li>▪ Asphalt plant road east of the existing ATAD Reactors and Biosolids Storage Tank will be shifted east to accommodate the location of the new ATAD reactors.</li> <li>▪ Existing stormwater ditch east of the existing plant road will be relocated to accommodate the new road alignment.</li> <li>▪ Existing stormwater pond will be evaluated for adequate capacity for new impervious area created onsite and enlarged as required to meet detention requirements.</li> <li>▪ Relocate existing site fence around new road limits.</li> <li>▪ Existing landscaping removed during construction will be replaced in kind.</li> </ul>
New Components	<ul style="list-style-type: none"> <li>▪ Process yard piping and stormwater piping and structures.</li> </ul>

<p>Unique Project Features</p>	<ul style="list-style-type: none"> <li>▪ Repaving or overlaying existing plant roads where they are trenched for new utilities is not planned. A standard street cut repair to the asphalt is planned per City detail drawing No. 8.</li> <li>▪ Design vehicles to be used to determine site access: Biosolids haul truck is an eight-axle tractor-trailer combination with an overall length of 75 feet. An American Association of State Highway and Transportation Officials (AASHTO) WB-67 vehicle (tractor trailer combo with a 53-foot trailer) will be used to model access to and from the Biosolids Storage tank for the biosolids haul truck. For the chemical delivery trucks, an AASHTO WB-50 tractor-trailer combo with (day cab tractor with a 42.5-foot trailer) will be used to model access to and from the chemical delivery facility.</li> </ul>
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### 3.4 Items to be Addressed in the Next Phase

<p>Description</p>	<p>The Schematic Design Phase will advance project concepts to confirm project scope and finalize major discipline and facility concepts. This phase will include, but is not limited to, advancement of the following:</p> <ul style="list-style-type: none"> <li>▪ Sizing new stormwater pipes and drainage ditches for design storm event flows</li> <li>▪ Stormwater runoff calculations to determine whether existing detention pond requires resizing</li> <li>▪ Turning radius analysis for solids hauling trucks using AutoTurn to determine appropriate curve radiuses and lane widths</li> <li>▪ Site grading and yard piping models to verify grading concepts, facility elevations, and pipe cover, and to identify conflicts between new and existing piping</li> <li>▪ Operations and maintenance access around new equipment and facilities</li> </ul>
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## 4. ELECTRICAL DATA SHEET

### 4.1 Applicable Codes and Reference Documents

Codes	In addition to Jacobs' adherence to industry guidelines, best practices, and applicable codes, the following code versions are specific to this project: <ul style="list-style-type: none"> <li>▪ 2017 National Electrical Code</li> <li>▪ 2020 Standard for Fire Protection in Wastewater Treatment and Collection Facilities (NFPA 820)</li> </ul>
As-Builts	<ul style="list-style-type: none"> <li>▪ McMinnville Water Reclamation Facility, 1995</li> <li>▪ McMinnville Tertiary Treatment and Disinfection Project, 2016</li> </ul>
Previous Reports	<ul style="list-style-type: none"> <li>▪ McMinnville WRF Expansion Schematic Design Report, 2013</li> </ul>

### 4.2 Existing System Description

Description	The existing power distribution system is fed from two utility sources from McMinnville Water and Light. Source A and Source B each feed a 1,000-kilovolt-ampere (kVA) transformer, which then feeds each side of the main-tie-main switchboard 01-SWBD-01A and 01-SWBD-01B. Utility Source B will be replaced with a generator before the start of this project by others. The main switchboard feeds motor control center (MCC) 30-MCC-01A, -01B, and -01C in the Headworks facility.
Major Components	<ul style="list-style-type: none"> <li>▪ Source A (utility) and Source B (alternate utility) each feed a service transformer rated 1,000- kVA, 12.47-kilovolt (kV) - 480/277 volt (V).</li> <li>▪ Existing switchboards 01-SWBD-01A and 01-SWBD-01B are 3000 ampere (A), 480V, three-phase, three-wire.</li> <li>▪ Existing MCCs 30-MCC-01A, -01B, and -01C are each 800A, 480V, three-phase, three-wire.</li> </ul>

### 4.3 Proposed Project

Description	A new main-tie-main MCC will be provided in the new facility to power new equipment related to the new ATADs. The new motor loads will be on variable frequency drives. A 208/120 volts alternating (VAC) lighting panel will be provided for new single-phase loads. Demolition and modification to the existing MCC will occur for equipment impacted by the project.
Changes to Existing	<ul style="list-style-type: none"> <li>▪ Based on preliminary equipment sizing, two options were evaluated for feeding the new MCC: <ul style="list-style-type: none"> <li>– The new MCC, located in the new facility, could be fed from the existing MCC, 30-MCC-01A, -01B, -01C, located in the Headworks building. If this option is selected: <ul style="list-style-type: none"> <li>• A 600A feeder breaker and feeders will be provided in MCC 30-MCC-01B and 30-MCC-01C. The feeder breakers will feed each side of the new MCC.</li> <li>• Feeding the new MCC from 30-MCC-01B and 30-MCC-01C will cause the existing MCC's main breakers to reach the maximum capacity.</li> <li>• Although the main breakers and tie-breakers for 30-MCC-01A, -01B, -01C are 1200A frame breakers, the buses for each of these MCCs are rated 800A.</li> </ul> </li> </ul> </li> </ul>

	<ul style="list-style-type: none"> <li>• Due to the amp rating of the existing MCCs buses, we recommend that the new MCC be fed directly from 01-SWBD-01A and 01-SWBD-01B.</li> <li>– Because the existing MCC located in the Headworks building does not have the available capacity to support the new MCC, the new MCC will be fed from 01-SWBD-01A and 01-SWBD-01B.</li> <li>• The existing 800A frame spare breakers in 01-SWBD-01A and 01-SWBD-01B will be used to feed the new MCC.</li> <li>• If existing duct banks have sufficient spare conduits, new feeders will be routed from 01-SWBD-01A and 01-SWBD-01B to the new MCC. If spare conduits are not available, a new duct bank would be required.</li> </ul>
New Components	<ul style="list-style-type: none"> <li>▪ A new MCC will be located in the new ATAD Support Building.</li> <li>▪ A new 208/120 VAC lighting panel will be located in the new MCC or along the wall near the MCC.</li> <li>▪ New duct banks will be installed to feed the new MCC from 01-SWBD-01A, 01B.</li> <li>▪ New lighting, light switches, and receptacles will be provided in the new ATAD Support Building.</li> <li>▪ Each ATAD motor will be on a variable frequency drive per manufacturer's direction.</li> <li>▪ The transfer pumps, jet motive pumps, and storage nitrification-denitrification reactor (SNDR) jet pumps are all located on the ground level of the new building and will all have disconnect switches.</li> </ul>
Unique Project Features	<ul style="list-style-type: none"> <li>▪ Determine whether 01-SWBD-01A and -01B need new breakers based on how reliable the existing spare breakers are. If new breakers are required at 01-SWBD-01A and -01B, determine best time to install these breakers.</li> <li>▪ Reevaluate utility sizing and coordinate with MW&amp;L once the new loads are finalized.</li> </ul>

