PUBLIC NOTICE

Date posted: 1/6/2025

DEQ Requests Comments on Proposed City of Pendleton's Mutual Agreement & Order in lieu of Water Quality Permit

HOW TO PROVIDE PUBLIC COMMENT

Facility name: City of Pendleton

Permit type: NPDES, MAO in lieu

Comments due by: Tuesday, Feb. 11, 2025 at 5 p.m.

Send written comments to:

By mail: Permit Coordinator, Oregon DEQ
800 SE Emigrant Ave., Ste. 330 Pendleton, OR 97801

By email: water.permiter@deq.oregon.gov

The Oregon Department of Environmental Quality invites the public to provide written comments on the conditions of the City of Pendleton's proposed Mutual Agreement and Order in lieu of Water Quality Permit.

Summary

Subject to public review and comment, DEQ intends to issue the proposed Mutual Agreement & Order in lieu of permit, which allows the City of Pendleton to remove and land apply biosolids at an area identified in the proposed Biosolids Management Plan. Biosolids are the solid, semisolid, or liquid residues generated during treatment of domestic sanitary sewage that has undergone additional treatment to reduce disease-causing organisms and attractiveness to vectors. DEQ requires the permittee to maintain a biosolids management plan as a condition of the City's permit. The biosolids program and beneficial use sites are described in the biosolids management plan. As a permit requirement, these plans have been updated and are on public notice. Part of the review process is an opportunity for public comment on the biosolids management plan. Subject to public review and comment, DEQ plans to approve the plan.

About the facility

The City of Pendleton has submitted a water quality permit renewal application for the municipal wastewater treatment facility located at 4300 SW Houtama Road Pendleton. However, this permit is not on DEQ plan for renewal until 2025. DEQ last modified this permit on August 31, 2007, and the permit was administratively extended on July 31, 2009. The facility is required to update their Biosolids Management Plan to identify and include new areas for land application of biosolids. The Mutual Agreement & Order allows the facility to update the Biosolids Management Plan prior to renewal of the water quality permit.

The facility also holds a National Pollution Discharge Elimination System permit from DEQ.

Translation or other formats

Español | 한국어 | 繁體中文 | Русский | Tiếng Việt | العربية

800-452-4011 | TTY: 711 | deqinfo@deq.oregon.gov

State of Oregon
DEQ Department of Environmental Quality

What happens next?

Submit comments by sending an email or using mail service addressed to the permit coordinator listed in the "how to provide public comment" box above.

DEQ will hold a public hearing if it receives written requests for a hearing during the public comment period from at least 10 people or from an organization representing at least 10 people.

DEQ will consider and respond to all comments received and may modify the proposed Mutual Agreement & Order in lieu and Biosolids Management Plan based on comments.

For more information

Find more information by reviewing draft documents attached to this notice, or contact Patty Isaak at 541-613-1125 or water.permit@deq.oregon.gov with questions or to view documents in person at a DEQ office.

Non-discrimination statement

DEQ does not discriminate on the basis of race, color, national origin, disability, age, sex, religion, sexual orientation, gender identity, or marital status in the administration of its programs and activities. Visit DEQ's Civil Rights and Environmental Justice page.

BEFORE THE ENVIRONMENTAL QUALITY COMMISSION

OF THE STATE OF OREGON

IN THE MATTER OF:	)	MUTUAL AGREEMENT
	)	AND ORDER IN LIEU OF
CITY OF PENDLETON, OREGON	)	PERMIT
	)	
	)	
	)	NO. WQ/M-WR-2024-143
	)	Umatilla County,
	)	Oregon

WHEREAS:

1. The City of Pendleton, Oregon (City) is a municipal corporation organized under the laws of the State of Oregon.

2. The City is located within Umatilla County in Oregon.

3. On February 3, 2005, the Department of Environmental Quality (DEQ) issued to the City National Pollutant Discharge Elimination System Waste Discharge Permit No. 102024 (NPDES Permit) authorizing the City to operate its wastewater collection, treatment, control and disposal system and discharge to waters of the state adequately treated wastewaters.

4. The City's NPDES Permit expired January 31, 2010, but is administratively continued pursuant to OAR 340-045-0040(2) because the City made timely application for renewal of the NPDES Permit.

5. Schedule C, Condition 1 of the NPDES Permit requires the City to submit to the DEQ for approval a biosolids management plan. Schedule D, Condition 2 of the NPDES Permit requires the City to manage all biosolids in accordance with the DEQ-approved biosolids management plan dated July 2005 and the DEQ-issued site authorization letters.

6. Schedule D, Condition 2 of the NPDES Permit further prohibits substantial changes to biosolids management activities which significantly differ from operations specified under the approved biosolids management plan without written DEQ approval.

7. The City's DEQ-approved biosolids plan no longer reflects necessary biosolids management operations. The City's identified land application sites for biosolids may no longer be accessible to for the City's use, therefore, it will be necessary to expand the City's biosolids land application activities to new sites. As such, significant modification is needed to the City's biosolids management plan. A copy of the City's new biosolids management plan is attached hereto as Exhibit 1.

8. The City is unable to obtain DEQ approval of the new biosolids management plan and DEQ is unable to authorize the new land application sites for biosolids because the NPDES Permit is expired. DEQ approval of the new biosolids management plan and site Authorization of the land application sites would constitute a modification of the NPDES Permit. Although the conditions of an administratively continued permit remain in effect until the effective date of a new or renewal permit, the DEQ may not modify those permit conditions or the plans approved pursuant to the permit until issuance of a new or renewal NPDES permit. The City's NPDES Permit is scheduled for issuance in the 2025 fiscal year, according to DEQ's most recent 5-year permitting plan.

9. Oregon Administrative Rule 340-045-0062(1) adopted pursuant to ORS 468.020, states:

> *"The Director may issue a mutual agreement and order (MAO) in lieu of or in addition to an NPDES permit or WPCF permit where the MAO is part of an enforcement action, for disposal of wastewater associated with the cleanup of a spill, or for an activity that does not lend itself to the normal permitting process or permit term."*

10. The DEQ finds that the issuance of this MAO satisfies the conditions set forth in OAR 340-045-0062(1).

11. Pursuant to OAR 340-045-0062(5), "When an MAO is used in lieu of a permit, the fee schedule for permits found in OAR 340-045-0075 will apply." DEQ waived the fee of $1,577 for the City of Pendleton.

12. According to OAR 340-045-0062(4), this MAO is equivalent to a Category II permitting action and must be put on public notice for a minimum of 35 days. The MAO was placed on public notice January 6, 2025 to February 11, 2025.

13. This MAO is not an NPDES permit issued pursuant to Section 402 of the federal Clean Water Act, 33 U.S.C §1342, and this MAO does not assure compliance with federal law.

14. The City agrees that this MAO is enforceable in all ways as a permit and that any and all applications, notices, plans, records, reports, or other documents required by this MAO are required by ORS Chapters 468 and 468B and implementing rules.

NOW THEREFORE, it is stipulated and agreed that:

15. The Director issues this final order:

A. Approving the City's new biosolids management plan attached to this MAO as Exhibit 1.

B. Requiring the City to implement and comply with the biosolids management plan approved pursuant to this MAO after initiation of operation of the dewatering equipment and composting facilities, unless otherwise approved in writing by DEQ.

16. The terms of this MAO may be amended by mutual agreement of the DEQ and the City. The DEQ may amend or terminate this MAO without the agreement of the City upon finding that such modification or termination is necessary because of changed circumstances or to protect public health or the environment. If the City contests the amendment or termination of this MAO, the City shall have the right to a contested case hearing which shall be conducted pursuant to the applicable procedures for conduct of contested cases pursuant to ORS Chapter 183, OAR Chapter 340, Division 11 and OAR Chapter 137, Division 003.

17. This MAO is not transferable. No change in ownership or corporate or

partnership status relating to the wastewater collection, treatment, control and disposal system shall in any way alter the City's obligations under this MAO, unless otherwise approved in writing by DEQ.

18. All reports, notices and other communications required under or relating to this MAO should be directed to Water Quality Permit Coordinator, DEQ Eastern Region Water Quality, 800 SE Emigrant Ave., Suite 330, Pendleton, OR 97801, phone: (541) 613-1125. The contact person for the City is Robb Corbett, City Manager, 4300 SW Houtama Road, Pendleton, Oregon, 97801, phone: (541) 917-7635.

19. The City waives any and all rights and objections it may have to the form, content, manner of service, or timeliness of this MAO. The City acknowledges that it has actual notice of the contents and requirements of this MAO and that failure to fulfill any of the requirements hereof will constitute a violation of this MAO and subject the City to payment of civil penalties pursuant to applicable rules in OAR Chapter 340, Division 12.

20. The City shall allow the DEQ's representatives access to the City's property and pertinent records at all reasonable times for the purposes of making inspections, surveys, collecting samples, obtaining data, reviewing and copying required records and otherwise conducting all necessary functions related to this MAO in accordance with ORS 468.095.

21. Any civil penalty imposed pursuant to OAR Chapter 340, Division 12 shall be due upon written demand. Civil penalties shall be paid by check or money order made payable to the "Oregon State Treasurer" and sent to: Business Office, Department of Environmental Quality, 700 NE Multnomah St, Suite 600, Portland OR 97232-4100. Within 21 days of receipt of a "Demand for Payment of Civil Penalty" Notice from DEQ, the City may request a contested case hearing to contest the Penalty Demand Notice, any alleged violation of this MAO and any order of DEQ relating to this MAO. The contested case hearing shall be conducted as provided in ORS Chapter 183, OAR Chapter 340, Division 11 and OAR Chapter 137, Division 003.

22. The terms of this MAO become effective on the date it is signed by DEQ's Regional Manager on behalf of the Director and terminates on the date the City discontinues the

activities that are the subject to this MAO, obtains a permit covering the activities, or DEQ denies the City the permit application, whichever is soonest. However, any penalties required pursuant to a Penalty Demand Notice as described in Paragraph 19 shall remain due and owing until paid in full. Records required by this MAO must be maintained for the period specified in the MAO or for three years, whichever is longer.

CITY OF PENDLETON, OREGON

Date

Robb Corbett
City Manager, City of Pendleton

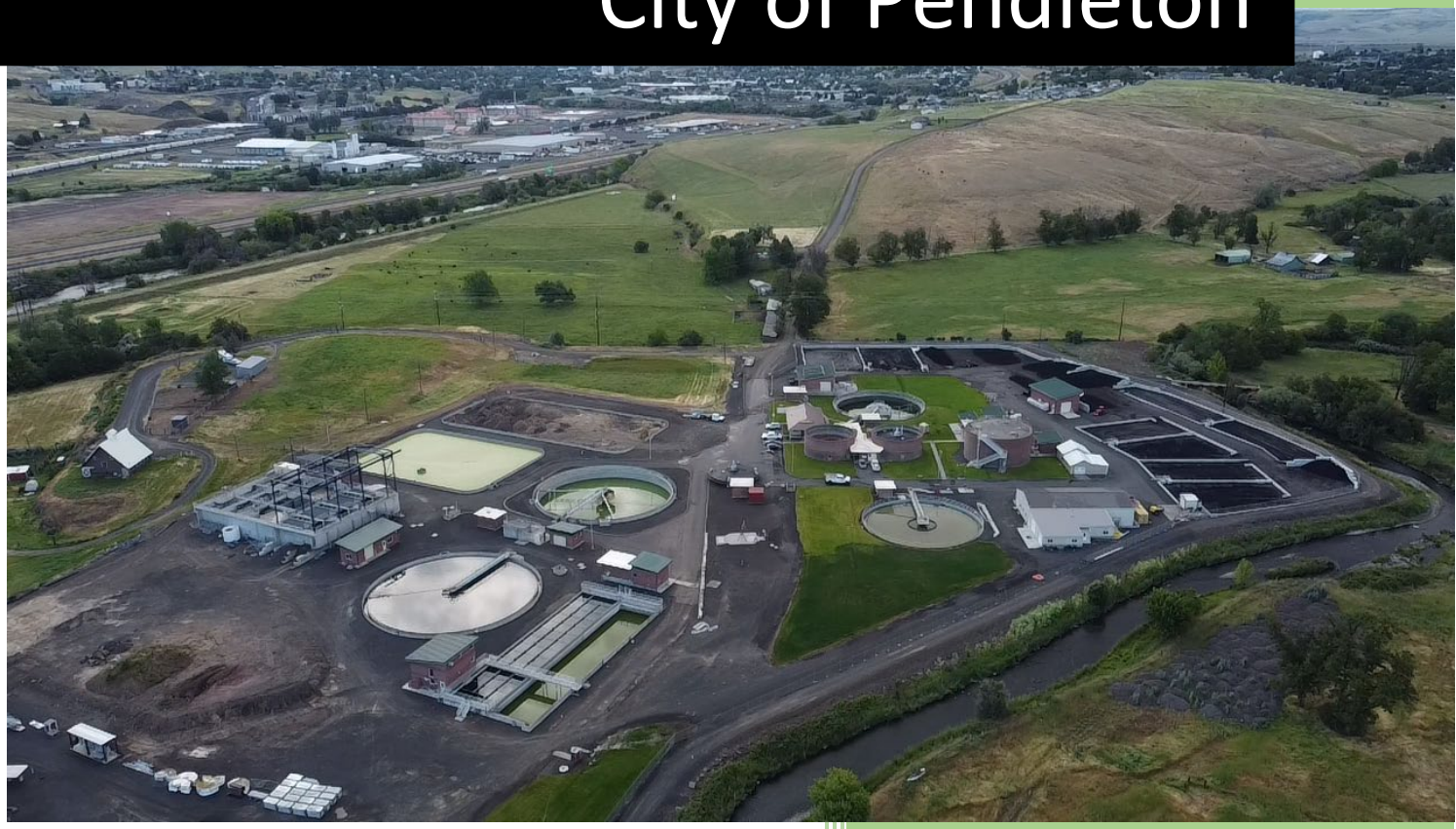
DEPARTMENT OF ENVIRONMENTAL QUALITY and
ENVIRONMENTAL QUALITY COMMISSION

Date

Mike Hiatt, Water Quality Program Manager
Eastern Region, Department of Environmental Quality
on behalf of DEQ pursuant to OAR 340-012-0170
on behalf of the EQC pursuant to OAR 340-011-0505

2024

Biosolids Management Plan
City of Pendleton



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INTRODUCTION

The **City of Pendleton** (Resource Recovery Facility) owns and operates a municipal wastewater collection and treatment system and manages a biosolids land application program. Wastewater processed by the treatment works is primarily of domestic origin, **and no** formal pretreatment program is required to be implemented under our **NPDES** permit. **The facility also receives and processes septage**. This biosolids management plan, as required by the **NPDES** permit, outlines the liquids and solids processes at the facility, how biosolids are managed to meet federal and state requirements, and how the biosolids land application program is operated. The **City of Pendleton's** biosolids management plan was originally approved by the Oregon Department of Environmental Quality (Department) on **2005** and is being updated at this time to address **a 20-year-old permit and the potential loss of land application sites**.

WASTEWATER TREATMENT FACILITY

Liquids Processing

City of Pendleton operates **A class IV conventional activated sludge facility** located at **4300 SW Houtama Road** in **Umatilla** county. Treated effluent is discharged **year-round** to **the Umatilla river** at river mile **51.5**. The designed average dry weather flow is **4.5** million gallons per day (MGD). Actual flows during the **2023** dry season averaged **2.2** MGD and during the wet season averaged **2.3** MGD. The peak flow design capacity is **3.74** MGD. The origin of the wastewater processed is **85** percent domestic, **13** percent commercial, and **2** percent industrial.

**Note: This section should describe the wastewater treatment facility liquid process flow schematic step-by-step and address the following. A diagram should also be included.*

The influent screening process within the headworks building consists of two parallel rotary drum screens. These mechanical fine screens each contain a 2-millimeter perforated-plate stainless steel drum screen. Screenings are lifted by a spiral lifting screw up an auger. Within the auger, screenings are washed and dewatered prior to being dumped into a dumpster for disposal at a landfill.

The grit removal system is comprised of a 16-foot square concrete grit chamber with a blower, grit pump, and grit auger classifier. The floor of the grit chamber is sloped towards the center to facilitate the collection and discharge of grit from the chamber to the grit classifier equipment. This system has a firm capacity of 7 MGD. Captured grit is pumped from the aerated grit chamber to a grit classifier by a self-priming pump. Removed grit is washed in a cyclone separator and dewatered/ transported by auger through the classifier, separating water from the grit. Large, mostly inorganic grit is disposed of into a dumpster and sent to landfill. Smaller, organic grit particles are returned to the influent stream prior to the Headworks screens. Approximately 1/2 cubic yard of grit is removed per week.

The WWTRRF primary treatment system consists of two circular primary clarifiers each with a 90-foot diameter and depth of 8.6 feet. For current flows, one clarifier is online at a time, because they are completely redundant. Surface loading rates for the two primary clarifiers is lower than the usual standard, because the structures co-thicken both primary sludge and waste activated sludge (WAS) from the secondary clarifiers.

The in-plant pump station (IPPS) is located directly north of the west primary clarifier, routes flow from the primary clarifiers to the aeration basin and was installed with the 2011 upgrade. It is comprised of a concrete wet well structure holding three 8-inch Meyers submersible pumps and a concrete vault

containing three plug valves for isolation when necessary. The pump station has a triplex pump configuration in a wet well that is 16 feet deep. The pump station conveys flow through a 14-inch force main to the aeration basin, and along the way, the RAS pump station discharge piping connects to this same force main. This is causing an issue with the station hydraulics as the RAS pumps are overriding the check valves in the IPPS discharge piping.

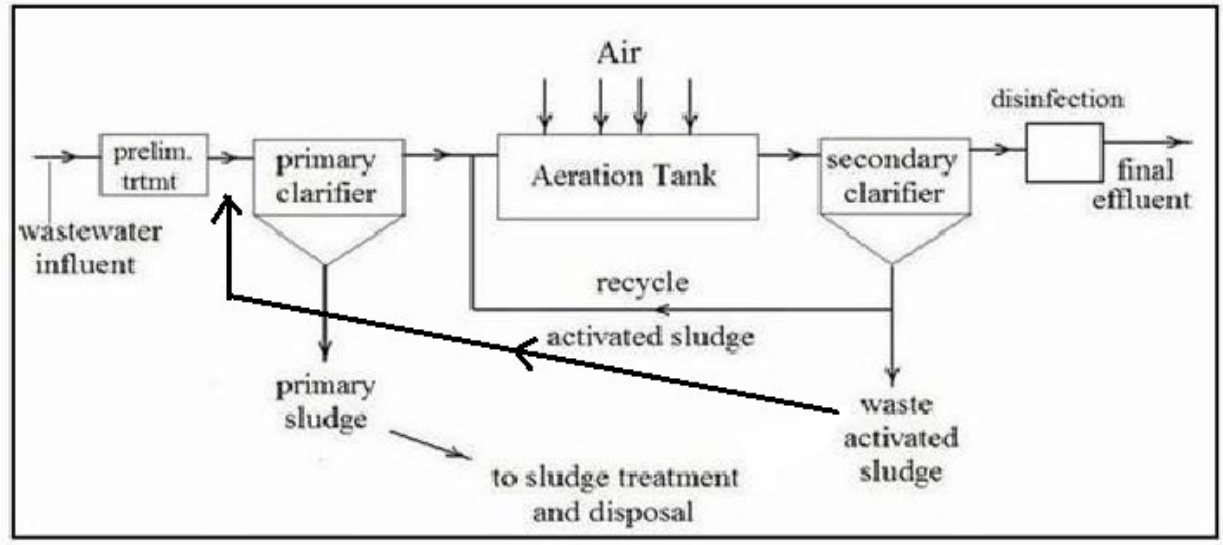
Secondary treatment at the WWTRRF consists of a three-train aeration basin and two secondary clarifiers. Once primary effluent and RAS flow reach the aeration basin, it is distributed between three aeration basin trains. Under normal operating conditions, the plant utilizes two trains at a time. The Trains consist of a; Selector cell, Anoxic cell, Swing cell (either anoxic or aerobic), Aerobic cell 1 and Aerobic cell 2. An internal recycle pump returns AB 2 mixed liquor suspended solids to the selector cell. The train design is a Modified Ludzack- Ettenger (MLE).

