

ENVIRONMENT COMMITTEE AGENDA

January 19, 2017 – North Conference Room

21630 11th Avenue South – Des Moines 98198

5:30P – 6:50P

1. Approval of the minutes of the 11.17.2016 meeting
2. NPDES Permit Issues at Public Works Service Center
(Discussion Item – 15 min)

Staff will review with the Committee action items from a recent Ecology Inspection of the Public Works Service Center.

3. Confirmation of 2017 Work Program
(Discussion Item – 5 min)

Staff will present the updated 2017 Work Program.

4. Lakehaven Utility District Comprehensive Sewer Plan
(Discussion Item – 30 min)

District staff will present the draft Comprehensive Sewer Plan. Comments to be incorporated into the final Plan.

5. Sound Ridge Condominium Groundwater Runoff
(Discussion Item – 15 min)

Citizen concerns were raised at a Council meeting regarding potential impacts of increased groundwater and surface water runoff should 16th Avenue South be extended north past the Condominium to 216th Street. Staff will review with the Committee the drainage in that area and potential mitigation measures that may be used to avoid impacts to the Condominium.

DRAFT MINUTES - ENVIRONMENTAL COUNCIL COMMITTEE MEETING 11.17.2016

The meeting was called to order @ 6:23 PM, Thursday, November 17, 2016, in the North Conference room @ 21630 11th Avenue South, Des Moines with the following in attendance:

Council Members

Robert Back, Chair

Melissa Musser

Matt Pina

City Staff

Loren Reinhold, SWM Utility Manager

Brandon Carver, Engineering Svc Manager

Michael Matthias, City Manager

Matt Hutchins, Asst City Attorney

Peggy Volin, Admin Asst II

AGENDA:

1. Approve minutes of the 10.20.2016 meeting
2. Draft 2017 Work Program
3. WRIA 9 Interlocal Agreement – Property Acquisition

MEETING:

1. Approve the minutes of the October 20, 2016 meeting: Unanimously approved.
2. Draft 2017 Work Program: SWM Engineering Manager Loren Reinhold introduced the proposed 2017 Work Program to the Committee. He went over the highlights and pointed out there are a couple of ongoing issues that will be reported on throughout the year. This item will come back for final approval at the January 2017 meeting.
3. WRIA 9 Interlocal Agreement – Property Acquisition: SWM Engineering Manager Loren Reinhold briefed the Committee on the proposal by the Water Resource Inventory Area (WRIA) 9 to acquire three parcels of property immediately north of Saltwater State Park as part of its Saltwater Park Shoreline Habitat Restoration Project. The Committee directed staff to issue a letter to WRIA 9 declining City participation in the proposal.

Meeting adjourned at 6:55 pm

Minutes respectfully Submitted by: Peggy Volin, Admin Asst II

January 19th, 2017 Environment Committee

Item 2. Public Works Service Center Storage Yard and Maintenance Shop Yard Improvements

Background:

The NPDES permit managed by the Department of Ecology states that a Stormwater Pollution Prevention Plan(SWPPP) be applied for all heavy equipment maintenance or storage yards, and material storage facilities owned or operated by the Permittee. For us this requirement applies to our Public Works Service Center Yard located at 2255 S 223rd St and our maintenance shop yard located at 21650 11th Ave S. The SWPPP document outlines the required best-management-practices(BMPs) for each site that need to be applied in order to protect pollutants from entering our stormwater system.

The SWPPP document was originally drafted in 2010 and was missing key requirements for each of the facilities. Both sites were deemed out of compliance with the permit and a “notice of non-compliance” was provided to the Department of Ecology. Ecology provided us with a technical assistance visit and inspection on December 7th 2016 to help us establish a baseline for their expectations for each site. The document attached is the report received from Ecology on January 4th 2017.

Inspection Summary:

Immediate Action Requirements:

- Sweep and clean paved surfaces
- Stop equipment and vehicle washing
- Implement BMPs for scrap vehicles
- Cover and contain stockpiled materials
- Implement BMPs for the fuel station
- Implement BMPs for stationary and portable storage tanks

Long Term Requirements:

- Develop a plan and schedule for a covered wash pad plumbed to a sanitary sewer
- Develop a plan and schedule to construct a cover, containment pad and changes to the drainage system that serves the fuel island (either obtain approval to discharge to the sanitary sewer or install an oil water separator)
- Develop a plan and schedule for providing secondary containment for the de-icer tank

Action Items:

The SWM Department is seeking consent to hire a consultant to develop a plan and schedule for meeting the long term requirements.



MUNICIPAL STORMWATER INSPECTION REPORT

State of Washington Department of Ecology
3190 – 160th Avenue SE, Bellevue, WA 98008-5452

Municipal Stormwater
Inspection Form

Phone: (425) 649-7000
FAX: (425) 649-7098

Section A: General Data

Inspection Date 12/7/16	NPDES Permit # WAR045511	County King	Receiving Waters Barnes Creek (tributary to Massey Creek)	Inspector(s) Rachel McCrea	Facility Type Municipal
Discharges to: Surface Water <input checked="" type="checkbox"/> Ground Water <input type="checkbox"/>				Invited Technical Assistance Visit	

Section B: Facility Data

Name and Location of Site Inspected		Entry Time	Permit Effective Date									
Des Moines Public Works Storage Yard 2255 S 223 rd Street Des Moines, WA 98198		11:50 a.m.	8/1/2013									
Permittee Contact(s)		Exit Time	Permit Expiration Date									
Tyler Beekley, NPDES Coordinator, City of Des Moines John Blackburn, Superintendent of Public Works, City of Des Moines		12:50 p.m.	7/31/2018									
Responsible Official(s):		Additional Participants:										
Loren Reinhold, Surface Water and Environmental Engineering Manager Planning, Building & Public Works City of Des Moines 21650 11 th Ave S Des Moines, WA 98198-6317		<table border="0"> <tr> <td></td> <td>Yes</td> <td>No</td> </tr> <tr> <td>Samples Taken?</td> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> </tr> <tr> <td>Photos Taken?</td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </table>			Yes	No	Samples Taken?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Photos Taken?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Yes	No										
Samples Taken?	<input type="checkbox"/>	<input checked="" type="checkbox"/>										
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Section C: Summary of Findings/Comments

BACKGROUND

The Phase II Municipal Stormwater Permit for Western WA (Permit) Special Condition S5C5.h requires the City of Des Moines to:

Implement a Stormwater Pollution Prevention Plan (SWPPP) for all heavy equipment maintenance or storage yards, and material storage facilities owned or operated by the Permittee in areas subject to this Permit that are not required to have coverage under the *General NPDES Permit for Stormwater Discharges Associated with Industrial Activities* or another NPDES permit that authorizes stormwater discharges associated with the activity. A schedule for implementation of structural BMPs shall be included in the SWPPP. Generic SWPPPs that can be applied at multiple sites may be used to comply with this requirement. The SWPPP shall include periodic visual observation of discharges from the facility to evaluate the effectiveness of the BMP.

On February 16, 2016, the City of Des Moines submitted a Notice of Noncompliance under General Condition 20 of the Permit indicating that the facility SWPPP for its Storage Yard and its Maintenance Yard had not been updated nor substantively implemented since 2010. In the fall of 2016, Tyler Beekley, NPDES Coordinator for the City of Des Moines, requested Ecology conduct a technical assistance site visit. The site visit took place on December 7, 2016 following a meeting at City offices involving Loren Reinhold, Tyler Beekley and Rachel McCrea (Ecology).

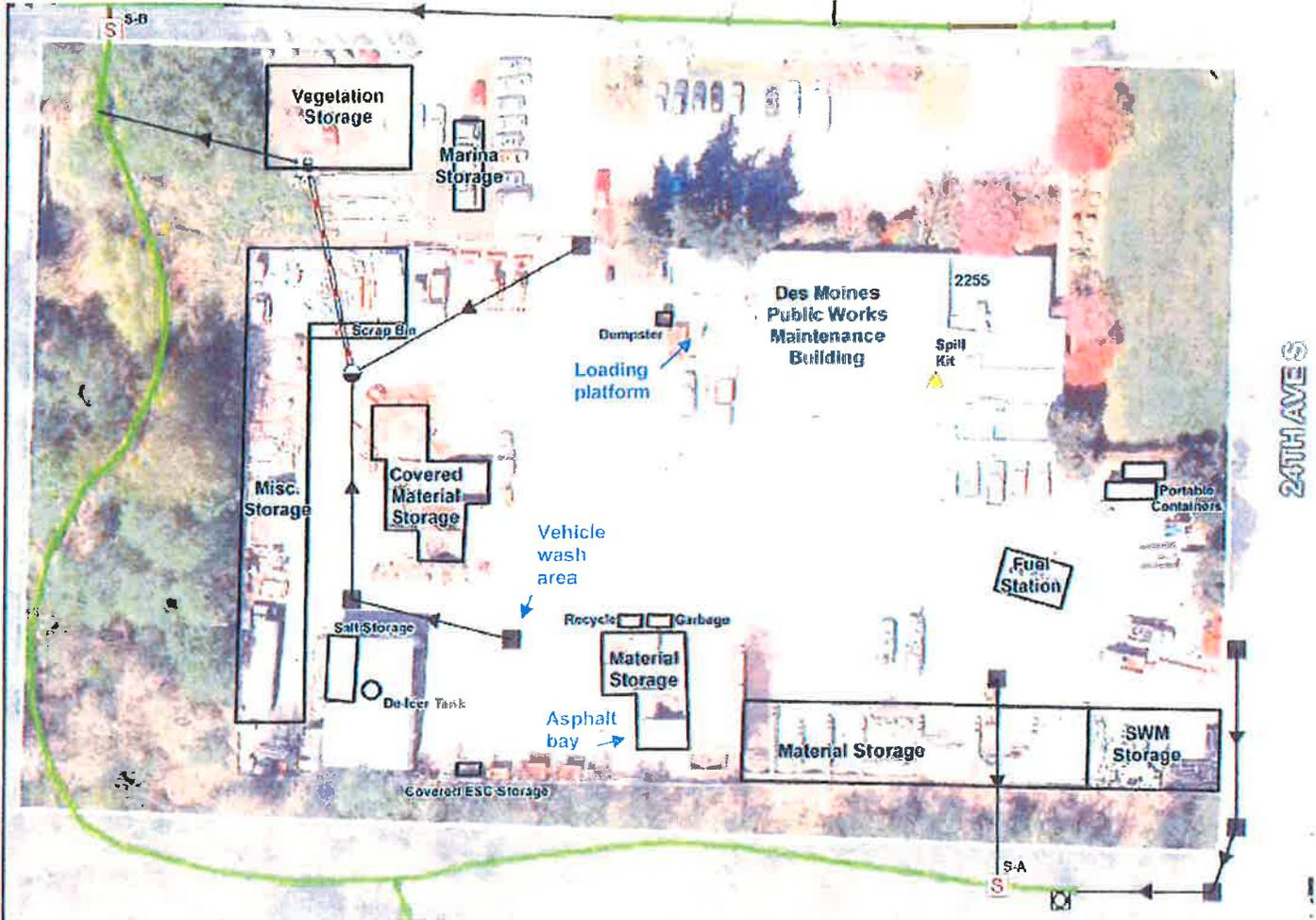
During the meeting, the City described the following activities and associated concerns with the Public Works Storage Yard:

1. The property was formerly owned by Puget Sound Energy and the western third of the site is contaminated with PCBs from historic transformer storage use. The City believes some cleanup was done and there are some form of use restrictions on that portion of the site. Information regarding the condition (e.g., conveyance pipe cracks) of the stormwater infrastructure in this portion of the site was not available.
2. The on-site fuel station had the tanks upgrades in the late 1990s. The fuel island is not covered. There is no oil water separator in the drainage system serving this portion of the site. There is no shut off valve. The City's entire vehicle fleet gases at this location.
3. De-icer tank does not have secondary containment.
4. Material storage bays are not covered nor bermed.
5. Fleet vehicle washing is performed in an area of the site served by a catch basin with straw wattles placed as a management practice. This catch basin is located in the western third of the site (see #1 above). The City stated that a discharge to the sanitary sewer system is not possible due to Midway sewer district capacity constraints.
6. City representatives believe there is a city-wide code prohibition on the use of tarps.

The City specifically requested assistance with identifying and prioritizing structural control best management practices (BMPs) in preparation for a planned meeting with City Council in January.

INSPECTION/OBSERVATIONS

Refer to the site map, below, excerpted from the draft City Fleets and Facilities Stormwater Pollution Prevention Plan (updated April 2016) with notes added to clarify some photo locations.



This facility completely lacks Good Housekeeping BMPs, both inside and outside of the fence. Materials, including sacrificial zinc anodes and a used transformer, are stored exposed to rainfall without regard for pollution generating potential. The build-up of street dust and debris and waste material are visible throughout the storage areas. See attached photo details.

Section D: Compliance/Recommendations

Note that BMPs listed below are paraphrased from the City's SWPPP (April 2016) and the 2016 King County Stormwater Pollution Prevention Manual because the City of Des Moines utilizes these manuals which are equivalent to Ecology's stormwater management manual. Photo references are provided as examples and do not reflect all instances of where the BMP is appropriate and/or necessary.

1. Immediately implement Good Housekeeping BMPs including but not limited to:
 - a. Sweep and clean paved surfaces. (Photos 01, 02, 04, 05, 06, 07, 08, 09, 14)
 - b. Cover and contain stockpiled materials that have the potential to contaminate stormwater runoff. (Photos 01, 02, 03, 04, 05, 07, 08, 09, 11, 12, 15)
 - i. The yard contains a substantial amount of material that appears to be unusable (refer to photo 01 for example). To enable routine pavement sweeping and minimize the need for material storage covers, remove waste material stored on-site and ensure proper legal disposal.
 - ii. Develop and implement an interim cover and containment plan for materials storage bays to ensure material piles that are not being worked on a daily basis are covered to prevent exposure to rainfall. Include effective containment practices such as sweeping (operational) and/or berms (structural) to minimize track out from the piles.
 - c. Have spill control materials/spill kit near tanks and all liquid transfer areas. (Photos 06 and 13)
2. Immediately stop vehicle and equipment washing where runoff will enter catch basins. (Photo 10)
 - a. Use a car wash kit, commercial vendor with a recycled system, or location where wash water will infiltrate to ground.
 - b. Develop a plan and schedule for a covered wash pad plumbed to a sanitary sewer.
3. Immediately implement required BMPs for older fueling operations. (Photo 10)
 - a. Provide a spill kit, drip pans and required signage at the fueling island and provide training on proper spill response and drip pan use procedures, including notification of proper authorities and on-site recordkeeping.
 - b. Develop a plan and schedule to construct a cover, containment pad and changes to the drainage system that serves the fuel island (either obtain approval to discharge to the sanitary sewer or install an oil water separator).
4. Immediately implement required BMPs for the storage of liquid materials in stationary tanks. (Photo 06)
 - a. Provide a spill kit, control plan and drip pans at the de-icer tank and ensure proper use when the tank is being accessed for filling or emptying.
 - b. Take precautions to prevent puncture of the de-icer tank. For example, heavy equipment is typically parked in front of the tank without any physical barrier to prevent the equipment from contacting the tank.
 - c. Develop and plan and schedule for providing secondary containment for the de-icer tank.
5. Ensure practices, policies and procedures are followed, in accordance with Special Condition S5.C5.f, to reduce stormwater impacts from runoff from lands and maintenance activities under the functional control of the City. Specifically, ensure ditch maintenance practices and procedures are documented and implemented. (Photo 16)
6. Identify applicable use restrictions associated with the PCB contamination and ensure stormwater BMPs and the site SWPPP include relevant details to prevent stormwater pollution from PCBs present onsite.
 - a. Information about site contamination can be found at <https://fortress.wa.gov/ecy/gsp/Sitepage.aspx?csid=9455>. The site has not undergone a formal cleanup action to address PCBs. Refer to Ecology's Toxics Cleanup Program for additional information.
 - b. Recommended actions include:
 - i. Assess stormwater infrastructure condition and conduct repairs as necessary to minimize PCB contamination into the stormwater infrastructure from onsite soils and/or groundwater.
 - ii. Implement IDDE field screening practices in this drainage basin to include screening for PCBs. A review of PCB-related source tracing techniques is available at: http://www.ecy.wa.gov/puget_sound/docs/PCBSourceTracingProgramsReport.pdf

For questions related to this report and related technical assistance please contact Rachel McCrea at: (425) 649-7223 or rmcc461@ecy.wa.gov.

The Department of Ecology has the authority to issue formal enforcement actions including issuance of orders and civil penalties of up to \$10,000 per day per violation for violations of an NPDES permit and/or state laws and regulations.

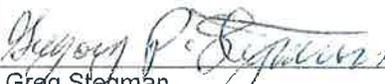
	Reviewed and approved by: 
Rachel McCrea Lead Water Quality Planner for the Lower Duwamish & Municipal Stormwater Specialist Water Quality Program	Date: 1/3/17 Greg Stegman Compliance & Technical Assistance Unit Supervisor Water Quality Program

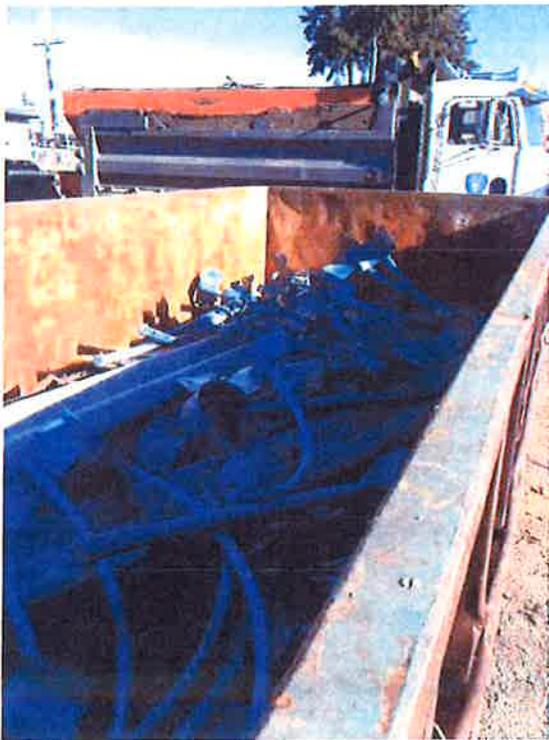
PHOTO LOG – DES MOINES PUBLIC WORKS STORAGE YARD



01 DESCRIPTION: NW CORNER MATERIAL STORAGE. POLLUTION GENERATING MATERIAL EXPOSED TO RAINFALL.



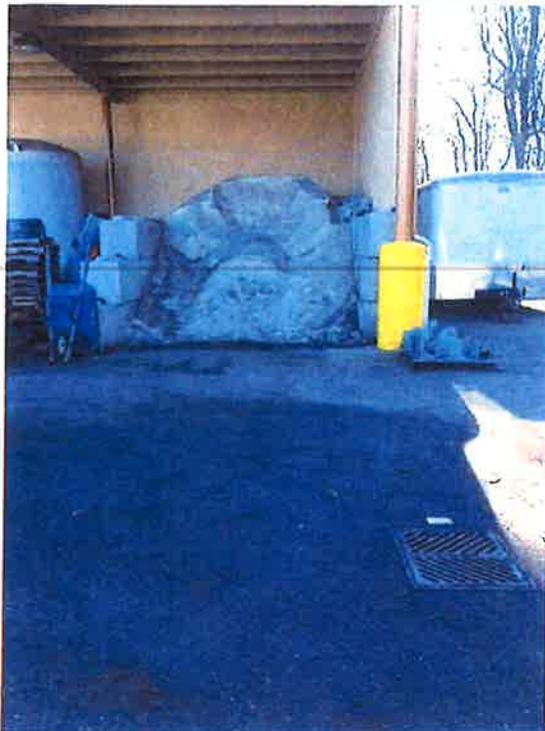
02 DESCRIPTION: NW CORNER MATERIAL STORAGE. MARITIME ZINCS (SACRIFICIAL ANODES) EXPOSED TO RAINFALL.