#### 4.3.1 Items to be Addressed in the Next Phase

Description	<p>The Schematic Design Phase will advance project concepts to confirm project scope and finalize major discipline and facility concepts. This phase will include, but is not limited to, advancement of the following:</p> <ul style="list-style-type: none"> <li>▪ New MCC size and space requirements.</li> <li>▪ Duct bank routing based on power feed source from 01-SWBD-01A and -01B.</li> <li>▪ Identification of existing handholes, manholes, and duct banks to be used based on the power source for the new MCC.</li> <li>▪ Determine whether 01-SWBD-01A and -01B need new breakers based on how old and reliable the existing spare breakers are.</li> <li>▪ Reevaluate utility sizing and coordinate with MW&amp;L once the new loads are finalized.</li> </ul>
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## 5. INSTRUMENTATION AND CONTROLS DATA SHEET

### 5.1 Applicable Codes and Reference Documents

Codes	<p>In addition to Jacobs' adherence to industry guidelines, best practices, and applicable codes, the following standards are specific to this project:</p> <ul style="list-style-type: none"> <li>▪ Instrumentation, Systems, and Automation Society</li> <li>▪ National Electrical Manufacturer's Association</li> <li>▪ Occupational Safety and Health Administration</li> <li>▪ Institute of Electrical and Electronic Engineers</li> <li>▪ National Electrical Code</li> </ul>
As-Builts	<ul style="list-style-type: none"> <li>▪ McMinnville Water Reclamation Facility, 1995</li> <li>▪ McMinnville Tertiary Treatment and Disinfection Project, 2016</li> </ul>
Previous Reports	<ul style="list-style-type: none"> <li>▪ McMinnville WRF Expansion Schematic Design Report, 2013</li> </ul>

### 5.2 Existing System Description

Description	<p>The current control system in Building 30 (Headworks) uses an Allen-Bradley PLC 5 model programmable logic controller (PLC), which is connected to the plant control network over a Data Highway Plus (DH+) communications link. Additionally, an operator workstation and a network switch are connected to the Administration Building through a fiber optic link.</p>
Major Components	<ul style="list-style-type: none"> <li>▪ LCP-30</li> <li>▪ PLC-30 (Allen-Bradley PLC-5 model)</li> <li>▪ Operator Workstation</li> <li>▪ Headworks Network Switch</li> <li>▪ DH+ Communication Cable</li> </ul>

### 5.3 Proposed Project

Description	<p>In addition to the new instrumentation and equipment needed for the biosolids process improvements, PLC-30 will be upgraded to a newer ControlLogix PLC that will access the plant control network over the existing fiber optic link as well as use an Ethernet to DH+ converter to maintain communications and control of existing equipment. Additionally, the existing network switch in Building 30 will be upgraded to a new managed Allen-Bradley Stratix Ethernet switch.</p>
Changes to Existing	<ul style="list-style-type: none"> <li>▪ The existing Allen-Bradley PLC-5 (PLC-30) in the Headworks building will be replaced with an Allen-Bradley ControlLogix L8 processor, input/output (I/O) modules, and rack.</li> <li>▪ The new PLC will reside in a new control panel, and existing control wiring will be marshalled from LCP-30 to the new panel if the existing wire length is sufficient. Otherwise, new control wiring will be routed from the new panel to the existing equipment. Additionally, a DH+ communication module will allow the new control system to communicate over the existing DH+ network.</li> <li>▪ The network switch will be replaced with new Allen-Bradley Stratix switch.</li> </ul>



New Components	<ul style="list-style-type: none"> <li>▪ The jet motive pumps, SNDR pumps, transfer pumps, SNDR blowers, and ATAD blowers will monitored and controlled using standard hardwired control signals. However, Ethernet links may be used to monitoring additional equipment statuses.</li> </ul>
Unique Project Features	<ul style="list-style-type: none"> <li>▪ All existing PLC control logic and communication functions that PLC-30 uses to control existing equipment will be transferred to the new ControlLogix PLC. This will require significant investigation and reverse engineering of the current PLC program.</li> </ul>

#### 5.4 Items to be Addressed in the Next Phase

Description	<p>The Schematic Design Phase will advance project concepts to confirm project scope and finalize major discipline and facility concepts. This phase will include, but is not limited to, advancement of the following:</p> <ul style="list-style-type: none"> <li>▪ Development of process instrumentation and control diagrams</li> <li>▪ I/O count and PLC component selections</li> <li>▪ New PLC placement</li> <li>▪ Process control strategies</li> <li>▪ Development of a PLC replacement plan to include: <ul style="list-style-type: none"> <li>– Investigating existing I/O wiring</li> <li>– Investigating the current PLC program in PLC-30</li> <li>– PLC switch-over steps</li> <li>– Interim operation required during switch-over</li> </ul> </li> </ul>
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## 6. PROCESS-MECHANICAL DATA SHEET

### 6.1 Applicable Codes and Reference Documents

Codes	<p>In addition to Jacobs' adherence to industry guidelines, best practices, and applicable codes, the following code versions are specific to this project:</p> <ul style="list-style-type: none"> <li>▪ American National Standards Institute</li> <li>▪ American Society of Mechanical Engineers</li> <li>▪ American Water Works Association</li> <li>▪ Hydraulic Institute</li> <li>▪ 2020 NFPA 820, Standard for Fire Protection in Wastewater Treatment and Collection Facilities</li> </ul>
As-Builts	<ul style="list-style-type: none"> <li>▪ McMinnville Water Reclamation Facility, 1995</li> <li>▪ McMinnville Tertiary Treatment and Disinfection Project, 2016 McMinnville Tertiary Treatment and Disinfection, 2019</li> </ul>
Previous Reports	<ul style="list-style-type: none"> <li>▪ McMinnville WRF Expansion Schematic Design Report, 2013</li> <li>▪ McMinnville Tertiary Treatment and Disinfection Schematic Design Report, 2018</li> </ul>

### 6.2 Existing System Description

Description	<p>Pumps for the various solids-side flow streams are in the Headworks Pump Room. The room contains septage pumps, thickened sludge transfer pumps, biosolids pumps, and ATAD transfer pumps. Piping is currently configured to support the three ATAD units and the single Biosolids Storage Tank.</p>
Major Components	<ul style="list-style-type: none"> <li>▪ Thickened Sludge Transfer Pumps 1, 2, and 3</li> <li>▪ Biosolids Pumps 1 and 2</li> <li>▪ ATAD Transfer Pumps 1 and 2</li> </ul>

### 6.3 Proposed Project

Description	<p>The new ATAD and retrofitted SNDR processes will require an evaluation of the existing pump systems referenced above with respect to suitability for the new required loads and flows or if replacement pumps are required.</p> <p>The new ATAD Support Building will contain pumps and blowers to support both the ATAD and SNDR processes.</p>
Changes to Existing	<ul style="list-style-type: none"> <li>▪ Possible replacement of the existing thickened sludge pumps in the Headworks Pump Room to support the expanded ATAD process.</li> <li>▪ Modification to existing piping to support new and expanded processes.</li> </ul>
New Components	<ul style="list-style-type: none"> <li>▪ Pumps, blowers, and additional equipment to support the new ATAD and SNDR processes. Equipment will be contained within the new ATAD Support Building.</li> <li>▪ The ATAD Support Building will be equipped with W3 utility water for washdown and equipment utility if required.</li> <li>▪ A bridge crane will be provided in the ATAD Support Building upper level to allow for equipment removal via floor hatch. Lifting eyes may also be included for select</li> </ul>