The two secondary clarifiers receive flow from the aeration trains and are redundant. One clarifier is typically online at a time under normal operating conditions. The secondary clarifiers are filled with MLSS effluent from the aeration basin. The MLSS travels through a 24-inch pipe to the concrete control junction box structure where flows are directed to either the east or west secondary clarifier, whichever is online. The secondary clarifiers are 115-foot diameter circular structure with an 11-foot side water depth. The clarifiers were constructed in 1970. The system consists of a central drive unit, scum scrapers, a scum box, arm rakes, weirs, and launder.

The RAS pump station is located between the two secondary clarifiers. This pump station pumps return activated sludge from the bottom of the secondary clarifiers and combines it with flow pumped from the in-plant pump station on its way to the head of the aeration basin. The pump station is comprised of a concrete structure and three submersible pumps. These pumps are identical to those installed in the in-plant pump station.

Secondary effluent leaves the secondary clarifier, passes through the effluent junction box where it is chlorinated, and flows into a splitter box where it is directed into one of two chlorine contact chamber (CCC) trains for disinfection. The chlorine contact chamber is the final process before the effluent leaves the treatment plant. The structure is 145 feet long, 60 feet wide, and 8.2 feet deep. It is divided into 2, 30-foot wide channels. The northern channel has been partitioned with divider panels to prevent short circuiting during disinfection. Once the water has reached the end of the CCC, it leaves the CCC through an effluent channel where it is dosed with calcium thiosulfate to dechlorinate. The dechlorinated effluent flows through a 36-inch outfall from the chlorine contact chamber, under McKay Creek, to a submerged diffuser in the Umatilla River. An effluent sampling point with a timed sampler is located roughly 40’ south of the CCC discharge. This discharge point lies beyond the convergence of the Umatilla River and McKay Creek.

Figure 1.1



Activated Sludge Wastewater Treatment Flow Diagram

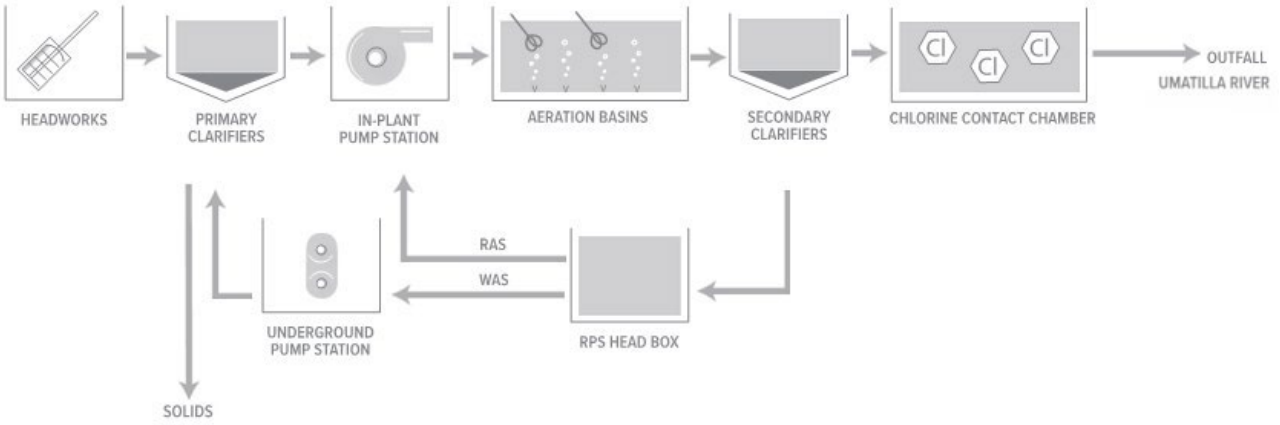


Table 1.1

Equipment	# of	Capacity each (g)	Average Retention time
Primary Clarifiers 90ft	2	429,000	3.2 Hours
Grit Chamber 16Ft AQW	1	28,700	NA
Secondary Clarifiers 115ft	2	900,000	6.8 Hours
Aeration Basin Train	3	466,580	12-day SRT
Chlorine Contact Chamber	2	250,000	3 HR
Chlorine Tank	1	8,000	3-4 months
Dechlor Tank	1	6,200	3-4 months

Solids Processing

**Note: This section should describe the wastewater treatment facility solids process flow schematic and address the following. A diagram should also be included.*

Influent flow enters the Pendleton RRF and is mixed with septic or aerobic sludge from an 8,000 gallon receiving tank. The flow enters the headworks where it is screen for trash and debris. The influent flows into the grit chamber where the velocity is dropped to about 1 cubic foot per second (cfs). This allows the heavier particles to settle to the bottom of the chamber. The grit (coffee grounds, gravel, etc.) is removed from the grit chamber and pumped into a cyclone separator and grit screw classifier where the organic material is washed out and returned to the primary clarifier influent. The grit from the grit screw classifier is collected in a hopper and dumped into a 2.5 cubic yard dumpster, along with the screenings from the screen. The Pendleton Sanitary Service empties the dumpsters twice a week and takes the grit to the Sanitary Transfer Station. The water from the grit chamber flows through the parshall flume into the primary clarifier.

Primary treatment is the physical separation of the biodegradable (organic) solids from the water by physical methods. The velocity of the water is slowed down to less than 1 cfs so solids will settle to the bottom of the Clarifier if they are heavier than water or float on the surface if they are lighter. The effluent (flow out of a unit) from the primary clarifier contains colloidal solids (small particles that will not dissolve and that remain dispersed in a liquid) and flows to the Aeration Basin through the in-plant pump station.

The raw sludge is collected in the bottom of the primary clarifier and pumped to the Primary Digester. The average total solids is 3 percent. The primary digester is a heated and mixed reactor, which increases digestion (reduces organic solids so they will not biodegrade further). The solids are retained in the primary digester for approximately 30 days at a temperature averaging 98 degrees F (36.7 C). Temperature readings are taken daily from the anaerobic primary digester to attain the necessary requirement for Class B pathogen reduction. The biosolids (digested or processed sludge) are transferred automatically from the primary digester to one of the secondary digesters. The secondary digester is a heated and mixed reactor. The solids are retained in the Secondary digester for approximately 15 days at a temperature averaging 100 degrees F (37.8 C). Temperature readings are taken daily from the secondary anaerobic digesters to attain the necessary requirement for Class B pathogen reduction. Byproducts from the digestion process include biosolids, water, methane, and carbon dioxide. The methane gas is utilized as fuel for the Combined Heat and Power Cogeneration system to produce hot water to heat the digesters and electric power for the facility.

The biosolids are removed from the bottom of the secondary digesters and transferred to the dewatering facility or to the drying beds. The average total solids moved out of the secondary digesters is less than 1.8 percent. The drying beds are filled to around 18 inches up to three times with the supernatant from the beds being returned to the headworks. The Drying beds are stirred using a rack on a tractor and air dried prior to being transferred to a storage bin. This process is dependent on the weather and can happen up to three times. The drying bed solids that are created in one year are then typically spread the following year. Drying bed biosolids are stored in a storage bin for 3-12 months before being land applied to DEQ approved sites where wheat or other crops are grown.

The solids dewatering process takes place in an enclosed solid dewatering facility. The dewatered biosolids from the dewatering facility are transferred to a storage bin or drying bed 7. It will spend 1-6 months in the storage bin. The dewatered biosolids are then further dried in Drying Bed #7 to a targeted greater than 40% solids using a rototiller attachment on a tractor. All solids are land applied to DEQ approved sites where wheat or other crops are grown.

During the months when field access is limited for application, biosolids are air dried on the drying pad or stored in storage bins. The possibility of field storage will be discussed with DEQ on a case by case bases.

The city treats and applies approximately 350 dry tons of biosolids per year in accordance with 40 CFR Part 503.

Figure 2.1

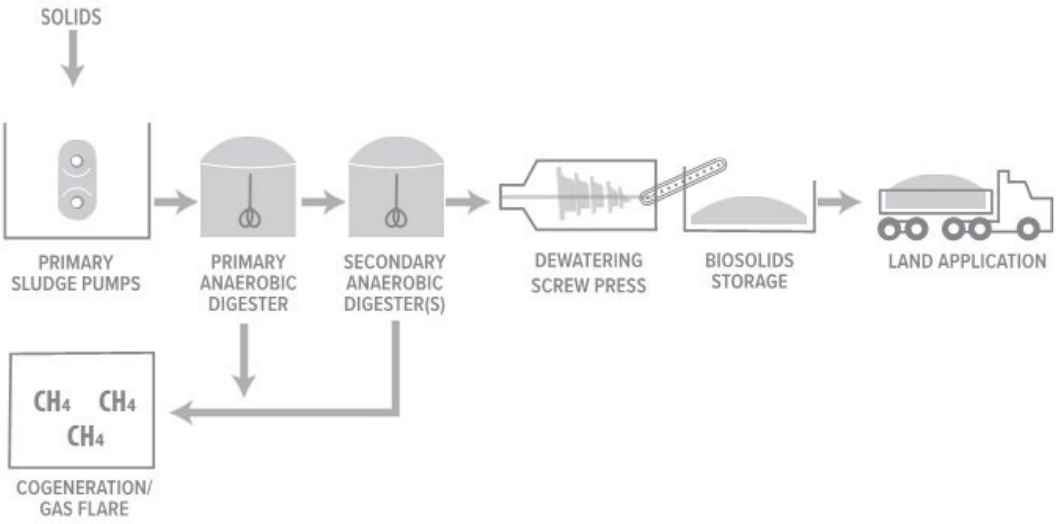
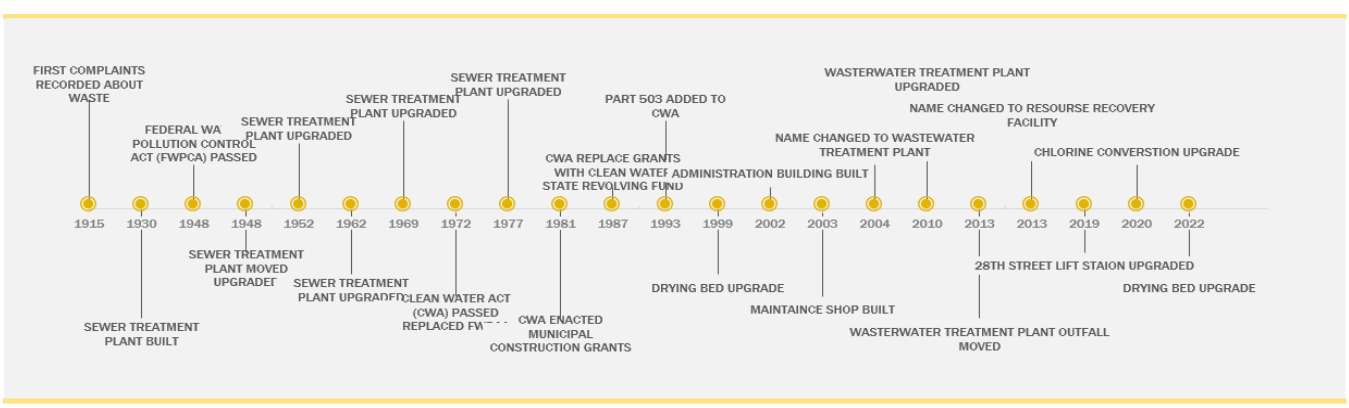


Figure 2.2



Upgrade Timeline

2025 secondary digester upgrade scheduled depending on CWSR funding
2022 Drying beds rebuild, septic receiving station installed, and storage bins improved.
2012 Dewatering facility install, primary digester mixing improved, Cogeneration capabilities installed, FOG tanks installed,
1999 Drying bed addition large drying bed #7 added to inventory

Table 2.1

Capacity and average retention time:

2 Primary Clarifiers,	429,000 gallons each	3.2 hours
1 Primary Digester	525,000 Gallons	30 days
2 Secondary Digesters	225,000 Gallons each	15 days
1 Septic Receiving tank	8,000 Gallons	30 min
1 FOG Receiving tank	14,000 Gallons	14 days
9 Asphalt Drying beds	652,000 Gallons total	3-9 months
3 Biosolids Storage bins	7,803 SQFT total	3-12 months

Septage Processing

**Note: If the wastewater treatment facility receives and processes septage, this section must be included and address the following.*

40 CFR Part 503 and Oregon Administrative Rules Chapter 340, Division 50
Fats, oils, and grease (FOG) are received from independent sources for disposal and treatment. This material is pumped from the truck through the FOG receiving station and into the FOG storage tank. From the storage tank, the FOG is heated and mixed, then metered and pumped into the primary anaerobic digester.

The FOG receiving station is a pipe assembly directly south of the primary mixing building. This assembly allows tanker trucks to directly couple to the receiving pump. The receiving pump is a Wemco-Hidrostal model CFV2 chop-flow pump. It is 6 years old, and it is in like-new condition. This pump has a very low suction head capacity, and because it is not a flooded suction, it often loses prime. The controls are on the east side of the building, away from the entryway, so operating the pump requires two people. The FOG receiving station is in very good condition. The FOG storage tank is a concrete structure located partially underneath the primary digester complex and partially below the adjacent loading dock. Its volume is approximately 12,000 gallons. The 12,000-gallon receiving tank for metered into the primary digester at a rate of 25-400 gallons per day. The mixing involves pumping the FOG through the FOG heat exchanger and back to the tank. There is also an in-tank mixer installed in 2016. This level of mixing is not adequate and causes solids to build up around the support columns within the tank. The heat exchanger associated with the FOG mixing loop is a straight tube heat exchanger. After heating and mixing, the FOG is pumped and metered into the primary anaerobic digester, which is done using a progressive cavity metering pump. Weekly TS TVS samples are done on the FOG metered into the digester.

Pretreatment Program

The **City of Pendleton is not** required at this time to implement an industrial wastewater pretreatment program as **<state reason>**. Pollutant monitoring requirements as stated in the permit will ensure land application of biosolids occurs within federal and state limitations.

BIOSOLIDS TREATMENT PROCESSES

Under 40 CFR Part 503 and Oregon Administrative Rules Chapter 340, Division 50, pathogen reduction and vector attraction reduction for biosolids must be met prior to land application. Vector attraction reduction requirements can also be met at the time of land application if biosolids are injected below the surface of the land or incorporated into the soil within 6 hours after application to the land. Biosolids are categorized as

Class A or Class B depending on the method used to determine pathogen reduction. Biosolids may also be classified as exceptional quality (EQ) if the product meets: pollutant concentration limits in 40 CFR Part 503, one of the Class A pathogen reduction alternatives in 40 CFR §503.32(a), and one of the vector attraction reduction options in 40 CFR §503.33(b)(1) through (8). To meet regulatory requirements, pathogen reduction must be met before or at the same time that vector attraction reduction is achieved. ***EPA/600/R-22/194*** Titled pathogens and vector attraction in sewage sludge is use to help understand and apply 40 CFR Part 503.

The **City of Pendleton** will certify in writing that Class **A/B** pathogen requirements and vector attraction reduction requirements are met. The **City of Pendleton** will also notify the Department in writing and obtain written approval prior to any process change that would use a pathogen reduction or vector attraction reduction method other than what is specified in this biosolids management plan. At any time either of these regulations change (40 CFR Part 503 and Oregon Administrative Rules Chapter 340, Division 50) the Department staff will notify City of Pendleton Staff of the change in writing within 30 days of the change.

The City of Pendleton is currently producing Class B biosolids. In the future the City of Pendleton may decide to test and certify that a portion or all of the biosolids produced meet the Class A classification. This would be triggered by DEQ or EPA regulations, other land restrictions, or economic situations.

Pathogen Reduction

Pathogen reduction requirements of 40 CFR Part 503 and OAR 340-050 are met through Anaerobic digestion under Alternative 2 for class B pathogen requirements. Class A Pathogen requirements are meet using alterative 4. These Alterative are described in EPA/600/R-22/194. See Appendix E for 2023 data and report.

Since the primary digester is a Complete Mixed Reactor with one feed stream and one product stream with no substantial change in volume, and constant feed and withdrawal, the residence time in the Primary digester can be calculated using the calculation for Case 1 in Publication # EPA /625/10-89/006

V = Volume of Digester (gallons)= 525,000 gallons
q = Flow rate leaving digester (gallons/day) = 18,640 gallons per day
Cv = Concentration of Solids in Digester = 1. 73 g TS
Cq = Concentration of Solids in exiting stream = 1. 73 g TS
Xn = (V*Cv)/(q*Cq) = (525000 gals*l.73 g TS)/(18640 gals per day*l.73 g TS)= 28 days

The mean cell residence time in the Primary digester would be 28 days at an average temperature of 98 degrees F for January 2005 to May 2005. This meets or exceeds the regulation cited above.

Secondary digesters 225,000 each.
V = Volume of Digester (gallons)= 450,000 gallons
q = Flow rate leaving digester (gallons/day) = 7066 gallons per day
Cv = Concentration of Solids in Digester = 1. 73 g TS
Cq = Concentration of Solids in exiting stream = 2.09 g TS
d = Decantate flow rate (gallons/ day) = 14 313 gallons per day
Cd= Concentration of solids in decantate stream = 1.27 g TS
Xn = (V*Cv)/(q*Cq+d*Cd) = (450000 gals*l.73 g TS)/((7066 gals/day*2.09 g TS)+(l4313 gallons/day* 1.27)) = 24 days

The mean cell residence time in the secondary digesters would be 24 days at an average temperature of 91 degrees F for January to May 2005.

