APPENDIX A

DEQ AND OSHD CORRESPONDENCE

Oregon
Kate Brown, Governor

Department of Environmental Quality
Northwest Region
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June 25, 2019

IMPORTANT DOCUMENT
AMMENDED LAND APPLICATION AUTHORIZATION

Greg Charr
Columbia Boulevard Wastewater Treatment Plant
City of Portland
5001 N Columbia Blvd.
Portland, OR 97201

Re: WQ- Multnomah County
Biosolids Land Application Authorization
Wasco County Landfill
Site ID: NWR2019-01-BS
Columbia Boulevard WWTF: NPDES Permit No. 100807;
File No. 70725

Dear Mr Charr:

This amended biosolids land application authorization replaces the May 28, 2019 land application authorization for this site to correct the total acreage of the site and the acreage authorized to receive biosolids.

On February 15, 2019, the Oregon Department of Environmental Quality (ODEQ or "the Department") received a request from Kevin Green of Waste Connections Wasco County Landfill for the use of the City of Portland's biosolids for site restoration. Waste Connections intends to use the City of Portland's biosolids to improve the productivity of the soil around the landfill footprint and to improve the soil used as an intermediate cover and final cover for the Wasco County Landfill located near The Dalles in Wasco County. This site was evaluated by ODEQ on March 8, 2019 and ODEQ received documentation of neighbor notification on May 10, 2019. The site submitted for ODEQ approval is identified in Table 1 and Figure 1.

Table 1. The site reviewed for reclamation with biosolids

Township, Range, Section	Tax Lot	Total Area (acres)	Area (acres)
T1N R13E 24	100 & 200	300	190

Site Description: The property is currently zoned A-1 (160) Large Scale Agriculture and permitted as a solid waste landfill by ODEQ (Facility # 11817, Permit # 53). This landfill is managed by Waste Connections. Adjacent property uses are agricultural.

ODEQ reviewed the site topography and soil to determine the suitability for biosolids land application. Hydrologic features, landscape position, and parent geologic features were also reviewed. In addition, current and proposed soil management of the site was discussed. The locations of residences, wells, roads, and other sensitive features were identified as well as setbacks and site restrictions that would be appropriate for the site. ODEQ confirmed with Wasco County zoning to ensure the zoning and land use designation is compatible for biosolids land application.

Based upon the site visit and supplemental information provided by the City of Portland and Waste Connections, the Wasco County Landfill referenced in Table 1 is approved for the use of biosolids for site reclamation efforts provided the following conditions are satisfied:

1. **Regulations, Rules, and Permit Requirements.** Biosolids processing and handling will comply with:
    a. Oregon biosolids and septage rules and guidelines (OAR 340-050);
    b. federal biosolids and septage regulations (40 CFR Part 503);
    c. the ODEQ issued permits to the City of Portland Columbia Boulevard Wastewater Treatment Facility (NPDES Permit No. 100807; File No. 70725);
    d. the ODEQ approved Biosolids Management Plan and Land Application Plan, including all subsequent amendments; and
    e. all other applicable federal and state statutes and rules.
2. **Treatment Processes.**
    a. Biosolids volatile solids shall be reduced by 38% or more.
3. **Transportation.**
    a. Transportation of the biosolids to the site shall be done in accordance with the City of Portland Biosolids Management Plan and Land Application Plan.
4. **Land Application Activities.**
    a. The site is approved for site reclamation with biosolids by utilizing appropriate soil mixing and application equipment.
    b. Biosolids shall be applied evenly and a manner that will prevent ponding and runoff from precipitation events.
    c. Biosolids may be staged on the site for no more than 12 months prior to spreading. For staging beyond 12 months, prior written request and ODEQ authorization is required.
    d. Immediately following land application, the biosolids equipment operator shall clean off (at the application site) any equipment coated with biosolids to prevent biosolids from spilling onto public roadways.
5. **Application Rates and Timing.**
    a. **Application Period**. The site is approved for year-around restoration when site conditions allow for uniform application that will not result in ponding or runoff. Land application timing must be appropriate to the site's land management practices and must be managed to provide maximum benefit to establish a vegetative cover on the site and minimize potential movement or adverse environmental effects.
    b. **Application Rate**. Biosolids shall be mixed with the soil at rates up to but not exceeding 200 lbs. of plant available nitrogen per acre (about 9 dry tons per acre or 44 wet tons per acre based on most recent data from the City of Portland) as a onetime soil reclamation effort. If other sources of nitrogen are used, the biosolids application rate must be reduced so that the other nitrogen sources in combination with the biosolids do not exceed the above stated site reclamation loading rate for the site. Additional ODEQ approval is required if, at a later date, Waste Connections or the City of Portland wish to apply additional biosolids to a parcel that has already received biosolids.

c. **Agronomic Rate Calculations**. Biosolids application rates will be calculated using one of the following: (i) the method approved in the ODEQ-approved Biosolids Management Plan; (ii) the method described in Worksheet for Calculating Biosolids Application Rates in Agriculture, published by the Oregon State University Extension Service, Publication No. PNW0511e (March 2007); or (iii) the method described in Managing Nitrogen from Biosolids, published by Washington State Department of Ecology and the Northwest Biosolids Management Association (April 1999). Any deviations from the methods and/or assumptions described in these publications must be pre-approved in writing by the ODEQ Northwest Region. (Updated versions of the aforementioned documents may be used at any time.)

d. **Supplemental N**. If other sources of nitrogen are applied to the field (e.g., commercial, animal manure or green chop), the biosolids application rate must be reduced so that the supplemental nitrogen plus biosolids nitrogen does not exceed the application rate approved for this site.

6. **Site Restrictions.**

a. **Wet Soil.** Care should be taken to avoid wet soil conditions, particularly in concave areas, at the time of application.

b. **Precipitation.** Biosolids land application shall cease when precipitation exceeds ¼ inch per hour or when one inch or more of precipitation occurs in a 24-hour period. Land application shall be withheld from the site for at least one day for every consecutive day of precipitation where a ¼ inch or one-inch per 24-hour precipitation event occurs.

c. **General Public Access.** General Public access to the site shall be restricted for at least 12 months after biosolids land application has ceased.

i. Individuals seeking access to the sites must be provided with information regarding biosolids land application activities; and, any questions and/or concerns they may have regarding exposure to biosolids must be addressed.

d. **Grazing.** A 30 day interval shall follow the application of biosolids prior to grazing livestock on any field or prior to the harvesting of crops that are to be fed to animals.

e. **Wind.** Land application shall cease if wind speed is such that biosolids cannot be applied uniformly or would be thrown into buffer strips, waterways, roads, trails, or onto the application vehicle itself. Application may resume after winds speeds have decreased such that no significant blowing or drifting occurs.

f. **Nuisance Conditions.** Biosolids land application shall cease when the potential exists for nuisance conditions or runoff beyond the approved areas.

Individuals authorized to be on the site, seeking access to the biosolid application areas within 12 months of application must be provided with information regarding biosolids land application activities; and, any questions and/or concerns they may have regarding exposure to biosolids must be addressed.

g. **Slope.** Biosolids mixed with soil is permitted to be applied on hill sides with up to a 3:1 slope. On hill sides exceeding a 3:1 slope, biosolids must be mixed with a binding agent to restrict sloughing and soil movement and written ODEQ approval of the application method. All biosolids must be managed to ensure there is no runoff or off site migration.

7. **Setbacks and Buffers.** Setbacks and buffers on the sites have been identified and include the following.

a. A minimum setback of 10 feet shall be required from all property boundaries.

b. A minimum setback of 200 feet shall be maintained between the nearest point of biosolids application and all water wells and other domestic water sources.

8. **Remedial Procedures.**

a. The City's biosolids hauler shall clean up any spillage of biosolids. The City shall consult with the ODEQ for appropriate methods of protecting public health and the environment for spills that cannot be completely cleaned up.

b. In the event an odor problem is reported to the City, its representative, or the ODEQ after biosolids has been land applied at the site, the City and the ODEQ will jointly determine the best method to mitigate the odor concern.

c. The ODEQ shall be notified within one hour, through the Oregon Emergency Response System (OERS), of any spills of more than ¼ cubic yard (0.19 cubic meters) of biosolid cake or more than 55 gallons of liquid biosolids or other threats to the environment that may occur. All spills adjacent to drainage ditches or drainage ways should be reported. Failure to provide prompt notification may be considered cause for taking enforcement action against the City. The telephone number for OERS is 1.800.452.0311 (24-hr service).

9. **Monitoring and Reporting.**

a. **Site Records.** Daily site records of the biosolids applied to the soil will be maintained. Site records shall be recorded on field grid map or other readable system. Records shall indicate the date, location and quantity of biosolids applied; segments of each field that received biosolids and pounds of nutrients applied to each area receiving biosolids. These records must be available to the ODEQ for review upon request. Regardless of the format in which records are kept, they must be readily available.

b. **Annual Report.** By February 19th of each year, the City shall provide the ODEQ with an annual report using the designated reporting form providing the previous year's biosolids processing and application activities, as required under the ODEQ rules (OAR 340-050-0035(6)). An annual report must be also be submitted to the United States Environmental Protection Agency (USEPA).

10. **Notification.**

a. The City or its representatives shall promptly notify ODEQ of any major changes it intends to make to its biosolids processing activities which could influence biosolids quality or quantity before anticipated modifications are initiated. Any variations from the Department approved biosolids management plan and this authorization letter must receive prior written approval from the ODEQ.

11. **Additional Conditions.**

a. The ODEQ shall have the right: (i) to enter (at reasonable times) the City's (or its representatives) place of biosolids land application and record keeping to review biosolids management operations and records; (ii) to obtain copies of any records required under the terms of the authorization and the City's biosolids management plan; (iii) to inspect any monitoring equipment required under this authorization; (iv) to inspect any collection transport, or land application vehicle; and, (v) to obtain any photographic documentation or evidence deemed appropriate.

b. This authorization is subject to revocation should health hazards, environmental degradation, or nuisance conditions develop as a result of inadequate biosolids treatment or site management.

c. Any variations from the City's approved biosolids management plan and this authorization letter must receive prior written approval from the ODEQ Northwest Region Office.

d. The ODEQ may amend this Site Authorization and impose any additional restrictions or conditions deemed necessary to protect environmental and human health.

This authorization is considered to be part of your approved biosolids management plan and is enforceable as part of your NPDES permits. Therefore, if operations are not conducted in accordance with terms specified under this authorization, the Department will initiate an enforcement action, which may lead to the assessment of a civil penalty. If you have any questions regarding the issues in this letter please call me at 503.229.5347 or contact me via email at heins.pat@deq.state.or.us.

Sincerely,

Pat Heins
Land Application Specialist

Att: Figure 1 –site map

cc: Kevin Green, Waste Connections, 2550 Steele Rd., The Dalles, OR 97058
North Central Public Health, 419 E 7th St. #100, The Dalles, OR 97058
Ken Lucas, DEQ Eastern Region, Solid Waste, The Dalles Office
Tim Ruby, DEQ NW Region, WQ, Portland Office

Lower Yamsay Pond
Yamsay Pond Reforestation
Boundary

Oregon

Kate Brown, Governor

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IMPORTANT DOCUMENT
LAND APPLICATION AUTHORIZATION

June 11, 2019

Mr. Greg Charr, Biosolids Program Manager
City of Portland Environmental Services
5001 North Columbia Boulevard
Portland, Oregon 97203

RE: Biosolids Land Application Authorization
City of Portland Environmental Services
File No. 70725/ Permit No. 101505
Weedman Brothers Ranch, Gilliam County, Oregon
Site Identification No. NWR-2019-03-BS

Dear Mr. Charr:

The Oregon Department of Environmental Quality (DEQ) has reviewed the City of Portland's Environmental Services (hereinafter referred to as the "City") Site Authorization Documentation Checklist for the Land Application of Biosolids on the Weedman Brothers Ranch dated April 2019.

Further, the DEQ physically surveyed the Weedman Brothers Ranch property on May 15, 2019, for compliance with best management practices and site selection criteria provided in OAR 340-050-0065 and OAR 340-050-0070.

In addition, public notice of this project was posted on May 2 and 9, 2019 in The Times – Journal by the City of Portland. During this process, no persons or organizations requested that the DEQ hold a public hearing pursuant to OAR 340-050-0030.

Based on our review of the checklist documents and site survey, pursuant to OAR 340-050-0015 the Weedman Brothers Ranch property is hereby approved for the bulk agricultural land application of Class B biosolids produced by the City subject to meeting all of the following conditions on an on-going basis.

1.0 APPROVED LAND APPLICATION SITES

City biosolids shall only be applied across the approved areas depicted in the maps provided in Attachment #1, and as further described in the table below. The identified site is owned by Weedman Brothers Ranch (Mike and Colby Weedman) and is located in an Exclusive Farm Use (EFU) Zone.

Site Name	Property Description	Tax Lot Number	Total Tax Lot (Acres)	Total Spreadable Area (Areas)
Weedman 57	Most of S20, most of S19, most of S29, and part of W1/2 of S30, T01N, R21E	1500	1,876	1,800

2.0 REGULATIONS, RULES, AND PERMITTING REQUIREMENTS

City biosolids processing, handling, and land application at the approved site shall comply with the following regulations, rules, and permitting requirements:

(A) Oregon's Land Application of Domestic Wastewater Treatment Facility Biosolids, Bisolids Derived Products, and Domestic Septage Regulations (OAR 340-50);

(B) Federal Standards for the Use or Disposal of Sewage Sludge (40 CFR, Part 503);

(C) City of Portland Environmental Services Biosolids Management Plan (February 2019 and any subsequent updates during the term of this approval); and

(D) All other applicable federal and state statues and rules.

3.0 BIOSOLIDS PATHOGENS AND VECTOR ATTRACTION REDUCTION

City biosolids shall be properly treated to reduce pathogens and vector attraction prior to land application at the site as required by OAR 340-050-0026, 40 CFR §503.32, and 40 CFR §503.33 as follows:

(A) Pathogen Reduction. Bulk Class B biosolids shall be treated to reduce pathogens pursuant to 40 CFR § 503.32(b)(2) or by anaerobic digestion pursuant to 40 CFR §503.32(b)(3), Appendix B, Processes to Significantly Reduce Pathogens (PSRP), Option 3, and as described in Sections 3(A)1) and 3(A)2) below.

1) Fecal Coliform Monitoring Requirement. At least seven representative samples of the biosolids shall be collected and analyzed prior to land application each month. The geometric mean of the density of fecal coliform in these samples shall be less than either 2,000,000 Most Probable Number (MPN) per gram of total solids (dry weight basis) or 2,000,000 Colony Forming Units (CFU) per gram of total solids (dry weight basis).

2) Anaerobic Digestion (PSRP). Biosolids shall be treated in the absence of air for a specific mean cell residence time at a specific temperature. Values for the mean cell residence time and temperature shall be between 15 days at 35 to 55 degrees Celsius (95 to 131 degrees Fahrenheit) and 60 days at 20 degrees Celsius (68 degrees Fahrenheit).

(B) Vector Attraction Reduction. Bulk Class B biosolids shall be treated to reduce the mass of volatile solids in the biosolids by a minimum of 38 percent (using the Van Kleeck Method) pursuant to 40 CFR §503.33(b)(1) prior to land application.

The following special definitions apply to the terms used in Sections 3(A) and 3(B) above: 1) Density of microorganisms is the number of microorganisms per unit mass of total solids (dry weight) in the biosolids; 2) Geometric mean is an average, which indicates the central tendency or typical value of a set of numbers by using the product of their numbers; 3) Pathogenic organisms are disease-causing organisms; 4) Anaerobic digestion is the biochemical decomposition of organic matter in biosolids into methane gas and carbon dioxide by microorganisms in the absence of air; 5) Vector attraction is the characteristic of biosolids that attracts rodents, flies, mosquitos, or other organisms capable of transporting infectious agents; 6) Volatile solids are the amount of the total solids in biosolids lost when the biosolids is combusted at 550 degrees Celsius in the presence of excess air; and 7) Van Kleeck Method is an equation used in calculating the percent reduction in volatile solids in biosolids as outlined in EPA's Manual, Control of Pathogens and Vector Attraction in Sewage Sludge, 2003 (EPA-625/R-92/013), Appendix C, Pages 120 – 126.

4.0 BIOSOLIDS QUALITY

City biosolids applied to the site shall be sampled and analyzed on a monthly basis pursuant to OAR 340-050-0035 and 40 CFR §5013(b)(3) Table 1 to demonstrate on-going compliance with pollutant concentration limits for land application as follows:

(A) Monthly Testing of Biosolids. City bioslids applied to the site shall be tested on a monthly basis for all of the parameters listed in the table below.

Parameter	Reporting Unit
Arsenic, Total As	Dry Weight, mg/kg
Cadmium, Total Cd	Dry Weight, mg/kg
Copper, Total Cu	Dry Weight, mg/kg
Lead, Total Pb	Dry Weight, mg/kg
Mercury, Total Hg	Dry Weight, mg/kg
Molybdenum, Total Mo	Dry Weight, mg/kg
Nickel, Total Ni	Dry Weight, mg/kg
Selenium, Total Se	Dry Weight, mg/kg
Zinc, Total Zn	Dry Weight, mg/kg
Nitrate-Nitrogen, NO_3-N	Dry Weight, mg/kg
Ammonia-Nitrogen, NH_3-N	Dry Weight, mg/kg
Total Kjeldahl Nitrogen, TKN	Dry Weight, mg/kg
Potassium, Total-K	Dry Weight, mg/kg
Phosphorus, Total-P	Dry Weight, mg/kg
pH	Standard Units, SU
Total Solids	Percent, %
Volatile Solids	%
Fecal Coliform	Dry Weight, MPN/gram or CFU/gram

(B) Pollutant Concentration Limits. City bisolids applied to the site shall meet the pollutant concentration limits listed in the table below on an on-going basis.

Parameter	40 CFR §503(b)(3) Pollutant Concentration Monthly Average Limits[1] (Dry Weight, mg/kg)[2]
Arsenic (As)	41
Cadmium (Cd)	39
Copper (Cu)	1500
Lead (Pb)	300
Mercury (Hg)	17
Molybdenum (Mo)	75 (Ceiling Concentration Limit)[3]
Selenium (Se)	100
Nickel (Ni)	420
Zinc (Zn)	2,800

NOTES:
mg/kg = Parts per Million
[1] Monthly average is the arithmetic mean of all measurements taken during the month.
[2] Dry weight basis means calculated on the basis of having been dried at 105 degrees Celsius until reaching a constant mass (i.e., essentially 100 percent solids content).
[3] 40 CRF §503.13 Table 1 Ceiling Concentration Limit for Mo. Biosolids that exceed the Mo Ceiling Concentration Limit are not eligible for land application and must be managed by other means.

(C) Sampling. The City shall collect representative samples of biosolids for laboratory analysis to comply with monthly testing requirements and demonstrate on-going compliance with limitations pursuant to Sections 4(A) and 4(B) above.

(D) Laboratory Methods. City bisosolids sampled to comply with Sections 4(A) through 4(C) above shall be analyzed by a qualified laboratory per the test methods listed in 40 CFR 503.8(b) and OAR 340-050-0035(2)(b).

5.0 TRANSPORTATION OF BIOSOLIDS

City bisolids shall be hauled to the site in accordance with the City's Transportation Spill Response Plan, Biosolids Management Plan, and as follows:

(A) City biosolids shall only be hauled to the site in vehicles with sealed gates, spill guards, and/or tarps to prevent roadway spills.

(B) All transport vehicles shall regularly be cleaned to avoid tracking of biosolids off-site onto public roadways.

(C) Transport vehicles shall be regularly cleaned in designated cleaning areas with any wash waters properly managed.

(D) All spills to roadways that take place during the transport of the biosolids to the site shall be immediately cleaned-up.

(E) Transport and spreading vehicles shall be properly maintained and equipped with noise control equipment as required under state and federal law.

6.0 LAND APPLICATION ACTIVITIES

City biosolids shall be spread at the site in accordance with the following land application activities best management practices:

(A) The site is approved for the land application of dewatered biosolids by a side-discharge spreader or other similar residuals-spreading equipment.

(B) Biosolids shall be applied evenly and in a manner that will prevent ponding and runoff during and after precipitation events.

(C) All spreading equipment shall be properly calibrated prior to use to ensure that biosolids are land applied at rates consistent with agronomic loading limits.

(D) Biosolids may be stored in the fields at the stockpile locations identified in the site maps provided in Attachment #1 for no more than 21 days prior to spreading. The quantity of biosolids in the storage locations may not exceed the agronomic loading rate for the site as detailed in Section 7.0 below.

(E) Immediately following land application, the biosolids equipment operator shall clean off (at the land application site) any equipment coated with biosolids to prevent biosolids from spilling onto roadways.

7.0 APPLICATION TIMING AND RATES

City Class B biosolids shall be land applied across the site at a rate that provides the annual total plant available nitrogen (PAN) to be less than or equal to crop requirements as follows:

(A) Application Period. The site is approved for the year-round land application of biosolids consistent with the seasonal planting, harvesting, and growth of crops across the site from year-to-year.

(B) Maximum Agronomic Application Rate. Biosolids shall be applied to the site at a whole biosolids application rate that is equal to or less than the maximum agronomic rate factored at no more than 156 lbs. Plant Available Nitrogen (PAN)/acre/year for the growth of dryland grains (soft white winter wheat or spring wheat) as provided in the Oregon State University (OSU) Fertilizer Guide FG 80 and summarized in the table below.

Site Crop	Yield Goal	OSU Fertilizer Guide FG 80 Recommended Rate of Nitrogen Application*	Maximum Amount of PAN That May Be Applied to Sites Annually
	(bu/ac)	(PAN/bu/ac)	(Total lbs. PAN/Acre/Year)
Wheat	50 – 65	2.0 – 2.4	100 – 156

**For future reference and use, a copy of Oregon State University (OSU) Fertilizer Guide FG 80 "Winter Wheat in Summer-Fallow Systems" is provided in Attachment #2.*

NOTES:
"lbs." = Pounds
"bu/ac" = Bushels/Acre
"PAN/bu/ac" = Plant Available Nitrogen/Bushel/Acre
"Total lbs. PAN/Acre/Year" = Total Pounds Plant Available Nitrogen/Acre/Year (Maximum Agronomic Rate)

(C) Agronomic Rate Calculation. Maximum agronomic biosolids application rates shall be calculated based on routine testing of the City's biosolids for the required nitrogen forms and using the method described in the "Worksheet for Calculating Biosolids Application Rates in Agriculture" (Pacific Northwest Extension Publication, PNW 511, September 2018) or any updated versions of this worksheet that may be developed during the term of this approval. Any deviations from the methods and/or assumptions described in this published worksheet for factoring biosolids loading rates must be pre-approved in writing by the DEQ. For reference, a copy of the Pacific Northwest Extension Worksheet for Calculating Biosolids Application Rates in Agriculture is found in Attachment #3. The on-line version of this worksheet may be found at https://puyallup.wsu.edu/soils/biosolids/

(D) Routine Applications. If biosolids applications exceed 2 out of 3 successive years at agronomic rates, the site shall be evaluated for carry over nitrate-nitrogen (NO_3-N) by soil testing before the next application as described in Oregon State University (OSU) Fertilizer Guide 80 provided in Attachment #2. Based on this soil testing, agronomic rates of application for the biosolids shall be adjusted for residual NO_3-N measured in the effective rooting zone of the soil per the Worksheet for Calculating Biosolids Application Rates in Agriculture provided in Attachment #3.

(E) Supplemental Nitrogen. If other sources of nitrogen are applied to the site fields (e.g., commercial nitrogen fertilizer, animal manure, or green chop), the biosolids application rates shall be reduced so that the supplemental nitrogen plus biosolids nitrogen does not exceed the agronomic application rate approved for this site.

(F) Changes. Changes in biosolids characteristics, cropping practices, or general land management shall necessitate appropriate adjustment in the application rate to maintain nitrogen applications consistent with crop demands. Major changes in any of the above will be communicated to DEQ's Northwest Region in writing.

8.0 SITE RESTRICTIONS

City biosolids shall be managed across the site in accordance with the following site restrictions applicable to management of Class B biosolids land application sites pursuant to OAR 340-050-0065.

(A) Wet Soils. Care shall be taken to avoid the spreading of biosolids across wet soil conditions, particularly in concave areas of the site [OAR 340-050-0065(3)].

(B) General Public Access. Access to the site by the general public shall be restricted for at least twelve (12) months after application of the biosolids. Access control is assumed for this site since it is located on rural private land [OAR 340-050-0065(4)].

(C) Grazing and Harvesting. A thirty (30) day interval shall follow the application of biosolids prior to grazing livestock on any field or prior to the harvesting of crops that are to be fed to animals [OAR 340-050-0065(6)].

(D) Wind. Land application shall cease if wind speed is such that biosolids cannot be applied uniformly or would be thrown into buffer strips, waterways, roads, trails, or onto the application vehicle itself. Application may resume after wind speeds have decreased such that no major blowing or drifting occurs [OAR 340-050-0065(3)].

(E) Nuisances. Biosolids land application shall cease when the potential exists for nuisance conditions or runoff beyond the approved site areas [OAR 340-050-0065(3)].

9.0 SETBACKS AND BUFFERS

City biosolids shall be land applied pursuant to the set-backs and buffer strips identified in the site maps provided in Attachment #1 designed to prevent wind drift and protect waterways and as further defined below.

(A) Travel Highways. No biosolids shall be spread at the site any closer than 25-feet of any paved highway or road.

(B) Domestic Water Source Well. No biosolids shall be spread any closer than 200-feet of any domestic water source well.

(C) Adjoining Properties. No biosolids shall be spread any closer than 10-feet of adjoining properties not owned by Weedman Brothers Ranch.

10.0 REMEDIAL PROCEDURES

The City shall comply with the following remedial procedures in the case of biosolids spills and nuisance odors at the approved land application site:

(A) All spills into waters of the state shall be reported immediately to the Oregon Emergency Response System (OERS) at 1-800-452-0311 and the DEQ's Regional Biosolids Specialist at (503) 229-5292.

(B) All biosolids spills in excess of 450 lbs. (~0.25 Tons) shall be reported to the DEQ's Regional Biosolids Specialist at the number provided in Section 10(A) above within 24-Hours of the spill incident.

(C) If the City has to report a spill to OERS, the City shall be prepared to provide the following basic spill information: 1) Contact names and phone numbers; 2) Type of material spilled; 3) Estimated quantity; 4) Location description (land or water); Measures being taken to clean-up the spill; and 5) Description of any resource damages (e.g., dead fish, damaged vegetation, etc.).

(D) All spills shall be immediately cleaned-up by completing the following: 1) Contain the spill; 2) Post the area and set-up temporary fencing if there is a potential for public exposure; 3) Remove spilled biosolids with front-end loader or shovel; 4) Apply absorbent if needed; 5) Move spilled biosolids to an approved land application area; and 6) File a written spill release form or report to the DEQ within 5 days following the release or spill.

(E) In the event an odor problem is reported to the City or the DEQ due to the storage and/or land application of biosolids at the site, the City shall work with the DEQ to jointly determine the best method to mitigate the odor concern.

NOTE: Be aware that any amount of oil or hazardous materials spilled to waters of the state and oil spills on land in excess of 42 gallons must be immediately reported to the DEQ.

11.0 MONITORING AND REPORTING

The City shall complete the following monitoring and reporting in relation to the approved land application site:

(A) Soil Testing. All sites used for repeat annual applications of biosolids at agronomic rates shall be periodically assessed for the impact of all fertilizer nitrogen, including that from biosolids. The criteria for requiring evaluation or performance monitoring is when any biosolids applications exceeds two out of three successive years at agronomic rates [OAR 340-050-0080(5)(a)]. Regardless the DEQ recommends routine soil testing for soil nutrients as well as for the trace pollutants listed in Table 1 of 40 CFR §503.13 for fields receiving annual biosolids applications. The DEQ may also require soil testing if adverse environmental impacts are suspected at the site.

(B) Site Records. Daily site records of accumulated land applied biosolids shall be maintained. Site records shall be recorded on field grid maps or another readable system. Records shall indicate the date, location, and quantity of biosolids applied; segments of each field that received biosolids; pounds of nutrients applied to each area receiving biosolids; and the type of crop grown. These records must be available to the DEQ for review upon request. Regardless of the format in which written and mapped records are kept, they shall be readily available in an electronic or hardcopy format.

(C) Annual Report. By 19 February of each year, the City shall provide the DEQ with an annual report of the previous year's biosolids processing and application activities per OAR 340-050-0035(6). The annual report shall include all of the specific information on biosolids management and land application listed on DEQ's Wastewater Solids and Biosolids Annual

Report Form. The annual report shall be signed and certified by the City. The annual report form is available for download at https://www.oregon.gov/deq/wq/programs/Pages/Biosolids-Assistance.aspx.

(D) USEPA Annual Report. The City shall file an electronic annual report with the United States Environmental Protection Agency (USEPA) through the EPA's NET NPDES Reporting System or as otherwise required by EPA during the term of this approval.

12.0 NOTIFICATION

The City shall promptly notify DEQ of any major changes it intends to make to its biosolids processing activities which may influence biosolids quality or quantity before anticipated modifications are initiated. Any variations from the DEQ approved biosolids management plan and this authorization letter shall receive prior written approval from DEQ.

13.0 ADDITIONAL CONDITIONS

The following additional conditions apply to the site and are enforceable as part of this land application site authorization.

(A) The DEQ shall have the right to: 1) At reasonable times, enter the City's place of biosolids land application and record keeping to review biosolids management operations and records; 2) Obtain copies of any records required under the terms of this authorization and the City's biosolids management plan; 3) Inspect any monitoring equipment required under this authorization; 4) Inspect any collection, transport, or land application vehicle; and 5) Obtain any photographic documentation or evidence deemed appropriate.

(B) This authorization is subject to revocation should health hazards, environmental degradation, or nuisance conditions develop as a result of inadequate biosolids treatment, quality, or site management.

(C) Any variations from the City's approved biosolids management plan and this land application site authorization letter shall receive prior written approval from the DEQ.

(D) The DEQ may amend this land application site authorization and impose any additional restrictions or conditions deemed necessary to protect environmental and human health.

This authorization is considered to be part of the City's approved biosolids management plan and is enforceable as part of the City's National Pollutant Discharge Elimination System (NPDES) permit. Therefore, if operations are not conducted in accordance with terms specified under this authorization, the DEQ may initiate an enforcement action, which may lead to the assessment of a civil penalty.

If you have any questions regarding this land application site authorization, please do not hesitate to contact me at Ruby.Tim@deq.state.or.us or at (503) 229-5292.

Sincerely,

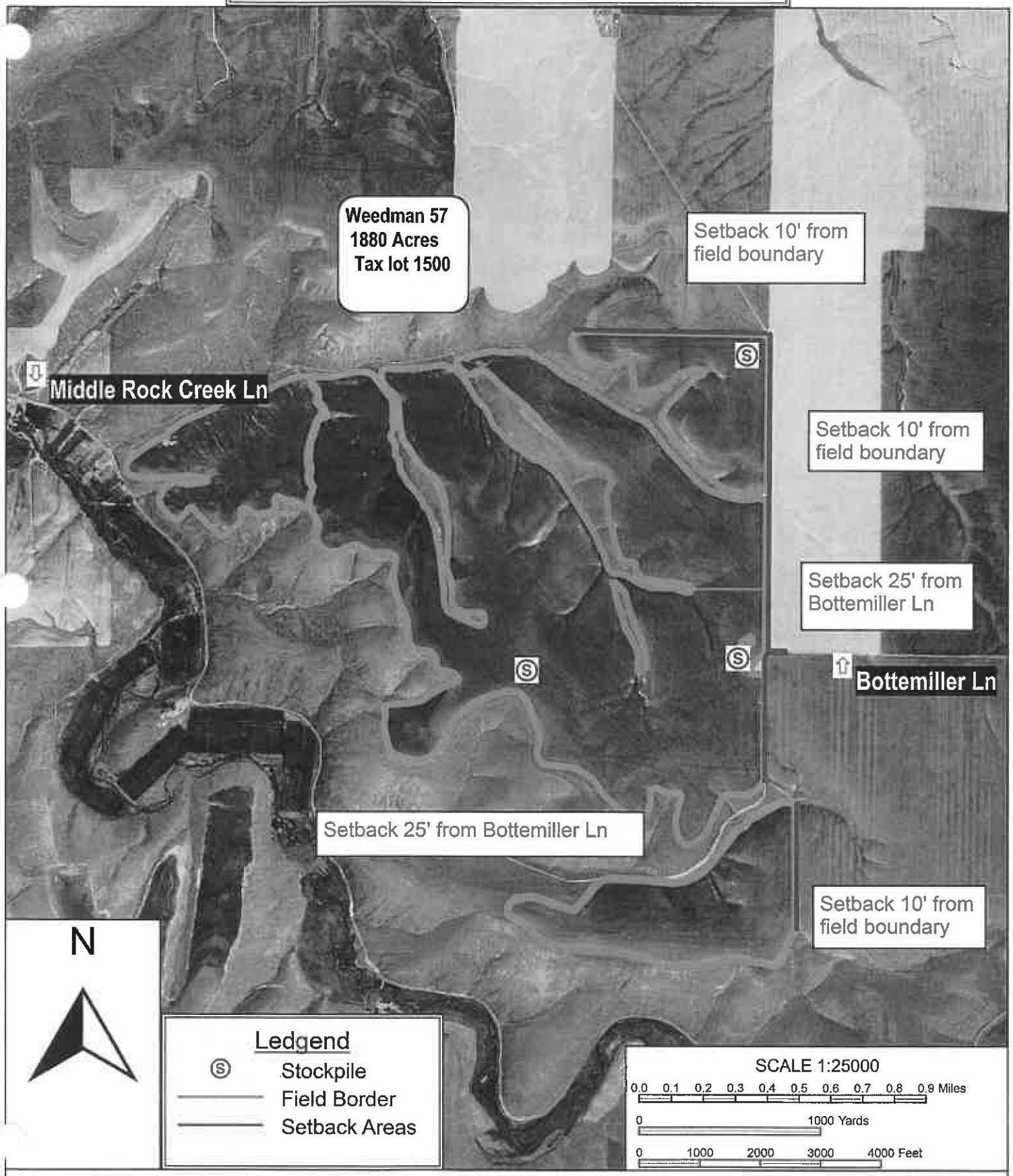
Timothy P. Ruby
NW Region WPCF Permit Specialist

Att: Attachment #1 Site Maps
Attachment #2 OSU Fertilizer Guide for Wheat
Attachment #3 OSU Biosolids Calculation Worksheet

cc: John Zalaznik, North Central Public Health District
Michelle Colby, Gilliam County Planning Department
Mike Weedman, Weedman Brothers Ranch
Garret Behram, Tribeca Transport

ATTACHMENT #1
SITE MAPS

WEEDMAN 57



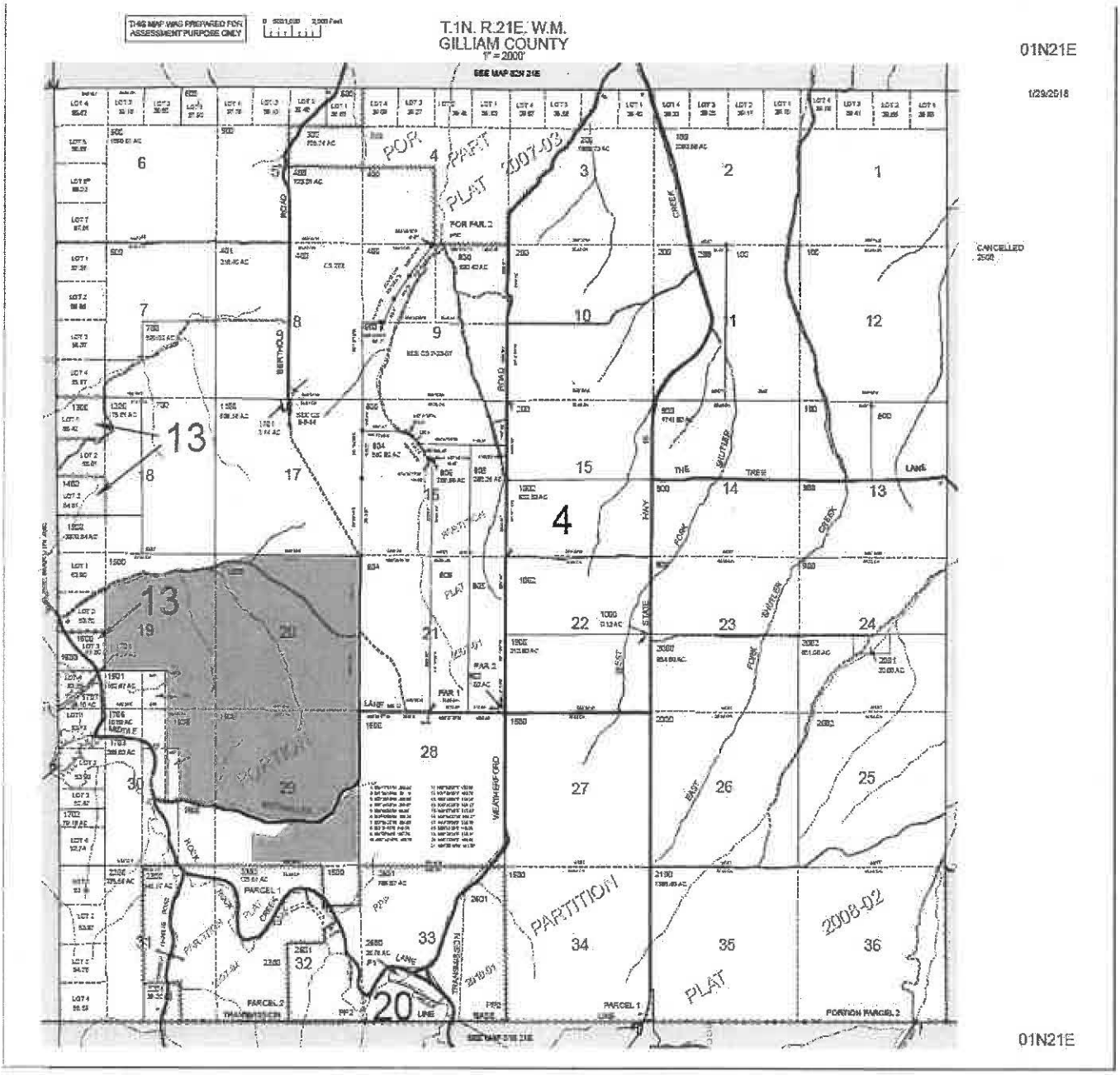
Scale: 1 inch = 2,083 ft.

Location: Tax lot 1500. Most of S20, most of S19, most of S29, and part of W 1/2 of S30, T01N,R21E (Gilliam Co.)

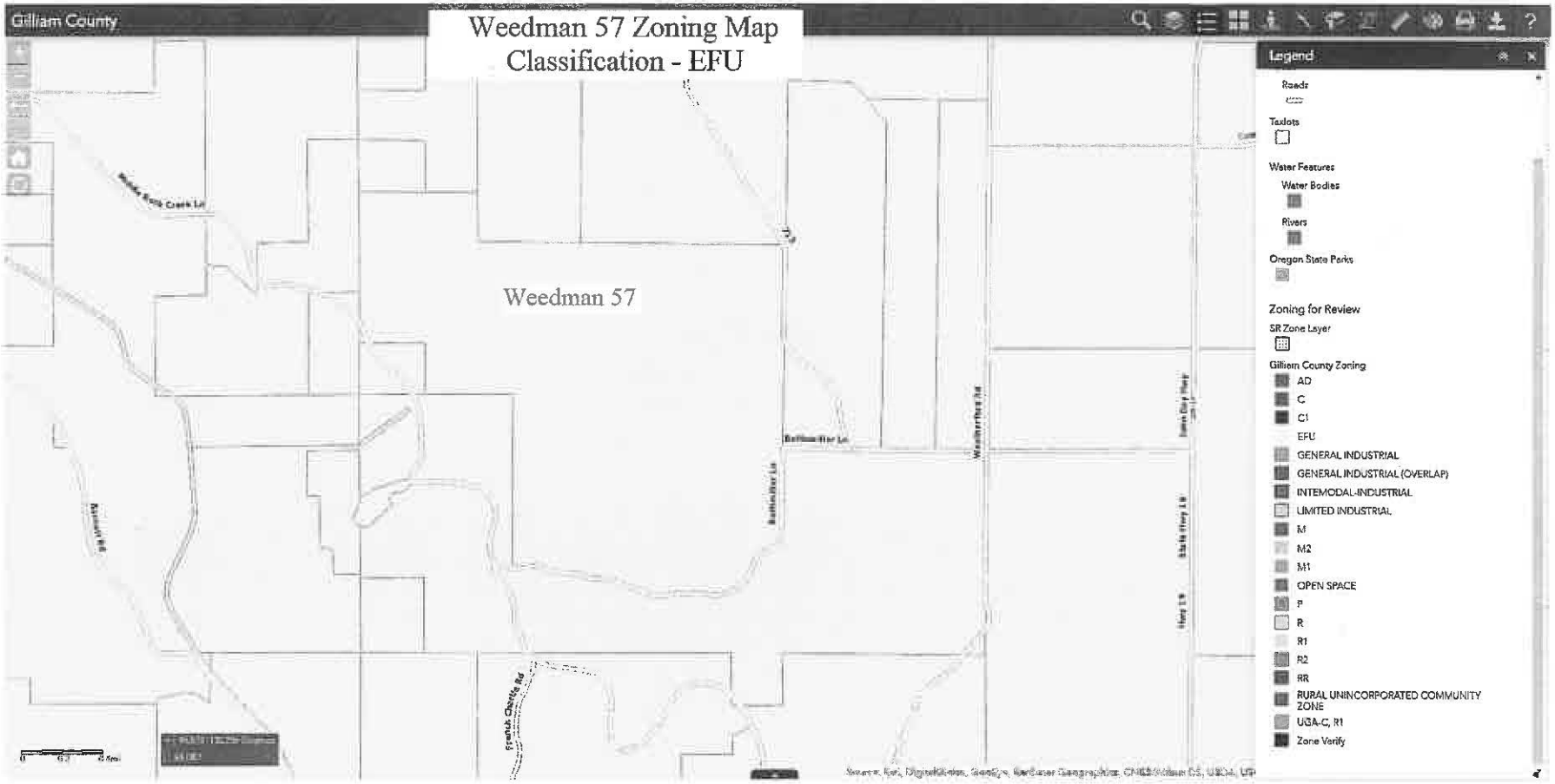
Tribeca Transport

(C) Copyright 2017, Mapbox

Weedman Tax Lot Map



Weedman Zoning EFU Verification Map (Gilliam County)



Oregon

Kate Brown, Governor

Department of Environmental Quality
Northwest Region
700 NE Multnomah Street, Suite 600
Portland, OR 97232
(503) 229-5263
FAX (503) 229-6945
TTY 711

IMPORTANT DOCUMENT
LAND APPLICATION AUTHORIZATION

June 11, 2019

Mr. Greg Charr, Biosolids Program Manager
City of Portland Environmental Services
5001 North Columbia Boulevard
Portland, Oregon 97203

RE: Biosolids Land Application Authorization
City of Portland Environmental Services
File No. 70725/ Permit No. 101505
L&S Simantel Land LLC, Gilliam County, Oregon
Site Identification No. NWR-2019-04-BS

Dear Mr. Charr:

The Oregon Department of Environmental Quality (DEQ) has reviewed the City of Portland's Environmental Services (hereinafter referred to as the "City") Site Authorization Documentation Checklist for the Land Application of Biosolids on the L&S Simantel Land property dated April 2019.

Further, the DEQ physically surveyed the L&S Simantel Land property on May 15, 2019, for compliance with best management practices and site selection criteria provided in OAR 340-050-0065 and OAR 340-050-0070.

In addition, public notice of this project was posted on May 2 and 9, 2019, in The Times – Journal by the City of Portland. During this process, no persons or organizations requested that the DEQ hold a public hearing pursuant to OAR 340-050-0030.

Based on our review of the checklist documents and site survey, pursuant to OAR 340-050-0015 the L&S Simantel Land property is hereby approved for the bulk agricultural land application of Class B biosolids produced by the City subject to meeting all of the following conditions on an on-going basis.

1.0 APPROVED LAND APPLICATION SITES

City biosolids shall only be applied across the approved areas depicted in the maps provided in Attachment #1, and as further described in the table below. The identified site is owned by L&S Simantel Land LLC (Jon and Dave Simantel) and is located in an Exclusive Farm Use (EFU) Zone.

Site Name	Property Description	Tax Lot Number	Total Tax Lot (Acres)	Total Spreadable Area (Areas)
Simantel 56	Most of S34 and part of W1/2 of S35, T02N, R19E	1905	700	570

2.0 REGULATIONS, RULES, AND PERMITTING REQUIREMENTS

City biosolids processing, handling, and land application at the approved site shall comply with the following regulations, rules, and permitting requirements:

(A) Oregon's Land Application of Domestic Wastewater Treatment Facility Biosolids, Bisolids Derived Products, and Domestic Septage Regulations (OAR 340-50);

(B) Federal Standards for the Use or Disposal of Sewage Sludge (40 CFR, Part 503);

(C) City of Portland Environmental Services Biosolids Management Plan (February 2019 and any subsequent updates during the term of this approval); and

(D) All other applicable federal and state statues and rules.

3.0 BIOSOLIDS PATHOGENS AND VECTOR ATTRACTION REDUCTION

City biosolids shall be properly treated to reduce pathogens and vector attraction prior to land application at the site as required by OAR 340-050-0026, 40 CFR §503.32, and 40 CFR §503.33 as follows:

(A) Pathogen Reduction. Bulk Class B biosolids shall be treated to reduce pathogens pursuant to 40 CFR § 503.32(b)(2) or by anaerobic digestion pursuant to 40 CFR §503.32(b)(3), Appendix B, Processes to Significantly Reduce Pathogens (PSRP), Option 3, and as described in Sections 3(A)1) and 3(A)2) below.

1) Fecal Coliform Monitoring Requirement. At least seven representative samples of the biosolids shall be collected and analyzed prior to land application each month. The geometric mean of the density of fecal coliform in these samples shall be less than either 2,000,000 Most Probable Number (MPN) per gram of total solids (dry weight basis) or 2,000,000 Colony Forming Units (CFU) per gram of total solids (dry weight basis).

2) Anaerobic Digestion (PSRP). Biosolids shall be treated in the absence of air for a specific mean cell residence time at a specific temperature. Values for the mean cell residence time and temperature shall be between 15 days at 35 to 55 degrees Celsius (95 to 131 degrees Fahrenheit) and 60 days at 20 degrees Celsius (68 degrees Fahrenheit).

(B) Vector Attraction Reduction. Bulk Class B biosolids shall be treated to reduce the mass of volatile solids in the biosolids by a minimum of 38 percent (using the Van Kleeck Method) pursuant to 40 CFR §503.33(b)(1) prior to land application.

The following special definitions apply to the terms used in Sections 3(A) and 3(B) above: 1) Density of microorganisms is the number of microorganisms per unit mass of total solids (dry weight) in the biosolids; 2) Geometric mean is an average, which indicates the central tendency or typical value of a set of numbers by using the product of their numbers; 3) Pathogenic organisms are disease-causing organisms; 4) Anaerobic digestion is the biochemical decomposition of organic matter in biosolids into methane gas and carbon dioxide by microorganisms in the absence of air; 5) Vector attraction is the characteristic of biosolids that attracts rodents, flies, mosquitos, or other organisms capable of transporting infectious agents; 6) Volatile solids are the amount of the total solids in biosolids lost when the biosolids is combusted at 550 degrees Celsius in the presence of excess air; and 7) Van Kleeck Method is an equation used in calculating the percent reduction in volatile solids in biosolids as outlined in EPA's Manual, Control of Pathogens and Vector Attraction in Sewage Sludge, 2003 (EPA-625/R-92/013), Appendix C, Pages 120 – 126.

4.0 BIOSOLIDS QUALITY

City biosolids applied to the site shall be sampled and analyzed on a monthly basis pursuant to OAR 340-050-0035 and 40 CFR §5013(b)(3) Table 1 to demonstrate on-going compliance with pollutant concentration limits for land application as follows:

(A) Monthly Testing of Biosolids. City bioslids applied to the site shall be tested on a monthly basis for all of the parameters listed in the table below.

Parameter	Reporting Unit
Arsenic, Total As	Dry Weight, mg/kg
Cadmium, Total Cd	Dry Weight, mg/kg
Copper, Total Cu	Dry Weight, mg/kg
Lead, Total Pb	Dry Weight, mg/kg
Mercury, Total Hg	Dry Weight, mg/kg
Molybdenum, Total Mo	Dry Weight, mg/kg
Nickel, Total Ni	Dry Weight, mg/kg
Selenium, Total Se	Dry Weight, mg/kg
Zinc, Total Zn	Dry Weight, mg/kg
Nitrate-Nitrogen, NO_3-N	Dry Weight, mg/kg
Ammonia-Nitrogen, NH_3-N	Dry Weight, mg/kg
Total Kjeldahl Nitrogen, TKN	Dry Weight, mg/kg
Potassium, Total-K	Dry Weight, mg/kg
Phosphorus, Total-P	Dry Weight, mg/kg
pH	Standard Units, SU
Total Solids	Percent, %
Volatile Solids	%
Fecal Coliform	Dry Weight, MPN/gram or CFU/gram

(B) Pollutant Concentration Limits. City bisolids applied to the site shall meet the pollutant concentration limits listed in the table below on an on-going basis.