	<p>equipment if practical and if desired. The WRF has a portable gantry crane that could be used for pump removal on the lower level.</p> <ul style="list-style-type: none"> <li>▪ Process floor drains will be provided for receiving washdown water. Hub drains will be provided at equipment where required.</li> <li>▪ Piping schedule will be carried forward from past projects, using previously established standards for piping material, insulation, coatings, etc.</li> </ul>
<p>Unique Project Features</p>	<ul style="list-style-type: none"> <li>▪ Rotary Lobe style pumps will be given preference where reasonable from a flow and head perspective.</li> <li>▪ Corrosion control measures for buried ductile iron piping will include joint bonding and polyethylene bagging.</li> </ul>

#### 6.4 Items to be Addressed in the Next Phase

<p>Description</p>	<p>The Schematic Design Phase will advance project concepts to confirm project scope and finalize major discipline and facility concepts. This phase will include, but is not limited to, advancement of the following:</p> <ul style="list-style-type: none"> <li>▪ Further develop ATAD Support Building facility and equipment layout.</li> <li>▪ Further develop pipe routing, support, and material requirements as a piping schedule.</li> <li>▪ Determine utility water, seal water, and facility drainage requirements.</li> <li>▪ Further refine pump and equipment selection for ATAD Support Building.</li> <li>▪ Develop detailed hydraulic calculations to determine any changes to existing pump systems and to size new pump systems.</li> <li>▪ Develop process instrumentation and control diagrams.</li> </ul>
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## 7. STRUCTURAL DATA SHEET

### 7.1 Applicable Codes and Reference Documents

Codes	<p>In addition to Jacobs' adherence to industry guidelines, best practices, and applicable codes, the following code versions are specific to this project:</p> <ul style="list-style-type: none"> <li>▪ Oregon Structural Specialty Code, 2019</li> <li>▪ International Building Code, 2018</li> <li>▪ American Society of Civil Engineers, ASCE 7-16, Minimum Design Loads and Associated Criteria for Buildings and Other Structures, 2016</li> <li>▪ American Concrete Institute 350, Environmental Engineering Concrete Structures, 2006</li> <li>▪ American Concrete Institute 318, Building Code Requirements for Structural Concrete, 2019</li> </ul>
As-Builts	<ul style="list-style-type: none"> <li>▪ McMinnville Water Reclamation Facility, 1995</li> <li>▪ McMinnville Tertiary Treatment and Disinfection Project, 2016</li> </ul>
Previous Reports	<ul style="list-style-type: none"> <li>▪ McMinnville WRF Expansion Schematic Design Report, 2013</li> </ul>

### 7.2 Existing System Description

Description	The existing structures are a mix of reinforced CMU for abovegrade buildings and reinforced concrete for water-retaining structures.
Major Components	<ul style="list-style-type: none"> <li>▪ Process tanks and belowgrade structures are reinforced concrete structures designed for water retention or to keep the area dry.</li> <li>▪ The existing ATAD tanks are abovegrade, welded steel tanks on concrete foundations.</li> <li>▪ Building structures are either reinforced CMU or reinforced concrete structures supporting steel roof systems.</li> </ul>

### 7.3 Proposed Project

Description	New work includes construction of new reinforced concrete tanks for the ATAD process, construction of a CMU facility for the ATAD equipment space, and modifications to existing structures in support of process upgrades.
Changes to Existing	<ul style="list-style-type: none"> <li>▪ Demolition of existing miscellaneous concrete such as equipment pads, if necessary.</li> <li>▪ Installation of new miscellaneous concrete such as equipment pads, if necessary.</li> <li>▪ New openings in existing concrete or CMU to provide pipe or ductwork access.</li> </ul>
New Components	<ul style="list-style-type: none"> <li>▪ New ATAD tanks will be a cast-in-place concrete water-holding structures with an adjacent gallery to house mechanical and electrical components. <ul style="list-style-type: none"> <li>– The treatment portion of the ATAD Support Building will be a reinforced concrete water-holding structure designed per the provisions of American Concrete Institute 350. The structure will have a cast-in-place concrete roof structure and monolithic concrete foundation slab.</li> <li>– Interior portions of the new ATAD Support Building will receive a corrosion-resistant lining cast integrally with the concrete.</li> </ul> </li> </ul>

	<ul style="list-style-type: none"> <li>▪ The adjacent gallery will be a two-story, reinforced CMU building. The building will have a concrete floor between stories and a steel roof system on the upper level.</li> <li>▪ New reinforced concrete retaining walls will be provided to contain the media in the new biofilter.</li> </ul>
Unique Project Features	<ul style="list-style-type: none"> <li>▪ Based on a review of previous geotechnical investigations and changes in the building codes, the new facilities will require subsurface modifications to reduce potential settlement and lateral movement due to liquefiable soils. Potential ground improvements are outlined in Memorandum 6.</li> </ul>

#### 7.4 Items to be Addressed in the Next Phase

Description	<p>The Schematic Design Phase will advance project concepts to confirm project scope and finalize major discipline and facility concepts. This phase will include, but is not limited to, advancement of the following:</p> <ul style="list-style-type: none"> <li>▪ General layout of new facilities. This phase includes sizing of major structural components including slabs and walls and supporting roof elements.</li> <li>▪ Final ground improvement concepts will be coordinated with the geotechnical engineer.</li> <li>▪ Structural project specification list will be generated.</li> </ul>
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**Memorandum 8**  
**Project Delivery and Construction Cost**



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**Subject:** Project Delivery and Construction Cost

**Project Name:** McMinnville Water Reclamation Facility Biosolids Storage Tank and Grit System Expansion Project

**Prepared For:** City of McMinnville

**Prepared By:** Jacobs Engineering Group

**Date:** January 29, 2021

**Project Number:** D3373900

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## 1. Basis for Cost Estimate

The Project Definition Report defines the project components required to improve the capacity of the existing solids treatment and odor control processes. The design criteria for the recommended long-term solids process alternative (Alternative 3B) are described in Memorandum 3, Evaluation of Biosolids Treatment Alternatives. Memorandum 7, Recommended Plan, accounts for the system components that have been developed to meet these criteria and project goals. These memoranda and the remaining documents that make up the Project Definition Report form the basis for the cost estimate presented herein. Specifically, the following cost estimate detail accounts for only the portion of the Alternative 3B recommended for implementation in the current project.

## 2. Cost Estimate

This estimate has been prepared based on the process modeling performed by Jacobs, vendor pricing, some detailed quantity takeoffs, and estimating based on RS Means and Jacobs historical estimating and bid data. The project definition phase estimated cost of construction is summarized in Table 1-1. Attachment 1 contains additional details of the estimate. Base construction costs are expressed in April 2023 dollars and include the following mark-ups:

- Contractor overhead 10 percent
- Contractor profit 5 percent
- Mobilization, bonds, and insurance 5 percent
- Contingency 25 percent

Escalation to midpoint of construction: 8 percent

In addition to the construction cost estimate provided in Table 1-1, the City should account for engineering and administration costs to account for the total project cost. The City's budget for total project cost typically includes 25 percent for professional services. While this does not represent a price quotation from Jacobs, it is a reasonable assumption for planning purposes at this point in the design.