Class B Pathogen Requirements

**Note: Must meet one of the following alternatives. Check applicable alternative.*

☐ Alternative 1: The geometric mean of the density of fecal coliform of seven representative samples shall be less than either 2 million Most Probable Number (MPN) or 2 million Colony Forming Units (CFU) per gram of total solids (dry weight basis).
☒ Alternative 2: Biosolids shall be treated in one of the Processes to Significantly Reduce Pathogens (PSRP) described in the table below.
☐ Alternative 3: Biosolids shall be treated in a process that is equivalent to a PSRP, as determined by the permitting authority.

Processes to Significantly Reduce Pathogens (PSRP) Listed in Appendix B of 40 CFR Part 503

**Note: Check applicable PSRP*

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☐	Aerobic Digestion	Sewage sludge is agitated with air or oxygen to maintain aerobic conditions for a specific mean cell residence time (i.e., solids retention time) at a specific temperature. Values for the mean cell residence time and temperature shall be between 40 days at 20ºC (68ºF) and 60 days at 15ºC (59ºF).
☐	Air Drying	Sewage sludge is dried on sand beds or on paved or unpaved basins. The sewage sludge dries for a minimum of 3 months. During 2 of the 3 months, the ambient average daily temperature is above 0ºC (23ºF).
☒	Anaerobic Digestion	Sewage sludge is treated in the absence of air for a specific mean cell residence time (i.e., solids retention time) at a specific temperature. Values for the mean cell residence time and temperature shall be between 15 days at 35ºC to 55ºC (131ºF) and 60 days at 20ºC (68ºF).
☐	Composting	Using either the within-vessel, static aerated pile, or windrow composting methods, the temperature of the sewage sludge is raised to 40ºC (104ºF) or higher and remains at 40ºC (104ºF) or higher for 5 days. For 4 hours during the 5-day period, the temperature in the compost pile exceeds 55ºC (131º).
☐	Lime Stabilization	Sufficient lime is added to the sewage sludge to raise the pH of the sewage sludge to 12 for ≥2 hours of contact.

Class A Pathogen Requirements

**Note: Must meet the requirement for fecal coliform or Salmonella sp. <u>and</u> one of the alternatives. Check applicable alternative.*

Either the density of fecal coliform in the biosolids must be less than 1,000 MPN per gram total solids (dry weight basis), or the density of *Salmonella* sp. bacteria in the biosolids must be less than 3 MPN per 4 grams of total solids (dry weight basis). Sampling must consists of <u>at least</u> seven (7) discrete samples taken over a two week period, unless otherwise specified in the permit.

☐ Alternative 1: Thermally treated biosolids must meet one of four time-temperature regimes as outlined in 40 CFR §503.32(a)(3)(ii).
☐ Alternative 2: Biosolids must meet specific high pH-high temperature, and air-drying requirements as outlined in 40 CFR §503.32(a)(4)(ii).

☐ Alternative 3: Demonstrate that biosolids treated in other processes (that don't meet Alternatives 1 and 2) can reduce enteric viruses and viable helminth ova, and maintain operating conditions used to demonstrate pathogen reduction as outlined in 40 CFR §503.32(a)(5)(ii) and (iii).

☒ Alternative 4: Biosolids treated in unknown processes must be tested for pathogens-*Salmonella* sp. or fecal coliform bacteria, enteric viruses, and viable helminth ova-at the time the biosolids are used or disposed, or in certain situations, prepared for use or disposal as outlined in 40 CFR §503.32(a) (6) (i), (ii) and (iii).

☐ Alternative 5: Biosolids shall be treated in one of the Processes to Further Reduce Pathogens (PFRP) described in the table below.

☐ Alternative 6: Biosolids shall be treated in a process that is equivalent to a PFRP, as determined by the permitting authority.

Processes to Further Reduce Pathogens (PFRP) Listed in Appendix B of 40 CFR Part 503
**Note: Check applicable PFRP.*

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

Vector Attraction Reduction

Vector attraction reduction requirements of 40 CFR Part 503 are met through Option 1. See supporting documentation of digester temps and volatile solids reduction in appendix E. All reduction are calculated from the raw through the secondary digester. Additional reductions happen while in storage prior to being land applied and are not figured into the VS reductions.

Publication #EPA 831B-93-002a page # 29 demonstrates the Van Kleeck equation:

VS(Reduction) = Percent reduction of volatile solids
VS(Raw) = Volatile fraction in raw sewage sludge
VS (stabilized)= Volatile Fraction in stabilized sewage sludge

% VS (Reduction)= {%VS(raw)-% VS (stabilized)}/{% VS (raw)-[(%VS(raw)* %vs(stabilized)]}

Weighted by mass averages are used for the volatilie solids reduction:

% VS= [(galsl * TS *%VS1) +(gals2*TS2*VS2+ .....)]/[(galsl *TSI)+(gals2*TS2)+ ...]

Vector Attraction Reduction Options

**Note: Must meet one of the following options. Check applicable option(s).*

40 CFR Part 503 Requirement		What is Required?	Most Appropriate For:
☒	Option 1 503.33(b)(1)	At least 38% reduction in volatile solids during sewage sludge treatment	Sewage sludge processed by: Anaerobic biological treatment Aerobic biological treatment
☐	Option 2 503.33(b)(2)	Less than 17% additional volatile solids loss during bench-scale anaerobic batch digestion of the sewage sludge for 40 additional days at 30ºC to 37ºC (86ºF to 99ºF)	Only for anaerobically digested sewage sludge that cannot meet the requirements of Option 1
☐	Option 3 503.33(b)(3)	Less than 15% additional volatile solids reduction during bench-scale aerobic batch digestion for 30 additional days at 20ºC (68ºF)	Only for aerobically digested liquid sewage sludge with 2% or less solids that cannot meet the requirements of Option 1 – e.g., sewage sludges treated in extended aeration plants. Sludges with 2% or greater solids must be diluted
☐	Option 4 503.33(b)(4)	SOUR at 20ºC (68ºF) is ≤ 1.5 mg oxygen/hr/g total sewage sludge solids	Liquid sewage sludges (2% or less solids) from aerobic processes run at temperatures between 10 to 30ºC (should not be used for composted sewage sludges)
☐	Option 5 503.33(b)(5)	Aerobic treatment of the sewage sludge for at least 14 days at over 40ºC (104ºF) with an average temperature of over 45ºC (113ºF)	Composted sewage sludge (For sewage sludges from other aerobic processes, it will likely be easier to meet option 3 or 4)
☐	Option 6 503.33(b)(6)	Addition of sufficient alkali to raise the pH to at least 12 at 25ºC (77ºF) and maintain a pH ≥ 12 for 2 hours and a pH ≥ 11.5 for 22 more hours	Alkali-treated sewage sludge (alkaline materials include lime, fly ash, kiln dust, and wood ash)
☐	Option 7 503.33(b)(7)	Percent solids ≥ 75% prior to mixing with other materials	Sewage sludges treated by an aerobic or anaerobic process (i.e., sewage sludges that do not contain unstabilized solids generated in primary wastewater treatment)
☐	Option 8 503.33(b)(8)	Percent solids ≥ 90% prior to mixing with other materials	Sewage sludges that contain unstabilized solids generated in primary wastewater treatment (e.g., heat-dried sewage sludges)
☐	Option 9 503.33(b)(9)	Sewage sludge is injected into soil so that no significant amount of sewage sludge is present on the land surface 1 hour after injection, except Class A sewage sludge which must be injected within 8 hours after the pathogen reduction process	Sewage sludge applied to the land or placed on a surface disposal site. Domestic septage applied to agricultural land, a forest, or a reclamation site, or placed on a surface disposal site

☐	Option 10 503.33(b)(10)	Sewage sludge is incorporated into the soil within 6 hours after application to land or placement on a surface disposal site, except Class A sewage sludge which must be applied to or placed on the land surface within 8 hours after the pathogen reduction process	Sewage sludge applied to the land or placed on a surface disposal site. Domestic septage applied to agricultural land, forest, or a reclamation site, or placed on a surface disposal site

Batch Processing

**Note: This section should describe any specific solids process (i.e., batch processing, alkaline stabilization, thermal drying, or composting) that is used at the wastewater treatment facility to achieve pathogen reduction and vector attraction reduction. The process should be described in detail and explain how operational conditions will ensure achievement of pathogen reduction and vector attraction reduction.*

BIOSOLIDS STORAGE

Treatment Facility

From the **Dewatering building or the drying beds dewatered** biosolids can be **transferred** into a truck for land application or **transported** to **a drying bed or storage bin**. The **storage facility** is designed with a total 7,803 SQFT to accommodate for **3-9 month** of storage during **October-June** until land application can commence. This is based on **2023** production rates**. Further pathogen reduction is achieved through storage unit prior to the biosolids being land applied.**

Staging

The unloading and placement of biosolids in one area at a land application site may occur on a limited time basis. If staging of biosolids occurs, the requirements outlined in the site authorization letters for each site will be followed.

Field Storage

Field storage **is currently not** authorized by the Department at this time. If field storage becomes authorized, biosolids may be stored as required by the site-specific authorization letter.

**Note: If field storage is authorized, the following must be submitted and will be included with the site-specific authorization letter or this biosolids management plan: agricultural information, site specific information, and a field management plan. Refer to "Implementing Oregon's Biosolids Program Internal Management Directive", December 2005, for specific information that must be submitted.*

TRANSPORTATION

The **City of Pendleton owns trucks** to transport biosolids from the wastewater treatment facility to authorized land application sites. The **trucks** are operated by **City of Pendleton employees or contract employees**. The **City of Pendleton** can handle the volume of biosolids produced through these transportation practices.

Liquid, dewatered, or dried are loaded from **storage bins** into trucks for land application. Dewatered or dried biosolids are loaded in the truck using a loader. The dewatering complex has site drainage that returns any liquid run off to the head of the plant. Liquid biosolids is not hauled at this time but would use to liquid biosolids fill station again any liquid spill would be returned to the head of the facility**.**

REMEDIAL PROCEDURES

All spills into waters of the state or spills on the ground surface that are likely to enter waters of the state will be reported immediately to Oregon Emergency Response System (OERS) at 1-800-452-0311 and the Department's regional biosolids specialist at Pendleton's DEQ Office. All spills of **1,000,000** gallons or more on the ground surface will be reported to the Department's regional biosolids specialist within **72** hour(s) of the spill incident.

Spill During Transportation of Biosolids

The **City of Pendleton** is responsible for cleanup of any biosolids spills that occur while transporting to land application sites. If a spill occurs during the transport of biosolids between the wastewater treatment facility and the land application site, the **City of Pendleton** will:

- Contain the spill.
- Post the area and set up temporary fencing if there is a potential for public exposure.
- Remove spilled biosolids with equipment or shovel.
- Cover the area with dry lime if needed.
- Apply absorbent (e.g., sand) if needed.
- Transport spilled product to a Department authorized biosolids land application or disposal site.

Solids Treatment Process Failure or Modification

If a mechanical problem occurs with **treatment components** and replacement parts are not in stock at the treatment facility, an emergency parts order will be placed. During this period, drying bed #7 is keep empty and only processes dewatered biosolids in order to accommodate any emergency failures with the dewatering equipment. DB 7 holds 138,000 gallons and can be filled and decanted multiple times giving the facility 14-20 days to repair any issue. There is other option that can be accommodated within the facilities design to increase this time. These options are not optimal and only would be used in an extreme disaster situation.

If maintenance is needed on a treatment process component that will affect compliance with pathogen reduction or vector attraction reduction requirements, the **City of Pendleton** will notify the Department. The City of Pendleton is obligated to maintain all equipment with in the facility to up hold the highest standards of complicative it possibly can.

MONITORING AND REPORTING

Monitoring and Sampling Program

The **City of Pendleton has Standard Operating Procedure (SOP) on** biosolids monitoring and sampling plan. Samples collected and analyzed will be representative of the biosolids to be land applied. Quality control measures and procedures will be implemented for microbiological tests to verify precision and accuracy. Currently fertility and heavy metal testing is conducted by a third party laboratory. **The City** uses NELAC or ORLAP certified labs to conduct all third party laboratory testing. Sampling location(s) stated will demonstrate how vector attraction reduction option(s) **Option 1 is** met. The SOPs includes:

- The sampling location (must be representative),
- How samples will be collected, preserved and transported
- Smapling COC will be included with samples

All monitoring and reporting will be conducted in accordance with the **City of Pendleton NPDES** permit. The monitoring frequency is based on the amount of biosolids generated that is land applied or marketed to be sold or given away. Based on 40 CFR §503.16, Table 1 and the amount of biosolids generated and used during **2023**, the **City of Pendleton** is required to sample biosolids **four times a year, but only currently land applies within two of the four quarters**.

Biosolids testing is currently (2024) done in four batches. The addition of batches would include additional batches for Class A biosolids.
Batch 1 = is the biosolids that was produced from the Press over the winter months.
Batch 2 = is the biosolids that was produced from the Drying beds the previous year.
Batch 3 = is the biosolids that was produced from the winter press then dryed out
Batch 4 = is the biosolids that was produced from the summer press months.

Recordkeeping and Reporting Procedures

The **City of Pendleton** as the preparer and land applier of biosolids is required to maintain records to demonstrate that federal and state biosolids requirements are met. Records will be kept on file by the **City of Pendleton** and will be available upon request by the Department. Monitoring and sampling records will be retained for a period no less than 5 years, unless otherwise required by the **NPDES** permit or a site authorization letter. The minimum required records include the following information:

- Pollutant concentrations of each parameter stated in the permit,
- Pathogen requirements as stated in the permit for Class **A/B**,
- Description of how one of the vector attraction reduction requirements in 40 CFR §503.33(b)(1) through (8) are met,
- Description of how the management practices in 40 CFR §503.14 and site restrictions in 40 CFR §503.32(b)(5) are met for each biosolids land application site (*note: this is for Class B bulk biosolids*), and
- Certification that the information submitted is accurate to determine compliance with pathogen and vector attraction reduction requirements, and site restriction/management requirements.

Annual Reporting

A biosolids annual report is required to be submitted to the Department each year by February 19th or as required by the permit if bulk biosolids have been land applied, or biosolids derived products were sold or given away the previous year. The report will include information on biosolids handling activities and data (i.e., monitoring results, nutrient loading rates) from the previous calendar year. Some of the information required with the annual report includes:

- Daily site logs or records, including date, time, and quantity (gallon, pounds) of nitrogen/acre land applied.
- Map, including scale, showing the site and the land application location that coincides with the daily site application method (e.g., truck spreader bar, irrigation cannon).
- Signed copy of the certification statement (see next section on Certification Statement).

Certification Statement

The **City of Pendleton** is capable of meeting Class **A/ B** pathogen reduction and vector attraction reduction requirements. As required under 40 CFR §503.17, the **City of Pendleton** must retain a certification statement indicating whether compliance with pathogen reduction, vector attraction reduction, and certain site restrictions have been met. The certification statement must be retained for a period of five years and must be submitted with the annual report that is due February 19th or as required by the permit. The **City of**

Pendleton will retain the following certification statement and it will be signed by a principal executive officer or ranking elected official (**note: for a municipality, State, Federal, or other public agency)* or their duly authorized representative (e.g., individual or position having responsibility for the overall operation of the system, such as the position of plant manager, supervisor, superintendent or equivalent responsibility).

> **Note: The following certification is for the most common situation when Class B bulk biosolids meet Table 3 metals values and VAR is achieved at the wastewater treatment works and is prepared and land applied by the permittee. For other situations including Class A biosolids, domestic septage, or when Table 2 Cumulative Pollutant Loading Rates are met, a different certification statement must be signed and retained. These statements are posted on the Department's web site at http://www.deq.state.or.us/wq/Biosolids/BioCerts.htm.*
>
> "I certify, under penalty of law, that the information that will be used to determine compliance with the Class B pathogen requirements in 40 CFR §503.32(b)**<insert either (2),(3), or (4)>**, the vector attraction reduction requirement in 40 CFR §503.33(b)**<insert appropriate option (1) through (8)>**, and the site restrictions in 40 CFR §503.32(b)(5) for each site on which Class B sewage sludge was applied, was prepared under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate this information. I am aware that there are significant penalties for false certification, including the possibility of fine and imprisonment."
>
> **Signature_____Date_____**

City of Pendleton is also required as the land applier to certify that the management practices in 40 CFR §503.14 are being met. This certification includes that biosolids are being land applied at approved agronomic loading rates as specified in department issued site authorization letters.

> "I certify, under penalty of law that the management practices in 40 CFR §503.14 have been met for each site on which bulk biosolids is applied. This determination has been made under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate the information used to determine that the management practices have been met. I am aware that there are significant penalties for false certification, including the possibility of fine and imprisonment."
>
> **Signature_____Date_____**

BIOSOLIDS CHARACTERISTICS

Pollutant Characteristics

The following table is a representative biosolids analysis for pollutant characteristics. This data and all previous data indicate that pollutant concentrations for all regulated pollutants have been met.
**Note: If a facility is required to monitor more than once a year, all data for the year should be provided in this section.*

Parameter	2023				40 CFR §503.13(b)(3) Pollutant Concentration Limits (mg/kg)
	Winter Press (mg/kg)	Drying beds (mg/kg)	Summer Press (mg/kg)	Press 2 Bed (mg/kg)	
Sample Date	**3/28/2023**	**8/26/2023**	**6/5/2023**	**10/2/2023**	
Arsenic (As)	4.59	3.9	3.74	4.53	41
Cadmium (Cd)	5.36	4.21	7.02	5.89	39
Chromium (Cr)	24.6	21.8	21.5	39.4	-
Copper (Cu)	347	323	281	381	1500
Lead (Pb)	25.8	18.6	18.6	21.8	300
Mercury (Hg)	0.856	0.652	0.557	0.689	17
Molybdenum (Mo)	13.2	11.9	11.8	14.1	-
Nickel (Ni)	18.5	17.8	18	27.5	420
Selenium (Se)	7.35	6.65	5.94	8.21	100
Zinc (Zn)	1230	1020	873	1160	2800

Nutrient Characteristics and Other Parameters

The following table is a representative biosolids analysis for nutrient characteristics and other parameters.
**Note: If a facility is required to monitor more than once a year, all data for the year should be provided in this section.*

Parameter	2023			
	Winter Press (mg/kg)	Drying beds (mg/kg)	Summer Press (mg/kg)	Press 2 Bed (mg/kg)
Sample Date	**3/28/2023**	**8/26/2023**	**6/5/2023**	**10/2/2023**
Total solids, %TS	24.9	93.5	33.3	85.5
Volatile solids, %VS	66.5	58.9	71.1	66.3
TKN,	48200	19500	51200	8810
NO_3-N, Nitrate	33.3	0.59	14.5	2.55
NO_2-N, Nitrite	ND	ND	ND	ND
NH_4-N, Ammonia	6910	1770	5620	6100
Phosphorus (P)	15600	21300	16800	16500
Potassium (K)	1370	3510	1670	1510
Iron (Fe)	15100	13200	10500	14500
Sulfur (S)	12800	11200	10900	11900
pH, standard unit	7.92	6.31	8.69	6.01

BIOSOLIDS UTILIZATION PROGRAM

100 percent of biosolids generated by **City of Pendleton** is beneficially used **through land application.** The following biosolids land application plan outlines agronomic application rate and site crops, where biosolids are land applied, site selection criteria for a new site, and site and crop management practices.