Parameter	40 CFR §503(b)(3) Pollutant Concentration Monthly Average Limits[1] (Dry Weight, mg/kg)[2]
Arsenic (As)	41
Cadmium (Cd)	39
Copper (Cu)	1500
Lead (Pb)	300
Mercury (Hg)	17
Molybdenum (Mo)	75 (Ceiling Concentration Limit)[3]
Selenium (Se)	100
Nickel (Ni)	420
Zinc (Zn)	2,800

NOTES:
mg/kg = Parts per Million
[1] Monthly average is the arithmetic mean of all measurements taken during the month.
[2] Dry weight basis means calculated on the basis of having been dried at 105 degrees Celsius until reaching a constant mass (i.e., essentially 100 percent solids content).
[3] 40 CRF §503.13 Table 1 Ceiling Concentration Limit for Mo. Biosolids that exceed the Mo Ceiling Concentration Limit are not eligible for land application and must be managed by other means.

(C) Sampling. The City shall collect representative samples of biosolids for laboratory analysis to comply with monthly testing requirements and demonstrate on-going compliance with limitations pursuant to Sections 4(A) and 4(B) above.

(D) Laboratory Methods. City bisosolids sampled to comply with Sections 4(A) through 4(C) above shall be analyzed by a qualified laboratory per the test methods listed in 40 CFR 503.8(b) and OAR 340-050-0035(2)(b).

5.0 TRANSPORTATION OF BIOSOLIDS

City bisolids shall be hauled to the site in accordance with the City's Transportation Spill Response Plan, Biosolids Management Plan, and as follows:

(A) City biosolids shall only be hauled to the site in vehicles with sealed gates, spill guards, and/or tarps to prevent roadway spills.

(B) All transport vehicles shall regularly be cleaned to avoid tracking of biosolids off-site onto public roadways.

(C) Transport vehicles shall be regularly cleaned in designated cleaning areas with any wash waters properly managed.

(D) All spills to roadways that take place during the transport of the biosolids to the site shall be immediately cleaned-up.

(E) Transport and spreading vehicles shall be properly maintained and equipped with noise control equipment as required under state and federal law.

6.0 LAND APPLICATION ACTIVITIES

City biosolids shall be spread at the site in accordance with the following land application activities best management practices:

(A) The site is approved for the land application of dewatered biosolids by a side-discharge spreader or other similar residuals-spreading equipment.

(B) Biosolids shall be applied evenly and in a manner that will prevent ponding and runoff during and after precipitation events.

(C) All spreading equipment shall be properly calibrated prior to use to ensure that biosolids are land applied at rates consistent with agronomic loading limits.

(D) Biosolids may be stored in the fields at the stockpile locations identified in the site maps provided in Attachment #1 for no more than 21 days prior to spreading. The quantity of biosolids in the storage locations may not exceed the agronomic loading rate for the site as detailed in Section 7.0 below.

(E) Immediately following land application, the biosolids equipment operator shall clean off (at the land application site) any equipment coated with biosolids to prevent biosolids from spilling onto roadways.

7.0 APPLICATION TIMING AND RATES

City Class B biosolids shall be land applied across the site at a rate that provides the annual total plant available nitrogen (PAN) to be less than or equal to crop requirements as follows:

(A) Application Period. The site is approved for the year-round land application of biosolids consistent with the seasonal planting, harvesting, and growth of crops across the site from year-to-year.

(B) Maximum Agronomic Application Rate. Biosolids shall be applied to the site at a whole biosolids application rate that is equal to or less than the maximum agronomic rate factored at no more than 156 lbs. Plant Available Nitrogen (PAN)/acre/year for the growth of dryland grains (soft white winter wheat or spring wheat) as provided in the Oregon State University (OSU) Fertilizer Guide FG 80 and summarized in the table below.

Site Crop	Yield Goal	OSU Fertilizer Guide FG 80 Recommended Rate of Nitrogen Application*	Maximum Amount of PAN That May Be Applied to Sites Annually
	(bu/ac)	(PAN/bu/ac)	(Total lbs. PAN/Acre/Year)
Wheat	50 – 65	2.0 – 2.4	100 – 156

****For future reference and use, a copy of Oregon State University (OSU) Fertilizer Guide FG 80 "Winter Wheat in Summer-Fallow Systems" is provided in Attachment #2.***

NOTES:
"lbs." = Pounds
"bu/ac" = Bushels/Acre
"PAN/bu/ac" = Plant Available Nitrogen/Bushel/Acre
"Total lbs. PAN/Acre/Year" = Total Pounds Plant Available Nitrogen/Acre/Year (Maximum Agronomic Rate)

(C) Agronomic Rate Calculation. Maximum agronomic biosolids application rates shall be calculated based on routine testing of the City's biosolids for the required nitrogen forms and using the method described in the "Worksheet for Calculating Biosolids Application Rates in Agriculture" (Pacific Northwest Extension Publication, PNW 511, September 2018) or any updated versions of this worksheet that may be developed during the term of this approval. Any deviations from the methods and/or assumptions described in this published worksheet for factoring biosolids loading rates must be pre-approved in writing by the DEQ. For reference, a copy of the Pacific Northwest Extension Worksheet for Calculating Biosolids Application Rates in Agriculture is found in Attachment #3. The on-line version of this worksheet may be found at https://puyallup.wsu.edu/soils/biosolids/

(D) Routine Applications. If biosolids applications exceed 2 out of 3 successive years at agronomic rates, the site shall be evaluated for carry over nitrate-nitrogen (NO_3-N) by soil testing before the next application as described in Oregon State University (OSU) Fertilizer Guide 80 provided in Attachment #2. Based on this soil testing, agronomic rates of application for the biosolids shall be adjusted for residual NO_3-N measured in the effective rooting zone of the soil per the Worksheet for Calculating Biosolids Application Rates in Agriculture provided in Attachment #3.

(E) Supplemental Nitrogen. If other sources of nitrogen are applied to the site fields (e.g., commercial nitrogen fertilizer, animal manure, or green chop), the biosolids application rates shall be reduced so that the supplemental nitrogen plus biosolids nitrogen does not exceed the agronomic application rate approved for this site.

(F) Changes. Changes in biosolids characteristics, cropping practices, or general land management shall necessitate appropriate adjustment in the application rate to maintain nitrogen applications consistent with crop demands. Major changes in any of the above will be communicated to DEQ's Northwest Region in writing.

8.0 SITE RESTRICTIONS

City biosolids shall be managed across the site in accordance with the following site restrictions applicable to management of Class B biosolids land application sites pursuant to OAR 340-050-0065.

(A) Wet Soils. Care shall be taken to avoid the spreading of biosolids across wet soil conditions, particularly in concave areas of the site [OAR 340-050-0065(3)].

(B) General Public Access. Access to the site by the general public shall be restricted for at least twelve (12) months after application of the biosolids. Access control is assumed for this site since it is located on rural private land [OAR 340-050-0065(4)].

(C) Grazing and Harvesting. A thirty (30) day interval shall follow the application of biosolids prior to grazing livestock on any field or prior to the harvesting of crops that are to be fed to animals [OAR 340-050-0065(6)].

(D) Wind. Land application shall cease if wind speed is such that biosolids cannot be applied uniformly or would be thrown into buffer strips, waterways, roads, trails, or onto the application vehicle itself. Application may resume after wind speeds have decreased such that no major blowing or drifting occurs [OAR 340-050-0065(3)].

(E) Nuisances. Biosolids land application shall cease when the potential exists for nuisance conditions or runoff beyond the approved site areas [OAR 340-050-0065(3)].

9.0 SETBACKS AND BUFFERS

City biosolids shall be land applied pursuant to the set-backs and buffer strips identified in the site maps provided in Attachment #1 designed to prevent wind drift and protect waterways and as further defined below.

(A) Travel Highways. No biosolids shall be spread at the site any closer than 25-feet of any paved highway or road.

(B) Domestic Water Source Well. No biosolids shall be spread any closer than 200-feet of any domestic water source well.

(C) Adjoining Properties. No biosolids shall be spread any closer than 10-feet of adjoining properties not owned by L&S Simantel Land LLC.

10.0 REMEDIAL PROCEDURES

The City shall comply with the following remedial procedures in the case of biosolids spills and nuisance odors at the approved land application site:

(A) All spills into waters of the state shall be reported immediately to the Oregon Emergency Response System (OERS) at 1-800-452-0311 and the DEQ's Regional Biosolids Specialist at (503) 229-5292.

(B) All biosolids spills in excess of 450 lbs. (~0.25 Tons) shall be reported to the DEQ's Regional Biosolids Specialist at the number provided in Section 10(A) above within 24-Hours of the spill incident.

(C) If the City has to report a spill to OERS, the City shall be prepared to provide the following basic spill information: 1) Contact names and phone numbers; 2) Type of material spilled; 3) Estimated quantity; 4) Location description (land or water); Measures being taken to clean-up the spill; and 5) Description of any resource damages (e.g., dead fish, damaged vegetation, etc.).

(D) All spills shall be immediately cleaned-up by completing the following: 1) Contain the spill; 2) Post the area and set-up temporary fencing if there is a potential for public exposure; 3) Remove spilled biosolids with front-end loader or shovel; 4) Apply absorbent if needed; 5) Move spilled biosolids to an approved land application area; and 6) File a written spill release form or report to the DEQ within 5 days following the release or spill.

(E) In the event an odor problem is reported to the City or the DEQ due to the storage and/or land application of biosolids at the site, the City shall work with the DEQ to jointly determine the best method to mitigate the odor concern.

NOTE: Be aware that any amount of oil or hazardous materials spilled to waters of the state and oil spills on land in excess of 42 gallons must be immediately reported to the DEQ.

11.0 MONITORING AND REPORTING

The City shall complete the following monitoring and reporting in relation to the approved land application site:

(A) Soil Testing. All sites used for repeat annual applications of biosolids at agronomic rates shall be periodically assessed for the impact of all fertilizer nitrogen, including that from biosolids. The criteria for requiring evaluation or performance monitoring is when any biosolids applications exceeds two out of three successive years at agronomic rates [OAR 340-050-0080(5)(a)]. Regardless the DEQ recommends routine soil testing for soil nutrients as well as for the trace pollutants listed in Table 1 of 40 CFR §503.13 for fields receiving annual biosolids applications. The DEQ may also require soil testing if adverse environmental impacts are suspected at the site.

(B) Site Records. Daily site records of accumulated land applied biosolids shall be maintained. Site records shall be recorded on field grid maps or another readable system. Records shall indicate the date, location, and quantity of biosolids applied; segments of each field that received biosolids; pounds of nutrients applied to each area receiving biosolids; and the type of crop grown. These records must be available to the DEQ for review upon request. Regardless of the format in which written and mapped records are kept, they shall be readily available in an electronic or hardcopy format.

(C) Annual Report. By 19 February of each year, the City shall provide the DEQ with an annual report of the previous year's biosolids processing and application activities per OAR 340-050-0035(6). The annual report shall include all of the specific information on biosolids management and land application listed on DEQ's Wastewater Solids and Biosolids Annual

Report Form. The annual report shall be signed and certified by the City. The annual report form is available for download at https://www.oregon.gov/deq/wq/programs/Pages/Biosolids-Assistance.aspx.

(D) USEPA Annual Report. The City shall file an electronic annual report with the United States Environmental Protection Agency (USEPA) through the EPA's NET NPDES Reporting System or as otherwise required by EPA during the term of this approval.

12.0 NOTIFICATION

The City shall promptly notify DEQ of any major changes it intends to make to its biosolids processing activities which may influence biosolids quality or quantity before anticipated modifications are initiated. Any variations from the DEQ approved biosolids management plan and this authorization letter shall receive prior written approval from DEQ.

13.0 ADDITIONAL CONDITIONS

The following additional conditions apply to the site and are enforceable as part of this land application site authorization.

(A) The DEQ shall have the right to: 1) At reasonable times, enter the City's place of biosolids land application and record keeping to review biosolids management operations and records; 2) Obtain copies of any records required under the terms of this authorization and the City's biosolids management plan; 3) Inspect any monitoring equipment required under this authorization; 4) Inspect any collection, transport, or land application vehicle; and 5) Obtain any photographic documentation or evidence deemed appropriate.

(B) This authorization is subject to revocation should health hazards, environmental degradation, or nuisance conditions develop as a result of inadequate biosolids treatment, quality, or site management.

(C) Any variations from the City's approved biosolids management plan and this land application site authorization letter shall receive prior written approval from the DEQ.

(D) The DEQ may amend this land application site authorization and impose any additional restrictions or conditions deemed necessary to protect environmental and human health.

This authorization is considered to be part of the City's approved biosolids management plan and is enforceable as part of the City's National Pollutant Discharge Elimination System (NPDES) permit. Therefore, if operations are not conducted in accordance with terms specified under this authorization, the DEQ may initiate an enforcement action, which may lead to the assessment of a civil penalty.

If you have any questions regarding this land application site authorization, please do not hesitate to contact me at Ruby.Tim@deq.state.or.us or at (503) 229-5292.

Sincerely,

Timothy P. Ruby

Timothy P. Ruby
NW Region WPCF Permit Specialist

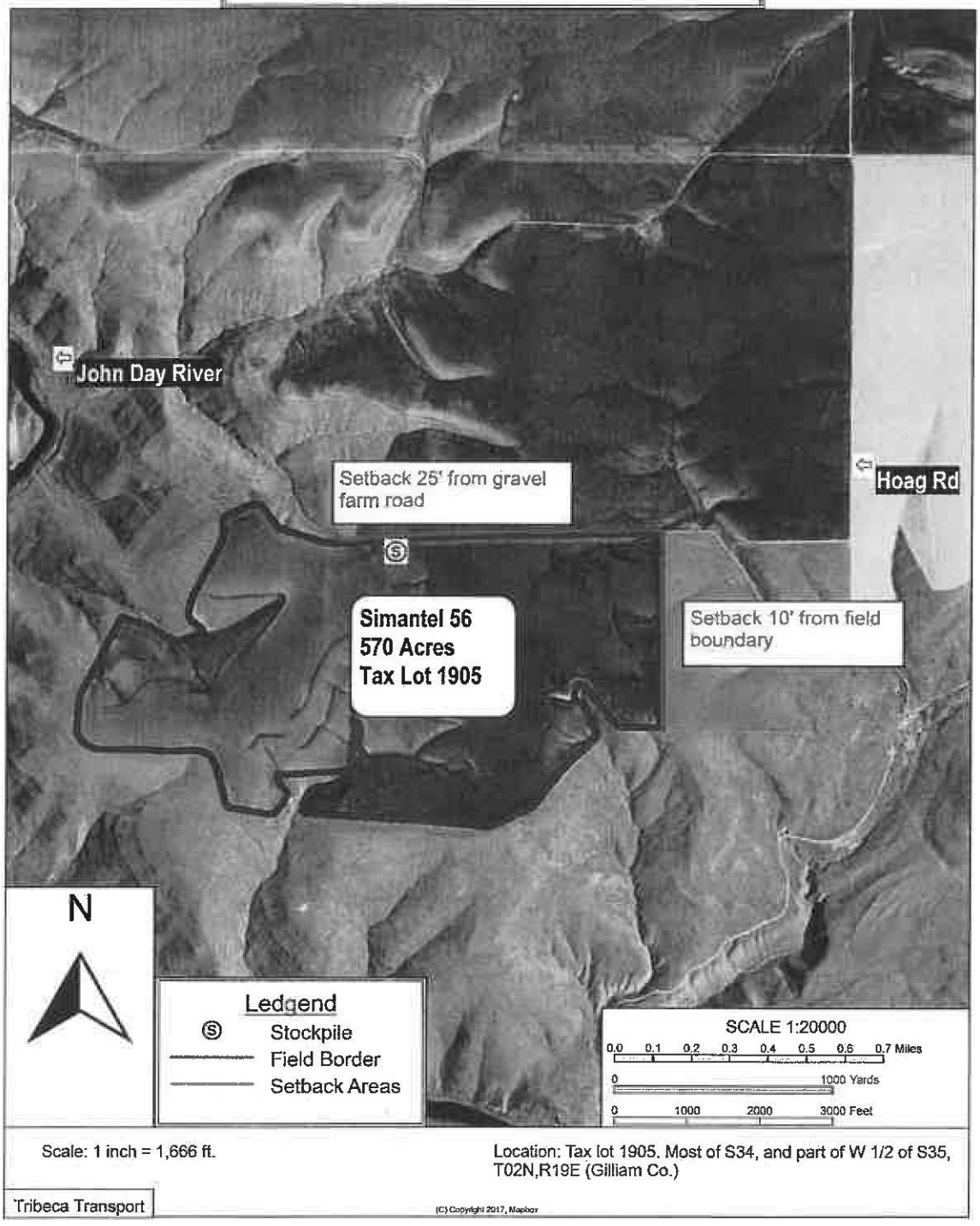
Att: Attachment #1 Site Maps
Attachment #2 OSU Fertilizer Guide for Wheat
Attachment #3 OSU Biosolids Calculation Worksheet

cc: John Zalaznik, North Central Public Health District
Michelle Colby, Gilliam County Planning Department
Jon Simantel, L&S Simantel Land LLC
Garret Behram, Tribeca Transport

ATTACHMENT #1
SITE MAPS

Simantel Field Map

SIMANTEL 56



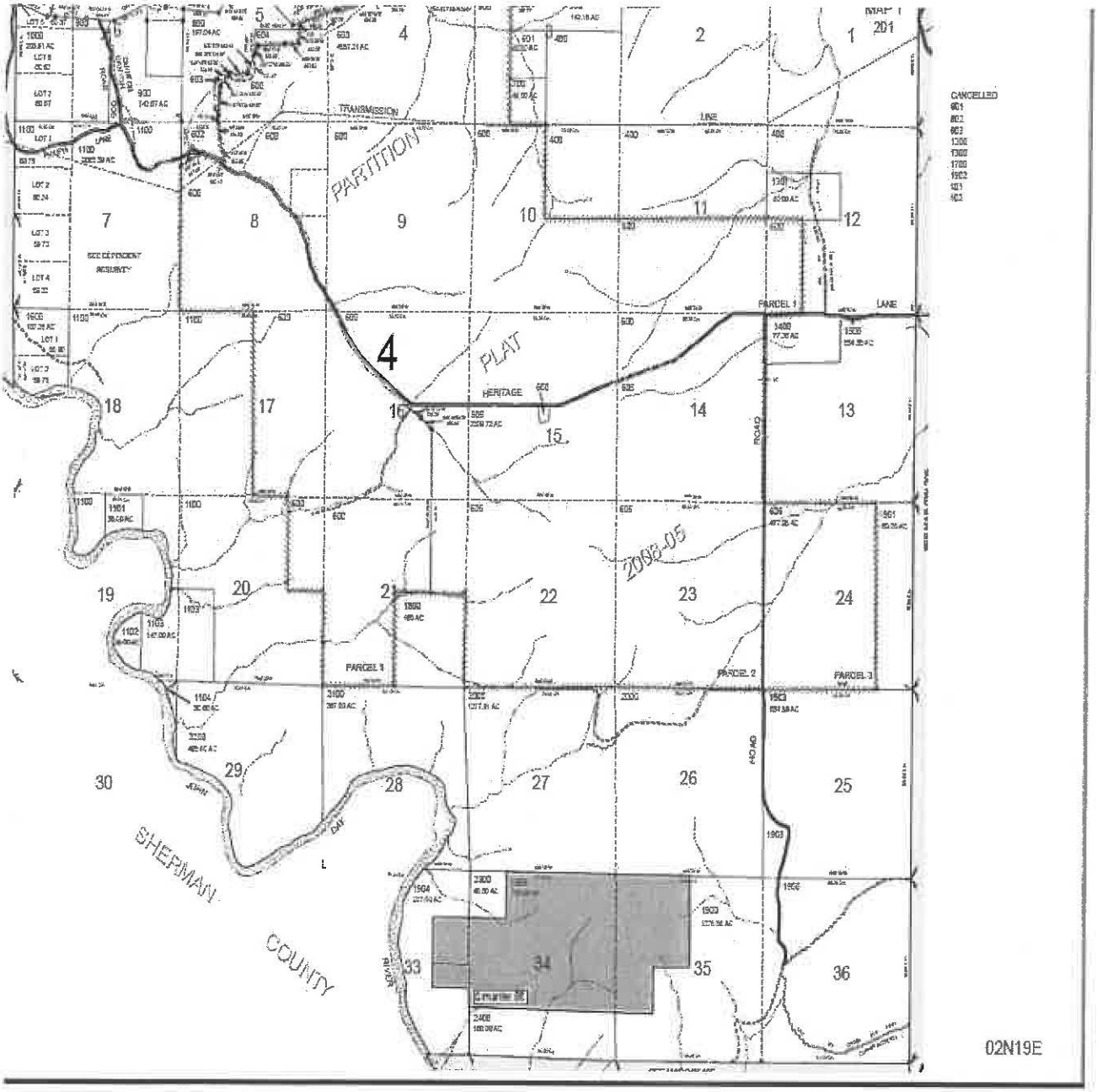
Scale: 1 inch = 1,666 ft.

Location: Tax lot 1905. Most of S34, and part of W 1/2 of S35, T02N,R19E (Gilliam Co.)

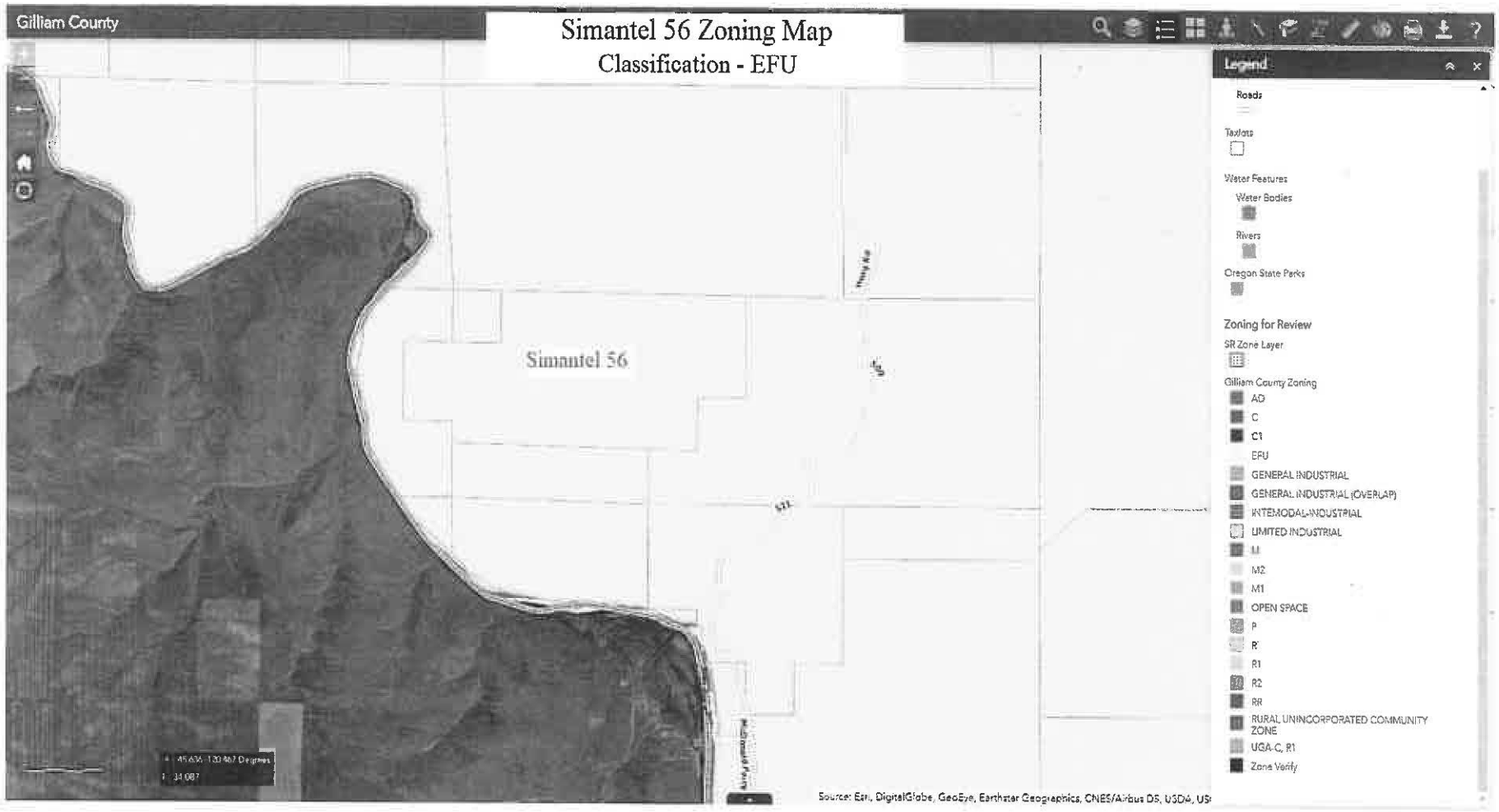
Tribeca Transport

(C) Copyright 2017, Mapbox

Simantel Tax Lot Map



Simantel Zoning EFU Verification Map (Gilliam County)



Oregon

Kate Brown, Governor

Department of Environmental Quality
Northwest Region
700 NE Multnomah Street, Suite 600
Portland, OR 97232
(503) 229-5263
FAX (503) 229-6945
TTY 711

IMPORTANT DOCUMENT
LAND APPLICATION AUTHORIZATION

June 7, 2019

Mr. Greg Charr, Biosolids Program Manager
City of Portland Environmental Services
5001 North Columbia Boulevard
Portland, Oregon 97203

RE: Biosolids Land Application Authorization
City of Portland Environmental Services
File No. 70725/ Permit No. 101505
Pinkerton Ranches, Sherman County, Oregon
Site Identification No. NWR-2019-02-BS

Dear Mr. Charr:

The Oregon Department of Environmental Quality (DEQ) has reviewed the City of Portland's Environmental Services (hereinafter referred to as the "City") Site Authorization Documentation Checklist for the Land Application of Biosolids on Pinkerton Ranches dated April 2019.

Further, the DEQ physically surveyed the Pinkerton Ranches property on May 15, 2019, for compliance with best management practices and site selection criteria provided in OAR 340-050-0065 and OAR 340-050-0070.

In addition, public notice of this project was also posted on May 2, 2019, for two consecutive weeks to The Times – Journal by the City of Portland. During this process, no persons or organizations requested that the DEQ hold a public hearing pursuant to OAR 340-050-0030.

Based on our review of the checklist documents and site survey, pursuant to OAR 340-050-0015 the Pinkerton Ranches property is hereby approved for the bulk agricultural land application of Class B biosolids produced by the City subject to meeting all of the following conditions on an on-going basis.

1.0 APPROVED LAND APPLICATION SITES

City biosolids shall only be applied across the approved areas depicted in the maps provided in Attachment #1, and as further described in the table below. All of the identified sites are owned by Pinkerton Ranches (Dave Pinkerton) and are located in Exclusive Farm Use (EFU) Zones.

Site Name	Property Description	Tax Lot Number	Spreadable Area (Acres)	Total Spreadable Area (Areas)
Pinkerton 51	Most of SW ¼ of S35, T01S, R17E	8500	153	415
	Most of SW ¼ of S35, T01S, R17E	8600	138	
	Most of NW ¼ of S2, T02S, R17E	400	124	
Pinkerton 52	Most of N ½ of S36, T01S, R17E	8900	250	250
Pinkerton 53	Part of SW ¼ of S11, T02S, R17E	600	94	368
	Most of NW ¼ of S14, T02S, R17E	600	140	
	Part of W 1/4 of S22, T02S, R17E, Part of W 1/2 of S23, T02S, R17E	2700	134	
Pinkerton 54	Part of SW ¼ of S14, T02S, R17E	2700	100	100
Total Pinkerton Site Area Available for Biosolids Spreading (Acres)				**1,133**

2.0 REGULATIONS, RULES, AND PERMITTING REQUIREMENTS

City biosolids processing, handling, and land application at the approved site shall comply with the following regulations, rules, and permitting requirements:

(A) Oregon's Land Application of Domestic Wastewater Treatment Facility Biosolids, Bisolids Derived Products, and Domestic Septage Regulations (OAR 340-50);

(B) Federal Standards for the Use or Disposal of Sewage Sludge (40 CFR, Part 503);

(C) City of Portland Environmental Services Biosolids Management Plan (February 2019 and any subsequent updates during the term of this approval); and

(D) All other applicable federal and state statues and rules.

3.0 BIOSOLIDS PATHOGENS AND VECTOR ATTRACTION REDUCTION

City biosolids shall be properly treated to reduce pathogens and vector attraction prior to land application at the site as required by OAR 340-050-0026, 40 CFR §503.32, and 40 CFR §503.33 as follows:

(A) Pathogen Reduction. Bulk Class B biosolids shall be treated to reduce pathogens pursuant to 40 CFR § 503.32(b)(2) or by anaerobic digestion pursuant to 40 CFR §503.32(3), Appendix B, Processes to Significantly Reduce Pathogens (PSRP), Option 3, and as described in Sections (A)1) and (A)2) below.

1) Fecal Coliform Monitoring Requirement. At least seven representative samples of the biosolids shall be collected and analyzed prior to land application each month. The geometric mean of the density of fecal coliform in these samples shall be less than either 2,000,000 Most Probable Number (MPN) per gram of total solids (dry weight) or 2,000,000 Colony Forming Units (CFU) per gram of total solids (dry weight basis).

2) Anaerobic Digestion (PSRP). Biosolids shall be treated in the absence of air for a specific mean cell residence time at a specific temperature. Values for the mean cell residence time and temperature shall be between 15 days at 35 to 55 degrees Celsius (95 to 131 degrees Fahrenheit) and 60 days at 20 degrees Celsius (68 degrees Fahrenheit).

(B) Vector Attraction Reduction. Bulk Class B biosolids shall be treated to reduce the mass of volatile solids in the biosolids by a minimum of 38 percent (using the Van Kleeck Method) pursuant to 40 CFR §503.33(b)(1) prior to land application.

The following special definitions apply to the terms used in Sections 3(A) and 3(B) above: 1) Density of microorganisms is the number of microorganisms per unit mass of total solids (dry weight) in the biosolids; 2) Geometric mean is an average, which indicates the central tendency or typical value of a set of number by using the product of their numbers; 3) Pathogenic organisms are disease-causing organisms; 4) Anaerobic digestion is the biochemical decomposition of organic matter in biosolids into methane gas and carbon dioxide by microorganisms in the absence of air; 5) Vector attraction is the characteristic of biosolids that attracts rodents, flies, mosquitos, or other organisms capable of transporting infectious agents; 6) Volatile solids are the amount of the total solids in biosolids lost when the biosolids is combusted at 550 degrees Celsius in the presence of excess air; and 7) Van Kleeck Method is an equation used in calculating the percent reduction in volatile solids in biosolids as outlined in EPA's Manual, Control of Pathogens and Vector Attraction in Sewage Sludge, 2003 (EPA-625/R-92/013), Appendix C, Pages 120 – 126.

4.0 BIOSOLIDS QUALITY

City biosolids applied to the site shall be sampled and analyzed on a monthly basis pursuant to OAR 340-050-0035 and 40 CFR §5013(b)(3) Table 1 to demonstrate on-going compliance with pollutant concentration limits for land application as follows:

(A) Monthly Testing of Biosolids. City bioslids applied to the site shall be tested on a monthly basis for all of the parameters listed in the table below.

Parameter	Reporting Unit
Arsenic, Total As	Dry Weight, mg/kg
Cadmium, Total Cd	Dry Weight, mg/kg
Copper, Total Cu	Dry Weight, mg/kg
Lead, Total Pb	Dry Weight, mg/kg
Mercury, Total Hg	Dry Weight, mg/kg
Molybdenum, Total Mo	Dry Weight, mg/kg
Nickel, Total Ni	Dry Weight, mg/kg
Selenium, Total Se	Dry Weight, mg/kg
Zinc, Total Zn	Dry Weight, mg/kg
Nitrate-Nitrogen, NO_3-N	Dry Weight, mg/kg
Ammonia-Nitrogen, NH_3-N	Dry Weight, mg/kg
Total Kjeldahl Nitrogen, TKN	Dry Weight, mg/kg
Potassium, Total-K	Dry Weight, mg/kg
Phosphorus, Total-P	Dry Weight, mg/kg
pH	Standard Units, SU

Parameter	Reporting Unit
Total Solids	Percent, %
Volatile Solids	%
Fecal Coliform	Dry Weight, MPN/gram or CFU/gram

(B) Pollutant Concentration Limits. City bisolids applied to the site shall meet the pollutant concentration limits listed in the table below on an on-going basis.

Parameter	40 CFR §503(b)(3) Pollutant Concentration Monthly Average Limits[1] (Dry Weight, mg/kg)[2]
Arsenic (As)	41
Cadmium (Cd)	39
Copper (Cu)	1500
Lead (Pb)	300
Mercury (Hg)	17
Molybdenum (Mo)	75 (Ceiling Concentration Limit)[3]
Selenium (Se)	100
Nickel (Ni)	420
Zinc (Zn)	2,800

NOTES:
mg/kg = Parts per Million
[1] Monthly average is the arithmetic mean of all measurements taken during the month.
[2] Dry weight basis means calculated on the basis of having been dried at 105 degrees Celsius until reaching a constant mass (i.e., essentially 100 percent solids content).
[3] 40 CRF §503.13 Table 1 Ceiling Concentration Limit for Mo. Biosolids that exceed the Mo Ceiling Concentration Limit are not eligible for land application and must be managed by other means.

(C) Sampling. The City shall collect representative samples of biosolids for laboratory analysis to comply with monthly testing requirements and demonstrate on-going compliance with limitations pursuant to Sections 4(A) and 4(B) above.

(D) Laboratory Methods. City bisosolids sampled to comply with Sections 4(A) through 4(C) above shall be analyzed by a qualified laboratory per the test methods listed in 40 CFR 503.8(b) and OAR 340-050-0035(2)(b).

5.0 TRANSPORTATION OF BIOSOLIDS

City bisolids shall be hauled to the site in accordance with the City's Transportation Spill Response Plan, Biosolids Management Plan, and as follows:

(A) City biosolids shall only be hauled to the site in vehicles with sealed gates, spill guards, and/or tarps to prevent roadway spills.

(B) All transport vehicles shall regularly be cleaned to avoid tracking of biosolids off-site onto public roadways.

(C) Transport vehicles shall be regularly cleaned in designated cleaning areas with any wash waters properly managed.

(D) All spills to roadways that take place during the transport of the biosolids to the site shall be immediately cleaned-up.

(E) Transport and spreading vehicles shall be properly maintained and equipped with noise control equipment as required under state and federal law.

6.0 LAND APPLICATION ACTIVITIES

City biosolids shall be spread at the site in accordance with the following land application activities best management practices:

(A) The site is approved for the land application of dewatered biosolids by a side-discharge spreader or other similar residuals-spreading equipment.

(B) Biosolids shall be applied evenly and in a manner that will prevent ponding and runoff during and after precipitation events.

(C) All spreading equipment shall be properly calibrated prior to use to ensure that biosolids are land applied at rates consistent with agronomic loading limits.

(D) Biosolids may be stored in the fields at the stockpile locations identified in the site maps provided in Attachment #1 for no more than 21 days prior to spreading. The quantity of biosolids in the storage locations may not exceed the agronomic loading rate for the site as detailed in Section 7.0 below.

(E) Immediately following land application, the biosolids equipment operator shall clean off (at the land application site) any equipment coated with biosolids to prevent biosolids from spilling onto roadways.

7.0 APPLICATION TIMING AND RATES

City Class B biosolids shall be land applied across the site at a rate that provides the annual total plant available nitrogen (PAN) to be less than or equal to crop requirements as follows:

(A) Application Period. The site is approved for the year-round land application of biosolids consistent with the seasonal planting, harvesting, and growth of crops across the site from year-to-year.

(B) Maximum Agronomic Application Rate. Biosolids shall be applied to the site at a whole biosolids application rate that is equal to or less than the maximum agronomic rate factored at no more than 156 lbs. Plant Available Nitrogen (PAN)/acre/year for the growth of dryland grains (soft white winter wheat or spring wheat) as provided in the Oregon State University (OSU) Fertilizer Guide FG 80 and summarized in the table below.

Site Crop	Yield Goal	OSU Fertilizer Guide FG 80 Recommended Rate of Nitrogen Application*	Maximum Amount of PAN That May Be Applied to Sites Annually
	(bu/ac)	(PAN/bu/ac)	(Total lbs. PAN/Acre/Year)
Wheat	50 – 65	2.0 – 2.4	100 – 156

****For future reference and use, a copy of Oregon State University (OSU) Fertilizer Guide FG 80 "Winter Wheat in Summer-Fallow Systems" is provided in Attachment #2.***

NOTES:
"lbs." = Pounds
"bu/ac" = Bushels/Acre
"PAN/bu/ac" = Plant Available Nitrogen/Bushel/Acre
"Total lbs. PAN/acre" = Total Pounds Plant Available Nitrogen/Acre/Year (Maximum Agronomic Rate)

(C) Agronomic Rate Calculation. Maximum agronomic biosolids application rates shall be calculated based on routine testing of the City's biosolids for the required nitrogen forms and using the method described in the "Worksheet for Calculating Biosolids Application Rates in Agriculture" (Pacific Northwest Extension Publication, PNW 511, September 2018) or any updated versions of this worksheet that may be developed during the term of this approval. Any deviations from the methods and/or assumptions described in this published worksheet for factoring biosolids loading rates must be pre-approved in writing by the DEQ. For reference, a copy of the Pacific Northwest Extension Worksheet for Calculating Biosolids Application Rates in Agriculture is found in Attachment #3. The on-line version of this worksheet may be found at https://puyallup.wsu.edu/soils/biosolids/

(D) Routine Applications. If biosolids applications exceed 2 out of 3 successive years at agronomic rates, the site shall be evaluated for carry over nitrate-nitrogen (NO_3-N) by soil testing before the next application as described in Oregon State University (OSU) Fertilizer Guide 80 provided in Attachment #2. Based on this soil testing, agronomic rates of application for the biosolids shall be adjusted for residual NO_3-N measured in the effective rooting zone of the soil per the Worksheet for Calculating Biosolids Application Rates in Agriculture provided in Attachment #3.

(E) Supplemental Nitrogen. If other sources of nitrogen are applied to the site fields (e.g., commercial nitrogen fertilizer, animal manure, or green chop), the biosolids application rates shall be reduced so that the supplemental nitrogen plus biosolids nitrogen does not exceed the agronomic application rate approved for this site.

(F) Changes. Changes in biosolids characteristics, cropping practices, or general land management shall necessitate appropriate adjustment in the application rate to maintain nitrogen applications consistent with crop demands. Major changes in any of the above will be communicated to DEQ's Northwest Region in writing.

8.0 SITE RESTRICTIONS

City biosolids shall be managed across the site in accordance with the following site restrictions applicable to management of Class B biosolids land application sites pursuant to OAR 340-050-0065.

(A) Wet Soils. Care shall be taken to avoid the spreading of biosolids across wet soil conditions, particularly in concave areas of the site [OAR 340-050-0065(3)].

(B) General Public Access. Access to the site by the general public shall be restricted for at least twelve (12) months after application of the biosolids. Access control is assumed for this site since it is located on rural private land [OAR 340-050-0065(4)].

(C) Grazing and Harvesting. A thirty (30) day interval shall follow the application of biosolids prior to grazing livestock on any field or prior to the harvesting of crops that are to be fed to animals [OAR 340-050-0065(6)].

(D) Wind. Land application shall cease if wind speed is such that biosolids cannot be applied uniformly or would be thrown into buffer strips, waterways, roads, trails, or onto the application vehicle itself. Application may resume after wind speeds have decreased such that no major blowing or drifting occurs [OAR 340-050-0065(3)].

(E) Nuisances. Biosolids land application shall cease when the potential exists for nuisance conditions or runoff beyond the approved site areas [OAR 340-050-0065(3)].

9.0 SETBACKS AND BUFFERS

City biosolids shall be land applied pursuant to the set-backs and buffer strips identified in the site maps provided in Attachment #1 designed to prevent wind drift and protect waterways and as further defined below.

(A) Travel Highways. No biosolids shall be spread at the site any closer than 25-feet of any paved highway or road.

(B) Domestic Water Source Well. No biosolids shall be spread any closer than 200-feet of any domestic water source well.

(C) Adjoining Properties. No biosolids shall be spread any closer than 10-feet of adjoining properties not owned by Pinkerton Ranches.

(D) Special Drainage Areas. No biosolids shall be spread any closer than 25-feet of the special drainage areas located on the Pinkerton 51 site.

10.0 REMEDIAL PROCEDURES

The City shall comply with the following remedial procedures in the case of biosolids spills and nuisance odors at the approved land application site:

(A) All spills into waters of the state shall be reported immediately to the Oregon Emergency Response System (OERS) at 1-800-452-0311 and the DEQ's Regional Biosolids Specialist at (503) 229-5292.

(B) All biosolids spills in excess of 450 lbs. (~0.25 Tons) shall be reported to the DEQ's Regional Biosolids Specialist at the number provided in Section 10(A) above within 24-Hours of the spill incident.

(C) If the City has to report a spill to OERS, the City shall be prepared to provide the following basic spill information: 1) Contact names and phone numbers; 2) Type of material spilled; 3) Estimated quantity; 4) Location description (land or water); Measures being taken to clean-up the spill; and 5) Description of any resource damages (e.g., dead fish, damaged vegetation, etc.).

(D) All spills shall be immediately cleaned-up by completing the following: 1) Contain the spill; 2) Post the area and set-up temporary fencing if there is a potential for public exposure; 3) Remove spilled biosolids with front-end loader or shovel; 4) Apply absorbent if needed; 5) Move spilled biosolids to an approved land application area; and 6) File a written spill release form or report to the DEQ within 5 days following the release or spill.

(E) In the event an odor problem is reported to the City or the DEQ due to the storage and/or land application of biosolids at the site, the City shall work with the DEQ to jointly determine the best method to mitigate the odor concern.

NOTE: Be aware that any amount of oil or hazardous materials spilled to waters of the state and oil spills on land in excess of 42 gallons must be immediately reported to the DEQ.

11.0 MONITORING AND REPORTING

The City shall complete the following monitoring and reporting in relation to the approved land application site:

(A) Soil Testing. All sites used for repeat annual applications of biosolids at agronomic rates shall be periodically assessed for the impact of all fertilizer nitrogen, including that from biosolids. The criteria for requiring evaluation or performance monitoring is when any biosolids applications exceeds two out of three successive years at agronomic rates [OAR 340-050-0080(5)(a)]. Regardless the DEQ recommends routine soil testing for soil nutrients as well as for the trace pollutants listed in Table 1 of 40 CFR §503.13 for fields receiving annual biosolids applications. The DEQ may also require soil testing if adverse environmental impacts are suspected at the site.

(B) Site Records. Daily site records of accumulated land applied biosolids shall be maintained. Site records shall be recorded on field grid maps or another readable system. Records shall indicate the date, location, and quantity of biosolids applied; segments of each field that received biosolids; pounds of nutrients applied to each area receiving biosolids; and the type of crop grown. These records must be available to the DEQ for review upon request. Regardless of the format in which written and mapped records are kept, they shall be readily available in an electronic or hardcopy format.

(C) Annual Report. By 19 February of each year, the City shall provide the DEQ with an annual report of the previous year's biosolids processing and application activities per OAR 340-050-0035(6). The annual report shall include all of the specific information on biosolids management and land application listed on DEQ's Wastewater Solids and Biosolids Annual Report Form. The annual report shall be signed and certified by the City. The annual report form is available for download at https://www.oregon.gov/deq/wq/programs/Pages/Biosolids-Assistance.aspx.

(D) USEPA Annual Report. The City shall file an electronic annual report with the United States Environmental Protection Agency (USEPA) through the EPA's NET NPDES Reporting System or as otherwise required by EPA during the term of this approval.

12.0 NOTIFICATION

The City shall promptly notify DEQ of any major changes it intends to make to its biosolids processing activities which may influence biosolids quality or quantity before anticipated modifications are initiated. Any variations from the DEQ approved biosolids management plan and this authorization letter shall receive prior written approval from DEQ.

13.0 ADDITIONAL CONDITIONS

The following additional conditions apply to the site and are enforceable as part of this land application site authorization.

(A) The DEQ shall have the right to: 1) At reasonable times, enter the City's place of biosolids land application and record keeping to review biosolids management operations and records; 2) Obtain copies of any records required under the terms of this authorization and the City's biosolids management plan; 3) Inspect any monitoring equipment required under this authorization; 4) Inspect any collection, transport, or land application vehicle; and 5) Obtain any photographic documentation or evidence deemed appropriate.

(B) This authorization is subject to revocation should health hazards, environmental degradation, or nuisance conditions develop as a result of inadequate biosolids treatment, quality, or site management.

(C) Any variations from the City's approved biosolids management plan and this land application site authorization letter shall receive prior written approval from the DEQ.

(D) The DEQ may amend this land application site authorization and impose any additional restrictions or conditions deemed necessary to protect environmental and human health.

This authorization is considered to be part of the City's approved biosolids management plan and is enforceable as part of the City's National Pollutant Discharge Elimination System (NPDES) permit. Therefore, if operations are not conducted in accordance with terms specified under this authorization, the DEQ may initiate an enforcement action, which may lead to the assessment of a civil penalty.

If you have any questions regarding this land application site authorization, please do not hesitate to contact me at **Ruby.Tim@deq.state.or.us** or at (503) 229-5292.

Sincerely,

Timothy P. Ruby

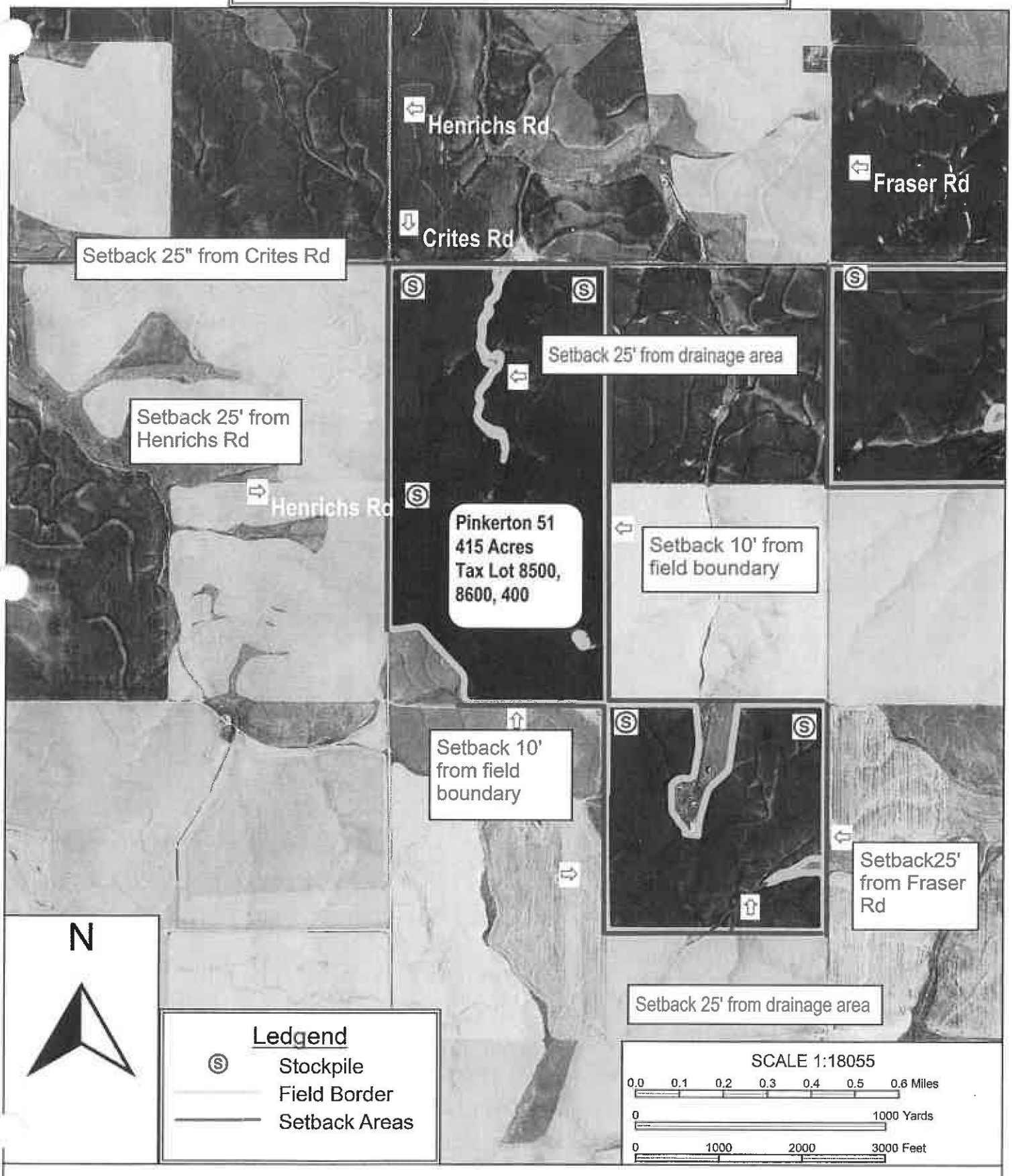
Timothy P. Ruby
NW Region WPCF Permit Specialist

Att: Attachment #1 Site Maps
Attachment #2 OSU Fertilizer Guide for Wheat
Attachment #3 OSU Biosolids Calculation Worksheet

cc: John Zalaznik, North Central Public Health District
David Pinkerton, Pinkerton Ranches
Garret Behram, Tribeca Transport

ATTACHMENT #1
SITE MAPS

PINKERTON 51



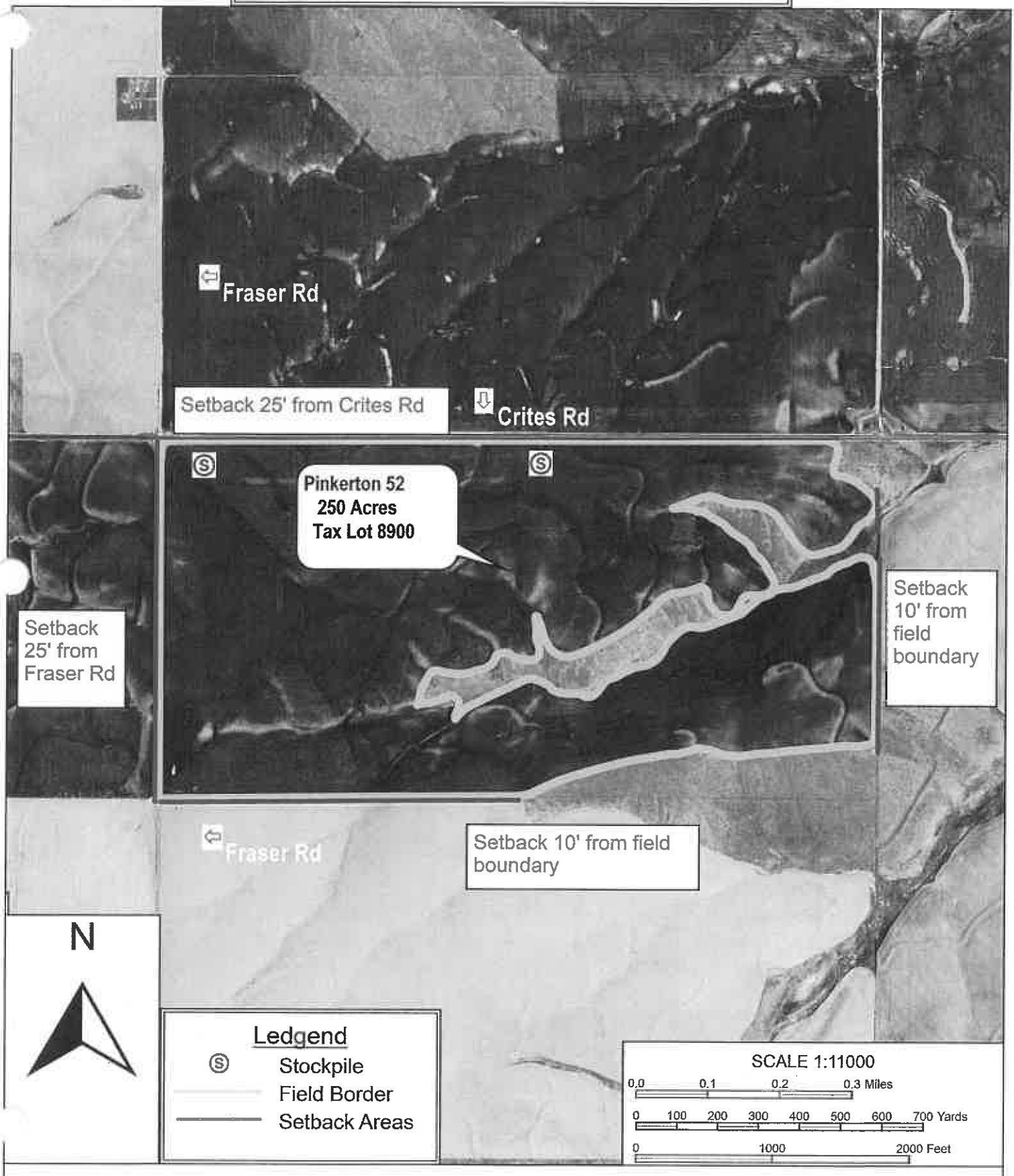
Scale: 1 inch = 1,504 ft.

