Oregon Department of Environmental Quality

RECYCLED WATER USE PLAN SUMMARY

Directions: Check (✓) appropriate boxes for tables and provide brief narrative where necessary. Submit with Recycled Water Use Plan to DEQ.

State of Oregon Department of Environmental Quality

APPLICANT INFORMATION

Facility Name: City of Sisters Waste Water Treatment Plant
Address: 912 S. Locust Street, Sisters OR 97759
Contact Name/Phone Number: Paul Bertagna/541-323-5212

TYPE OF WASTEWATER TREATMENT PLANT

☐	Activated Sludge	☐	Re-circulating Gravel/Sand Filter
☐	Mechanically Aerated Lagoon	☐	Rotating Biological Filter
☑	Aerated Lagoon	☐	Other (Specify):

Average Dry Weather Flow, million gallons per day (MGD): _____

TREATMENT CLASS IN ACCORDANCE WITH OAR 340-055-0012

☐	Class A	☐	Class C
☐	Class B	☑	Class D
☐	Non-Disinfected water		

TREATMENT EFFICIENCY CAPABILITY DURING REUSE

☐	Tertiary Treatment	☐	85% or more BOD/TSS removal
☐	95% or more BOD/TSS removal	☐	Rotating Biological Filter
☐	90% or more BOD/TSS removal	☑	Other (Specify): 80% TSS removal efficiency

DISINFECTION METHOD

☑	Chlorine injection just prior to irrigation
☐	Chlorine injection with storage of recycled water
☐	Chlorine injection after storage just prior to irrigation
☐	UV exposure just prior to irrigation
☐	UV exposure with storage of recycled water
☐	UV exposure after storage just prior to irrigation
☐	Other (specify):

STORAGE IMPOUNDMENT	Y	N
Is there a storage facility proposed for this project?	☐	☑
If yes, at the WWTP	☐	☑
If yes, located at a location other than the WWTP	☐	☑
If yes to either of the above, specify the location and length of time the storage facility will be used:		

ARE THERE ALARMS FOR VARIOUS UNIT PROCESSES?	Y	N
Are alarms independent of the normal power supply of the plant?	☐	☑
Failure of a disinfection treatment process?	☑	☐
Failure of a clarification process? N/A	☐	☐
Failure of a coagulation process? N/A	☐	☐
Failure of a filtration process? N/A	☐	☐
Are the alarms on separate circuit breakers from the reuse pumps?	☑	☐
Is the Recycled Water back-up generator tested regularly? N/A	☐	☐

IN THE EVENT OF POWER LOSS:	Y	N
Can the plant continue to discharge?	☐	☑
Can there be any irrigation of non-disinfected water?	☐	☑

If no to either of the above, specify control measures that will be in place to stop the irrigation as soon as possible.

The irrigation pumps cannot operate without power so the entire system will not run and the auto-dialer will call out to our on-call personnel that there has been a power outage.

RECYCLED WATER WILL BE BENEFICIALLY USED FOR THE FOLLOWING (CHECK ALL THAT APPLY):

✓	Beneficial Purpose	Class				
		A	B	C	D	ND
	Irrigation					
☑	Fodder, fiber, seed crops not intended for human ingestion, commercial timber	Y	Y	Y	Y	Y
☐	Firewood, ornamental nursery stock, Christmas trees	Y	Y	Y	Y	N
☐	Sod	Y	Y	Y	Y	N
☐	Pasture for animals	Y	Y	Y	Y	N
☐	Processed food crops	Y	Y	Y	N	N
☐	Orchards or vineyards if an irrigation method is used to apply recycled water directly to the soil	Y	Y	Y	N	N
☐	Golf courses, cemeteries, highway medians, industrial or business campuses	Y	Y	Y	N	N
☐	Any agricultural or horticultural use	Y	N	N	N	N
☐	Parks, playgrounds, school yards, residential landscapes, other landscapes accessible to the public	Y	N	N	N	N
☐	**Industrial, Commercial, or Construction**					
☐	Industrial cooling	Y	Y	Y	N	N
☐	Rock crushing, aggregate washing, mixing concrete	Y	Y	Y	N	N
☐	Dust control	Y	Y	Y	N	N
☐	Nonstructural fire fighting using aircraft	Y	Y	Y	N	N
☐	Street sweeping or sanitary sewer flushing	Y	Y	Y	N	N
☐	Stand alone fire suppression systems in commercial and residential buildings	Y	Y	N	N	N
☐	Non-residential toilet or urinal flushing, floor drain trap priming	Y	Y	N	N	N
☐	Commercial car washing	Y	N	N	N	N
☐	Fountains when the water is not intended for human consumption	Y	N	N	N	N

✓	Beneficial Purpose	Class				
		A	B	C	D	ND
☐	**Impoundments or Artificial Groundwater Recharge**					
☐	Water supply for landscape impoundments including, but not limited to, golf course water ponds and non-residential landscape ponds	Y	Y	Y	N	N
☐	Restricted recreational impoundments	Y	Y	N	N	N
☐	Nonrestricted recreational impoundments including, but not limited to, recreational lakes, water features accessible to the public, and public fishing ponds	Y	N	N	N	N
☐	Artificial groundwater recharge	Y	N	N	N	N
☐	**Other (describe):**					

PAGES 4 & 5 REQUIRED FOR IRRIGATION ONLY

THE IRRIGATION AREA WILL BE USED FOR THE FOLLOWING (CHECK ALL THAT APPLY):

☑	Crops (specify types): Orchard Grass
☐	Pasture
☑	Forest
☐	Public access areas (specify types):
☐	Natural areas (specify species or mix):
☐	Other (specify):

APPLICATION RATE	**Y**	**N**
Will irrigation be controlled not to exceed the water consumption rate of the crop being grown?	☑	☐
Will irrigation be controlled not to exceed the nutrient requirements of the crop being grown?	☑	☐

What is the proposed application rate of the recycled water? Varies, see RWUP Section 7.0

Acreage of irrigation site Varies, see RWUP Section 7.0

The months that irrigation will be permitted April to October

If irrigation occurs with Class C recycled water at nighttime, will the public access be restricted to allow for sunlight contact on irrigated water? ☐ Yes ☐ No N/A

If so, specify length of time _____

TRANSMISSION & DISTRIBUTION LINES/PIPES	**Y**	**N**
At the end of the irrigation day, will the transport lines/pipes be drained back to the wastewater treatment facility?	☐	☑
Is there a gate/ball shut off valve at the irrigation pump?	☑	☐
Is there an in line pressure relief valve to by-pass reuse water back into the source basin if there is a line transmission plug?	☐	☑
At the cessation of the irrigation season, will the transport lines/pipes be flushed and cleaned?	☐	☑
Is there a gate/ball shut off valve at the irrigation field, or at each irrigation zone?	☑	☐

ZONED LAND USE OF IRRIGATION SITE (CHECK ALL THAT APPLY)

☑	Exclusive Farm Use (EFU)	☐	Industrial
☐	Forestry	☐	State/Federal lands
☐	Rural Residential	☐	Other (Specify):

ZONED LAND USE OF AREA AROUND IRRIGATION SITE (CHECK ALL THAT APPLY)

☑	Exclusive Farm Use (EFU)	☐	Industrial
☐	Forestry	☐	State/Federal lands
☐	Rural Residential	☐	Other (Specify):

Prevailing wind direction during irrigation season (specify): North

Will irrigation be restricted when winds exceed 10 MPH?: Yes

THE NEAREST DEVELOPED PROPERTY FROM IRRIGATION SITE (ft):

North boundary: 1455' to TL 1510100000708
South boundary: 155' to TL 1510140000800 (SOUTHEAST)
East boundary: 120' to TL 1510140000400 AND TL 151040000300
West boundary: 1385' to TL 1510000001401 (NORTHWEST)
What is the nearest developed property downwind of irrigation site (specify type and distance): TL 1510100000708, Single Family Residence, zoned EFUSC.
Are there any playgrounds, schools, or public parks within ½ mile of irrigation site? (specify): No.

DOMESTIC WELLS	Y	N
Are there any domestic wells or other domestic water sources located within the irrigation site?	☐	☑
Are there any domestic wells or other domestic water sources located within 150', 100, or 50' of the irrigation site?	☐	☑
If yes to either of the above, identify the number of wells or sources and identify their location on the attached site plan.		

POTENTIAL RUN-OFF POINTS ARE LOCATED AT THE (CHECK ALL THAT APPLY):

☐	North boundary (specify): ALL RUNOFF WILL BE CONTROLLED ON SITE
☐	South boundary (specify):
☐	East boundary (specify):
☐	West boundary (specify):

PUBLIC ACCESS WILL BE CONTROLLED BY THE FOLLOWING (CHECK ALL THAT APPLY):

☑	No trespassing or warning signs (specify spacing): 200'
☑	Fencing (specify type): Barb Wire
☐	Other (specify):

BARRIERS ON BOUNDARIES THAT MAY MITIGATE AEROSOL DRIFT (CHECK ALL THAT APPLY)

☑	Natural vegetation (specify height and width): Ponderosa Pine and Juniper, up to 2' diameter, and 50' height.
☐	Natural topography (specify):
☐	Tree or fence row (specify height):
☑	Other (specify): native shrubs and grasses
☐	None:

IRRIGATION METHOD (CHECK ALL THAT APPLY)

☑	Set sprinkler heads with spray height of 20' and spray diameter of 140'
☐	Wheel irrigation line with spray height of _____ and spray diameter of _____
☐	Big gun irrigation with spray height of _____ and spray diameter of _____
☐	Other (specify):

IRRIGATION EQUIPMENT SPECIFICATIONS (insert more rows as needed)

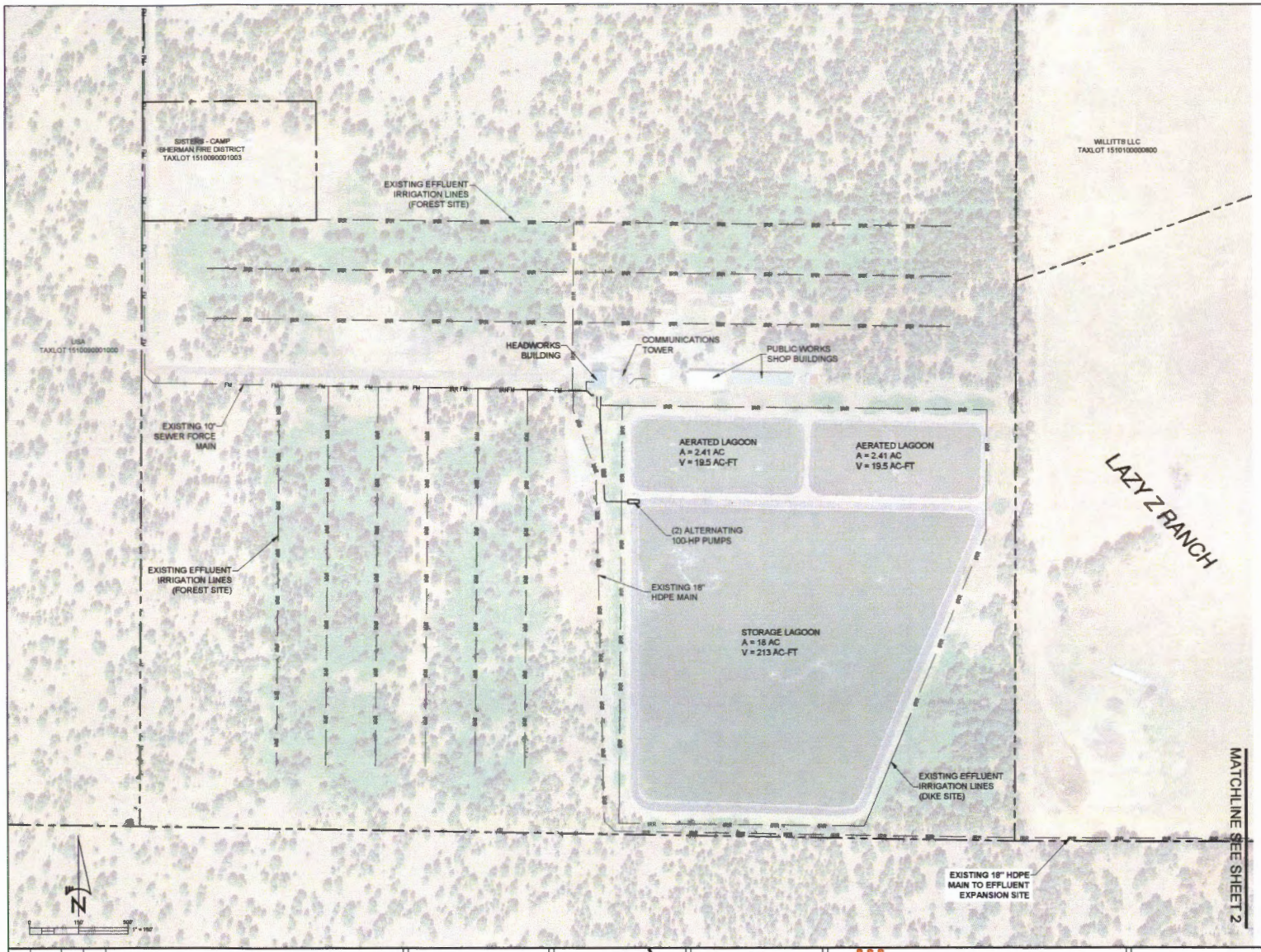
Sprinkler head types (brand and model)	Irrigation zones/cells	PSI operating ranges
RAINBIRD, RAIN GUN SR3003/F3002	4 - 6 Zones	40 TO 100 PSI

REQUIRED ATTACHEMENTS:

1. Overhead scale diagram/plan view of the wastewater treatment plant that identifies the treatment and disinfection components of the plant.
2. Overhead scale diagram/plan view of the transport line from wastewater treatment plant to the reuse area.
3. Overhead scale diagram/plan of the irrigation site showing surrounding properties and irrigation system layout.
4. A full copy of the Recycled Water Use Plan.