BIOSOLIDS LAND APPLICATION PLAN

Agronomic Application Rate and Site Crops

Class B biosolids are required to be land applied to a site at a rate that is equal to or less than the agronomic rate for the site. An agronomic rate is the whole biosolids application rate (dry weight basis) designed to provide the annual total amount of nitrogen needed by a crop and to minimize the amount of nitrogen passing below the root zone of the crop or vegetation to groundwater.

Biosolids application rates for the **City of Pendleton** sites were developed based on Oregon State University (OSU) Extension Service Fertilizer Guide: **FG82, FG83, and PNW511**. The annual application rate for **wheat** is **180** available nitrogen (N) per acre, unless the application site demonstrates additional nitrogen is required to match crop uptake rates. (**Note: If more than one type of crop is used at the same site, then state each type of crop and the application rate.*) The land application sites authorized for use can assimilate the total plant available nitrogen the biosolids provide on an annual basis. Specific site agronomic loading rates are stated in the Department issued site authorization letters.

Following the Oregon State Extension Service guide FG82, the range for PAN assimilation depends on crop, protein content and expected yield. Such application range would be 176 pounds PAN- 330 pounds PAN per acre. Low end would be for a Soft White with 9% protein, high end would be for a Hard Red with 13% protein. Yield range is 80-100 bushels per acre.

The amount of N needed depends on the type of wheat and expected yield. According to Oregon State University Soil Scientist, Don Wysocki, Ph. D., Columbia Basin Agricultural Research Center, the nitrogen requirement for a crop is computed by multiplying the expected harvest (bushels/acre) by 2.4 and subtracting the total lbs/acre available N.
N LOAD= 2.4 lbs nitrogen* no. of bushels wheat per acre= lbs nitrogen/acre needed (for estimated harvest)

no. lbs nitrogen ***/*** acre needed - no. lbs nitrogen available = no. lbs needed to apply / acre (measured on soil test)

For example: 2.4 lbs nitrogen* 60 bushels wheat/ acre= 144 lbs nitrogen/ acre

144 lbs nitrogen/ acre - 65.6 lbs nitrogen/ acre= 78.4 lbs nitrogen/ acre is needed

The land application sites are farmed by the owner of the land and the crop that is planted on the site is up to the owner. The City of Pendleton has no influence on the type of crop planted on any land application site. The City of Pendleton has always and will continue to work with the land owner and DEQ staff to insure that the appropriate OSU fertilizer Guide is use to determine the annual application rate for that crop is meet.

Site Inventory of Existing and Potential Sites

The **City of Pendleton** currently land applies Class **A/B** biosolids to the Department authorized sites listed in the **Appendix A**. Surface application of biosolids is performed using a truck with a spreader box on it. Site maps with the general location and size of existing authorized sites are included as Appendix **D** of this biosolids management plan. The **City of Pendleton** currently has **540.4** acres that are authorized for land application. This is an adequate land base for current operations, based on current biosolids generation rates.

Biosolids Land Application Site Inventory

See Appendix A

Site Selection Criteria for a New Site

If necessary, the **City of Pendleton** will locate additional sites for land applying biosolids. Prior to using any site for land application, the **City of Pendleton** is required to receive a written site authorization letter from the Department. The following site conditions will be considered when determining the suitability of a site for land application:

- All sites will be located on **agricultural/forest/reclamation** land in **Umatilla County**.
- A site should be on a stable geologic formation not subject to flooding or excessive run-off from adjacent land.
- Minimum depth to permanent groundwater should be four feet **and the minimum depth to temporary groundwater should be one foot at the time when application of liquid biosolids occurs**.
- Topography should be suitable for normal agricultural operations. **Liquid biosolids should not be land applied on bare soils when the slope exceeds 12 percent. / Dewatered or dried biosolids may be land applied on well vegetated slopes up to 30 percent**.
- Soil should have a minimum rooting depth of 24 inches.
- City will use the developed document from the 2020 Land application site Authorization Request which can be found on the City Serves and in the Ops room in the biosolids binder.
- Saline and/or sodic soils should be avoided

Public Notification

The **City of Pendleton** is required to notify the public of the proposed land application activity. Each year prior to land application of biosolids, the **City of Pendleton** should verify for those sites to be used for the year that the property owners who received prior notification have not changed. If a property owner has changed, notification of the land application activity should be made to the new property owner and documented.

Site Management Practices

Site access restrictions and setbacks will be followed as outlined in the Department's site authorization letters. The **City of Pendleton** will ensure that access is restricted by appropriate means as necessary, such as fencing or posting of signs at the land application site. Biosolids land application will not occur in those areas designated as buffer strips and will be achieved through accurate measurement of the buffer area prior to commencing land application.

Crop Management Practices

As listed in the Biosolids Land Application Site Inventory table appendix A, biosolids are applied to **Grain crops**. Timing of application and the harvest cycle of the crop are also listed. Soil conditions must be favorable for application such that runoff, leaching, or soil compaction does not occur. The timing of land application will take into consideration tilling and irrigation practices that may occur on an authorized site.

The overall management of nutrients at the land application sites considers the amount of biosolids land applied, the amount of commercial fertilizers used and the amount of residual nutrients in the soil. When additional sources of nitrogen (e.g., commercial fertilizer) are applied to a site, then the application of biosolids should be reduced to compensate for the additional nitrogen loading.

Prior to the initiation of biosolids application to a site, a representative soil sample is collected across the entire site and analyzed by an independent commercial laboratory. Existing nitrogen levels in the soil profile are subtracted from the OSU Extension Service recommended nitrogen application rates for the crop and the biosolids application rate is adjusted. Soil testing is conducted at **all sites** on an **annual** basis. In the event of annual biosolids application to the same field for 3 consecutive years, annual sampling and testing of application site soils for nitrate and ammonia nitrogen will be conducted prior to biosolids application. Application rates must be adjusted to account for available nitrogen carried over from previous applications. If crop removal of nitrogen exceeds the calculated agronomic rate, additional nitrogen may be required to sustain crop production.

Soil sampling will be conducted in accordance to the City of Pendleton's SOP on soil sampling. In the event that the number of fields needed is less than the number of fields available the fields that are to be used that year will be sampled for fertility. Heavy metal sampling will be conducted no less than five years apart.

SOIL SAMPLING

Soil Samples for Nutrients - Soil samples are collected for each site that will have biosolids applied to it. A number of samples will be collected for each unit and composited. The number of samples will vary depending on the size of the area. There should be at least 3 soil cores at 1 foot increments up to 4 feet deep collected at 3 to 6 seperates sites for each unit. When the cores are collected they should be composited with the cores oa corresponding depths (ie there should should be separate composite samples for each unit for each depth of 0-1 ', 1-2', 2-3', etc.) The 0-1' sample should have the following analysis done prior to application: pH, Nitrate-N, Ammonia-N, TKN, Phosphorus, Potassium and % Moisture. The 1-2', 2-3' etc following analysis done Nitrate-N.

Soil Samples for Metal Analysis - Soil samples are collected and analyzed for baseline metals on each site prior to any biosolids applications to establish background references. The metals to be monitored are: Arsenic, Cadmium, Chromium, Copper, Lead, Mercury, Molybdenum, Nickel, Selenium, and Zinc.

Appendix A

Site Name/Identifier	Map ID	Tax lot ID	Type of Crop	Useable Acreage	Total Acres	lb. N/acre	lb. N/site	Time of year applied (month)	Harvest Cycle	DEQ Authorized?
Straughan East	3N320000	9100	Wheat	112.00	156.70	180	20160	Jun-July, or Oct	summer fallow	Yes
Straughan West	3N320000	6300	Wheat	140.00	157.20	180	25200	Jun-July, or Oct	summer fallow	Yes
Straughan North	3N320000	3801	Wheat	140.18	158.18	180	25232	Jun-July, or Oct	summer fallow	Yes
Straughan South	3N320000	3800	Wheat	148.18	158.18	180	26672	Jun-July, or Oct	summer fallow	Yes
Straughan CRP	1N320000	4902	CRP	145.80	191.02				NA	Yes
Straughan CRP	1N310000	1801	CRP		156.36				NA	Yes
City owned Airport property not active										
Airport 1	3N320000	9900	Wheat	37.50		180	6750	Jun-July, or Oct	summer fallow	Yes
Airport 2	3N320000	9900	Wheat	39.20		180	7056	Jun-July, or Oct	summer fallow	Yes
Airport 3	3N320000	9900	Wheat	19.50		180	3510	Jun-July, or Oct	summer fallow	Yes
Airport 4E	3N320000	9900	Wheat	135.30		180	24354	Jun-July, or Oct	summer fallow	Yes
Airport 4W	3N320000	9900	Wheat	122.40		180	22032	Jun-July, or Oct	summer fallow	Yes
Airport 5	3N320000	9900	Wheat	64.80		180	11664	Jun-July, or Oct	summer fallow	Yes
Airport 6	3N320000	9900	Wheat	18.80		180	3384	Jun-July, or Oct	summer fallow	Yes
Airport 7A	3N320000	9900	Wheat	48.50		180	8730	Jun-July, or Oct	summer fallow	Yes
Airport 7E	3N320000	9900	Wheat	111.30		180	20034	Jun-July, or Oct	summer fallow	Yes
Airport 7W	3N320000	9900	Wheat	83.40		180	15012	Jun-July, or Oct	summer fallow	Yes
Airport 8	3N320000	9900	Wheat	73.70		180	13266	Jun-July, or Oct	summer fallow	Yes
Airport 9	3N320000	9900	Wheat	16.40		180	2952	Jun-July, or Oct	summer fallow	Yes
Airport 10	3N320000	9900	Wheat	64.70		180	11646	Jun-July, or Oct	summer fallow	Yes
Airport 11	3N320000	9900	Wheat	27.00		180	4860	Jun-July, or Oct	summer fallow	Yes
Airport 13	3N320000	9900	Wheat	7.60		180	1368	Jun-July, or Oct	summer fallow	Yes
Airport 14	3N320000	9900	Wheat	17.80		180	3204	Jun-July, or Oct	summer fallow	Yes
Airport 15	3N320000	9900	Wheat	35.20		180	6336	Jun-July, or Oct	summer fallow	Yes
Airport 16	3N320000	9900	Wheat	86.80		180	15624	Jun-July, or Oct	summer fallow	Yes
In process of becoming authorized to replace the lost of Airport property avaiblity and Mr. Straughan retiring										
Hill 1	3N320000	8800	Wheat		155.91			Jun-July, or Oct	summer fallow	No, future land
Hill 2	3N320000	8700	Wheat		160			Jun-July, or Oct	summer fallow	No, future land
Hill 3	3N320000	8400	Wheat		158.18			Jun-July, or Oct	summer fallow	No, future land
Hill 4	3N320000	9000	Wheat		312			Jun-July, or Oct	summer fallow	No, future land
Hill 5	3N320000	8600	Wheat		237.27			Jun-July, or Oct	summer fallow	No, future land
Hill 6	3N323300	100	Wheat		95.22			Jun-July, or Oct	summer fallow	No, future land
Hill 7	3N320000	11400	Wheat		396.24			Jun-July, or Oct	summer fallow	No, future land
Duff 1	3N330000	8601	Wheat		452.62			Jun-July, or Oct	summer fallow	No, future land
Duff 2	2N333000	700	Wheat		72.6			Jun-July, or Oct	summer fallow	No, future land
Duff 3	2N333000	600	Wheat		80			Jun-July, or Oct	summer fallow	No, future land

Appendix B

BIOSOLIDS CHARACTERISTICS

Anatek Labs Biosolids analytical reports for the four lots produced at the city of Pendleton's WWT/RRF.

Lot 1 2023 Winter Press is the biosolids produced from October 2022 thru March 2023
Lot 2 2023 Dry beds is the biosolids produced from the drying beds
Lot 3 2023 Press to Bed is the biosolids produced through the Press and then dried further in a drying bed
Lot 4 2023 Summer Press is the biosolids produced from April 2023 thru September 2023 thru the Press

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Client:	City of Pendleton	Work Order:	MDC0971
Address:	500 SW Dorion Avenue	Project:	Biosolids 2023
	Pendleton, OR 97801	Reported:	4/19/2023 11:05
Attn:	Kyle Willman		

Analytical Results Report

Sample Location:	2023 Winter Press		
Lab/Sample Number:	MDC0971-01	Collect Date:	03/28/23 08:45
Date Received:	03/30/23 14:58	Collected By:	Kyle Willman
Matrix:	Solid		

Analyte	Result	Units	MDL	PQL	Analyzed	Analyst	Method	Qualifier
Inorganics								
% Moisture	75.1	%	0.00	0.00	3/31/23 12:45	BKP	SM 2540 G	
% Solids	24.9	%	0.100	0.100	3/31/23 12:44	BKP	SM 2540 G	
Ammonia/N	6910	mg/kg dry	96.6	0.00	4/14/23 15:44	MMC	SM 4500-NH3 G	
Nitrate + Nitrite	33.3	mg/kg dry	4.80	26.7	4/6/23 19:30	BKP	EPA 300.0	
Nitrate/N	33.3	mg/kg dry	4.80	26.7	4/6/23 19:30	BKP	EPA 300.0	H3
Nitrite/N	ND	mg/kg dry	4.80	26.7	4/6/23 19:30	BKP	EPA 300.0	H3, U
pH	7.92 @ 20.0°C	pH Units			4/11/23 14:42	CC	SM 4500-H-B	H5
Total Solids (105C)	28.9	%	0.100	0.100	4/4/23 10:00	BKP	SM 2540 B	
TVS	66.5	%	0.0100	0.0100	4/4/23 15:45	GPB	SM 2540 E	
TKN	48200	mg/kg dry	13700	22800	4/7/23 13:49	MMC	SM 4500-Norg C	
Metals by ICP-MS								
Arsenic	4.59	mg/kg dry	0.833	1.67	4/10/23 12:27	TEC	EPA 6020B	
Cadmium	5.36	mg/kg dry	0.167	1.67	4/10/23 12:27	TEC	EPA 6020B	
Chromium	24.6	mg/kg dry	0.833	1.67	4/10/23 12:27	TEC	EPA 6020B	
Copper	347	mg/kg dry	0.833	1.67	4/10/23 12:27	TEC	EPA 6020B	
Mercury	0.856	mg/kg dry	0.0333	0.167	4/10/23 12:27	TEC	EPA 6020B	
Molybdenum	13.2	mg/kg dry	0.833	1.67	4/10/23 12:27	TEC	EPA 6020B	
Nickel	18.5	mg/kg dry	0.833	1.67	4/10/23 12:27	TEC	EPA 6020B	
Lead	25.8	mg/kg dry	0.833	1.67	4/10/23 12:27	TEC	EPA 6020B	
Selenium	7.35	mg/kg dry	0.0983	1.67	4/10/23 12:27	TEC	EPA 6020B	
Zinc	1230	mg/kg dry	16.7	167	4/10/23 12:27	TEC	EPA 6020B	
Metals by ICP								
Iron	15100	mg/kg dry	33.3	33.3	4/11/23 13:27	TEC	EPA 6010D	
Potassium	1370	mg/kg dry	33.3	167	4/11/23 13:27	TEC	EPA 6010D	
Phosphorous	15600	mg/kg dry	33.3	33.3	4/11/23 13:27	TEC	EPA 6010D	
Sulfur	12800	mg/kg dry	33.3	33.3	4/11/23 13:27	TEC	EPA 6010D	

Authorized Signature,

Justin Doty For Todd Taruscio, Laboratory Manager

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Client:	City of Pendleton	Work Order:	MDH0783
Address:	500 SW Dorion Avenue	Project:	BioSolids 2023
	Pendleton, OR 97801	Reported:	9/15/2023 10:44
Attn:	Kyle Willman		

Analytical Results Report

Sample Location:	2023 Drying Beds		
Lab/Sample Number:	MDH0783-01	Collect Date:	08/16/23 12:00
Date Received:	08/22/23 13:45	Collected By:	Kyle Willman
Matrix:	Solid		

Analyte	Result	Units	MDL	PQL	Analyzed	Analyst	Method	Qualifier
Inorganics								
% Moisture	6.49	%	0.00	0.00	8/28/23 10:00	BKP	SM 2540 G	
% Solids	93.5	%	0.100	0.100	8/28/23 10:00	BKP	SM 2540 G	
Ammonia/N	1770	mg/kg dry	2.75	26.0	9/8/23 10:44	MMC	SM 4500-NH3 G	
Nitrate/N	0.590	mg/kg dry	0.183	1.02	9/6/23 18:46	DA	EPA 300.0	H1, J
Nitrite/N	ND	mg/kg dry	0.00732	0.0407	9/6/23 18:46	DA	EPA 300.0	H1, U
pH	6.31 @ 22.3°C	pH Units			8/28/23 15:00	SW	SM 4500-H-B	H5
Total Solids (105C)	93.5	%	0.100	0.100	8/28/23 10:00	BKP	SM 2540 B	
TVS	58.9	%	0.0100	0.0100	8/23/23 15:30	GPB	SM 2540 E	
TKN	19500	mg/kg dry	3270	5460	9/8/23 10:44	MMC	SM 4500-Norg C	
Metals by ICP-MS								
Arsenic	3.90	mg/kg dry	0.267	0.535	8/31/23 12:35	TEC	EPA 6020B	
Cadmium	4.21	mg/kg dry	0.0535	0.535	8/31/23 12:35	TEC	EPA 6020B	
Chromium	21.8	mg/kg dry	0.267	0.535	8/31/23 12:35	TEC	EPA 6020B	
Copper	323	mg/kg dry	2.67	5.35	8/31/23 13:03	TEC	EPA 6020B	
Mercury	0.652	mg/kg dry	0.0107	0.0535	8/31/23 12:35	TEC	EPA 6020B	
Molybdenum	11.9	mg/kg dry	0.267	0.535	8/31/23 12:35	TEC	EPA 6020B	
Nickel	17.8	mg/kg dry	0.267	0.535	8/31/23 12:35	TEC	EPA 6020B	
Lead	18.6	mg/kg dry	0.267	0.535	8/31/23 12:35	TEC	EPA 6020B	
Selenium	6.65	mg/kg dry	0.0315	0.535	8/31/23 12:35	TEC	EPA 6020B	
Zinc	1020	mg/kg dry	53.5	535	8/31/23 13:03	TEC	EPA 6020B	
Metals by ICP								
Iron	13200	mg/kg dry	107	107	9/1/23 11:27	TEC	EPA 6010D	
Potassium	3510	mg/kg dry	107	535	9/1/23 11:27	TEC	EPA 6010D	
Phosphorous	21300	mg/kg dry	107	107	9/1/23 11:27	TEC	EPA 6010D	
Sulfur	11200	mg/kg dry	107	107	9/1/23 11:27	TEC	EPA 6010D	