Location: Tax lot 8500, 8600 and 400. Most of SW 1/4 of S35. Most of NW 1/4 of S35, T01S,R17E (Sherman Co.) Most of NW 1/4 of S2, T02S,R17E (Sherman Co.)

Tribeca Transport

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PINKERTON 52



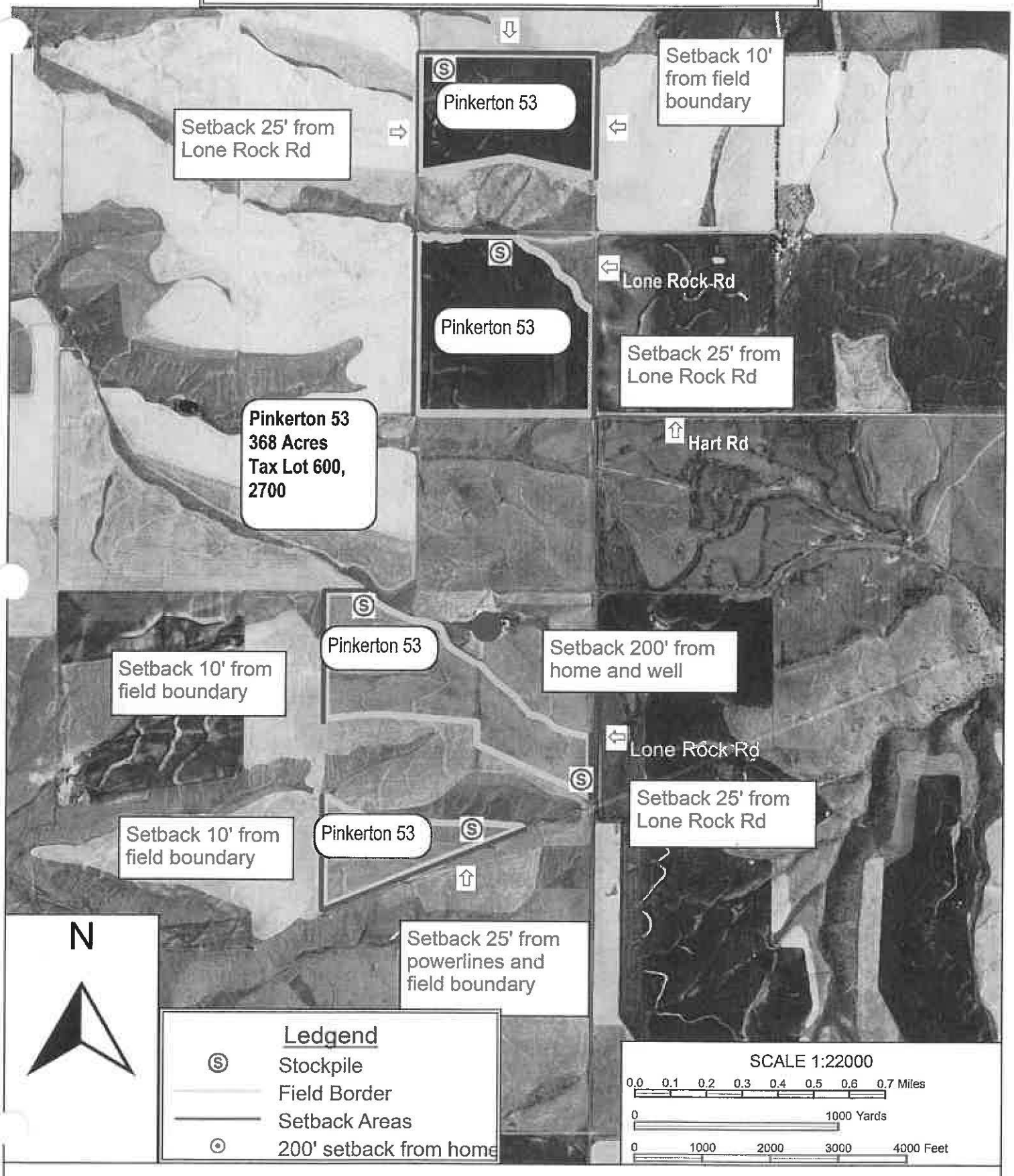
Scale: 1 inch = 916 ft.

Location: Tax lot 8900. Most of N 1/2 of S36, T01S,R17E (Sherman Co.)

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PINKERTON 53 OVERVIEW



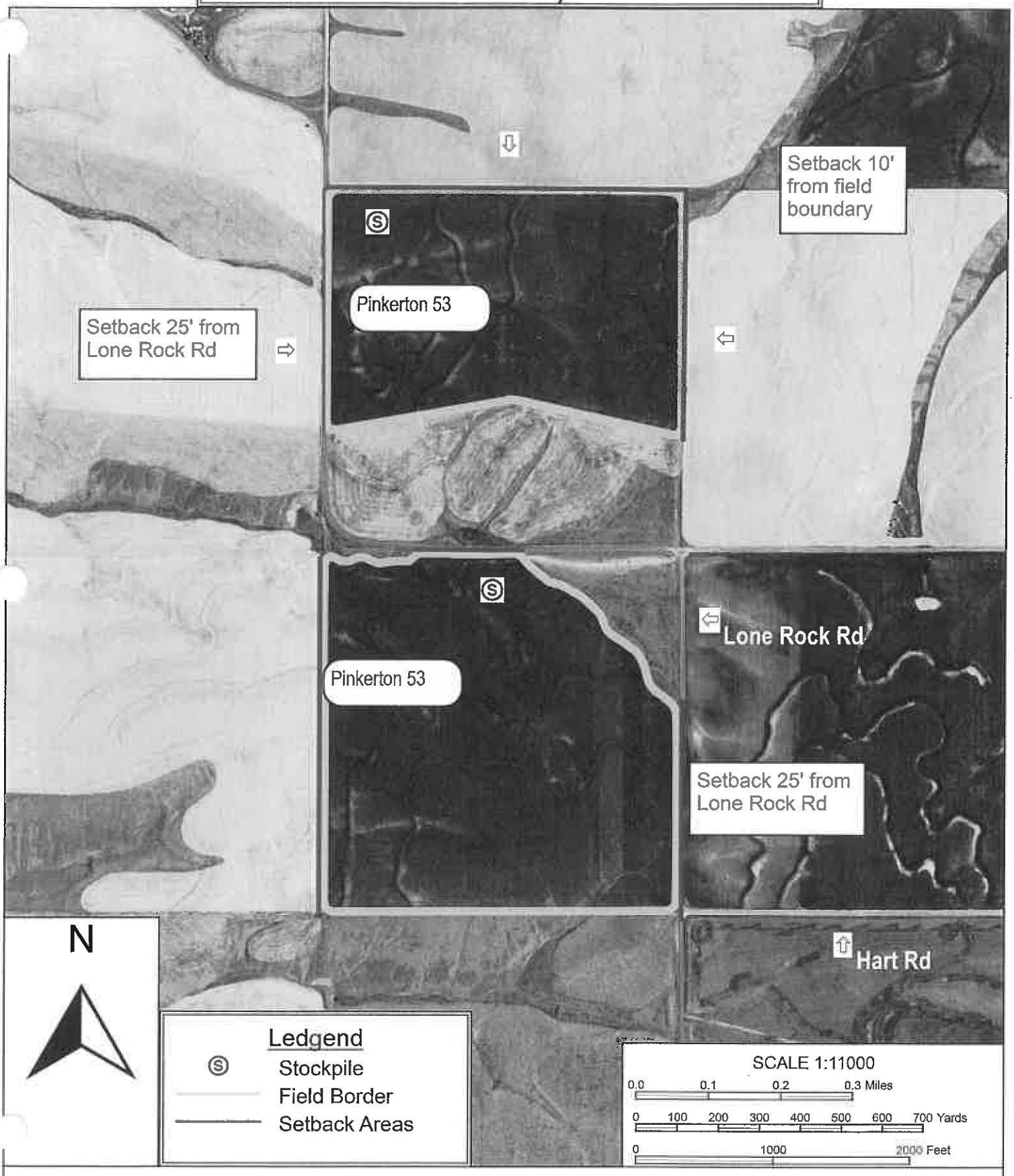
Scale: 1 inch = 1,833 ft.

Location: Tax Lot 600 and 2700. Part of SW 1/4 of S11, Most of NW 1/4 of S14, T02S,R17E (Sherman Co.). Part of E 1/4 of S22, T02S,R17E, part of W 1/2 of S23, T02S,R17E (Sherman

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PINKERTON 53 (NORTH HALF)

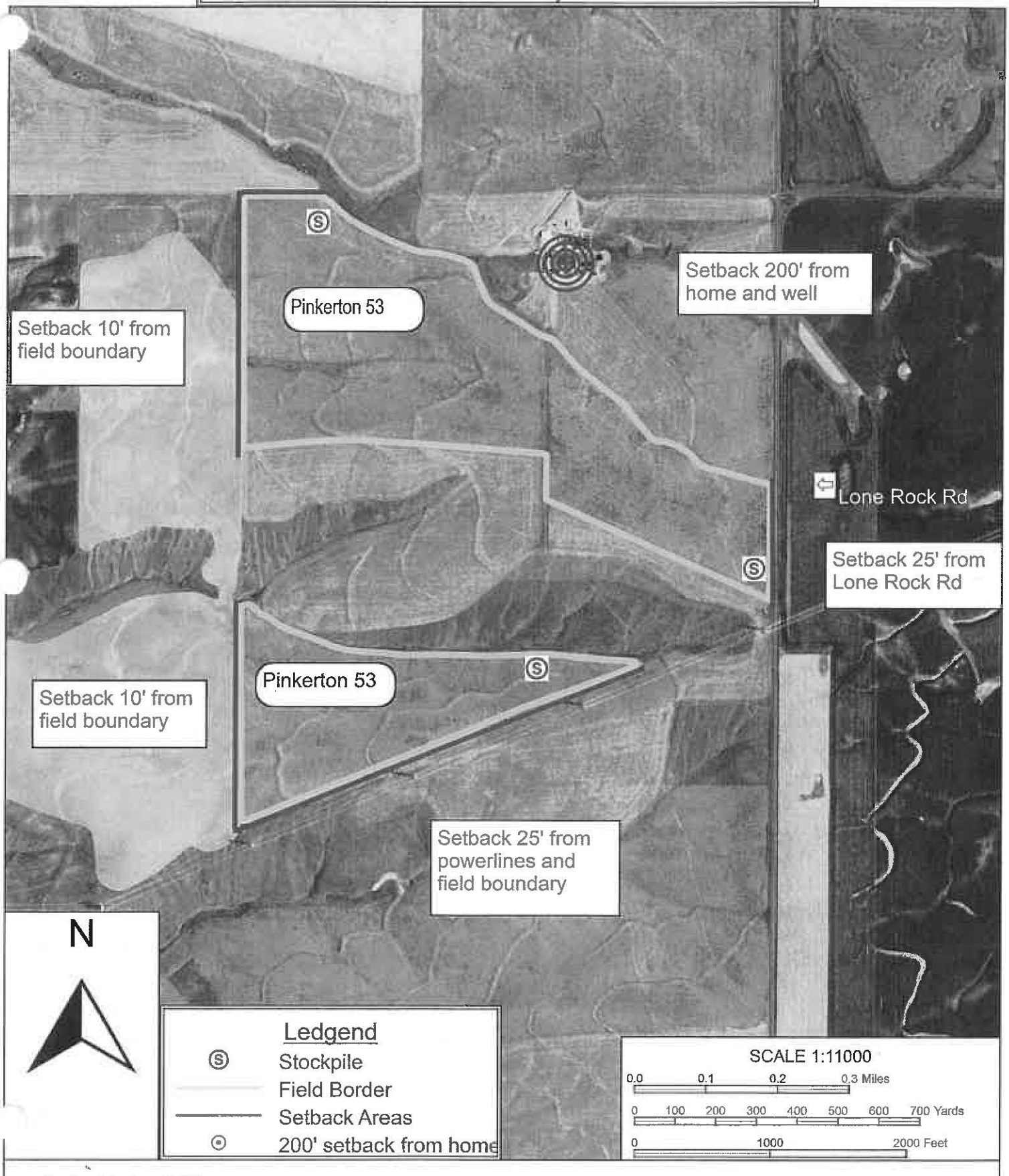


Scale: 1 inch = 916 ft.

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PINKERTON 53 (SOUTH HALF)

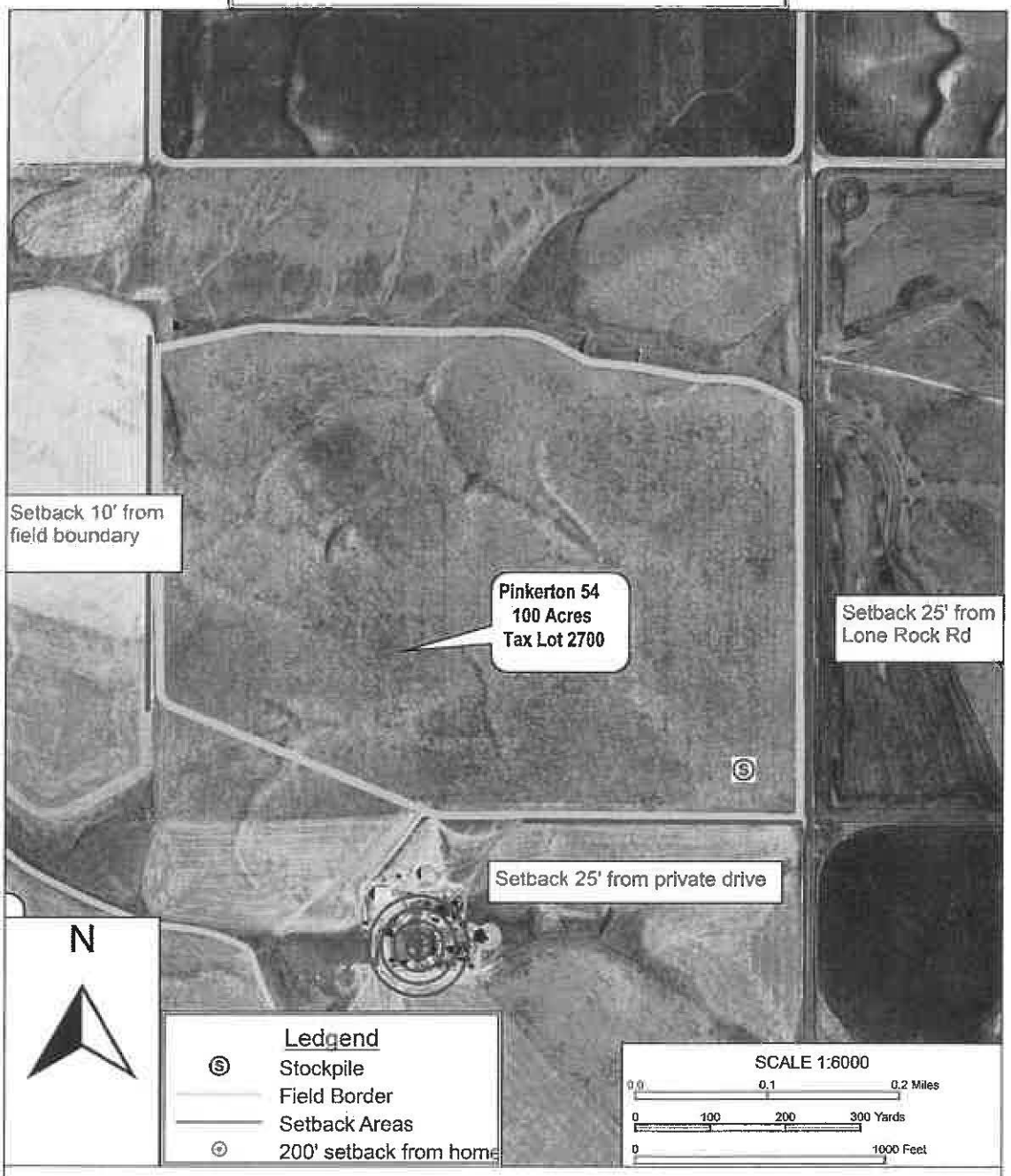


Scale: 1 inch = 916 ft.

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PINKERTON 54



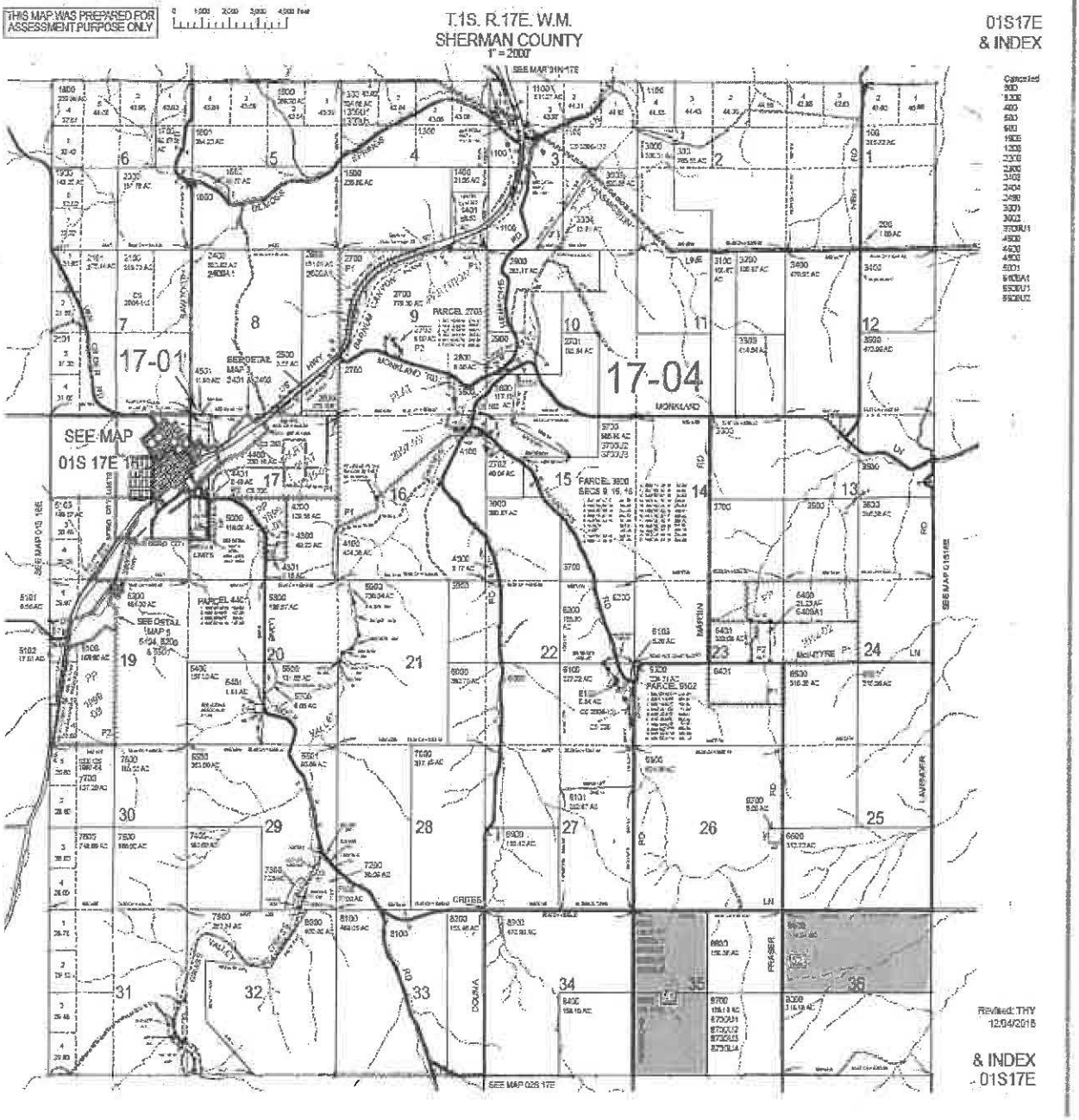
Scale: 1 inch = 500 ft.

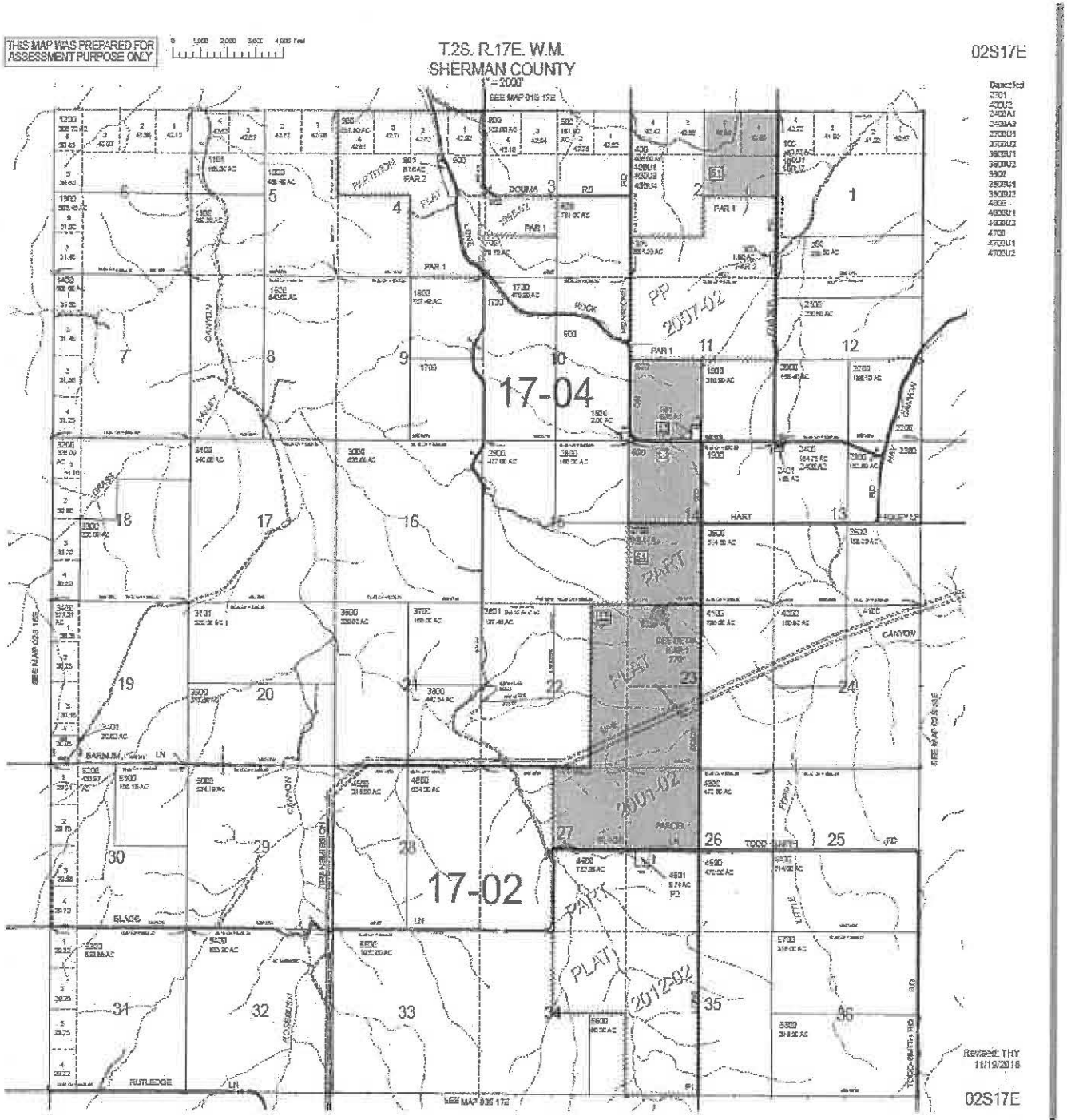
Location: Tax lot 2700. Part of SW 1/4 of S14, T02S,R17E (Sherman Co.)

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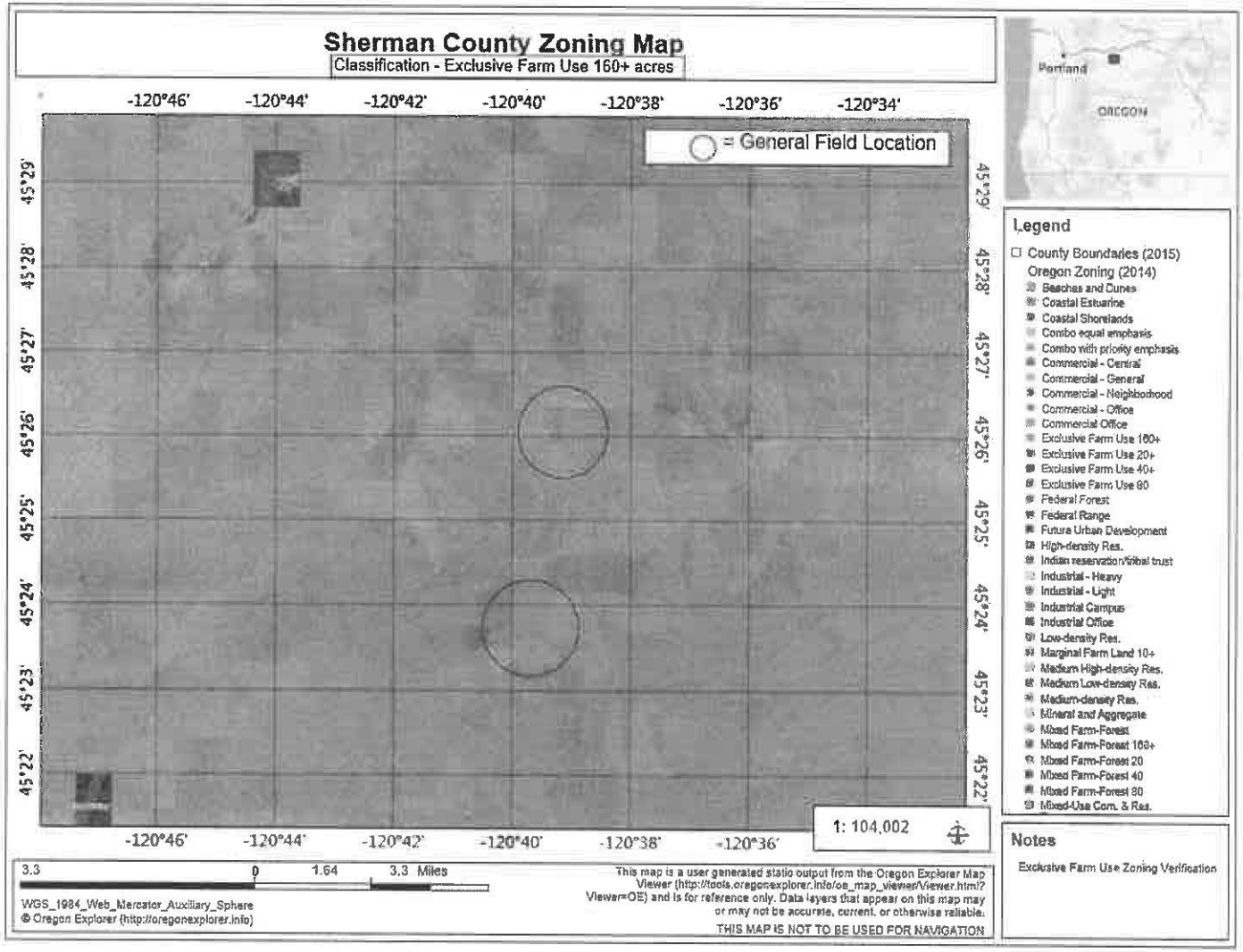
(C) Copyright 2017, Mapbox

Pinkerton Tax Lot Map(s)




THIS MAP WAS PREPARED FOR ASSESSMENT PURPOSE ONLY
T.2S. R.17E. W.M.
SHERMAN COUNTY
1" = 2000'
02S17E
17-04
17-02
PLAT 2007-02
PLAT 2012-02
PP 2007-02
DOUMA RD
HART
BARNUM LN
SLAGG
RUTLEDGE LN
TODD-BUTTE RD
Revised: THY
10/19/2016
02S17E

Pinkerton Sites Zoning EFU Verification Map (Sherman County)



— CITY OF PORTLAND —
ENVIRONMENTAL SERVICES

Columbia Boulevard Wastewater Treatment Plant

5001 N Columbia Boulevard, Portland, Oregon 97203 ▪ Nick Fish, Commissioner ▪ Michael Jordan, Director

June 29, 2016
Pat Heins
DEQ Northwest Region
700 NE Multnomah St., Suite #600
Portland, OR 97232

Subject: Request for Revocation of Authorization

Dear Mr. Heins,

This letter is a request to revoke a site authorization for a City of Portland site currently farmed by Randy Hilderbrand in Sherman County. This site consists of approximately 156.95 acres.

The legal description for this site is Township 1 North, Range 18 East, Section 5, and Tax Lot # 1200. The site was previously authorized for the City of Portland in a site authorization letter dated 7/27/2010 (Site ID NWR2010-23-BS: attached). The site is expected to be re-authorized under the management of Clean Water Services.

If you have any questions regarding this request, please contact me at 503-823-2491 or by e-mail at greg.charr@portlandoregon.gov.

Sincerely,

Greg Charr
Biosolids Program Manager
City of Portland – Environmental Services

The City of Portland complies with all non-discrimination laws including Title VI (Civil Rights) and Title II (ADA).
To request a translation, accommodation or additional information, please call 503-823-7740, or use City TTY 503-823-6868, or Oregon Relay Service: 711.

Oregon
Kate Brown, Governor

Department of Environmental Quality
Northwest Region
700 NE Multnomah St., Suite 600
Portland, OR 97232
(503) 229-5347
FAX (503) 229-6945
TTY 711

April 21, 2016

IMPORTANT DOCUMENT
LAND APPLICATION AUTHORIZATION
UPDATED

Greg Charr
Columbia Boulevard Wastewater Treatment Plant
City of Portland
5001 N Columbia Blvd.
Portland, OR 97201

Re: WQ- Multnomah County
Biosolids Land Application Authorization
Jon & Rob Simantel Site 2
Site ID: NWR2010-32-BS
Columbia Boulevard WWTF: NPDES Permit No. 100807;
File No. 70725

Dear Mr Charr:

On April 12, 2016, the Oregon Department of Environmental Quality (ODEQ or "the Department") received your request for an updated Land Application Authorization for the Jon & Rob Simantel Site 2, located near Wasco, Oregon, to correct some issues with the original site authorization. This field was originally evaluated by ODEQ on September 15, 2010 and was authorized for land application of biosolids on October 27, 2010. The fields submitted for ODEQ approval are identified in Table 1 and Figure 1.

Table 1. The fields reviewed for biosolids land application

Township, Range, Section	Tax Lot	Area (acres)	Spreadable Area (acres)
T1N R19E S6	1000	58.84	
T1N R19E S7	1300	251.4	
T1N R19E S7 & 18	1500	158.76	
T1N R19E S7, 8, & 17	1600	347.38	
T1N R19E S8	1900	167.16	
Totals		983.54	743

Site Description: The property, owned by Stevens Family Farms LLC and farmed by Jon and Rob Simantel (dba J Bar S Ranch), is zoned as Exclusive Farm Use (EFU) and is managed for production of dryland small grain on a two year cop/fallow rotation using conventional tillage. Adjacent property uses are also agricultural.

During the original evaluation, ODEQ reviewed the suitability of the property for biosolids land application. Site topography and soil were evaluated to determine the suitability for biosolids land application. Soil at the site appeared to be composed of Walla Walla silt loam and Anderly silt loam which is consistent with the NRCS soil maps for the area. Hydrologic features, landscape position, and parent geologic features were also reviewed to determine the suitability of the site. In addition,

current and proposed agricultural use of the sites was discussed, and use of surrounding properties was noted. The locations of residences, wells, roads, and other sensitive features were identified as well as setbacks and site restrictions that would be appropriate for the site.

Based upon the site visit notes and supplemental information provided by the City, the fields referenced in Table 1 are approved for the land application of biosolids produced by the Columbia Blvd. facility provided the following conditions are satisfied:

1. **Regulations, Rules, and Permit Requirements.** Biosolids processing and handling will comply with:
    a. Oregon biosolids and septage rules and guidelines (OAR 340-050);
    b. federal biosolids and septage regulations (40 CFR Part 503);
    c. the ODEQ issued permits to the City of Portland Columbia Boulevard Wastewater Treatment Facility (NPDES Permit No. 100807; File No. 70725);
    d. the ODEQ approved Biosolids Management Plan and Land Application Plan, including all subsequent amendments; and
    e. all other applicable federal and state statutes and rules.
2. **Treatment Processes.**
    a. Biosolids volatile solids shall be reduced by 38% or more via anaerobic digestion prior to land application.
3. **Transportation.**
    a. Transportation of the biosolids to the land application site shall be done in accordance with the City of Portland Biosolids Management Plan and Land Application Plan.
4. **Land Application Activities.**
    a. The site is approved for land application biosolids by appropriate application equipment.
    b. Biosolids shall be applied evenly and thinly in a manner that will prevent ponding and runoff from precipitation events.
    c. Biosolids may be stored in the fields at "landings" on the site for no more than 21 days prior to spreading. The quantity of biosolids in the storage locations may not exceed the agronomic loading rate for the field. For storage beyond 21 days, prior written request and ODEQ authorization is required.
    d. Immediately following land application, the biosolids equipment operator shall clean off (at the application site) any equipment coated with biosolids to prevent biosolids from spilling onto public roadways.
5. **Application Rates and Timing.**
    a. **Application Period**. The site is approved for year-around land application of biosolids when field conditions allow for uniform application that will not result in ponding or runoff. Land application timing must be appropriate to the site's land management practices and must be managed to provide maximum benefit to crops grown on the site and minimize potential adverse environmental impacts.
    b. **Application Rate**. Biosolids shall be applied at rates up to but not exceeding an agronomic loading limit appropriate to the crop being grown on the field after accounting for supplemental sources of nitrogen and losses as described under Conditions 5.d and

5.e. If other sources of nitrogen are used, the biosolids application rate must be reduced so that the other nitrogen sources in combination with the biosolids do not exceed the agronomic loading rate for the crop grown on the site.

The City has requested and is approved for field-specific agronomic loading limits that are based on crop yield goals (ranging from 30 to 60 bushels/acre) and on the nitrogen requirement factor for specific grain protein content goals (ranging from 9 to 13 percent), such as described in the OSU Field Guide 80 (FG80) – Winter Wheat in Summer-Fallow Systems (Low Precipitation Zone). Crop yield goals will be provided by the farmers and will be based on historic yields from each field.

For each field that receives biosolids applications at field-specific agronomic loading rates during the year, the crop yield goal, the grain protein content goal (or nitrogen requirement factor), the amount of residual soil nitrogen, and both the calculated and actual plant available nitrogen (PAN) loading rates shall be included in the annual report described under Condition 9.c.

c. **Agronomic Rate Calculations**. Biosolids application rates will be calculated using one of the following: (i) the method approved in the ODEQ-approved Biosolids Management Plan; (ii) the method described in Worksheet for Calculating Biosolids Application Rates in Agriculture, published by the Oregon State University Extension Service, Publication No. PNW0511e (March 2007); or (iii) the method described in Managing Nitrogen from Biosolids, published by Washington State Department of Ecology and the Northwest Biosolids Management Association (April 1999). Any deviations from the methods and/or assumptions described in these publications must be pre-approved in writing by the ODEQ Northwest Region. (Updated versions of the aforementioned documents may be used at any time.)

d. **Routine Applications**. If biosolids applications exceed 2 out of 3 successive years at agronomic rates, the soils will be analyzed for residual nitrate-nitrogen (NO3-N) before the next application. Agronomic application rates are to be adjusted for residual NO3-N in the effective rooting zone.

e. **Supplemental N**. If other sources of nitrogen are applied to the fields (e.g., commercial, animal manure or green chop), the biosolids application rate must be reduced so that the supplemental nitrogen plus biosolids nitrogen does not exceed the agronomic application rate approved for this site.

f. **Changes**. Changes in biosolids characteristics, cropping practices, or general land management will necessitate appropriate adjustments in the application rate to maintain nitrogen applications consistent with crop demands. Major changes in any of the above must be communicated to the ODEQ's Northwest Region in writing before the changes are implemented.

6. **Site Restrictions.**

a. **Wet Soil.** Care should be taken to avoid wet soil conditions, particularly in concave areas, at the time of application.

b. **Precipitation.** Biosolids land application shall cease when precipitation exceeds ¼ inch per hour or when one inch or more of precipitation occurs in a 24-hour period. Land application shall be withheld from the site for at least one day for every consecutive day of precipitation where a ¼ inch or one-inch per 24-hour precipitation event occurs.

c. **General Public Access.** General Public access to the site shall be restricted for at least 12 months after biosolids land application has ceased.

d. **Grazing.** A 30 day interval shall follow the application of biosolids prior to grazing livestock on any field or prior to the harvesting of crops that are to be fed to animals.

e. **Food Crops.** A 30-day interval shall follow the application of biosolids prior to harvesting any food crops (not for direct human consumption) or fiber crops.

f. **Wind.** Land application shall cease if wind speed is such that biosolids cannot be applied uniformly or would be thrown into buffer strips, waterways, roads, trails, or onto the application vehicle itself. Application may resume after winds speeds have decreased such that no significant blowing or drifting occurs.

g. **Nuisance Conditions.** Biosolids land application shall cease when the potential exists for nuisance conditions or runoff beyond the approved areas.

h. **Wind Farm Access.** Appropriate setbacks will be maintained from wind turbines and access roads (Condition 7). Restricted access to the fields by non-farm personnel associated with wind tower maintenance (or other activities) will be maintained for at least 30 days after land application has ceased. Signs will be posted at all potential access roads and will provide (at a minimum) the following information:

   i. identification of the field as a Biosolids Land Application site;

   ii. state that access is restricted for at least 30 days following the most recent land application event;

   iii. the date of the most recent land application event;

   iv. a requirement that non-farm personnel seeking access to the fields, after 30 days but less than 12 months following the most recent land application event, must be provided information on the biosolids land application activities; and

   v. contact information for the Columbia WWTF and/or the City's Columbia WWTF's representative.

   Individuals seeking access to the sites must be provided with information regarding biosolids land application activities; and, any questions and/or concerns they may have regarding exposure to biosolids must be addressed.

7. **Setbacks and Buffers.** Setbacks and buffers on the sites have been identified and include the following.

   a. A minimum setback of 10 feet shall be required from all property boundaries.

   b. A minimum setback of 25 feet shall be maintained from all wind turbines and paved and graveled wind turbine roads.

   c. A minimum setback of 200 feet shall be maintained between the nearest point of biosolids application and all water wells and other domestic water sources.

8. **Remedial Procedures.**

   a. The City's biosolids hauler shall clean up any spillage of biosolids. The City shall consult with the ODEQ for appropriate methods of protecting public health and the environment for spills that cannot be completely cleaned up.

b. In the event an odor problem is reported to the City, its representative, or the ODEQ after biosolids has been land applied at the site, the City and the ODEQ will jointly determine the best method to mitigate the odor concern.

c. The ODEQ shall be notified within one hour, through the Oregon Emergency Response System (OERS), of any spills of more than ¼ cubic yard (0.19 cubic meters) of biosolid cake or more than 55 gallons of liquid biosolids or other threats to the environment that may occur. All spills adjacent to drainage ditches or drainage ways should be reported. Failure to provide prompt notification may be considered cause for taking enforcement action against the City. The telephone number for OERS is 1.800.452.0311 (24-hr service).

9. **Monitoring and Reporting.**

a. **Soil Testing.** Annual soil testing for residual nitrate-nitrogen (NO_3-N) will occur under the conditions described in Item 5.c. The ODEQ recommends routine soil testing for soil nutrients as well as the trace pollutants listed in Table 1 of 40 CFR §503.13 for fields receiving annual biosolids applications. The Department may require soil testing if adverse environmental impacts are suspected at the site.

b. **Site Records.** Daily site records of accumulated land applied biosolids will be maintained. Site records shall be recorded on field grid map or other readable system. Records shall indicate the date, location and quantity of biosolids applied; segments of each field that received biosolids; pounds of nutrients applied to each area receiving biosolids; and the type of crop grown. These records must be available to the ODEQ for review upon request. Regardless of the format in which written and mapped records are kept, they must be readily available in hardcopy format

c. **Annual Report.** By 19 February of each year, the City shall provide the ODEQ with an annual report of the previous year's biosolids processing and application activities, as required under the ODEQ rules (OAR 340-050-0035(6)). At a minimum, this report shall include the information described in Attachment A. An annual report must be also be submitted to the United States Environmental Protection Agency (USEPA).

10. **Notification.**

a. The City or its representatives shall promptly notify ODEQ of any major changes it intends to make to its biosolids processing activities which could influence biosolids quality or quantity before anticipated modifications are initiated. Any variations from the Department approved biosolids management plan and this authorization letter must receive prior written approval from the ODEQ.

11. **Additional Conditions.**

a. The ODEQ shall have the right: (i) to enter (at reasonable times) the City's (or its representatives) place of biosolids land application and record keeping to review biosolids management operations and records; (ii) to obtain copies of any records required under the terms of the authorization and the City's biosolids management plan; (iii) to inspect any monitoring equipment required under this authorization; (iv) to inspect any collection transport, or land application vehicle; and, (v) to obtain any photographic documentation or evidence deemed appropriate.

b. This authorization is subject to revocation should health hazards, environmental degradation, or nuisance conditions develop as a result of inadequate biosolids treatment or site management.

c. Any variations from the City's approved biosolids management plan and this authorization letter must receive prior written approval from the ODEQ Northwest Region Office.

d. The ODEQ may amend this Site Authorization and impose any additional restrictions or conditions deemed necessary to protect environmental and human health.

This authorization is considered to be part of your approved biosolids management plan and is enforceable as part of your NPDES permits. Therefore, if operations are not conducted in accordance with terms specified under this authorization, the Department will initiate an enforcement action, which may lead to the assessment of a civil penalty. If you have any questions regarding the issues in this letter please call me at 503.229.5347 or contact me via email at heins.pat@deq.state.or.us.

Sincerely,

Pat Heins
Land Application Specialist

Att: Figure 1 –site map
Attachment A – Annual Biosolids/Septage Reports

cc: Stevens Family Farms LLC, PO Box 257, Husum, WA 98623
Jon & Rob Simantel dba J Bar S Ranch, PO Box 31, Wasco, OR 97065


Site Map
Jon & Rob Simantel
Site 2
NWR2010-32-BS
North
McDonalds Ferry Ln
© 2016 Google

Attachment A – Annual Biosolids/Domestic Septage Reports

All NPDES and WPCF permittees in Oregon that land applied bulk biosolids or domestic septage, or that sold or gave away biosolids derived products (e.g., biosolids compost) for distribution and marketing are required to submit an annual report to the department by February 19; the report must provide a detailed accounting of solids handling activities from the previous calendar year [OAR 340- 050-0035(6)]. This annual reporting requirement is a condition under Schedule B in NPDES and WPCF permits. As permits are renewed, a condition will be included in Schedule B that requires the annual report data to be submitted in a department approved format.

A copy of the annual report should be submitted to the regional DEQ biosolids staff contact and to the DEQ biosolids program coordinator. Under 40 CFR §503.18(a), Class I facilities (those classified as major facilities) must also submit an annual report to the Environmental Protection Agency (EPA) Region 10 by **February 19** for the previous calendar year. The same annual report submitted to DEQ meets the requirements for the EPA. The annual report form is posted on the department's web site at http://www.deq.state.or.us/wq/biosolids/assistance.htm.

Required Information

The annual report describes the quality and quantity of biosolids or domestic septage produced and land applied, as well as the specific land application activities practiced. The report should provide a summary of activities at each site to adequately demonstrate that biosolids were applied within agronomic loading rates and that other required site management practices were followed. The statewide Biosolids Annual Report form developed by the department should be used by all facilities required to submit annual reports in accordance with OAR 340-050-0035(6). The annual report must include the following:

- Description of how biosolids or septage were produced, stabilized, and tested;
- The amount of biosolids or septage produced;
- Information characterizing the quality of the biosolids or septage;
- Description of how pathogen reduction and vector attraction reduction requirements were met;
- Description of how and where the biosolids or septage were managed;
- Necessary signed certifications for pathogen reduction, vector attraction reduction, and site management practices (see section on available documents);
- Description of any major modifications to solids handling or land application site management practices; and
- Description of any violation of state or federal rules pertaining to biosolids or septage and remedial actions taken.

In addition to the above information, if biosolids or septage are land applied, the following is needed on the beneficial use sites:

- Site names and locations;
- Crops grown, and for septage the nitrogen requirements for each site;
- Amount of acreage amended;
- Amount of biosolids (dry tons/acre) or septage (gallons/acre) applied, including date and location;
- Amount of available nitrogen supplied by the biosolids or septage;
- Specific types of septage treated and applied; and
- Soil test(s) if required by a site authorization letter.

CITY OF PORTLAND
ENVIRONMENTAL SERVICES

Columbia Boulevard Wastewater Treatment Plant

5001 N Columbia Boulevard, Portland, Oregon 97203 ▪ Nick Fish, Commissioner ▪ Michael Jordan, Director

February 11, 2016

Pat Heins
DEQ Northwest Region
700 NE Multnomah St., Suite #600
Portland, OR 97232

Dear Mr. Heins,

Subject: Request for Revocation of Authorization

This letter is a request to revoke a site authorization for a City of Portland site currently farmed by Mr. Guy Weedman in Sherman County. This site consists of approximately 303.49 acres.

The legal description for this site is Township 1 North, Range 18 East, Section 20, and Tax Lot # 3102. The site was previously authorized for the City of Portland in a site authorization letter dated 12/9/1999 (attached). The site is expected to be re-authorized under the management of Clean Water Services.

If you have any questions regarding this request, please contact me at 503-823-2491 or by e-mail at greg.charr@portlandoregon.gov.