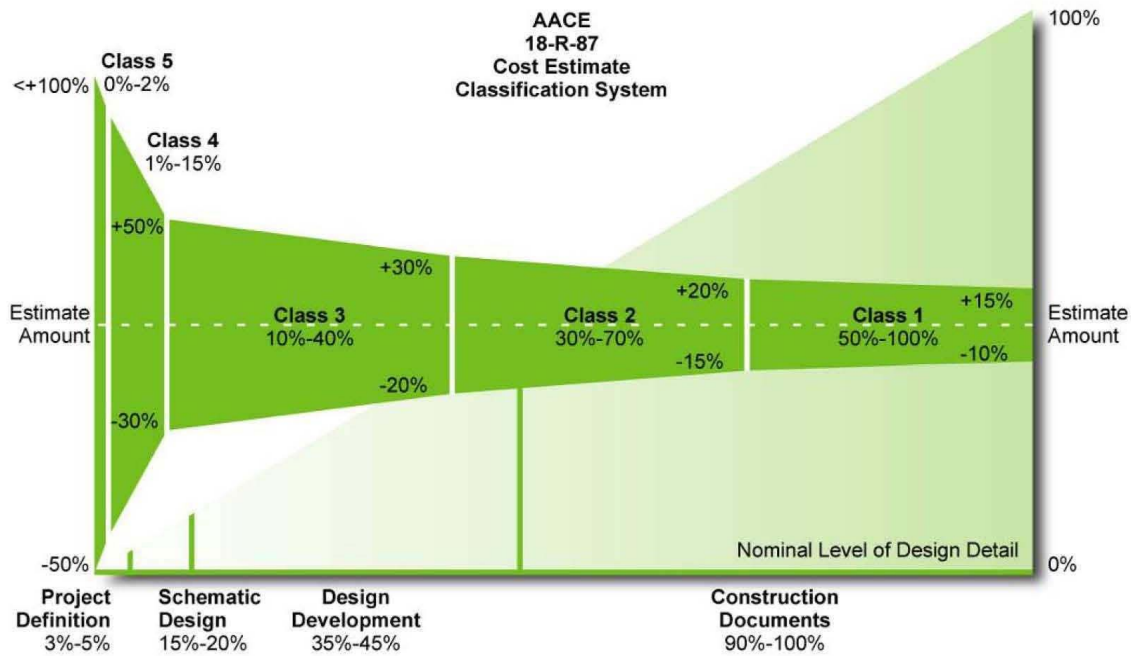


**Table 1-1. Summary of Project Cost Estimate**

Item	Estimated Cost (\$)
Autothermal Thermophilic Aerobic Digestion (ATAD) Tanks	1,185,000
Equipment Support Building	4,175,000
Storage Nitrification Denitrification Reactor (SNDR) and Headworks Retrofit	225,000
Biosolids Storage Tank Improvements	75,000
Odor Control System	431,000
Process Mechanical Installation (20% allowance applied to equipment)	590,000
Process Mechanical Piping (10% allowance applied to equipment)	270,000
Civil/Yard Piping (5% allowance)	259,000
Electrical (8% allowance)	415,000
Instrumentation and Controls (10% allowance)	519,000
<b>Subtotal (before markups)</b>	<b>8,660,000</b>
Contractor Overhead (10%)	910,000
Contractor Profit (5%)	500,000
Mobilization, Bonds, Insurance (5%)	430,000
Contingency (25%)	2,630,000
Escalation to Midpoint of Construction (8%)	1,071,000
<b>Total Construction Cost</b>	<b>14,201,000</b>
Professional Services (25% allowance)	3,550,000
<b>Total Project Cost</b>	<b>17,751,000</b>

### 3. Classification of Cost Estimate and Detail Definition

The construction cost estimate is consistent with the classification of estimates as defined by the Association for the Advancement of Cost Engineering. The industry classification system is Recommended Practice 17R-97, Cost Estimate Classification System, and 18R-97, Cost Estimating Classification System as Applied in Engineering, Procurement, and Construction for the Process Industries. Figure 1-1 shows the relationship of level of detail to the expected accuracy of the estimate.



**Figure 1-1. Construction Cost Estimate Accuracy Ranges**

The construction costs developed in the Project Definition Report are defined as order-of-magnitude-level (Class 5) cost estimates defined by the Association for the Advancement of Cost Engineering and adopted by the American National Standards Institute. An estimate of this type is normally expected to be within +50 percent or -30 percent of the actual construction cost. The opinions of cost (estimates) shown, and any resulting conclusions on project financial or economic feasibility or funding requirements, have been prepared for guidance in project evaluation and implementation from the information available at the time the opinion was prepared. The final cost of the projects will depend on actual labor and materials costs, actual site conditions, productivity, competitive market conditions, bid dates, seasonal fluctuations, final project scope, final project schedule, and other variables. As a result, the final project costs will vary from the estimates presented in this report.

The economic repercussions of the current COVID-19 global response have not been accounted for in this estimate. The City is cautioned that the current bidding environment is volatile and unpredictable, which could result in significantly higher bid prices or longer schedules than Jacobs is presenting.

## 4. Project Delivery

### 4.1 Contracting Method

Several contracting options are available to the City to implement construction of the improvements. These include conventional design-bid-build, construction manager – general contractor (CMGC) and design-build, each option with specific advantages and disadvantages.

CMGC is not recommended for the following reasons:

- The CMGC process provides the flexibility to start the work with partially completed design work, allowing collaboration between contractor, engineer, and owner during the design phase. However,

this is typically most advantageous on larger projects with constructability or schedule challenges. The current project does not have these characteristics so would not benefit.

- May reduce the Owner's ability to rely on the low-bid process to stimulate competition among contractors.
- More cost and effort is incurred during the design phase because the CMGC has a contract for preconstruction services in addition to one later for construction services. Owners incur more cost associated with review of CMGC generated cost estimates and schedules.
- Depending on how contract payment and total contract value are developed, the project cost would likely be higher than what a low-bid process would have produced at bid time. However, contract cost changes are more rare with CMGC contracts because they include an agreed to contingency, while change order amounts on design-bid-build contract can range from 2 to 5 percent of the original contract bid amount, which may be more than the agreed to CMGC contingency

Design-build is not recommended for the following reasons:

- Although the overall schedule of a project can often be reduced, cost is often equal or higher, and quality can be lower. This may not be the case with reputable firms and procurement processes, but in the open marketplace it is a risk for the Owner and difficult to sort out in the engineer/contractor selection process without extensive selection processes.
- The potential cost savings of the design-build approach is more likely for larger projects. The recommended project would likely not attract firms with appropriate design-build experience.
- While the design-build process could result in a schedule savings, schedule is not a strong driver for the recommended project and the design-build process would need to be implemented earlier in the design process.

Conventional design-bid-build is recommended for the current project for the following reasons:

- Design-bid-build allows the City to be presented with a set bid price for the work before making a complete commitment to proceed with the project construction.
- Design-bid-build is a familiar process to the City and the engineering and construction industry.
- Although the conventional process does not allow the City to select a contractor based on qualifications, several well-qualified contractors are in the Portland metropolitan and Willamette Valley areas who would provide competitive bids on a project of this size.
- The potential advantages of other contracting methods are not drivers for the recommended project.

## 4.2 Equipment Procurement

Approach to equipment procurement is important for obtaining quality equipment, maintaining equipment consistency between similar facilities, reducing costs, obtaining price certainty, and ensuring timely delivery of long-lead items. The following are the primary methods of equipment procurement with simplified descriptions of each:

- **Typical Open Bid Approach** - The equipment specifications list several preferred/suitable equipment manufacturers (vendors), and the contractor can choose any product (typically the lowest price equipment) that meets the specifications. The typical open bid approach presents the most competitive pricing option, although it leaves the Owner with less ability to procure a desired piece of equipment. The typical open bid approach would be used when the Owner is comfortable with any of the three manufacturers listed in the specification.