Authorized Signature,

Justin Doty For Todd Taruscio, Laboratory Manager

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Client:	City of Pendleton	Work Order:	MDJ0163
Address:	500 SW Dorion Avenue	Project:	BioSolids 2023
	Pendleton, OR 97801	Reported:	11/3/2023 13:11
Attn:	Kyle Willman		

Analytical Results Report

Sample Location: 2023 press2bed
Lab/Sample Number: MDJ0163-01 Collect Date: 10/02/23 10:40
Date Received: 10/04/23 14:20 Collected By:
Matrix: Solid

Analyte	Result	Units	MDL	PQL	Analyzed	Analyst	Method	Qualifier
Inorganics								
% Moisture	14.2	%	0.00	0.00	10/5/23 9:00	BKP	SM 2540 G	
% Solids	85.8	%	0.100	0.100	10/5/23 9:00	BKP	SM 2540 G	
Ammonia/N	6100	mg/kg dry	26.6	251	10/20/23 15:17	MMC	SM 4500-NH3 G	
Nitrate/N	2.55	mg/kg dry	1.53	8.49	10/10/23 15:27	DA	EPA 300.0	J, H1
Nitrite/N	ND	mg/kg dry	1.53	8.49	10/10/23 15:27	DA	EPA 300.0	H1, U
pH	6.01 @ 22.5°C	pH Units			10/16/23 13:17	CC	SM 4500-H-B	H5
Total Solids (105C)	85.8	%	0.100	0.100	10/5/23 9:00	BKP	SM 2540 B	
TVS	66.3	%	0.0100	0.0100	10/9/23 16:05	GPB	SM 2540 E	
TKN	8810	mg/kg dry	3360	5600	10/20/23 15:17	MMC	SM 4500-Norg C	
Metals by ICP-MS								
Arsenic	4.53	mg/kg dry	0.298	0.596	10/31/23 19:20	TEC	EPA 6020B	
Cadmium	5.89	mg/kg dry	0.0596	0.596	10/31/23 19:20	TEC	EPA 6020B	
Chromium	39.4	mg/kg dry	0.298	0.596	10/31/23 19:20	TEC	EPA 6020B	
Copper	381	mg/kg dry	2.98	5.96	10/31/23 19:03	TEC	EPA 6020B	
Mercury	0.689	mg/kg dry	0.0119	0.0596	10/31/23 19:20	TEC	EPA 6020B	
Molybdenum	14.1	mg/kg dry	0.298	0.596	10/31/23 19:20	TEC	EPA 6020B	
Nickel	27.5	mg/kg dry	0.298	0.596	10/31/23 19:20	TEC	EPA 6020B	
Lead	21.8	mg/kg dry	0.298	0.596	10/31/23 19:20	TEC	EPA 6020B	
Selenium	8.21	mg/kg dry	0.0352	0.596	10/31/23 19:20	TEC	EPA 6020B	
Zinc	1160	mg/kg dry	5.96	59.6	10/31/23 19:03	TEC	EPA 6020B	
Metals by ICP								
Iron	14500	mg/kg dry	119	119	10/19/23 18:02	TEC	EPA 6010D	
Potassium	1510	mg/kg dry	11.9	59.6	10/19/23 17:56	TEC	EPA 6010D	
Phosphorous	16500	mg/kg dry	11.9	11.9	10/19/23 17:56	TEC	EPA 6010D	
Sulfur	11900	mg/kg dry	11.9	11.9	10/19/23 17:56	TEC	EPA 6010D	

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Client:	City of Pendleton	Work Order:	MDF0420
Address:	500 SW Dorion Avenue	Project:	BioSolids 2023
	Pendleton, OR 97801	Reported:	7/6/2023 12:13
Attn:	Kyle Willman		

Analytical Results Report

Sample Location:	2023 Summer Press		
Lab/Sample Number:	MDF0420-01	Collect Date:	06/05/23 14:00
Date Received:	06/09/23 15:00	Collected By:	Kyle Willman
Matrix:	Solid		

Analyte	Result	Units	MDL	PQL	Analyzed	Analyst	Method	Qualifier
Inorganics								
% Moisture	66.7	%	0.00	0.00	6/15/23 13:49	BKP	SM 2540 G	
% Solids	33.3	%	0.100	0.100	6/15/23 13:48	BKP	SM 2540 G	
Ammonia/N	5620	mg/kg dry	7.31	276	6/29/23 12:58	MMC	SM 4500-NH3 G	
Nitrate/N	14.5	mg/kg dry	0.543	3.02	6/13/23 21:45	BKP	EPA 300.0	H3
Nitrite/N	ND	mg/kg dry	0.543	3.02	6/13/23 21:45	BKP	EPA 300.0	H3, U
pH	8.69 @ 22.1°C	pH Units			6/14/23 14:00	CC	SM 4500-H-B	H5
Total Solids (105C)	33.3	%	0.100	0.100	6/15/23 13:49	BKP	SM 2540 B	H1
TVS	71.1	%	0.0100	0.0100	6/12/23 16:30	GPB	SM 2540 E	
TKN	51200	mg/kg dry	9400	15700	6/15/23 11:48	MMC	SM 4500-Norg C	
Metals by ICP-MS								
Arsenic	3.74	mg/kg dry	0.741	1.48	6/21/23 19:18	TEC	EPA 6020B	
Cadmium	7.02	mg/kg dry	0.148	1.48	6/21/23 19:18	TEC	EPA 6020B	
Chromium	21.5	mg/kg dry	0.741	1.48	6/21/23 19:18	TEC	EPA 6020B	
Copper	281	mg/kg dry	0.741	1.48	6/21/23 19:18	TEC	EPA 6020B	
Mercury	0.557	mg/kg dry	0.0297	0.148	6/21/23 19:18	TEC	EPA 6020B	
Molybdenum	11.8	mg/kg dry	0.741	1.48	6/21/23 19:18	TEC	EPA 6020B	
Nickel	18.0	mg/kg dry	0.741	1.48	6/21/23 19:18	TEC	EPA 6020B	
Lead	18.6	mg/kg dry	0.741	1.48	6/21/23 19:18	TEC	EPA 6020B	
Selenium	5.94	mg/kg dry	0.0875	1.48	6/21/23 19:18	TEC	EPA 6020B	
Zinc	873	mg/kg dry	14.8	148	6/21/23 19:12	TEC	EPA 6020B	
Metals by ICP								
Iron	10500	mg/kg dry	29.7	29.7	6/22/23 16:54	TEC	EPA 6010D	
Potassium	1670	mg/kg dry	29.7	148	6/22/23 16:54	TEC	EPA 6010D	
Phosphorous	16800	mg/kg dry	29.7	29.7	6/22/23 16:54	TEC	EPA 6010D	
Sulfur	10900	mg/kg dry	29.7	29.7	6/22/23 16:54	TEC	EPA 6010D	

Authorized Signature,

Justin Doty For Todd Taruscio, Laboratory Manager

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H1	Sample analysis performed past holding time.
H5	This test is specified to be performed in the field within 15 minutes of sampling; sample was received and analyzed past the regulatory holding time.
J	The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
M3	Spike recovery value is unusable. Analyte concentration disproportionate to the spike level. Blank spike recovery acceptable.
U	Compound was analyzed for but not detected
PQL	Practical Quantitation Limit
ND	Not Detected
MDL	Method Detection Limit
Dry	Sample results reported on a dry weight basis
*	Not a state-certified analyte
RPD	Relative Percent Difference
%REC	Percent Recovery
Source	Sample that was spiked or duplicated.

Appendix C

2023 Soil Sampling

Depth Inches		Field ID	NO3-N KCl	NH4-N KCl	pH 1:2	Arsenic	Cadmium	cobalt	Lead	Molybdenum	Nickel	Selenium	Zinc	Mercury
Start	End		lbs/ac	lbs/ac		mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
0	12	Straughan East	26	14	6.3	29.350	<0.005	14.090	24.270	2.740	0.590	10.760	42.860	ND
12	24	Straughan East	20			6.500	<0.005	13.360	24.550	<0.01	3.790	<0.02	36.100	ND
24	36	Straughan East	14			<0.01	<0.005	3.200	16.570	5.650	5.270	<0.02	31.450	ND
36	48	Straughan East	18			19.770	<0.005	10.730	8.660	<0.01	8.100	5.650	32.200	ND
			92											
0	12	Straughan West	26	11	6.1	16.320	<0.005	9.380	18.200	0.380	5.250	<0.02	32.080	ND
12	24	Straughan West	18			<0.01	<0.005	10.430	12.000	0.170	3.300	<0.02	30.090	ND
24	36	Straughan West	12			25.630	<0.005	9.030	12.450	2.350	4.870	26.170	33.940	ND
36	48	Straughan West	12			18.070	<0.005	7.480	3.100	0.730	5.470	<0.02	34.120	ND
			79											
0	12	Straughan North	17	14	6.6	13.240	1.540	9.600	6.140	<0.01	12.280	<0.02	47.980	ND
12	24	Straughan North	12			14.970	1.660	8.870	4.070	<0.01	14.970	13.120	47.500	ND
24	36	Straughan North	9			10.610	3.170	12.660	16.200	<0.01	14.340	7.820	47.860	ND
36	48	Straughan North	9			13.000	2.800	12.000	2.400	<0.01	10.600	<0.02	49.000	0.003
			62											
0	12	Straughan South	15	18	6.7	21.920	2.210	9.210	3.870	<0.01	14.730	<0.02	53.780	0.008
12	24	Straughan South	10			22.060	2.240	16.640	1.870	<0.01	13.080	<0.02	49.720	0.009
24	36	Straughan South	10			27.840	2.130	10.110	7.980	<0.01	12.770	<0.02	46.280	ND
36	48	Straughan South	10			<0.01	1.470	8.620	<0.015	<0.01	16.510	<0.02	47.520	ND
			63											

Date: May 22, 2023
Report No: 96883
Grower: Pat Straughan
Client: City of Pendleton RRF
Sampler: Kyle Willman
Sampled: 5/18/2023

Samples will be stored until 6/4/2023

KTL KUOTESTING LABS
A Matrix Sciences Company

SUMMARY PAGE

SOIL ANALYSIS REPORT

Lab #	Depth Inches Start	Depth Inches End	Field ID	Sample ID	Crop	NO3-N KCl lbs/ac	NO3-N KCl ppm	NH4-N KCl lbs/ac	NH4-N KCl ppm	P Olsen ppm	P Bray ppm	K Ammonium Acetate ppm	Ca Ammonium Acetate meq/100g	Mg Ammonium Acetate meq/100g	Na Ammonium Acetate meq/100g	SO4-S ppm	B DTPA ppm	Zn DTPA ppm	Mn DTPA ppm	Cu DTPA ppm	Fe DTPA ppm	pH 1:2	SMP pH	Soluble Salts 1:1	OM %	Efferve-scence Test	Available Moisture in/foot	Total Bases Meq/100g	Base Saturation % Ca	% Mg	% K	% Na	% H
881	0	12	north Straughan		Wheat	17	4.3	14	3.6	39		462				7						6.6			2.03		1.46						
882	12	24	north Straughan		Wheat	12	3.1	13	3.3							5											1.47						
883	24	36	north Straughan		Wheat	9	2.3	12	2.9																		1.43						
884	36	48	north Straughan		Wheat	9	2.2	10	2.6																		1.36						
885	0	12	south Straughan		Wheat	15	3.7	18	4.4	30		490				7						6.7			1.60		1.55						
886	12	24	south Straughan		Wheat	10	2.6	13	3.3							4											1.49						
887	24	36	south Straughan		Wheat	10	2.4	15	3.7																		1.44						
888	36	48	south Straughan		Wheat	10	2.6	13	3.3																		1.43						

Soil PAP NAPT 2020

ALP Agricultural Laboratory Proficiency Program

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Oregon Office: 1300 Sixth St., Suite J, Umatilla, OR 97882
Pasco Office: 1320 E Spokane St., Pasco, WA 99301
(509) 488-0112 info@kuotestinglabs.com

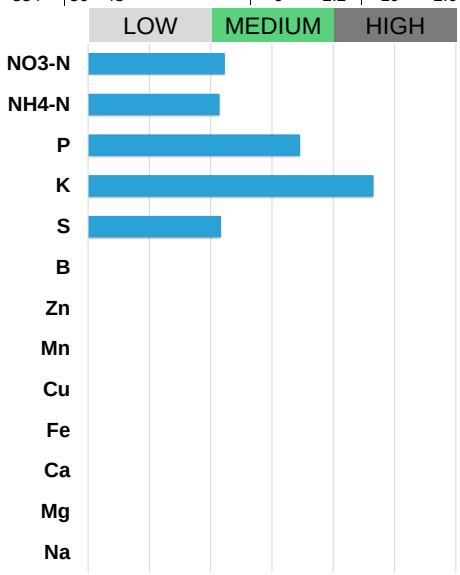
Date: May 22, 2023
Report No: 96883
Grower: Pat Straughan
Client: City of Pendleton RRF
Sampler: Kyle Willman
Field: north Straughan
Crop: Wheat
Sampled: 5/18/2023

Samples will be stored until 6/4/2023

KTL KUOTESTING LABS
A Matrix Sciences Company

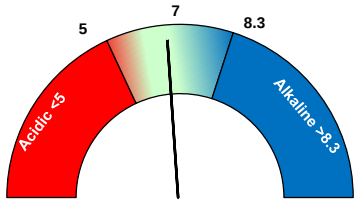
SOIL ANALYSIS REPORT

Lab #	Depth (inches) Start	Depth (inches) End	Sample ID	NO3-N KCl lbs/ac	NO3-N KCl ppm	NH4-N KCl lbs/ac	NH4-N KCl ppm	P Olsen ppm	P Bray ppm	K ppm	Ca Ammonium Acetate meq/100g	Mg Ammonium Acetate meq/100g	Na Ammonium Acetate meq/100g	SO4-S ppm	B ppm	Zn DTPA ppm	Mn DTPA ppm	Cu DTPA ppm	Fe DTPA ppm	pH 1:2	SMP pH	Soluble Salts 1:1 mmho/cm	OM %	Effervescence (Free Lime)	Available Moisture in/foot
881	0	12		17	4.3	14	3.6	39		462				7						6.6			2.03		1.46
882	12	24		12	3.1	13	3.3							5											1.47
883	24	36		9	2.3	12	2.9																		1.43
884	36	48		9	2.2	10	2.6																		1.36

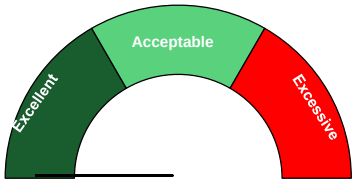


BASE SATURATION

	meq/100 g	%	Ideal Soil
Total Bases			
Calcium			65-75%
Magnesium			15-20%
Potassium			2-9%
Sodium			<1%



Soil pH (1:2)



Soluble Salts (1:1)

Fertilizer Recommendations

Nitrogen	Lbs per acre N
Phosphorus	Lbs per acre P2O5
Potassium	Lbs per acre K2O
Sulfur	Lbs per acre actual S
Boron	Lbs per acre actual B
Zinc	Lbs per acre actual Zn
Mangenese	Lbs per acre actual Mn
Copper	Lbs per acre actual Cu
Iron	Lbs per acre actual Fe
Lime Requirement	Lbs per acre 100 % Lime Score material

Additional Parameters

Soil PAP NAPT 2020

ALP Agricultural Laboratory Proficiency Program

Main Office: 119 E Main St., Othello WA, 99344
Oregon Office: 1300 Sixth St., Suite J, Umatilla OR, 97882
Pasco Office: 1320 E Spokane St., Pasco WA, 99301
(509) 488-0112 **info@kuotestinglabs.com**

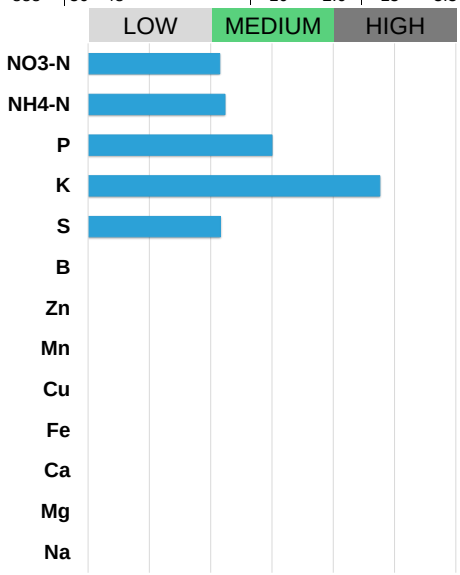
Date: May 22, 2023
Report No: 96883
Grower: Pat Straughan
Client: City of Pendleton RRF
Sampler: Kyle Willman
Field: south Straughan
Crop: Wheat
Sampled: 5/18/2023

Samples will be stored until 6/4/2023

KTL KUOTESTING LABS
A Matrix Sciences Company

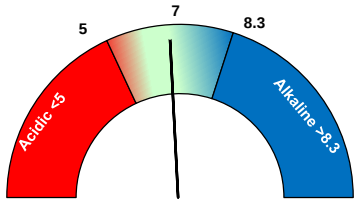
SOIL ANALYSIS REPORT

Lab #	Depth inches Start	Depth inches End	Sample ID	NO3-N KCl lbs/ac	NO3-N KCl ppm	NH4-N KCl lbs/ac	NH4-N KCl ppm	P Olsen ppm	P Bray ppm	K ppm	Ca Ammonium Acetate meq/100g	Mg Ammonium Acetate meq/100g	Na Ammonium Acetate meq/100g	SO4-S ppm	B ppm	Zn DTPA ppm	Mn DTPA ppm	Cu DTPA ppm	Fe DTPA ppm	pH 1:2	SMP pH	Soluble Salts 1:1 mmho/cm	OM %	Effervescence (Free Lime)	Available Moisture in/foot
885	0	12		15	3.7	18	4.4	30		490				7						6.7			1.60		1.55
886	12	24		10	2.6	13	3.3							4											1.49
887	24	36		10	2.4	15	3.7																		1.44
888	36	48		10	2.6	13	3.3																		1.43

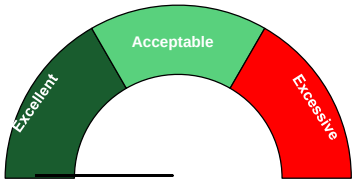


BASE SATURATION

	meq/100 g	%	Ideal Soil
Total Bases			
Calcium			65-75%
Magnesium			15-20%
Potassium			2-9%
Sodium			<1%



Soil pH (1:2)



Soluble Salts (1:1)

Fertilizer Recommendations

Nitrogen	Lbs per acre N
Phosphorus	Lbs per acre P2O5
Potassium	Lbs per acre K2O
Sulfur	Lbs per acre actual S
Boron	Lbs per acre actual B
Zinc	Lbs per acre actual Zn
Mangenese	Lbs per acre actual Mn
Copper	Lbs per acre actual Cu
Iron	Lbs per acre actual Fe
Lime Requirement	Lbs per acre 100 % Lime Score material