Sincerely,

Greg Charr
Biosolids Program Manager
City of Portland – Environmental Services

The City of Portland complies with all non-discrimination laws including Title VI (Civil Rights) and Title II (ADA).
To request a translation, accommodation or additional information, please call 503-823-7740, or use City TTY 503-823-6868, or Oregon Relay Service: 711.

Oregon
John A. Kitzhaber, MD, Governor

Department of Environmental Quality
Northwest Region Portland Office/Water Quality
2020 SW 4th Avenue, Suite 400
Portland, OR 97201-4987
(503) 229-5263
FAX (503) 229-6957
TTY 711

April 4, 2012

IMPORTANT DOCUMENT
LAND APPLICATION AUTHORIZATION

Greg Charr, Biosolids Program Manager
Columbia Boulevard Wastewater Treatment Plant
City of Portland
5001 North Columbia Blvd.
Portland, OR 97201

Re: WQ-Multnomah County
Columbia Boulevard Wastewater Treatment Plant
NPDES Permit No. 100807; File No. 70725
Biosolids Land Application Authorization
Skiles-McCullough Site 3
TL 1500, Sec. 6, T1N, R18E, Sherman County
Site ID: NWR2012-01-BS

Dear Mr. Charr:

On February 7, 2012, the Oregon Department of Environmental Quality (ODEQ or "the Department") received a request from the City of Portland Environmental Services ("the City") to land apply anaerobically-digested, dewatered cake biosolids produced by the City of Portland Columbia Boulevard Wastewater Treatment Facility (Columbia Blvd. WWTF) to a property located near Wasco, Oregon (see Table 1 and attached site map). The request included information characterizing soils, topography, biosolids, crop management, public notification and a signed agreement between the City and the property owner. **This authorization letter represents your approval to land apply biosolids to the above-referenced property. This authorization supersedes any previous authorization that may have been granted to the property and is valid only as part of your ODEQ-issued permit.**

Site Description. The property, owned by John Skiles and farmed by Kevin McCullough, is zoned as Exclusive Farm Use (EFU) and consists of one field managed for dryland small grain production on a 2-year rotation of plant-harvest/fallow using "no-till" practices. Adjacent property uses are also agricultural.

Table 1. The property reviewed for biosolids land application, located in Sherman Co., Oregon.

Unit ID	Township, Range, Section	Tax Lot(s)	Total Area (acres)	Spreadable Area† (acres)
Site 3	T1N R18E S06	1500	315.4	315.4

†Spreadable acres do not reflect site-specific setback requirements. Actual acres spread may also vary based upon site conditions at time of application.

ODEQ made an inspection of the property on March 13, 2012, to evaluate the suitability of the site for biosolids land application. I reviewed site geology, soils, hydrology, and topography, considered current and proposed land use and agricultural practices, and noted the locations of residences, wells and other site features. Appropriate setbacks for land application areas were also considered.

The site is located on upland benches or terraces above the Columbia River and is intersected with swales and deep, narrow drainages that remain dry except during winter and rare, extreme or prolonged storm events. The topography on the proposed land application site is variable with slopes ranging from 3 to 7 percent. Soils are composed of Anderly silt loam and Walla Walla silt loam or close variants, which is consistent with the NRCS soil maps for the area. Walla Walla soils are typically deep and well drained; Anderly soils are shallow (~30 in.) to basalt. Both soils are subject to erosion from surface runoff. Caliche or calcic layers were exhibited by several road cuts in the vicinity of the site at depths of 5 to 6 feet below ground surface.

One abandoned well was identified in the northwest portion of the property. Two wind turbine rows and associated access roads are located north-south along the eastern property boundary and west side of Klondike Road which borders the western boundary of the site. Proposed staging areas for interim biosolids storage include one near Klondike Road midway along the west boundary of the site, another near Klondike Road at the southwest corner of the site and a third midway along the north boundary of the site near Dehler Lane. Wind turbine access roads will *not* be utilized by biosolids hauler trucks for field ingress and egress.

Based upon the site visit and review of supplemental information provided by the City, the property is approved for the land application of anaerobically-digested, dewatered cake biosolids produced by the Columbia Blvd. WWTF provided the following conditions are satisfied:

1. **Regulations, Rules, and Permit Requirements.** Biosolids processing and handling will comply with:
    a. Oregon biosolids and septage rules and guidelines (OAR 340-050);
    b. federal biosolids and septage regulations (40 CFR Part 503);
    c. the ODEQ-issued permit to the City of Portland, Columbia Blvd. WWTF (NPDES Permit No.100807; File No. 70725);
    d. the most recent ODEQ approved Biosolids Management Plan (last revised February 2012), including all subsequent amendments; and
    e. all other applicable federal and state statutes and rules.
2. **Treatment Processes.**
    a. Biosolids volatile solids content shall be reduced by 38% or more via anaerobic digestion prior to land application.
3. **Transportation.**
    a. Transportation of the biosolids to the land application site shall be done in accordance with the City of Portland Biosolids Management Plan.
4. **Land Application Activities.**
    a. The site is approved for the land application of biosolids by a side-discharge spreader or other similar manure-spreading equipment.
    b. Biosolids shall be applied evenly and thinly in a manner that will prevent ponding and runoff during and after precipitation events.
    c. When more than one operator conducts biosolids land application or completion of the biosolids application on a site is interrupted for more than one week, areas where

biosolids have been applied must be clearly marked by flag pins or stakes which note the date when biosolids were last applied. This tracking method may be replaced by use of GPS equipment if it provides as accurate tracking. Written and mapped daily land application records must be maintained as described under Condition 9.b.

d. Biosolids may be stored in the fields at the locations identified as "landings" on the site map for no more than 21 days prior to spreading. The quantity of biosolids in the storage locations may not exceed the agronomic loading rate for the field. For storage beyond 21 days, prior written request and ODEQ authorization is required.

e. Immediately following land application, the biosolids equipment operator shall clean off (at the application site) any equipment coated with biosolids to prevent biosolids from spilling onto public roadways.

5. Application Rates and Timing.

a. **Effective Date.** This authorization is effective **04 APRIL 2012**.

b. **Application Period.** The site is approved for ***year-around*** land application of biosolids when field conditions allow for uniform application that will not result in ponding or runoff. Land application timing must be appropriate to the site's land management practices and must be managed to provide maximum benefit to crops grown on the site and minimize potential adverse environmental impacts.

c. **Application Rate.** Biosolids shall be applied at rates up to but not exceeding an agronomic loading limit appropriate to the crop being grown on the field after accounting for supplemental sources of nitrogen and losses as described under Conditions 5.e and 5.f. If other sources of nitrogen are used, the biosolids application rate must be reduced so that the other nitrogen sources in combination with the biosolids do not exceed the agronomic loading rate for the crop grown on the site.

The City has requested and is approved for field-specific agronomic loading limits that are based on crop yield goals (ranging from 30 to 60 bushels/acre) and on the nitrogen requirement factor for specific grain protein content goals (ranging from 9 to 13 percent), such as described in the OSU Field Guide 80 (FG80) – *Winter Wheat in Summer-Fallow Systems (Low Precipitation Zone)*. Crop yield goals will be provided by the farmers and will be based on historic yields from each field.

For each field that receives biosolids applications at field-specific agronomic loading rates during the year, the crop yield goal, the grain protein content goal (or nitrogen requirement factor), the amount of residual soil nitrogen, and both the calculated and actual plant available nitrogen (PAN) loading rates shall be included in the annual report described under Condition 9.c.

d. **Agronomic Rate Calculations.** Biosolids application rates will be calculated using one of the following: (i) the method approved in the ODEQ-approved Biosolids Management Plan; (ii) the method described in *Worksheet for Calculating Biosolids Application Rates in Agriculture*, published by the Oregon State University Extension Service, Publication No. PNW0511e (March 2007); or (iii) a more robust method such as that described in *Managing Nitrogen from Biosolids*, published by Washington State Department of Ecology and the Northwest Biosolids Management Association (April 1999). Any deviations from the methods and/or assumptions described in these publications must be pre-approved in writing by the ODEQ Northwest Region. (Updated versions of the aforementioned documents may be used at any time.)

e. **Routine Applications.** If biosolids applications exceed 2 out of 3 successive years at agronomic rates, the soils will be analyzed for residual nitrate-nitrogen (NO_3-N) before the next application. Agronomic application rates are to be adjusted for residual NO_3-N in the effective rooting zone.

f. **Supplemental N.** If other sources of nitrogen are applied to the fields (e.g., commercial, animal manure or green chop), the biosolids application rate must be reduced so that the supplemental nitrogen plus biosolids nitrogen does not exceed the agronomic application rate approved for this site.

g. **Changes.** Changes in biosolids characteristics, cropping practices, or general land management will necessitate appropriate adjustments in the application rate to maintain nitrogen applications consistent with crop demands. Major changes in any of the above must be communicated to the ODEQ's Northwest Region in writing before the changes are implemented.

6. Site Restrictions.

a. **Wet Soils.** Care should be taken to avoid wet soil conditions at the time of application, particularly in concave areas.

b. **Precipitation.** Biosolids land application shall cease when precipitation exceeds ¼ inch per hour or when one inch or more of precipitation occurs in a 24-hour period. Land application shall be withheld from the site for at least one day for every consecutive day of precipitation where a ¼ inch or one-inch per 24-hour precipitation event occurs.

c. **General Public Access.** Access to the site by the general public shall be restricted for at least 12 months after biosolids land application has ceased.

d. **Grazing.** A 30-day interval shall follow the application of biosolids prior to grazing livestock on any field or prior to the harvesting of crops that are to be fed to animals.

e. **Wind.** Land application shall cease if wind speed is such that biosolids cannot be applied uniformly or would be thrown into buffer strips, waterways, roads, trails, or onto the application vehicle itself. Application may resume after wind speeds have decreased such that no significant blowing or drifting occurs.

f. **Slopes.** Dewatered or dried biosolids shall not be applied to sites with slopes greater than 30 percent. Sites with slopes between 12 and 30 percent must be well-vegetated to receive biosolids application.

g. **Nuisance Conditions.** Biosolids land application shall cease when the potential exists for nuisance conditions or runoff beyond the approved areas.

h. **Wind Farm Access.** Appropriate setbacks will be maintained from wind turbines and access roads (Condition 7). Restricted access to the fields by non-farm personnel associated with wind tower maintenance (or other activities) will be maintained for at least 30 days after land application has ceased. Signs will be posted at all potential access roads and will provide (at a minimum) the following information:

i. identification of the field as a Biosolids Land Application site;

ii. state that access is restricted for at least 30 days following the most recent land application event;

iii. the date of the most recent land application event;

iv. a requirement that non-farm personnel seeking access to the fields, after 30 days but less than 12 months following the most recent land application event, must be provided information on the biosolids land application activities; and

v. contact information for the Columbia WWTF and/or the City's Columbia WWTF representative.

Individuals seeking access to the sites must be provided with information regarding biosolids land application activities; and, any questions and/or concerns they may have regarding exposure to biosolids must be addressed.

7. **Setbacks and Buffers.** Setbacks and buffers on the sites are listed in Table 2 and have also been identified in the attached site map(s).

Table 2. Site-specific setbacks for biosolids land application.

Feature	Setback[1] (ft.)
Property boundaries & private roadways	10
Paved or graveled roadways & wind turbines	25
Residences and wells	200

[1]**The setback is determined from the edge of the feature.**

8. **Remedial Procedures.**

   a. The City's biosolids hauler shall clean up any spillage of biosolids. The City shall consult with the ODEQ for appropriate methods of protecting public health and the environment for spills that cannot be completely cleaned up.

   b. In the event an odor problem is reported to the City, its representative, or the ODEQ after biosolids has been land applied at the site, the best method to mitigate the odor concern will be determined jointly.

   c. The ODEQ shall be notified within one hour, through the Oregon Emergency Response System (OERS), of any spills of more than ¼ cubic yards or other threats to the environment that may occur. All spills adjacent to drainage ditches or drainage ways should be reported. Failure to provide prompt notification may be considered cause for taking enforcement action against the City. The telephone number for OERS is 1.800.452.0311 (24-hr service).

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   a. **Soil Testing.** Soil testing for residual nitrate-nitrogen (NO_3-N) will occur as described under Condition 5.c. The ODEQ recommends routine soil testing for soil nutrients as well as the trace pollutants listed in Table 1 of 40 CFR §503.13 for fields receiving annual biosolids applications. The Department may require soil testing if adverse environmental impacts are suspected at the site.

   b. **Site Records.** Daily site records of accumulated land applied biosolids will be maintained. Site records shall be recorded on field grid map or other readable system. Records shall indicate the date, location and quantity of biosolids applied; segments of each field that received biosolids; target plant available nitrogen (PAN) loading rate of the area receiving biosolids; and the type of crop grown. These records must be available to the ODEQ for review upon request. Regardless of the format in which written and mapped records are kept, they must be readily available in hardcopy format

   c. **Annual Report.** By 19 February of each year, the City shall provide the ODEQ with an annual report of the previous year's biosolids processing and application activities, as required under the ODEQ rules (OAR 340-050-0035(6)). An annual report must be also be submitted to the United States Environmental Protection Agency (USEPA) Region 10.

10. **Notification.**

   a. The City or its representatives shall promptly notify ODEQ of any major changes it intends to make to its biosolids processing activities that could influence biosolids quality or quantity before anticipated modifications are initiated, as described under Condition 11.c.

11. **Additional Conditions.**

   a. The ODEQ shall have the right to: (i) enter (at reasonable times) the City's (or its representatives) place of biosolids land application and record keeping to review biosolids management operations and records; (ii) obtain copies of any records required under the terms of this authorization and the City's biosolids management plan; (iii)

inspect any monitoring equipment required under this authorization; (iv) inspect any collection, transport, or land application vehicle; and (v) obtain any photographic documentation or evidence deemed appropriate.

b. This authorization is subject to revocation should health hazards, environmental degradation, or nuisance conditions develop as a result of inadequate biosolids treatment or site management.

c. Any variations from the City's approved biosolids management plan and this authorization letter must receive prior written approval from the ODEQ Northwest Region Office.

d. The ODEQ may amend this Site Authorization and impose any additional restrictions or conditions deemed necessary to protect environmental and human health.

This authorization is considered to be part of your approved biosolids management plan and is enforceable as part of your NPDES permit. Therefore, if operations are not conducted in accordance with terms specified under this authorization, the Department will initiate an enforcement action, which may lead to the assessment of a civil penalty. If you have any questions regarding the issues in this letter please call me at 503.229.5347 or contact me via email at schrandt.connie@deq.state.or.us.

Sincerely,

Connie M. Schrandt

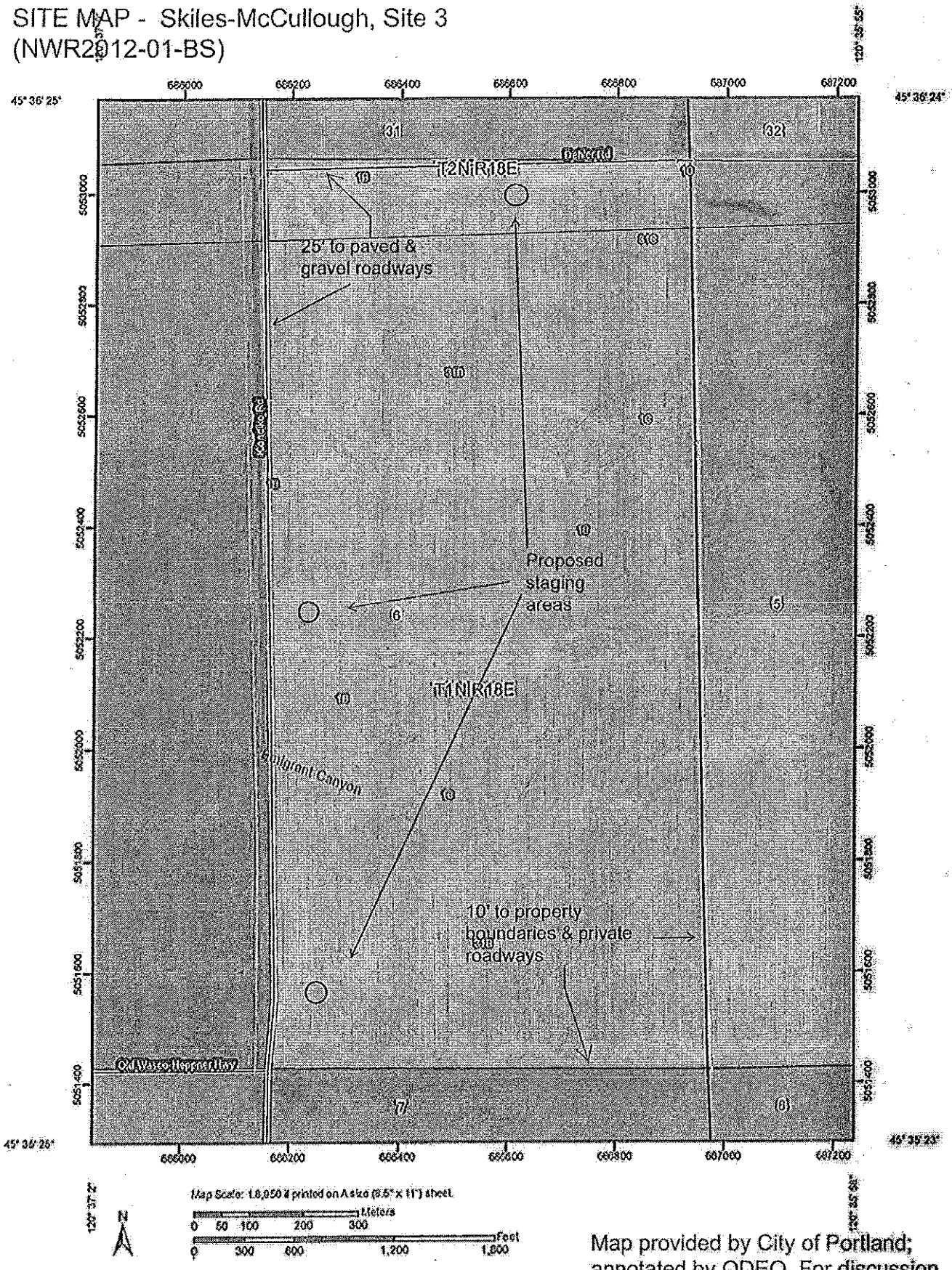
Connie M. Schrandt
Solls/Land Application Specialist
Northwest Region

Enc: Site Maps

Cc: John E. Skiles, PO Box 32, Dufur, OR 97021
Kevin McCullough, PO Box 194, Wasco, OR 97065
Wasco Sherman Gilliam Public Health, 419 E. 7th Street, Room 100, The Dalles, OR 97058

Ec: Ron Doughten, DEQ Biosolids Coordinator, ODEQ Headquarters
Kent Madison, K&S Madison, Inc.

SITE MAP - Skiles-McCullough, Site 3 (NWR2012-01-BS)



Map provided by City of Portland; annotated by ODEQ. For discussion purposes only.

Oregon
John A. Kitzhaber, MD, Governor

Department of Environmental Quality
Northwest Region Portland Office/Water Quality
2020 SW 4th Avenue, Suite 400
Portland, OR 97201-4987
(503) 229-5263
FAX (503) 229-6957
TTY 711

March 8, 2011

IMPORTANT DOCUMENT
LAND APPLICATION AUTHORIZATION

Greg Charr, Biosolids Program Manager
Columbia Boulevard Wastewater Treatment Plant
City of Portland
5001 North Columbia Blvd.
Portland, OR 97201

Re: WQ-Multnomah County
Columbia Boulevard Wastewater Treatment Plant
NPDES Permit No. 100807; File No. 70725
Biosolids Land Application Authorization
Svenson & Medler-McCullough Site 1
TL 1000, Sec. 5, T2N, R18E,
TL 1200, Sec. 6, T2N, R18E, and
TL's 600 & 700, Sec. 31, T3N, R18E, Sherman County
Site ID: NWR2011-1-BS

Dear Mr. Charr:

On January 7, 2011, the Oregon Department of Environmental Quality (ODEQ or "the Department") received a request from the City of Portland Environmental Services ("the City") to land apply anaerobically-digested, dewatered cake biosolids produced by the City of Portland Columbia Boulevard Wastewater Treatment Facility (Columbia Blvd. WWTF) to properties located near Wasco, Oregon (see Table 1 and attached site map). The request included information characterizing soils, topography, biosolids, crop management, public notification and a signed agreement between the City and the property owner. **This authorization letter represents your approval to land apply biosolids to the referenced property. This authorization supersedes any previous authorization that may have been granted to the property and is valid only as part of your ODEQ-issued permit.**

Site Description. The property, owned by Barbara Svenson and Douglas Medler and farmed by Kevin McCullough, is zoned as Exclusive Farm Use (EFU) and consists of two units managed for dryland small grain production on a 2-year rotation of planting-harvesting/fallow using "no-till" practices. Adjacent property uses are also agricultural.

Table 1. The property reviewed for biosolids land application, located in Sherman Co., Oregon.

Unit ID	Township, Range, Section	Tax Lot(s)	Total Area (acres)	Spreadable Area[1] (acres)
South	T2N R18E S05	1000	438.3	1075.7
	T2N R18E S06	1200	637.4	
North	T3N R1E S31	600	224.8	264.8
	T3N R1E S31	700	40.0	
Total Acres			**1340.5**	

[1]**Spreadable acres do not reflect site-specific setback requirements. Actual acres spread may also vary based upon site conditions at time of application.**

ODEQ made an inspection of the property on February 16, 2011, to evaluate the suitability of the site for biosolids land application. I reviewed site geology, soils, hydrology, and topography, considered current and proposed land use and agricultural practices, and noted the locations of residences, wells and other sensitive site features. Appropriate setbacks for land application areas were also considered.

The site is located on upland benches or terraces above the Columbia River in the vicinity of Fox Canyon and is intersected with swales and deep, narrow drainages that remain dry except during winter and rare, extreme or prolonged storm events. The topography on the proposed land application site is variable with slopes ranging from 3% to greater than 20%. Soils on the farmed portions of the site are composed of Anderly silt loam and Walla Walla silt loam or close variants, which is consistent with the NRCS soil maps for the area. Walla Walla soils are typically deep and well drained; Anderly soils are shallow (~30 in.) to basalt. Both soils are subject to erosion from surface runoff. Several road cuts in the vicinity of the fields exhibited caliche or calcic layers at 4 to 6 feet below ground surface.

One well and an associated residence/farm was identified in the north central portion of TL 1000. Wind turbine rows and associated access roads are located near the western boundary of TL's 600 and 1200 and north to south through the central portion of TL 1000. The access roads will be utilized by biosolids hauler trucks for field ingress and egress. Staging areas for interim biosolids storage are also proposed; six near the western boundary of the farmed units along Helms Lane and the adjacent, parallel access road (Bigelow Canyon Wind Farm #10) and two associated with the access road on TL 1000 (Bigelow Canyon Wind Farm #11).

Based upon the site visit and review of supplemental information provided by the City, the property is approved for the land application of anaerobically-digested, dewatered cake biosolids produced by the Columbia Blvd. WWTF provided the following conditions are satisfied:

1. **Regulations, Rules, and Permit Requirements.** Biosolids processing and handling will comply with:
    a. Oregon biosolids and septage rules and guidelines (OAR 340-050);
    b. federal biosolids and septage regulations (40 CFR Part 503);
    c. the ODEQ-issued permit to the City of Portland, Columbia Blvd. WWTF (NPDES Permit No.100807; File No. 70725);
    d. the most recent ODEQ approved Biosolids Management Plan (last revised February 2009), including all subsequent amendments; and
    e. all other applicable federal and state statutes and rules.
2. **Treatment Processes.**
    a. Biosolids volatile solids content shall be reduced by 38% or more via anaerobic digestion prior to land application.
3. **Transportation.**
    a. Transportation of the biosolids to the land application site shall be done in accordance with the City of Portland Biosolids Management Plan.
4. **Land Application Activities.**
    a. The site is approved for the land application of biosolids by a side-discharge spreader or other similar manure-spreading equipment.
    b. Biosolids shall be applied evenly and thinly in a manner that will prevent ponding and runoff during and after precipitation events.
    c. When more than one operator conducts biosolids land application or completion of the biosolids application on a site is interrupted for more than one week, areas where

biosolids have been applied must be clearly marked by flag pins or stakes which note the date when biosolids were last applied. This tracking method may be replaced by use of GPS equipment if it provides as accurate tracking. Written and mapped daily land application records must be maintained as described under Condition 9.b.

d. Biosolids may be stored in the fields at the locations identified as "landings" on the site map for no more than 21 days prior to spreading. The quantity of biosolids in the storage locations may not exceed the agronomic loading rate for the field. For storage beyond 21 days, prior written request and ODEQ authorization is required.

e. Immediately following land application, the biosolids equipment operator shall clean off (at the application site) any equipment coated with biosolids to prevent biosolids from spilling onto public roadways.

5. Application Rates and Timing.

a. **Effective Date.** This authorization is effective **MARCH 8, 2011**.

b. **Application Period.** The site is approved for ***year-around*** land application of biosolids when field conditions allow for uniform application that will not result in ponding or runoff. Land application timing must be appropriate to the site's land management practices and must be managed to provide maximum benefit to crops grown on the site and minimize potential adverse environmental impacts.

c. **Application Rate.** Biosolids shall be applied at rates up to but not exceeding an agronomic loading limit appropriate to the crop being grown on the field after accounting for supplemental sources of nitrogen and losses as described under Conditions 5.e and 5.f. If other sources of nitrogen are used, the biosolids application rate must be reduced so that the other nitrogen sources in combination with the biosolids do not exceed the agronomic loading rate for the crop grown on the site.

The City has requested and is approved for field-specific agronomic loading limits that are based on crop yield goals (ranging from 30 to 60 bushels/acre) and on the nitrogen requirement factor for specific grain protein content goals (ranging from 9 to 13 percent), such as described in the OSU Field Guide 80 (FG80) – *Winter Wheat in Summer-Fallow Systems (Low Precipitation Zone)*. Crop yield goals will be provided by the farmers and will be based on historic yields from each field.

For each field that receives biosolids applications at field-specific agronomic loading rates during the year, the crop yield goal, the grain protein content goal (or nitrogen requirement factor), the amount of residual soil nitrogen, and both the calculated and actual plant available nitrogen (PAN) loading rates shall be included in the annual report described under Condition 9.c.

d. **Agronomic Rate Calculations.** Biosolids application rates will be calculated using one of the following: (i) the method approved in the ODEQ-approved Biosolids Management Plan; (ii) the method described in *Worksheet for Calculating Biosolids Application Rates in Agriculture*, published by the Oregon State University Extension Service, Publication No. PNW0511e (March 2007); or (iii) a more robust method such as that described in *Managing Nitrogen from Biosolids*, published by Washington State Department of Ecology and the Northwest Biosolids Management Association (April 1999). Any deviations from the methods and/or assumptions described in these publications must be pre-approved in writing by the ODEQ Northwest Region. (Updated versions of the aforementioned documents may be used at any time.)

e. **Routine Applications.** If biosolids applications exceed 2 out of 3 successive years at agronomic rates, the soils will be analyzed for residual nitrate-nitrogen (NO_3-N) before the next application. Agronomic application rates are to be adjusted for residual NO_3-N in the effective rooting zone.

f. **Supplemental N.** If other sources of nitrogen are applied to the fields (e.g., commercial, animal manure or green chop), the biosolids application rate must be reduced so that the supplemental nitrogen plus biosolids nitrogen does not exceed the agronomic application rate approved for this site.

g. **Changes.** Changes in biosolids characteristics, cropping practices, or general land management will necessitate appropriate adjustments in the application rate to maintain nitrogen applications consistent with crop demands. Major changes in any of the above must be communicated to the ODEQ's Northwest Region in writing before the changes are implemented.

6. Site Restrictions.

a. **Wet Soils.** Care should be taken to avoid wet soil conditions at the time of application, particularly in concave areas.

b. **Precipitation.** Biosolids land application shall cease when precipitation exceeds ¼ inch per hour or when one inch or more of precipitation occurs in a 24-hour period. Land application shall be withheld from the site for at least one day for every consecutive day of precipitation where a ¼ inch or one-inch per 24-hour precipitation event occurs.

c. **General Public Access.** Access to the site by the general public shall be restricted for at least 12 months after biosolids land application has ceased.

d. **Grazing.** A 30-day interval shall follow the application of biosolids prior to grazing livestock on any field or prior to the harvesting of crops that are to be fed to animals.

e. **Wind.** Land application shall cease if wind speed is such that biosolids cannot be applied uniformly or would be thrown into buffer strips, waterways, roads, trails, or onto the application vehicle itself. Application may resume after wind speeds have decreased such that no significant blowing or drifting occurs.

f. **Slopes.** Dewatered or dried biosolids shall not be applied to sites with slopes greater than 30 percent. Sites with slopes between 12 and 30 percent must be well-vegetated to receive biosolids application.

g. **Nuisance Conditions.** Biosolids land application shall cease when the potential exists for nuisance conditions or runoff beyond the approved areas.

h. **Wind Farm Access.** Appropriate setbacks will be maintained from wind turbines and access roads (Condition 7). Restricted access to the fields by non-farm personnel associated with wind tower maintenance (or other activities) will be maintained for at least 30 days after land application has ceased. Signs will be posted at all potential access roads and will provide (at a minimum) the following information:

i. identification of the field as a Biosolids Land Application site;

ii. state that access is restricted for at least 30 days following the most recent land application event;

iii. the date of the most recent land application event;

iv. a requirement that non-farm personnel seeking access to the fields, after 30 days but less than 12 months following the most recent land application event, must be provided information on the biosolids land application activities; and

v. contact information for the Columbia WWTF and/or the City's Columbia WWTF representative.

Individuals seeking access to the sites must be provided with information regarding biosolids land application activities; and, any questions and/or concerns they may have regarding exposure to biosolids must be addressed.

7. **Setbacks and Buffers.** Setbacks and buffers on the sites are listed in Table 3 and have also been identified in the attached site map(s).

Table 3. Site-specific setbacks for biosolids land application.

Feature	Setback[1] (ft.)
Property boundaries & private, unpaved roadways	10
Paved or graveled roadways & wind turbines	25
Residences and wells	200

[1]**The setback is determined from the edge of the feature.**

8. **Remedial Procedures.**

   a. The City's biosolids hauler shall clean up any spillage of biosolids. The City shall consult with the ODEQ for appropriate methods of protecting public health and the environment for spills that cannot be completely cleaned up.

   b. In the event an odor problem is reported to the City, its representative, or the ODEQ after biosolids has been land applied at the site, the best method to mitigate the odor concern will be determined jointly.

   c. The ODEQ shall be notified within one hour, through the Oregon Emergency Response System (OERS), of any spills of more than ¼ cubic yards or other threats to the environment that may occur. All spills adjacent to drainage ditches or drainage ways should be reported. Failure to provide prompt notification may be considered cause for taking enforcement action against the City. The telephone number for OERS is 1.800.452.0311 (24-hr service).

9. **Monitoring and Reporting.**

   a. **Soil Testing.** Soil testing for residual nitrate-nitrogen (NO_3-N) will occur as described under Condition 5.c. The ODEQ recommends routine soil testing for soil nutrients as well as the trace pollutants listed in Table 1 of 40 CFR §503.13 for fields receiving annual biosolids applications. The Department may require soil testing if adverse environmental impacts are suspected at the site.

   b. **Site Records.** Daily site records of accumulated land applied biosolids will be maintained. Site records shall be recorded on field grid map or other readable system. Records shall indicate the date, location and quantity of biosolids applied; segments of each field that received biosolids; target plant available nitrogen (PAN) loading rate of the area receiving biosolids; and the type of crop grown. These records must be available to the ODEQ for review upon request. Regardless of the format in which written and mapped records are kept, they must be readily available in hardcopy format.

   c. **Annual Report.** By 19 February of each year, the City shall provide the ODEQ with an annual report of the previous year's biosolids processing and application activities, as required under the ODEQ rules (OAR 340-050-0035(6)). An annual report must be also be submitted to the United States Environmental Protection Agency (USEPA) Region 10.

10. **Notification.**

   a. The City or its representatives shall promptly notify ODEQ of any major changes it intends to make to its biosolids processing activities that could influence biosolids quality or quantity before anticipated modifications are initiated, as described under Condition 11.c.

11. **Additional Conditions.**

   a. The ODEQ shall have the right to: (i) enter (at reasonable times) the City's (or its representatives) place of biosolids land application and record keeping to review biosolids management operations and records; (ii) obtain copies of any records required

under the terms of this authorization and the City's biosolids management plan; (iii) inspect any monitoring equipment required under this authorization; (iv) inspect any collection, transport, or land application vehicle; and (v) obtain any photographic documentation or evidence deemed appropriate.

b. This authorization is subject to revocation should health hazards, environmental degradation, or nuisance conditions develop as a result of inadequate biosolids treatment or site management.

c. Any variations from the City's approved biosolids management plan and this authorization letter must receive prior written approval from the ODEQ Northwest Region Office.

d. The ODEQ may amend this Site Authorization and impose any additional restrictions or conditions deemed necessary to protect environmental and human health.

This authorization is considered to be part of your approved biosolids management plan and is enforceable as part of your NPDES permit. Therefore, if operations are not conducted in accordance with terms specified under this authorization, the Department will initiate an enforcement action, which may lead to the assessment of a civil penalty. If you have any questions regarding the issues in this letter please call me at 503.229.5347 or contact me via email at schrandt.connie@deq.state.or.us.

Sincerely,

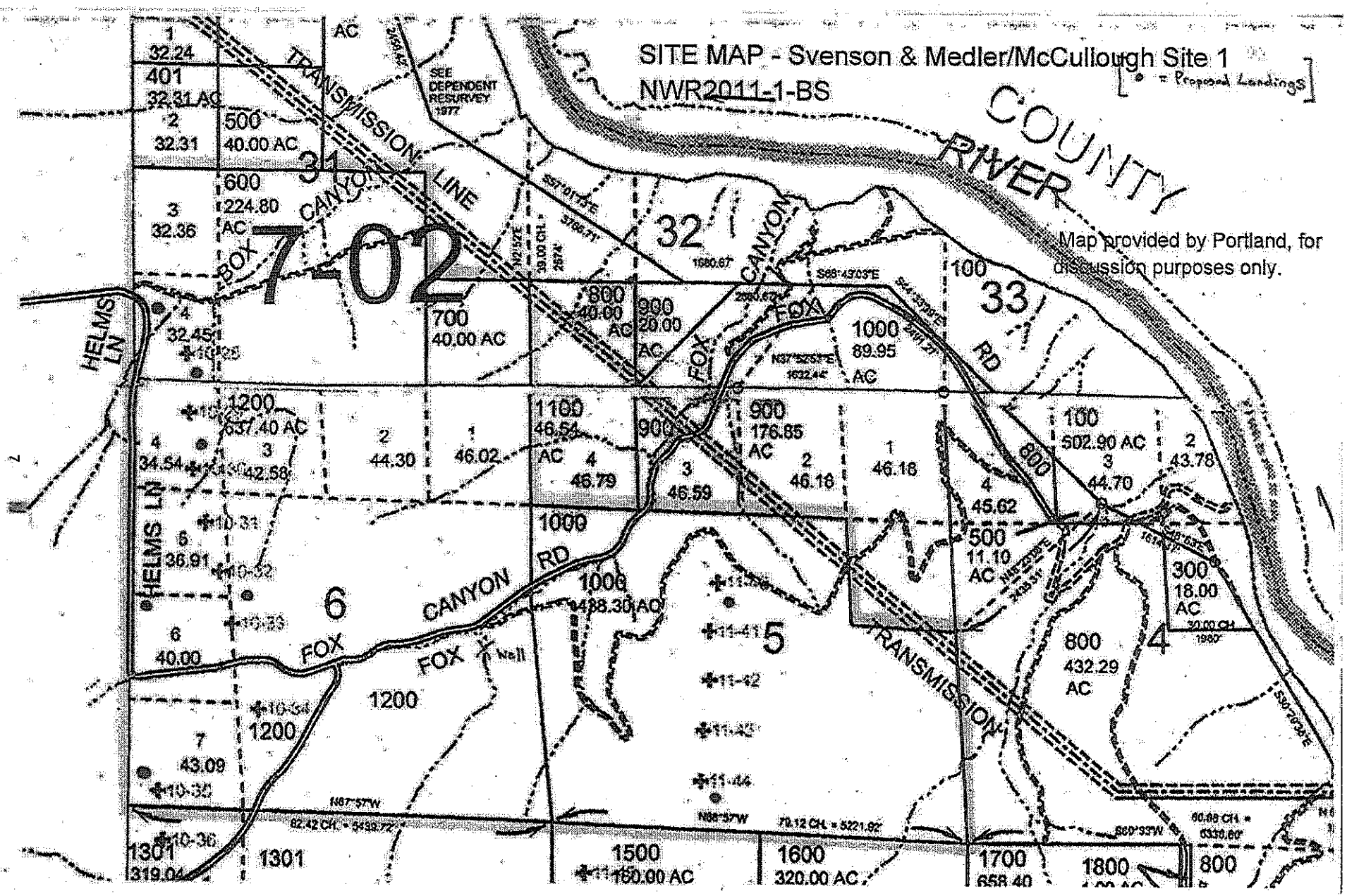
Connie M. Schrandt

Connie M. Schrandt
Soils/Land Application Specialist
Northwest Region

Enc: Site Maps

Cc: Barbara Svenson, 51658 SE 8th St., Scappoose, OR 97056
Douglas Medler, 1928 NW Florence Ave., Gresham, OR 97030
Kevin McCullough, P.O. Box 194, Wasco, OR 97065
Wasco Sherman Gilliam Public Health, 419 E. 7th Street, Room 100, The Dalles, OR 97058

Ec: Ron Doughten, DEQ Biosolids Coordinator, ODEQ Headquarters
Kent Madison, 29299 Madison Rd., Echo, OR 97826


SITE MAP - Svenson & Medler/McCullough Site 1
NWR2011-1-BS
[• = Proposed Landings]
Map provided by Portland, for discussion purposes only.
COUNTY
RIVER
TRANSMISSION LINE
CANYON
FOX
HELMS LN
RD
7-02
6
5
4
31
32
33
SEE DEPENDENT RESURVEY 1977
1 32.24 AC
401 32.31 AC
2 32.31
500 40.00 AC
600 224.80 AC
3 32.36
4 32.45
700 40.00 AC
800 40.00 AC
900 20.00 AC
1000 89.95 AC
100 502.90 AC
1200 637.40 AC
1100 46.54 AC
900 176.85 AC
1000 488.30 AC
500 11.10 AC
300 18.00 AC
800 432.29 AC
1200
1301 319.04
1500 160.00 AC
1600 320.00 AC
1700 658.40
1800
800

Oregon
Theodore R. Kulongoski, Governor

Department of Environmental Quality
Northwest Region Portland Office/Water Quality
2020 SW 4th Avenue, Suite 400
Portland, OR 97201-4987
(503) 229-5263
FAX (503) 229-6957
OTRS 1-800-735-2900

October 27, 2010

IMPORTANT DOCUMENT
LAND APPLICATION AUTHORIZATION

Greg Charr, Biosolids Program Manager
Columbia Boulevard Wastewater Treatment Plant
City of Portland
5001 North Columbia Blvd.
Portland, OR 97201

Re: WQ-Multnomah County
Columbia Boulevard Wastewater Treatment Plant
NPDES Permit No. 100807; File No. 70725
Biosolids Land Application Authorization
Thomas Brothers Site
TL 2200, Sec. 11, T1N, R18E,
TL 3000, Sec. 15, T1N, R18E,
TL 3600, Sec. 19 T1N, R18E, and
TL 5100, Sec. 30, T1N, R18E, Sherman County
Site ID: NWR2010-30-BS

Dear Mr. Charr:

On August 18, 2010, the Oregon Department of Environmental Quality (ODEQ or "the Department") received a request from the City of Portland Environmental Services ("the City") to land apply anaerobically-digested, dewatered cake biosolids produced by the City of Portland Columbia Boulevard Wastewater Treatment Facility (Columbia Blvd. WWTF) to properties located near Wasco, Oregon (see Table 1 and attached site maps). The request included information characterizing soils, topography, biosolids, crop management, public notification and a signed agreement between the City and the property owner. **This authorization letter represents your approval to land apply biosolids to the referenced property. This authorization supersedes any previous authorization that may have been granted to the property and is valid only as part of your ODEQ-issued permit.**

Site Description. The property, owned by the Thomas Brothers and farmed by Richard Hayes, is zoned as Exclusive Farm Use (EFU) and consists of two units managed for dryland small grain production on a 2-year crop/fallow rotation using conventional tillage. Adjacent property uses are also agricultural.

Table 1. The property reviewed for biosolids land application, located in Sherman Co., Oregon.

Unit ID	Township, Range, Section	Tax Lot(s)	Total Area (acres)	Spreadable Area† (acres)
1	T1N R18E S11	2200	79.09	239.09
	T1N R18E S15	3000	160	
2	T1N R1E S19	3600	466.78	552.5
	T1N R1E S30	5100	377.91	
Total Acres			**1083.78**	**791.59**

†Spreadable acres do not reflect site-specific setback requirements. Actual acres spread may also vary slightly based upon site conditions at time of application.

ODEQ made an inspection of the property on September 15, 2010, to evaluate the suitability of the site for biosolids land application. I reviewed site geology, soils, hydrology, and topography, considered current and proposed land use and agricultural practices, and noted the locations of residences, wells and other sensitive site features. Appropriate setbacks for land application areas were also considered.

The site is located on upland benches or terraces above the Columbia River. The topography is generally gently undulating with slopes less than 10% intersected with broad swales and drainages that remain dry except during rare, extreme or prolonged storm events. Soils at the site are composed of Walla Walla silt loam and Anderly silt loam or close variants, which is consistent with the NRCS soil maps for the area. Walla Walla soils are typically deep and well drained; Anderly soils are shallow (~30 in.) to basalt. Both soils are subject to erosion from surface runoff.

No wells, residences or surface water features were identified in the vicinity of the two farmed units. A row of wind turbines and the associated access road is located along the western boundary of TL 3000 in Unit 1 and north to south through the west central portion of Unit 2. The access roads will be utilized by biosolids hauler trucks for field ingress and egress. Staging areas for interim biosolids storage are also proposed; three associated with Unit 1 and one associated with Unit 2.

Based upon the site visit and review of supplemental information provided by the City, the property is approved for the land application of anaerobically-digested, dewatered cake biosolids produced by the Columbia Blvd. WWTF provided the following conditions are satisfied:

1. **Regulations, Rules, and Permit Requirements.** Biosolids processing and handling will comply with:
    a. Oregon biosolids and septage rules and guidelines (OAR 340-050);
    b. federal biosolids and septage regulations (40 CFR Part 503);
    c. the ODEQ-issued permit to the City of Portland, Columbia Blvd. WWTF (NPDES Permit No.100807; File No. 70725);
    d. the most recent ODEQ approved Biosolids Management Plan (last revised February 2009), including all subsequent amendments; and
    e. all other applicable federal and state statutes and rules.
2. **Treatment Processes.**
    a. Biosolids volatile solids content shall be reduced by 38% or more via anaerobic digestion prior to land application.
3. **Transportation.**
    a. Transportation of the biosolids to the land application site shall be done in accordance with the City of Portland Biosolids Management Plan.
4. **Land Application Activities.**
    a. The site is approved for the land application of biosolids by a side-discharge spreader or other similar manure-spreading equipment.
    b. Biosolids shall be applied evenly and thinly in a manner that will prevent ponding and runoff during and after precipitation events.
    c. When more than one operator conducts biosolids land application or completion of the biosolids application on a site is interrupted for more than one week, areas where biosolids have been applied must be clearly marked by flag pins or stakes which note the date when biosolids were last applied. This tracking method may be replaced by use of GPS equipment if it provides as accurate tracking. Written and mapped daily land application records must be maintained as described under Condition 9.b.

d. Biosolids may be stored in the fields at the locations identified as "landings" on the site map for no more than 21 days prior to spreading. The quantity of biosolids in the storage locations may not exceed the agronomic loading rate for the field. For storage beyond 21 days, prior written request and ODEQ authorization is required.

e. Immediately following land application, the biosolids equipment operator shall clean off (at the application site) any equipment coated with biosolids to prevent biosolids from spilling onto public roadways.

5. Application Rates and Timing.

a. **Effective Date.** This authorization is effective **OCTOBER 27, 2010**.

b. **Application Period.** The site is approved for ***year-around*** land application of biosolids when field conditions allow for uniform application that will not result in ponding or runoff. Land application timing must be appropriate to the site's land management practices and must be managed to provide maximum benefit to crops grown on the site and minimize potential adverse environmental impacts.

c. **Application Rate.** Biosolids shall be applied at rates up to but not exceeding an agronomic loading limit appropriate to the crop being grown on the field after accounting for supplemental sources of nitrogen and losses as described under Conditions 5.e and 5.f. If other sources of nitrogen are used, the biosolids application rate must be reduced so that the other nitrogen sources in combination with the biosolids do not exceed the agronomic loading rate for the crop grown on the site.

The City has requested and is approved for field-specific agronomic loading limits that are based on crop yield goals (ranging from 30 to 60 bushels/acre) and on the nitrogen requirement factor for specific grain protein content goals (ranging from 9 to 13 percent), such as described in the OSU Field Guide 80 (FG80) – *Winter Wheat in Summer-Fallow Systems (Low Precipitation Zone)*. Crop yield goals will be provided by the farmers and will be based on historic yields from each field.

For each field that receives biosolids applications at field-specific agronomic loading rates during the year, the crop yield goal, the grain protein content goal (or nitrogen requirement factor), the amount of residual soil nitrogen, and both the calculated and actual plant available nitrogen (PAN) loading rates shall be included in the annual report described under Condition 9.c.

d. **Agronomic Rate Calculations.** Biosolids application rates will be calculated using one of the following: (i) the method approved in the ODEQ-approved Biosolids Management Plan; (ii) the method described in *Worksheet for Calculating Biosolids Application Rates in Agriculture*, published by the Oregon State University Extension Service, Publication No. PNW0511e (March 2007); or (iii) a more robust method such as that described in *Managing Nitrogen from Biosolids*, published by Washington State Department of Ecology and the Northwest Biosolids Management Association (April 1999). Any deviations from the methods and/or assumptions described in these publications must be pre-approved in writing by the ODEQ Northwest Region. (Updated versions of the aforementioned documents may be used at any time.)

e. **Routine Applications.** If biosolids applications exceed 2 out of 3 successive years at agronomic rates, the soils will be analyzed for residual nitrate-nitrogen (NO_3-N) before the next application. Agronomic application rates are to be adjusted for residual NO_3-N in the effective rooting zone.

f. **Supplemental N.** If other sources of nitrogen are applied to the fields (e.g., commercial, animal manure or green chop), the biosolids application rate must be reduced so that the supplemental nitrogen plus biosolids nitrogen does not exceed the agronomic application rate approved for this site.

g. **Changes.** Changes in biosolids characteristics, cropping practices, or general land management will necessitate appropriate adjustments in the application rate to maintain

nitrogen applications consistent with crop demands. Major changes in any of the above must be communicated to the ODEQ's Northwest Region in writing before the changes are implemented.

6. **Site Restrictions.**

   a. **Wet Soils.** Care should be taken to avoid wet soil conditions at the time of application, particularly in concave areas.

   b. **Precipitation.** Biosolids land application shall cease when precipitation exceeds ¼ inch per hour or when one inch or more of precipitation occurs in a 24-hour period. Land application shall be withheld from the site for at least one day for every consecutive day of precipitation where a ¼ inch or one-inch per 24-hour precipitation event occurs.

   c. **General Public Access.** Access to the site by the general public shall be restricted for at least 12 months after biosolids land application has ceased.

   d. **Grazing.** A 30-day interval shall follow the application of biosolids prior to grazing livestock on any field or prior to the harvesting of crops that are to be fed to animals.

   e. **Wind.** Land application shall cease if wind speed is such that biosolids cannot be applied uniformly or would be thrown into buffer strips, waterways, roads, trails, or onto the application vehicle itself. Application may resume after wind speeds have decreased such that no significant blowing or drifting occurs.

   f. **Nuisance Conditions.** Biosolids land application shall cease when the potential exists for nuisance conditions or runoff beyond the approved areas.

   g. **Wind Farm Access.** Appropriate setbacks will be maintained from wind turbines and access roads (Condition 7). Restricted access to the fields by non-farm personnel associated with wind tower maintenance (or other activities) will be maintained for at least 30 days after land application has ceased. Signs will be posted at all potential access roads and will provide (at a minimum) the following information:

      i. identification of the field as a Biosolids Land Application site;

      ii. state that access is restricted for at least 30 days following the most recent land application event;

      iii. the date of the most recent land application event;

      iv. a requirement that non-farm personnel seeking access to the fields, after 30 days but less than 12 months following the most recent land application event, must be provided information on the biosolids land application activities; and

      v. contact information for the Columbia WWTF and/or the City's Columbia WWTF's representative.

   Individuals seeking access to the sites must be provided with information regarding biosolids land application activities; and, any questions and/or concerns they may have regarding exposure to biosolids must be addressed.

7. **Setbacks and Buffers.** Setbacks and buffers on the sites are listed in Table 3 and have also been identified in the attached site map(s).

   Table 3. Site-specific setbacks for biosolids land application.