HEALTH DIVISION REVIEW COMMENTS:

Print Form



SITE NOTES:

GENERAL:

OWNER/APPLICANT:	CITY OF SISTERS
PROPERTY:	WASTE WATER TREATMENT PLANT
PROPERTY ADDRESS:	1000 SOUTH LOCUST ST., SISTERS, OR, 97759
PROPERTY SIZE:	108.60 ACRES
ZONING:	F1, PF, UAR10
TAXLOT NUMBER:	1510090001002

NOTE: SEE FIGURE 2: PROCESS SCHEMATIC IN THE RECYCLED WATER USE PLAN FOR TREATMENT AND DISINFECTION COMPONENTS OF THE PLANT.

LEGEND:

- PROPERTY LINE
- SETBACK LINE
- EXISTING IRRIGATION LINE
- EXISTING SEWER FORCE MAIN

PRELIMINARY - NOT FOR CONSTRUCTION

NO.	DATE	BY	APPR	REVISIONS

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0" 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

REGISTERED PROFESSIONAL ENGINEER
OREGON
JULY 21, 2001
E. J. HUFFMAN
PRELIMINARY
RENEWS: JUNE 30, 2017

CITY OF SISTERS INCORPORATED 1946

BECON
549 SW MILL VIEW WAY, SUITE 105
BEND, OREGON 97702
(541) 633-3140
www.beconeng.com

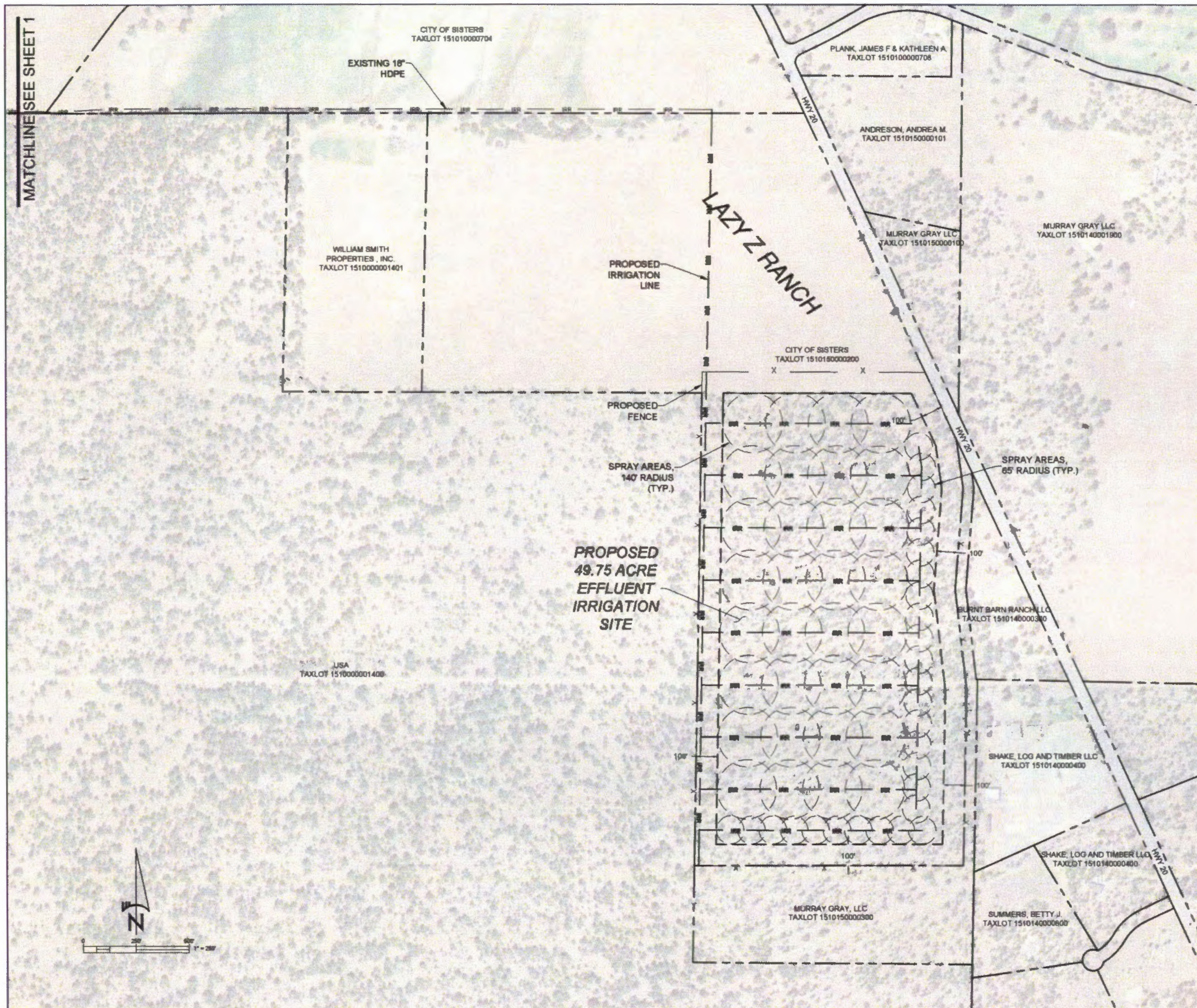
DESIGNED BY	DRAWN BY	CHECKED BY	SCALE
EJH	JLB	EJH	1" = 150'

DATE: 09 - 22 - 2016
PROJECT NO: 13702.118

CITY OF SISTERS
RECYCLED WATER USE PHASE 1 EXPANSION

WASTE WATER TREATMENT PLANT

DRAWING NO: P1
SHEET NO: 1 of 2



SITE NOTES

GENERAL:

OWNER/APPLICANT:	CITY OF SISTERS
PROPERTY:	LAZY Z RANCH
PROPERTY ADDRESS:	68355 HWY 20, SISTERS, OR, 97759
PROPERTY SIZE:	125.68 ACRES
ZONING:	EFUSC
TAXLOT NUMBER:	1510150000200

PHASE 1 EFFLUENT IRRIGATION EXPANSION:

PROJECT AREA:	49.75 ACRES
IRRIGATION PIPE:	≈ 12,660 - LF
PROPERTY LINE SETBACK:	100 - FT

LEGEND:

- PROPERTY LINE
- SETBACK LINE
- PROPOSED EFFLUENT IRRIGATION LINE
- PROPOSED FENCE
- EXISTING IRRIGATION LINE
- SPRAY AREA

PRELIMINARY - NOT FOR CONSTRUCTION

NO	DATE	BY	APPR	REVISIONS

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0" 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

PRELIMINARY
RENEWS: JUNE 30, 2017

CITY OF SISTERS INCORPORATED 1946

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BEND, OREGON 97702
(541) 633-3140
www.beconeng.com

DESIGNED BY	DRAWN BY	CHECKED BY	SCALE
EJH	JLB	EJH	1" = 250'
DATE: 09 - 22 - 2016		PROJECT NO: 13702.119	

CITY OF SISTERS
RECYCLED WATER USE PHASE 1 EXPANSION

SITE PLAN

DRAWING NO: P2

SHEET NO: 2 of 2

2016 Recycled Water Use Plan

City of Sisters, Oregon

October 2016

PREPARED BY:

BECON CIVIL ENGINEERING AND LAND SURVEYING

549 SW MILL VIEW WAY, 105

BEND, OREGON 97702

TABLE OF CONTENTS

Recycled Water Use Plan
For
City of Sisters
WPCF Permit No. 101779
File No. 81850

Facility: City of Sisters Wastewater Treatment Plant
912 S. Locust Street
Sisters, Oregon 97759

Physical Address:
1000 South Locust Street
Sisters, Oregon 97759

Mailing Address:
520 East Cascade, PO Box 39
Sisters, Oregon 97759

Contact: Paul Bertagna
Phone: 541.323.5212
Email: pbertagna@ci.sisters.or.us

October 2016

1.0 INTRODUCTION

1.1 OVERVIEW

The City of Sisters wastewater system operates under a Water Pollution Control Facilities Permit, Number 101779, which was last issued on January 22, 2016. An initial Wastewater Recycled Water use Plan was completed in April of 2002 by HGE Inc. for the irrigation of 100.3-Acres of land in the South ½ of Section 9. For future increase in flows the City is expanding their irrigation reuse sites to include the Lazy Z Ranch property. The property is City owned and includes both: T15, R10, S10; TL 704 (100.26 acres) and T15, R10, S15; TL 200 (125.68 acres) for a total of 225.64 acres. However, only TL 200 has received land use approval, to date, from Deschutes County - signed and dated August 6, 2008. The permit conditions require submission of an updated Recycled Water Use Plan (RWUP) prior to effluent discharge to the new site.

The City of Sisters 2016 Wastewater Capital Facilities plan identify the need to expand their effluent irrigation facilitates to obtain capacity for future flows. A wastewater reuse and conservation planning study, by Newton Consultants, Inc. (2013) was used to determine the feasibility for effluent irrigation in the Lazy Z property. Shown in Figure 1 are the City's existing wastewater system facilities and proposed irrigation expansion sites. Phase 1 (planned for 2017), Phase 2 (planned for 2031), and future phases (after 2035) are incorporated into this Recycled Water Use Plan update.

Recycled water usage of treated effluent will allow the City of Sisters to meet water quality standards of the State of Oregon, and to maintain compliance with conditions of the Water Pollution Control Facilities Permit. ***This RWUP supersedes any previous plans.***

1.2 CONTACTS

The City of Sisters is the end user and recycled water generator for the waste water treatment plant (WWTP), located at the following address:

1000 S Locust St.
Sisters, Oregon 97759

Paul Bertagna is the Public Works Director and WWTP operator, his contact information is listed below:

Director of Public Works
Paul Bertagna
(541) 323-5212
pbertagna@ci.sisters.or.us

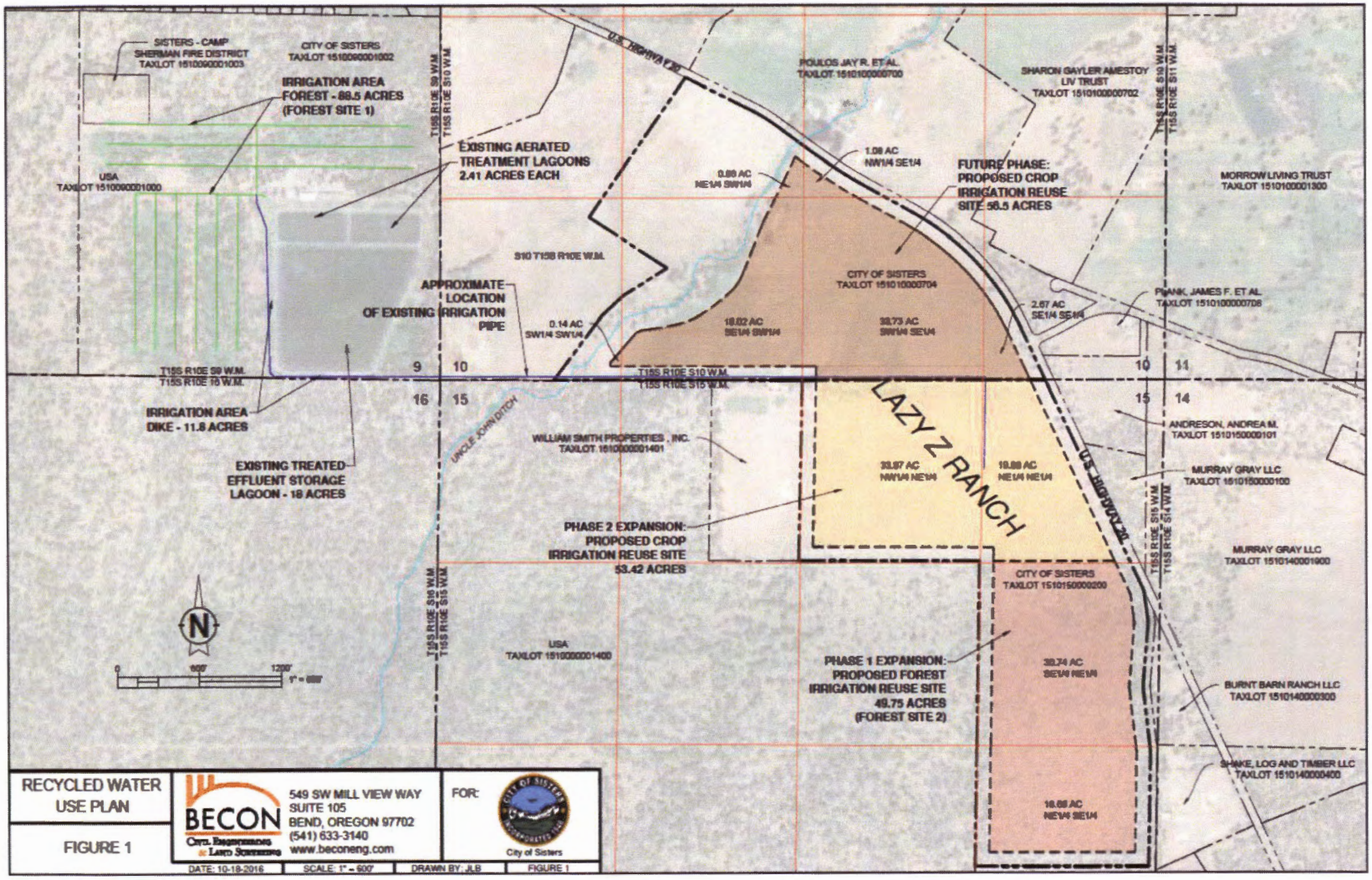

Figure 1: Recycled Water Use Plan Exhibit Map

2.0 BENEFICIAL PURPOSES

Beneficial purposes lie at the core of the recycled water use program and can influence wastewater treatment, monitoring, as well as public health and environmental concerns.

Beneficial Purpose	Class of Water	Quantity (mgd)	Frequency
• Irrigation of orchard grass • Compliance with WPCF permit, and to provide capacity for future wastewater flows.	D	0.522 mgd	April – October

3.0 WASTEWATER TREATMENT

3.1 EXISTING WASTEWATER SYSTEM

The City wastewater system has been operating since 2002. Gravity collection system piping varies from 6" to 24" diameter PVC wastewater mains, with four (4) wastewater pump stations. A 12" diameter pressure main of 9350 lineal feet carries wastewater flows from Pump Station # 1 in the City, directly to the Wastewater Treatment Plant. The wastewater treatment plant is a 3-cell aerated lagoon system with winter holding. Two aerated treatment cells are 2.41 acres, providing for a capacity of 19.5 Ac. Ft. An 18-acre aerated winter holding lagoon is provided for storage, containing 213 Ac. Ft. of storage.

Total inflow for the 2015 year was 70.8 million gallons, with a summer average of 233,570 gpd (gallons per day) and winter average of 153,770 gpd. Shown in Figure 2 is the process schematic for the City of Sisters WWTP.

3.2 EXISTING EFFLUENT IRRIGATION SYSTEM

The existing recycled water use irrigation site is a 108.60-Acre site on the South ½ of Section 9, T15S, 10E, W.M. Land reuse of the stored water is provided on 88.5 acres of natural forest and 11.8 acres of dike and lawn areas (100.3-Acres Total). Application is applied at agronomic rates. The existing (year 2002) recycled water use plan limits irrigation to 13.2 and 47.4 million gallons of dike and forest irrigation respectively. The treatment plant produces Class D quality for both the treated and recycled water. A full copy of the approved WPCF permit is in Appendix C of this document.

The irrigation site surrounds the wastewater treatment and holding ponds. Three separate irrigation systems are provided. Each of the two forest irrigation sites is served by a 10-inch diameter PVC irrigation header from the effluent pumps located in the control building. The dike irrigation system is fed through a looped 4-inch diameter irrigation system. A marking ribbon is buried with the pipe to indicate non-potable water. Two alternating 100 HP pumps are provided to deliver treated recycled water to the forest irrigation system, and a single 15 HP pump is provided to deliver water to the dike irrigation system. An existing pipeline exists on the Lazy Z Ranch property (see Figure I), which may be used for irrigation purposes.

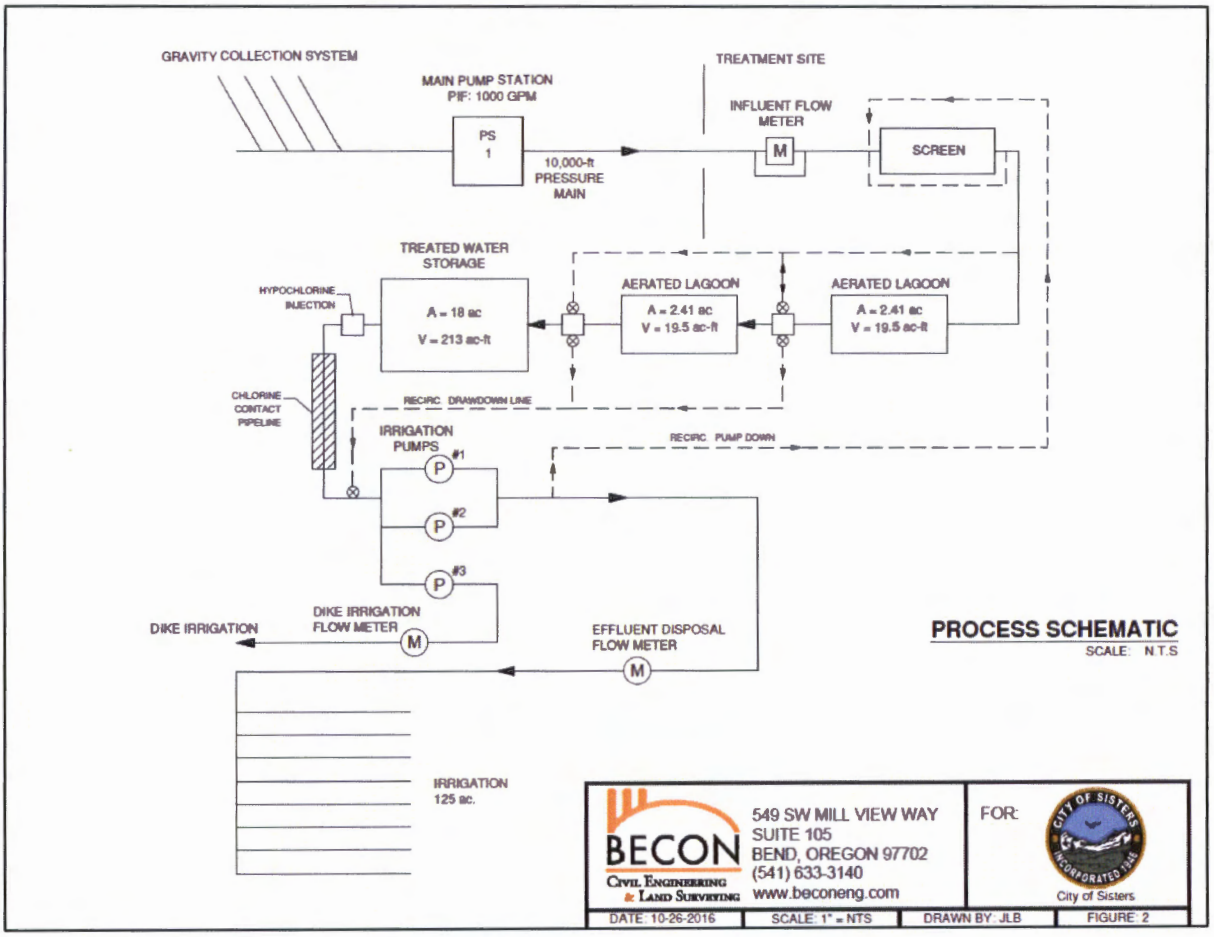

Figure 2: Water Treatment Plant Schematic

3.3 INFLUENT FLOW MEASUREMENT AND SAMPLING

Influent flow measurement is provided in the pump room of the control building for the wastewater treatment plant. The meter is an 8" ASA electromagnetic flow meter which has been calibrated annually since installation. Influent sampling is provided by an ISCO 3710FR refrigerated sampler located in the pump room of the control building at the treatment plant. This is a 24-hour composite sampler which provides composite data for influent BODs and TSS.

3.4 DISINFECTION FACILITIES

Disinfection of effluent at the Sisters plant is provided by chlorination, specifically through sodium hypo-chlorite. Equipment includes a Lightnin chemical mixer, a 500-gallon polyethylene sodium hypo-chlorite tank, a Wallace & Tiernan chemical feed pump, a Grundgs Fost back-up chemical feed pump, a Gas Mastrrr 3-hp flash mixer, a vacuum regulator, rate controller, ejector water supply system, and a chlorine contact pipeline. The chlorine contact pipeline is 1,140 feet of 36" PVC piping buried in the dike along the west side of lagoon # 1 and the holding pond. A Gas Mastrrr Series 32 chlorine induction feeder-flash mixer is provided in the transfer structure from the holding pond to the chlorine contact pipeline. This unit provides a positive flash mix of sodium hypo- chlorite solution which flows through the chlorine contact pipeline toward the land reuse system. A sampling tap is provided on the effluent

(reuse) piping to allow for sampling of effluent pumped from the reuse pumps to either of the two reuse systems provided. Disinfection facilities are controlled through the SCADA system with the PLC provided.

3.5 EFFLUENT REUSE SYSTEM

The effluent reuse facilities are intended to discharge treated and disinfected effluent for land reuse through irrigation of both forest land and lagoon dikes and lawns on the treatment plant site. The effluent reuse system that is in place includes a holding pond for storage, a chlorine contact line for effluent disinfection, three irrigation pumps, a re-circulation system, and a sprinkler system to provide reuse on treatment plant lagoon dikes and lawn areas, and on 88.5 acres of forest land. Additional area for reuse is set aside for buffer to adjacent properties on the North, East and South boundaries of the treatment plant site, in compliance with Oregon DEQ regulations.

Prior to land reuse, the effluent is disinfected in 1,140 feet of 36" chlorine contact line, which provides for a minimum detention time of 60 minutes at peak discharge flows of 1,000 gpm. Sodium hypochlorite from the 500 gallon HDPE storage tank is mixed with effluent from Lagoon No. 3, in the chlorine contact facility. Effluent is discharged to forest land and pond dikes and lawn areas from April 1 to October 31 and stored in the holding pond during the remaining months. The storage lagoon must be lowered sufficiently by the end of the irrigation season to ensure maximum practicable storage capacity during the no irrigation months.

The land reuse system diverts the majority of the effluent to 88.5 acres of forest land, and the remaining to the treatment plant lagoon dikes and lawn areas (11.8 acres). The effluent is pumped to these locations using three pumps. Two 100 HP, 1000 gpm capacity pumps transport effluent to the forest land, while one 15 HP, 125 gpm capacity pushes the water to the dike. The effluent is carried to the forest land in a 10" main line which branches out into 8" lines across the irrigation area. There are flow meters stationed after the pumping facility that are measuring the quantity of effluent traveling to both the forest land and dike.

Both effluent reuse systems provided for discharge from the Sisters WWTP are controlled through the SCADA system, with the Programmable Logic Controller provided. Both the SCADA system and the PLC have been in use since the plant became operational, and equipment of this type and age becomes outdated, is not supported and difficult to repair due to availability of parts. Both the SCADA system and the PLC will need to be replaced in the near future.

3.6 EFFLUENT FLOW MEASUREMENT AND SAMPLING

Effluent flow measurements are provided in the pump room of the control building for the WWTP. Two meters are provided, with one on the dike and lawn reuse system, and one on the forest reuse system. Each meter is an ASA model IF6 electromagnetic flow meter, which have been calibrated annually since installation. Grab samples are taken out of the transfer structure before the effluent enters the chlorine contact line. These samples are then tested for concentration of E.coli. Flow measurements are recorded in the SCADA system provided. Flowmeter performance has been excellent, all the units were rebuilt in 2007 due to the pump building inadvertently flooding. All flow meters are flow tested and calibrated annually to ensure accuracy within specifications.