- **Base Bid/Mandatory Alternate Bid Approach** - An “A” listed or preferred equipment manufacturer is listed in the specification, and each bidding general contractor must use the price of the “A” listed manufacturer in their bid. The general contractor also is required to list a deductive (if any) bid price of the alternate (perhaps one or two) manufacturers and submit it in their bid.
- **Sole-source** - One manufacturer supplies a specific piece of equipment with no competition, so the facility design can be tailored to the sole-source equipment. For this option, the manufacturer is required to produce quotes for similar equipment from other projects during the design phase to ensure competitive pricing.
- **Pre-purchase** – Requires a separate set of Contract Documents between Owner and equipment supplier for pre-purchase prior to the selection of a general contractor. This option is especially important for long lead time items that would otherwise delay construction if the equipment was supplied by the general contractor.
- **Pre-Qualification** – Requires preparation of a request for proposals during the design phase with proposals submitted from a short-list of manufacturers to be evaluated based on monetary and non-monetary criteria. One manufacturer is selected as the basis of design.

The above equipment procurement approach will be considered as the design progresses to develop an approach to each equipment package. Typical open bid, sole-source, and pre-qualification have been used successfully for work at the Water Reclamation Facility (WRF) in the past several years.

The ATAD equipment by Thermal Process Systems is the largest equipment package and is recommended to be sole-sourced. In subsequent design phases, thorough justification would be developed to support this recommendation, including evidence of fair pricing to the City.

### 4.3 Project Phasing and Bid Approach

Although Memorandum 7 recommends implementing Phase 1 of Alternative 3B, further phasing or a “bid alternative” approach could be used. For example, if reduction in initial capital construction cost is required, the SNDR retrofit portion of the project could be deferred to a later date. Another approach could be to designate the SNDR retrofit as a “bid alternate,” requiring bidders to provide pricing for the SNDR work but excluding it from the basis of bid award. Once the apparent low-bidder is selected on base bid, the City could choose whether to execute the SDNR portion of the work for the price offered by the winning construction contractor, which allows the City some control over the construction cost once the bidding environment is better understood.

## 5. Construction Coordination

### 5.1 Schedule, Sequencing, and Constraints

As the design phase progresses, Jacobs will work with the City to develop a set of construction constraints that minimize the impact of construction activities on WRF operations. However, tie-ins and short unit process shutdowns will be required, and those require careful planning and construction sequencing. The WRF must remain in operation at all times. Temporary pumping might be required, although this is likely limited to solids treatment flows, which are more flexible than liquids treatment processes. With a construction period start target of spring 2022, it is anticipated that substantial completion will be achieved in fall 2023. A suggested preliminary construction sequence is as follows:

- Spring/Summer 2022
  - Mobilize
  - Major equipment submittals

- Site work
- Begin foundation improvements.
- Fall/Winter 2022/2023
  - Yard piping
  - Major concrete work
  - Begin mechanical installation
- Spring/Summer 2023
  - Major mechanical work
  - Electrical/instrumentation and control work fall/winter
- Fall 2023
  - Commissioning and startup

# **Attachment 1**

## **Detailed Cost Estimate**

**McMinnville WRF - Biosolids Treatment Alternatives Evaluation**

**Monetary Evaluation**

Updated January 2021 (Phase 1 only)

	<b>Alternative 3B Phase 1 Gen 2 ATAD w/o Dewatering</b>	
<b>PROJECT COSTS</b>	<b>Assumptions</b>	
<b>New Facilities and Equipment</b>		
2 New ATAD Tanks		
Tank 1 Ground improvements	\$270,000	
Tank 1 construction	\$322,667	
Tank 2 Ground improvements	\$270,000	
Tank 2 construction	\$322,667	
 ATAD Support Building and Equipment		
Ground improvements	\$364,500	
Building construction	\$810,000	
 Pumps, aeration blowers, instruments, controls	\$3,000,000	Based on Thermal Process Systems quote (July 2020). Includes equipment and electrical packages, but not valve package. Pricing increased 10% to account for increase in loading. Updated TPS proposal pending.
 Retrofit of existing ATAD (SNDR) and Headworks		
Misc demo/install at Headworks	\$150,000	Assumes replacement of TS Pumps, changes to related piping and appurtenances, and HVAC changes.
Demo at ATADS	\$75,000	Assumes staged demolition of ATAD mechanical equipment.
 Dewatering Building		Not included in Phase 1 project.
 Dewatered Biosolids Storage Bunkers		Not included in Phase 1 project.
 Existing Biosolids Storage Tank Decant improvements allowance	\$75,000	Allowance.
 Biofilter		
Fans	\$100,000	
Ground Improvements	\$0	
Biofilter walls	\$134,444	
Media	\$196,065	Based on long-life media option.
 <b>TOTAL of New Facilities and Equipment</b>	<b>\$6,090,000</b>	
<b>Construction Markups</b>		
20% Process mechanical installation	\$590,000	Applied to equipment, including TPS package without electrical package.
10% Process mechanical piping	\$270,000	Applied to equipment, including TPS package without electrical package.
5% Yard piping	\$259,275	Applied to new facilities and equipment total but without ground improvements.
10% Site civil	\$518,550	Applied to new facilities and equipment total but without ground improvements.
8% Electrical allowance	\$414,840	Applied to new facilities and equipment total but without ground improvements. 8% used since electrical package provided by TPS.
10% Instrumentation allowance	\$518,550	Applied to new facilities and equipment total but without ground improvements. Accounts for PLC replacement.
<b>TOTAL of Construction Markups</b>	<b>\$2,570,000</b>	
<b>SUBTOTAL</b>	<b>\$8,660,000</b>	
<b>Contractor Markups and Contingency</b>		
5% Mob/Bonds/Permits/Insurance	\$430,000	Applied to subtotal above.
<b>SUBTOTAL</b>	<b>\$9,090,000</b>	
10% Contractors Overheads	\$910,000	Applied to subtotal immediately above
<b>SUBTOTAL</b>	<b>\$10,000,000</b>	
5% Contractors Profits	\$500,000	Applied to subtotal immediately above
<b>SUBTOTAL</b>	<b>\$10,500,000</b>	
25% Contingency	\$2,630,000	Applied to subtotal immediately above
<b>SUBTOTAL</b>	<b>\$13,130,000</b>	
4% Excalation Year 1	\$525,200	
4% Excalation Year 2	\$546,208	
<b>TOTAL CONSTRUCTION COST</b>	<b>\$14,201,408</b>	
<b>Non-Construction Costs</b>		
25% Professional Services	\$3,550,000	
<b>TOTAL PROJECT COST</b>	<b>\$17,751,000</b>	



**Memorandum 9**  
**Project Budget Analysis**



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**Subject:** Project Budget Analysis

**Project Name:** McMinnville Water Reclamation Facility Biosolids Storage Tank and Grit System Expansion

**Prepared For:** City of McMinnville

**Prepared By:** Jacobs Engineering Group

**Date:** January 29, 2021

**Project Number:** D3373900

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## 1. Introduction

The 2009 City of McMinnville Water Reclamation Facilities Plan (2009 Facilities Plan) (West Yost Associates and CH2M HILL, 2009) recommended implementing a solids management strategy consisting of continued use of the autothermal thermophilic aerobic digestion (ATAD) process up to the capacity of the existing process and constructing a parallel process that includes dewatering, sludge stabilization, and storage for the treatment of additional sludge volume. The resulting Capital Improvements Plan (CIP) accounted for a 1-million-gallon biosolids storage tank in 2010–2012; a dewatering facility, cake storage, and odor control in 2014–2016; and a dryer in 2021–2023. None of those projects have been executed.