Feature	Setback[1] (ft.)
Property boundaries & private, unpaved roadways	10
Paved or graveled roadways & wind turbines	25
Residences and wells	200

[1]**The setback is determined from the edge of the feature.**

8. **Remedial Procedures.**

a. The City's biosolids hauler shall clean up any spillage of biosolids. The City shall consult with the ODEQ for appropriate methods of protecting public health and the environment for spills that cannot be completely cleaned up.

b. In the event an odor problem is reported to the City, its representative, or the ODEQ after biosolids has been land applied at the site, the best method to mitigate the odor concern will be determined jointly.

c. The ODEQ shall be notified within one hour, through the Oregon Emergency Response System (OERS), of any spills of more than ¼ cubic yards or other threats to the environment that may occur. All spills adjacent to drainage ditches or drainage ways should be reported. Failure to provide prompt notification may be considered cause for taking enforcement action against the City. The telephone number for OERS is 1.800.452.0311 (24-hr service).

9. Monitoring and Reporting.

a. **Soil Testing.** Soil testing for residual nitrate-nitrogen (NO_3-N) will occur as described under Condition 5.c. The ODEQ recommends routine soil testing for soil nutrients as well as the trace pollutants listed in Table 1 of 40 CFR §503.13 for fields receiving annual biosolids applications. The Department may require soil testing if adverse environmental impacts are suspected at the site.

b. **Site Records.** Daily site records of accumulated land applied biosolids will be maintained. Site records shall be recorded on field grid map or other readable system. Records shall indicate the date, location and quantity of biosolids applied; segments of each field that received biosolids; target plant available nitrogen (PAN) loading rate of the area receiving biosolids; and the type of crop grown. These records must be available to the ODEQ for review upon request. Regardless of the format in which written and mapped records are kept, they must be readily available in hardcopy format

c. **Annual Report.** By 19 February of each year, the City shall provide the ODEQ with an annual report of the previous year's biosolids processing and application activities, as required under the ODEQ rules (OAR 340-050-0035(6)). An annual report must be also be submitted to the United States Environmental Protection Agency (USEPA) Region 10.

10. Notification.

a. The City or its representatives shall promptly notify ODEQ of any major changes it intends to make to its biosolids processing activities that could influence biosolids quality or quantity before anticipated modifications are initiated, as described under Condition 11.c.

11. Additional Conditions.

a. The ODEQ shall have the right to: (i) enter (at reasonable times) the City's (or its representatives) place of biosolids land application and record keeping to review biosolids management operations and records; (ii) obtain copies of any records required under the terms of this authorization and the City's biosolids management plan; (iii) inspect any monitoring equipment required under this authorization; (iv) inspect any collection, transport, or land application vehicle; and (v) obtain any photographic documentation or evidence deemed appropriate.

b. This authorization is subject to revocation should health hazards, environmental degradation, or nuisance conditions develop as a result of inadequate biosolids treatment or site management.

c. Any variations from the City's approved biosolids management plan and this authorization letter must receive prior written approval from the ODEQ Northwest Region Office.

d. The ODEQ may amend this Site Authorization and impose any additional restrictions or conditions deemed necessary to protect environmental and human health.

This authorization is considered to be part of your approved biosolids management plan and is enforceable as part of your NPDES permit. Therefore, if operations are not conducted in accordance with terms specified under this authorization, the Department will initiate an enforcement action, which may lead to the assessment of a civil penalty. If you have any questions regarding the issues in this letter please call me at 503.229.5347 or contact me via email at schrandt.connie@deq.state.or.us.

Sincerely,

Connie M. Schrandt

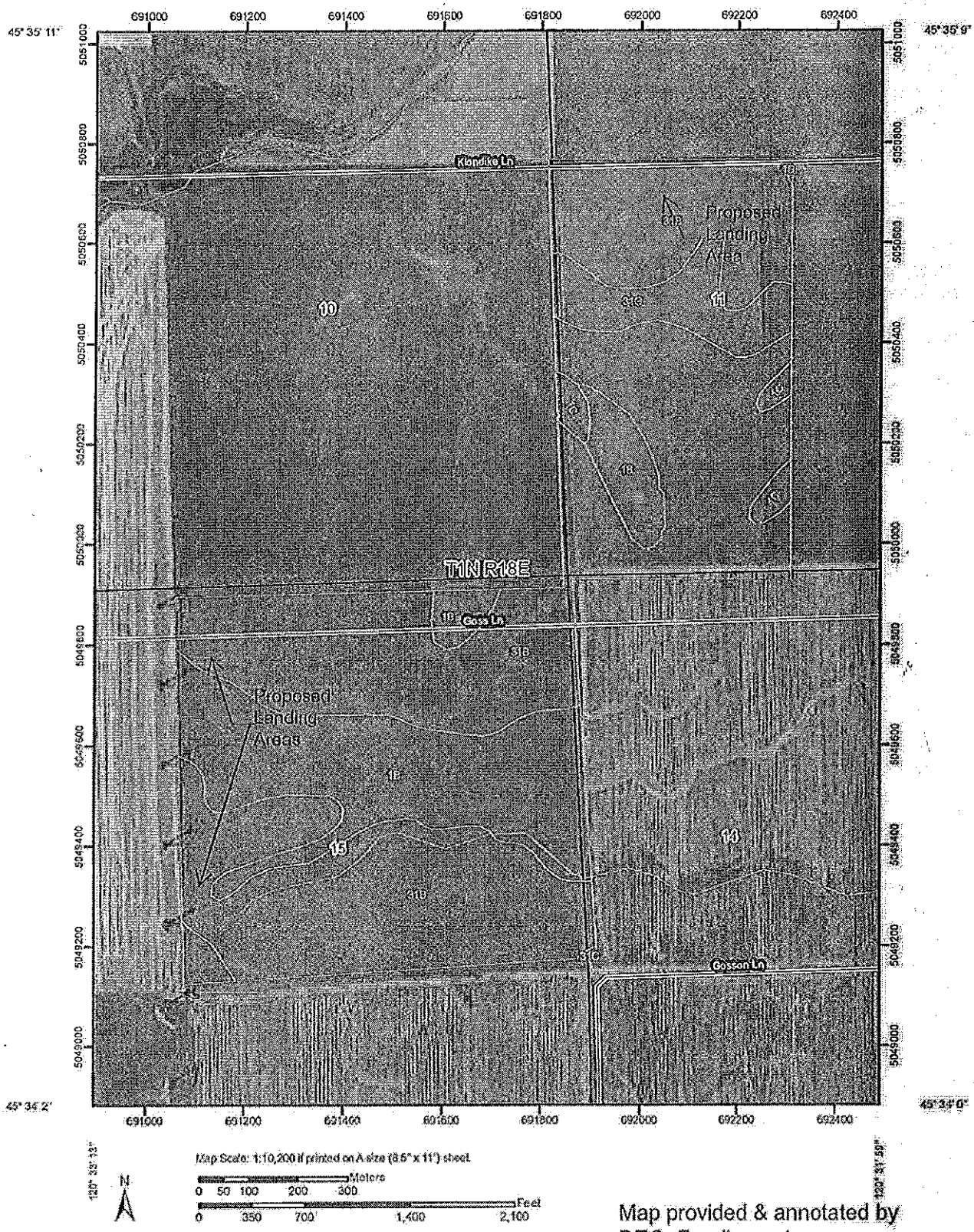
Connie M. Schrandt
Soils/Land Application Specialist
Northwest Region

Enc: Site Maps

Cc: Thomas Bros., c/o David P. Thomas, 3564 E 2nd, #61, The Dalles, OR 97058
Richard Hayes, P.O. Box 162, Wasco, OR 97065
Wasco Sherman Gilliam Public Health, 419 E. 7th Street, Room 100, The Dalles, OR 97058

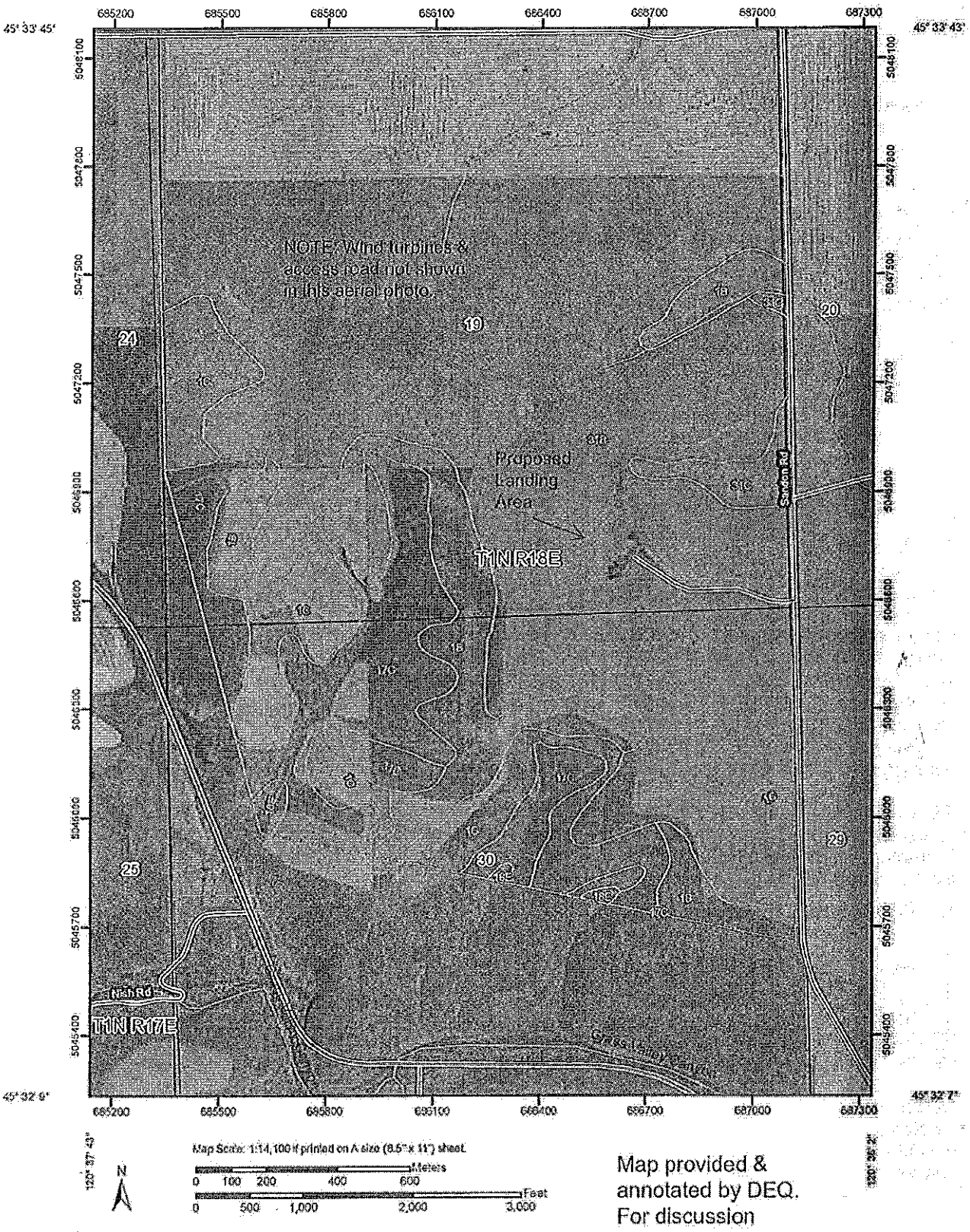
Ec: Ron Doughten, DEQ Biosolids Coordinator, ODEQ Headquarters (email)
Kent Madison, 29299 Madison Rd., Echo, OR 97826

SITE MAP - Thomas Bros. Unit 1
(NWR2010-30-BS)



Map provided & annotated by DEQ. For discussion purposes only.

SITE MAP - Thomas Bros. Unit 2 (NWR2010-30-BS)



Map provided & annotated by DEQ. For discussion purposes only.

Oregon
Theodore R. Kulongoski, Governor

Department of Environmental Quality
Northwest Region Portland Office/Water Quality
2020 SW 4th Avenue, Suite 400
Portland, OR 97201-4987
(503) 229-5263
FAX (503) 229-6957
OTRS 1-800-735-2900

October 27, 2010

IMPORTANT DOCUMENT
LAND APPLICATION AUTHORIZATION

Greg Charr, Biosolids Program Manager
Columbia Boulevard Wastewater Treatment Plant
City of Portland
5001 North Columbia Blvd.
Portland, OR 97201

Re: WQ-Multnomah County
Columbia Boulevard Wastewater Treatment Plant
NPDES Permit No. 100807; File No. 70725
Biosolids Land Application Authorization
Jon & Rob Simantel Site 1
TL 3700, Sec. 20, 21, 28 & 29, T1N, R18E,
Sherman County
Site ID: NWR2010-31-BS

Dear Mr. Charr:

On August 18, 2010, the Oregon Department of Environmental Quality (ODEQ or "the Department") received a request from the City of Portland Environmental Services ("the City") to land apply anaerobically-digested, dewatered cake biosolids produced by the City of Portland Columbia Boulevard Wastewater Treatment Facility (Columbia Blvd. WWTF) to properties located near Wasco, Oregon (see Table 1 and attached site map). The request included information characterizing soils, topography, biosolids, crop management, public notification and a signed agreement between the City and the property owner. **This authorization letter represents your approval to land apply biosolids to the referenced property. This authorization supersedes any previous authorization that may have been granted to the property and is valid only as part of your ODEQ-issued permit.**

Site Description. The property, owned by Stevens Family Farms LLC and farmed by Jon and Rob Simantel (dba J Bar S Ranch), is zoned as Exclusive Farm Use (EFU) and consists of one tax lot with fields managed for dryland small grain production on a 2-year crop/fallow rotation using conventional tillage. Adjacent property uses are also agricultural.

Table 1. The property reviewed for biosolids land application, located in Sherman Co., Oregon.

Township, Range, Section	Tax Lot(s)	Total Area (acres)	Spreadable Area† (acres)
T1N R18E S20, 21, 28 & 29	3700	1753.89	1349

†Spreadable acres do not reflect site-specific setback requirements. Actual acres spread may also vary slightly based upon site conditions at time of application.

ODEQ made an inspection of the property on September 15, 2010, to evaluate the suitability of the site for biosolids land application. I reviewed site geology, soils, hydrology, and topography, considered current and proposed land use and agricultural practices, and noted the locations of residences, wells and other sensitive site features. Appropriate setbacks for land application areas were also considered.

The site is located on upland benches or terraces above the Columbia River. The topography is generally gently undulating with slopes less than 10% intersected with broad swales and drainages that remain dry except during rare, extreme or prolonged storm events. Grass Valley Canyon crosses east to west near the southern boundary of the site. Soils at the site are composed of Walla Walla silt loam and Anderly silt loam or close variants, which is consistent with the NRCS soil maps for the area. Walla Walla soils are typically deep and well drained; Anderly soils are shallow (~30 in.) to basalt. Both soils are subject to erosion from surface runoff.

Three wells were identified in the vicinity of the site; two associated with home sites and a third associated with a 19-acre irrigated barley field that is not included in the area requested for biosolids applications. Wind turbines and associated access roads are also located within the boundaries of the site. These access roads will be utilized by biosolids hauler trucks for field ingress and egress. Five staging areas for interim biosolids storage are also proposed; two directly east of Sandon Rd. and three others located near the wind turbine access roads.

Based upon the site visit and review of supplemental information provided by the City, the property is approved for the land application of anaerobically-digested, dewatered cake biosolids produced by the Columbia Blvd. WWTF provided the following conditions are satisfied:

1. **Regulations, Rules, and Permit Requirements.** Biosolids processing and handling will comply with:
    a. Oregon biosolids and septage rules and guidelines (OAR 340-050);
    b. federal biosolids and septage regulations (40 CFR Part 503);
    c. the ODEQ-issued permit to the City of Portland, Columbia Blvd. WWTF (NPDES Permit No.100807; File No. 70725);
    d. the most recent ODEQ approved Biosolids Management Plan (last revised February 2009), including all subsequent amendments; and
    e. all other applicable federal and state statutes and rules.
2. **Treatment Processes.**
    a. Biosolids volatile solids content shall be reduced by 38% or more via anaerobic digestion prior to land application.
3. **Transportation.**
    a. Transportation of the biosolids to the land application site shall be done in accordance with the City of Portland Biosolids Management Plan.
4. **Land Application Activities.**
    a. The site is approved for the land application of biosolids by a side-discharge spreader or other similar manure-spreading equipment.
    b. Biosolids shall be applied evenly and thinly in a manner that will prevent ponding and runoff during and after precipitation events.
    c. When more than one operator conducts biosolids land application or completion of the biosolids application on a site is interrupted for more than one week, areas where biosolids have been applied must be clearly marked by flag pins or stakes which note the date when biosolids were last applied. This tracking method may be replaced by use of GPS equipment if it provides as accurate tracking. Written and mapped daily land application records must be maintained as described under Condition 9.b.
    d. Biosolids may be stored in the fields at the locations identified as "landings" on the site map for no more than 21 days prior to spreading. The quantity of biosolids in the storage locations may not exceed the agronomic loading rate for the field. For storage beyond 21 days, prior written request and ODEQ authorization is required.

e. Immediately following land application, the biosolids equipment operator shall clean off (at the application site) any equipment coated with biosolids to prevent biosolids from spilling onto public roadways.

5. Application Rates and Timing.

a. **Effective Date.** This authorization is effective **OCTOBER 27, 2010**.

b. **Application Period.** The site is approved for ***year-around*** land application of biosolids when field conditions allow for uniform application that will not result in ponding or runoff. Land application timing must be appropriate to the site's land management practices and must be managed to provide maximum benefit to crops grown on the site and minimize potential adverse environmental impacts.

c. **Application Rate.** Biosolids shall be applied at rates up to but not exceeding an agronomic loading limit appropriate to the crop being grown on the field after accounting for supplemental sources of nitrogen and losses as described under Conditions 5.e and 5.f. If other sources of nitrogen are used, the biosolids application rate must be reduced so that the other nitrogen sources in combination with the biosolids do not exceed the agronomic loading rate for the crop grown on the site.

The City has requested and is approved for field-specific agronomic loading limits that are based on crop yield goals (ranging from 30 to 60 bushels/acre) and on the nitrogen requirement factor for specific grain protein content goals (ranging from 9 to 13 percent), such as described in the OSU Field Guide 80 (FG80) – *Winter Wheat in Summer-Fallow Systems (Low Precipitation Zone)*. Crop yield goals will be provided by the farmers and will be based on historic yields from each field.

For each field that receives biosolids applications at field-specific agronomic loading rates during the year, the crop yield goal, the grain protein content goal (or nitrogen requirement factor), the amount of residual soil nitrogen, and both the calculated and actual plant available nitrogen (PAN) loading rates shall be included in the annual report described under Condition 9.c.

d. **Agronomic Rate Calculations.** Biosolids application rates will be calculated using one of the following: (i) the method approved in the ODEQ-approved Biosolids Management Plan; (ii) the method described in *Worksheet for Calculating Biosolids Application Rates in Agriculture*, published by the Oregon State University Extension Service, Publication No. PNW0511e (March 2007); or (iii) a more robust method such as that described in *Managing Nitrogen from Biosolids*, published by Washington State Department of Ecology and the Northwest Biosolids Management Association (April 1999). Any deviations from the methods and/or assumptions described in these publications must be pre-approved in writing by the ODEQ Northwest Region. (Updated versions of the aforementioned documents may be used at any time.)

e. **Routine Applications.** If biosolids applications exceed 2 out of 3 successive years at agronomic rates, the soils will be analyzed for residual nitrate-nitrogen (NO_3-N) before the next application. Agronomic application rates are to be adjusted for residual NO_3-N in the effective rooting zone.

f. **Supplemental N.** If other sources of nitrogen are applied to the fields (e.g., commercial, animal manure or green chop), the biosolids application rate must be reduced so that the supplemental nitrogen plus biosolids nitrogen does not exceed the agronomic application rate approved for this site.

g. **Changes.** Changes in biosolids characteristics, cropping practices, or general land management will necessitate appropriate adjustments in the application rate to maintain nitrogen applications consistent with crop demands. Major changes in any of the above must be communicated to the ODEQ's Northwest Region in writing before the changes are implemented.

6. **Site Restrictions.**

   a. **Wet Soils.** Care should be taken to avoid wet soil conditions at the time of application, particularly in concave areas.

   b. **Precipitation.** Biosolids land application shall cease when precipitation exceeds ¼ inch per hour or when one inch or more of precipitation occurs in a 24-hour period. Land application shall be withheld from the site for at least one day for every consecutive day of precipitation where a ¼ inch or one-inch per 24-hour precipitation event occurs.

   c. **General Public Access.** Access to the site by the general public shall be restricted for at least 12 months after biosolids land application has ceased.

   d. **Grazing.** A 30-day interval shall follow the application of biosolids prior to grazing livestock on any field or prior to the harvesting of crops that are to be fed to animals.

   e. **Wind.** Land application shall cease if wind speed is such that biosolids cannot be applied uniformly or would be thrown into buffer strips, waterways, roads, trails, or onto the application vehicle itself. Application may resume after wind speeds have decreased such that no significant blowing or drifting occurs.

   f. **Nuisance Conditions.** Biosolids land application shall cease when the potential exists for nuisance conditions or runoff beyond the approved areas.

   g. **Wind Farm Access.** Appropriate setbacks will be maintained from wind turbines and access roads (Condition 7). Restricted access to the fields by non-farm personnel associated with wind tower maintenance (or other activities) will be maintained for at least 30 days after land application has ceased. Signs will be posted at all potential access roads and will provide (at a minimum) the following information:

      i. identification of the field as a Biosolids Land Application site;

      ii. state that access is restricted for at least 30 days following the most recent land application event;

      iii. the date of the most recent land application event;

      iv. a requirement that non-farm personnel seeking access to the fields, after 30 days but less than 12 months following the most recent land application event, must be provided information on the biosolids land application activities; and

      v. contact information for the Columbia WWTF and/or the City's Columbia WWTF's representative.

   Individuals seeking access to the sites must be provided with information regarding biosolids land application activities; and, any questions and/or concerns they may have regarding exposure to biosolids must be addressed.

7. **Setbacks and Buffers.** Setbacks and buffers on the sites are listed in Table 3 and have also been identified in the attached site map(s).

Table 3. Site-specific setbacks for biosolids land application.

Feature	Setback[1] (ft.)
Property boundaries & private, unpaved roadways	10
Paved or graveled roadways & wind turbines	25
Residences and wells	200

[1]**The setback is determined from the edge of the feature.**

8. **Remedial Procedures.**

a. The City's biosolids hauler shall clean up any spillage of biosolids. The City shall consult with the ODEQ for appropriate methods of protecting public health and the environment for spills that cannot be completely cleaned up.

b. In the event an odor problem is reported to the City, its representative, or the ODEQ after biosolids has been land applied at the site, the best method to mitigate the odor concern will be determined jointly.

c. The ODEQ shall be notified within one hour, through the Oregon Emergency Response System (OERS), of any spills of more than ¼ cubic yards or other threats to the environment that may occur. All spills adjacent to drainage ditches or drainage ways should be reported. Failure to provide prompt notification may be considered cause for taking enforcement action against the City. The telephone number for OERS is 1.800.452.0311 (24-hr service).

9. Monitoring and Reporting.

a. **Soil Testing.** Soil testing for residual nitrate-nitrogen (NO_3-N) will occur as described under Condition 5.c. The ODEQ recommends routine soil testing for soil nutrients as well as the trace pollutants listed in Table 1 of 40 CFR §503.13 for fields receiving annual biosolids applications. The Department may require soil testing if adverse environmental impacts are suspected at the site.

b. **Site Records.** Daily site records of accumulated land applied biosolids will be maintained. Site records shall be recorded on field grid map or other readable system. Records shall indicate the date, location and quantity of biosolids applied; segments of each field that received biosolids; target plant available nitrogen (PAN) loading rate of the area receiving biosolids; and the type of crop grown. These records must be available to the ODEQ for review upon request. Regardless of the format in which written and mapped records are kept, they must be readily available in hardcopy format

c. **Annual Report.** By 19 February of each year, the City shall provide the ODEQ with an annual report of the previous year's biosolids processing and application activities, as required under the ODEQ rules (OAR 340-050-0035(6)). An annual report must be also be submitted to the United States Environmental Protection Agency (USEPA) Region 10.

10. Notification.

a. The City or its representatives shall promptly notify ODEQ of any major changes it intends to make to its biosolids processing activities that could influence biosolids quality or quantity before anticipated modifications are initiated, as described under Condition 11.c.

11. Additional Conditions.

a. The ODEQ shall have the right to: (i) enter (at reasonable times) the City's (or its representatives) place of biosolids land application and record keeping to review biosolids management operations and records; (ii) obtain copies of any records required under the terms of this authorization and the City's biosolids management plan; (iii) inspect any monitoring equipment required under this authorization; (iv) inspect any collection, transport, or land application vehicle; and (v) obtain any photographic documentation or evidence deemed appropriate.

b. This authorization is subject to revocation should health hazards, environmental degradation, or nuisance conditions develop as a result of inadequate biosolids treatment or site management.

c. Any variations from the City's approved biosolids management plan and this authorization letter must receive prior written approval from the ODEQ Northwest Region Office.

d. The ODEQ may amend this Site Authorization and impose any additional restrictions or conditions deemed necessary to protect environmental and human health.

This authorization is considered to be part of your approved biosolids management plan and is enforceable as part of your NPDES permit. Therefore, if operations are not conducted in accordance with terms specified under this authorization, the Department will initiate an enforcement action, which may lead to the assessment of a civil penalty. If you have any questions regarding the issues in this letter please call me at 503.229.5347 or contact me via email at schrandt.connie@deq.state.or.us.

Sincerely,

Connie M Schrandt

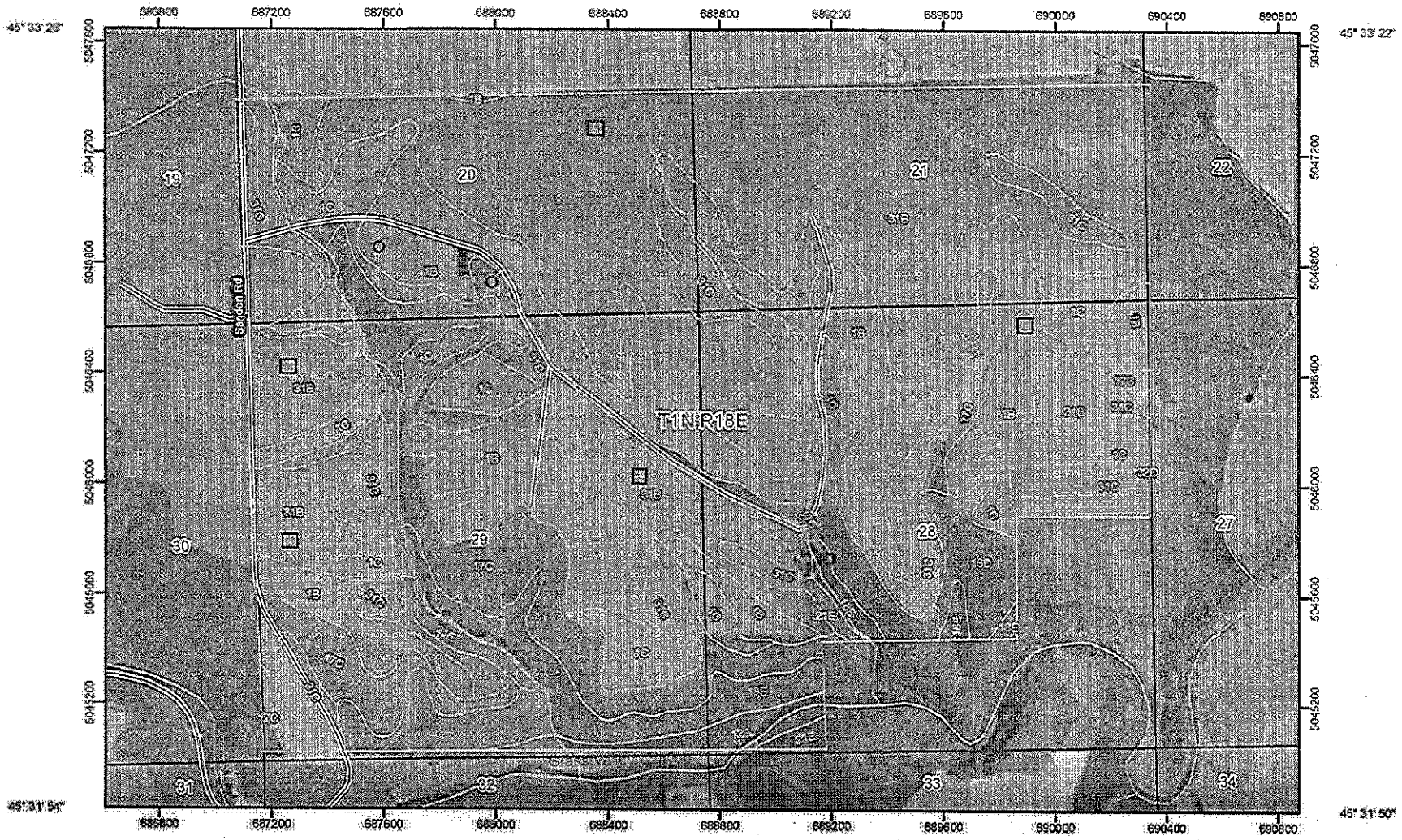
Connie M. Schrandt
Soils/Land Application Specialist
Northwest Region

Enc: Site Map

Cc: Stevens Family Farms LLC, P.O. Box 257, Husum, WA 98623
Jon & Rob Simantel dba J Bar S Ranch, P.O. Box 31, Wasco, OR 97065
Wasco Sherman Gilliam Public Health, 419 E. 7th Street, Room 100, The Dalles, OR 97058

Ec: Ron Doughten, DEQ Biosolids Coordinator, ODEQ Headquarters (email)
Kent Madison, 29299 Madison Rd., Echo, OR 97826

SITE MAP - Simantel Bros., Site 1 (NWR2010-31-BS)



USDA Natural Resources Conservation Service

□ - Proposed Landing Area

O - Well

Web Soil Survey
National Cooperative Soil Survey

Map provided & annotated by DEQ. For discussion purposes only.

Oregon
Theodore R. Kulongoski, Governor

Department of Environmental Quality
Northwest Region Portland Office/Water Quality
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October 27, 2010

IMPORTANT DOCUMENT
LAND APPLICATION AUTHORIZATION

Greg Charr, Biosolids Program Manager
Columbia Boulevard Wastewater Treatment Plant
City of Portland
5001 North Columbia Blvd.
Portland, OR 97201

Re: WQ-Multnomah County
Columbia Boulevard Wastewater Treatment Plant
NPDES Permit No. 100807; File No. 70725
Biosolids Land Application Authorization
Jon & Rob Simantel Site 2
TL's 1300, 1500, 1600 & 1900, Sec. 7, 8, 17 & 18, T1N, R19E,
Sherman County
Site ID: NWR2010-32-BS

Dear Mr. Charr:

On August 18, 2010, the Oregon Department of Environmental Quality (ODEQ or "the Department") received a request from the City of Portland Environmental Services ("the City") to land apply anaerobically-digested, dewatered cake biosolids produced by the City of Portland Columbia Boulevard Wastewater Treatment Facility (Columbia Blvd. WWTF) to properties located near Wasco, Oregon (see Table 1 and attached site map). The request included information characterizing soils, topography, biosolids, crop management, public notification and a signed agreement between the City and the property owner. **This authorization letter represents your approval to land apply biosolids to the referenced property. This authorization supersedes any previous authorization that may have been granted to the property and is valid only as part of your ODEQ-issued permit.**

Site Description. The property, owned by Stevens Family Farms LLC and farmed by Jon and Rob Simantel (dba J Bar S Ranch), is zoned as Exclusive Farm Use (EFU) and consists of four tax lots managed for dryland small grain production on a 2-year crop/fallow rotation using conventional tillage. Adjacent property uses are also agricultural.

Table 1. The property reviewed for biosolids land application, located in Sherman Co., Oregon.

Township, Range, Section	Tax Lot(s)	Total Area (acres)	Spreadable Area† (acres)
T1N R19E S7	1300	251.40	
T1N R19E S7 & 18	1500	158.76	
T1N R19E S7, 8 & 17	1600	347.38	
T1N R19E S8	1900	167.16	
Total Acres		**924.70**	**743**

†Spreadable acres do not reflect site-specific setback requirements. Actual acres spread may also vary slightly based upon site conditions at time of application.

ODEQ made an inspection of the property on September 15, 2010, to evaluate the suitability of the site for biosolids land application. I reviewed site geology, soils, hydrology, and topography, considered current and proposed land use and agricultural practices, and noted the locations of residences, wells and other sensitive site features. Appropriate setbacks for land application areas were also considered.

The site is located on upland benches or terraces above the Columbia River. The topography is generally gently undulating with slopes less than 10% intersected with broad swales and drainages that remain dry except during rare, extreme or prolonged storm events. Soils at the site are composed of Walla Walla silt loam and Anderly silt loam or close variants, which is consistent with the NRCS soil maps for the area. Walla Walla soils are typically deep and well drained; Anderly soils are shallow (~30 in.) to basalt. Both soils are subject to erosion from surface runoff.

No wells or residences were identified in the vicinity of the site. Several wind turbines and associated access or power line roads are located within the boundaries of the site and north of McDonald Ferry Lane along the east boundary of Tax Lot 1300. These access roads will be utilized by biosolids hauler trucks for field ingress and egress. Four staging areas for interim biosolids storage are also proposed; two directly south of McDonald Ferry Lane and one each on Tax Lots 1300 and 1900, respectively, directly off of existing wind power line roads.

Based upon the site visit and review of supplemental information provided by the City, the property is approved for the land application of anaerobically-digested, dewatered cake biosolids produced by the Columbia Blvd. WWTF provided the following conditions are satisfied:

1. **Regulations, Rules, and Permit Requirements.** Biosolids processing and handling will comply with:
    a. Oregon biosolids and septage rules and guidelines (OAR 340-050);
    b. federal biosolids and septage regulations (40 CFR Part 503);
    c. the ODEQ-issued permit to the City of Portland, Columbia Blvd. WWTF (NPDES Permit No.100807; File No. 70725);
    d. the most recent ODEQ approved Biosolids Management Plan (last revised February 2009), including all subsequent amendments; and
    e. all other applicable federal and state statutes and rules.
2. **Treatment Processes.**
    a. Biosolids volatile solids content shall be reduced by 38% or more via anaerobic digestion prior to land application.
3. **Transportation.**
    a. Transportation of the biosolids to the land application site shall be done in accordance with the City of Portland Biosolids Management Plan.
4. **Land Application Activities.**
    a. The site is approved for the land application of biosolids by a side-discharge spreader or other similar manure-spreading equipment.
    b. Biosolids shall be applied evenly and thinly in a manner that will prevent ponding and runoff during and after precipitation events.
    c. When more than one operator conducts biosolids land application or completion of the biosolids application on a site is interrupted for more than one week, areas where biosolids have been applied must be clearly marked by flag pins or stakes which note the date when biosolids were last applied. This tracking method may be replaced by use of GPS equipment if it provides as accurate tracking. Written and mapped daily land application records must be maintained as described under Condition 9.b.

d. Biosolids may be stored in the fields at the locations identified as "landings" on the site map for no more than 21 days prior to spreading. The quantity of biosolids in the storage locations may not exceed the agronomic loading rate for the field. For storage beyond 21 days, prior written request and ODEQ authorization is required.

e. Immediately following land application, the biosolids equipment operator shall clean off (at the application site) any equipment coated with biosolids to prevent biosolids from spilling onto public roadways.

5. Application Rates and Timing.

a. **Effective Date.** This authorization is effective **OCTOBER 27, 2010**.

b. **Application Period.** The site is approved for ***year-around*** land application of biosolids when field conditions allow for uniform application that will not result in ponding or runoff. Land application timing must be appropriate to the site's land management practices and must be managed to provide maximum benefit to crops grown on the site and minimize potential adverse environmental impacts.

c. **Application Rate.** Biosolids shall be applied at rates up to but not exceeding an agronomic loading limit appropriate to the crop being grown on the field after accounting for supplemental sources of nitrogen and losses as described under Conditions 5.e and 5.f. If other sources of nitrogen are used, the biosolids application rate must be reduced so that the other nitrogen sources in combination with the biosolids do not exceed the agronomic loading rate for the crop grown on the site.

The City has requested and is approved for field-specific agronomic loading limits that are based on crop yield goals (ranging from 30 to 60 bushels/acre) and on the nitrogen requirement factor for specific grain protein content goals (ranging from 9 to 13 percent), such as described in the OSU Field Guide 80 (FG80) – *Winter Wheat in Summer-Fallow Systems (Low Precipitation Zone)*. Crop yield goals will be provided by the farmers and will be based on historic yields from each field.

For each field that receives biosolids applications at field-specific agronomic loading rates during the year, the crop yield goal, the grain protein content goal (or nitrogen requirement factor), the amount of residual soil nitrogen, and both the calculated and actual plant available nitrogen (PAN) loading rates shall be included in the annual report described under Condition 9.c.

d. **Agronomic Rate Calculations.** Biosolids application rates will be calculated using one of the following: (i) the method approved in the ODEQ-approved Biosolids Management Plan; (ii) the method described in *Worksheet for Calculating Biosolids Application Rates in Agriculture*, published by the Oregon State University Extension Service, Publication No. PNW0511e (March 2007); or (iii) a more robust method such as that described in *Managing Nitrogen from Biosolids*, published by Washington State Department of Ecology and the Northwest Biosolids Management Association (April 1999). Any deviations from the methods and/or assumptions described in these publications must be pre-approved in writing by the ODEQ Northwest Region. (Updated versions of the aforementioned documents may be used at any time.)

e. **Routine Applications.** If biosolids applications exceed 2 out of 3 successive years at agronomic rates, the soils will be analyzed for residual nitrate-nitrogen (NO_3-N) before the next application. Agronomic application rates are to be adjusted for residual NO_3-N in the effective rooting zone.

f. **Supplemental N.** If other sources of nitrogen are applied to the fields (e.g., commercial, animal manure or green chop), the biosolids application rate must be reduced so that the supplemental nitrogen plus biosolids nitrogen does not exceed the agronomic application rate approved for this site.

g. **Changes.** Changes in biosolids characteristics, cropping practices, or general land management will necessitate appropriate adjustments in the application rate to maintain

nitrogen applications consistent with crop demands. Major changes in any of the above must be communicated to the ODEQ's Northwest Region in writing before the changes are implemented.

6. **Site Restrictions.**

   a. **Wet Soils.** Care should be taken to avoid wet soil conditions at the time of application, particularly in concave areas.

   b. **Precipitation.** Biosolids land application shall cease when precipitation exceeds ¼ inch per hour or when one inch or more of precipitation occurs in a 24-hour period. Land application shall be withheld from the site for at least one day for every consecutive day of precipitation where a ¼ inch or one-inch per 24-hour precipitation event occurs.

   c. **General Public Access.** Access to the site by the general public shall be restricted for at least 12 months after biosolids land application has ceased.

   d. **Grazing.** A 30-day interval shall follow the application of biosolids prior to grazing livestock on any field or prior to the harvesting of crops that are to be fed to animals.

   e. **Wind.** Land application shall cease if wind speed is such that biosolids cannot be applied uniformly or would be thrown into buffer strips, waterways, roads, trails, or onto the application vehicle itself. Application may resume after wind speeds have decreased such that no significant blowing or drifting occurs.

   f. **Nuisance Conditions.** Biosolids land application shall cease when the potential exists for nuisance conditions or runoff beyond the approved areas.

   g. **Wind Farm Access.** Appropriate setbacks will be maintained from wind turbines and access roads (Condition 7). Restricted access to the fields by non-farm personnel associated with wind tower maintenance (or other activities) will be maintained for at least 30 days after land application has ceased. Signs will be posted at all potential access roads and will provide (at a minimum) the following information:

      i. identification of the field as a Biosolids Land Application site;

      ii. state that access is restricted for at least 30 days following the most recent land application event;

      iii. the date of the most recent land application event;

      iv. a requirement that non-farm personnel seeking access to the fields, after 30 days but less than 12 months following the most recent land application event, must be provided information on the biosolids land application activities; and

      v. contact information for the Columbia WWTF and/or the City's Columbia WWTF's representative.

   Individuals seeking access to the sites must be provided with information regarding biosolids land application activities; and, any questions and/or concerns they may have regarding exposure to biosolids must be addressed.

7. **Setbacks and Buffers.** Setbacks and buffers on the sites are listed in Table 3 and have also been identified in the attached site map(s).

Table 3. Site-specific setbacks for biosolids land application.

Feature	Setback[1] (ft.)
Property boundaries & private, unpaved roadways	10
Paved or graveled roadways & wind turbines	25
Residences and wells	200

[1]**The setback is determined from the edge of the feature.**

8. **Remedial Procedures.**

a. The City's biosolids hauler shall clean up any spillage of biosolids. The City shall consult with the ODEQ for appropriate methods of protecting public health and the environment for spills that cannot be completely cleaned up.

b. In the event an odor problem is reported to the City, its representative, or the ODEQ after biosolids has been land applied at the site, the best method to mitigate the odor concern will be determined jointly.

c. The ODEQ shall be notified within one hour, through the Oregon Emergency Response System (OERS), of any spills of more than ¼ cubic yards or other threats to the environment that may occur. All spills adjacent to drainage ditches or drainage ways should be reported. Failure to provide prompt notification may be considered cause for taking enforcement action against the City. The telephone number for OERS is 1.800.452.0311 (24-hr service).

9. Monitoring and Reporting.

a. **Soil Testing.** Soil testing for residual nitrate-nitrogen (NO_3-N) will occur as described under Condition 5.c. The ODEQ recommends routine soil testing for soil nutrients as well as the trace pollutants listed in Table 1 of 40 CFR §503.13 for fields receiving annual biosolids applications. The Department may require soil testing if adverse environmental impacts are suspected at the site.

b. **Site Records.** Daily site records of accumulated land applied biosolids will be maintained. Site records shall be recorded on field grid map or other readable system. Records shall indicate the date, location and quantity of biosolids applied; segments of each field that received biosolids; target plant available nitrogen (PAN) loading rate of the area receiving biosolids; and the type of crop grown. These records must be available to the ODEQ for review upon request. Regardless of the format in which written and mapped records are kept, they must be readily available in hardcopy format

c. **Annual Report.** By 19 February of each year, the City shall provide the ODEQ with an annual report of the previous year's biosolids processing and application activities, as required under the ODEQ rules (OAR 340-050-0035(6)). An annual report must be also be submitted to the United States Environmental Protection Agency (USEPA) Region 10.

10. Notification.

a. The City or its representatives shall promptly notify ODEQ of any major changes it intends to make to its biosolids processing activities that could influence biosolids quality or quantity before anticipated modifications are initiated, as described under Condition 11.c.

11. Additional Conditions.

a. The ODEQ shall have the right to: (i) enter (at reasonable times) the City's (or its representatives) place of biosolids land application and record keeping to review biosolids management operations and records; (ii) obtain copies of any records required under the terms of this authorization and the City's biosolids management plan; (iii) inspect any monitoring equipment required under this authorization; (iv) inspect any collection, transport, or land application vehicle; and (v) obtain any photographic documentation or evidence deemed appropriate.

b. This authorization is subject to revocation should health hazards, environmental degradation, or nuisance conditions develop as a result of inadequate biosolids treatment or site management.

c. Any variations from the City's approved biosolids management plan and this authorization letter must receive prior written approval from the ODEQ Northwest Region Office.

d. The ODEQ may amend this Site Authorization and impose any additional restrictions or conditions deemed necessary to protect environmental and human health.

This authorization is considered to be part of your approved biosolids management plan and is enforceable as part of your NPDES permit. Therefore, if operations are not conducted in accordance with terms specified under this authorization, the Department will initiate an enforcement action, which may lead to the assessment of a civil penalty. If you have any questions regarding the issues in this letter please call me at 503.229.5347 or contact me via email at schrandt.connie@deq.state.or.us.

Sincerely,

Connie M. Schrandt

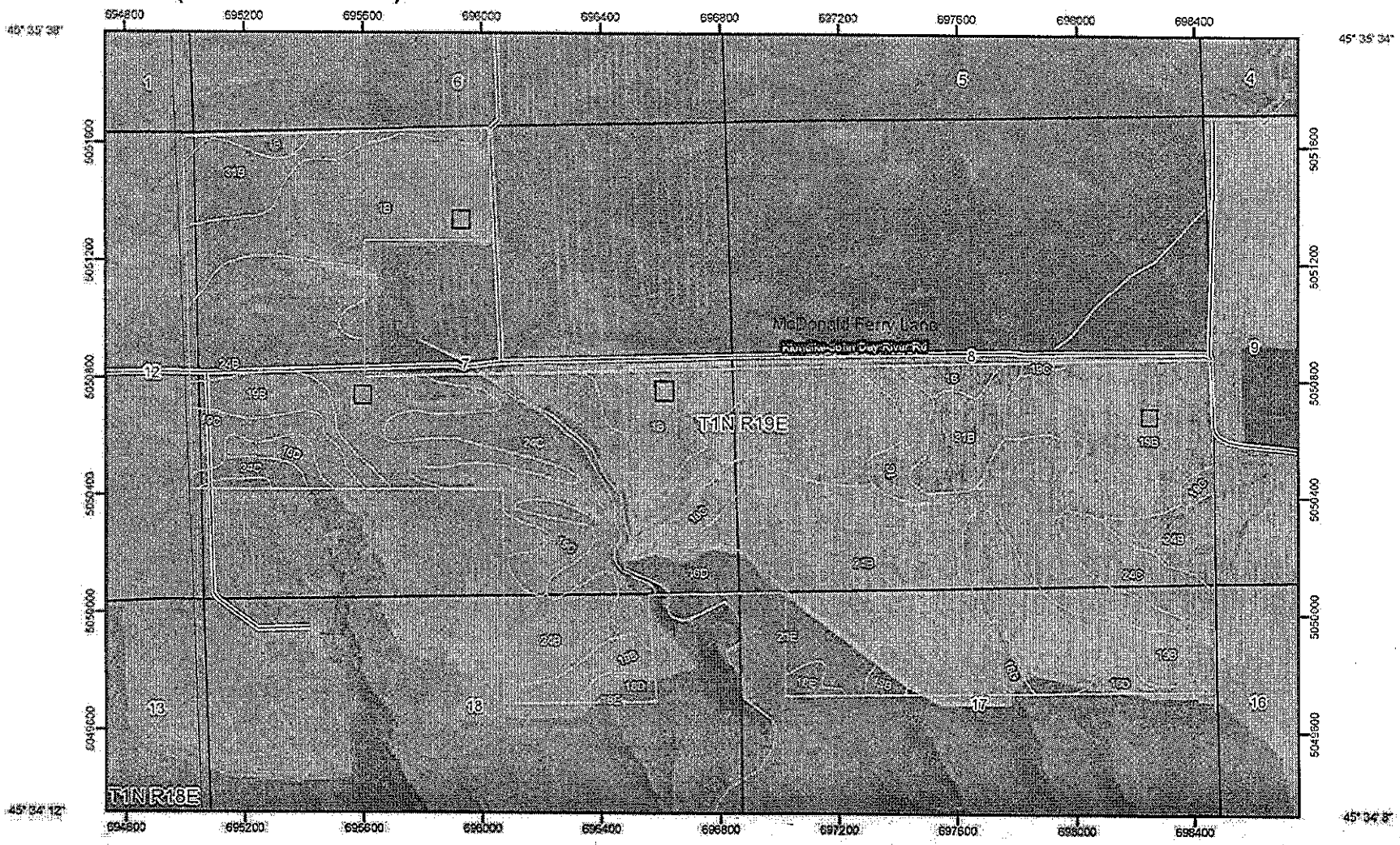
Connie M. Schrandt
Soils/Land Application Specialist
Northwest Region

Enc: Site Map

Cc: Stevens Family Farms LLC, P.O. Box 257, Husum, WA 98623
Jon & Rob Simantel dba J Bar S Ranch, P.O. Box 31, Wasco, OR 97065
Wasco Sherman Gilliam Public Health, 419 E. 7th Street, Room 100, The Dalles, OR 97058

Ec: Ron Doughten, DEQ Biosolids Coordinator, ODEQ Headquarters (email)
Kent Madison, 29299 Madison Rd., Echo, OR 97826

SITE MAP - Simantel Bros., Site 2
(NWR2010-32-BS)



Map Scale: 1:19,100 if printed on A size (8.5" x 11") sheet.

N

Meters: 0, 250, 500, 1,000, 1,500

Feet: 0, 1,000, 2,000, 4,000, 6,000

Map provided & annotated by DEQ.
For discussion purposes only.

USDA Natural Resources Conservation Service

☐ - Proposed Landing Area

Web Soil Survey
National Cooperative Soil Survey

Oregon
Theodore R. Kulongoski, Governor

Department of Environmental Quality
Northwest Region Portland Office/Water Quality
2020 SW 4th Avenue, Suite 400
Portland, OR 97201-4987
(503) 229-5263
FAX (503) 229-6957
OTRS 1-800-735-2900

October 27, 2010

IMPORTANT DOCUMENT
LAND APPLICATION AUTHORIZATION

Greg Charr, Biosolids Program Manager
Columbia Boulevard Wastewater Treatment Plant
City of Portland
5001 North Columbia Blvd.
Portland, OR 97201

Re: WQ-Multnomah County
Columbia Boulevard Wastewater Treatment Plant
NPDES Permit No. 100807; File No. 70725
Biosolids Land Application Authorization
Jon & Rob Simantel Site 3
TL 100, Sec. 1, T1N, R18E and
TL's 9300 & 9400, Sec. 36, T2N, R18E,
Sherman County
Site ID: NWR2010-33-BS

Dear Mr. Charr:

On August 18, 2010, the Oregon Department of Environmental Quality (ODEQ or "the Department") received a request from the City of Portland Environmental Services ("the City") to land apply anaerobically-digested, dewatered cake biosolids produced by the City of Portland Columbia Boulevard Wastewater Treatment Facility (Columbia Blvd. WWTF) to properties located near Wasco, Oregon (see Table 1 and attached site map). The request included information characterizing soils, topography, biosolids, crop management, public notification and a signed agreement between the City and the property owner. **This authorization letter represents your approval to land apply biosolids to the referenced property. This authorization supersedes any previous authorization that may have been granted to the property and is valid only as part of your ODEQ-issued permit.**

Site Description. The property, owned by Stevens Family Farms LLC and farmed by Jon and Rob Simantel (dba J Bar S Ranch), is zoned as Exclusive Farm Use (EFU) and consists of three tax lots managed for dryland small grain production on a 2-year crop/fallow rotation using conventional tillage. Adjacent property uses are also agricultural.