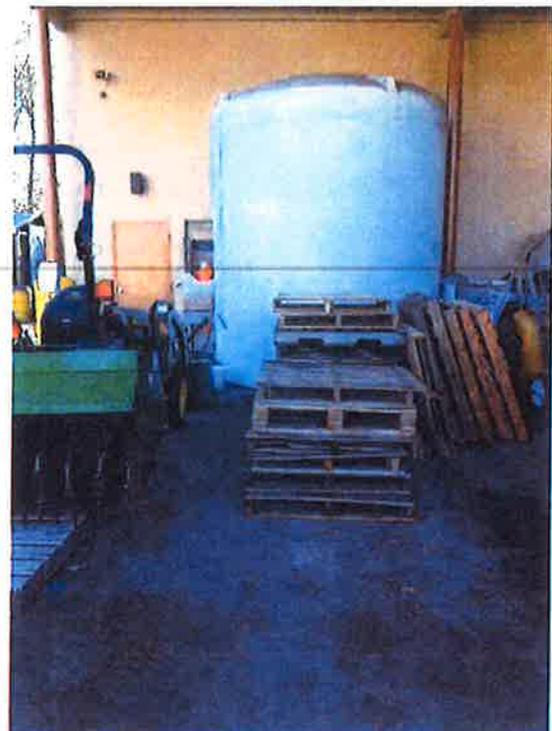
03 DESCRIPTION: METAL SCRAP BIN WITHOUT COVER.



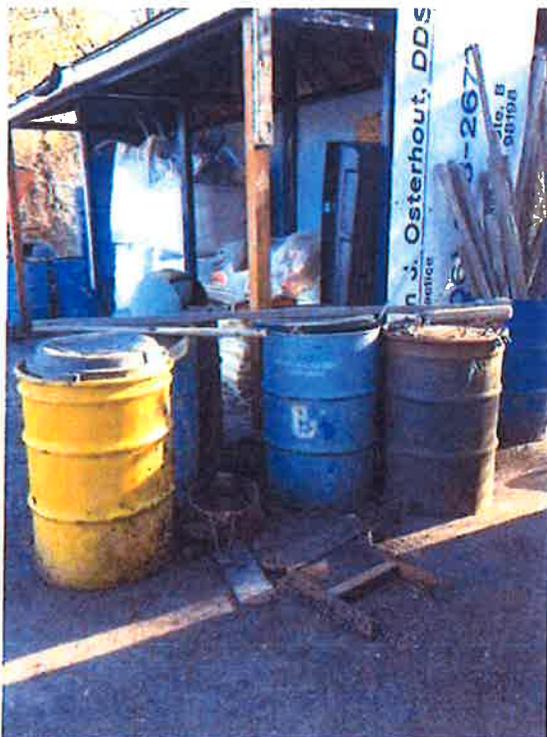
04 DESCRIPTION: WEST FENCELINE MATERIAL STORAGE. POLLUTION GENERATING MATERIAL EXPOSED TO RAINFALL.



05 DESCRIPTION: COVERED SALT PILE IN CLOSE PROXIMITY TO CATCH BASIN



06 DESCRIPTION: DE-ICER TANK UNDER COVER WITHOUT SECONDARY CONTAINMENT.



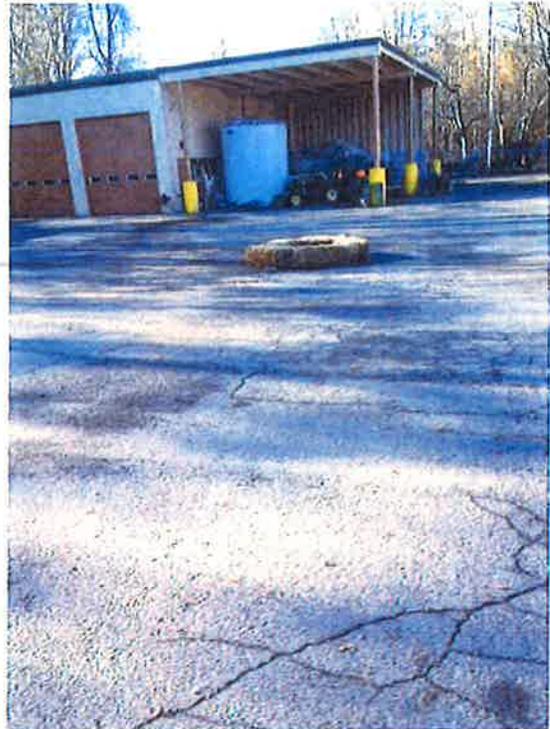
07 DESCRIPTION: WEST FENCELINE MATERIAL STORAGE. POLLUTION GENERATING MATERIAL EXPOSED TO RAINFALL. SAND BAGS UNDER COVER TO PREVENT DETERIORATION.



08 DESCRIPTION: WEST FENCELINE MATERIAL STORAGE. POLLUTION GENERATING MATERIAL EXPOSED TO RAINFALL.



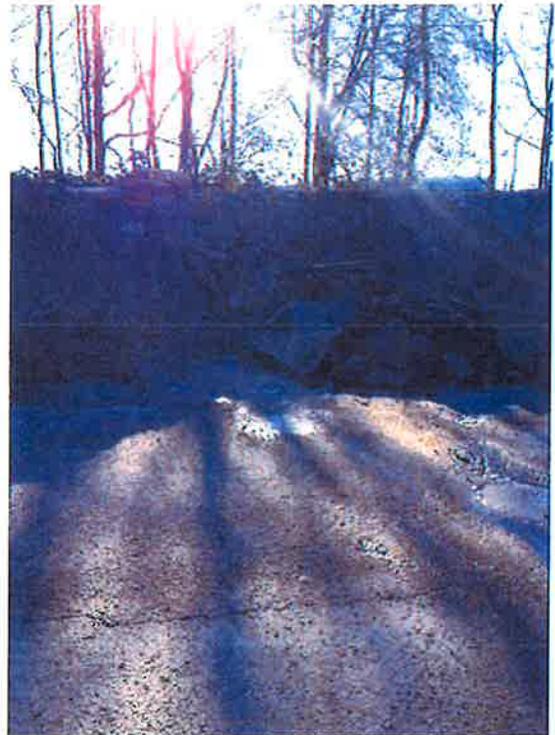
09 DESCRIPTION: TRACKOUT FROM ASPHALT STORAGE BAY.



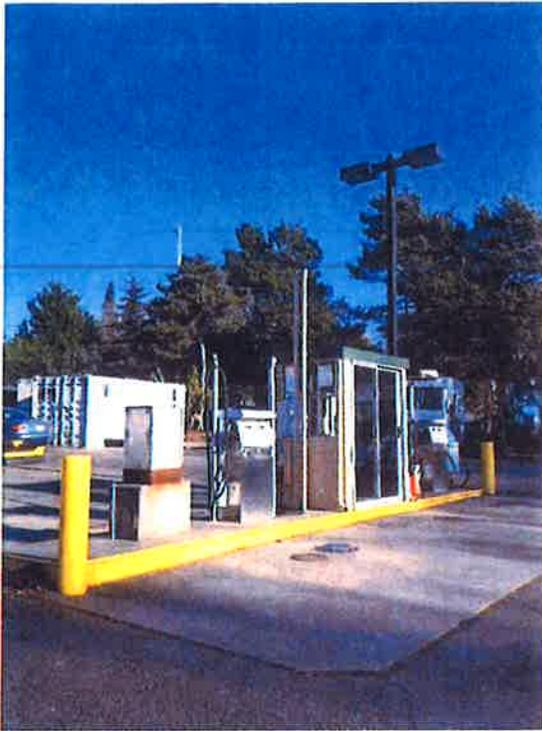
10 DESCRIPTION: HAY BALE BERM SURROUNDING CATCH BASIN IN VEHICLE WASH AREA.