Additional Parameters

Soil PAP NAPT 2020

ALP Agricultural Laboratory Proficiency Program

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Oregon Office: 1300 Sixth St., Suite J, Umatilla OR, 97882
Pasco Office: 1320 E Spokane St., Pasco WA, 99301
(509) 488-0112 **info@kuotestinglabs.com**

DATE: May 26, 2023
REPORT No: 96883
GROWER: Pat Straughan
CLIENT: **City of Pendleton RRF**
CONSULTANT: Kyle Willman
SAMPLE DATE: 5/18/2023
SAMPLE NAME: **south Straughan**
SAMPLE ID: 0-48
SAMPLE TYPE: Wheat
LAB No: 885

KTL KUOTESTING LABS
A Matrix Sciences Company

Heavy Metal Analysis Report

	Analyte	Results	Units	PQL	Method
0-12					
	Arsenic (As)	21.920	mg/kg	0.01	EPA 6010D/3050B
	Cadmium (Cd)	2.210	mg/kg	0.005	EPA 6010D/3050B
	Cobalt (Co)	9.210	mg/kg	0.50	EPA 6010D/3050B
	Lead (Pb)	3.870	mg/kg	0.015	EPA 6010D/3050B
	Mercury (Hg)	0.00783	mg/kg	0.000595	EPA 7471B
	Molybdenum (Mo)	<0.01	mg/kg	0.01	EPA 6010D/3050B
	Nickel (Ni)	14.730	mg/kg	0.02	EPA 6010D/3050B
	Selenium (Se)	<0.02	mg/kg	0.02	EPA 6010D/3050B
	Zinc (Zn)	53.780	mg/kg	0.02	EPA 6010D/3050B

	Analyte	Results	Units	PQL	Method
12-24					
	Arsenic (As)	22.060	mg/kg	0.01	EPA 6010D/3050B
	Cadmium (Cd)	2.240	mg/kg	0.005	EPA 6010D/3050B
	Cobalt (Co)	16.640	mg/kg	0.50	EPA 6010D/3050B
	Lead (Pb)	1.870	mg/kg	0.015	EPA 6010D/3050B
	Mercury (Hg)	0.00090	mg/kg	0.000806	EPA 7471B
	Molybdenum (Mo)	<0.01	mg/kg	0.01	EPA 6010D/3050B
	Nickel (Ni)	13.080	mg/kg	0.02	EPA 6010D/3050B
	Selenium (Se)	<0.02	mg/kg	0.02	EPA 6010D/3050B
	Zinc (Zn)	49.720	mg/kg	0.02	EPA 6010D/3050B

	Analyte	Results	Units	PQL	Method
24-36					
	Arsenic (As)	27.840	mg/kg	0.01	EPA 6010D/3050B
	Cadmium (Cd)	2.130	mg/kg	0.005	EPA 6010D/3050B
	Cobalt (Co)	10.110	mg/kg	0.50	EPA 6010D/3050B
	Lead (Pb)	7.980	mg/kg	0.015	EPA 6010D/3050B
	Mercury (Hg)	ND	mg/kg	0.000833	EPA 7471B
	Molybdenum (Mo)	<0.01	mg/kg	0.01	EPA 6010D/3050B
	Nickel (Ni)	12.770	mg/kg	0.02	EPA 6010D/3050B
	Selenium (Se)	<0.02	mg/kg	0.02	EPA 6010D/3050B
	Zinc (Zn)	46.280	mg/kg	0.02	EPA 6010D/3050B

	Analyte	Results	Units	PQL	Method
36-48					
	Arsenic (As)	<0.01	mg/kg	0.01	EPA 6010D/3050B
	Cadmium (Cd)	1.470	mg/kg	0.005	EPA 6010D/3050B
	Cobalt (Co)	8.620	mg/kg	0.50	EPA 6010D/3050B
	Lead (Pb)	<0.015	mg/kg	0.015	EPA 6010D/3050B
	Mercury (Hg)	ND	mg/kg	0.000862	EPA 7471B
	Molybdenum (Mo)	<0.01	mg/kg	0.01	EPA 6010D/3050B
	Nickel (Ni)	16.510	mg/kg	0.02	EPA 6010D/3050B
	Selenium (Se)	<0.02	mg/kg	0.02	EPA 6010D/3050B
	Zinc (Zn)	47.520	mg/kg	0.02	EPA 6010D/3050B

PQL refers to the Practical Quantitation Limit
Mercury Analysis performed by Edge Analytical

Main Office: **119 E Main St., Othello WA, 99344**
Oregon Office: **1300 Sixth St., Suite J, Umatilla OR, 97882**
(509) 488-0112 **info@kuotestinglabs.com**

DATE: May 26, 2023
REPORT No: 96883
GROWER: Pat Straughan
CLIENT: **City of Pendleton RRF**
CONSULTANT: Kyle Willman
SAMPLE DATE: 5/18/2023
SAMPLE NAME: **North Straughan**
SAMPLE ID: 0-48
SAMPLE TYPE: Wheat
LAB No: 885

KTL KUOTESTING LABS
A Matrix Sciences Company

Heavy Metal Analysis Report

	Analyte	Results	Units	PQL	Method
0-12					
	Arsenic (As)	13.240	mg/kg	0.01	EPA 6010D/3050B
	Cadmium (Cd)	1.540	mg/kg	0.005	EPA 6010D/3050B
	Cobalt (Co)	9.600	mg/kg	0.50	EPA 6010D/3050B
	Lead (Pb)	6.140	mg/kg	0.015	EPA 6010D/3050B
	Mercury (Hg)	ND	mg/kg	0.000694	EPA 7471B
	Molybdenum (Mo)	<0.01	mg/kg	0.01	EPA 6010D/3050B
	Nickel (Ni)	12.280	mg/kg	0.02	EPA 6010D/3050B
	Selenium (Se)	<0.02	mg/kg	0.02	EPA 6010D/3050B
	Zinc (Zn)	47.980	mg/kg	0.02	EPA 6010D/3050B

	Analyte	Results	Units	PQL	Method
12-24					
	Arsenic (As)	14.970	mg/kg	0.01	EPA 6010D/3050B
	Cadmium (Cd)	1.660	mg/kg	0.005	EPA 6010D/3050B
	Cobalt (Co)	8.870	mg/kg	0.50	EPA 6010D/3050B
	Lead (Pb)	4.070	mg/kg	0.015	EPA 6010D/3050B
	Mercury (Hg)	ND	mg/kg	0.000714	EPA 7471B
	Molybdenum (Mo)	<0.01	mg/kg	0.01	EPA 6010D/3050B
	Nickel (Ni)	14.970	mg/kg	0.02	EPA 6010D/3050B
	Selenium (Se)	13.120	mg/kg	0.02	EPA 6010D/3050B
	Zinc (Zn)	47.500	mg/kg	0.02	EPA 6010D/3050B

	Analyte	Results	Units	PQL	Method
24-36					
	Arsenic (As)	10.610	mg/kg	0.01	EPA 6010D/3050B
	Cadmium (Cd)	3.170	mg/kg	0.005	EPA 6010D/3050B
	Cobalt (Co)	12.660	mg/kg	0.50	EPA 6010D/3050B
	Lead (Pb)	16.200	mg/kg	0.015	EPA 6010D/3050B
	Mercury (Hg)	ND	mg/kg	0.000658	EPA 7471B
	Molybdenum (Mo)	<0.01	mg/kg	0.01	EPA 6010D/3050B
	Nickel (Ni)	14.340	mg/kg	0.02	EPA 6010D/3050B
	Selenium (Se)	7.820	mg/kg	0.02	EPA 6010D/3050B
	Zinc (Zn)	47.860	mg/kg	0.02	EPA 6010D/3050B

	Analyte	Results	Units	PQL	Method
36-48					
	Arsenic (As)	13.000	mg/kg	0.01	EPA 6010D/3050B
	Cadmium (Cd)	2.800	mg/kg	0.005	EPA 6010D/3050B
	Cobalt (Co)	12.000	mg/kg	0.50	EPA 6010D/3050B
	Lead (Pb)	2.400	mg/kg	0.015	EPA 6010D/3050B
	Mercury (Hg)	0.003	mg/kg	0.000595	EPA 7471B
	Molybdenum (Mo)	<0.01	mg/kg	0.01	EPA 6010D/3050B
	Nickel (Ni)	10.600	mg/kg	0.02	EPA 6010D/3050B
	Selenium (Se)	<0.02	mg/kg	0.02	EPA 6010D/3050B
	Zinc (Zn)	49.000	mg/kg	0.02	EPA 6010D/3050B

PQL refers to the Practical Quantitation Limit
Mercury Analysis performed by Edge Analytical

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Anatek Labs, Inc.

1282 Alturas Drive - Moscow, ID 83843 - (208) 883-2839 - email moscow@anateklabs.com
504 E Sprague Ste. D - Spokane, WA 99202 - (509) 838-3999 - email spokane@anateklabs.com

Sample Location: South Straughan 0-12" Soil-3060885
Lab/Sample Number: WDE1428-05 Collect Date: 05/18/23 12:00
Date Received: 05/24/23 11:30 Collected By: KTL
Matrix: Solid

Analyte	Result	Units	PQL	Analyzed	Analyst	Method	Qualifier
Mercury							
Mercury	0.00783	mg/kg wet	0.000595	5/30/23 13:24	JLG	EPA 7471B	

Sample Location: South Straughan 12-24" Soil-3060886
Lab/Sample Number: WDE1428-06 Collect Date: 05/18/23 12:00
Date Received: 05/24/23 11:30 Collected By: KTL
Matrix: Solid

Analyte	Result	Units	PQL	Analyzed	Analyst	Method	Qualifier
Mercury							
Mercury	0.000903	mg/kg wet	0.000806	5/30/23 13:32	JLG	EPA 7471B	

Sample Location: South Straughan 24-36" Soil-3060887
Lab/Sample Number: WDE1428-07 Collect Date: 05/18/23 12:00
Date Received: 05/24/23 11:30 Collected By: KTL
Matrix: Solid

Analyte	Result	Units	PQL	Analyzed	Analyst	Method	Qualifier
Mercury							
Mercury	ND	mg/kg wet	0.000833	5/30/23 13:34	JLG	EPA 7471B	

Sample Location: South Straughan 36-48" Soil-3060888
Lab/Sample Number: WDE1428-08 Collect Date: 05/18/23 12:00
Date Received: 05/24/23 11:30 Collected By: KTL
Matrix: Solid

Analyte	Result	Units	PQL	Analyzed	Analyst	Method	Qualifier
Mercury							
Mercury	ND	mg/kg wet	0.000862	5/30/23 13:37	JLG	EPA 7471B	

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504 E Sprague Ste. D - Spokane, WA 99202 - (509) 838-3999 - email spokane@anateklabs.com

Sample Location: South Straughan 0-12" Soil-3060885
Lab/Sample Number: WDE1428-05 Collect Date: 05/18/23 12:00
Date Received: 05/24/23 11:30 Collected By: KTL
Matrix: Solid

Analyte	Result	Units	PQL	Analyzed	Analyst	Method	Qualifier
Mercury							
Mercury	0.00783	mg/kg wet	0.000595	5/30/23 13:24	JLG	EPA 7471B	

Sample Location: South Straughan 12-24" Soil-3060886
Lab/Sample Number: WDE1428-06 Collect Date: 05/18/23 12:00
Date Received: 05/24/23 11:30 Collected By: KTL
Matrix: Solid

Analyte	Result	Units	PQL	Analyzed	Analyst	Method	Qualifier
Mercury							
Mercury	0.000903	mg/kg wet	0.000806	5/30/23 13:32	JLG	EPA 7471B	

Sample Location: South Straughan 24-36" Soil-3060887
Lab/Sample Number: WDE1428-07 Collect Date: 05/18/23 12:00
Date Received: 05/24/23 11:30 Collected By: KTL
Matrix: Solid

Analyte	Result	Units	PQL	Analyzed	Analyst	Method	Qualifier
Mercury							
Mercury	ND	mg/kg wet	0.000833	5/30/23 13:34	JLG	EPA 7471B	

Sample Location: South Straughan 36-48" Soil-3060888
Lab/Sample Number: WDE1428-08 Collect Date: 05/18/23 12:00
Date Received: 05/24/23 11:30 Collected By: KTL
Matrix: Solid

Analyte	Result	Units	PQL	Analyzed	Analyst	Method	Qualifier
Mercury							
Mercury	ND	mg/kg wet	0.000862	5/30/23 13:37	JLG	EPA 7471B	

Anatek Labs, Inc.

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Quality Control Data

Mercury

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: BDE1106 - W 7471 Digest										
Blank (BDE1106-BLK1)					Prepared: 5/26/2023 Analyzed: 5/30/2023					
Mercury	ND		0.000500	mg/kg wet						
Blank (BDE1106-BLK2)					Prepared: 5/26/2023 Analyzed: 5/30/2023					
Mercury	ND		0.000500	mg/kg wet						
LCS (BDE1106-BS1)					Prepared: 5/26/2023 Analyzed: 5/30/2023					
Mercury	0.608		0.000500	mg/kg wet	0.560		108	80-120		
LCS (BDE1106-BS2)					Prepared: 5/26/2023 Analyzed: 5/30/2023					
Mercury	0.623		0.000500	mg/kg wet	0.560		111	80-120		
Duplicate (BDE1106-DUP2)		**Source: WDE1403-01**			Prepared: 5/26/2023 Analyzed: 5/30/2023					
Mercury	ND		0.000610	mg/kg wet		ND				20
Duplicate (BDE1106-DUP3)		**Source: WDE1428-08**			Prepared: 5/26/2023 Analyzed: 5/30/2023					
Mercury	ND		0.000862	mg/kg wet		ND				20
Matrix Spike (BDE1106-MS1)		**Source: WDE1185-01**			Prepared: 5/26/2023 Analyzed: 5/30/2023					
Mercury	1.09		0.00112	mg/kg dry	1.26	0.00892	85.8	80-120		
Matrix Spike (BDE1106-MS3)		**Source: WDE1428-08**			Prepared: 5/26/2023 Analyzed: 5/30/2023					
Mercury	0.916		0.000758	mg/kg wet	0.848	ND	108	80-120		
Matrix Spike Dup (BDE1106-MSD1)		**Source: WDE1185-01**			Prepared: 5/26/2023 Analyzed: 5/30/2023					
Mercury	1.14		0.00118	mg/kg dry	1.32	0.00892	85.8	80-120	4.88	20
Matrix Spike Dup (BDE1106-MSD3)		**Source: WDE1428-08**			Prepared: 5/26/2023 Analyzed: 5/30/2023					
Mercury	0.768		0.000625	mg/kg wet	0.700	ND	110	80-120	17.6	20

Authorized Signature,

Kathleen A. Sattler

Kathleen Sattler, Laboratory Manager

PQL	Practical Quantitation Limit
ND	Not Detected
MCL	EPA's Maximum Contaminant Level
Dry	Sample results reported on a dry weight basis
*	Not a state-certified analyte

Date: October 11, 2023
Report No: 102205
Grower: Pat Straughan
Client: City of Pendleton RRF
Sampler: Kyle Willman
Sampled: 10/5/2023

Samples will be stored until
10/24/2023

KTL KUOTESTING LABS
A Matrix Sciences Company

SUMMARY PAGE

SOIL ANALYSIS REPORT

Lab #	Depth (Inches) Start	End	Field ID	Sample ID	Crop	NO3-N (KCl) lbs/ac	NO3-N (KCl) ppm	NH4-N (KCl) lbs/ac	NH4-N (KCl) ppm	P Olsen ppm	P Bray ppm	K (Ammonium Acetate) ppm	Ca (Ammonium Acetate) meq/100g	Mg (Ammonium Acetate) meq/100g	Na (Ammonium Acetate) meq/100g	SO4-S ppm	B (DTPA) ppm	Zn (DTPA) ppm	Mn (DTPA) ppm	Cu (DTPA) ppm	Fe (DTPA) ppm	pH 1:2	SMP pH	Soluble Salts 1:1	OM %	Efferve-scence Test	Available Moisture in/foot	Total Bases Meq/100g	Base Saturation % Ca	% Mg	% K	% Na	% H
4013	0	12	East Straughan		Wheat	26	6.4	14	3.6	33		494				22						6.3			1.63		0.37						
4014	12	24	East Straughan		Wheat	20	4.9	10	2.4							5											0.38						
4015	24	36	East Straughan		Wheat	14	3.4	9	2.3																		0.44						
4016	36	48	East Straughan		Wheat	18	4.6	14	3.5																		0.68						
4017	0	12	West Straughan		Wheat	26	6.6	11	2.8	13		433				4						6.1			1.33		0.23						
4018	12	24	West Straughan		Wheat	18	4.6	12	2.9							1											0.10						
4019	24	36	West Straughan		Wheat	12	3.1	13	3.3																		0.32						
4020	36	48	West Straughan		Wheat	12	2.9	13	3.3																		0.56						

Soil PAP NAPT 2020

ALP Agricultural Laboratory Proficiency Program

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Pasco Office: 1320 E Spokane St., Pasco, WA 99301
(509) 488-0112 info@kuotestinglabs.com

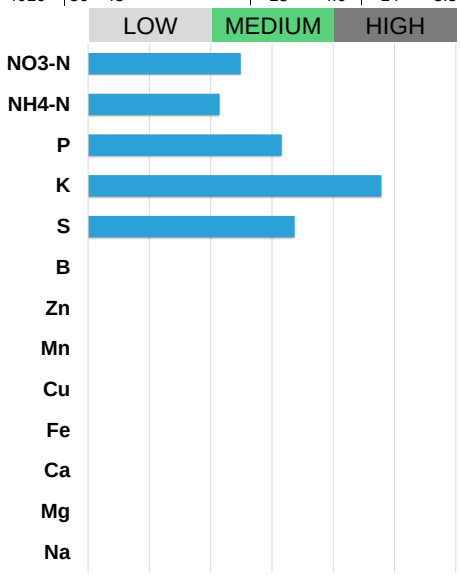
Date: October 11, 2023
Report No: 102205
Grower: Pat Straughan
Client: City of Pendleton RRF
Sampler: Kyle Willman
Field: East Straughan
Crop: Wheat
Sampled: 10/5/2023

Samples will be stored until 10/24/2023

KTL KUOTESTING LABS
A Matrix Sciences Company

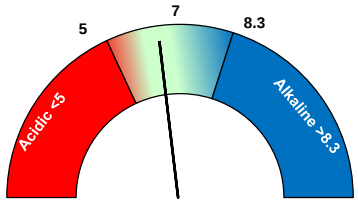
SOIL ANALYSIS REPORT

Lab #	Depth (inches) Start	Depth (inches) End	Sample ID	NO3-N KCl lbs/ac	NO3-N KCl ppm	NH4-N KCl lbs/ac	NH4-N KCl ppm	P Olsen ppm	P Bray ppm	K ppm	Ca Ammonium Acetate meq/100g	Mg Ammonium Acetate meq/100g	Na Ammonium Acetate meq/100g	SO4-S ppm	B ppm	Zn DTPA ppm	Mn DTPA ppm	Cu DTPA ppm	Fe DTPA ppm	pH 1:2	SMP pH	Soluble Salts 1:1 mmho/cm	OM %	Effervescence (Free Lime)	Available Moisture in/foot
4013	0	12		26	6.4	14	3.6	33		494				22						6.3			1.63		0.37
4014	12	24		20	4.9	10	2.4							5											0.38
4015	24	36		14	3.4	9	2.3																		0.44
4016	36	48		18	4.6	14	3.5																		0.68