Table 1. The property reviewed for biosolids land application, located in Sherman Co., Oregon.

Township, Range, Section	Tax Lot(s)	Total Area (acres)	Spreadable Area† (acres)
T1N R18E S1	100	159.80	
T2N R18E S36	9300	312.72	
T2N R18E S36	9400	316.36	
Total Acres		**788.88**	**729**

†Spreadable acres do not reflect site-specific setback requirements. Actual acres spread may also vary slightly based upon site conditions at time of application.

ODEQ made an inspection of the property on September 15, 2010, to evaluate the suitability of the site for biosolids land application. I reviewed site geology, soils, hydrology, and topography, considered current and proposed land use and agricultural practices, and noted the locations of residences, wells and other sensitive site features. Appropriate setbacks for land application areas were also considered.

The site is located on upland benches or terraces above the Columbia River. The topography is generally gently undulating with slopes less than 10% intersected with broad swales and drainages that remain dry except during rare, extreme or prolonged storm events. Soils at the site are composed of Walla Walla silt loam and Anderly silt loam or close variants, which is consistent with the NRCS soil maps for the area. Walla Walla soils are typically deep and well drained; Anderly soils are shallow (~30 in.) to basalt. Both soils are subject to erosion from surface runoff.

No wells or residences were identified in the vicinity of the site. One row of wind turbines and an associated access or power line road are located north to south near the west boundary of Tax Lot 9300 and west of Tax Lot 100. These access roads will be utilized by biosolids hauler trucks for field ingress and egress. Two staging areas for interim biosolids storage are also proposed, one each on Tax Lot 9300 and 9400, respectively, and both directly north of Dehler Road.

Based upon the site visit and review of supplemental information provided by the City, the property is approved for the land application of anaerobically-digested, dewatered cake biosolids produced by the Columbia Blvd. WWTF provided the following conditions are satisfied:

1. **Regulations, Rules, and Permit Requirements.** Biosolids processing and handling will comply with:
    a. Oregon biosolids and septage rules and guidelines (OAR 340-050);
    b. federal biosolids and septage regulations (40 CFR Part 503);
    c. the ODEQ-issued permit to the City of Portland, Columbia Blvd. WWTF (NPDES Permit No.100807; File No. 70725);
    d. the most recent ODEQ approved Biosolids Management Plan (last revised February 2009), including all subsequent amendments; and
    e. all other applicable federal and state statutes and rules.
2. **Treatment Processes.**
    a. Biosolids volatile solids content shall be reduced by 38% or more via anaerobic digestion prior to land application.
3. **Transportation.**
    a. Transportation of the biosolids to the land application site shall be done in accordance with the City of Portland Biosolids Management Plan.
4. **Land Application Activities.**
    a. The site is approved for the land application of biosolids by a side-discharge spreader or other similar manure-spreading equipment.
    b. Biosolids shall be applied evenly and thinly in a manner that will prevent ponding and runoff during and after precipitation events.
    c. When more than one operator conducts biosolids land application or completion of the biosolids application on a site is interrupted for more than one week, areas where biosolids have been applied must be clearly marked by flag pins or stakes which note the date when biosolids were last applied. This tracking method may be replaced by use of GPS equipment if it provides as accurate tracking. Written and mapped daily land application records must be maintained as described under Condition 9.b.

d. Biosolids may be stored in the fields at the locations identified as "landings" on the site map for no more than 21 days prior to spreading. The quantity of biosolids in the storage locations may not exceed the agronomic loading rate for the field. For storage beyond 21 days, prior written request and ODEQ authorization is required.

e. Immediately following land application, the biosolids equipment operator shall clean off (at the application site) any equipment coated with biosolids to prevent biosolids from spilling onto public roadways.

5. Application Rates and Timing.

a. **Effective Date.** This authorization is effective **OCTOBER 27, 2010.**

b. **Application Period.** The site is approved for ***year-around*** land application of biosolids when field conditions allow for uniform application that will not result in ponding or runoff. Land application timing must be appropriate to the site's land management practices and must be managed to provide maximum benefit to crops grown on the site and minimize potential adverse environmental impacts.

c. **Application Rate.** Biosolids shall be applied at rates up to but not exceeding an agronomic loading limit appropriate to the crop being grown on the field after accounting for supplemental sources of nitrogen and losses as described under Conditions 5.e and 5.f. If other sources of nitrogen are used, the biosolids application rate must be reduced so that the other nitrogen sources in combination with the biosolids do not exceed the agronomic loading rate for the crop grown on the site.

The City has requested and is approved for field-specific agronomic loading limits that are based on crop yield goals (ranging from 30 to 60 bushels/acre) and on the nitrogen requirement factor for specific grain protein content goals (ranging from 9 to 13 percent), such as described in the OSU Field Guide 80 (FG80) – *Winter Wheat in Summer-Fallow Systems (Low Precipitation Zone)*. Crop yield goals will be provided by the farmers and will be based on historic yields from each field.

For each field that receives biosolids applications at field-specific agronomic loading rates during the year, the crop yield goal, the grain protein content goal (or nitrogen requirement factor), the amount of residual soil nitrogen, and both the calculated and actual plant available nitrogen (PAN) loading rates shall be included in the annual report described under Condition 9.c.

d. **Agronomic Rate Calculations.** Biosolids application rates will be calculated using one of the following: (i) the method approved in the ODEQ-approved Biosolids Management Plan; (ii) the method described in *Worksheet for Calculating Biosolids Application Rates in Agriculture*, published by the Oregon State University Extension Service, Publication No. PNW0511e (March 2007); or (iii) a more robust method such as that described in *Managing Nitrogen from Biosolids*, published by Washington State Department of Ecology and the Northwest Biosolids Management Association (April 1999). Any deviations from the methods and/or assumptions described in these publications must be pre-approved in writing by the ODEQ Northwest Region. (Updated versions of the aforementioned documents may be used at any time.)

e. **Routine Applications.** If biosolids applications exceed 2 out of 3 successive years at agronomic rates, the soils will be analyzed for residual nitrate-nitrogen (NO_3-N) before the next application. Agronomic application rates are to be adjusted for residual NO_3-N in the effective rooting zone.

f. **Supplemental N.** If other sources of nitrogen are applied to the fields (e.g., commercial, animal manure or green chop), the biosolids application rate must be reduced so that the supplemental nitrogen plus biosolids nitrogen does not exceed the agronomic application rate approved for this site.

g. **Changes.** Changes in biosolids characteristics, cropping practices, or general land management will necessitate appropriate adjustments in the application rate to maintain

nitrogen applications consistent with crop demands. Major changes in any of the above must be communicated to the ODEQ's Northwest Region in writing before the changes are implemented.

6. **Site Restrictions.**

   a. **Wet Soils.** Care should be taken to avoid wet soil conditions at the time of application, particularly in concave areas.

   b. **Precipitation.** Biosolids land application shall cease when precipitation exceeds ¼ inch per hour or when one inch or more of precipitation occurs in a 24-hour period. Land application shall be withheld from the site for at least one day for every consecutive day of precipitation where a ¼ inch or one-inch per 24-hour precipitation event occurs.

   c. **General Public Access.** Access to the site by the general public shall be restricted for at least 12 months after biosolids land application has ceased.

   d. **Grazing.** A 30-day interval shall follow the application of biosolids prior to grazing livestock on any field or prior to the harvesting of crops that are to be fed to animals.

   e. **Wind.** Land application shall cease if wind speed is such that biosolids cannot be applied uniformly or would be thrown into buffer strips, waterways, roads, trails, or onto the application vehicle itself. Application may resume after wind speeds have decreased such that no significant blowing or drifting occurs.

   f. **Nuisance Conditions.** Biosolids land application shall cease when the potential exists for nuisance conditions or runoff beyond the approved areas.

   g. **Wind Farm Access.** Appropriate setbacks will be maintained from wind turbines and access roads (Condition 7). Restricted access to the fields by non-farm personnel associated with wind tower maintenance (or other activities) will be maintained for at least 30 days after land application has ceased. Signs will be posted at all potential access roads and will provide (at a minimum) the following information:

      i. identification of the field as a Biosolids Land Application site;

      ii. state that access is restricted for at least 30 days following the most recent land application event;

      iii. the date of the most recent land application event;

      iv. a requirement that non-farm personnel seeking access to the fields, after 30 days but less than 12 months following the most recent land application event, must be provided information on the biosolids land application activities; and

      v. contact information for the Columbia WWTF and/or the City's Columbia WWTF's representative.

   Individuals seeking access to the sites must be provided with information regarding biosolids land application activities; and, any questions and/or concerns they may have regarding exposure to biosolids must be addressed.

7. **Setbacks and Buffers.** Setbacks and buffers on the sites are listed in Table 3 and have also been identified in the attached site map(s).

Table 3. Site-specific setbacks for biosolids land application.

Feature	Setback[1] (ft.)
Property boundaries & private, unpaved roadways	10
Paved or graveled roadways & wind turbines	25
Residences and wells	200

[1]**The setback is determined from the edge of the feature.**

8. **Remedial Proceduros.**

a. The City's biosolids hauler shall clean up any spillage of biosolids. The City shall consult with the ODEQ for appropriate methods of protecting public health and the environment for spills that cannot be completely cleaned up.

b. In the event an odor problem is reported to the City, its representative, or the ODEQ after biosolids has been land applied at the site, the best method to mitigate the odor concern will be determined jointly.

c. The ODEQ shall be notified within one hour, through the Oregon Emergency Response System (OERS), of any spills of more than ¼ cubic yards or other threats to the environment that may occur. All spills adjacent to drainage ditches or drainage ways should be reported. Failure to provide prompt notification may be considered cause for taking enforcement action against the City. The telephone number for OERS is 1.800.452.0311 (24-hr service).

9. Monitoring and Reporting.

a. **Soil Testing.** Soil testing for residual nitrate-nitrogen (NO_3-N) will occur as described under Condition 5.c. The ODEQ recommends routine soil testing for soil nutrients as well as the trace pollutants listed in Table 1 of 40 CFR §503.13 for fields receiving annual biosolids applications. The Department may require soil testing if adverse environmental impacts are suspected at the site.

b. **Site Records.** Daily site records of accumulated land applied biosolids will be maintained. Site records shall be recorded on field grid map or other readable system. Records shall indicate the date, location and quantity of biosolids applied; segments of each field that received biosolids; target plant available nitrogen (PAN) loading rate of the area receiving biosolids; and the type of crop grown. These records must be available to the ODEQ for review upon request. Regardless of the format in which written and mapped records are kept, they must be readily available in hardcopy format

c. **Annual Report.** By 19 February of each year, the City shall provide the ODEQ with an annual report of the previous year's biosolids processing and application activities, as required under the ODEQ rules (OAR 340-050-0035(6)). An annual report must be also be submitted to the United States Environmental Protection Agency (USEPA) Region 10.

10. Notification.

a. The City or its representatives shall promptly notify ODEQ of any major changes it intends to make to its biosolids processing activities that could influence biosolids quality or quantity before anticipated modifications are initiated, as described under Condition 11.c.

11. Additional Conditions.

a. The ODEQ shall have the right to: (i) enter (at reasonable times) the City's (or its representatives) place of biosolids land application and record keeping to review biosolids management operations and records; (ii) obtain copies of any records required under the terms of this authorization and the City's biosolids management plan; (iii) inspect any monitoring equipment required under this authorization; (iv) inspect any collection, transport, or land application vehicle; and (v) obtain any photographic documentation or evidence deemed appropriate.

b. This authorization is subject to revocation should health hazards, environmental degradation, or nuisance conditions develop as a result of inadequate biosolids treatment or site management.

c. Any variations from the City's approved biosolids management plan and this authorization letter must receive prior written approval from the ODEQ Northwest Region Office.

d. The ODEQ may amend this Site Authorization and impose any additional restrictions or conditions deemed necessary to protect environmental and human health.

This authorization is considered to be part of your approved biosolids management plan and is enforceable as part of your NPDES permit. Therefore, if operations are not conducted in accordance with terms specified under this authorization, the Department will initiate an enforcement action, which may lead to the assessment of a civil penalty. If you have any questions regarding the issues in this letter please call me at 503.229.5347 or contact me via email at schrandt.connie@deq.state.or.us.

Sincerely,

Connie M Schrandt

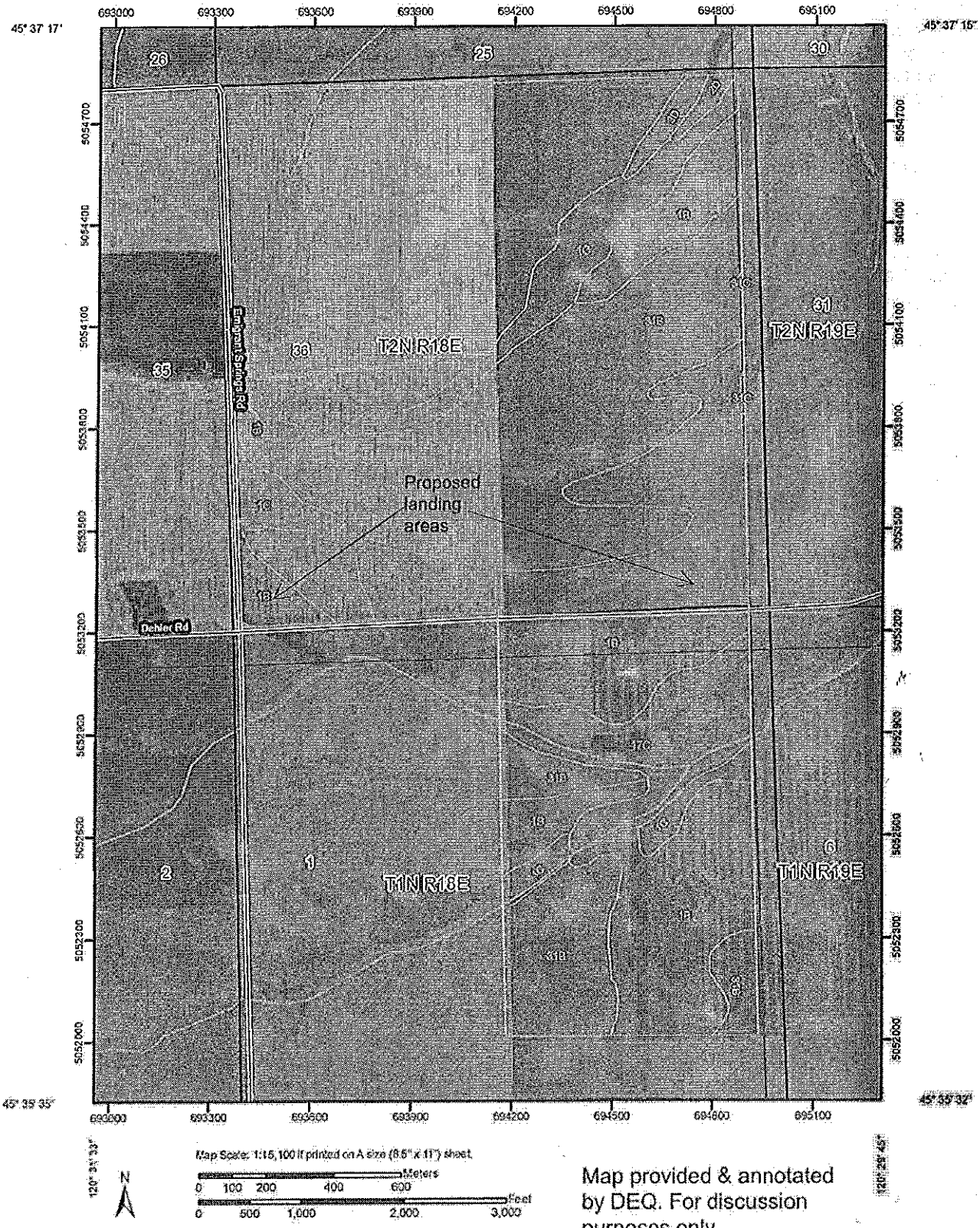
Connie M. Schrandt
Soils/Land Application Specialist
Northwest Region

Enc: Site Map

Cc: Stevens Family Farms LLC, P.O. Box 257, Husum, WA 98623
Jon & Rob Simantel dba J Bar S Ranch, P.O. Box 31, Wasco, OR 97065
Wasco Sherman Gilliam Public Health, 419 E. 7th Street, Room 100, The Dalles, OR 97058

Ec: Ron Doughten, DEQ Biosolids Coordinator, ODEQ Headquarters (email)
Kent Madison, 29299 Madison Rd., Echo, OR 97826

SITE MAP - Simantel Bros., Site 3 (NWR2010-33-BS)



Map provided & annotated by DEQ. For discussion purposes only.

Oregon
Theodore R. Kulongoski, Governor

Department of Environmental Quality
Northwest Region Portland Office/Water Quality
2020 SW 4th Avenue, Suite 400
Portland, OR 97201-4987
(503) 229-5263
FAX (503) 229-6957
OTRS 1-800-735-2900

October 13, 2010

Greg Charr, Biosolids Program Manager
Columbia Boulevard Wastewater Treatment Plant
City of Portland
5001 North Columbia Blvd.
Portland, OR 97204

Re: WQ- Multnomah County
Columbia Boulevard WWTP, City of Portland
NPDES Permit No. 100807; File No. 70725
Biosolids Land Application Amendment to 2010 Site Authorizations -
Simantel, Hildebrand, Weedman and McGregor Sites, Sherman County
Site ID's: NWR2010-13-BS, NWR2010-23-BS, NWR2010-26-BS & NWR2010-27-BS

Dear Mr. Charr:

At your request, via email dated August 12, 2010, and as submitted to the Department of Environmental Quality (the Department) Northwest Region office on August 27, 2010, the above-described site authorizations issued in 2010 are hereby amended to allow agronomic loading limits to be determined on a field-specific basis using crop yield goals (ranging from 30 to 60 bushels/acre) and nitrogen requirement factors for grain protein content goals (ranging from 9 to 13 percent) such as described in the OSU Field Guide 80 (FG80) – *Winter Wheat in Summer-Fallow Systems (Low Precipitation Zone)*. Crop yield goals will be provided by the farmers and will be based on historic yields from each field.

For each field that receives biosolids at field-specific agronomic loading rates, the annual report required under Oregon Administrative Rules (OAR) 340-50-0035(c)(6) shall include the crop yield and grain protein content goals, the amount of residual nitrogen-nitrogen in the soil, and the calculated and actual plant available nitrogen (PAN) loading rates of biosolids received.

All other applicable requirements of the site authorizations for Roland Simantel dated June 1, 2010, Randy Hilderbrand dated July 27, 2010, Guy Weedman dated July 28, 2010 and Richard McGregor dated August 5, 2010; the City of Portland Biosolids Management Plan and the current federal and state regulations (40 CFR Part 503 and Chapter 340 Division 50, respectively) remain in effect.

This amendment is subject to revocation should health hazards, environmental degradation, or nuisance conditions develop as a result of inadequate biosolids treatment or site management. The Department may further amend these site authorizations and impose any additional restrictions or conditions deemed necessary to protect environmental and human health.

If you have any questions regarding this site authorization amendment, please contact me at 503.229.5347, or via email at schrandt.connie@deq.state.or.us.
Sincerely,

Connie M. Schrandt

Connie M. Schrandt
Soils/Land Application Specialist
Northwest Region

cc: Jon & Rob Simantel, P.O. Box 31, Wasco, OR 97065
Randy Hilderbrand, P.O. Box 326, Wasco, OR 97065
Guy Weedman, Weedman Ranches, Inc., P.O. Box 376, Wasco, OR 97065
Richard McGregor, 10242 SE Walnut Dr., Portland, OR 97086
Wasco Sherman Gilliam Public Health, 419 E. 7th Street, Room 100, The Dalles, OR 97058

Ec: Ron Doughten, Biosolids Coordinator, DEQ-HQ
Kent Madison, K&S Madison, Inc.

Oregon
Theodore R. Kulongoski, Governor

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October 13, 2010

IMPORTANT DOCUMENT
LAND APPLICATION AUTHORIZATION

Greg Charr, Biosolids Program Manager
Columbia Boulevard Wastewater Treatment Plant
City of Portland
5001 North Columbia Blvd.
Portland, OR 97201

Re: WQ-Multnomah County
Columbia Boulevard Wastewater Treatment Plant
NPDES Permit No. 100807; File No. 70725
Biosolids Land Application Authorization
David Pinkerton Sites 1, 2 & 3
TL's 6500, 6600 & 6700, Sec. 29, T1N, R17E,
TL's 7300, 7301, 7400 & 7500, Sec. 32, T1N, R17E,
TL 7600, Sec. 33, T1N, R17E, and
TL's 1300 & 1500, Sec. 4, T1S, R17E, Sherman County
Site ID: NWR2010-24-BS

Dear Mr. Charr:

On June 8, 2010, the Oregon Department of Environmental Quality (ODEQ or "the Department") received a request from Kennedy-Jenks Consultants on behalf of the City of Portland ("the City") to land apply anaerobically-digested, dewatered cake biosolids produced by the City of Portland Columbia Boulevard Wastewater Treatment Facility (Columbia Blvd. WWTF) to properties located near Wasco, Oregon (see Table 1 and attached site maps). The request included information characterizing soils, topography, biosolids, crop management, public notification and a signed agreement between the City and the property owner. **This authorization letter represents your approval to land apply biosolids to the referenced property. This authorization supersedes any previous authorization that may have been granted to the property and is valid only as part of your ODEQ-issued permit.**

Site Description. The property, owned and farmed by David Pinkerton, is zoned as Exclusive Farm Use (EFU) and consists of three fields managed in no-till for soft white winter wheat and other dryland small grain production on a 2-year rotation of planting/harvesting/chem fallow, and a small area (40 acres) planted in grasses for the Conservation Reserve Program (CRP). Adjacent property uses are also agricultural.

Table 1. The property reviewed for biosolids land application, located in Sherman Co., Oregon.

Site ID	Township, Range, Section	Tax Lot(s)	Total Area (acres)	Spreadable Area† (acres)
1	T1N R17E S32 and T1N R17E S29	7300, 7301, 7400, 7500 and 6500, 6600, 6700	634.36	634.36
2	T1N R17E S4	1300, 1500	559.91	559.91
3	T1N R17E S33	7600	218.32	218.32
Total Acres			1412.59	

†Spreadable acres do not reflect site-specific setback requirements. Actual acres spread may also vary slightly based upon site conditions at time of application.

ODEQ made an inspection of the property on September 15, 2010, to evaluate the suitability of the site for biosolids land application. I reviewed site geology, soils, hydrology, and topography, considered current and proposed land use and agricultural practices, and noted the locations of residences, wells and other sensitive site features. Appropriate setbacks for land application areas were also considered.

The site is located on upland benches or terraces above the Columbia River. The topography is generally gently undulating with slopes less than 10% intersected with broad swales and drainages that remain dry except during rare, extreme or prolonged storm events. Soils at the site are composed of Walla Walla silt loam and Anderly silt loam or close variants, which is consistent with the NRCS soil maps for the area. Walla Walla soils are typically deep and well drained; Anderly soils are shallow (~30 in.) to basalt. Both soils are subject to erosion from surface runoff.

One well associated with the Pinkerton home site was identified in the vicinity of Site 2. No other wells, residences or other features were identified. A wind farm development with wind turbines and access roads is planned in the vicinity that will facilitate ingress and egress for the biosolids hauler trucks. Until development of these roads is complete, the site will be accessed from US Hwy 97 and existing county roads. Staging areas for interim biosolids storage are also proposed; one associated with each of the 3 fields.

Based upon the site visit and review of supplemental information provided by Consultants and the City, the property is approved for the land application of anaerobically-digested, dewatered cake biosolids produced by the Columbia Blvd. WWTF provided the following conditions are satisfied:

1. **Regulations, Rules, and Permit Requirements.** Biosolids processing and handling will comply with:
    a. Oregon biosolids and septage rules and guidelines (OAR 340-050);
    b. federal biosolids and septage regulations (40 CFR Part 503);
    c. the ODEQ-issued permit to the City of Portland, Columbia Blvd. WWTF (NPDES Permit No.100807; File No. 70725);
    d. the most recent ODEQ approved Biosolids Management Plan (last revised February 2009), including all subsequent amendments; and
    e. all other applicable federal and state statutes and rules.
2. **Treatment Processes.**
    a. Biosolids volatile solids content shall be reduced by 38% or more via anaerobic digestion prior to land application.
3. **Transportation.**
    a. Transportation of the biosolids to the land application site shall be done in accordance with the City of Portland Biosolids Management Plan.
4. **Land Application Activities.**
    a. The site is approved for the land application of biosolids by a side-discharge spreader or other similar manure-spreading equipment.
    b. Biosolids shall be applied evenly and thinly in a manner that will prevent ponding and runoff during and after precipitation events.
    c. When more than one operator conducts biosolids land application or completion of the biosolids application on a site is interrupted for more than one week, areas where biosolids have been applied must be clearly marked by flag pins or stakes which note the date when biosolids were last applied. This tracking method may be replaced by use of GPS equipment if it provides as accurate tracking. Written and mapped daily land application records must be maintained as described under Condition 9.b.

d. Biosolids may be stored in the fields at the locations identified as "landings" on the site map for no more than 21 days prior to spreading. The quantity of biosolids in the storage locations may not exceed the agronomic loading rate for the field. For storage beyond 21 days, prior written request and ODEQ authorization is required.

e. Immediately following land application, the biosolids equipment operator shall clean off (at the application site) any equipment coated with biosolids to prevent biosolids from spilling onto public roadways.

5. Application Rates and Timing.

a. **Effective Date.** This authorization is effective **OCTOBER 13, 2010**.

b. **Application Period.** The site is approved for ***year-around*** land application of biosolids when field conditions allow for uniform application that will not result in ponding or runoff. Land application timing must be appropriate to the site's land management practices and must be managed to provide maximum benefit to crops grown on the site and minimize potential adverse environmental impacts.

c. **Application Rate.** Biosolids shall be applied at rates up to but not exceeding an agronomic loading limit appropriate to the crop being grown on the field after accounting for supplemental sources of nitrogen and losses as described under Conditions 5.e and 5.f. If other sources of nitrogen are used, the biosolids application rate must be reduced so that the other nitrogen sources in combination with the biosolids do not exceed the agronomic loading rate for the crop grown on the site.

The City has requested and is approved for field-specific agronomic loading limits that are based on crop yield goals (ranging from 30 to 60 bushels/acre) and on the nitrogen requirement factor for specific grain protein content goals (ranging from 9 to 13 percent), such as described in the OSU Field Guide 80 (FG80) – *Winter Wheat in Summer-Fallow Systems (Low Precipitation Zone)*. Crop yield goals will be provided by the farmers and will be based on historic yields from each field.

For each field that receives biosolids applications at field-specific agronomic loading rates during the year, the crop yield goal, the grain protein content goal (or nitrogen requirement factor), the amount of residual soil nitrogen, and both the calculated and actual plant available nitrogen (PAN) loading rates shall be included in the annual report described under Condition 9.c.

d. **Agronomic Rate Calculations.** Biosolids application rates will be calculated using one of the following: (i) the method approved in the ODEQ-approved Biosolids Management Plan; (ii) the method described in *Worksheet for Calculating Biosolids Application Rates in Agriculture*, published by the Oregon State University Extension Service, Publication No. PNW0511e (March 2007); or (iii) a more robust method such as that described in *Managing Nitrogen from Biosolids*, published by Washington State Department of Ecology and the Northwest Biosolids Management Association (April 1999). Any deviations from the methods and/or assumptions described in these publications must be pre-approved in writing by the ODEQ Northwest Region. (Updated versions of the aforementioned documents may be used at any time.)

e. **Routine Applications.** If biosolids applications exceed 2 out of 3 successive years at agronomic rates, the soils will be analyzed for residual nitrate-nitrogen (NO_3-N) before the next application. Agronomic application rates are to be adjusted for residual NO_3-N in the effective rooting zone.

f. **Supplemental N.** If other sources of nitrogen are applied to the fields (e.g., commercial, animal manure or green chop), the biosolids application rate must be reduced so that the supplemental nitrogen plus biosolids nitrogen does not exceed the agronomic application rate approved for this site.

g. **Changes.** Changes in biosolids characteristics, cropping practices, or general land management will necessitate appropriate adjustments in the application rate to maintain

nitrogen applications consistent with crop demands. Major changes in any of the above must be communicated to the ODEQ's Northwest Region in writing before the changes are implemented.

6. **Site Restrictions.**

   a. **Wet Soils.** Care should be taken to avoid wet soil conditions at the time of application, particularly in concave areas.

   b. **Precipitation.** Biosolids land application shall cease when precipitation exceeds ¼ inch per hour or when one inch or more of precipitation occurs in a 24-hour period. Land application shall be withheld from the site for at least one day for every consecutive day of precipitation where a ¼ inch or one-inch per 24-hour precipitation event occurs.

   c. **General Public Access.** Access to the site by the general public shall be restricted for at least 12 months after biosolids land application has ceased.

   d. **Grazing.** A 30-day interval shall follow the application of biosolids prior to grazing livestock on any field or prior to the harvesting of crops that are to be fed to animals.

   e. **Wind.** Land application shall cease if wind speed is such that biosolids cannot be applied uniformly or would be thrown into buffer strips, waterways, roads, trails, or onto the application vehicle itself. Application may resume after wind speeds have decreased such that no significant blowing or drifting occurs.

   f. **Nuisance Conditions.** Biosolids land application shall cease when the potential exists for nuisance conditions or runoff beyond the approved areas.

   g. **Wind Farm Access.** Appropriate setbacks will be maintained from wind turbines and access roads (Condition 7). Restricted access to the fields by non-farm personnel associated with wind tower maintenance (or other activities) will be maintained for at least 30 days after land application has ceased. Signs will be posted at all potential access roads and will provide (at a minimum) the following information:

      i. identification of the field as a Biosolids Land Application site;

      ii. state that access is restricted for at least 30 days following the most recent land application event;

      iii. the date of the most recent land application event;

      iv. a requirement that non-farm personnel seeking access to the fields, after 30 days but less than 12 months following the most recent land application event, must be provided information on the biosolids land application activities; and

      v. contact information for the Columbia WWTF and/or the City's Columbia WWTF's representative.

   Individuals seeking access to the sites must be provided with information regarding biosolids land application activities; and, any questions and/or concerns they may have regarding exposure to biosolids must be addressed.

7. **Setbacks and Buffers.** Setbacks and buffers on the sites are listed in Table 3 and have also been identified in the attached site map(s).

Table 3. Site-specific setbacks for biosolids land application.

Feature	Setback[1] (ft.)
Property boundaries & private, unpaved roadways	10
Paved or graveled roadways & wind turbines	25
Residences and wells	200

[1]**The setback is determined from the edge of the feature.**

8. **Remedial Procedures.**

a. The City's biosolids hauler shall clean up any spillage of biosolids. The City shall consult with the ODEQ for appropriate methods of protecting public health and the environment for spills that cannot be completely cleaned up.

b. In the event an odor problem is reported to the City, its representative, or the ODEQ after biosolids has been land applied at the site, the best method to mitigate the odor concern will be determined jointly.

c. The ODEQ shall be notified within one hour, through the Oregon Emergency Response System (OERS), of any spills of more than ¼ cubic yards or other threats to the environment that may occur. All spills adjacent to drainage ditches or drainage ways should be reported. Failure to provide prompt notification may be considered cause for taking enforcement action against the City. The telephone number for OERS is 1.800.452.0311 (24-hr service).

9. Monitoring and Reporting.

a. **Soil Testing.** Soil testing for residual nitrate-nitrogen (NO_3-N) will occur as described under Condition 5.c. The ODEQ recommends routine soil testing for soil nutrients as well as the trace pollutants listed in Table 1 of 40 CFR §503.13 for fields receiving annual biosolids applications. The Department may require soil testing if adverse environmental impacts are suspected at the site.

b. **Site Records.** Daily site records of accumulated land applied biosolids will be maintained. Site records shall be recorded on field grid map or other readable system. Records shall indicate the date, location and quantity of biosolids applied; segments of each field that received biosolids; target plant available nitrogen (PAN) loading rate of the area receiving biosolids; and the type of crop grown. These records must be available to the ODEQ for review upon request. Regardless of the format in which written and mapped records are kept, they must be readily available in hardcopy format

c. **Annual Report.** By 19 February of each year, the City shall provide the ODEQ with an annual report of the previous year's biosolids processing and application activities, as required under the ODEQ rules (OAR 340-050-0035(6)). An annual report must be also be submitted to the United States Environmental Protection Agency (USEPA) Region 10.

10. Notification.

a. The City or its representatives shall promptly notify ODEQ of any major changes it intends to make to its biosolids processing activities that could influence biosolids quality or quantity before anticipated modifications are initiated, as described under Condition 11.c.

11. Additional Conditions.

a. The ODEQ shall have the right to: (i) enter (at reasonable times) the City's (or its representatives) place of biosolids land application and record keeping to review biosolids management operations and records; (ii) obtain copies of any records required under the terms of this authorization and the City's biosolids management plan; (iii) inspect any monitoring equipment required under this authorization; (iv) inspect any collection, transport, or land application vehicle; and (v) obtain any photographic documentation or evidence deemed appropriate.

b. This authorization is subject to revocation should health hazards, environmental degradation, or nuisance conditions develop as a result of inadequate biosolids treatment or site management.

c. Any variations from the City's approved biosolids management plan and this authorization letter must receive prior written approval from the ODEQ Northwest Region Office.

d. The ODEQ may amend this Site Authorization and impose any additional restrictions or conditions deemed necessary to protect environmental and human health.

This authorization is considered to be part of your approved biosolids management plan and is enforceable as part of your NPDES permit. Therefore, if operations are not conducted in accordance with terms specified under this authorization, the Department will initiate an enforcement action, which may lead to the assessment of a civil penalty. If you have any questions regarding the issues in this letter please call me at 503.229.5347 or contact me via email at schrandt.connie@deq.state.or.us.

Sincerely,

Connie M. Schrandt

Connie M. Schrandt
Soils/Land Application Specialist
Northwest Region

Enc: Site Maps

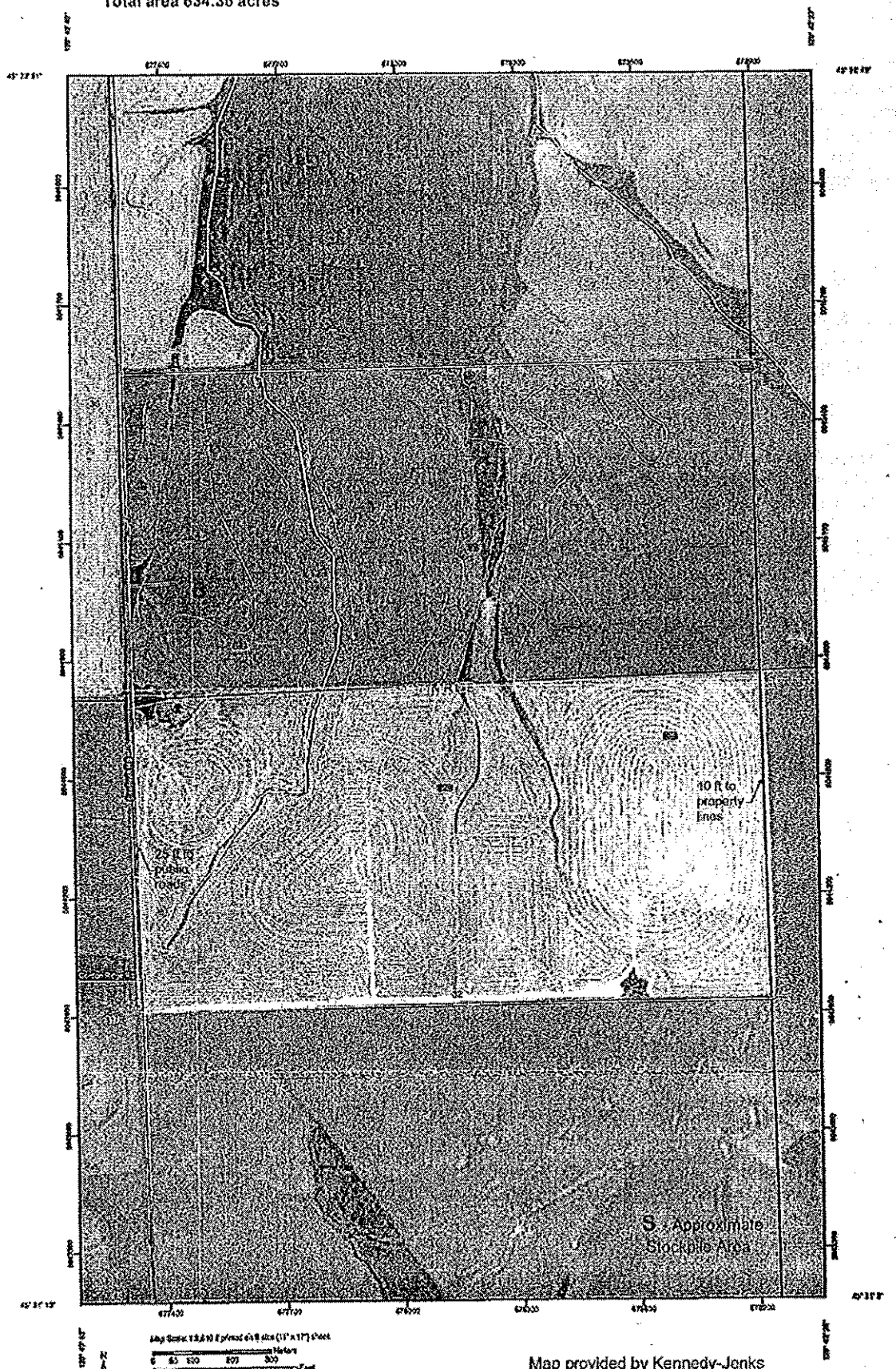
Cc: Dave Pinkerton, P.O. Box 302, Moro, OR 97039
Wasco Sherman Gilliam Public Health, 419 E. 7th Street, Room 100, The Dalles, OR 97058
Wasco County Farm Service Agency, 2325 River Rd., Suite 3, The Dalles, OR 97058

Ec: Ron Doughten, DEQ Biosolids Coordinator, ODEQ Headquarters
Mark Cullington, Kennedy-Jenks Consultants
Kent Madison, K&S Madison, Inc.

SITE MAP - David Pinkerton Site 1 (NWR2010-24-BS)

Total area 634.36 acres

Soil Map—Sherman County, Oregon



Map provided by Kennedy-Jenks Consultants; annotated by DEQ for discussion purposes only.

USDA Natural Resources Conservation Service

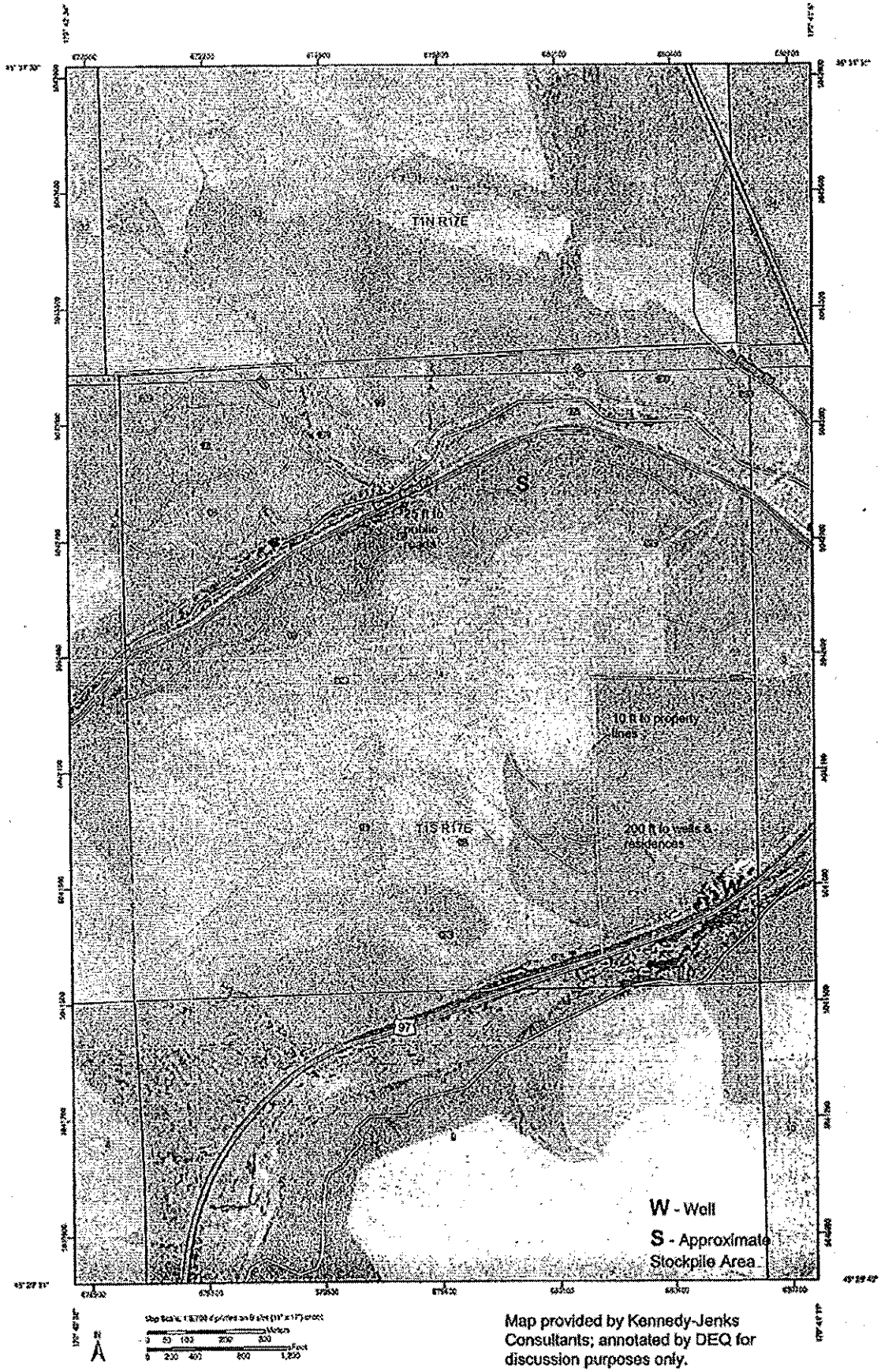
Web Soil Survey
National Cooperative Soil Survey

3/10/2010
Page 1 of 3

SITE MAP - David Pinkerton Site 2 (NWR2010-24-BS)

Total area 559.61 acres

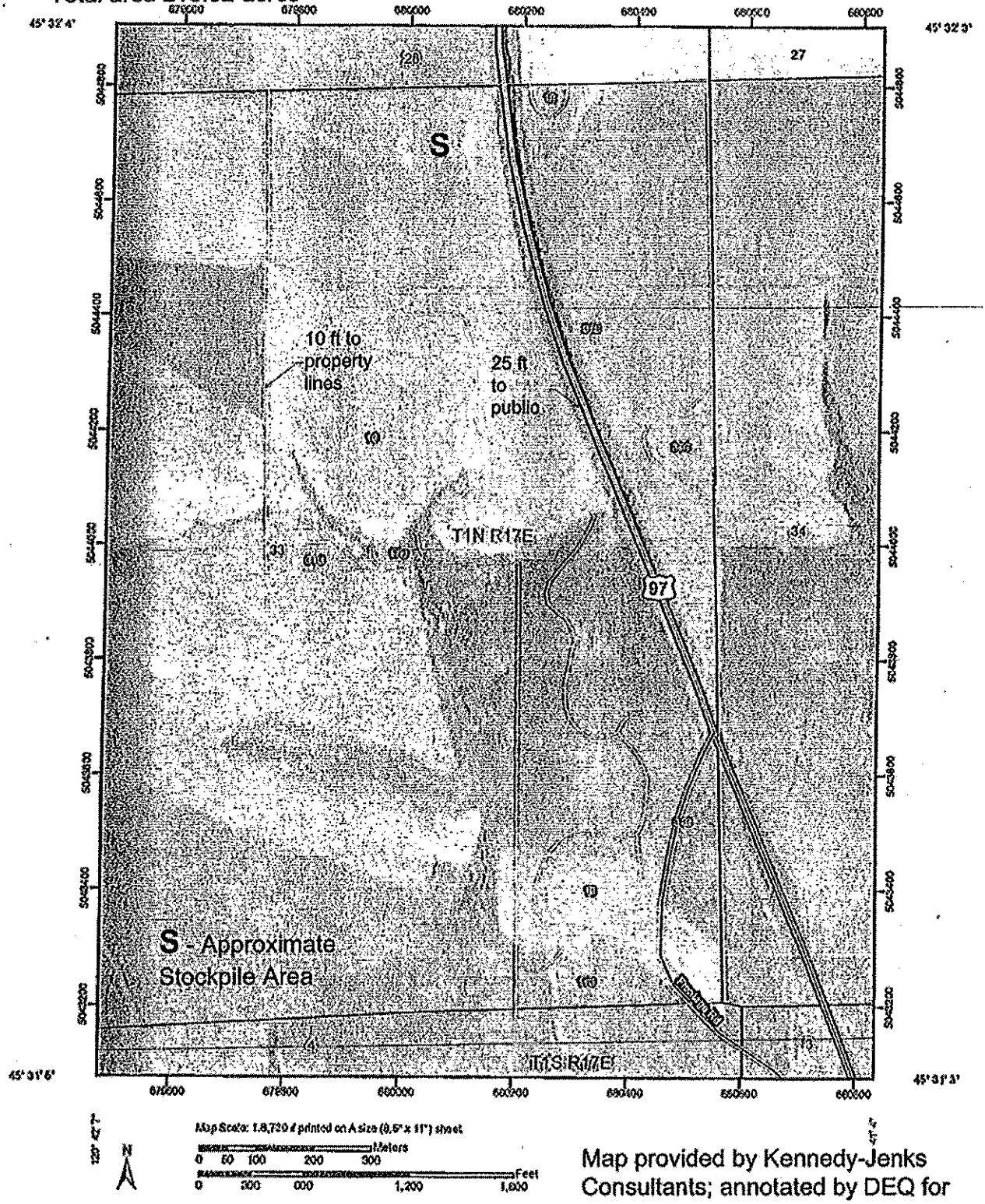
Soil Map—Sherman County, Oregon



Map provided by Kennedy-Jenks Consultants; annotated by DEQ for discussion purposes only.

SITE MAP - David Pinkerton Site 3 (NWR2010-24-BS)

Total area 218.32 acres



Map provided by Kennedy-Jenks Consultants; annotated by DEQ for discussion purposes only.

Oregon
Theodore R. Kulongoski, Governor

Department of Environmental Quality
Northwest Region Portland Office/Water Quality
2020 SW 4th Avenue, Suite 400
Portland, OR 97201-4987
(503) 229-5263
FAX (503) 229-6957
OTRS 1-800-735-2900

August 5, 2010

IMPORTANT DOCUMENT
LAND APPLICATION AUTHORIZATION

Greg Charr, Biosolids Program Manager
Columbia Boulevard Wastewater Treatment Plant
City of Portland
5001 North Columbia Blvd.
Portland, OR 97201

Re: WQ-Multnomah County
Columbia Boulevard Wastewater Treatment Plant, City of Portland
NPDES Permit No. 101505; File No. 70725
Biosolids Land Application Authorization
Richard McGregor Site
TL 1100, Sec. 5, T1N, R18E and TL 1800, Sec. 8, T1N, R18E,
Sherman County
Site ID: NWR2010-27-BS

Dear Mr. Charr:

On June 9, 2010, the Oregon Department of Environmental Quality (ODEQ or "the Department") received a request from Kennedy-Jenks Consultants on behalf of the City of Portland ("the City") to land apply anaerobically-digested, dewatered cake biosolids produced by the City of Portland Columbia Boulevard Wastewater Treatment Facility (Columbia Blvd. WWTF) to properties located near Wasco, Oregon (see Table 1 and attached site map). The request included information characterizing soils, topography, biosolids, crop management, public notification and a signed agreement between the City and the property owner. **This authorization letter represents your approval to land apply biosolids to the referenced property. This authorization supersedes any previous authorization that may have been granted to the property and is valid only as part of your ODEQ-issued permit.**

Site Description. The property, owned and farmed by Richard McGregor, is zoned as Exclusive Farm Use (EFU) and consists of 2 fields managed for soft white winter wheat and other dryland small grains production on a 2-year rotation using conventional tillage. Adjacent properties are also agricultural, and many fields in the vicinity of the site have also been authorized by ODEQ for land application of biosolids.

Table 1. The property reviewed for biosolids land application, located in Sherman Co., Oregon.