4.0 RECYCLED WATER MONITORING AND SAMPLING

OAR 340-055 defines the regulations for land application of recycled water.

i. Prior to land application of the recycled water, it must receive at least Class D treatment as defined in OAR 340-055. Class D recycled water must not exceed a 30-day log mean day log mean of 126 E. coli organisms per 100 milliliters and 406 E. coli organisms per 100 milliliters in any single sample. Class C recycled water must not exceed a 7 day median of 23 organisms/100 milliliters and no two consecutive samples must exceed 240 organisms/100 milliliters.

ii. Irrigation must conform to a Recycled Water Use Plan approved by DEQ and meet the required setbacks as defined in OAR 340-055.

iii. The City of Sisters must restrict public access to the reuse site(s) for the protection of public health.

iv. Treated effluent may only be irrigated on land between April 1 through October 31 for dissipation by evapotranspiration and controlled seepage by following sound irrigation practices unless otherwise approved in writing by DEQ.

v. Recycled water equipment must be operated so as to prevent:

   a) Prolonged ponding of treated recycled water on the ground surface;

   b) Surface runoff or subsurface drainage through drainage tile;

   c) The creation of odors, fly and mosquito breeding or other nuisance conditions;

   d) The overloading of land with nutrients, organics, or other pollutant parameters; and

   e) Impairment of existing or potential beneficial uses of groundwater.

   f) Until otherwise approved in writing by the Department via a revised reclaimed water use plan, treated effluent must only be reused on Class D beneficial uses.

4.1 EFFLUENT MONITORING

Monthly discharge monitoring reports (DMR) are sent to the DEQ before the 15th day of the following month providing monitoring and sampling information for the WWTP including the reuse facility as required by the WPCF permit and summarized in Table 1. The recycled water applied to the irrigation field is measured daily when the system is in use. During the irrigation operation in 2015 there was a total of 5.46 and 72.57 million gallons applied to the dike and forest respectively.

Table 1: Recycled Monitoring Program

Item or Parameter	Minimum Frequency	Type of Sample
Total Inflow to WWTP	Daily	Measurement
Total reuse flows (recycled water)	Daily	Measurement
Flow Meter Verification	Annually	Verification
E. Coli	Weekly	Grab
Nitrogen Nitrate (NH_3-N)	Annually	Grab
Inspect Lagoon	Daily	Visual
Inspect Lagoon Liner	Daily	Visual

4.2 WATER QUALITY

Operations have experienced no problems in meeting permit conditions for E. coli. Effluent nutrient data for August 2015 indicated the following: Nitrate Nitrogen (NO_3-N): 0.03 mg/l. Nutrient levels are reasonable and do not raise concerns regarding system performance or effluent loadings.

5.0 SYSTEM MAINTENANCE AND CONTINGENCY PROCEDURES

The WWTP recycled water facilities will be maintained, per OAR 340-055-0025(1)(f), as well as a description of contingency procedures, per OAR 340-055-0025 (1)(d). The City of Sisters has submitted system maintenance and contingency procedures to Oregon DEQ as part of the submittal documents for the WPCF permit in 2002. The City maintains copies of the system maintenance and contingency procedures and are available upon request.

6.0 PUBLIC HEALTH AND ENVIRONMENTAL CONTROLS

6.1 ACCESS AND EXPOSURE CONTROLS

The irrigation sites are on City owned property with the required setbacks for Class D recycled water. Public access is prevented from entry into the existing and proposed area by barb wire fences around the irrigation site, a 6 foot chain link site with barb wire around the treatment plant site, and locked gates for both. Signs are posted around the perimeter of the irrigation field to indicate the water is not safe for drinking and that effluent is being applied as irrigation. Access and exposure are addressed as follows:

- Staff are the only people authorized to enter the site.
- The general public does not have access to the site.
- There are no grazing animals allowed on the site.
- The irrigation water is not used for sod, nursey stock or Christmas trees.
- The irrigation water is not used for commercial or industrial uses.
- The irrigation site is posted.
- All supervisors and staff working near the site are educated regarding access restrictions for this land application site.
- Irrigation over spray shall be monitored during windy days to ensure the buffer zones are not violated. When wind velocities exceed 10 mph, irrigation should stop or be reduced to prevent over spray on neighboring properties if this situation was to occur.
- When winds are high staff will assure that the buffer zones are not violated or the irrigation system will be turned off.
- The lagoon is fenced and gated.

6.2 SETBACKS

The required setbacks for Class D recycled water are as follows (per ORS 340-055-0012):

- 100 feet from the property line
- 100 feet from a water supply
- 70 feet from food preparation sites or drinking fountains.

6.3 NOTIFICATION

OAR 340-055 requires notification of recycled water use. There are two audiences for notification: personnel and the public. The notification methods used for each audience are as follows:

- Personnel:
  - Employees who will be working near the site are educated about the recycled water reuse program.
  - The irrigation site is posted with signs.
- The general public is notified through the WPCF permitting process through the Oregon Department of Environmental Quality.

6.4 SITE MANAGEMENT PRACTICES

Site management practices include the following:

- When using recycled water for irrigation, the perimeter of the site is posted with signs indicating that recycled water is not safe for drinking.
- When the ground is frozen, no irrigation is done.
- If the wind is high, no irrigation is done.
- Irrigation is done only when maintenance staff are on duty.
- Irrigation of fodder, fiber, seed crops not intended for human ingestion, sod, commercial timber, firewood, ornamental nursery stock, or Christmas trees is prohibited for three days before harvesting.

7.0 LAND APPLICATION PLAN

OAR 340-055-0025(2)(a) establishes additional requirements for recycled water use plans when conventional irrigation is used. In general, this includes a site characterization, description of the irrigation system, soils and crops, application rates, site management practices and public access control. Some of these items have already been described, such as the system description (Section 3), and site management and public access control (Section 6). The reader may refer to earlier sections of this plan for these items.

7.1 PROPOSED EFFLUENT IRRIGATION EXPANSION

The proposed recycled water use irrigation site, also known as the Lazy Z Ranch property, is approximately 225.6-Acres and located directly east from the existing Wastewater Treatment Plant. The site is divided into 2 lots, T15, R10, S10; TL (Taxlot) 704 (100.26 acres) and T15, R10, S15; TL 200 (125.68 acres) for a total of 225.64 acres (See Figure 1). The city anticipates using the 49.75-Acres forested area (Phase 1) and a 53.42-Acre crop land area (Phase 2) for effluent irrigation.

The Lazy Z Ranch property provides multiple possibilities for effluent reuse expansion. Both forest irrigation and crop irrigation sites are available. Both Phase 1 and Phase 2 have been incorporated into this Recycle Water Use Plan update.

A flow balance is provided in Table A and Table B (see Appendix B), considering available holding capacity and effluent reuse through the constructed irrigation systems described previously. The flow balance was developed assuming a lifetime for the effluent system of 10 and 20 years, to the year 2025 and 2035 respectively. Assuming that growth projections are accurate, and that estimated agronomic usage of the recycled water are accurate, the existing facilities cannot provide adequate area for disposal of flows.

In the 2025 water balance (Table A) the existing effluent irrigation system will continue to operate at threshold levels (see Table 1). The Phase 1 expansion site (Forest Site 2) will operate at irrigation rates necessary to lower the holding pond storage to the initial depth (6'). As shown in the 2035 water balance (Table B), the forest sites and the dike will operate at the irrigation application limit. The crop site will operate at irrigation rates required to lower the holding pond storage to the initial depth (6.0'). Irrigation discharge may be modified if necessary as long as the application rates in Table 2 are not exceeded on any give season, peak month, and peak day.

7.1.1 Phase 1 – Forest Irrigation Effluent Expansion – TL 200

A 49.75-Acre forested area is available for effluent irrigation at the southeast corner of the Lazy Z Ranch property. The Phase 1 effluent expansion will be fully implemented during 2017. Phase 1 is included in the 2025 and 2035 water balance computations for this Recycled Water Use Plan update (Table A and B).

7.1.2 Phase 2 – Future Crop Irrigation Effluent Expansion – TL 200

A 53.42-Acre crop land area is available for effluent irrigation in the southeast portion of the Lazy Z Ranch property. It is anticipated that this area would have a permitted application rate of 25.5 inches per

year and could be connected to the existing pipeline which terminates in the center of the site. A wastewater reuse study by Newton Consultants Inc., completed in June 2013, identified multiple crop irrigation applications, grass crop is assumed. The City anticipates to implement Phase 2 by 2031. Phase 2 was incorporated into the water balance computations for 2035 conditions. Phase 2 will conform to DEQ requirements for Class D recycled water.

7.1.3 Future Phase – Future Crop Irrigation Effluent Expansion – TL 704

An additional 56.5-Acres of land is available for crop irrigation. The wastewater reuse study by Newton Consultants Inc., identified multiple crop irrigation applications, all to take place after 2035. The Future Phase was included in the water balance computations for 2035 conditions. The future phase will conform to DEQ requirements for Class D recycled water.

7.2 SITE CHARACTERIZATION

A USGS topo map, NRCS soil maps, and soil series descriptions for the proposed area described are included in Appendix A. The proposed irrigation expansion site (TL 200 described above) is located at 68355 HWY 20, Sisters, Oregon 97759. The site has the following characteristics:

- Land Use Zone: Exclusive Farm Use (to be rezoned to Public Facilities prior to any irrigation expansion activity).
- Size: 125.68 Acres

Rain fall and evaporation data was obtained from the Western Regional Climate Center (WRCC 2016).

- Annual Average Rainfall: 13.5 inches
- Annual Evaporation: 51.68 inches
- Average Annual Temperatures: average annual max – 84.4°F, average annual Min – 20.9°F
- Topography: Slope is roughly 0 – 2.5%
- Elevation: 3180-FT to 3230-FT
- Setbacks from property Line: 100-FT
- Not located in a flood plain.
- Depth to Groundwater: Based on City well logs, depth varies from 63 – 113 feet.
- Winter ground can be frozen.
- Winds can be moderate. Prevailing wind direction is north per the National Oceanic and Atmospheric Administration (NOAA 2016).

The 2002 Wastewater Reclaimed Water Use Plan calculated an application rate of 28.79-in/acre per season in the Dike and 14.3-inches/acre per season in the forest (an efficiency coefficient of 70% was applied to compensate for evaporation losses during the application). The City now uses an efficiency coefficient of 75% for all future planning purposes. Application rate limits (using a 75% efficiency coefficient) per the Soil and Water Reuse Reports, prepared by Wert & Associates, Inc. (1998 and 2007) are shown in Table 2 below:

Table 2: Irrigation Application Rate Limits

Application	Dike	Forest	Crop
Seasonal Amount	34"	19.1"	34"

Peak Month (July)	8.3"	7.3"	8.3"
Peak Daily	0.4"	0.2"	0.4"

7.3 PHASE 1: FOREST EFFLUENT IRRIGATION EXPANSION

The City will expand their irrigation to the 49.75 – Acre site at the southeast corner of the Lazy Z Ranch Property. Using data from existing Lagoons, the wastewater will contain:

NO_3-	0.5 mg/l
NH_4	0.5 mg/l
TKN	9.0 mg/l
Total Nitrogen:	10 mg/l

- Water Application:
  - There are no Oregon State University extension bulletins for water consumption of the existing stand of ponderosa pine, lodgepole pine, pine-sage, and bitter brush. Literature review was made by Wert and Associates, Inc. (1998) to determine application rates.
  - Total Irrigated area is 49.75 – Acres with Setbacks.
  - See water balance computations in Appendix B for application rates per month.
  - The peak daily irrigation rate shall be 0.2", or 290,096 gpd.
  - The total irrigation volume is 19.10 inches over a 7-month period (April – October). The amount applied through irrigation is within the applications rate limits (see Table 2).
- Nitrogen Loading:
  - Based on literature and Wert and Associates, Inc. (1998) concluded that applying 1.3 Acre-Feet of wastewater to the existing forest will add 35 lbs of available nitrogen per acre. Based on this result, 2132 lbs of organic nitrogen loading will be applied to the site per year.
  - Total volume applied is 25,802,683 gallons or 97,637,780 liters.

    Nitrogen loading in mg: 967,060,000 mg

    Total concentration = 9.9 mg/l (less than 10 mg/L)
- Cropping Program:
  - The site will be mowed 2 to 3 times per irrigation season. Mowing's will be disposed of or moved to a non-irrigation site. Herbicides will be applied annually to control weeds.

7.4 PHASE 2: CROP EFFLUENT IRRGATION EXPANSION

The 53.42-Acre site will be planted with hay/alfalfa/grass. No other crops are proposed. Using data from existing Lagoons, the wastewater will contain:

NO3	0.5 mg/l
NH_4	0.5 mg/l
TKN	9.0 mg/l
Total Nitrogen:	10 mg/l

- Water Application:
  - Consumptive use rates by month for pasture grasses grown in the Bend/Sisters are were taken from Oregon State University Extension Bulletin 8530.
  - Total irrigated area is 53.42 – Acres (with setbacks).
  - The crop will require about 3" of water per month (see water balance computation in Appendix B).
  - The peak daily irrigation rate shall be 0.4 inches or 580,193 gpd (see Table 2).
  - The total irrigation volume is 19.50 inches over a 7-month period (April – October). The amount applied through irrigation is within the applications rate limits (see Table 2).
- Nitrogen Loading:
  - Per the 2007 Soil and Water Reuse Report by Wert and Associates, Inc., the average organic concentration of 10 mg/l or 27 lbs of nitrogen per 1 Acre-Foot of wastewater. Oregon State University recommends orchard grass for the site. For orchard grass, 3 Acre-Feet/Acre of wastewater will be applied which will contain 81 pounds of organic nitrogen per acre.
  - The calculated irrigation discharge is 19.5 inches per year, or 86.8 Acre-Feet, which is equivalent to 2344 lbs of organic nitrogen loading per year.
  - Total volume applied is 11,695,352 gallons or 44,271,723 liters.