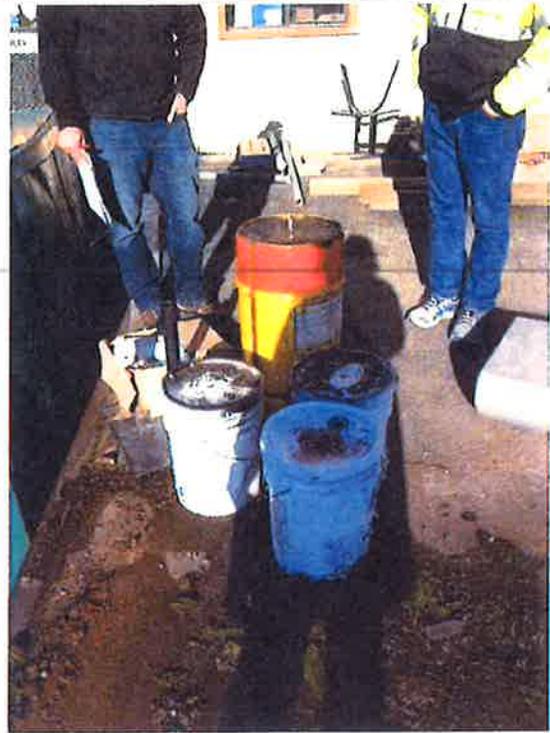
11 DESCRIPTION: UNCOVERED MATERIAL STORAGE BAYS



12 DESCRIPTION: UNCOVERED MATERIAL STORAGE BAY (SOILS, TRASH, ASPHALT)



13 DESCRIPTION: FUELING ISLAND



14 DESCRIPTION: CONTAINERS ON LOADING PLATFORM EXPOSED TO RAINFALL



15 DESCRIPTION: MATERIAL STORAGE (SOIL, METAL, CONSTRUCTION DEBRIS) OUTSIDE FENCE (NW CORNER). POLLUTION GENERATING MATERIAL EXPOSED TO RAINFALL.



16 DESCRIPTION: RECENTLY EXCAVATED UNSTABILIZED DITCHLINE FROM WESTERN STORMWATER CONVEYANCE AND DETENTION PIPE TERMINUS TO STREET DITCHLINE. TERMINUS OF ON-SITE STORMWATER SYSTEM AT BOTTOM OF PHOTO.



MUNICIPAL STORMWATER INSPECTION REPORT

State of Washington Department of Ecology
3190 – 160th Avenue SE, Bellevue, WA 98008-5452

Municipal Stormwater
Inspection Form

Phone: (425) 649-7000
FAX: (425) 649-7098

Section A: General Data

Inspection Date 12/7/16	NPDES Permit # WAR045511	County King	Receiving Waters unknown	Inspector(s) Rachel McCrea	Facility Type Municipal
Discharges to: Surface Water <input checked="" type="checkbox"/> Ground Water <input type="checkbox"/>				Invited Technical Assistance Visit	

Section B: Facility Data

Name and Location of Site Inspected		Entry Time	Permit Effective Date									
Des Moines Public Works Maintenance Yard (& Mechanic Shop)		11:25 a.m.	8/1/2013									
21650 11 th Ave S		Exit Time	Permit Expiration Date									
Des Moines, WA 98198		11:45 a.m.	7/31/2018									
Permittee Contact(s)		Additional Participants:										
Tyler Beekley, NPDES Coordinator, City of Des Moines												
Responsible Official(s):												
Loren Reinhold, Surface Water and Environmental Engineering Manager Planning, Building & Public Works City of Des Moines 21650 11 th Ave S Des Moines, WA 98198-6317		<table border="0"> <tr> <td></td> <td>Yes</td> <td>No</td> </tr> <tr> <td>Samples Taken?</td> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> </tr> <tr> <td>Photos Taken?</td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </table>			Yes	No	Samples Taken?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Photos Taken?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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Samples Taken?	<input type="checkbox"/>	<input checked="" type="checkbox"/>										
Photos Taken?	<input checked="" type="checkbox"/>	<input type="checkbox"/>										

Section C: Summary of Findings/Comments

BACKGROUND

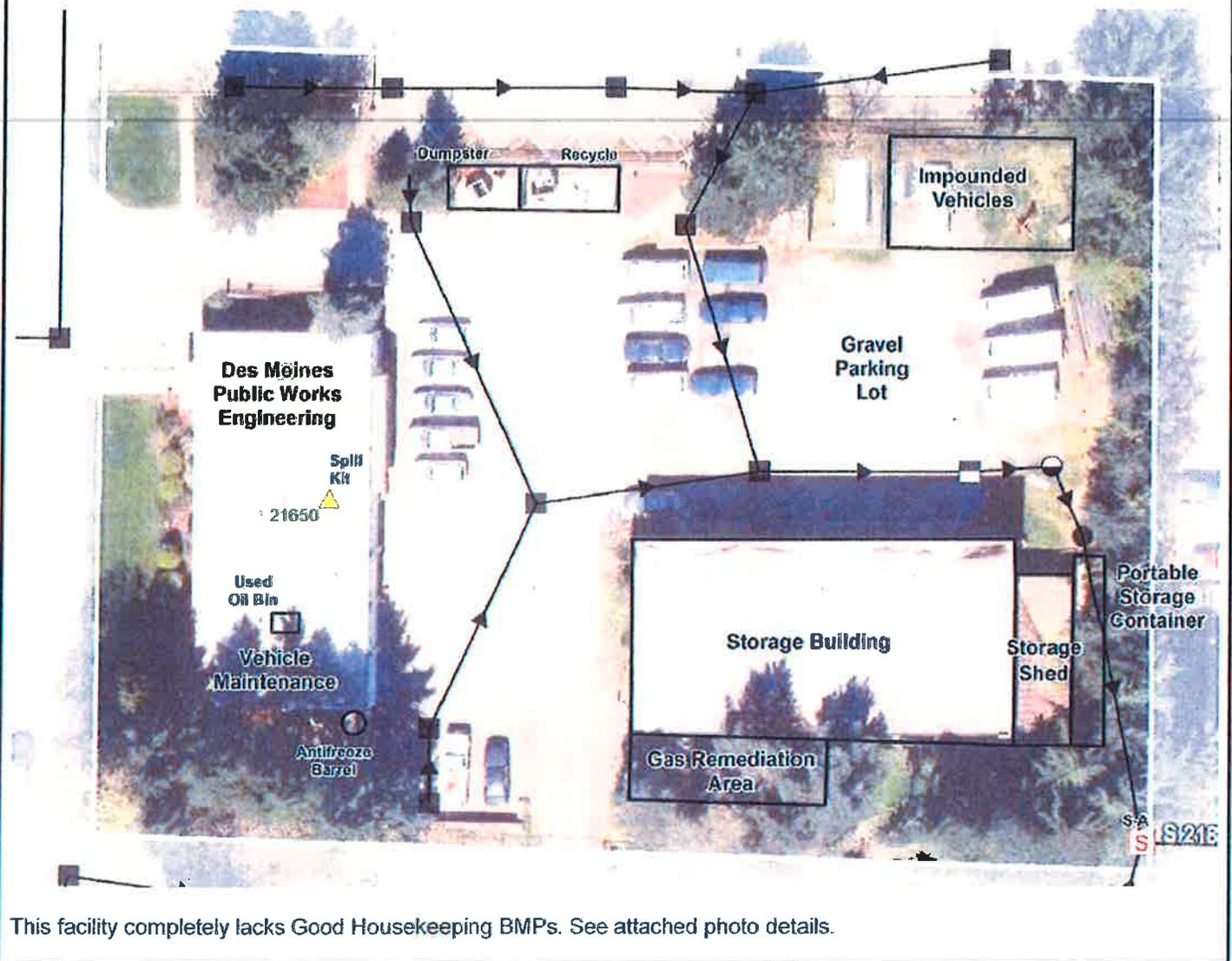
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INSPECTION/OBSERVATIONS

Refer to the site map, below, excerpted from the draft City Fleets and Facilities Stormwater Pollution Prevention Plan (updated April 2016).



This facility completely lacks Good Housekeeping BMPs. See attached photo details.

Section D: Compliance/Recommendations

Note that BMPs listed below are paraphrased from the City's SWPPP (April 2016) and the 2016 King County Stormwater Pollution Prevention Manual because the City of Des Moines utilizes these manuals which are equivalent to Ecology's stormwater management manual. Photo references are provided as examples and do not reflect all instances of where the BMP is appropriate and/or necessary.

1. Immediately implement Good Houskeeping BMPs including but not limited to:
 - a. Sweep and clean paved surfaces. (Photos 03, 04)
 - b. Cover stored materials that have the potential to contaminate stormwater runoff. (Photos 01, 02, 03, 04, 05, 06)
 - i. The yard contains several covered storage areas, however the materials stored inside may not have been selected for inside storage based on pollutant generating potential and associated stormwater BMPs.
 - c. Have spill control materials/spill kit near all liquid transfer areas. (Photo 01)
2. Immediately implement required BMPs for the storage of liquid materials in portable containers. (Photo 01, 02)
 - a. Raise containers off the ground with a spill containment pallet or similar method to contain the material in the event of a spill or accident.
3. Immediately implement applicable BMPs for the impound lot and related areas. (Photos 03, 05)
 - a. Place drip pans beneath inoperative or leaking vehicles.
 - b. Cover (and raise) vehicles and/or car parts to prevent exposure to rainfall.
 - c. Ensure operational BMPs for both Storage of Scrap and Recycling Materials (A-9) and Vehicle and Equipment Parking and Storage (A31) are implemented and the use of such BMPs is documented.
4. Implement operational BMPs to clean up vehicle and equipment fluid drips and spills immediately. (Photo 06)

For questions related to this report and related technical assistance please contact Rachel McCrea at: (425) 649-7223 or rmcc461@ecy.wa.gov.

The Department of Ecology has the authority to issue formal enforcement actions including issuance of orders and civil penalties of up to \$10,000 per day per violation for violations of an NPDES permit and/or state laws and regulations.