Memoranda in the 2021 Project Definition Report evaluated existing conditions at the Water Reclamation Facility (WRF), projected future flows and loads, revisited recommendations from the 2009 Facilities Plan, and recommended that the City proceed with a Solids Treatment Capacity Improvements Project (2021 Recommended Project). Although the facilities recommended at this time differ from the recommendations in 2009, the goals remain the same. The project would consist of construction of new ATAD tanks, addition of a new storage nitrification denitrification reactor (SNDR) process by retrofitting the existing ATADs, construction of a new ATAD equipment support building, and replacement of the odor control system. The 2021 Recommended Project also includes replacement of the headworks programmable logic controller (PLC) and other mechanical equipment to accommodate the process improvements. The estimated construction cost is \$14.2 million, escalated to midpoint of construction, and total project cost is \$17.75 million, including 25 percent assumption for professional services.

In addition to the solids treatment projects noted above, other projects recommended in 2009 and reflected in the CIP differ from recently completed project recommendations. A facility plan update would develop comprehensive recommendations for the WRF, including a new CIP. While that effort is outside the scope of the current project, this memorandum summarizes an approach to the WRF CIP that more closely represents current conditions. This memorandum is not a substitute for a facility plan update.

## 2. Existing City CIP Projects

### 2.1 Grit System Expansion

The 2009 Facilities Plan stated, “Improvements to the WRF’s grit removal facilities are needed to provide sufficient capacity at the projected peak hour flow (PHF) condition at the plant and to correct operational

and performance deficiencies.” The 2009 Facilities Plan also recommended implementing infiltration and inflow (I/I) improvements to limit the PHF to 32.0 mgd. The 2021 Project Definition Report evaluated the grit removal facility’s capacity and performance issues:

- Capacity: The I/I improvements appear to be limiting PHF as intended, and the existing grit system is able to handle current and projected PHF of 32.0 million gallons per day (mgd). Redundancy of the grit removal unit process is not an Oregon Department of Environmental Quality requirement. The existing grit removal system contains a bypass so that the grit system can be taken offline without major interruption to plant operation.
  - Performance: Although the grit system performance is not optimal, the impact on the downstream WRF processes appears to be minimal. Grit not captured in the grit system appears to collect in the outer ring of the oxidation ditches. WRF staff have shown this grit can be readily removed for approximately \$3,500, and cleanings are required only every few years. Minor modifications, including baffling, could be made to the existing grit chamber to improve performance, although it is unclear if this would have a major impact on grit removal performance.
  - The City has reported grit accumulation in the existing ATADs, although it is unclear if this is grit from plant influent or carryover from the tertiary filters.
- Because the existing grit system has sufficient hydraulic capacity for PHF and because performance improvements may not provide a significant benefit to the WRF, the City could consider reallocating the associated funds planned for this capital improvement.

## 2.2 Filtration System Expansion

The existing filtration system has a total average dry weather flow (ADWF) capacity of 6.6 mgd and firm capacity (one unit out of service) of 5.5 mgd. The 2009 Facilities Plan showed an ADWF of 3.3 mgd from 1996 to 2007 and anticipated a buildout ADWF of 6.1 mgd. Recent analysis from the 2021 Project Definition Report shows that from 2010 to 2014, the ADWF remained consistent at approximately 3.3 mgd, and from 2015 to 2019, the ADWF dropped to 2.95 mgd. Current 2045 buildout projection for ADWF is 4.0 mgd, which is below the capacity of the existing filter system. Consistent with the recommendations in CH2M HILL’s 2018 Schematic Design Report for the Tertiary Treatment and Disinfection Project, current ADWF trends indicate filter system expansion will not be required.

- Because projected dry weather flows are within the capacity of the existing filtration system, expansion seems unlikely; therefore, the City could consider reallocating the associated funds planned for this capital improvement.

## 2.3 New 1-million-gallon Storage Tank and Mixer

The 2009 Facilities Plan recommended construction of a 1-million-gallon (MG) biosolids storage tank (and mixing system) in addition to the existing 2.8 MG tank. The new tank would extend storage capacity used together with the existing 2.8 MG tank. The new tank would also provide redundancy, allowing a storage tank to be taken out of service for cleaning and maintenance. The existing tank is currently operating beyond capacity due to the quantity of liquid biosolids produced by the ATAD process. The existing tank decant system is needed beginning around January 1 each year because the tank is full. The decant system is inefficient and returns a large portion of solids to the head of the WRF.

Providing an additional 1 MG of storage capacity would minimize the portion of the year that decant is necessary and would provide redundancy to the existing tank. However, expanding liquid biosolids storage does not address the following:

- The existing ATAD process is nearing capacity. Providing additional biosolids storage does not resolve the ATAD capacity concern. However, resolving the ATAD capacity concern (as proposed in the 2021 Project Definition Report) has the additional benefit of achieving greater volatile solids reduction and allows for a thicker sludge to be pumped to the ATAD process. Both of these benefits

result in a reduction of biosolids (mass and volume) pumped to the existing biosolids storage, extending the existing tank's ability to store a season's worth of biosolids.

- "Phaseability" and flexibility of the process was important in the 2009 Facilities Plan and is important to the City today. While the current liquid biosolids product remains in high demand, public perception, regulations, and/or fuel cost could eventually result in the need to convert to a dewatered cake product. If dewatering is implemented, liquid biosolids storage will no longer be necessary. Constructing additional liquid biosolids storage now could result in a stranded asset later.
- The City's CIP currently has approximately \$6.0 million allocated for this project; however, this is more likely to be a \$10.0 million project. The primary reason for the increase is the costly ground improvements required to construct new facilities at the WRF site, and the large footprint of a biosolids storage tank makes the ground improvements particularly costly.
- Because constructing additional biosolids storage does not resolve the ATAD capacity issue, is not conducive to future phaseability, and results in substantially higher costs than included in the CIP, an alternative project is recommended. The City could consider repurposing the funds associated with the biosolids storage tank project to fund an alternative biosolids project.

## 2.4 Dewatering Process

The addition of a dewatering process was recommended in the 2009 Facilities Plan, specifically implementation of management strategy SM2: ATAD Treatment and Dewatering and Stabilization. This strategy consists of continued use of the ATAD process up to the capacity of the existing process and constructing a parallel process that includes dewatering, sludge stabilization (for example, thermal drying or an alternative process), and additional storage volume for processed biosolids. This solution would diversify the biosolids product produced by the WRF.