Site ID	Township, Range, Section	Tax Lot(s)	Total Area (acres)	Spreadable Area[1] (acres)
1	T1N R18E S5	1100	157.27	157.27
2	T1N R18E S8	1800	157.27	157.27
Total Acres			314.54	

[1]Spreadable acres do not reflect site-specific setback requirements. Actual acres spread may also vary slightly based upon site conditions at time of application.

ODEQ reviewed the site information, including proposed land use and agricultural practices, and noted locations of residences, wells and other sensitive site features in order to establish appropriate setbacks from land application areas. From information provided by Kennedy-Jenks and other sources, an access road and wind towers are located in a north-south alignment through the central west portion of the 2 fields. The north and west portions of Site 1 (TL #1100) are dissected by Emigrant Canyon and an intermittent drainage into Emigrant Canyon from the southwest. Another intermittent drainage crosses Site 2 (TL #1800) through the center of the field. No other wind towers, residences or wells are identified on or in the vicinity of the two fields. One staging (or landing) area for interim biosolids storage is also proposed for both of the fields located on Site 2.

The site is located on upland benches or terraces above the Columbia River. The topography is generally gently undulating with slopes less than 10% intersected with broad swales and drainages that remain dry except during rare, extreme or prolonged storm events. Consistent with the NRCS soil maps for the area, soils at the site are composed of Walla Walla silt loam, with a smaller portion of Anderly silt loam associated with the Emigrant Canyon topography. These soils are typically deep and well drained, and are subject to erosion from surface runoff.

Based upon the reviews of site-specific information provided by Kennedy-Jenks and the site selection criteria presented in the City's approved Biosolids Management Plan, as well as ODEQ records from other properties in the area authorized for land application of biosolids, the property is approved for the land application of anaerobically-digested, dewatered cake biosolids produced by the Columbia Blvd. WWTF provided the following conditions are satisfied:

1. **Regulations, Rules, and Permit Requirements.** Biosolids processing and handling will comply with:
    a. Oregon biosolids and septage rules and guidelines (OAR 340-050);
    b. federal biosolids and septage regulations (40 CFR Part 503);
    c. the ODEQ-issued permit to the City of Portland, Columbia Blvd. WWTF (NPDES Permit No.101505; File No. 70725);
    d. the most recent ODEQ approved Biosolids Management Plan (last revised February 2009), including all subsequent amendments; and
    e. all other applicable federal and state statutes and rules.
2. **Treatment Processes.**
    a. Biosolids volatile solids content shall be reduced by 38% or more via anaerobic digestion prior to land application.
3. **Transportation.**
    a. Transportation of the biosolids to the land application site shall be done in accordance with the City of Portland Biosolids Management Plan.
4. **Land Application Activities.**
    a. The site is approved for the land application of biosolids by a side-discharge spreader or other similar manure-spreading equipment.
    b. Biosolids shall be applied evenly and thinly in a manner that will prevent ponding and runoff during and after precipitation events.
    c. When more than one operator conducts biosolids land application or completion of the biosolids application on a site is interrupted for more than one week, areas where biosolids have been applied must be clearly marked by flag pins or stakes which note the date when biosolids were last applied. This tracking method may be replaced by use of GPS equipment if it provides as accurate tracking. Written and mapped daily land application records must be maintained as described under Condition 9.b.

d. Biosolids may be stored in the fields at the locations identified as "landings" on the site map for no more than 21 days prior to spreading. The quantity of biosolids in the storage locations may not exceed the agronomic loading rate for the field. For storage beyond 21 days, prior written request and ODEQ authorization is required.

e. Immediately following land application, the biosolids equipment operator shall clean off (at the application site) any equipment coated with biosolids to prevent biosolids from spilling onto public roadways.

5. Application Rates and Timing.

a. **Effective Date.** This authorization is effective **05 AUGUST 2010**.

b. **Application Period.** The site is approved for ***year-around*** land application of biosolids when field conditions allow for uniform application that will not result in ponding or runoff. Land application timing must be appropriate to the site's land management practices and must be managed to provide maximum benefit to crops grown on the site and minimize potential adverse environmental impacts.

c. **Application Rate.** Biosolids shall be applied at rates up to but not exceeding an agronomic loading limit appropriate to the crop being grown on the fields (Table 2), after accounting for supplemental sources of nitrogen and losses as described under Condition 5.d.

Table 2. Crops and Plant Available Nitrogen (PAN) approved for this land application site. The maximum quantity of biosolids applied to the field will not exceed the PAN for the identified crop, after accounting for supplemental sources and losses of nitrogen.

Crop	Irrigated	PAN (lbs/ac/yr)
Winter wheat	No	75

d. **Agronomic Rate Calculations.** Biosolids application rates will be calculated using one of the following: (i) the method approved in the ODEQ-approved Biosolids Management Plan; (ii) the method described in *Worksheet for Calculating Biosolids Application Rates in Agriculture*, published by the Oregon State University Extension Service, Publication No. PNW0511e (March 2007); or (iii) a more robust method such as that described in *Managing Nitrogen from Biosolids*, published by Washington State Department of Ecology and the Northwest Biosolids Management Association (April 1999). Any deviations from the methods and/or assumptions described in these publications must be pre-approved in writing by the ODEQ Northwest Region. (Updated versions of the aforementioned documents may be used at any time.)

e. **Routine Applications.** If biosolids applications exceed 2 out of 3 successive years at agronomic rates, the soils will be analyzed for residual nitrate-nitrogen (NO_3-N) before the next application. Agronomic application rates are to be adjusted for residual NO_3-N in the effective rooting zone.

f. **Supplemental N.** If other sources of nitrogen are applied to the fields (e.g., commercial, animal manure or green chop), the biosolids application rate must be reduced so that the supplemental nitrogen plus biosolids nitrogen does not exceed the agronomic application rate approved for this site.

g. **Changes.** Changes in biosolids characteristics, cropping practices, or general land management will necessitate appropriate adjustments in the application rate to maintain nitrogen applications consistent with crop demands. Major changes in any of the above must be communicated to the ODEQ's Northwest Region in writing before the changes are implemented.

6. **Site Restrictions.**

   a. **Wet Soils.** Care should be taken to avoid wet soil conditions at the time of application, particularly in concave areas.

   b. **Precipitation.** Biosolids land application shall cease when precipitation exceeds ¼ inch per hour or when one inch or more of precipitation occurs in a 24-hour period. Land application shall be withheld from the site for at least one day for every consecutive day of precipitation where a ¼ inch or one-inch per 24-hour precipitation event occurs.

   c. **General Public Access.** Access to the site by the general public shall be restricted for at least 12 months after biosolids land application has ceased.

   d. **Grazing.** A 30-day interval shall follow the application of biosolids prior to grazing livestock on any field or prior to the harvesting of crops that are to be fed to animals.

   e. **Wind.** Land application shall cease if wind speed is such that biosolids cannot be applied uniformly or would be thrown into buffer strips, waterways, roads, trails, or onto the application vehicle itself. Application may resume after wind speeds have decreased such that no significant blowing or drifting occurs.

   f. **Nuisance Conditions.** Biosolids land application shall cease when the potential exists for nuisance conditions or runoff beyond the approved areas.

   g. **Wind Farm Access.** Appropriate setbacks will be maintained from wind turbines and access roads (Condition 7). Restricted access to the fields by non-farm personnel associated with Wind Farms (or other activities) will be maintained for at least 30 days after land application has ceased. Signs will be posted at all potential access roads and will provide (at a minimum) the following information:

      i. identification of the field as a Biosolids Land Application site;

      ii. state that access is restricted for at least 30 days following the most recent land application event;

      iii. the date of the most recent land application event;

      iv. a requirement that non-farm personnel seeking access to the fields, after 30 days but less than 12 months following the most recent land application event, must be provided information on the biosolids land application activities; and

      v. contact information for the Columbia WWTF and/or the City's Columbia WWTF's representative.

   Individuals seeking access to the sites must be provided with information regarding biosolids land application activities; and, any questions and/or concerns they may have regarding exposure to biosolids must be addressed.

7. **Setbacks and Buffers.** Setbacks and buffers on the sites are listed in Table 3 and have also been identified in the attached site map(s).

Table 3. Site-specific setbacks for biosolids land application.

Feature	Setback[1] (ft.)
Property boundaries & private, unpaved roadways	10
Paved or graveled roadways & wind turbines	25
Residences and wells	200

[1]The setback is determined from the edge of the feature. For example, a wind tower access road requires 25' setback from each side of the road, so the buffer area would be 50' plus the actual width of the road.

8. Remedial Procedures.

a. The City's biosolids hauler shall clean up any spillage of biosolids. The City shall consult with the ODEQ for appropriate methods of protecting public health and the environment for spills that cannot be completely cleaned up.

b. In the event an odor problem is reported to the City, its representative, or the ODEQ after biosolids has been land applied at the site, the best method to mitigate the odor concern will be determined jointly.

c. The ODEQ shall be notified within one hour, through the Oregon Emergency Response System (OERS), of any spills of more than ¼ cubic yards or other threats to the environment that may occur. All spills adjacent to drainage ditches or drainage ways should be reported. Failure to provide prompt notification may be considered cause for taking enforcement action against the City. The telephone number for OERS is 1.800.452.0311 (24-hr service).

9. Monitoring and Reporting.

a. **Soil Testing.** Soil testing for residual nitrate-nitrogen (NO_3-N) will occur as described under Condition 5.c. The ODEQ recommends routine soil testing for soil nutrients as well as the trace pollutants listed in Table 1 of 40 CFR §503.13 for fields receiving annual biosolids applications. The Department may require soil testing if adverse environmental impacts are suspected at the site.

b. **Site Records.** Daily site records of accumulated land applied biosolids will be maintained. Site records shall be recorded on field grid map or other readable system. Records shall indicate the date, location and quantity of biosolids applied; segments of each field that received biosolids; target plant available nitrogen (PAN) loading rate of the area receiving biosolids; and the type of crop grown. These records must be available to the ODEQ for review upon request. Regardless of the format in which written and mapped records are kept, they must be readily available in hardcopy format

c. **Annual Report.** By 19 February of each year, the City shall provide the ODEQ with an annual report of the previous year's biosolids processing and application activities, as required under the ODEQ rules (OAR 340-050-0035(6)). An annual report must be also be submitted to the United States Environmental Protection Agency (USEPA) Region 10.

10. Notification.

a. The City or its representatives shall promptly notify ODEQ of any major changes it intends to make to its biosolids processing activities that could influence biosolids quality or quantity before anticipated modifications are initiated, as described under Condition 11.c.

11. Additional Conditions.

a. The ODEQ shall have the right to: (i) enter (at reasonable times) the City's (or its representatives) place of biosolids land application and record keeping to review biosolids management operations and records; (ii) obtain copies of any records required under the terms of this authorization and the City's biosolids management plan; (iii) inspect any monitoring equipment required under this authorization; (iv) inspect any collection, transport, or land application vehicle; and (v) obtain any photographic documentation or evidence deemed appropriate.

b. This authorization is subject to revocation should health hazards, environmental degradation, or nuisance conditions develop as a result of inadequate biosolids treatment or site management.

c. Any variations from the City's approved biosolids management plan and this authorization letter must receive prior written approval from the ODEQ Northwest Region Office.

d. The ODEQ may amend this Site Authorization and impose any additional restrictions or conditions deemed necessary to protect environmental and human health.

This authorization is considered to be part of your approved biosolids management plan and is enforceable as part of your NPDES permit. Therefore, if operations are not conducted in accordance with terms specified under this authorization, the Department will initiate an enforcement action, which may lead to the assessment of a civil penalty. If you have any questions regarding the issues in this letter please call me at 503.229.5347 or contact me via email at schrandt.connie@deq.state.or.us.

Sincerely,

Connie M. Schrandt

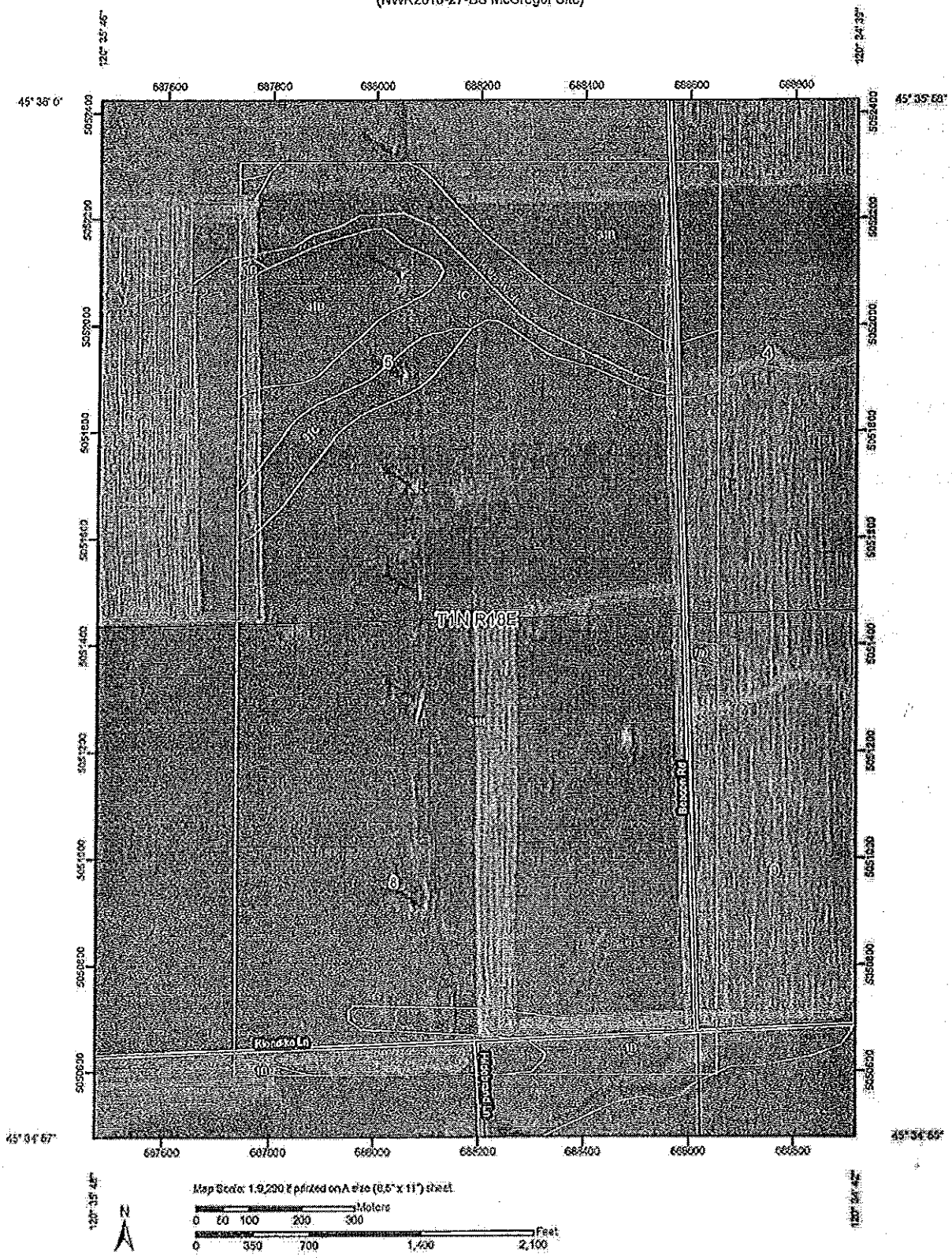
Connie M. Schrandt
Soils/Land Application Specialist
Northwest Region

Enc: Site Map

Cc: Richard McGregor, 10242 SE Walnut Dr., Portland, OR 97086
Wasco Sherman Gilliam Public Health, 419 E. 7th Street, Room 100, The Dalles, OR 97058

Ec: Ron Doughten, DEQ Biosolids Coordinator, ODEQ Headquarters (email)
Mark Cullington, Kennedy-Jenks Consultants, 200 SW Market St., Suite 500, Portland, OR 97201
Kent Madison, 29299 Madison Rd., Echo, OR 97826

Soil Map—Sherman County, Oregon
(NWR2010-27-BS McGregor Site)



USDA Natural Resources Conservation Service

Web Soil Survey
National Cooperative Soil Survey

6/4/2010
Page 1 of 3

Oregon
Theodore R. Kulongoski, Governor

Department of Environmental Quality
Northwest Region Portland Office/Water Quality
2020 SW 4th Avenue, Suite 400
Portland, OR 97201-4987
(503) 229-5263
FAX (503) 229-6957
OTRS 1-800-735-2900

July 28, 2010

IMPORTANT DOCUMENT
LAND APPLICATION AUTHORIZATION

Greg Charr, Biosolids Program Manager
Columbia Boulevard Wastewater Treatment Plant
City of Portland
5001 North Columbia Blvd.
Portland, OR 97201

Re: WQ-Multnomah County
Columbia Boulevard Wastewater Treatment Plant
NPDES Permit No. 101505; File No. 70725
Biosolids Land Application Authorization
Guy Weedman Site
TL 900, Sec. 4, T1N, R18E,
TL 3400, Sec. 19, T1N, R18E,
TL 8100, Sec. 31, T2N, R18E, and
TL 8600, Sec. 33, T2N, R18E,
Sherman County
Site ID: NWR2010-26-BS

Dear Mr. Charr:

On June 8, 2010, the Oregon Department of Environmental Quality (ODEQ or "the Department") received a request from Kennedy-Jenks Consultants on behalf of the City of Portland ("the City") to land apply anaerobically-digested, dewatered cake biosolids produced by the City of Portland Columbia Boulevard Wastewater Treatment Facility (Columbia Blvd. WWTF) to properties located near Wasco, Oregon (see Table 1 and attached site maps). The request included information characterizing soils, topography, biosolids, crop management, public notification and a signed agreement between the City and the property owner. **This authorization letter represents your approval to land apply biosolids to the referenced property. This authorization supersedes any previous authorization that may have been granted to the property and is valid only as part of your ODEQ-issued permit.**

Site Description. The property, owned and farmed by Guy Weedman, is zoned as Exclusive Farm Use (EFU) and consists of four fields managed for soft white winter wheat on 2-year rotation using conventional tillage. Adjacent properties are also agricultural, and many fields in the vicinity of the site have also been authorized by ODEQ for land application of biosolids.

Table 1. The property reviewed for biosolids land application, located in Sherman Co., Oregon.

Site ID	Township, Range, Section	Tax Lot(s)	Total Area (acres)	Spreadable Area[1] (acres)
1	T1N R18E S19	3400	168.26	168.26
2	T1N R18E S31	8100	158.18	158.18
3	T1N R18E S4	900	316.07	316.07
4	T1N R18E S33	8600	310.9	310.9
Total Acres			953.41	

[1]Spreadable acres do not reflect site-specific setback requirements. Actual acres spread may also vary slightly based upon site conditions at time of application.

ODEQ reviewed the site information provided, including proposed land use and agricultural practices, and noted locations of residences, wells and other sensitive site features in order to establish appropriate setbacks from land application areas. From information provided by Kennedy-Jenks, wind towers are located along Egypt Rd. adjacent to the west boundary of Site 1 (TL #3400). An intermittent drainage dissects the northwest portion of Site 2 (TL #8100), the southeast portion of Site 3 (TL #900) is dissected by Emigrant Canyon and two separate intermittent drainages cross from southwest to northeast through Site 4 (TL #8600). No other wind towers, residences or wells are identified on or in the vicinity of the 4 fields. Staging (or landing) areas for interim biosolids storage are also proposed; one in each field for a total of 4 staging areas.

The site is located on upland benches or terraces above the Columbia River. The topography is generally gently undulating with slopes less than 10% intersected with broad swales and drainages that remain dry except during rare, extreme or prolonged storm events. Soils at the site are composed of Walla Walla silt loam and Anderly silt loam or close variants, which is consistent with the NRCS soil maps for the area. Soils are typically deep and well drained, and subject to erosion from surface runoff.

Based upon the reviews of site-specific information provided by Kennedy-Jenks and the site selection criteria presented in the City's approved Biosolids Management Plan, as well as ODEQ records from other properties in the area authorized for land application of biosolids, the property is approved for the land application of anaerobically-digested, dewatered cake biosolids produced by the Columbia Blvd. WWTF provided the following conditions are satisfied:

1. **Regulations, Rules, and Permit Requirements.** Biosolids processing and handling will comply with:
    a. Oregon biosolids and septage rules and guidelines (OAR 340-050);
    b. federal biosolids and septage regulations (40 CFR Part 503);
    c. the ODEQ-issued permit to the City of Portland, Columbia Blvd. WWTF (NPDES Permit No.100807; File No. 70725);
    d. the most recent ODEQ approved Biosolids Management Plan (last revised February 2009), including all subsequent amendments; and
    e. all other applicable federal and state statutes and rules.
2. **Treatment Processes.**
    a. Biosolids volatile solids content shall be reduced by 38% or more via anaerobic digestion prior to land application.
3. **Transportation.**
    a. Transportation of the biosolids to the land application site shall be done in accordance with the City of Portland Biosolids Management Plan.
4. **Land Application Activities.**
    a. The site is approved for the land application of biosolids by a side-discharge spreader or other similar manure-spreading equipment.
    b. Biosolids shall be applied evenly and thinly in a manner that will prevent ponding and runoff during and after precipitation events.
    c. When more than one operator conducts biosolids land application or completion of the biosolids application on a site is interrupted for more than one week, areas where biosolids have been applied must be clearly marked by flag pins or stakes which note the date when biosolids were last applied. This tracking method may be replaced by use of GPS equipment if it provides as accurate tracking. Written and mapped daily land application records must be maintained as described under Condition 9.b.

d. Biosolids may be stored in the fields at the locations identified as "landings" on the site map for no more than 21 days prior to spreading. The quantity of biosolids in the storage locations may not exceed the agronomic loading rate for the field. For storage beyond 21 days, prior written request and ODEQ authorization is required.

e. Immediately following land application, the biosolids equipment operator shall clean off (at the application site) any equipment coated with biosolids to prevent biosolids from spilling onto public roadways.

5. Application Rates and Timing.

a. **Effective Date.** This authorization is effective **28 JULY 2010**.

b. **Application Period.** The site is approved for ***year-around*** land application of biosolids when field conditions allow for uniform application that will not result in ponding or runoff. Land application timing must be appropriate to the site's land management practices and must be managed to provide maximum benefit to crops grown on the site and minimize potential adverse environmental impacts.

c. **Application Rate.** Biosolids shall be applied at rates up to but not exceeding an agronomic loading limit appropriate to the crop being grown on the fields (Table 2), after accounting for supplemental sources of nitrogen and losses as described under Conditions 5.f and 5.g.

Table 2. Crops and Plant Available Nitrogen (PAN) approved for this land application site. The maximum quantity of biosolids applied to the field will not exceed the PAN for the identified crop, after accounting for supplemental sources and losses of nitrogen.

Crop	Irrigated	PAN (lbs/ac/yr)
Winter wheat	No	75

d. **Agronomic Rate Calculations.** Biosolids application rates will be calculated using one of the following: (i) the method approved in the ODEQ-approved Biosolids Management Plan; (ii) the method described in *Worksheet for Calculating Biosolids Application Rates in Agriculture*, published by the Oregon State University Extension Service, Publication No. PNW0511e (March 2007); or (iii) a more robust method such as that described in *Managing Nitrogen from Biosolids*, published by Washington State Department of Ecology and the Northwest Biosolids Management Association (April 1999). Any deviations from the methods and/or assumptions described in these publications must be pre-approved in writing by the ODEQ Northwest Region. (Updated versions of the aforementioned documents may be used at any time.)

e. **Routine Applications.** If biosolids applications exceed 2 out of 3 successive years at agronomic rates, the soils will be analyzed for residual nitrate-nitrogen (NO_3-N) before the next application. Agronomic application rates are to be adjusted for residual NO_3-N in the effective rooting zone.

f. **Supplemental N.** If other sources of nitrogen are applied to the fields (e.g., commercial, animal manure or green chop), the biosolids application rate must be reduced so that the supplemental nitrogen plus biosolids nitrogen does not exceed the agronomic application rate approved for this site.

g. **Changes.** Changes in biosolids characteristics, cropping practices, or general land management will necessitate appropriate adjustments in the application rate to maintain nitrogen applications consistent with crop demands. Major changes in any of the above must be communicated to the ODEQ's Northwest Region in writing before the changes are implemented.

6. **Site Restrictions.**

   a. **Wet Soils.** Care should be taken to avoid wet soil conditions at the time of application, particularly in concave areas.

   b. **Precipitation.** Biosolids land application shall cease when precipitation exceeds ¼ inch per hour or when one inch or more of precipitation occurs in a 24-hour period. Land application shall be withheld from the site for at least one day for every consecutive day of precipitation where a ¼ inch or one-inch per 24-hour precipitation event occurs.

   c. **General Public Access.** Access to the site by the general public shall be restricted for at least 12 months after biosolids land application has ceased.

   d. **Grazing.** A 30-day interval shall follow the application of biosolids prior to grazing livestock on any field or prior to the harvesting of crops that are to be fed to animals.

   e. **Wind.** Land application shall cease if wind speed is such that biosolids cannot be applied uniformly or would be thrown into buffer strips, waterways, roads, trails, or onto the application vehicle itself. Application may resume after wind speeds have decreased such that no significant blowing or drifting occurs.

   f. **Nuisance Conditions.** Biosolids land application shall cease when the potential exists for nuisance conditions or runoff beyond the approved areas.

   g. **Wind Farm Access.** Appropriate setbacks will be maintained from wind turbines and access roads (Condition 7). Restricted access to the fields by non-farm personnel associated with wind tower maintenance (or other activities) will be maintained for at least 30 days after land application has ceased. Signs will be posted at all potential access roads and will provide (at a minimum) the following information:

      i. identification of the field as a Biosolids Land Application site;

      ii. state that access is restricted for at least 30 days following the most recent land application event;

      iii. the date of the most recent land application event;

      iv. a requirement that non-farm personnel seeking access to the fields, after 30 days but less than 12 months following the most recent land application event, must be provided information on the biosolids land application activities; and

      v. contact information for the Columbia WWTF and/or the City's Columbia WWTF's representative.

   Individuals seeking access to the sites must be provided with information regarding biosolids land application activities; and, any questions and/or concerns they may have regarding exposure to biosolids must be addressed.

7. **Setbacks and Buffers.** Setbacks and buffers on the sites are listed in Table 3 and have also been identified in the attached site map(s).

Table 3. Site-specific setbacks for biosolids land application.

Feature	Setback[1] (ft.)
Property boundaries & private, unpaved roadways	10
Paved or graveled roadways & wind turbines	25
Residences and wells	200

[1]The setback is determined from the edge of the feature.

8. **Remedial Procedures.**

   a. The City's biosolids hauler shall clean up any spillage of biosolids. The City shall consult with the ODEQ for appropriate methods of protecting public health and the environment for spills that cannot be completely cleaned up.

b. In the event an odor problem is reported to the City, its representative, or the ODEQ after biosolids has been land applied at the site, the best method to mitigate the odor concern will be determined jointly.

c. The ODEQ shall be notified within one hour, through the Oregon Emergency Response System (OERS), of any spills of more than ¼ cubic yards or other threats to the environment that may occur. All spills adjacent to drainage ditches or drainage ways should be reported. Failure to provide prompt notification may be considered cause for taking enforcement action against the City. The telephone number for OERS is 1.800.452.0311 (24-hr service).

9. Monitoring and Reporting.

a. **Soil Testing.** Soil testing for residual nitrate-nitrogen (NO_3-N) will occur as described under Condition 5.c. The ODEQ recommends routine soil testing for soil nutrients as well as the trace pollutants listed in Table 1 of 40 CFR §503.13 for fields receiving annual biosolids applications. The Department may require soil testing if adverse environmental impacts are suspected at the site.

b. **Site Records.** Daily site records of accumulated land applied biosolids will be maintained. Site records shall be recorded on field grid map or other readable system. Records shall indicate the date, location and quantity of biosolids applied; segments of each field that received biosolids; target plant available nitrogen (PAN) loading rate of the area receiving biosolids; and the type of crop grown. These records must be available to the ODEQ for review upon request. Regardless of the format in which written and mapped records are kept, they must be readily available in hardcopy format

c. **Annual Report.** By 19 February of each year, the City shall provide the ODEQ with an annual report of the previous year's biosolids processing and application activities, as required under the ODEQ rules (OAR 340-050-0035(6)). An annual report must be also be submitted to the United States Environmental Protection Agency (USEPA) Region 10.

10. Notification.

a. The City or its representatives shall promptly notify ODEQ of any major changes it intends to make to its biosolids processing activities that could influence biosolids quality or quantity before anticipated modifications are initiated, as described under Condition 11.c.

11. Additional Conditions.

a. The ODEQ shall have the right to: (i) enter (at reasonable times) the City's (or its representatives) place of biosolids land application and record keeping to review biosolids management operations and records; (ii) obtain copies of any records required under the terms of this authorization and the City's biosolids management plan; (iii) inspect any monitoring equipment required under this authorization; (iv) inspect any collection, transport, or land application vehicle; and (v) obtain any photographic documentation or evidence deemed appropriate.

b. This authorization is subject to revocation should health hazards, environmental degradation, or nuisance conditions develop as a result of inadequate biosolids treatment or site management.

c. Any variations from the City's approved biosolids management plan and this authorization letter must receive prior written approval from the ODEQ Northwest Region Office.

d. The ODEQ may amend this Site Authorization and impose any additional restrictions or conditions deemed necessary to protect environmental and human health.

This authorization is considered to be part of your approved biosolids management plan and is enforceable as part of your NPDES permit. Therefore, if operations are not conducted in accordance with terms specified under this authorization, the Department will initiate an enforcement action, which may lead to the assessment of a civil penalty. If you have any questions regarding the content of this letter, please call me at 503.229.5347 or contact me via email at schrandt.connie@deq.state.or.us.

Sincerely,

Connie M. Schrandt

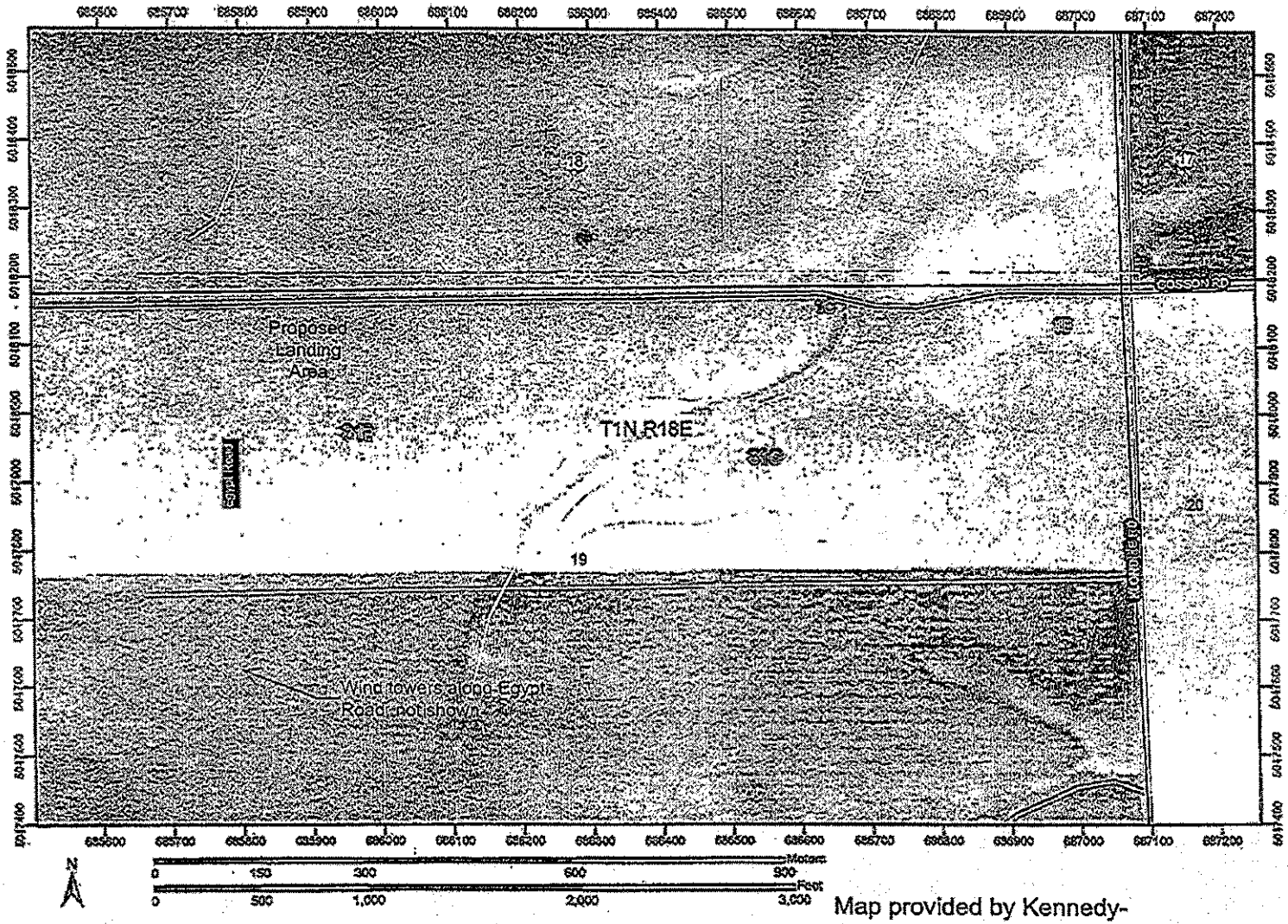
Connie M. Schrandt
Soils/Land Application Specialist
Northwest Region

Enc: Site Maps

Cc: Guy Weedman, Weedman Ranches, Inc., P.O. Box 376, Wasco, OR 97065
Wasco Sherman Gilliam Public Health, 419 E. 7th Street, Room 100, The Dalles, OR 97058

Ec: Ron Doughten, Biosolids Coordinator, ODEQ Headquarters (email)
Mark Cullington, Kennedy-Jenks Consultants, 200 SW Market St., Suite 500, Portland, OR 97201
Kent Madison, 29299 Madison Rd., Echo, OR 97826

SITE MAP - Guy Weedman, Site 1
(NWR2010-26-BS)



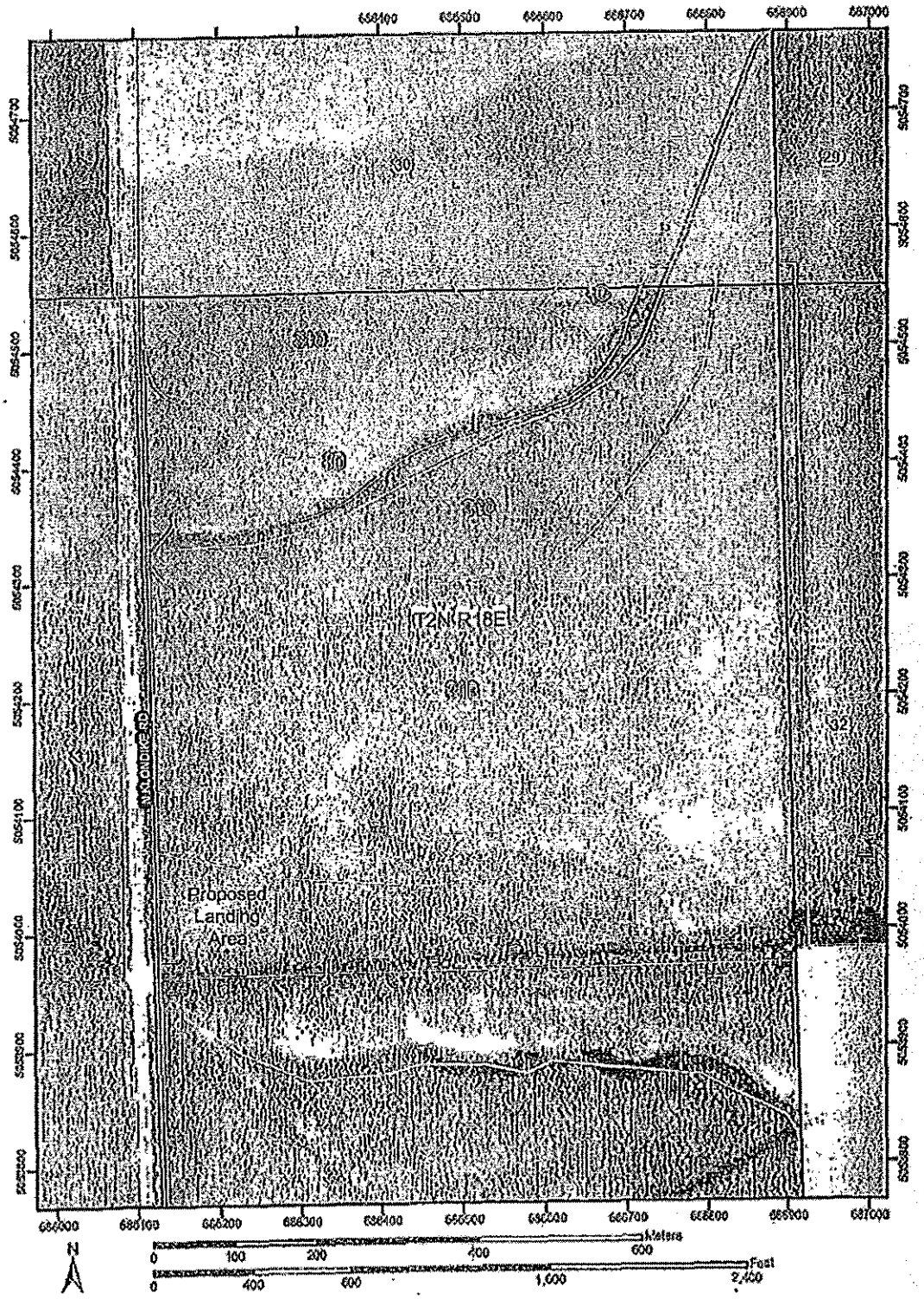
USDA Natural Resources Conservation Service

Web Soil Survey 2.0
National Cooperative Soil Survey

Map provided by Kennedy-Jenks; annotated by DEQ. For discussion purposes only.

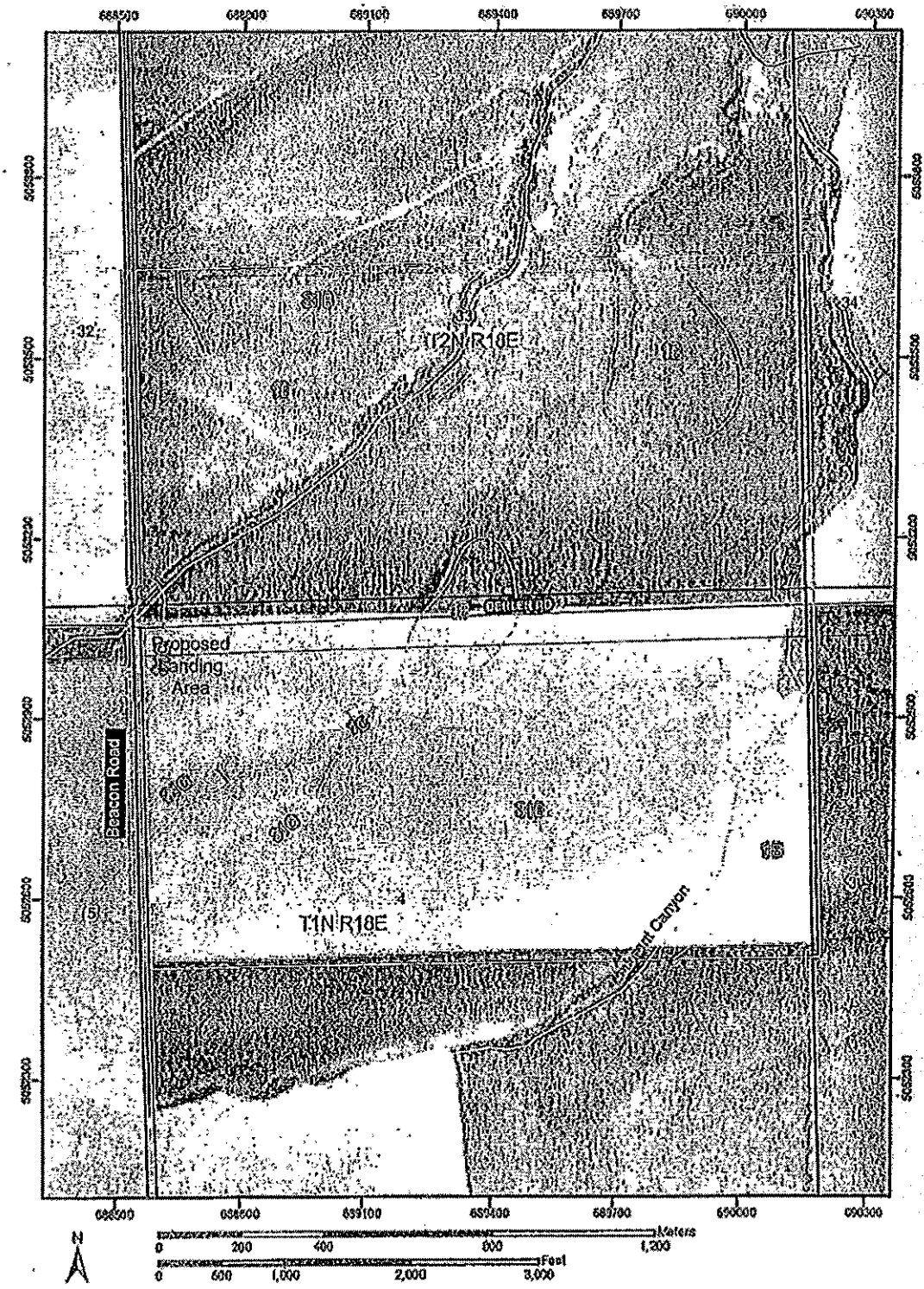
6/27/2007
Page 1 of 3

SITE MAP - Guy Weedman, Site 2
(NWR2010-26-BS)



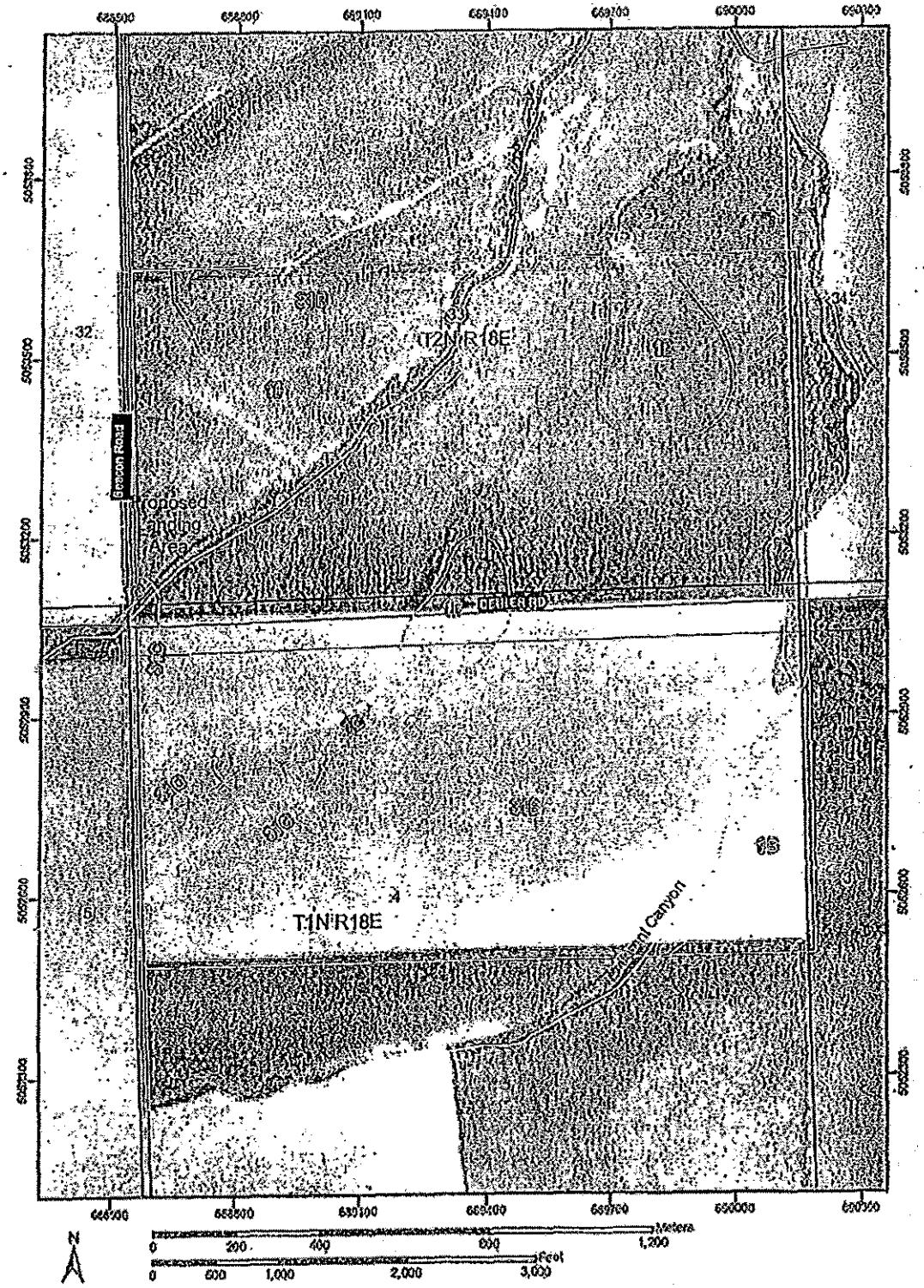
Map provided by Kennedy-Jenks; annotated by DEQ. For discussion purposes only.

SITE MAP - Guy Weedman, Site 3 (NWR2010-26-BS)



Map provided by Kennedy-Jenks; annotated by DEQ. For discussion purposes only.

SITE MAP - Guy Weedman, Site 4
(NWR2010-26-BS)



Map provided by Kennedy-Jenks; annotated by DEQ. For discussion purposes only.

Oregon
Theodore R. Kulongoski, Governor

Department of Environmental Quality
Northwest Region Portland Office/Water Quality
2020 SW 4th Avenue, Suite 400
Portland, OR 97201-4987
(503) 229-5263
FAX (503) 229-6957
OTRS 1-800-735-2900

July 27, 2010

IMPORTANT DOCUMENT
LAND APPLICATION AUTHORIZATION

Greg Charr, Biosolids Program Manager
Columbia Boulevard Wastewater Treatment Plant
City of Portland
5001 North Columbia Blvd.
Portland, OR 97201

Re: WQ-Multnomah County
Columbia Boulevard Wastewater Treatment Plant
NPDES Permit No. 100807; File No. 70725
Biosolids Land Application Authorization
Randy Hilderbrand Site
TL 1200, Sec. 5, T1N, R18E,
TL 1700 (S^2), Sec. 8, T1N, R18E, and
TL 3100, Sec. 18, T1N, R18E,
Sherman County
Site ID: NWR2010-23-BS

Dear Mr. Charr:

On June 8, 2010, the Oregon Department of Environmental Quality (ODEQ or "the Department") received a request from Kennedy-Jenks Consultants on behalf of the City of Portland ("the City") to land apply anaerobically-digested, dewatered cake biosolids produced by the City of Portland Columbia Boulevard Wastewater Treatment Facility (Columbia Blvd. WWTF) to properties located near Wasco, Oregon (see Table 1 and attached site maps). The request included information characterizing soils, topography, biosolids, crop management, public notification and a signed agreement between the City and the property owner. **This authorization letter represents your approval to land apply biosolids to the referenced property. This authorization supersedes any previous authorization that may have been granted to the property and is valid only as part of your ODEQ-issued permit.**

Site Description. The property, owned and farmed by Randy Hilderbrand, is zoned as Exclusive Farm Use (EFU) and consists of three fields managed for soft white winter wheat and other dryland small grain production on a 2-year rotation of planting-harvesting/fallow using "no-till" practices. Adjacent properties are also agricultural, and many fields in the vicinity of the site have also been authorized by DEQ for land application of biosolids.

Table 1. The property reviewed for biosolids land application, located in Sherman Co., Oregon.

Site ID	Township, Range, Section	Tax Lot(s)	Total Area (acres)	Spreadable Area† (acres)
1	T1N R18E S5	1200	156.95	156.95
3	T1N R18E S8	S2 1700	156.34	156.34
4	T1N R18E S18	3100	320.88	320.88
Total Acres			**634.17**	

†Spreadable acres do not reflect site-specific setback requirements. Actual acres spread may also vary slightly based upon site conditions at time of application.

ODEQ reviewed the site information provided, including proposed land use and agricultural practices, and noted locations of residences, wells and other sensitive site features in order to establish appropriate setbacks from land application areas. ODEQ's records of several adjacent and/or nearby sites authorized for biosolids land application within the past few years were also reviewed. From information provided by Kennedy-Jenks, Site 1 (TL 1200) has a row of 4 wind towers joined by an access road that crosses north to south near the central-west portion of the field. Wind towers and an access road are also present on adjacent property along the west boundary of Site 3 (TL 1700). One well and an associated residence exists on Site 4 (TL 3100) near the center of the field and adjacent to the east property boundary. Staging areas (or landings) for interim biosolids storage are also proposed; one associated with each field for a total of 3 staging areas.

The site is located on upland benches or terraces above the Columbia River. The topography is generally gently undulating with slopes less than 10% intersected with broad swales and drainages that remain dry except during rare, extreme or prolonged storm events. Consistent with the NRCS soil maps for the area, soils at the site are composed of Walla Walla silt loam and Anderly silt loam or close variants. These soils are typically deep and well drained, and subject to erosion from surface runoff.