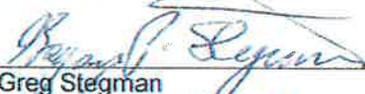
	Reviewed and approved by: 
Rachel McCrea Lead Water Quality Planner for the Lower Duwamish & Municipal Stormwater Specialist Water Quality Program	Date: 1/3/17 Greg Stegman Compliance & Technical Assistance Unit Supervisor Water Quality Program

PHOTO LOG – DES MOINES PUBLIC WORKS MAINTENANCE YARD (& MECHANIC SHOP)



01 DESCRIPTION: USED ANTIFREEZE BARREL UNCOVERED AND WITHOUT SECONDARY CONTAINMENT



02 DESCRIPTION: STORAGE BARREL CONTAINING UNKNOWN MATERIAL UNCOVERED AND WITHOUT SECONDARY CONTAINMENT



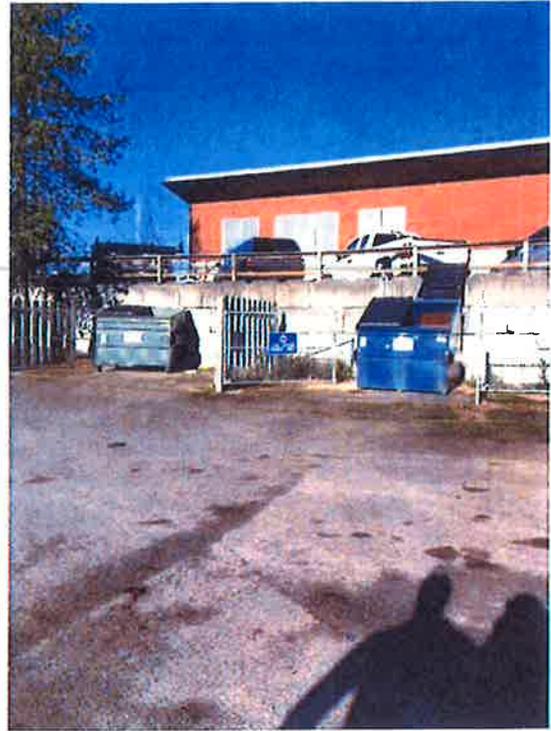
03 DESCRIPTION: PORTION OF A VEHICLE CONTAINING ELECTRONICS EXPOSED TO RAINFALL AND STORED NEAR CATCH BASIN



04 DESCRIPTION: ELECTRONICS WASTE EXPOSED TO RAINFALL



05 DESCRIPTION: IMPOUND LOT WITH WRECKED CARS EXPOSED TO RAINFALL



06 DESCRIPTION: GARBAGE AND RECYCLING DUMPSTERS LEFT UNCOVERED. SOME STAINING FROM VEHICLE FLUIDS VISIBLE ON PAVEMENT.

**Environment Committee
2017 Work Program
(January 11, 2017)**

January 19, 2017

Service Center NPDES permit requirements
Confirm 2017 Work Program
Lakehaven Utility District Comprehensive Sewer Plan
Sound Ridge Condominium Groundwater Runoff

February 16, 2017

Poverty Bay Shellfish Downgrade Update
LID Integration - Draft Stormwater and Road Standards

March 16, 2017

Barnes Creek Culvert Replacement – Update
Critical Areas Ordinance Amendments - Briefing
Public Works Yard Groundwater Remediation Update

April 20, 2017

Update on CMP Pipe Replacement Inventory
NPDES Program Update
Midway Sewer District Comprehensive Sewer Plan - tentative

May 18, 2017

CIP Project Updates.
Poverty Bay Shellfish Downgrade Update

June 15, 2017

Draft 2018-2023 SWM CIP
LID Integration Program Update

July 20, 2017

Water District No. 54 Comprehensive Water Plan - tentative
Draft 2018-2023 NPDES Permit - tentative

August 17, 2017

NPDES Program Update
SWM Development Fees

September 21, 2017

2018 SWM Capital Improvement Budget
2018 Budget Discussions

October 19, 2017

Poverty Bay Shellfish Downgrade Update

November 16, 2017

No meeting scheduled.

December 21, 2017

No meeting scheduled.

January 19, 2017 Environment Committee

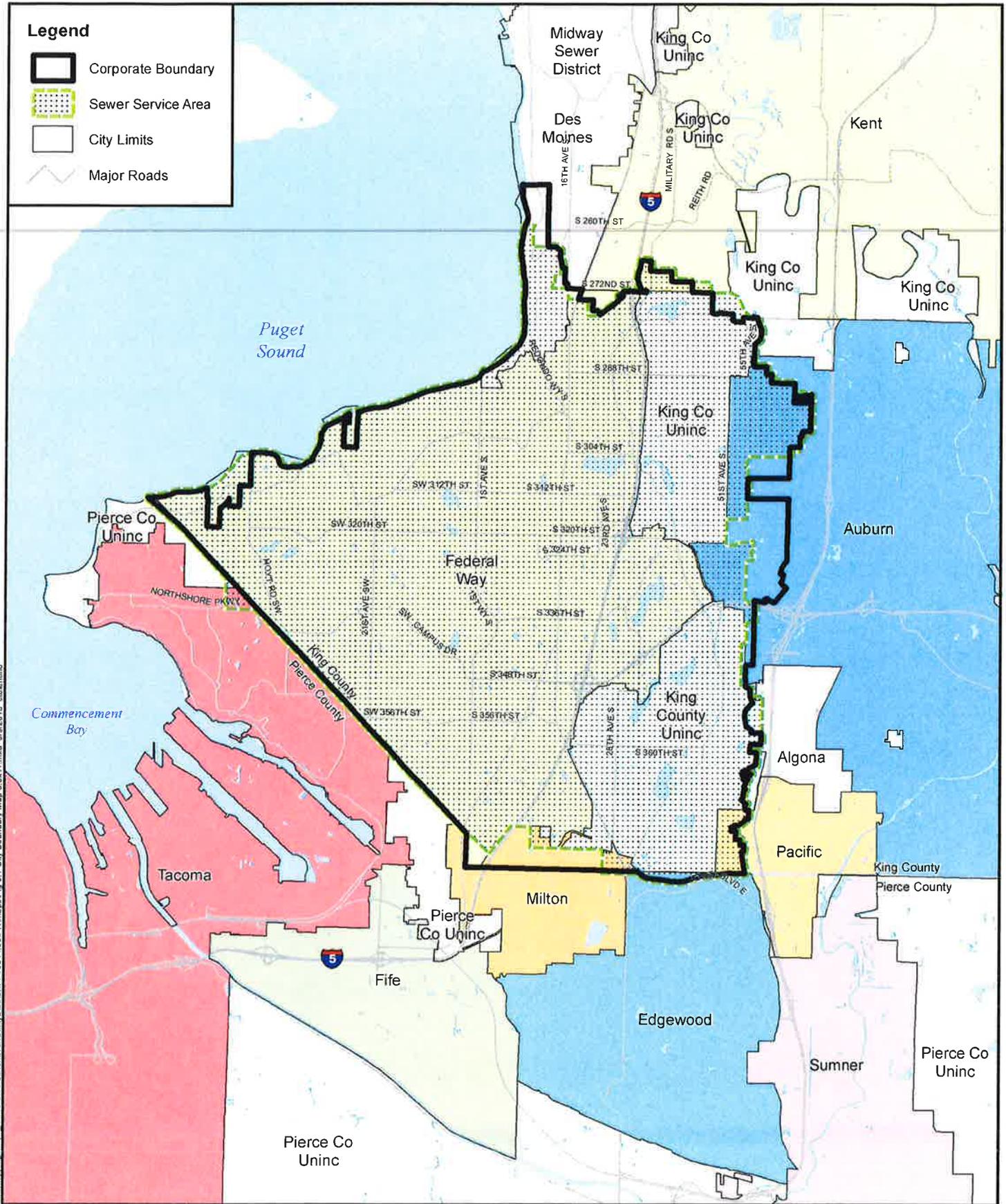
Item 4. Lakehaven Utility District Comprehensive Sewer Plan (Plan Excerpts)

- Service Area Map

- Executive Summary of the Plan is attached. See highlighted areas.
- Collection System Capital Improvements
No near term improvements. 1,520 feet of sewer on Redondo Beach Drive to be replaced as a long-term project (more than six years).
- Table 10-8 shows \$9.2M of planned 6-year Capital Improvements to the Redondo Treatment Plant
Plan described an incident of an overflow in the outfall area of the plant. It is recommended to install additional air vents in the outfall to eliminate trapped air that may be restricting the capacity of the outfall.
- Attached Sewer Rate Structure and Financial 6-year Budget

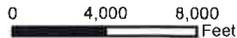
Legend

-  Corporate Boundary
-  Sewer Service Area
-  City Limits
-  Major Roads



P:\Mapping\Maps_Generated\Lakehaven\UtilityDistrict\14-10344-00\PR\maps\Fig 3.1 City Boundary Map 8.5x11.mxd 5/9/2016 cbl/rlinc

This map is a geographic representation based on available information. No warranty is made concerning the accuracy, currency, or completeness of data depicted on this map.



City Boundary Map
 Lakehaven Utility District
 May 2016

Figure
3.1

Section ES Executive Summary

This Comprehensive Wastewater System Plan is a summary of the conclusions and findings completed by District staff and with the assistance of BHC Consultants, LLC in analyzing Lakehaven Utility District's existing wastewater collection and treatment systems. The Plan updates and supersedes the District's previous (2009) Comprehensive Wastewater Plan and has been prepared in accordance with all applicable regulatory requirements. The primary goals of the planning effort were to:

- Determine the adequacy of the existing wastewater collection and treatment system to meet the current and projected needs of Lakehaven's customers in accordance with all state, federal and local regulations, as well as current industry standards.
- Develop recommendations for system improvements which meet the wastewater collection and treatment system needs in an environmentally conscious manner, all while protecting public health and welfare.
- Identify potential mechanisms for funding recommended studies, improvements and other recommendations of the Plan.