Because the WRF is approaching capacity of the existing ATAD process, it is faced with implementing strategy SM2 now, which would mean handling parallel process streams (ATAD liquid biosolids and dewatered/dried cake). It is important to understand this recommendation assumes dewatering of raw, undigested sludge. To produce a Class A product, the stabilization step would be required, and this must be constructed concurrent with dewatering. The 2021 Project Definition Report recommends against implementing this alternative because:

- Managing parallel treatment processes and products would be a burden for WRF staff, both within the WRF and for product distribution, and would increase the long-term operations and maintenance cost.
- There is currently high demand for a liquid biosolids product, thus no trigger (or tested local market) for dewatered/dried cake.
- Changing to a cake product would require an updated Biosolids Management Plan, which could add substantial complication and/or delay to the project.
- Recent experience with dryers, including at nearby Wilsonville, raises concerns for implementing a similar dryer operation at the WRF. (Note that although the City is treating the dryer as a separate CIP project, it would need to be implemented concurrent with dewatering to produce a Class A product.)
- As indicated in the 2021 Project Definition Report, the City should consider Alternative 3B for planning purposes. This includes construction of dewatering, to be phased and constructed in the future when/if the need is triggered by public perception issues associated with land application of liquid product, regulatory concerns, or fuel cost increases that make hauling of liquid biosolids financially unsustainable. Therefore, the City should keep this project in the CIP, although they could consider pushing the timing to later fiscal years.

## 2.5 Dryer

As part of the 2009 Facilities Plan recommendation of management strategy SM2, sludge stabilization would be needed. The City has assumed drying for this purpose. Based on recent experience with the thermal drying process for similarly sized facilities, drying is not a suggested alternative for the City. Instead, the 2021 Project Definition Report recommends a second generation ATAD process, sized for buildout flows/loads. The result would be a single digestion process that produces a Class A product up to buildout conditions. Further stabilization is not required to meet Class A requirements. If further volume/weight reduction is needed due to hauling greater distances, dewatering would be implemented, producing a Class A cake product.

- The 2021 Project Definition Report recommendation of second generation ATAD to produce a Class A product at buildout flows/loads with the option to construct a future dewatering process, if required, eliminates the need for a dryer. The City could consider repurposing these dryer project funds for an alternative biosolids project.

## 2.6 Dry Biosolids Storage

See the descriptions above for recommendations related to dewatering and dryer projects. Dry biosolids storage would not be needed. The dewatering project would require cake storage to be constructed concurrent with the dewatering process. This is consistent with the 2021 Project Definition Report recommendation of Alternative 3B.

- As indicated in the 2021 Project Definition Report, the City should consider Alternative 3B for planning purposes. This includes construction of dewatering to be phased and constructed in the future when/if the need is triggered by public perception issues associated with land application of liquid product, regulatory concerns, or fuel cost increases that make hauling of liquid biosolids financially unsustainable. Therefore, the City should keep this project in the CIP, although they could consider pushing the timing to later fiscal years.

## 2.7 Odor Control (and “Rebuild Biofilter Structure” within the “Equipment Replacement” Project)

The existing odor control system’s major components (fans, ductwork, biofilter infrastructure, and biofilter media) are at the end of their service life. The City has partially accounted for these replacements in the odor control project (\$0.4 million in fiscal year [FY]25-28) and the rebuild biofilter structure project (\$0.185 million in FY24-25). Changes to the biosolids process inherently impact the odor control system; therefore, these projects should be completed as part of recommended Alternative 3B. Odor control system replacement is included in the 2021 Recommended Project cost estimate.

- Because the 2021 Recommended Project Alternative 3B includes odor control system replacement, the City could reallocate the separate odor control (and biofilter) projects in the CIP toward the recommended project. However, those combined CIP budgets (\$0.4 million + \$0.185 million = \$0.585 million) are insufficient. The new odor control system is estimated to be \$0.7 million to \$1.0 million, depending on the media selected. The low end of the range represents a wood chip biofilter, similar to the existing biofilter. The high end of the range represents a long-life, engineered media that requires less frequent media replacement.

## 2.8 PLC Replacement (within Equipment Replacement)

The CIP includes PLC replacement in FY21-22 for \$0.15 million, although it is unclear which PLCs are intended. Replacement of the headworks PLC, included in the current project, is estimated at \$0.2 million.

- If the \$0.15 million in the CIP was intended for headworks PLC replacement, budget could be allocated toward the recommended project. Headworks PLC replacement is included in the 2021 Recommended Project cost estimate.

### 3. Budget Summary

Table 3-1 summarizes the above CIP projects and the associated CIP budget and timing, based on the City's 2019 CIP update. The adjustments described previously are also included for the City's consideration. The 2021 Recommended Project total project cost is estimated to be approximately \$17,751,000, including 25 percent assumed for professional services. This new project is identified in Table 3-1.

Current conditions at the WRF and the recommended plan show that the overall CIP budget at the WRF could be approximately \$29.1 million rather than the \$40 million in the current CIP. To achieve the savings, a larger capital expenditure (\$17.75 million rather than \$9.2 million) would be required in FY19-24.

Note that the costs in Table 3-1 show only the capital project costs, not life-cycle costs. Memorandum 3, Evaluation of Biosolids Treatment Alternatives, includes a detailed evaluation of cost and non-cost criteria, based on a 25-year net present value and benefit scoring, respectively. The evaluation concluded that Alternative 3B, the basis for the 2021 Recommended Project, had a comparable or lower life cycle cost and the highest benefit score compared to alternatives.

### 4. Additional Phasing Options

As indicated in Memorandum 8, Project Delivery and Construction Cost, the City could consider additional phasing alternatives to implement Alternative 3B. Rather than executing Alternative 3B in two phases, it could be separated into three phases or the bid alternative approach could be used. The phasing would likely target the SNDR retrofit, which is estimated to be \$2.8 million of the total project cost. Phasing options include:

- Baseline
  - Phase 1: Construct new ATADs, ATAD Support Building, SNDR retrofit, and Odor Control.
  - Phase 2: Construct dewatering building and cake storage.
- Bid Alternative Approach
  - Phase 1: Construct new ATADs, ATAD Support Building, and Odor Control.
    - Include SNDR retrofit as a bid alternate. If pricing is acceptable, then construct with Phase 1. If pricing exceeds City's budget, execute as a standalone project or as part of Phase 2.
  - Phase 2: Construct dewatering building and cake storage.
- Extended Phasing Approach
  - Phase 1: Construct new ATADs, ATAD Support Building, and Odor Control
  - Phase 2: Design and construct SNDR retrofit as a standalone project
  - Phase 3: Construct dewatering building and cake storage

**Table 3-1. City of McMinnville Existing CIP Projects and Potential Adjustments**

Project	Current CIP		Potential Adjustment	
	Timing	Budget (\$M) <sup>4</sup>	Timing	Budget (\$M)
2021 Recommended Project (Phase 1 of Alternative 3B)	n/a		FY19-24	17.8 <sup>3</sup>
Grit System Expansion	FY19-22	2.8	n/a	
Filtration System Expansion <sup>2</sup>	FY23-26	4.0	n/a	
New 1 MG Storage Tank and Mixer	FY19-22	6.0	n/a	
Dewatering Process (Phase 2 of Alternative 3B)	FY25-28	9.2	FY30 (TBD)	\$10.0 <sup>5</sup>
Dryer	FY26-29	16.1	n/a	
Dry Biosolids Storage (Phase 2 of Alternative 3B)	FY25-28	1.2	FY30 (TBD)	\$1.3 <sup>5</sup>
Odor Control	FY25-28	0.4	FY19-24	n/a <sup>1</sup>
Equipment Replacement				
PLC Replacements	FY21-22	0.15	FY19-24	n/a <sup>1</sup>
Rebuild Biofilter Structure	FY24-25	0.185	FY19-24	n/a <sup>1</sup>
<b>Total</b>		<b>40</b>		<b>29.1</b>
<b>Total in FY19-24</b>		<b>9.2</b>		<b>17.8</b>

## Notes:

<sup>1</sup> Included in 2021 Recommended Project.