    Nitrogen loading in mg: 1,063,200,000 mg

    Total concentration = 5.6 mg/l (less than 10 mg/L)
  - The orchard grass will need an additional 119 lb/acre of nitrogen fertilizer.
- Cropping Program:
  - The crop will absorb nutrients, be harvested and be removed from the site for beneficial use.

7.5 IRRIGATION MANAGEMENT AND SCHEDULING

7.5.1 Irrigation Site: Startup

During each startup of either irrigation system, the chief operator should make certain that disinfection facilities are fully operational, and should verify that water quality testing is provided to assure compliance with the WPCF permit conditions. This will require activation of the chlorination system provided, and testing to assure that permit conditions are being met prior to discharge of the treated effluent for reuse purposes.

7.5.2 Irrigation Site: Field Observations

During April through October, field observations should be made daily, or when effluent reuse is being utilized, of the site for evidence of runoff. All irrigation water must percolate into the ground for usage by the disposal site. The irrigation rate must be maintained at agronomic rates. Aerosol drift from the application site should be observed and reported if excessive distances are observed. A wind monitoring system is provided from the weather station, and should function to limit irrigation during periods when excessive wind conditions are experienced on site.

7.5.3 Recording: Verification of Permit Conditions prior to Disposal

The City should maintain records of water quality testing at any time that effluent reuse is anticipated for either of the irrigation sites provided. Compliance will be required for both E.coli, and for total coliform, and actual testing data should be reported on the Daily Monitoring Report, for submittal to the Oregon Department of Environmental Quality on a monthly basis.

7.5.4 Recording: Flow Meter Records, Pump Time and Rainfall

The City should maintain influent and effluent flow meter records for all flow meters provided, with information provided through physical measurements verified against records maintained in the SCADA system provided. Similar records should be maintained for daily pump times and rainfall monitored during the irrigation period. Operational records and rainfall shall be recorded in order to review final management of reclaimed water usage and potential operational requirements. Since irrigation needs will be limited to specific application periods, the irrigation equipment can be operated through the SCADA system to apply effluent reuse when irrigation can best be applied for beneficial usage, with storage being maintained in the interim.

7.5.5 Operational Conditions

City staff should maintain records for operational conditions on the effluent reuse sites. Records shall include: 1) amount of effluent applied to each irrigation site, 2) ability to control storage and irrigation needs, and 3) agricultural concerns or benefits with water available for effluent reuse.

7.5.6 Summary of Record-Keeping

Reporting of water quality testing as addressed by the WPCF permit, (E. coli and coliform), irrigation site field observations, and operational conditions will be important for long term operation of the reclaimed water use site. Effluent flow meter readings and rainfall will need to be recorded daily.

- A summary of the reporting needs is as follows:
- Daily influent flows, in gpd, into the Wastewater Treatment Facility
- Daily water quality E.coli numbers to show compliance with permit conditions
- Daily water quality coliform numbers to show compliance with permit conditions
- Daily effluent flow meter records for the effluent irrigation and disposal systems
- Daily pump records, in hours, for each of the irrigation pumps being utilized
- Daily rainfall volumes, in 1/100th inches
- Irrigation rates and volumes on a daily basis
- Field observations of potential locations for runoff, and photos of any runoff occurrences

7.6 SITE MONITORING PLAN

Soil sampling will be used to monitor the nutrient balance with regards to the soil fertility of the sites. Soil sampling will take place at all forest and crop effluent irrigation sites. The sampling procedure shall be per section 7.6.1, or per the latest Oregon State University (OSU) Extension Service soil sampling guide.

7.6.1 General Soil Sampling Procedures

On forest sites sampling shall be done along one irrigation line for uniformity and consistency. On crop sites sampling shall be done in a simple random pattern. At least 30 samples shall be taken from each effluent irrigation site. Sampling shall be conducted every two years in the forest sites and annually in the crop sites. Sampling will take place at the end of each irrigation season (November). The soil sampling process is listed below:

1. Proper information and materials shall be obtained (Education Extension from OSU).
2. Proper sampling tools/equipment shall be used (e.g. soil auger, shovel, bucket etc.). Equipment must be clean, specifically free of fertilizer. Galvanized buckets or rusted tools/equipment shall not be used. Tools shall be used properly.
3. Unusual areas shall be avoided. This includes but is not limited to abandoned farmsteads, feed lots, manure piles, fences eroded knolls, low areas, and salty or wet spots shall be avoided or sampled separately.
4. Sites shall be divided into areas for sampling. (i.e. Forest Site 1, Forest Site 2, Crop Site 1 etc.).
5. Samples shall be taken to a 3-ft depth at 1-ft increments (1st sample at 1-ft depth, 2nd sample at 2-ft depth etc.).
6. Composite samples shall be analyzed for each site. The composite sample is a mixture of all the samples within the site. The composite sample shall be well mixed.
7. Moist soil samples shall be kept cool at all times (during and after sampling). Samples can be frozen or refrigerated for extended periods of time without adverse effects. If samples cannot be refrigerated or frozen after collection, they shall be air dried or taken directly to the testing laboratory.
8. All data shall be collected, stored, and documented.

7.6.2 Soil Sample Analysis

The City shall sample for nitrate (NO_{3-}), nitrite (NO_{2-}), ammonia (NH_4), Total Kjeldahl Nitrogen (TKN), and phosphorus (P). Samples shall be sent to laboratories that are certified by the North American Proficiency Testing (NAPT) program. The NH_4 will be lost to vitalization when it is irrigated. Most of the nitrogen will be in the form of algae cells. When the algae is spread on the soil it will be mineralized into forms available to plants. (Wert, 2007).

REFERENCES

*References available upon request.

Huffman, E.J. "Wastewater System Capital Facilities Plan Update." *City of Sisters*. (February 2016).

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Nored, R.D. "Wastewater Reclaimed Water Use Plan." *HGE, Inc.* (April 2002).

Wert, S. "Soil and Water Reuse Report for Sister Wastewater Project." *Wert & Associates, Inc.* (February 1998).Print.

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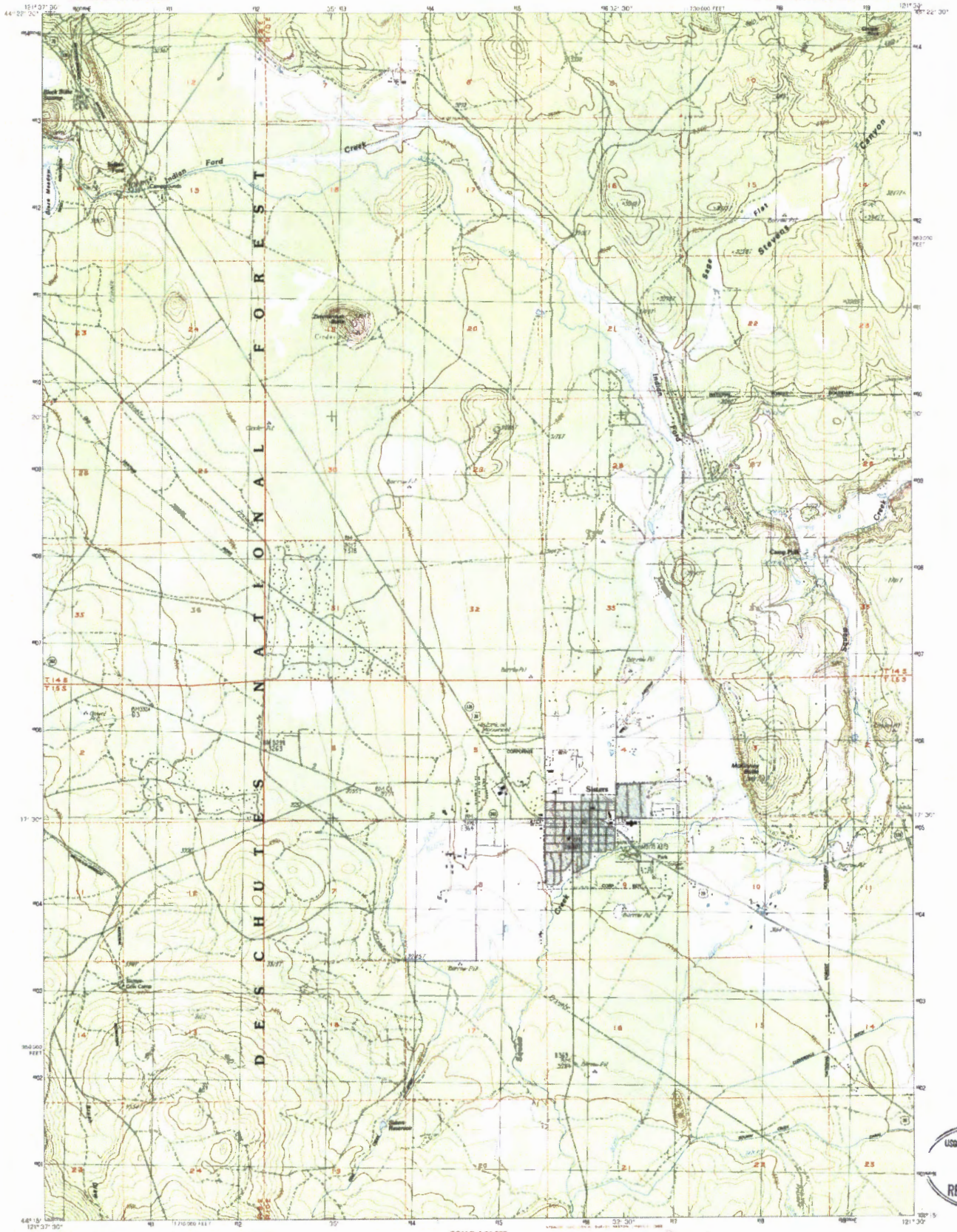
WRCC. "Period of Record Monthly Climate Summary." *Western Regional Climate Center*. < http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?or7857> (Accessed August 2016). Web.

APPENDIX A

- USGS Topo Maps
- NRCS soil maps, and soil series descriptions

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SISTERS QUADRANGLE
OREGON—DESCHUTES CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)



PRODUCED BY THE UNITED STATES GEOLOGICAL SURVEY
CONTROL BY ..... USGS, NOAA/NOAA AND STATE OF OREGON
COMPILED FROM AERIAL PHOTOGRAPHS TAKEN 1951
FIELD CHECKED 1956
LIMITED REVISION FROM AERIAL PHOTOGRAPHS TAKEN 1982 AND 84
FIELD CHECKED ..... 1985, MAP EDITED 1988
PROJECTION ..... LAMBERT CONFORMAL CONIC
GRID 1000-METER UNIVERSAL TRANSVERSE MERCATOR ..... ZONE 10
10000-FOOT STATE GRID TICKS ..... OREG. SOUTH ZONE
UTM GRID DESIGNATION 10T
1988 MAGNETIC NORTH DECLINATION ..... 17°09' EAST
VERTICAL DATUM ..... NATIONAL GEODETIC VERTICAL DATUM OF 1929
HORIZONTAL DATUM ..... 1927 NORTH AMERICAN DATUM

To place on the predicted North American Datum of 1983, move the projection lines as shown by dashed corner ticks (23 meters north and 92 meters east)

There may be private inholdings within the boundaries of any Federal and State Reservation shown on this map

Public Land Survey System is shown as published in 1959 and unified or supplemented in 1988

No distinction made between levees, berms, and other buildings

PROVISIONAL MAP
Produced from original manuscript drawings. Information shown as of date of field check.