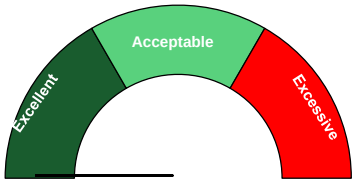


BASE SATURATION

	meq/100 g	%	Ideal Soil
Total Bases			
Calcium			65-75%
Magnesium			15-20%
Potassium			2-9%
Sodium			<1%



Soil pH (1:2)



Soluble Salts (1:1)

Fertilizer Recommendations

Nitrogen	Lbs per acre N
Phosphorus	Lbs per acre P2O5
Potassium	Lbs per acre K2O
Sulfur	Lbs per acre actual S
Boron	Lbs per acre actual B
Zinc	Lbs per acre actual Zn
Mangenese	Lbs per acre actual Mn
Copper	Lbs per acre actual Cu
Iron	Lbs per acre actual Fe
Lime Requirement	Lbs per acre 100 % Lime Score material

Additional Parameters

Soil PAP NAPT 2020

ALP Agricultural Laboratory Proficiency Program

Main Office: 119 E Main St., Othello WA, 99344
Oregon Office: 1300 Sixth St., Suite J, Umatilla OR, 97882
Pasco Office: 1320 E Spokane St., Pasco WA, 99301
(509) 488-0112 info@kuotestinglabs.com

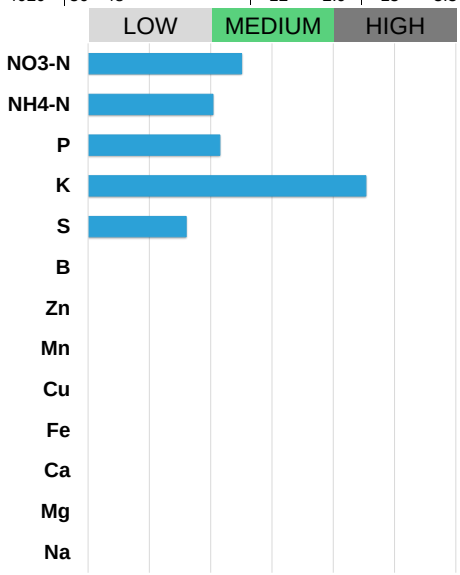
Date: October 11, 2023
Report No: 102205
Grower: Pat Straughan
Client: City of Pendleton RRF
Sampler: Kyle Willman
Field: West Straughan
Crop: Wheat
Sampled: 10/5/2023

Samples will be stored until 10/24/2023

KTL KUOTESTING LABS
A Matrix Sciences Company

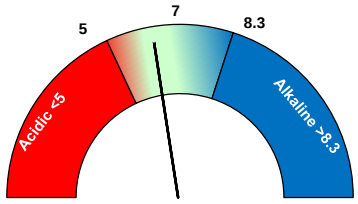
SOIL ANALYSIS REPORT

Lab #	Depth (inches) Start	Depth (inches) End	Sample ID	NO3-N KCl lbs/ac	NO3-N KCl ppm	NH4-N KCl lbs/ac	NH4-N KCl ppm	P Olsen ppm	P Bray ppm	K ppm	Ca Ammonium Acetate meq/100g	Mg Ammonium Acetate meq/100g	Na Ammonium Acetate meq/100g	SO4-S ppm	B ppm	Zn DTPA ppm	Mn DTPA ppm	Cu DTPA ppm	Fe DTPA ppm	pH 1:2	SMP pH	Soluble Salts 1:1 mmho/cm	OM %	Effervescence (Free Lime)	Available Moisture in/foot
4017	0	12		26	6.6	11	2.8	13		433				4						6.1			1.33		0.23
4018	12	24		18	4.6	12	2.9							1											0.10
4019	24	36		12	3.1	13	3.3																		0.32
4020	36	48		12	2.9	13	3.3																		0.56

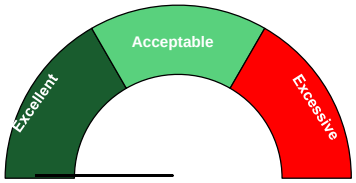


BASE SATURATION

	meq/100 g	%	Ideal Soil
Total Bases			
Calcium			65-75%
Magnesium			15-20%
Potassium			2-9%
Sodium			<1%



Soil pH (1:2)



Soluble Salts (1:1)

Fertilizer Recommendations

Nitrogen	Lbs per acre N
Phosphorus	Lbs per acre P2O5
Potassium	Lbs per acre K2O
Sulfur	Lbs per acre actual S
Boron	Lbs per acre actual B
Zinc	Lbs per acre actual Zn
Mangenese	Lbs per acre actual Mn
Copper	Lbs per acre actual Cu
Iron	Lbs per acre actual Fe
Lime Requirement	Lbs per acre 100 % Lime Score material

Additional Parameters

Soil PAP NAPT 2020

ALP Agricultural Laboratory Proficiency Program

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Oregon Office: 1300 Sixth St., Suite J, Umatilla OR, 97882
Pasco Office: 1320 E Spokane St., Pasco WA, 99301
(509) 488-0112 info@kuotestinglabs.com

DATE: October 30, 2023
REPORT No: 102212
GROWER: Pat Straughan
CLIENT: **City of Pendleton RRF**
CONSULTANT: Kyle Willman
SAMPLE DATE: 10/5/2023
SAMPLE NAME: **East Straughan**
SAMPLE ID: 0-12
SAMPLE TYPE: Wheat
LAB No: 4013

KTL KUOTESTING LABS
A Matrix Sciences Company

Heavy Metal Analysis Report

	Analyte	Results	Units	PQL	Method
0-12					
	Arsenic (As)	29.350	mg/kg	0.01	EPA 6010D/3050B
	Cadmium (Cd)	<0.005	mg/kg	0.005	EPA 6010D/3050B
	Cobalt (Co)	14.090	mg/kg	0.50	EPA 6010D/3050B
	Lead (Pb)	24.270	mg/kg	0.015	EPA 6010D/3050B
	Mercury (Hg)	ND	mg/kg	0.054000	EPA 6020B
	Molybdenum (Mo)	2.740	mg/kg	0.01	EPA 6010D/3050B
	Nickel (Ni)	0.590	mg/kg	0.02	EPA 6010D/3050B
	Selenium (Se)	10.760	mg/kg	0.02	EPA 6010D/3050B
	Zinc (Zn)	42.860	mg/kg	0.02	EPA 6010D/3050B

	Analyte	Results	Units	PQL	Method
12-24					
	Arsenic (As)	6.500	mg/kg	0.01	EPA 6010D/3050B
	Cadmium (Cd)	<0.005	mg/kg	0.005	EPA 6010D/3050B
	Cobalt (Co)	13.360	mg/kg	0.50	EPA 6010D/3050B
	Lead (Pb)	24.550	mg/kg	0.015	EPA 6010D/3050B
	Mercury (Hg)	ND	mg/kg	0.056000	EPA 6020B
	Molybdenum (Mo)	<0.01	mg/kg	0.01	EPA 6010D/3050B
	Nickel (Ni)	3.790	mg/kg	0.02	EPA 6010D/3050B
	Selenium (Se)	<0.02	mg/kg	0.02	EPA 6010D/3050B
	Zinc (Zn)	36.100	mg/kg	0.02	EPA 6010D/3050B

	Analyte	Results	Units	PQL	Method
24-36					
	Arsenic (As)	<0.01	mg/kg	0.01	EPA 6010D/3050B
	Cadmium (Cd)	<0.005	mg/kg	0.005	EPA 6010D/3050B
	Cobalt (Co)	3.200	mg/kg	0.50	EPA 6010D/3050B
	Lead (Pb)	16.570	mg/kg	0.015	EPA 6010D/3050B
	Mercury (Hg)	ND	mg/kg	0.057000	EPA 6020B
	Molybdenum (Mo)	5.650	mg/kg	0.01	EPA 6010D/3050B
	Nickel (Ni)	5.270	mg/kg	0.02	EPA 6010D/3050B
	Selenium (Se)	<0.02	mg/kg	0.02	EPA 6010D/3050B
	Zinc (Zn)	31.450	mg/kg	0.02	EPA 6010D/3050B

	Analyte	Results	Units	PQL	Method
36-48					
	Arsenic (As)	19.770	mg/kg	0.01	EPA 6010D/3050B
	Cadmium (Cd)	<0.005	mg/kg	0.005	EPA 6010D/3050B
	Cobalt (Co)	10.730	mg/kg	0.50	EPA 6010D/3050B
	Lead (Pb)	8.660	mg/kg	0.015	EPA 6010D/3050B
	Mercury (Hg)	ND	mg/kg	0.056700	EPA 6020B
	Molybdenum (Mo)	<0.01	mg/kg	0.01	EPA 6010D/3050B
	Nickel (Ni)	8.100	mg/kg	0.02	EPA 6010D/3050B
	Selenium (Se)	5.650	mg/kg	0.02	EPA 6010D/3050B
	Zinc (Zn)	32.200	mg/kg	0.02	EPA 6010D/3050B

PQL refers to the Practical Quantitation Limit
Mercury Analysis performed by Edge Analytical

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Oregon Office: **1300 Sixth St., Suite J, Umatilla OR, 97882**
(509) 488-0112 **info@kuotestinglabs.com**

DATE: October 30, 2023
REPORT No: 102212
GROWER: Pat Straughan
CLIENT: **City of Pendleton RRF**
CONSULTANT: Kyle Willman
SAMPLE DATE: 10/5/2023
SAMPLE NAME: **West Straughan**
SAMPLE ID: 0-48
SAMPLE TYPE: Wheat
LAB No: 4017

KTL KUOTESTING LABS
A Matrix Sciences Company

Heavy Metal Analysis Report

	Analyte	Results	Units	PQL	Method
0-12					
	Arsenic (As)	16.320	mg/kg	0.01	EPA 6010D/3050B
	Cadmium (Cd)	<0.005	mg/kg	0.005	EPA 6010D/3050B
	Cobalt (Co)	9.380	mg/kg	0.50	EPA 6010D/3050B
	Lead (Pb)	18.200	mg/kg	0.015	EPA 6010D/3050B
	Mercury (Hg)	ND	mg/kg	0.057000	EPA 6020B
	Molybdenum (Mo)	0.380	mg/kg	0.01	EPA 6010D/3050B
	Nickel (Ni)	5.250	mg/kg	0.02	EPA 6010D/3050B
	Selenium (Se)	<0.02	mg/kg	0.02	EPA 6010D/3050B
	Zinc (Zn)	32.080	mg/kg	0.02	EPA 6010D/3050B

	Analyte	Results	Units	PQL	Method
12-24					
	Arsenic (As)	<0.01	mg/kg	0.01	EPA 6010D/3050B
	Cadmium (Cd)	<0.005	mg/kg	0.005	EPA 6010D/3050B
	Cobalt (Co)	10.430	mg/kg	0.50	EPA 6010D/3050B
	Lead (Pb)	12.000	mg/kg	0.015	EPA 6010D/3050B
	Mercury (Hg)	ND	mg/kg	0.055800	EPA 6020B
	Molybdenum (Mo)	0.170	mg/kg	0.01	EPA 6010D/3050B
	Nickel (Ni)	3.300	mg/kg	0.02	EPA 6010D/3050B
	Selenium (Se)	<0.02	mg/kg	0.02	EPA 6010D/3050B
	Zinc (Zn)	30.090	mg/kg	0.02	EPA 6010D/3050B

	Analyte	Results	Units	PQL	Method
24-36					
	Arsenic (As)	25.630	mg/kg	0.01	EPA 6010D/3050B
	Cadmium (Cd)	<0.005	mg/kg	0.005	EPA 6010D/3050B
	Cobalt (Co)	9.030	mg/kg	0.50	EPA 6010D/3050B
	Lead (Pb)	12.450	mg/kg	0.015	EPA 6010D/3050B
	Mercury (Hg)	ND	mg/kg	0.057200	EPA 6020B
	Molybdenum (Mo)	2.350	mg/kg	0.01	EPA 6010D/3050B
	Nickel (Ni)	4.870	mg/kg	0.02	EPA 6010D/3050B
	Selenium (Se)	26.170	mg/kg	0.02	EPA 6010D/3050B
	Zinc (Zn)	33.940	mg/kg	0.02	EPA 6010D/3050B

	Analyte	Results	Units	PQL	Method
36-48					
	Arsenic (As)	18.070	mg/kg	0.01	EPA 6010D/3050B
	Cadmium (Cd)	<0.005	mg/kg	0.005	EPA 6010D/3050B
	Cobalt (Co)	7.480	mg/kg	0.50	EPA 6010D/3050B
	Lead (Pb)	3.100	mg/kg	0.015	EPA 6010D/3050B
	Mercury (Hg)	ND	mg/kg	0.057900	EPA 6020B
	Molybdenum (Mo)	0.730	mg/kg	0.01	EPA 6010D/3050B
	Nickel (Ni)	5.470	mg/kg	0.02	EPA 6010D/3050B
	Selenium (Se)	<0.02	mg/kg	0.02	EPA 6010D/3050B
	Zinc (Zn)	34.120	mg/kg	0.02	EPA 6010D/3050B

PQL refers to the Practical Quantitation Limit
Mercury Analysis performed by Edge Analytical

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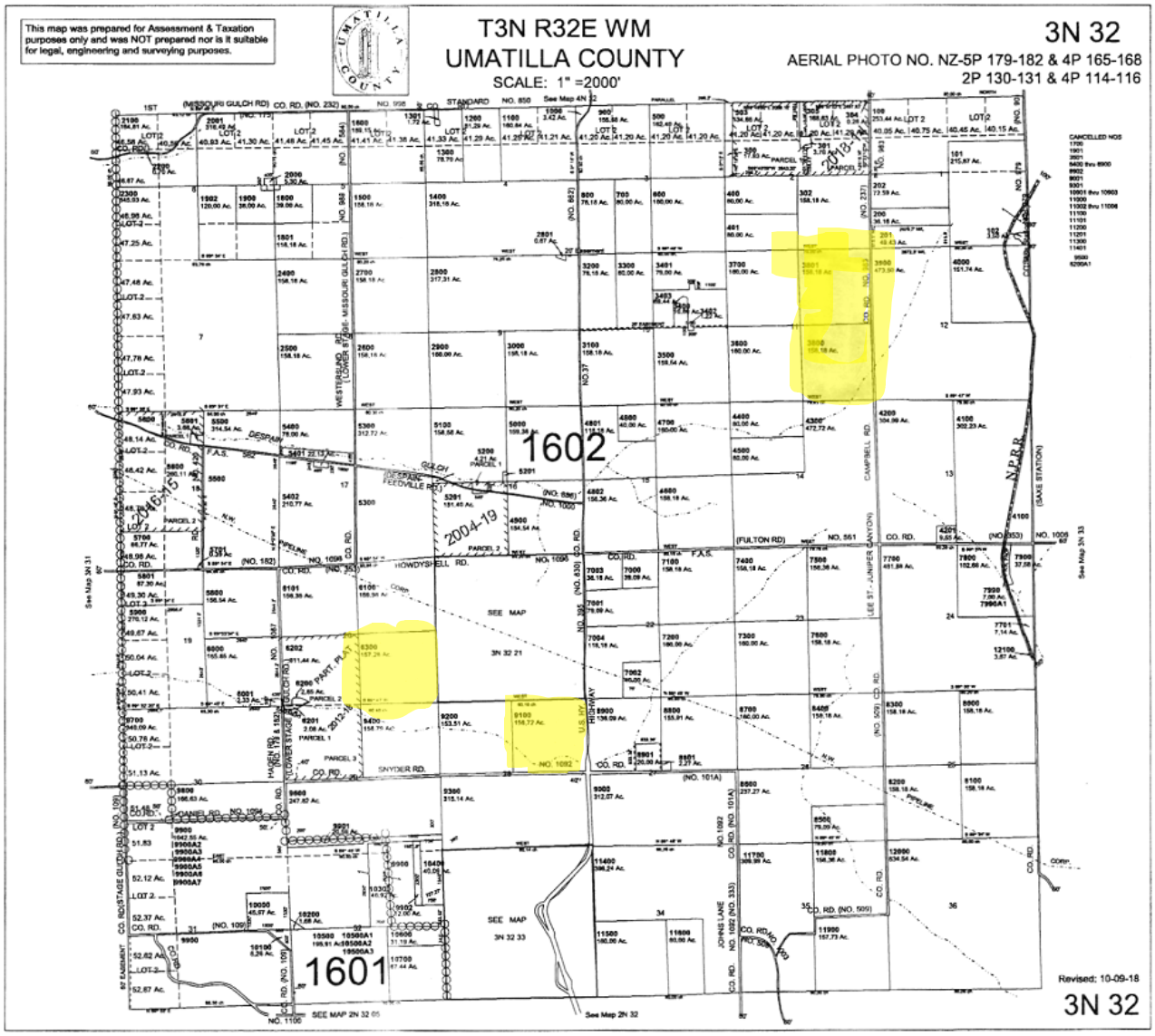
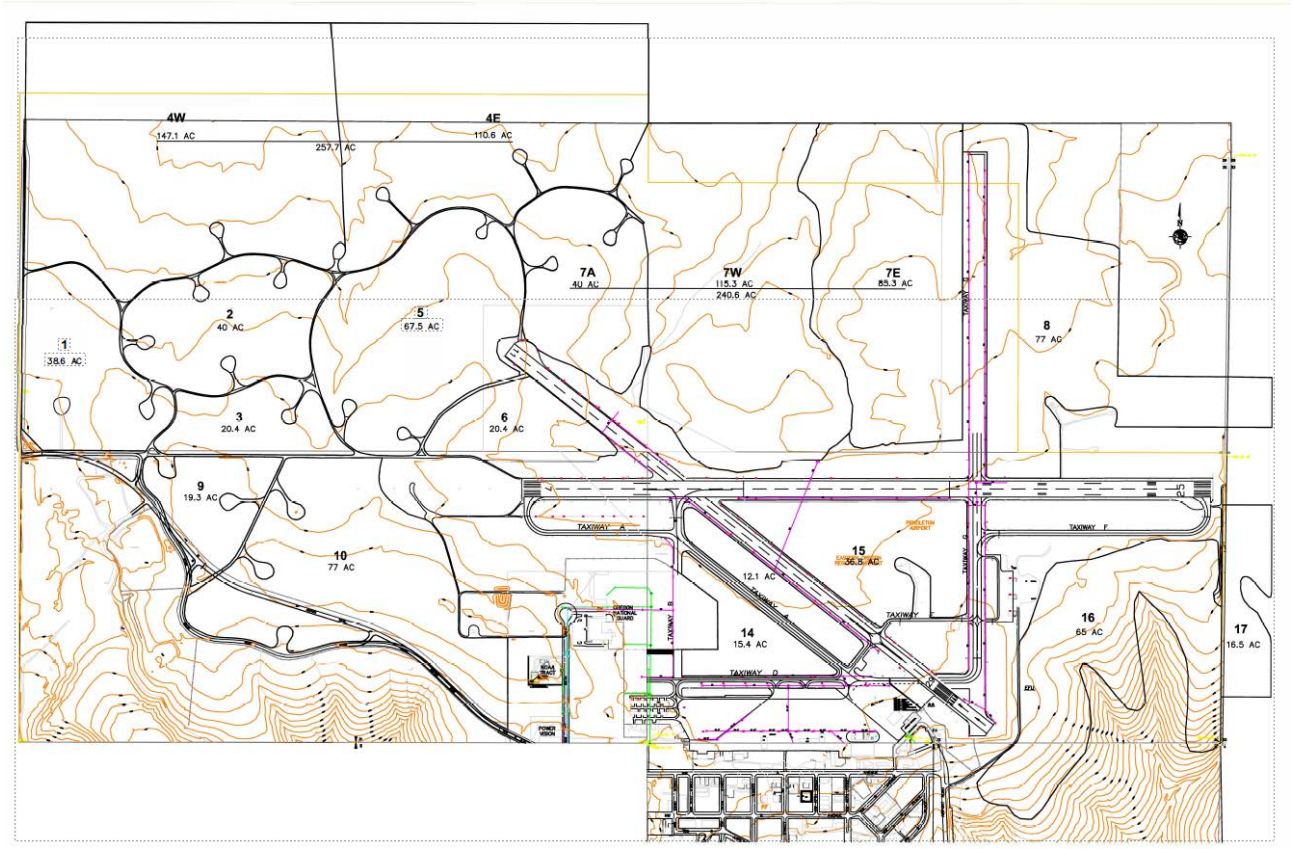
Appendix D:

Site maps
Straughan East, west, north and south



Airport Field map



Appendix E:

Volatile solids reduction data and digester temp data here. Additional reduction happens while in storage but is not accounted for within this report.