A State Environmental Policy Act (SEPA) Checklist and determination of non-significance (DNS) has been prepared for this Plan. The District anticipates this Plan does not have probable significant adverse impacts on the environment in accordance with the DNS under WAC 197-11-340(2). The SEPA Checklist and DNS are included in Appendix D. This Plan is required to meet state, county, and local requirements. The District will submit this plan to the DOH, the Department of Ecology (DOE), King County, adjacent utilities, and local governments as part of the Agency Review process. See Appendix B for the Comment Letters. The Adopting Resolution will be included in Appendix A, upon Plan approval by the Board of Commissioners.

The following is a summary of the key elements of the planning process and sections of the Plan:

ES.1 Introduction

This section presents an overview of the study, history and objectives of the District, and a summary of the rules and regulations which govern the operation of the District and the development of the Comprehensive Plan document.

ES.2 Basic Planning Data

Lakehaven Utility District currently serves within the corporate limits of eight jurisdictions. The existing sewer service area identified in the Plan is not coincidental with the District's corporate boundary, but efforts continue to provide the most feasible consistency between the two boundaries as possible. Growth Management Act planning has established an Urban Growth Area (UGA) within which urban levels of service are to be provided in a timely and reasonable manner by Lakehaven Utility District. The entire corporate boundary of the District is within the UGA and Lakehaven is therefore responsible for planning accordingly.

ES.3 Demographics

Population and employment forecasts are based on the adopted land use plans of the various jurisdictions within which the District operates. The future demographics were estimated using growth projections provided by the Puget Sound Regional Council (PSRC), King County, City of Federal Way and each jurisdiction within the Study Area. They are presented by drainage basin to allow for evaluation of the system and consideration of future improvement alternatives. In 2014, there were an estimated 132,600 residents and 33,350 employees within Lakehaven's Sewer Service Area (SSA). Population has increased slightly above what was projected in the prior Plan. The previous Plan forecasted a population of 126,410 in the year 2015.

The population is expected to be accelerated by changes in the City of Federal Way's zoning code to allow for more dense development and redevelopment to occur within the City, particularly in its Downtown Core. The population is projected to increase to nearly 144,500 by 2020, and almost 149,300 by the year 2030. Employment is expected to increase to more than 36,660 by 2020 and more than 40,500 by 2030. Some areas of the SSA remain unserved, particularly in the southeast, but plans to expand to unsewered areas as on-site systems become less viable to maintain and/or new development occurs is anticipated over the next 20 years and beyond.

ES.4 Flow Projections

Section 4 of this Plan discusses current and projected flows for the six major drainage basins identified in this Plan. Average base sanitary flow for all customers in Lakehaven is currently (2012) estimated at 6.32 MGD, and is expected to increase to nearly 6.71 MGD by 2020, and potentially up to 12.73 MGD at full development (Buildout). Peak flows, including infiltration and inflow (I & I), are estimated at 17 MGD in 2012, 19 MGD by 2020, and nearly 28 MGD at Buildout. All calculated flow numbers referenced within this section were obtained from Table 4-8.

ES.5 Existing Wastewater Collection System

The existing collection system consists of approximately 325 miles of sanitary sewer pipes, 8,984 manholes, 28 pump stations, five siphons and two secondary wastewater treatment facilities. The system has been constructed over a number of years, and from a wide variety of materials, as dictated by development trends in the area. The system is divided into six primary basins and 56 smaller sub-basins. The two largest basins, Lakota and Redondo, flow to the District's wastewater treatment plants. The remaining basins currently discharge to other utilities for treatment and disposal.

ES.6 Collection System Recommended Improvements

Analysis of the collection system was accomplished with a computer modeling system using the design criteria established in the Plan. Primary issues resulting from analysis of the collection system were related to normal renewal and replacement programs, **I & I control in the older areas of the system (especially Redondo)**, and capacity issues related to various growth scenarios. Collection system improvement projects identified in the Capital Facilities Plan are representative of these findings, as well as extension of service to currently unsewered areas. One particular challenge of this plan was to analyze the Downtown Core of Federal Way, which may see large increases in population and employment resulting from the City's Comprehensive Plan revised in 2015. Major recommended improvements for the collection system are primarily centered around Lakehaven's desire to treat as much sanitary flow within its corporate boundaries as feasible. The District has made significant progress to provide back-up power at

all pump stations since the previous Plan. Further upgrades are discussed and budgeted for in the Capital Facilities Plan.

ES.7 Treatment Facilities

The Lakota Plant was constructed as a primary treatment plant in 1967 and upgraded to secondary treatment in 1991. The Lakota Plant was designed for a peak month flow of 10 mgd and a peak hour flow of 22.2 MGD. The Redondo Plant was constructed as a primary treatment plant in 1962 and upgraded to secondary treatment in 1983. The Redondo Plant was designed for an annual average flow of 5.6 MGD and a peak hour flow of 13.8 MGD. The Redondo Plant has limited room for expansion at its current site, while Lakota has room for expansion when dictated by growth and development.

ES.8 Recommended Treatment Facility Improvements

The recommended improvements fall into two categories, general improvement requirements and capacity expansion requirements. General improvements are those needed to improve individual processes and provide improved control of the plants. **Capacity improvements are those needed to accommodate future wastewater flows, particularly peak hour and month flows. Some capacity improvements, particularly at the Redondo Treatment Plant, may be avoided if ongoing efforts to study and reduce I & I are successful.** Alternatively, estimated cost for added collection and treatment capacity may be more cost effective and should achieve more reliable results. Lakehaven continues to study the effects of their successful water conservation efforts on the treatment process, and have evaluated options for re-routing flows from the Redondo collection system to the Lakota system in order to optimize the treatment process. At this 2016 date, re-routing flows is not anticipated to occur in the near term of the next 6 years.

ES.9 Hydraulic Capacity Analysis

Analyses were performed using 2011-2013 data during which period annual average day wastewater flow to Lakota was 5.4 MGD and to Redondo was 2.8 MGD. Maximum day flows for 2013 were 8.2 MGD at Lakota and 7.2 MGD at Redondo. Hydraulic Capacity Analysis Average day flows for the hydraulic analysis formed a key component for model calibration. Hydraulic capacity was evaluated dynamically for peak day flow with a derived diurnal curve to estimate peak hour conditions for the Lakota and Redondo Basins. Lacking measured flows to calibrate a hydraulic model, capacities in the four smaller basins were evaluated with an Excel spreadsheet to compute peak hour flows by basin using Lakota and Redondo unit flows. Treatment capacity allowed by the NPDES Permit at both plants is 10.0 million gallons per day (MGD) at Lakota and 5.6 MGD at Redondo. Based on the **permit capacity trigger of 85 percent of permitted flow for three consecutive maximum months, Lakota treatment facility is currently operating at about 59 percent of hydraulic capacity and Redondo treatment facility is currently operating at about 68 percent of hydraulic capacity.**

ES.10 Lakota Process Capacity Analysis

Analyses were performed on 2011 to 2013 data and individual process unit capacities were compared to Washington State Ecology Department design criteria. Primary treatment comprises screening (22.0 MGD peak hour capacity), grit removal (22.9 mgd peak hour capacity) and primary clarifiers (22.4 MGD peak hour capacity) and has adequate capacity. Grit and primary scum removal need improvement to protect and optimize downstream processes. Secondary treatment comprises aeration basins, secondary clarifiers (22.2 MGD peak hour) and UV disinfection (22.2 MGD peak hour). Solids treatment comprises thickening, digestion and dewatering. An overview of capacity by unit process is summarized in Table 8-5. The table

includes physical and operating parameters for each process. Operating parameters are shown based on the design flows and loads, current flows and loads, projected 2020 flows and loads and the projected build-out flows and loads. The plan has addressed some of the treatment process components that may require capacity upgrades in the near future like the screens, blowers and raw activated sludge (RAS) pumps. A more detailed assessment of the treatment process components capacity limitations during the six-year program can be found in Section 8.

ES.11 Redondo Process Capacity Analysis

Analyses were performed on 2011-2013 data and individual process unit capacities were compared to Washington State design criteria. Primary treatment comprises screening (13.8 MGD peak hour capacity), grit removal (14.5 mgd peak hour capacity) and primary clarifiers (12.1 MGD peak hour capacity). Secondary treatment is comprised of aerating trickling filters, secondary clarifiers and UV disinfection. Secondary capacity, and consequently overall process capacity, is limited by clarifier capacity (10.1 MGD peak hour) and UV disinfection capacity (13.8 MGD peak hour). Solids treatment comprising digestion and dewatering has adequate capacity. Limited thickening is achieved in the process tanks rather than a separate thickening process. An overview of capacity by unit process is summarized in Table 9.4. The table includes physical and operating parameters for each process. Operating parameters are shown based on the design flows and loads, current flows and loads, projected 2020 flows and loads and the projected build-out flows and loads. The plan has addressed some of the treatment process components that may require capacity upgrades in the near future like the, screens, grit removal, primary and secondary clarifiers and pumps. A more detailed assessment of the treatment process components capacity limitations during the six-year program can be found in Section 9.

ES.12 Biosolids

Dewatered biosolids cake from both plants, stabilized to Class B quality in the digesters, is trucked to Eastern Washington to be utilized by farmers on their crop lands. Metals content in the biosolids has been consistently well below EPA regulatory limits for land application and is currently below EPA limits for "clean" biosolids.