SCALE 1:24 000

CONTOUR INTERVAL 20 FEET
SUPPLEMENTARY CONTOUR INTERVAL 10 FEET

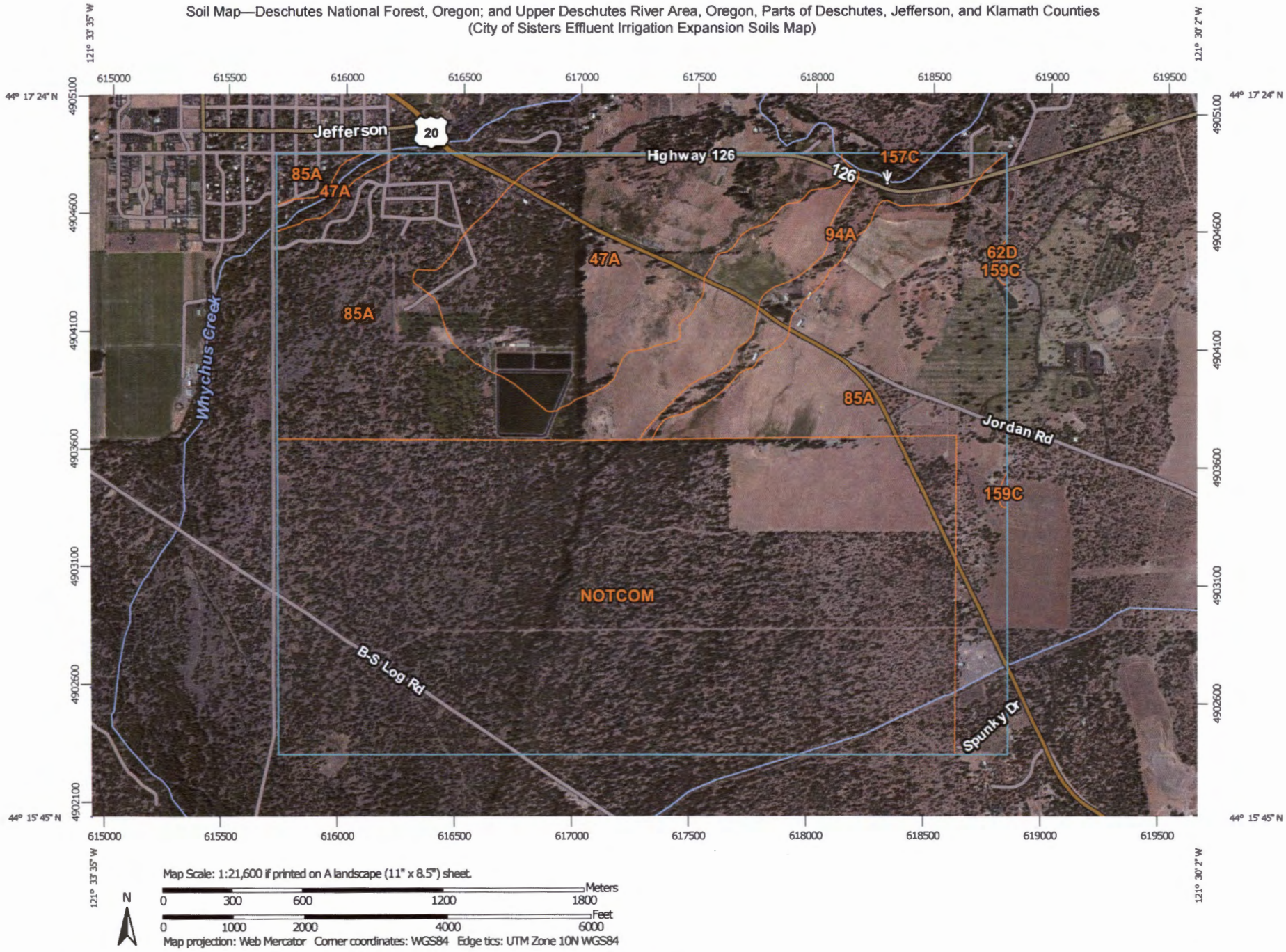
THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U. S. GEOLOGICAL SURVEY, DENVER, COLORADO 80225, OR RESTON, VIRGINIA 22092

ADJOINING 7.5 QUADRANGLE NAMES
1. Black Butte
2. Little Squaw Back
3. Squaw Back Ridge
4. Black Canyon
5. Tumalo Butte
6. Grant Creek Butte
7. Three Creek Butte
8. Tumalo Basin

ROAD LEGEND
Improved Road .....
Unimproved Road .....
Trail .....
Interstate Route ○ U.S. Route ○ State Route

SISTERS, OREG.
PROVISIONAL EDITION 1988
46181-C3-TF-024

Soil Map—Deschutes National Forest, Oregon; and Upper Deschutes River Area, Oregon, Parts of Deschutes, Jefferson, and Klamath Counties
(City of Sisters Effluent Irrigation Expansion Soils Map)



MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Deschutes National Forest, Oregon
Survey Area Data: Version 2, Dec 5, 2013

Soil Survey Area: Upper Deschutes River Area, Oregon, Parts of Deschutes, Jefferson, and Klamath Counties
Survey Area Data: Version 11, Sep 18, 2015

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 20, 2010—Sep 4, 2010

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Deschutes National Forest, Oregon (OR605)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
NOTCOM	No Digital Data Available	960.8	48.8%
Subtotals for Soil Survey Area		**960.8**	**48.8%**
Totals for Area of Interest		**1,967.4**	**100.0%**

Upper Deschutes River Area, Oregon, Parts of Deschutes, Jefferson, and Klamath Counties (OR620)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
47A	Ermabell loamy fine sand, 0 to 3 percent slopes	283.0	14.4%
62D	Henkle-Lava flows-Fryrear complex, 15 to 50 percent slopes	0.7	0.0%
85A	Lundgren sandy loam, 0 to 3 percent slopes	658.1	33.5%
94A	Omahaling fine sandy loam, 0 to 5 percent slopes	61.9	3.1%
157C	Wanoga-Fremkle-Rock outcrop complex, 0 to 15 percent slopes	0.7	0.0%
159C	Wilt sandy loam, 0 to 15 percent slopes	2.2	0.1%
Subtotals for Soil Survey Area		**1,006.6**	**51.2%**
Totals for Area of Interest		**1,967.4**	**100.0%**

APPENDIX B

- Water balance computations for 2025 and 2035 conditions.

City of Sisters Recycled Water Use Plan

Table I

Water Balance for Aerated Treatment, Holding, and Irrigation (2025 Conditions) - Balance Including Evaporation on Treatment and Holding Ponds

Holding Pond Constants:
*Assume 6' Water on 10/01 for Start

Treatment Pond Constants:
Water Surface Area 4.82 ac

Annual Irrigation:

Forest Irrigation Site 1	88.5	ac
Forest Irrigation Site 2	49.75	ac
Dike Irrigation	11.8	ac

Crop: Forest Land With Dike Irrigation System

Crop Irrigation Req. Dike	25.5	in/acre
Forest Site 1	14.3	in/acre
Forest Site 2	10.5	in/acre

Mo.	Holding Pond Initial Volume (Ac-ft)	Initial Depth flow (ft) [1]	Influent Flow (gpd)	Monthly Influent Flow (Ac-ft)	Rainfall (in)	Evaporation from Ponds (in)	Net (in)	Net Ponds Evap. (Ac-ft)	Irrigation Discharge Forest Site 1 (Ac-ft)	Irrigation Discharge Forest Site 2 (Ac-ft)	Irrigation Discharge Dikes (Ac-ft)	Final Volume (Ac-ft)	Final Depth (ft)		Irrigation Discharge Forest Site 1 (in/acre)	Irrigation Discharge Forest Site 2 (in/acre)	Irrigation Discharge Dikes (in/acre)
Oct.	30.07	6.00	253833.49	24.15	0.95	3.29	-2.34	-3.92	0.00	0.00	2.95	47.35	7.12		0.00	0.00	3.00
Nov.	47.35	7.12	255011.19	23.48	2.10	1.80	0.30	0.51	0.00	0.00	0.00	71.34	8.65		0.00	0.00	0.00
Dec.	71.34	8.65	258576.80	24.60	2.27	0.00	2.27	3.91	0.00	0.00	0.00	99.86	10.42		0.00	0.00	0.00
Jan.	99.86	10.42	251085.03	23.89	2.24	0.00	2.24	3.94	0.00	0.00	0.00	127.69	12.12		0.00	0.00	0.00
Feb.	127.69	12.12	244023.90	20.97	1.45	0.00	1.45	2.60	0.00	0.00	0.00	151.25	13.51		0.00	0.00	0.00
Mar.	151.25	13.51	256936.59	24.45	1.12	0.00	1.12	2.04	0.00	0.00	0.00	177.74	15.05		0.00	0.00	0.00
Apr.	177.74	15.05	250384.62	23.05	0.79	5.26	-4.47	-8.27	7.38	4.15	2.95	178.05	15.07		1.00	1.00	3.00
May	178.05	15.07	259330.41	24.67	0.78	7.25	-6.47	-11.97	14.75	8.29	2.95	164.77	14.30		2.00	2.00	4.25
June	164.77	14.30	297566.50	27.40	0.61	8.70	-8.09	-14.84	25.81	14.51	4.18	132.82	12.42		3.50	3.50	5.50
July	132.82	12.42	303571.73	28.88	0.38	10.17	-9.79	-17.60	36.88	16.58	5.41	85.24	9.52		5.00	4.00	6.00
Aug.	85.24	9.52	288543.87	27.45	0.41	9.06	-8.65	-15.06	29.50	8.29	5.90	53.94	7.55		4.00	2.00	7.50
Sept.	53.94	7.55	278602.13	25.65	0.40	6.15	-5.75	-9.79	26.55	6.22	7.38	29.66	5.97		3.60	1.50	4.75
Total				298.65	13.5	51.68	-38.18	-68.44	140.9	58.0	31.7				19.1	14.0	34.0
														75% Efficiency	14.33	10.50	25.50

Notes: 1. Depth at deep end. 4.0 foot depth corresponds to 0.0 foot depth at shallow end of pond. The end of season depth is approximately 6 feet in order to keep the surface aerators in operation and to avoid the need for removing the unutilized aerators prior to the pond freezing over.
2. Application rates in water balance are lower than allowable rates. See Section 6.1 for allowable application rates in each area.

Table II

Water Balance for Aerated Treatment, Holding, and Irrigation (2035 Conditions) - Balance Including Evaporation on Treatment and Holding Ponds

Holding Pond Constants:
*Assume 6' Water on 10/01 for Start

Treatment Pond Constants:
Water Surface Area 4.82 ac

Annual Irrigation:

Forest Irrigation Site 1	88.5	ac
Forest Irrigation Site 2	49.75	ac
Dike Irrigation	11.8	ac
Crop	53.42	ac

Irrigation Required:

Dike	25.5	in/acre
Forest Site 1	14.3	in/acre
Forest Site 2	14.3	in/acre
Crop	14.6	in/acre

Mo.	Holding Pond Initial Volume (Ac-ft)	Initial Depth flow (ft) [1]	Influent Flow (gpd)	Monthly Influent Flow (Ac-ft)	Rainfall (in)	Evaporation from Ponds (in)	Net (in)	Net Ponds Evap. (Ac-ft)	Irrigation Discharge Forest Site 1 (Ac-ft)	Irrigation Discharge Forest Site 2 (Ac-ft)	Irrigation Discharge Dikes (Ac-ft)	Irrigation Discharge Crop (Ac-ft)	Final Volume (Ac-ft)	Final Depth (ft)		Irrigation Discharge Forest Site 1 (in/acre)	Irrigation Discharge Forest Site 2 (in/acre)	Irrigation Discharge Dikes (in/acre)	Irrigation Discharge Crop (in/acre) [2]
Oct.	30.07	6.00	348825.48	33.19	0.95	3.29	-2.34	-3.92	9.96	5.60	2.46	11.13	30.20	6.01		1.35	1.35	2.50	2.50
Nov.	30.20	6.01	350443.91	32.27	2.10	1.80	0.30	0.50	0.00	0.00	0.00	0.00	62.97	8.12		0.00	0.00	0.00	0.00
Dec.	62.97	8.12	355343.87	33.81	2.27	0.00	2.27	3.89	0.00	0.00	0.00	0.00	100.67	10.47		0.00	0.00	0.00	0.00
Jan.	100.67	10.47	345048.46	32.83	2.24	0.00	2.24	3.94	0.00	0.00	0.00	0.00	137.44	12.70		0.00	0.00	0.00	0.00
Feb.	137.44	12.70	335344.85	28.82	1.45	0.00	1.45	2.61	0.00	0.00	0.00	0.00	168.87	14.54		0.00	0.00	0.00	0.00
Mar.	168.87	14.54	353089.85	33.59	1.12	0.00	1.12	2.06	0.00	0.00	0.00	0.00	204.53	16.58		0.00	0.00	0.00	0.00
Apr.	204.53	16.58	344085.93	31.68	0.79	5.26	-4.47	-8.40	18.44	10.36	4.43	14.47	180.11	15.19		2.50	2.50	4.50	3.25
May	180.11	15.19	356379.50	33.91	0.78	7.25	-6.47	-11.98	22.13	12.44	4.43	13.36	149.69	13.42		3.00	3.00	5.00	3.00
June	149.69	13.42	408924.67	37.65	0.61	8.70	-8.09	-14.70	29.50	16.58	4.92	11.13	110.51	11.08		4.00	4.00	6.00	2.50
July	110.51	11.08	417177.24	39.69	0.38	10.17	-9.79	-17.34	36.88	20.73	5.90	12.24	57.11	7.75		5.00	5.00	8.00	2.75
Aug.	57.11	7.75	396525.50	37.73	0.41	9.06	-8.65	-14.76	18.44	10.36	7.87	12.24	31.16	6.07		2.50	2.50	6.00	2.75
Sept.	31.16	6.07	382863.27	35.25	0.40	6.15	-5.75	-9.63	5.53	3.11	5.90	12.24	30.00	6.00		0.75	0.75	2.00	2.75
Total				410.41	13.50	51.68	38.18	-67.73	140.9	79.2	35.9	86.8				19.10	19.10	34.00	19.50
															75% Efficiency	**14.33**	**14.33**	**25.50**	**14.63**

Notes: 1. Depth at deep end. 4.0 foot depth corresponds to 0.0 foot depth at shallow end of pond. The end of season depth is approximately 6 feet in order to keep the surface aerators in operation and to avoid the need for removing the unutilized aerators prior to the pond freezing over.
2. Application rates in water balance are lower than allowable rates. See Section 6.1 for allowable application rates in each area.