PENDLETON RESOURCE RECOVERY FACILTY

Date Report: 6/21/2024 Phone: 541-276-3372

	RAW Sludge	Pri Digester	Sec Digester	RAW-PRI	RAW-SEC	RAW-SEC	Pri Dig	Sec Dig	Total	Pri Digester	Sec Digester	Combined
	VS/TS	VS/TS	VS/TS	VSR	VSR	VSR	Temp	Temp	Sludge	MCRT	MCRT	MCRT
Month						EPA Quarte	Deg F	Deg F	Gallons	Days	Days	Days
Jan 2023	0.846	0.732	0.715	50.14	54.35		98.3	99.4	662,650	23.77	10.19	33.95
Feb 2023	0.847	0.728	0.712	51.73	55.43		98.3	100.0	588,363	26.77	11.47	38.24
Mar 2023	0.816	0.710	0.685	44.95	51.06	**53.6**	98.4	101.3	680,328	23.15	9.92	33.07
Apr 2023	0.827	0.697	0.686	52.00	54.45		98.4	100.3	607,377	25.93	11.11	37.04
May 2023	0.833	0.697	0.683	54.08	56.85		98.1	101.9	648,407	24.29	10.41	34.70
Jun 2023	0.841	0.717	0.686	52.02	58.52	**56.6**	98.1	100.5	390,576	40.33	17.28	57.61
Jul 2023	0.845	0.722	0.701	52.09	56.88		98.1	100.8	459,108	34.31	14.70	49.01
Aug 2023	0.822	0.727	0.696	42.33	50.33		98.1	100.4	330,996	47.58	20.39	67.98
Sep 2023	0.836	0.728	0.695	47.64	55.40	**54.2**	98.0	100.2	340,722	46.23	19.81	66.04
Oct 2023	0.823	0.749	0.719	35.80	44.90		98.0	99.2	686,603	22.94	9.83	32.77
Nov 2023	0.809	0.746	0.734	30.32	34.75		97.9	97.6	775,917	20.30	8.70	29.00
Dec 2023	0.825	0.744	0.727	38.55	43.67	**41.1**	97.7	100.0	923,918	17.05	7.31	24.35
Minimum	0.809	0.697	0.683	30.32	**34.75**		97.7	97.6	330,996	17.05	7.31	**24.35**
Maximum	0.847	0.749	0.734	54.08	58.52		98.4	101.9	923,918	47.58	20.39	67.98
Average	0.831	0.725	0.703	45.97	**51.38**		**98.1**	**100.1**	591,247	29.39	12.59	**41.98**
Toal									6,418,538			

Class B Alternative 2, Process to Significantly Reduce Pathogen

Anaerobic digestion for a minimum of 15 days at a temperature between 95ºF and 131ºF.

The City of Pendleton operates two digesters in series the first digester had an average temperature of 98.12 F and the secondary digester had an average temperature of 100.13 F

The monthly average residence time with both digesters was 41.98 days with the low month being 24.35 days.

Vector Attraction Reduction

At least a 38% reduction in volatile solids (VS) during sewage sludge treatment.

Vector attraction reduction is confirmed through volatile solids testing. The volatile solids reduction was greater than 38% for each month this yea

Average monthly Volatile Solids Reduction wa 51.38 % with a low month of 34.75 %.

This was calculated using the Van Kleek equation:

$$\frac{\text{VS in} - \text{VS out}}{\text{VS in} - (\text{VS in} \times \text{VS out})}$$

VS in was sampled from the Primary Co-Settled Clarifier Raw sludge and VS out was sampled as the sludge left the Secondary Digesters going to the screw press or drying beds. Waste from the Activated Sludge process is sent to the primary clarifier and is accounted for in the Raw sludg

Appendix F:

2023 Hauling Spreadsheet example

Field				Biosolids											Soil				
				WET				DRY					Sampling cost			N (#/Acre)			AG Rate
Field	Acers	% used	Acers Used	Lbs	Ton	lbs/acer	Tons/acer	Lbs	Ton	lbs/acer	Tons/acer	% Dry	Lot #	Bio Solids	Soil	Test Results	Avaible	Applied	160
ST E 1	136.72		0.00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	#DIV/0!		$ 411.00		92	68.0		
ST W 1	154.80	50%	77.40	212,260	106.13	1,371.19	0.69	129,753.98	64.88	838.20	0.42	61.13%	Lot # 3	$ 501.00		79	81.0		
ST W 2	154.80	50%	77.40	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	#DIV/0!		$ 501.00		79	81.0		
ST N	158.18	100%	158.18	877,930	438.97	5,550.20	2.78	310,865.93	155.43	1,965.27	0.98	35.41%	Lot # 1	$ 411.00	$ 79.00	62.0	98.0	30.52	
ST S	158.18	100%	158.18	407,650	203.83	2,577.13	1.29	185,369.22	92.68	1,171.89	0.59	45.47%	Lot # 4	$ 411.00	$ 79.00	62.8	97.2	19.01	
ST CRP	148.50		0.00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	#DIV/0!					160.0		
Reese	314.50		0.00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	#DIV/0!					160.0		

DATE	Hours	LOADS	GROSS	TARE	NET	TOTAL	% SOLIDS	FIELD	Total dry solids	Initails	Lot #	Fuel	Notes
5/30/2023		5	46,760	30,640	16,120	80,600	50.01	ST N	40,308	HS	Lot # 1	86	
5/31/2023		4	48,720	30,580	18,140	72,560	44.37	ST N	32,195	HS	Lot # 1		
6/1/2023	4	3	50,580	30,520	20,060	80,240	37.03	ST N	29,713	HS	Lot # 1	89	
6/5/2023	4	3	50,020	30,680	19,340	77,360	29.24	ST N	22,620	HS	Lot # 1		
6/6/2023	7	6	48,820	30,600	18,220	127,540	37.73	ST N	48,121	HS	Lot # 1		
6/7/2023	7	6	46,660	30,520	16,140	112,980	23.58	ST N	26,641	HS	Lot # 1	88	
6/9/2023	4	3	46,340	30,620	15,720	62,880	31.55	ST N	19,839	HS	Lot # 1		
6/12/2023	7	5	52,860	30,580	22,280	144,820	39.01	ST N	56,494	HS	Lot # 1	83	
6/14/2023	7	5	48,960	30,660	18,300	118,950	29.37	ST N	34,936	HS	Lot # 1		
6/20/2023	8	7	46,000	30,160	15,840	118,800	53.39	ST S	63,427	JH	Lot # 4		
6/21/2023	8	6	45,860	30,120	15,740	118,050	48.66	ST S	57,443	JH	Lot # 4	94	
6/22/2023	5	4	48,660	30,160	18,500	92,500	50.31	ST S	46,537	JH	Lot # 4		
6/23/2023	5	4	45,800	30,140	15,660	78,300	22.94	ST S	17,962	JH	Lot # 4	92	
10/23/2023	10.00	5	47,600	37,180	10,420	52,100	85.22	ST W 1	44,400	JH	Lot # 3	100	
10/24/2023	10.00	5	48,340	30,140	18,200	91,000	76.81	ST W 1	69,897	JH	Lot # 3		
10/30/2023	5.00	4	47,450	30,160	17,290	69,160	22.35	ST W 1	15,457	JH	Lot # 3		
					0	0			0				
Total	89	75	769,430	493,460	275,970	1,497,840			625,989	6/21/2024			
Average	6.4	4.7	48,089	30,841	16,234	88,108	42.60%		36,823				

Press (Lot 1)

Field	ST N	Press Winter							
Acres used >	158.18	Gallons Applied		% Solids >	35%				
Hectare >	64.01	Pounds Applied	877,930	DRY Tons/ >	155.43				
Dry kilograms >	141006.4			dmt	141.01				
kg/hectare >	2202.77			Tons / Acre >	0.98				

Ammonia N	Nitrate & Nitrite	TKN	Organic N	Total N	Plant Available N	Plant Available N	Field	ST N
mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	LBS/TON	LBS/ Acre	Avaible	Left
6910	33.3	48200	41290	48233.3	31.06	30.52	98	67.48

Laboratory			Limits				Applied to Field	
	Report		Sludge limit	EQ limit	Application limit	Year limit	lbs/acer	# Pounds
Metal	mg/kg	kg/hectare	mg/kg	mg/kg	Kilograms/hactare	kg/hectare/year		
Aesenic	4.59	0.0101	75	41	41	2	0.01	1.43
Cadmium	5.36	0.0118	85	39	39	1.9	0.01	1.67
Chromium	24.6	0.0542	3000	1200	3000	150	0.05	7.65
Copper	347	0.7644	4300	1500	1500	75	0.68	107.87
Lead	25.8	0.0568	840	300	300	15	0.05	8.02
Mercury	0.856	0.0019	57	17	17	0.85	0.00	0.27
Molybdenum	13.2	0.0291	75				0.03	4.10
Nickle	18.5	0.0408	420	420	420	21	0.04	5.75
Selenium	7.35	0.0162	100	36	100	5	0.01	2.28
Zinc	1230	2.7094	7500	2800	2800	140	2.42	382.37
			lbs/ton					
Sulfur	12800	28.20	25.60				25.16	3979
Total P	15600	34.36	31.20				30.66	4850
K	1370	3.02	2.74				2.69	426
Fe	15100	33.26	30.20				29.68	4694
PH	7.92							
% TVS	66.5							
% mositure	75.1							

(Lot 3)

Field	ST W 1	Press dryed in bed						
Acres used >	77.4	Gallons Applied		% Solids >	61%			
Hectare >	31.32	Pounds Applied	212,260	DRY Tons/ >	64.88			
Dry kilograms >	58855.4			dmt	58.86			
kg/hectare	1879.00			Tons / Acre >	0.84			

Ammonia N	Nitrate & Nitrite	TKN	Organic N	Total N	Plant Available N	Plant Available N	Field	ST W 1
mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	LBS/TON	LBS/ Acre	Avaible	Left
6100	2.55	8810	2710	8812.55	7.12	5.97	81	75.03

Laboratory			Limits				Applied to Field	
Metal	Report mg/kg	kg/hectare	Sludge limit mg/kg	EQ limit mg/kg	Application limit Kilograms/hactare	Year limit kg/hectare/year	lbs/acer	# Pounds
Aesenic	4.53	0.008511887	75	41	41	2	0.01	0.59
Cadmium	5.89	0.011067333	85	39	39	1.9	0.01	0.76
Chromium	39.4	0.074032752	3000	1200	3000	150	0.07	5.11
Copper	381	0.715900469	4300	1500	1500	75	0.64	49.44
Lead	21.8	0.040962284	840	300	300	15	0.04	2.83
Mercury	0.689	0.001294634	57	17	17	0.85	0.00	0.09
Molybdenum	14.1	0.026493954	75				0.02	1.83
Nickle	27.5	0.051672606	420	420	420	21	0.05	3.57
Selenium	8.21	0.015426622	100	36	100	5	0.01	1.07
Zinc	1160	2.179644474	7500	2800	2800	140	1.94	150.51
			lbs/ton					
Sulfur	11900	22.36014589	23.80				19.95	1544
Total P	16500	31.00356363	33.00				27.66	2141
K	1510	2.837295824	3.02				2.53	196
Fe	14500	27.24555592	29.00				24.31	1881
PH	6.01							
% TVS	66.3							
% mositure	14.2							

(Lot 4)

Field	ST S	Press Summer						
Acres used >	158.18	Gallons Applied		% Solids >	45%			
Hectare >	64.01	Pounds Applied	407,650	DRY Tons/ >	92.68			
Dry kilograms >	84082.1			dmt	84.08			
kg/hectare	1313.51			Tons / Acre >	0.59			

Ammonia N	Nitrate & Nitrite	TKN	Organic N	Total N	Plant Available N	Plant Available N	Field	ST S
mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	LBS/TON	LBS/ Acre	Avaible	Left
5620	14.5	51200	45580	51214.5	32.44	19.01	97.2	78.19

Laboratory			Limits				Applied to Field	
Metal	Report	kg/hectare	Sludge limit mg/kg	EQ limit mg/kg	Application limit Kilograms/hactare	Year limit kg/hectare/year	lbs/acer	# Pounds
Aesenic	3.74	0.004912534	75	41	41	2	0.00	0.69
Cadmium	7.02	0.009220853	85	39	39	1.9	0.01	1.30
Chromium	21.5	0.028240505	3000	1200	3000	150	0.03	3.99
Copper	281	0.36909683	4300	1500	1500	75	0.33	52.09
Lead	18.6	0.02443132	840	300	300	15	0.02	3.45
Mercury	0.557	0.000731626	57	17	17	0.85	0.00	0.10
Molybdenum	11.8	0.01549944	75				0.01	2.19
Nickle	18	0.023643213	420	420	420	21	0.02	3.34
Selenium	5.94	0.00780226	100	36	100	5	0.01	1.10
Zinc	873	1.146695846	7500	2800	2800	140	1.02	161.83
			lbs/ton					
Sulfur	10900	14.31727917	21.80				12.77	2020.52
Total P	16800	22.06699909	33.60				19.69	3114.20
K	1670	2.193564791	3.34				1.96	309.57
Fe	10500	13.79187443	21.00				12.30	1946.38
PH	8.69							
% TVS	71.1							
% mositure	66.7							

City of Pendleton Public Works

Standard Operating Procedure (SOP)

SOP TITLE:	**Biosolids Sampling**
SOP NUMBER:	**2024-0*XX***
DATE:	***August 1, 2024***
RESPONSIBLE DEPARTMENT:	***Resources Recovery Facility***
SOP AUTHOR(S):	***Kyle Willman***
SUPERINTENDENT APPROVAL:	***Kyle Willman***
PUBLIC WORKS DIRECTOR APPROVAL:	***Jeff Brown***
REVISION NUMBER:	
REVISION DATE:	***10-1-2024***

1. ***PURPOSE:***
    - ***a.*** To establish procedures for sampling biosolid piles as per permit required.
2. ***PERSONNEL REQUIRED:***
    a. One competent employee with training on appropriate sampling techniques.
3. ***EQUIPMENT REQUIRED:***
    a. One-Brown Glass sample container w/ label – size will be determined by testing laboratory
    b. Plastic 500ml sample container
    c. Plastic 125ml sample container
    d. Sample stick-cup
    e. Clean plastic container/bucket

f. Chain of Custody (COC) form the laboratory doing the testing for sample
g. Gloves
h. Shipping box w/ cooler and ice

4. TRAINING REQUIRED:

a. Review of this SOP

5. SAFETY REQUIREMENTS:

a. Disposable gloves
b. Safety Glasses

6. PROCESS STEPS:

a. Digester Sampling – This applies to both the primary and secondary digesters.
    i. Flush the sample port of any dried sludge or other debris
    ii. Collect about 200ml of sample into a plastic sample container
    iii. Turn in to the city lab for total solids, volatile solids, alkalinity, volatile acids, and any other required testing.
b. Biosolids Drying Bed Sampling - Filling
    i. Collect samples at the beginning, halfway done, and before shutting down
    ii. Collect samples at the influent pipe.
    iii. Wait min of five minutes after turning on flow to flush pipe before taking the first sample.
    iv. Use the sample stick-cup to collect sample.
    v. Pour 100mls of sample into 500ml plastic sample container.
    vi. Repeat process for halfway and shutdown samples.
    vii. Label the bottle appropriately.
    viii. Shake up and turn into the City lab for total solids, volatile solids, and any other required testing.
c. Biosolids Drying Beds Sampling - Emptying
    i. Collect a sample once the drying bed is scraped into a pile and before it is moved to a storage bin.
    ii. Make sure the biosolids pile is turned before collecting a sample.

iii. Using the collection bucket walk around the pile and collect 6 to 9 samples from different location from varying depths and heights on the pile. Grab a hand full of biosolids at each spot. Each grab should be about the same size.
iv. After placing each sample in the bucket stir the sample until a uniformed mixture is created.
v. Fill a 125ml plastic sample container.
vi. Label the bottle appropriately.
vii. Turn into City lab for total solids, volatile solids, and any other required testing.

d. Biosolids Storage Pile sampling
    i. Collect a sample after the biosolids pile is turned but before it is spread on fields.
    ii. Using the collection bucket walk around the pile and collect 6 to 9 samples from different location from varying depths and heights on the pile. Grab a hand full of biosolids at each spot. Each grab should be about the same size.
    iii. After placing each sample in the bucket stir the sample until a uniformed mixture is created.
    iv. Once you have a uniform sample fill the brown glass sample jar.
    v. Label the jar appropriately
    vi. Wrap the jar in bubble wrap place in cooler with ice packs
    vii. Ship to external lab with properly filled out Chain of Custody (COC) listing the required tests.

7. ADDITIONAL INFORMATION:

a. Operating manuals are available at the RRF should any questions arise on the operation and maintenance of the equipment.
b. If any problems arise you should contact your immediate supervisor.