ES.13 Water Reuse

Lakehaven has evaluated the feasibility of municipal wastewater reuse to replenish ground water resources extracted for potable water use. As a component of the District's water use efficiency programs, a program for the reuse of treated wastewater was prepared. This plan was first prepared in 2005 and has since been updated to reflect the most recent regulatory requirements and water reuse opportunities. The 2015 Comprehensive Water System Plan Section 6 provides an evaluation of the Lakota WWTP feasibility of wastewater reuse. Landscape irrigation and groundwater recharge are the two potential reclaimed water uses identified within the District. Future reclamation treatment facilities would be located at the Lakota WWTP and possibly the Redondo WWTP, if implemented.

ES.14 Financing Implementation

Several typical funding options are available to the Lakehaven Utility District. These include the following:

State and Federal Grants and Loans; Bond Financing, both General Obligation Bonds and Revenue Bonds; Privatization; Pay-As-You-Go; Capital Reserve Funds; Development Based Funding; Customer Service Rates and Connection Fees.

An appropriate funding mix is needed by the District to finance the proposed Capital Facilities Plan summarized in Section 11 of this Plan. Given the current (2015) economic climate, the District should continue to aggressively pursue government loan funding, economic recovery funding as it becomes available, and build reserve funds to finance scheduled system repairs and upgrades. The District should continue to evaluate the benefit of inter-local contracts with Agencies who may share in the cost of the improvements.

As noted in Section 10.1, some changes to the Redondo Basin service area and development densities may be enacted before Build-Out occurs. These changes would likely affect the Build-Out collection system capacities required and render any current cost estimate misleading.

10.5 Redondo Treatment Facilities

10.5.1 Six Year Capital Improvement Program

Improvements for the Redondo WWTP are organized similarly to the Lakota WWTP improvement program. Figure 10-6 shows how all WWTP improvements would be integrated through the Long-Term Improvement Program.

Table 10-8 shows the recommended short-term improvements, in the order of priority, along with their estimated probable construction costs.

Table 10-8 Redondo WWTP Short-Term Capital Improvements		
Item	Capital Improvement Projects	Opinion of Probable Project Cost
A	Disinfection Study & Replace UV System	\$ 2,440,000
B	Replace Sludge Collection Mechanism in Primary Clarifier No. 2	340,000
C	Add Secondary Sludge Thickener / Discontinue Co-settling	520,000
D	Repair & Recoat Secondary Clarifier Mechanisms (2)	500,000
E	Biotower Shell and Structural Repairs (2)	290,000
F	Add Effluent Cloth Disc Filters	2,880,000
G	Add Outfall Vents	200,000
H	Replace Electric Power System	1,230,000
I	Replace Instrumentation and Control System	350,000
J	Replace Gas Flare and Pipe	110,000
K	Odor & Storm Water Studies	60,000
L	Replace Odor Ducts	250,000
Total Redondo WWTP Short-Term Improvement Program		\$ 9,170,000

All of these short-term projects are related to keeping the existing facilities functional and in compliance with current discharge permit requirements. Replacing the Bio-Tower No. 2 distributor is the highest priority because the distributor for Bio-Tower No. 1 has already failed. Replacing existing Primary Clarifier No. 2 sludge collection mechanism is the next highest priority because the primary clarifiers will continue to be utilized through build-out in all of the scenarios considered.

Discontinuing co-settling in the primary clarifiers is the third highest priority, because the primary clarifiers are already overloaded under peak hourly flow conditions. The design overflow rates shown in Table 9-2 are for primary clarifiers that do not co-settle. With co-settling the overflow rates are de-rated to 1,200 to 1,700 gpd/sf. The existing peak hour overflow rates are already at the high end of this range.

Depending on the timing of the secondary process conversion, rehabilitating the secondary clarifiers' mechanisms and the Bio-Towers will also have a high priority. It is likely that the secondary process conversion will not be required for at least 10 to 15 years, so these facilities must remain in service for at least that long.

The plant has previously had effluent fecal coliform violations as a result of poor UV light transmission in the secondary clarifier effluent. An UV technology and economic study was conducted to evaluate newer UV technologies that might perform better by delivering a higher UV dose, at the same or lower operating cost and with less cleaning labor. The study may also need to consider how not replacing the biofilter media may impact effluent quality into the future and how that would affect performance of the UV disinfection system and need for an effluent filter.

The type of filtration to be implemented is primarily dependent on the anticipated timing and type of the secondary process conversion. If it will be less than about 10 years and the MBR process will be used, then using membrane filtration is recommended because the membrane equipment could be reused and would offset part of the cost of the MBR installation. If the MBR process will not be used, or if the secondary process conversion will be over 15 years into the future (which is most likely), then effluent filtration using cloth disc filters should be implemented because of the cost savings.

The plant has previously had an overflow, at an unknown flow rate, in the outfall area of the plant. Hydraulic flow computations indicate that this should not have occurred. It is recommended that the plant install the additional outfall air vents recommended by the Cosmopolitan Outfall Inspection Report, December 16, 2014, to improve the hydraulic capacity of the outfall.

10.5.2 Mid-Term Capital Improvement Program

The recommended mid-term improvements needed sometime after about 2020 are listed in Table 10-9 in the order of priority along with their estimated probable construction costs.

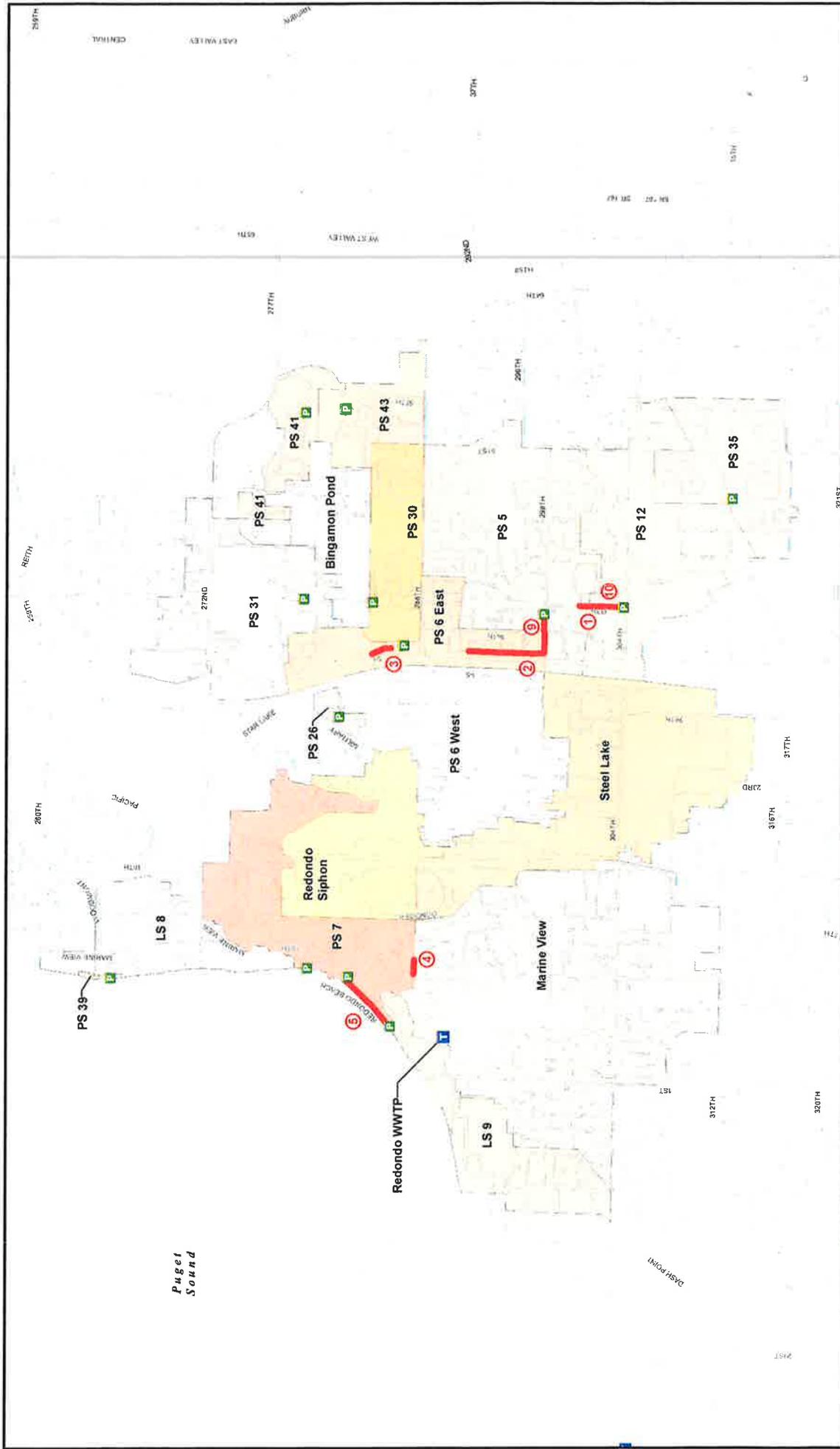
Table 10-9 Redondo WWTP Mid-Term Capital Improvements	
Capital Improvement Projects	Opinion of Probable Project Cost
Add new headworks with chemical feed facilities for CEPT	\$ 3,700,000
Covert secondary clarifiers to 1 st stage MBR	31,900,000
Total Redondo WWTP Mid-Term Improvement Program	\$ 35,600,000

As previously discussed, the membrane process requires very careful screening and grit removal, prior to the membranes, to avoid damaging or clogging membrane modules. Therefore, adding the new headworks should be completed prior to, or in conjunction with, converting the secondary process to MBRs.