APPENDIX C

Water Pollution Control Facilities (WPCF) Permit No. 101779, Expires December 31, 2025.

WATER POLLUTION CONTROL FACILITIES PERMIT

Department of Environmental Quality
475 NE Bellevue Dr. Suite 110, Bend, OR 97701
Telephone: 541-388-6146
(541) 388-6146
Issued pursuant to ORS 468B.050

ISSUED TO:

City of Sisters
P.O. Box 39
Sisters, OR 97759

SOURCES COVERED BY THIS PERMIT:

Type of Waste	Outfall Number	Method of Disposal
Domestic Sewage	001	Recycled Water Reuse

SYSTEM TYPE AND LOCATION:

Domestic Sewage Lagoons
912 S. Locust Street
T15S, R10 EWM, S09; TL 1002
Longitude -121.538480;
Latitude 44.280506
Sisters, Oregon

RIVER BASIN INFORMATION:

Basin: Deschutes
Sub-Basin: Upper Deschutes
LLID: 1213357444600-20.47-N
County: Deschutes
Nearest surface stream which would receive waste if it were to discharge: Whychus Creek formally called Squaw Creek

Treatment System Class: I
Collection System Class: II

Issued in response to Application No. 968002 received December 17, 2010.

This permit is issued based on the land use findings in the permit record.

Don Butcher, Water Quality Permit Manager
Eastern Region

January 22, 2016
Date

PERMITTED ACTIVITIES

Until this permit expires or is modified or revoked, the permittee is authorized to construct, install, modify, or operate a wastewater collection, treatment, control and disposal system in conformance with all the requirements, limitations, and conditions set forth in the attached schedules as follows:

All direct a discharge to surface waters is prohibited.

SCHEDULE A

Waste Disposal Limitations

1. The permittee is authorized to construct, operate, and maintain wastewater collection, treatment and disposal systems to serve the City of Sisters in accordance with the conditions set forth in this permit.

2. The wastewater collections, treatment and land application system must not be hydraulically or organically loaded in excess of their respective, DEQ approved design capacities. At full build-out, however, the annual average daily influent flow must not exceed 0.38 MGD.

3. All wastewater treatment and disposal systems must be operated in compliance with the following conditions:

   a. No discharge to state waters is permitted. All wastewater must be stored and treated for disposal by land application following sound irrigation practices.

   b. Recycled Wastewater
      i. Prior to land application of the recycled water, it must receive at least Class D treatment as defined in OAR 340-055. Class D recycled water must not exceed a 30-day log mean of 126 E. coli organisms per 100 milliliters and 406 E. coli organisms per 100 milliliters in any single sample. Class C recycled water must not exceed a 7 day median of 23 organisms/100 milliliters and no two consecutive samples must exceed 240 organisms/100 milliliters.
      ii. Irrigation must conform to a Recycled Water Use Plan approved by DEQ and meet the required setbacks as defined in OAR 340-055.
      iii. The City of Sisters must restrict public access to the reuse site(s) for the protection of public health.
      iv. Treated effluent may only be irrigated on land between April 1 through October 31 for dissipation by evapotranspiration and controlled seepage by following sound irrigation practices unless otherwise approved in writing by DEQ.
      v. Recycled water equipment must be operated so as to prevent:
         (A) Prolonged ponding of treated recycled water on the ground surface;
         (B) Surface runoff or subsurface drainage through drainage tile;
         (C) The creation of odors, fly and mosquito breeding or other nuisance conditions;
         (D) The overloading of land with nutrients, organics, or other pollutant parameters; and
         (E) Impairment of existing or potential beneficial uses of groundwater.
         (F) Until otherwise approved in writing by the Department via a revised reclaimed water use plan, treated effluent must only be reused on Class D beneficial uses.

4. The storage lagoon must be lowered sufficiently by the end of the irrigation season to ensure maximum practicable storage capacity during the non-irrigation months.

5. The permittee must, during all times of treatment and disposal, provide personnel whose primary responsibilities are to assure the continuous performance of the disposal system in accordance with the conditions of this permit.

6. No activities must be conducted that could cause an adverse impact on existing or potential beneficial uses of groundwater. All wastewater and process related residuals must be managed and disposed in a manner that will prevent a violation of the Groundwater Quality Protection Rules (OAR 340-040).

SCHEDULE B

1. System Monitoring Requirements

The permittee must monitor the operation and efficiency of all treatment and disposal facilities. Sampling and measurements taken as required herein must be representative of the nature of the wastewater, and must be taken under normal operating conditions. Unless otherwise agreed to in writing by the Department of Environmental Quality, data collected, and submitted must include but not necessarily be limited to the following parameters and minimum frequencies:

a. Influent Monitoring and Reporting Requirements

Table B 1: Influent Monitoring

Item or Parameter	Time Period	Minimum Frequency	Sample Type/Required Action	Report
Total Flow (MGD)	Year-round	Daily	Measurement	Daily totals Monthly maximum Monthly minimum Monthly average Monthly total
Flow Meter Verification	Year-round	Annually	Verification	Completed or not completed (Pass, Fail)
BOD_5 and TSS (mg/L)	Year-round	Weekly	Composite	Monthly averages Weekly values
pH (S.U.)	Year-round	3/week	Grab	Monthly maximum Monthly minimum Monthly average

b. Recycled Water Monitoring Requirements:

Table B2: Recycled Water Monitoring

Item or Parameter	Minimum Frequency	Sample Type/Required Action
Total Flow (MGD) or Quantity Irrigated (in/ac)	Daily	Measurement
Flow Meter Calibration	Annually	Verification
Chlorine, Total Residual (mg/L)	Daily	Grab
pH	3/Week	Grab
E. coli Bacteria	1/Week	Grab*
Total Coliform	1/Week	Grab*
Total P and Total N	Annually	Grab
Annual Irigation		

*The permittee is only required to sample for either E. coli or total coliform, but not both for an individual use. If the permittee is irrigating on crops requiring only Class D quality effluent, E. coli must be monitored. If the permittee irrigates/reuses effluent for Class C uses, total coliform must be monitored.

2. Reporting Procedures

a. Monitoring results must be reported on DEQ approved forms. Reports must be submitted to DEQ's Eastern Region – Bend office by the 15th day of the following month.

b. State monitoring reports must identify the name, certificate classification and grade level of each principal operator designated by the permittee as responsible for supervising the wastewater collection and treatment systems during the reporting period. Monitoring reports must also identify each system classification as found on page one of this permit.

c. Monitoring reports must also include a record of the quantity and method of use of all sludge removed from the treatment facility and a record of all applicable equipment breakdowns and bypassing.

d. The laboratory used by the permittee to analyze samples must have a quality assurance/quality control (QA/QC) program to verify the accuracy of sample analysis. If QA/QC requirements are not met for any analysis, the results must be included in the report, but not used in calculations required by this permit. When possible, the permittee must re-sample in a timely manner for parameters failing the QA/QC requirements, analyze the samples, and report the results.

e. By no later than January 15 of each year, the permittee must submit to DEQ an annual report describing the effectiveness of the recycle water system to comply with the approved recycle water use plan, the rules of Division 55, and the limitations and conditions of this permit applicable to reuse of recycled water. The review is to provide a summary of land application conducted at each site which is adequate to demonstrate that reuse water was applied agronomically and/or hydraulic loading rates, and that required site management practices were followed.

SCHEDULE C

Compliance Conditions and Schedules

a. Within 180 days the permittee must update their recycled water use plan for DEQ approval. A recycled water use plan must describe how the wastewater treatment system owner will comply with OAR 340-055 (refer to OAR 340-055-0025).

b. The permittee is expected to meet the compliance date that have been established in this schedule. Either prior to or no later than 14 days following any lapsed compliance date, the permittee shall submit to the Department a notice of compliance or noncompliance with the established schedule. The Director or his authorized representative may revise a schedule of compliance if he determines good and valid cause resulting from events over which the permittee has little or no control.

SCHEDULE D

Special Conditions

1. Prior to constructing or modifying any wastewater control facilities, detailed plans and specifications shall be approved in writing by DEQ. After approval of the plans, all construction shall be in strict conformance with the plans unless otherwise approved in writing by DEQ.

2. Within 6 months of such time as the sewage lagoons require removal of accumulated biosolids, the permittee shall submit a biosolids management plan that complies with the Department's biosolids management regulations as established in OAR 340-50.

3. This permit may be modified to incorporate any applicable standard for sewage sludge use or disposal promulgated under section 405(d) of the Clean Water Act, if the standard for sewage sludge use or disposal is more stringent than any requirements for sludge use or disposal in the permit, or controls a pollutant or practice not limited in this permit.

4. The permittee must, during all times of disposal, provide personnel to ensure the continuous performance of the disposal system within the limitations of this permit. In the event that any condition of this permit or DEQ rules are violated, the permittee must immediately take action to correct the violation and to notify DEQ **within 24 hours** at: DEQ's Eastern Region Water Quality Program Office (541) 388-6146.

   Response: In response to a notification, DEQ may conduct an investigation to evaluate the nature and extent of the problem, and may require additional corrective actions, as necessary. Compliance with this requirement does not relieve the permittee from responsibility to maintain continuous compliance with the conditions of this permit or the resulting liability for failure to comply.

5. All materials and equipment, including but not limited to tanks, pumps, controls, valves, etc. must be installed, operated, and maintained in accordance with manufacturer's minimum specifications.

6. The permittee must immediately notify the DEQ Bend office (phone 388-6146) of any occurrence of surfacing sewage so corrective action can be coordinated between the permittee and DEQ. When the DEQ offices are not open, the permittee must report the incident to the Oregon Emergency Response System (phone 1-800-452-0311).

7. Emergency Response and Public Notification Plan

   a. The permittee must develop, and maintain and implement an Emergency Response and Public Notification Plan (the Plan) per Schedule F, Section B, and Conditions 5 & 6. The permit holder must develop the plan within six months of permit issuance and update the Plan annually to ensure that telephone and email contact information for applicable public agencies are current and accurate. An updated copy of the plan must be kept on file at the wastewater treatment facility for Department review. The latest plan revision date must be listed on the Plan cover along with the reviewer's initials or signature.

8. Recycled Water Use Plan

a. In order to distribute recycled water for reuse, the permittee must develop, have and maintain and implement a DEQ-approved Recycled Water Use Plan meeting the requirements in OAR 340-055-0025. The permittee must submit substantial modifications to an existing plan to DEQ for approval at least 60 days prior to making the proposed changes. Conditions in the Plan are enforceable requirements under this permit.

9. The permittee must meet the requirements for use of recycled water under Division 55, including the following:

a. All recycled water must be managed in accordance with the approved Recycled Water Use Plan. No substantial changes must be made in the approved plan without written approval by DEQ.

b. The permittee must notify DEQ within 24 hours if it is determined that the treated effluent is being used in a manner not in compliance with OAR 340-055. When the DEQ offices are not open, the permittee must report the incident of noncompliance to the Oregon Emergency Response System (Telephone Number 1-800-452-0311).

c. No recycled water must be made available to a person proposing to recycle unless that person certifies in writing that they have read and understand the provisions in Division 55. This written certification must be kept on file by the sewage treatment system owner and be made available to DEQ for inspection.

e. Treated effluent must not be irrigated on ground that is frozen, snow-covered, or saturated with water. The volume of irrigated effluent and its total nitrogen loading must not exceed that established in a DEQ-approved recycled water use plan.

f. Unless otherwise approved in writing by DEQ, a vegetative cover must be maintained on the land irrigation area at all times. Vegetation is to be periodically cut and removed to ensure maximum evapotranspiration and nutrient capture.