<sup>2</sup> Additional budget is shown for this project in FY17-20. If a portion of this budget was not used, the value indicated in Table 3-1 may be higher.

<sup>3</sup> Value represents total project cost, including 25% assumption for professional services. Cost is escalated to mid-point of construction.

<sup>4</sup> All costs shown are based on the City's "Wastewater Capital" spreadsheet, provided on 12/23/2020. The budget values have not been converted to present worth and have not been escalated.

<sup>5</sup> The City's previous CIP budget escalated at 3% per year for 3 years. Actual project timing is unknown but unlikely to occur within the City's current 10-year planning period.



## STAFF REPORT

**DATE:** October 8, 2021

**TO:** City Council

**FROM:** Matt Scales, Chief of Police

**SUBJECT:** Request to Permit a Waiver of the Noise Ordinance from McMinnville High School for October 22, 2021.

---

### **Report in Brief:**

This action is the consideration of a request to permit a waiver of the Noise Ordinance.

### **Background:**

McMinnville High School, through Principal Dr. Amy Fast, is requesting to host the McMinnville High School homecoming dance on Friday, October 22<sup>nd</sup>, from 9:00pm to 11:00pm on Baker Field. This area is an outside event venue adjacent to the high school property located at 615 NE 15<sup>th</sup> Street. The homecoming dance will have amplified music which will likely impact the neighborhood next to Baker Field.

The McMinnville Municipal Code, Section 8.10.260, specifies that:

A. A person in charge of a premises must not permit, allow or cause to exist any loud, disturbing or unnecessary noise that is injurious or detrimental to the health, safety or peace of other persons or property.

E. The prohibition described in this section do not apply to:

1. Activities occurring within the scope of any permit issued by the city under the provisions of the McMinnville Municipal Code.

In granting previous waivers, the City has requested that the applicant provide notice in advance to affected neighbors.

**Attachments:**

1. McMinnville Municipal Code (MMC) section 8.10.260 Noises.

**Fiscal Impact:**

There is no anticipated fiscal impact.

**Recommendation:**

Should the Council choose to vote in favor of a motion allowing this waiver, the City Manager will write a letter to Dr. Amy Fast, letting her know that she has the Council's approval.

## 8.10.260 Noise.

A. A person in charge of a premises must not permit, allow or cause to exist any loud, disturbing or unnecessary noise that is injurious or detrimental to the health, safety or peace of other persons or property.

B. It is prohibited for any person on a public way to cause to exist any loud, disturbing or unnecessary noise that either annoys, disturbs, injures or endangers the comfort, repose, health, safety or peace of other persons or property.

C. For the purposes of this section, noise exceeding the following thresholds when measured 25 feet from the source if in the right-of-way or 25 feet from the property line if the source is on private property, is presumed to be a nuisance in violation of subsection [A](#) of this section:

<b>ZONE</b>	<b>7:00 a.m. to 8:00 p.m.</b>	<b>8:00 p.m. to 7:00 a.m.</b>
Residential	55 dBA	50 dBA
Commercial	60 dBA	55 dBA
Light Industrial	70 dBA	65 dBA
Industrial	80 dBA	75 dBA

D. For the purposes of this section, “loud, disturbing or unnecessary noise” includes but is not limited to the following substances, conditions or acts:

1. *Animals and Birds.* The keeping of any bird or animal that disturbs the comfort and repose of any person in the vicinity by causing frequent or long continued noise;
2. *Dog Barking.* The keeping of a dog that barks for more than 10 minutes during any one-hour period when such barking is audible off the premises of the dog’s owner or keeper;
3. *Animal Bells.* The attaching of a bell to any animal or allowing a bell to remain on any animal that is disturbing to any person in the immediate vicinity;
4. *Vehicle Noises.* The use of any vehicle or engine, either stationary or moving, in a manner that causes or creates any loud or unnecessary grating, grinding, rattling or other noise, including the discharge in the open air of the exhaust of any steam engine, internal combustion engine, motor boat or motor vehicle except through a muffler or other device which will effectively prevent loud or explosive noises and the emission of annoying smoke;
5. *Horns and Signaling Devices.* The sounding of any horn or signaling device on any vehicle on any street, public or private place, except as a necessary warning of danger;

6. *Nonemergency Signaling Devices.* The sounding of any amplified signal from any bell, chime, siren, whistle or similar device, intended primarily for nonemergency purposes, from any place for more than 10 consecutive seconds in any hourly period, except that the reasonable sounding of such devices by houses of religious worship, ice cream trucks, seasonal contribution solicitors or by the city for traffic control purposes are exempt;

7. *Construction Noise.* The erection, including excavation, demolition, alteration or repair, of any building in residential districts, other than between the hours of 7:00 a.m. and 8:00 p.m., except upon special permit granted by the city manager or designee;

8. *Noise Sensitive Areas: Adjacency to Schools, Churches and Hospitals.* The creation of any excessive noise on any street adjacent to any school, institution of learning, church or court of justice while the same are in use, or adjacent to any hospital or institution for the care of the sick or infirm which unreasonably interferes with the operation of such institution, or which disturbs or unduly annoys patients;

9. *Loudspeakers, Amplifiers, Public Address Systems and Similar Devices.* The use or operation of any automatic or electric piano, phonograph, radio, television, loudspeaker or any instrument for sound producing or any sound-amplifying device so loudly as to disturb persons in the vicinity thereof or in such a manner as renders the use thereof a nuisance; provided, however, that upon application to the city manager, permits may be granted to responsible persons or organizations to broadcast programs of music, news, speeches or general entertainment;

10. *Blowers and Similar Devices.* The operation of any noise-creating blower, power fan, power tools, or any internal combustion engine in a manner the operation of which causes noise due to the explosion of operating gases or fluids:

- a. In a residential district or noise sensitive areas between the hours of 8:00 p.m. and 7:00 a.m.; and
- b. In a manner that can be heard by persons on nearby residential property.

11. *Commercial Establishments Adjacent to Residential Property.* Unreasonably loud and raucous noise from the premises of any commercial establishment, including any outdoor area which is part of or under the control of the establishment, between the hours of 10:00 p.m. and 7:00 a.m., that is plainly audible to persons on any nearby residential property.

E. The prohibition described in this section do not apply to:

1. Activities occurring within the scope of any permit issued by the city under the provisions of the McMinnville Municipal Code;
2. Emergency response activities;

3. Vehicles performing repairs or upgrades in the right-of-way, including but not limited to street sweeping, sewer cleaning, construction and maintenance activities occurring between the hours of 7:00 a.m. and 8:00 p.m.

F. In addition to any corrective action ordered by the city, a person found to have violated the provisions of this section may be assessed a civil penalty. The amount of the civil penalty assessed for each day of continuing violation will not exceed the amount established for a Class 5 code violation. (Ord. 5079 §1 (Exh. 1 (part)), 2019).

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**The McMinnville Municipal Code is current through Ordinance 5104, passed June 8, 2021.**

Disclaimer: The city recorder's office has the official version of the McMinnville Municipal Code. Users should contact the city recorder's office for ordinances passed subsequent to the ordinance cited above.

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