One of the major advantages of the MBR process is that the membrane modules can be staged as needed. Therefore, it is not necessary to install the entire \$38.1 million project initially. It is estimated that about 75 percent of the total build-out flow would be required initially, therefore the first stage MBR equipment package could be reduced from \$10.9 million to about \$8.2 million, and the first stage estimated probable construction costs is reduced from \$38.1 million to \$31.9 million, as indicated above. The remaining \$6.2 million in to reach build-out capacity would be constructed in Phase 3.

10.5.3 Long Term Improvements

The recommended long-term improvements to reach full build-out of the Redondo WWTP are shown in Table 10-10 along with their estimated probable construction costs.



NORTH

0 1,000 2,000 Feet

321ST

Redondo WWTP
 Pump Station
 Sewer To Be Replaced

Water System Lakehaven Utility District 2014
 King County base data may not reflect current or actual conditions. This map is a geographic representation based on information available. It does not constitute a warranty of accuracy or completeness of data reported on this map. BIC Consultants LLC assumes no responsibility for the validity of any information published herein, nor any responsibility for the use or misuse of the data.

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Redondo Build-Out Improvements
 2015 Comprehensive Wastewater System Plan
 Lakehaven Utility District
 October 2016
 Figure 10-5

These improvements are summarized in Table 10-6 with an opinion of probable project costs.

Table 10-6 Redondo Collection System Six-Year Capital Improvements					
Item	Location	From	To	Proposed	Opinion of Probable Project Cost
1	288 th Street SW	21 st Ave S	18 th Ave S	1,020 LF x 24-inch	\$980,000
2	Pump Station 12	-----	-----	820 GPM x 100 HP	\$1,650,000
3	Pump Station 41	-----	-----	200 GPM x 25 HP	\$1,240,000
4	Pump Station 43	-----	-----	320 GPM x 75 HP	\$1,210,000
Redondo Collection System Six-Year Improvement Program					\$7,680,000

10.4.2 Long Term Improvements

The capital improvements needed by Build-Out for the Redondo Basin as currently modeled are summarized in Table 10-7.

Table 10-7 Redondo Collection System Build-Out Capital Improvements					
Item	Improvement	From	To	Description	
1	37 th Avenue S	S 302 St	S 300 Pl	510-FT x 12-inch	
2	S 298 th Street	34 Ave S	32 Pl S	540-FT x 18-inch	
2	32 nd Place S	S 298 St	S 292 St	1,890-FT x 8-inch	
3	32 nd Avenue S	S 284 St	S 285 Pl	500-FT x 15-inch	
3	32 nd Avenue S		PS 6	100-FT x 15-inch	
4	Nautilus Elem S	S 286 Pl	8 Pl S	360-FT x 24-inch	
5	Redondo Beach Dr	PS 9	270 FT SW of Redondo Way	1,520 FT x 12-inch	
6	Pump Station 9	-----	-----	460 GPM x 2 HP	
7	Pump Station 30	-----	-----	625 GPM x 15 HP	
8	Pump Station 35	-----	-----	640 GPM x 60 HP	
9	PS 5 Force Main	PS 5	-----	460 LF x 14-inch	
10	Pump Station 12 FM	S 304 St	S 302 St	610-FT x 10-inch	

These improvements are shown on Figure 10-5.

Table 12-1 Sewer Rate Structure⁽¹⁾

Customer Classification	Base Rate		Volume Service Charge Per CCF	King County Metro Charge Per CCF	Pierce County/Tacoma Charge Per CCF
	Monthly	Bi-Monthly			
Residential					
Single-Family	\$12.41	\$24.82	\$2.60	\$2.00	\$1.53
Multi-Family	\$12.41	\$24.82	\$2.60	"	"
Commercial ⁽²⁾					
CDC #1	\$12.41	\$24.82	\$2.60	"	"
CDC #2	\$12.41	\$24.82	\$4.05	"	"
CDC #3	\$12.41	\$24.82	\$5.50	"	"
CDC #4	\$12.41	\$24.82	\$6.94	"	"
CDC #5	\$12.41	\$24.82	\$8.39	"	"

Notes:

(1) Resolution 2015-1254 Effective January, 2016

(2) Add \$0.62/lb for BOD and Total Suspended Solids (TSS) in excess of 1,000 mg/l

Billing Codes:

CDC #1 - BOD and/or TSS ≤ 301mg/l

CDC #2 - BOD and/or TSS = 301 – 500 mg/l

CDC #3 - BOD and/or TSS = 501 – 700 mg/l

CDC #4 - BOD and/or TSS = 701 – 900 mg/l

CDC #5 - BOD and/or TSS ≥ 901 mg/l

12.3 Projected Funding of Wastewater System Plan Projects

Table 12-2 presents a comparison of scheduled CIP projects relative to recent budgeting efforts. With recent major new upgrade projects being identified, the CIP costs have increased significantly. Finalization of the District's CIP by District staff on an annual or bi-annual basis will confirm the findings of this Plan and provide the basis for determining the rate impact that construction costs may have.

Table 12-2 Preliminary CIP Budget Comparison

Source	Scheduled District Project Cost (in thousands) by Year						2021 to 2025 CIP	Total 5-Year CIP 2016-20	Total 10-Year CIP 2016-25
	2015	2016	2017	2018	2019	2020			
2015-2016 Budget CIP ⁽¹⁾	\$15,521	\$16,543							\$102,093
2015 WWSP CIP		\$16,439	\$10,273	\$16,820	\$12,248	\$9,489	\$37,758	\$65,323	\$103,081
2015-2016 Rate Study ⁽²⁾	\$2,100	\$16,493	\$10,273	\$16,820	\$12,248	\$9,489	\$37,758	\$65,323	\$103,081

Notes:

1) Lakehaven Resolution Nos. 2014-1244 & 2015-1256.

2) Rate study used a draft of the District's 2016 CIP, refer to Appendix "F"

Budgeted and projected information on sewer revenues, expenses, annual debt service, cash and cash equivalent balances, and other sewer operating data was used to develop a 6-year projection of the sources of funds that are available to finance the District's ongoing sewer operations and capital expenditures. Wastewater System Plan improvement projects are based on the Capital Improvement Plan (CIP) presented in Chapter 11. A balanced financial operating budget based on the 2015 WWSP CIP is presented in Table 12-3. The following are key District financial policies and planning assumptions that the financing plan is based on:

- General Cost inflation rate was projected to be 2.5% per year.
- For capital inflation was projected to be 1% above inflation.
- For salary escalations, it was assumed at 3% per year (combined labor and benefits costs).
- Total projected for the 5-year unadjusted capital expenditures equal approximately \$65.3 million in scheduled costs.
- Cash and cash equivalents to be used to fund the sewer program include restricted and unrestricted cash, investments and accrued interest.
- Additional assumptions can be found in the 2015-16 rate study (refer to Appendix F).

The District maintains a revenue requirements model for evaluating future financial requirements based on budgeted operating expenditures, projected capital project costs, debt-based financing proceeds, and other planning assumptions and parameters. The District's 2015-16 Rate Study was used to determine adequate revenue. **Over the next 5 years, the District may need to borrow additional funds to meet both operating and planned capital needs.** The need for this amount was assumed in the current rate forecast detailed in the rate study. It was conservatively assumed the funds would come from the issuance of future bonds; however, it may come from any of the other described sources in his section.

Lakehaven Water & Sewer District
2015 Comprehensive Wastewater System Plan

Table 12-3 Balanced Financial Operating Budget							
	Budget 2015	Actual 2015	Budget 2016	Projected 2017	Projected 2018	Projected 2019	Projected 2020
Sewer Revenue							
Rate Revenue	\$ 15,202,012	\$ 15,996,202	\$ 15,557,586	\$ 16,024,314	\$ 16,505,043	\$ 17,000,194	\$ 17,510,200
Non-Rate Revenue	\$ 241,300	\$ 373,524	\$ 241,300	\$ 248,539	\$ 255,995	\$ 263,675	\$ 271,585
Total Revenue	\$ 15,443,312	\$ 16,369,726	\$ 15,798,886	\$ 16,272,853	\$ 16,761,038	\$ 17,263,869	\$ 17,781,785
Connection Charges	\$ 2,445,368	\$ 1,261,524	\$ 2,519,884	\$ 2,595,481	\$ 2,673,345	\$ 2,753,545	\$ 2,836,152
Grants/Loans/Bonds		\$ 273,315					
Total Capital Contributions	\$ 2,445,368	\$ 1,534,839	\$ 2,519,884	\$ 2,595,481	\$ 2,673,345	\$ 2,753,545	\$ 2,836,152
Total Sewer Revenue	\$ 17,888,680	\$ 17,904,565	\$ 18,318,770	\$ 18,868,333	\$ 19,434,383	\$ 20,017,415	\$ 20,617,937
Sewer Expenditures							
Operations & Maintenance	\$ 14,345,490	\$ 11,413,811	\$ 14,894,470	\$ 15,341,304	\$ 15,801,543	\$ 16,275,590	\$ 16,763,857
Debt Service		\$ 258,312					
Capital Projects	\$ 4,672,000	\$ 2,795,704	\$ 4,733,000	\$ 10,265,000	\$ 16,813,000	\$ 12,240,000	\$ 8,499,000
Total Sewer Expenditures	\$ 19,017,490	\$ 14,467,827	\$ 19,627,470	\$ 25,606,304	\$ 32,614,543	\$ 28,515,590	\$ 25,262,857
Net Increase (Decrease) of Reserves	\$ (1,128,810)	\$ 3,436,738	\$ (1,308,700)	\$ (6,737,971)	\$ (13,180,160)	\$ (8,498,175)	\$ (4,544,920)

GeoView

City of Des Moines GIS



GeoView

City of Des Moines GIS