10. Operator Certification

The permittee must comply with Oregon Administrative Rules (OAR), Chapter 340, Division 49, "Regulations Pertaining To Certification of Wastewater System Operator Personnel" and designate a supervisor whose certification corresponds with the classification of the collection and/or treatment system as specified on page 1 of this permit.

a. Definitions

i. "Supervise" means to have full and active responsibility for the daily onsite technical operation of a wastewater treatment system or wastewater collection system.

ii. "Supervisor" or "designated operator", means the operator delegated authority by the permittee for establishing and executing the specific practice and procedures for operating the wastewater treatment system or wastewater collection system in accordance with the policies of the owner of the system and any permit requirements.

iii. "Shift Supervisor" means the operator delegated authority by the permittee for executing the specific practice and procedures for operating the wastewater treatment

system or wastewater collection system when the system is operated on more than one daily shift.

iv. "System" includes both the collection system and the treatment systems.

b. The permittee must have its system supervised by one or more operators who hold a valid certificate for the type of wastewater treatment or wastewater collection system, and at a grade equal to or greater than the wastewater system's classification as specified on page 1 of this permit.

c. The permittee's wastewater system may not be without the designated supervisor for more than 30 days. During this period, there must be another person available to supervisor who is certified at no more than one grade lower than the classification of the wastewater system. The permittee must delegate authority to this operator to supervise the operation of the system.

d. If the wastewater system has more than one daily shift, the permittee must have another properly certified operator available to supervisor operation of the system. Each shift supervisor, if any, must be certified at no more than one grade lower than the system classification.

e. The permittee is not required to have a supervisor on site at all times; however, the supervisor must be available to the permittee and operator at all times.

f. The permittee must notify DEQ in writing of the name of the system supervisor. The permittee may replace or re-designate the system supervisor with another properly certified operator at any time and must notify DEQ in writing within 30 days of replacement or re-designation of operator in charge. As of this writing, the notice of replacement or re-designation must be sent to Water Quality Division, Operator Certification Program, 2020 SW 4th Avenue, Suite 400, Portland, OR 97201. This address may be updated in writing by DEQ during the term of this permit.

g. When compliance with paragraph (c) of Item 8 in this section is not possible or practicable because the system supervisor is not available or the position is vacated unexpectedly, and another certified operator is not qualified to assume supervisory responsibility, the Director may grant a time extension for compliance with the requirements in response to a written request from the system owner. The Director will not grant an extension longer than 120 days unless the system owner documents the existence of extraordinary circumstances.

11. DEQ may reopen the Schedules in this permit, if necessary, to include new or revised conditions.

12. If warranted, at any time, DEQ may evaluate the need for or require a full assessment of the facilty's impact on groundwater quality.

SCHEDULE F

WPCF GENERAL CONDITIONS – DOMESTIC FACILITIES

SECTION A. STANDARD CONDITIONS

1. Duty to Comply with Permit

The permittee must comply with all conditions of this permit. Failure to comply with any permit condition is a violation of Oregon Revised Statutes (ORS) 468B.025 and grounds for an enforcement action. Failure to comply is also grounds for the Department to modify, revoke, or deny renewal of a permit.

2. Property Rights and Other Legal Requirements

Issuance of this permit does not convey any property rights of any sort, or any exclusive privilege, or authorize any injury to persons or property or invasion of any other rights, or any infringement of federal, tribal, state, or local laws or regulations.

3. Liability

The Department of Environmental Quality or its officers, agents, or employees may not sustain any liability on account of the issuance of this permit or on account of the construction or maintenance of facilities or systems because of this permit.

4. Permit Actions

After notice by the Department, this permit may be modified, suspended, or revoked in whole or in part during its term for cause including but not limited to the following:

a. Violation of any term or condition of this permit, any applicable rule or statute, or any order of the Commission;

b. Obtaining this permit by misrepresentation or failure to disclose fully all relevant facts.

5. Transfer of Permit

This permit may not be transferred to a third party without prior written approval from the Department. The Department may approve transfers where the transferee acquires a property interest in the permitted activity and agrees in writing to fully comply with all the terms and conditions of this permit and the rules of the Commission. A transfer application and filing fee must be submitted to the Department.

6. Permit Fees

The permittee must pay the fees required by Oregon Administrative Rules.

SECTION B. OPERATION AND MAINTENANCE OF POLLUTION CONTROLS

1. Proper Operation and Maintenance

At all times the permittee must maintain in good working order and properly operate as efficiently as possible all treatment or control facilities or systems installed or used by the permittee to comply with the terms and conditions of this permit.

2. Standard Operation and Maintenance

All waste collection, control, treatment, and disposal facilities or systems must be operated in a manner consistent with the following:

a. At all times, all facilities or systems must be operated as efficiently as possible in a manner that will prevent discharges, health hazards, and nuisance conditions.

b. All screenings, grit, and sludge must be disposed of in a manner approved by the Department to prevent any pollutant from the materials from reaching waters of the state, creating a public health hazard, or causing a nuisance condition.

c. Bypassing untreated waste is generally prohibited. Bypassing may not occur without prior written permission from the Department except where unavoidable to prevent loss of life, personal injury, or severe property damage.

3. Noncompliance and Notification Procedures

If the permittee is unable to comply with conditions of this permit because of surfacing sewage; a breakdown of equipment, facilities or systems; an accident caused by human error or negligence; or any other cause such as an act of nature, the permittee must:

a. Immediately take action to stop, contain, and clean up the unauthorized discharges and correct the problem.

b. Immediately notify the Department's Regional office so that an investigation can be made to evaluate the impact and the corrective actions taken, and to determine any additional action that must be taken.

c. Within 5 days of the time the permittee becomes aware of the circumstances, the permittee must submit to the Department a detailed written report describing the breakdown, the actual quantity and quality of waste discharged, corrective action taken, steps taken to prevent a recurrence, and any other pertinent information.

Compliance with these requirements does not relieve the permittee from responsibility to maintain continuous compliance with the conditions of this permit or liability for failure to comply.

4. Wastewater System Personnel

The permittee must provide an adequate operating staff that is duly qualified to carry out the operation, maintenance, and monitoring requirements to assure continuous compliance with the conditions of this permit.

5. Public Notification of Effluent Violation or Overflow

If effluent limitations specified in this permit are exceeded or an overflow occurs that threatens public health, the permittee must take such steps as are necessary to alert the public, health agencies and other affected entities (e.g., public water systems) about the extent and nature of the discharge in accordance with the notification procedures developed under General Condition B.6. Such steps may include, but are not limited to, posting of the river at access points and other places, news releases, and paid announcements on radio and television.

6. Emergency Response and Public Notification Plan

The permittee must develop and implement an emergency response and public notification plan that identifies measures to protect public health from overflows, bypasses or upsets that may endanger public health. At a minimum the plan must include mechanisms to:

a. Ensure that the permittee is aware (to the greatest extent possible) of such events;
b. Ensure notification of appropriate personnel and ensure that they are immediately dispatched for investigation and response;
c. Ensure immediate notification to the public, health agencies, and other affected public entities (including public water systems). The overflow response plan must identify the public health and other officials who will receive immediate notification;
d. Ensure that appropriate personnel are aware of and follow the plan and are appropriately trained;
e. Provide emergency operations; and
f. Ensure that DEQ is notified of the public notification steps taken.

SECTION C. MONITORING AND RECORDS

1. Inspection and Entry

The permittee must at all reasonable times allow authorized representatives of the Department to:

a. Enter upon the permittee's premises where a waste source or disposal system is located or where any records are required to be kept under the terms and conditions of this permit;

b. Have access to and copy any records required by this permit;

c. Inspect any treatment or disposal system, practices, operations, monitoring equipment, or monitoring method regulated or required by this permit; or

d. Sample or monitor any substances or permit parameters at any location at reasonable times for the purpose of assuring permit compliance or as otherwise authorized by state law...

2. Averaging of Measurements

Calculations of averages of measurements required for all parameters except bacteria must use an arithmetic mean; bacteria must be averaged as specified in the permit.

3. Monitoring Procedures

Monitoring must be conducted according to test procedures specified in the most recent edition of **Standard Methods for the Examination of Water and Wastewater**, unless other test procedures have been approved in writing by the Department and specified in this permit.

4. Representative Sampling

Sampling and measurements taken as required herein must be representative of the volume and nature of the monitored discharge when discharging or land applying. Monitoring points must not be changed without notification to and the approval of DEQ.

5. Retention of Records

The permittee must retain records of all monitoring and maintenance information, including all calibrations, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least 3 years from the date of the sample, measurement, report or application. The Department may extend this period at any time.

SECTION D. REPORTING REQUIREMENTS

1. Plan Submittal

Pursuant to Oregon Revised Statute 468B.055, unless specifically exempted by rule, construction, installation, or modification of disposal systems, treatment works, or sewerage systems may not commence until plans and specifications are submitted to and approved in writing by the Department. All construction, installation, or modification shall be in strict conformance with the Department's written approval of the plans.

2. Change in Discharge

Whenever a facility expansion, production increase, or process modification is expected to result in a change in the character of pollutants to be discharged or in a new or increased discharge that will exceed the conditions of this permit, a new application must be submitted together with the necessary reports, plans, and specifications for the proposed changes. A change may not be made until plans have been approved and a new permit or permit modification has been issued.

3. Signatory Requirements

All applications, reports, or information submitted to the Department must be signed and certified by the official applicant of record (owner) or authorized designee.

4. Twenty-Four Hour Reporting

The permittee must report any noncompliance that may endanger health or the environment. Any information must be provided orally (by telephone) to DEQ or to the Oregon Emergency Response System (1-800-452-0311) as specified below within 24 hours from the time the permittee becomes aware of the circumstances.

a. Overflows.

(1) Oral Reporting within 24 hours.

i. For overflows other than basement backups, the following information must be reported to the Oregon Emergency Response System (OERS) at 1-800-452-0311. For basement backups, this information should be reported directly to DEQ.

a) The location of the overflow;
b) The receiving water (if there is one);
c) An estimate of the volume of the overflow;
d) A description of the sewer system component from which the release occurred (e.g., manhole, constructed overflow pipe, crack in pipe); and
e) The estimated date and time when the overflow began and stopped or will be stopped.

ii. The following information must be reported to the Department's Regional office within 24 hours, or during normal business hours, whichever is first:

a) The OERS incident number (if applicable) along with a brief description of the event.

(2) Written reporting within 5 days.

i. The following information must be provided in writing to the Department's Regional office within 5 days of the time the permittee becomes aware of the overflow:

a) The OERS incident number (if applicable);
b) The cause or suspected cause of the overflow;
c) Steps taken or planned to reduce, eliminate, and prevent reoccurrence of the overflow and a schedule of major milestones for those steps;
d) Steps taken or planned to mitigate the impact(s) of the overflow and a schedule of major milestones for those steps; and
e) (for storm-related overflows) The rainfall intensity (inches/hour) and duration of the storm associated with the overflow.

The Department may waive the written report on a case-by-case basis if the oral report has been received within 24 hours.

b. Other instances of noncompliance.

(1) The following instances of noncompliance must be reported:

i. Any unanticipated bypass that exceeds any effluent limitation in this permit;
ii. Any upset that exceeds any effluent limitation in this permit;
iii. Violation of maximum daily discharge limitation for any of the pollutants listed by the Department in this permit; and
iv. Any noncompliance that may endanger human health or the environment.

(2) During normal business hours, the Department's Regional office must be called. Outside of normal business hours, the Department must be contacted at 1-800-452-0311 (Oregon Emergency Response System).

(3) A written submission must be provided within 5 days of the time the permittee becomes aware of the circumstances. The written submission must contain:

i. A description of the noncompliance and its cause;
ii. The period of noncompliance, including exact dates and times;
iii. The estimated time noncompliance is expected to continue if it has not been corrected;
iv. Steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance; and
v. Public notification steps taken, pursuant to General Condition B.6.

(4) The Department may waive the written report on a case-by-case basis if the oral report has been received
within 24 hours.

SECTION E. DEFINITIONS

1. *BOD_5* means five-day biochemical oxygen demand.
2. *TSS* means total suspended solids.
3. *FC* means fecal coliform bacteria.
4. *NH_3-N* means Ammonia Nitrogen.
5. *NO_3-N* means Nitrate Nitrogen.
6. *NO_2-N* means Nitrite Nitrogen.
7. *TKN* means Total Kjeldahl Nitrogen.
8. *Cl* means Chloride.
9. *TN* means Total Nitrogen.
10. "*Bacteria*" includes but is not limited to fecal coliform bacteria, total coliform bacteria, and E. coli bacteria.
11. *Total residual chlorine* means combined chlorine forms plus free residual chlorine.
12. *mg/l* means milligrams per liter.
13. *ug/l* means micrograms per liter.
14. *kg* means kilograms.
15. *GPD* means gallons per day.
16. *MGD* means million gallons per day.
17. *Grab sample* means an individual discrete sample collected over a period of time not to exceed 15 minutes.
18. *Composite sample* means a combination of samples collected, generally at equal flow or time intervals over a 24-hour period.
19. *Week* means a calendar week of Sunday through Saturday.
20. *Month* means a calendar month.
21. *Quarter* means January through March, April through June, July through September, or October through December.