Based upon the reviews of site-specific information provided by Kennedy-Jenks and the site selection criteria presented in the City's approved Biosolids Management Plan, as well as DEQ records from other properties in the area authorized for land application of biosolids, the property is approved for the land application of anaerobically-digested, dewatered cake biosolids produced by the Columbia Blvd. WWTF provided the following conditions are satisfied:

1. **Regulations, Rules, and Permit Requirements.** Biosolids processing and handling will comply with:
    a. Oregon biosolids and septage rules and guidelines (OAR 340-050);
    b. federal biosolids and septage regulations (40 CFR Part 503);
    c. the ODEQ-issued permit to the City of Portland, Columbia Blvd. WWTF (NPDES Permit No.100807; File No. 70725);
    d. the most recent ODEQ approved Biosolids Management Plan (last revised February 2009), including all subsequent amendments; and
    e. all other applicable federal and state statutes and rules.
2. **Treatment Processes.**
    a. Biosolids volatile solids content shall be reduced by 38% or more via anaerobic digestion prior to land application.
3. **Transportation.**
    a. Transportation of the biosolids to the land application site shall be done in accordance with the City of Portland Biosolids Management Plan.
4. **Land Application Activities.**
    a. The site is approved for the land application of biosolids by a side-discharge spreader or other similar manure-spreading equipment.
    b. Biosolids shall be applied evenly and thinly in a manner that will prevent ponding and runoff during and after precipitation events.
    c. When more than one operator conducts biosolids land application or completion of the biosolids application on a site is interrupted for more than one week, areas where biosolids have been applied must be clearly marked by flag pins or stakes which note the date when biosolids were last applied. This tracking method may be replaced by use of GPS equipment if it provides as accurate tracking. Written and mapped daily land application records must be maintained as described under Condition 9.b.

d. Biosolids may be stored in the fields at the locations identified as "landings" on the site map for no more than 21 days prior to spreading. The quantity of biosolids in the storage locations may not exceed the agronomic loading rate for the field. For storage beyond 21 days, prior written request and ODEQ authorization is required.

e. Immediately following land application, the biosolids equipment operator shall clean off (at the application site) any equipment coated with biosolids to prevent biosolids from spilling onto public roadways.

5. Application Rates and Timing.

a. **Effective Date.** This authorization is effective **27 JULY 2010**.

b. **Application Period.** The site is approved for ***year-around*** land application of biosolids when field conditions allow for uniform application that will not result in ponding or runoff. Land application timing must be appropriate to the site's land management practices and must be managed to provide maximum benefit to crops grown on the site and minimize potential adverse environmental impacts.

c. **Application Rate.** Biosolids shall be applied at rates up to but not exceeding an agronomic loading limit appropriate to the crop being grown on the fields (Table 2), after accounting for supplemental sources of nitrogen and losses as described under Conditions 5.f and 5.g.

Table 2. Crops and Plant Available Nitrogen (PAN) approved for this land application site. The maximum quantity of biosolids applied to the field will not exceed the PAN for the identified crop, after accounting for supplemental sources and losses of nitrogen.

Crop	Irrigated	PAN (lbs/ac/yr)
Winter wheat	No	75

d. **Agronomic Rate Calculations.** Biosolids application rates will be calculated using one of the following: (i) the method approved in the ODEQ-approved Biosolids Management Plan; (ii) the method described in *Worksheet for Calculating Biosolids Application Rates in Agriculture*, published by the Oregon State University Extension Service, Publication No. PNW0511e (March 2007); or (iii) a more robust method such as that described in *Managing Nitrogen from Biosolids*, published by Washington State Department of Ecology and the Northwest Biosolids Management Association (April 1999). Any deviations from the methods and/or assumptions described in these publications must be pre-approved in writing by the ODEQ Northwest Region. (Updated versions of the aforementioned documents may be used at any time.)

e. **Routine Applications.** If biosolids applications exceed 2 out of 3 successive years at agronomic rates, the soils will be analyzed for residual nitrate-nitrogen (NO_3-N) before the next application. Agronomic application rates are to be adjusted for residual NO_3-N in the effective rooting zone.

f. **Supplemental N.** If other sources of nitrogen are applied to the fields (e.g., commercial, animal manure or green chop), the biosolids application rate must be reduced so that the supplemental nitrogen plus biosolids nitrogen does not exceed the agronomic application rate approved for this site.

g. **Changes.** Changes in biosolids characteristics, cropping practices, or general land management will necessitate appropriate adjustments in the application rate to maintain nitrogen applications consistent with crop demands. Major changes in any of the above must be communicated to the ODEQ's Northwest Region in writing before the changes are implemented.

6. **Site Restrictions.**

   a. **Wet Soils.** Care should be taken to avoid wet soil conditions at the time of application, particularly in concave areas.

   b. **Precipitation.** Biosolids land application shall cease when precipitation exceeds ¼ inch per hour or when one inch or more of precipitation occurs in a 24-hour period. Land application shall be withheld from the site for at least one day for every consecutive day of precipitation where a ¼ inch or one-inch per 24-hour precipitation event occurs.

   c. **General Public Access.** Access to the site by the general public shall be restricted for at least 12 months after biosolids land application has ceased.

   d. **Grazing.** A 30-day interval shall follow the application of biosolids prior to grazing livestock on any field or prior to the harvesting of crops that are to be fed to animals.

   e. **Wind.** Land application shall cease if wind speed is such that biosolids cannot be applied uniformly or would be thrown into buffer strips, waterways, roads, trails, or onto the application vehicle itself. Application may resume after wind speeds have decreased such that no significant blowing or drifting occurs.

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7. **Setbacks and Buffers.** Setbacks and buffers on the sites are listed in Table 3 and have also been identified in the attached site map(s).

Table 3. Site-specific setbacks for biosolids land application.

Feature	Setback[1] (ft.)
Property boundaries & private, unpaved roadways	10
Paved or graveled roadways & wind turbines	25
Residences and wells	200

[1]The setback is determined from the edge of the feature.

8. **Remedial Procedures.**

a. The City's biosolids hauler shall clean up any spillage of biosolids. The City shall consult with the ODEQ for appropriate methods of protecting public health and the environment for spills that cannot be completely cleaned up.

b. In the event an odor problem is reported to the City, its representative, or the ODEQ after biosolids has been land applied at the site, the best method to mitigate the odor concern will be determined jointly.

c. The ODEQ shall be notified within one hour, through the Oregon Emergency Response System (OERS), of any spills of more than ¼ cubic yards or other threats to the environment that may occur. All spills adjacent to drainage ditches or drainage ways should be reported. Failure to provide prompt notification may be considered cause for taking enforcement action against the City. The telephone number for OERS is 1.800.452.0311 (24-hr service).

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a. **Soil Testing.** Soil testing for residual nitrate-nitrogen (NO_3-N) will occur as described under Condition 5.c. The ODEQ recommends routine soil testing for soil nutrients as well as the trace pollutants listed in Table 1 of 40 CFR §503.13 for fields receiving annual biosolids applications. The Department may require soil testing if adverse environmental impacts are suspected at the site.

b. **Site Records.** Daily site records of accumulated land applied biosolids will be maintained. Site records shall be recorded on field grid map or other readable system. Records shall indicate the date, location and quantity of biosolids applied; segments of each field that received biosolids; target plant available nitrogen (PAN) loading rate of the area receiving biosolids; and the type of crop grown. These records must be available to the ODEQ for review upon request. Regardless of the format in which written and mapped records are kept, they must be readily available in hardcopy format

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a. The City or its representatives shall promptly notify ODEQ of any major changes it intends to make to its biosolids processing activities that could influence biosolids quality or quantity before anticipated modifications are initiated, as described under Condition 11.c.

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a. The ODEQ shall have the right to: (i) enter (at reasonable times) the City's (or its representatives) place of biosolids land application and record keeping to review biosolids management operations and records; (ii) obtain copies of any records required under the terms of this authorization and the City's biosolids management plan; (iii) inspect any monitoring equipment required under this authorization; (iv) inspect any collection, transport, or land application vehicle; and (v) obtain any photographic documentation or evidence deemed appropriate.

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c. Any variations from the City's approved biosolids management plan and this authorization letter must receive prior written approval from the ODEQ Northwest Region Office.

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Sincerely,

Connie M. Schrandt

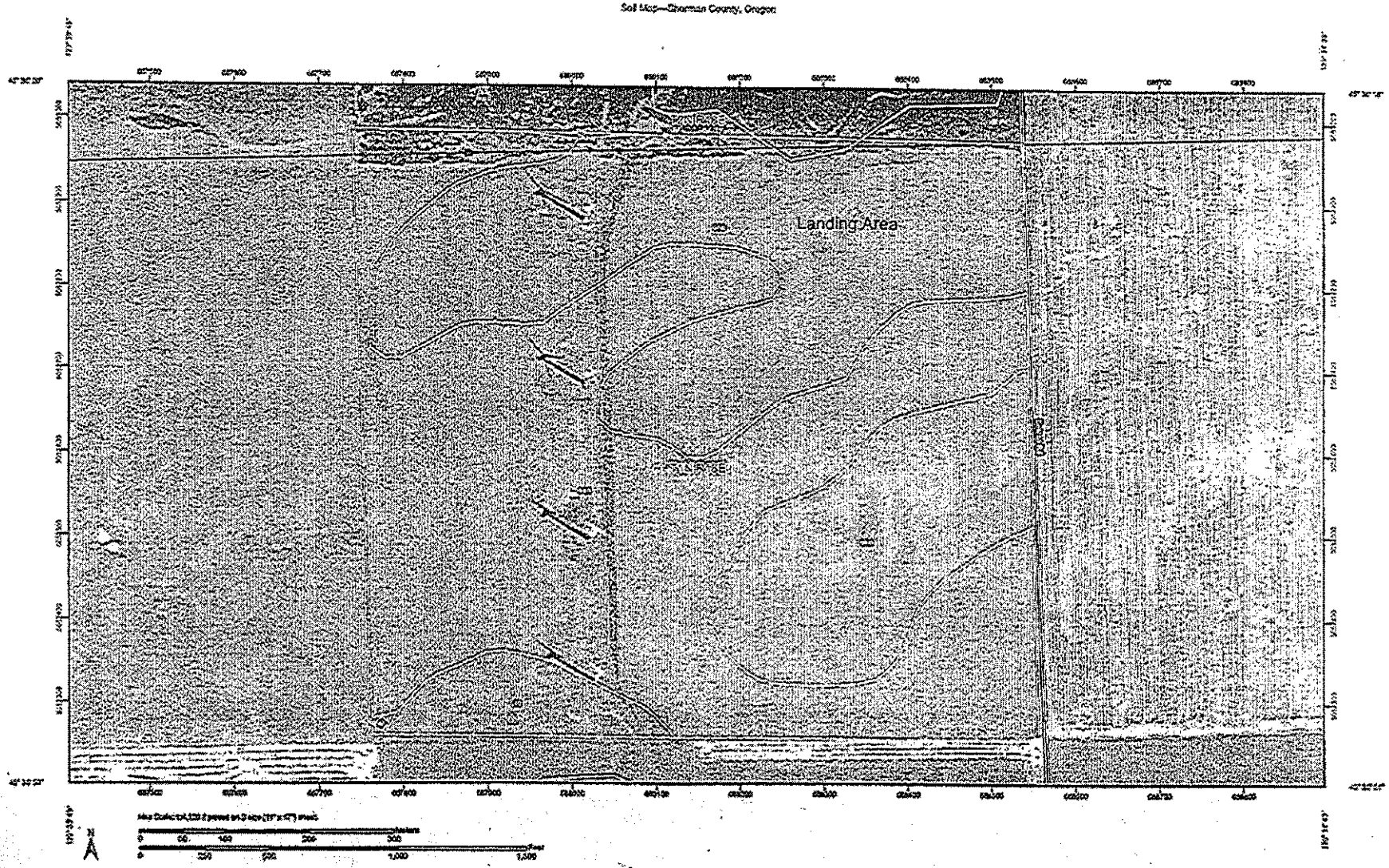
Connie M. Schrandt
Soils/Land Application Specialist
Northwest Region

Enc: Site Maps

Cc: Wasco Sherman Gilliam Public Health, 419 E. 7th Street, Room 100, The Dalles, OR 97058
Randy Hilderbrand, P.O. Box 326, Wasco, OR 97065

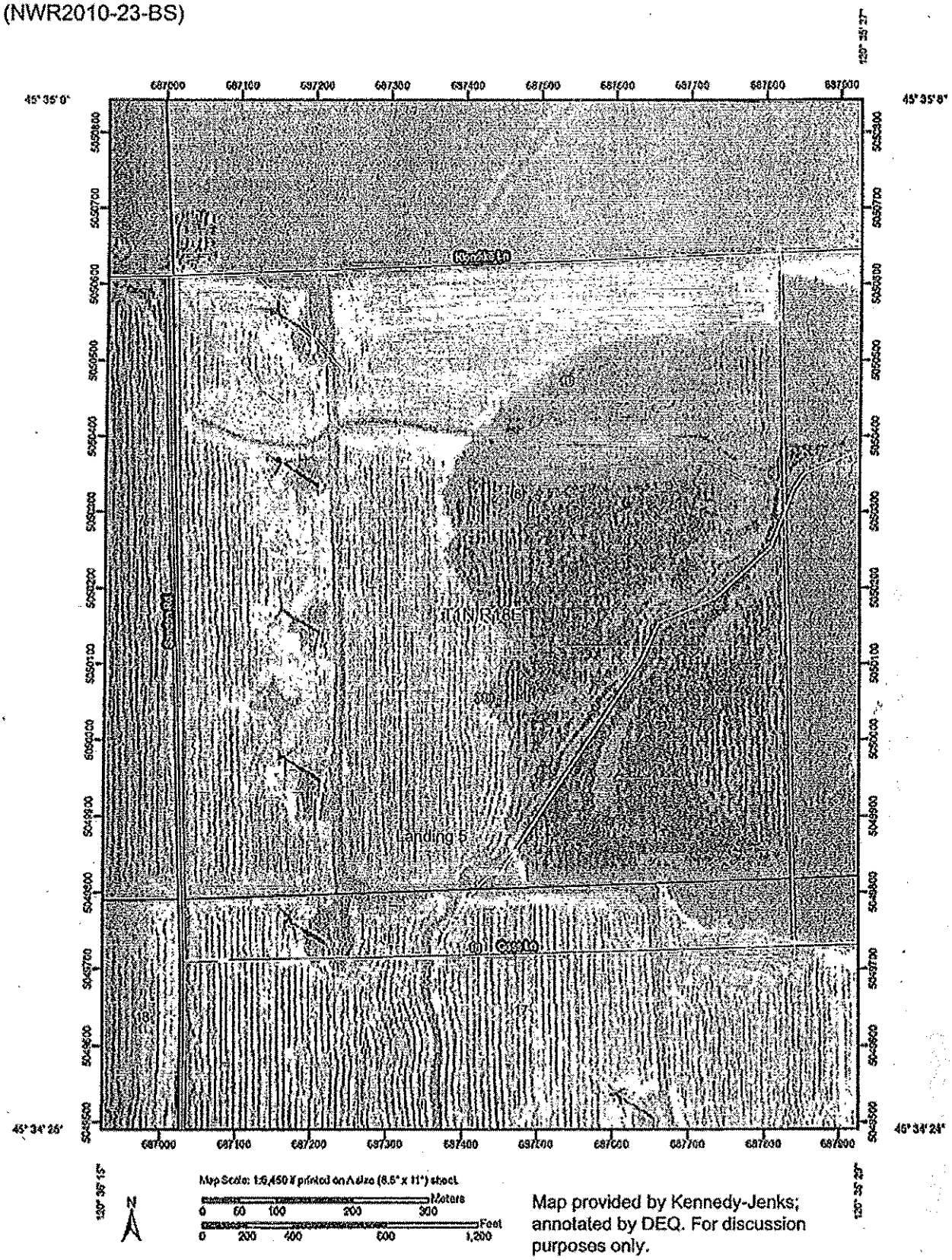
Ec: Ron Doughten, DEQ Biosolids Coordinator, ODEQ Headquarters (email)
Mark Cullington, Kennedy-Jenks Consultants, 200 SW Market St., Suite 500, Portland, OR 97201
Kent Madison, 29299 Madison Rd., Echo, OR 97826

SITE MAP - Randy Hilderbrand, Site 1
(NWR2010-23-BS)



Map provided by Kennedy-Jenks; annotated by DEQ. For discussion purposes only.

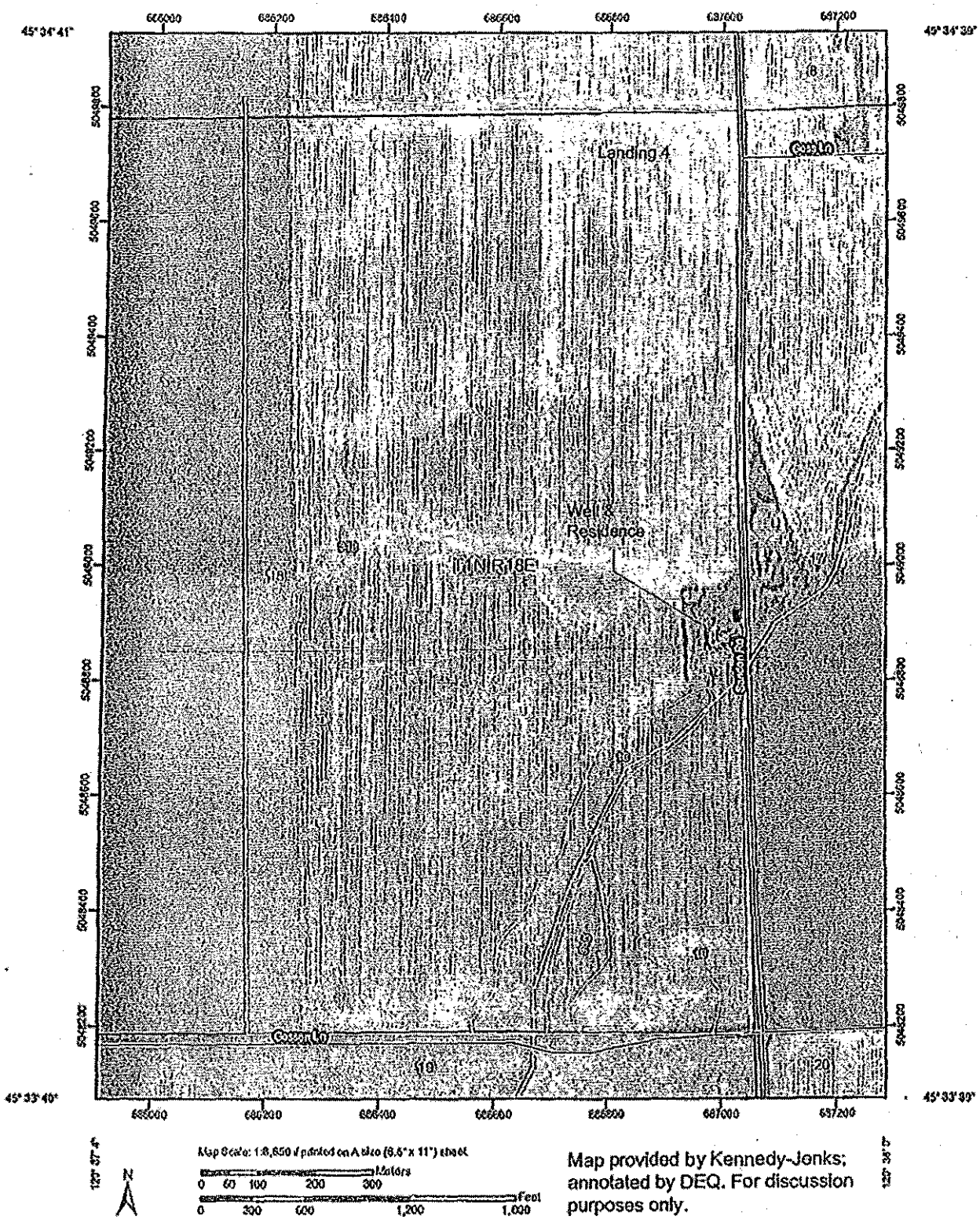
Site Map - Randy Hilderbrand, Site 3 (NWR2010-23-BS)



Map provided by Kennedy-Jenks; annotated by DEQ. For discussion purposes only.

SITE MAP - Randy Hilderbrand, Site 4 (NWR2010-23-BS)

Soil Map—Sherman County, Oregon


Landing 4
Well & Residence
T1NR18E
Co
Co
Co

Oregon
Theodore R. Kulongoski, Governor

Department of Environmental Quality
Northwest Region Portland Office/Water Quality
2020 SW 4th Avenue, Suite 400
Portland, OR 97201-4987
(503) 229-5263
FAX (503) 229-6957
OTRS 1-800-735-2900

June 1, 2010

IMPORTANT DOCUMENT
LAND APPLICATION AUTHORIZATION

Greg Charr, Biosolids Program Manager
Columbia Boulevard Wastewater Treatment Plant
City of Portland
5001 North Columbia Blvd.
Portland, OR 97201

Re: WQ-Multnomah County
Columbia Boulevard Wastewater Treatment Plant, City of Portland
NPDES Permit No. 100807; File No. 70725
Biosolids Land Application Authorization
Roland Simantel Site; Site ID: NWR2010-13-BS
TL 200, Sec. 1 & 12, T1N, R18E,
TL 2400, Sec. 11 & 12, T1N, R18E,
TL 2700, Sec. 13 & 14, T1N, R18E, and
TL 2800, Sec. 13, 14, 23 & 24, T1N, R18E, Sherman County

Dear Mr. Charr:

On April 20, 2010, the Oregon Department of Environmental Quality (ODEQ or "the Department") received a request from Kennedy-Jenks Consultants on behalf of the City of Portland ("the City") to land apply anaerobically-digested, dewatered cake biosolids produced by the City of Portland Columbia Boulevard Wastewater Treatment Facility (Columbia Blvd. WWTF) to properties located near Wasco, Oregon (see Table 1 and attached site map). The request included information characterizing soils, topography, biosolids, crop management, public notification and a signed agreement between the City and the property owner. **This authorization letter represents your approval to land apply biosolids to the referenced property. This authorization supersedes any previous authorization that may have been granted to the property and is valid only as part of your ODEQ-issued permit.**

Site Description. The property, owned by Roland Simantel and farmed by Jon and Rob Simantel, is zoned as Exclusive Farm Use (EFU) and consists of approximately 2,946 acres managed for soft white winter wheat and other dryland small grains production. The majority of this acreage is farmed using conventional tillage, with approximately 300 acres in "no-till" and another small area (approximately 120 acres) in dryland pasture. Adjacent properties are also agricultural.

Table 1. The property reviewed for biosolids land application, located in Clackamas Co., Oregon.

Township, Range, Section	Tax Lot(s)	Total Area (acres)	Spreadable Area† (acres)
T1N R18E S1,11,12,13,14,23,& 24	200, 2400, 2700 & 2800	2946.32	2295.8

†Spreadable acres are approximate and based upon assumptions associated with current site conditions. Actual acres spread may vary slightly based upon site conditions at time of application.

ODEQ made an inspection of the property on May 24, 2010, to evaluate the suitability of the site for biosolids land application. We reviewed site geology, soils, hydrology, and topography, discussed current and proposed land use and agricultural practices, and noted the locations of residences, wells and other sensitive site features. Finally, we discussed appropriate setbacks for land application areas.

The site is located on upland benches or terraces above the Columbia River. The topography is generally gently undulating with slopes less than 10%. Along the southeast boundary of Section 23 and south of Section 24, the landscape falls steeply into a canyon. Soils at the site appeared to be predominately composed of Walla Walla silt loam and Anderly silt loam or close variants, which is consistent with the NRCS soil maps for the area. Soils are typically deep and well drained, but subject to erosion from surface runoff.

The site contains a number of wind turbines and tower line roads. Three wells were identified, one near a wind turbine operation and maintenance facility and grain bins in Section 11, one associated with a neighbor's residence near the northwest corner of Section 11 and a third associated with an old homestead in Section 23. Proposed staging areas for interim biosolids storage were also noted.

Based upon the site visit and supplemental information provided by Kennedy-Jenks and the City, the property is approved for the land application of anaerobically-digested, dewatered cake biosolids produced by the Columbia Blvd. WWTF provided the following conditions are satisfied:

1. **Regulations, Rules, and Permit Requirements.** Biosolids processing and handling will comply with:
    a. Oregon biosolids and septage rules and guidelines (OAR 340-050);
    b. federal biosolids and septage regulations (40 CFR Part 503);
    c. the ODEQ-issued permit to the City of Portland, Columbia Blvd. WWTF (NPDES Permit No.100807; File No. 70725);
    d. the most recent ODEQ approved Biosolids Management Plan (last revised February 2009), including all subsequent amendments; and
    e. all other applicable federal and state statutes and rules.
2. **Treatment Processes.**
    a. Biosolids volatile solids content shall be reduced by 38% or more via anaerobic digestion prior to land application.
3. **Transportation.**

a. Transportation of the biosolids to the land application site shall be done in accordance with the City of Portland Biosolids Management Plan.

4. Land Application Activities.

a. The site is approved for the land application of biosolids by a side-discharge spreader or other similar manure-spreading equipment.

b. Biosolids shall be applied evenly and thinly in a manner that will prevent ponding and runoff during and after precipitation events.

c. When more than one operator conducts biosolids land application or completion of the biosolids application on a site is interrupted for more than one week, areas where biosolids have been applied must be clearly marked by flag pins or stakes which note the date when biosolids were last applied. This tracking method may be replaced by use of GPS equipment if it provides as accurate tracking. Written and mapped daily land application records must be maintained as described under Condition 9.b.

d. Biosolids may be stored in the fields at the locations identified as "landings" on the site map for no more than 21 days prior to spreading. The quantity of biosolids in the storage locations may not exceed the agronomic loading rate for the field. For storage beyond 21 days, prior written request and ODEQ authorization is required.

e. Immediately following land application, the biosolids equipment operator shall clean off (at the application site) any equipment coated with biosolids to prevent biosolids from spilling onto public roadways.

5. Application Rates and Timing.

a. **Effective Date.** This authorization is effective **01 JUNE 2010**.

b. **Application Period.** The site is approved for ***year-around*** land application of biosolids when field conditions allow for uniform application that will not result in ponding or runoff. Land application timing must be appropriate to the site's land management practices and must be managed to provide maximum benefit to crops grown on the site and minimize potential adverse environmental impacts.

c. **Application Rate.** Biosolids shall be applied at rates up to but not exceeding an agronomic loading limit appropriate to the crop being grown on the fields (Table 2), after accounting for supplemental sources of nitrogen and losses as described under Condition 5.d.

Table 2. Crops and Plant Available Nitrogen (PAN) approved for this land application site. The maximum quantity of biosolids applied to the field will not exceed the PAN for the identified crop, after accounting for supplemental sources and losses of nitrogen.

Crop	Irrigated	PAN (lbs/ac/yr)
Winter wheat	No	75
Pasture	No	150

d. **Agronomic Rate Calculations.** Biosolids application rates will be calculated using one of the following: (i) the method approved in the ODEQ-approved Biosolids Management Plan; (ii) the method described in *Worksheet for Calculating Biosolids Application Rates in Agriculture*, published by the Oregon State University Extension Service, Publication No. PNW0511e (March 2007); or (iii) a more robust method such as that described in *Managing Nitrogen from*

Biosolids, published by Washington State Department of Ecology and the Northwest Biosolids Management Association (April 1999). Any deviations from the methods and/or assumptions described in these publications must be pre-approved in writing by the ODEQ Northwest Region. (Updated versions of the aforementioned documents may be used at any time.)

e. **Routine Applications.** If biosolids applications exceed 2 out of 3 successive years at agronomic rates, the soils will be analyzed for residual nitrate-nitrogen (NO_3-N) before the next application. Agronomic application rates are to be adjusted for residual NO_3-N in the effective rooting zone.

f. **Supplemental N.** If other sources of nitrogen are applied to the fields (e.g., commercial, animal manure or green chop), the biosolids application rate must be reduced so that the supplemental nitrogen plus biosolids nitrogen does not exceed the agronomic application rate approved for this site.

g. **Changes.** Changes in biosolids characteristics, cropping practices, or general land management will necessitate appropriate adjustments in the application rate to maintain nitrogen applications consistent with crop demands. Major changes in any of the above must be communicated to the ODEQ's Northwest Region in writing before the changes are implemented.

6. **Site Restrictions.**

a. **Wet Soils.** Care should be taken to avoid wet soil conditions at the time of application, particularly in concave areas.

b. **Precipitation.** Biosolids land application shall cease when precipitation exceeds ¼ inch per hour or when one inch or more of precipitation occurs in a 24-hour period. Land application shall be withheld from the site for at least one day for every consecutive day of precipitation where a ¼ inch or one-inch per 24-hour precipitation event occurs.

c. **General Public Access.** Access to the site by the general public shall be restricted for at least 12 months after biosolids land application has ceased.

d. **Grazing.** A 30-day interval shall follow the application of biosolids prior to grazing livestock on any field or prior to the harvesting of crops that are to be fed to animals.

e. **Wind.** Land application shall cease if wind speed is such that biosolids cannot be applied uniformly or would be thrown into buffer strips, waterways, roads, trails, or onto the application vehicle itself. Application may resume after wind speeds have decreased such that no significant blowing or drifting occurs.

f. **Nuisance Conditions.** Biosolids land application shall cease when the potential exists for nuisance conditions or runoff beyond the approved areas.

g. **Wind Farm Access.** Appropriate setbacks will be maintained from wind turbines and access roads (Condition 7). Restricted access to the fields by non-farm personnel associated with Wind Farms (or other activities) will be maintained for at least 30 days after land application has ceased. Signs will be posted at all potential access roads and will provide (at a minimum) the following information:

i. identification of the field as a Biosolids Land Application site;

ii. state that access is restricted for at least 30 days following the most recent land application event;

iii. the date of the most recent land application event;

iv. a requirement that non-farm personnel seeking access to the fields, after 30 days but less than 12 months following the most recent land application event, must be provided information on the biosolids land application activities; and

v. contact information for the Columbia WWTF and/or the City's Columbia WWTF's representative.

Individuals seeking access to the sites must be provided with information regarding biosolids land application activities; and, any questions and/or concerns they may have regarding exposure to biosolids must be addressed.

7. **Setbacks and Buffers.** Setbacks and buffers on the sites are listed in Table 3 and have also been identified in the attached site map(s).

Table 3. Site-specific setbacks for biosolids land application.

Feature	Setback† (ft.)
Property boundaries & private, unpaved roadways	10
Paved or graveled roadways & wind turbines	25
Residences and wells	200

†The setback is determined from the edge of the feature. For example, a wind tower access road requires 25' setback from each side of the road, so the buffer area would be 50' plus the actual width of the road.

8. **Remedial Procedures.**

a. The City's biosolids hauler shall clean up any spillage of biosolids. The City shall consult with the ODEQ for appropriate methods of protecting public health and the environment for spills that cannot be completely cleaned up.

b. In the event an odor problem is reported to the City, its representative, or the ODEQ after biosolids has been land applied at the site, the City and the ODEQ will jointly determine the best method to mitigate the odor concern.

c. The ODEQ shall be notified within one hour, through the Oregon Emergency Response System (OERS), of any spills of more than ¼ cubic yards or other threats to the environment that may occur. All spills adjacent to drainage ditches or drainage ways should be reported. Failure to provide prompt notification may be considered cause for taking enforcement action against the City. The telephone number for OERS is 1.800.452.0311 (24-hr service).

9. **Monitoring and Reporting.**

a. **Soil Testing.** Soil testing for residual nitrate-nitrogen (NO_3-N) will occur as described under Condition 5.c. The ODEQ recommends routine soil testing for soil nutrients as well as the trace pollutants listed in Table 1 of 40 CFR §503.13 for fields receiving annual biosolids applications. The Department may require soil testing if adverse environmental impacts are suspected at the site.

b. **Site Records.** Daily site records of accumulated land applied biosolids will be maintained. Site records shall be recorded on field grid map or other readable system. Records shall indicate the date, location and quantity of biosolids applied; segments of each field that received biosolids; target plant available nitrogen (PAN) loading rate of the area receiving biosolids; and the type of crop grown. These records must be available to the ODEQ for review upon request. Regardless of the format in which written and mapped records are kept, they must be readily available in hardcopy format

c. **Annual Report.** By 19 February of each year, the City shall provide the ODEQ with an annual report of the previous year's biosolids processing and application activities, as required under the ODEQ rules (OAR 340-050-0035(6)). An annual report must be also be submitted to the United States Environmental Protection Agency (USEPA) Region 10.

10. Notification.

a. The City or its representatives shall promptly notify ODEQ of any major changes it intends to make to its biosolids processing activities that could influence biosolids quality or quantity before anticipated modifications are initiated, as described under Condition 11.c.

11. Additional Conditions.

a. The ODEQ shall have the right to: (i) enter (at reasonable times) the City's (or its representatives) place of biosolids land application and record keeping to review biosolids management operations and records; (ii) obtain copies of any records required under the terms of this authorization and the City's biosolids management plan; (iii) inspect any monitoring equipment required under this authorization; (iv) inspect any collection, transport, or land application vehicle; and (v) obtain any photographic documentation or evidence deemed appropriate.

b. This authorization is subject to revocation should health hazards, environmental degradation, or nuisance conditions develop as a result of inadequate biosolids treatment or site management.

c. Any variations from the City's approved biosolids management plan and this authorization letter must receive prior written approval from the ODEQ Northwest Region Office.

d. The ODEQ may amend this Site Authorization and impose any additional restrictions or conditions deemed necessary to protect environmental and human health.

This authorization is considered to be part of your approved biosolids management plan and is enforceable as part of your NPDES permit. Therefore, if operations are not conducted in accordance with terms specified under this authorization, the Department will initiate an enforcement action, which may lead to the assessment of a civil penalty. If you have any questions regarding the issues in this letter please call me at 503.229.5347 or contact me via email at schrandt.connie@deq.state.or.us.

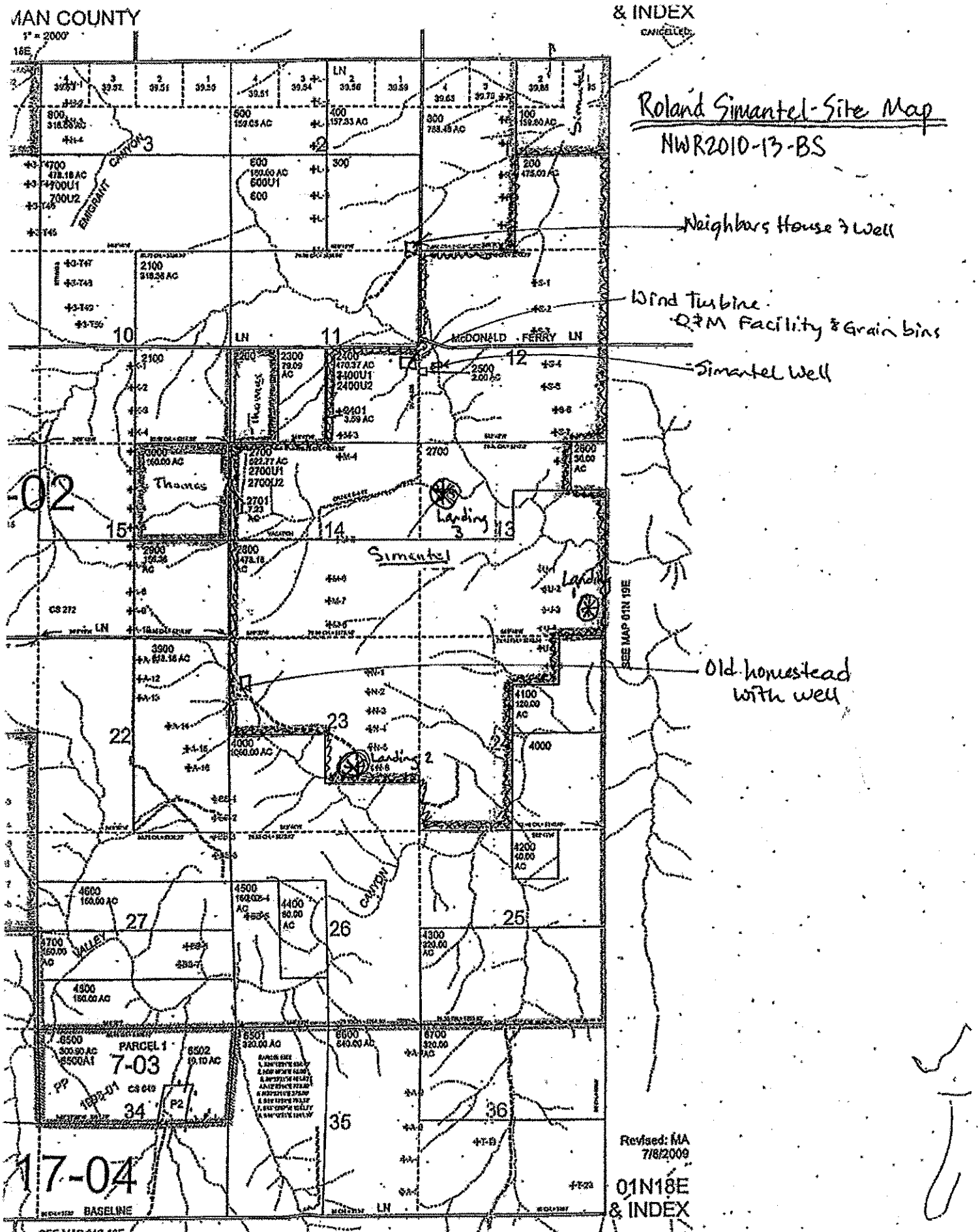
Sincerely,

Connie M. Schrandt

Connie M. Schrandt
Soils/Land Application Specialist
Northwest Region

Enc: Site Map

Cc: Ron Doughten, DEQ Biosolids Coordinator, ODEQ Headquarters (email)
Mark Cullington, Kennedy-Jenks Consultants, 200 SW Market St., Suite 500, Portland, OR 97201
Kent Madison, 29299 Madison Rd., Echo, OR 97826
Wasco Sherman Gilliam Public Health, 419 E. 7th Street, Room 100, The Dalles, OR 97058
Jon & Rob Simantel, P.O. Box 31, Wasco, OR 97065



Map provided by Kennedy-Jenks, annotated by DEQ for discussion purposes only.

Oregon
Theodore R. Kulongoski, Governor

Department of Environmental Quality
Northwest Region
2020 SW 4th Ave, Suite 400
Portland, OR 97201
(503) 229-5263
FAX (503) 229-6945
OTRS 1-800-735-2900

February 3, 2010

Greg Charr, Biosolids Program Manager
Columbia Boulevard Wastewater Treatment Plant
City of Portland
5001 North Columbia Blvd.
Portland, OR 97204

Re: WQ-Multnomah County
Columbia Boulevard WWTP, City of Portland
NPDES Permit No. 100807; File No.70725
Biosolids Land Application Authorization Withdrawal
K&S Madison, Inc. Site, T3N R27E S34 (West Half), TL 5700, Umatilla County

Dear Greg Charr:

On January 26, 2010, the Oregon Department of Environmental Quality (DEQ or "the Department") received a written request from Kent Madison to relinquish the above-described site to Oak Lodge Sanitary District with hopes of providing them with additional land for biosolids application during winter months. The site, consisting of 320 acres or 169.02 spreadable acres, was originally authorized to the City of Portland in a Department letter dated March 8, 1995, for biosolids applications to dryland pasture. **The Department is hereby withdrawing the City of Portland's biosolids land application site authorization for the property described above.**

The property is eligible for future site authorizations for the beneficial use of biosolids via land application.

If you have any questions regarding the site authorization withdrawal, please call me at 503.325.5347 (Mon & Tue) or 503.861.3280 or contact me via email at schrandt.connie@deq.state.or.us.

Sincerely,

Connie M. Schrandt

Connie M. Schrandt
Soils/Land Application Specialist
Northwest Region

cc: Ron Doughten, DEQ Biosolids Coordinator, DEQ Headquarters (email)
Umatilla County Health Department, 200 SE 3rd St., Pendleton, OR 97801
Kent Madison, 29299 Madison Rd., Echo, OR 97826
Rick Webster, Oak Lodge Sanitary District, 14611 SE River Rd., Milwaukie, OR 97267

Oregon
Theodore R. Kulongoski, Governor

Department of Environmental Quality
Northwest Region Portland Office/Water Quality
2020 SW 4th Avenue, Suite 400
Portland, OR 97201-4987
(503) 229-5263
FAX (503) 229-6957
OTRS 1-800-735-2900

November 4, 2009

Greg Charr, Biosolids Program Manager
Columbia Boulevard Wastewater Treatment Plant
City of Portland
5001 North Columbia Blvd.
Portland, OR 97204

Re: WQ- Multnomah County
Columbia Boulevard WWTP, City of Portland
Biosolids Land Application Amendment
K & S Madison, Inc., New Portland Site
TL5000, S22, T3N, R27E; Umatilla County
TL 5600, S27, T3N, R27E, Umatilla County and
TL1700; S28 & 29, T3N, R27E, Morrow County
File No. 70725
NPDES Permit No. 100807

Dear Mr. Charr:

At your request, via email dated September 25, 2009, the New Portland Land Application site authorization issued by the Department of Environmental Quality (the Department) on April 26, 2005, and amended on July 8, 2005, and June 23, 2006, is further amended to allow a maximum of 150 lbs. plant available nitrogen (PAN) per acre to be applied to dryland winter wheat within any two year period, provided that at least two cropping seasons elapse prior to any subsequent biosolids applications. Those portions of the above-described properties for which the option of alternating between dryland soft winter wheat and dryland canola (DEQ amendment dated June 23, 2006) are also further amended to allow a maximum of 140 lbs. PAN per acre within any two year period.

The Department requests that soils be tested for residual nitrate nitrogen and the results reported to the Department on an annual basis. This amendment is granted on a trial basis to determine if this practice can eventually be accepted as a regular means of biosolids application for the above-described properties.

All other applicable requirements of the site authorization dated April 26, 2005, the site authorization amendments dated July 8, 2005, and June 23, 2006, the City of Portland Biosolids Management Plan and the current federal and state regulations (40 CFR Part 503 and Chapter 340 Division 50, respectively) remain in effect.

If you have any questions regarding this site authorization amendment, please contact me at 503.229.5347 (Mon. & Tues. only) or 503.861.3280, or via email at schrandt.connie@deq.state.or.us.

Sincerely,

Connie M. Schrandt

Connie M. Schrandt
Soils/Land Application Specialist
Northwest Region

cc: Ron Doughten, DEQ Biosolids Coordinator, ODEQ Headquarters (email)
Umatilla County Health Department, 200 SE 3rd St., Pendleton, OR 97801
Morrow County Health Department, 120 S. Main St., Heppner, OR 97836
Kent Madison, 29299 Madison Rd., Echo, OR 97826

— CITY OF PORTLAND —
ENVIRONMENTAL SERVICES

Columbia Boulevard Wastewater Treatment Plant

5001 N. Columbia Boulevard, Bldg 310, Portland, Oregon 97203 ▪ Sam Adams, Commissioner ▪ Dean Marriott, Director

Neil Mullane
Oregon Department of Environmental Quality
Northwest Region
2020 SW 4th Avenue # 900
Portland, OR 97201-4987

September 19, 2007

Re: Alteration of acreage associated with Madison Farms Irrigation Circle 28 in Sections 13 and 24, Township 3 No., Range 27, E,WM. and Sections 18 and 19, Township 3 No., Range 28, E,WM., Umatilla County

Dear Mr. Mullane:

Under a June 19, 2007 letter to Ben Maynard, the City requested DEQ recognize the development and operation of three irrigation circles that Madison Farms wanted to assemble on Portland biosolids land application sites historically managed as dryland pasture. The request also described a variety of crops that would be rotated in irrigated areas together with intended biosolids plant available nitrogen loading rates that were consistent with Oregon State University fertilizer guide recommendations.

The June 19, 2007, letter indicated geographic areas associated with each circle. In the case of Circle 28, 74.5 acres were originally slated for center pivot irrigation system build out. As it turns out, Madison Farms installed a center pivot irrigation system which encompassed 90.47 acres (comprised of 1.99 ac in Section 13 and 63.8 ac in Section 24, Township 3 North, Range 27 EWM and 0.09 ac and 24.59 ac, respectively in Sections 18 and 19, Township 3 North, Range 28, EWM in Umatilla County) rather than the originally envisioned 74.5 acres.

Soils and topography in the expanded area associated with Circle 28 are consentient with those in the lesser circle area originally planned. They occur on nearly level topography and are sufficiently deep to facilitate good plant rooting depth. The Natural Resources Conservation Service (NRSCS) has mapped soils in the proximity of proposed Circle No. 28 as Quincy fine sand (0 to 5 percent slope) and Taunton fine sandy loam (1 to 7 percent slope). The Quincy series consists of deep, excessively drained soils appearing on Columbia River strath terraces. They are derived from aeolian sand. These soils are characterized by rapid permeability, an effective rooting depth greater than 60 inches, low natural fertility and low available water holding capacity (i.e., frequent, short duration irrigation intervals will be necessary). The Taunton series consists of moderately deep, well-drained soils on Columbia River terraces. These soils are formed in eolian sand over cemented alluvium. Typically sandy soils overly a gravelly duripan at 26 to 29 inches. This barrier material would serve as a natural safeguard, which would preclude excess moisture from reaching groundwater.

Irrigated crops would be rotated annually. Water supplied from the Columbia River and local production wells would be used as irrigation sources for the circle.

The irrigated circle would be established in canola (used for the production of biodiesel and livestock feed), winter or spring wheat, alfalfa and livestock feed corn. The quantity of biosolids applied within the circle would

fall within Oregon State University's recommended fertilizer loading rates based on biosolids derived plant available nitrogen and any background nitrogen existing in soils indicated (see table).

PAN (Biosolids) Loading Rate for Madison Farms Irrigated Circles 28, 96 & 97		
Crop	PAN (lb/ac/yr) Recommended by Dr. Don Horneck-OSU	Proposed PAN (lb/ac/yr) Kent Madison
Canola	200	200
Winter or Spring Wheat	310	<300
Feed Corn	350	<300
Alfalfa	400	<300

IRZ Consulting will regularly monitor irrigated soil water beneath all proposed circles via neutron probe to assure optimal soil moisture. Deficit irrigation will be practiced at Circle 28. As an added safeguard against over irrigation, soils would be monitored annually to assure that NO_3-N levels in the subsoil remained within 10 mg/kg prior to the application of additional biosolids.

If irrigated alfalfa, corn or wheat were established on the site and up to 300 pounds of plant available nitrogen (PAN) were land applied annually under a deficit irrigation program, based on the average chemistry of Portland's biosolids (roughly 72 percent freshly digested primary and secondary solids and 28 percent older digested solids which had undergone additional stabilization in the Triangle Lake facultative storage lagoon), approximately nine and one-half dry tons of biosolids per acre would supply crop nitrogen needs (see Table 13-4 in February 2007 Biosolids Management Plan). Similarly, at a loading rate of 200 pounds of biosolids derived PAN per acre (i.e., for irrigated canola); approximately six and one-third dry tons per acre would be required to address crop fertility requirements.

In response to Portland's June 19, 2007 letter, on July 30, 2007, Ben Maynard issued a site authorization modification letter that recognized and facilitated the conversion of dryland pasture to irrigated agriculture as well as an expanded suite of irrigated crops. Ben's letter did not specifically delineate the number of acres authorized in any particular irrigation circle planned. It generically enabled changes in cropping practices consistent with Oregon State University fertilizer guidance.

This letter is intended to provide clarification on the actual acreage and geographic location of irrigation Circle 28 at Madison Farms. This area will be articulated in the biosolids management plan/annual report submitted to DEQ by the City of Portland in February 2008.

If you have any questions concerning this irrigation circle area clarification, feel free to call me at 503-823-2437.

Sincerely,

Mark P. Ronayne
Biosolids Management Program

cc: Joni Hammond
Judy Johndohl
Dick Hetherington
Dan Clark
Greg Charr

Oregon
Theodore Kulongoski, Governor

Department of Environmental Quality
Northwest Region Portland Office
2020 SW 4th Avenue, Suite 400
Portland, OR 97201-4987
(503) 229-5263
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TTY (503) 229-5471

July 30, 2007

MARK P. RONAYNE, BIOSOLIDS PROGRAM MANAGER
COLUMBIA BOULEVARD WASTEWATER TREATMENT PLANT
CITY OF PORTLAND
5001 NORTH COLUMBIA BOULEVARD
PORTLAND, OR 97203-2098

Re: WQ-SDS-Multnomah County
Columbia Boulevard WWTP
City of Portland Oregon
File No. 70725
NPDES Permit No. 100807
Site Authorization Modification for Planned Changes in Cropping Practices at K&S Madison, Inc. Biosolids Land Application Site
T3N; R27E; Sections 11, 12, 14, 15, 22-26, 34-36 and
T3N; R28E; Sections 6,7,19
Umatilla County

Dear Mr. Ronayne:

This letter is in response to your June 19, 2007 letter summarizing planned changes to cropping practices at the referenced land application site. According to our records, the Site Authorization for the property issued March 8, 1995, was modified May 21, 1998, and again on June 26, 1998.

This Site Authorization modification restores the condition that if there are changes in biosolids characteristics or cropping practices, land application rates must be adjusted to ones not exceeding the crop's agronomic rate specified in OSU Fertilizer Guides (this requirement is in Condition 6 of the original Site Authorization). The planned cropping practice changes are authorized if the appropriate adjustments are made.

If you have any questions regarding this Site Authorization amendment, please contact

me at 503.229.5050 (o), 503.229.6957 (f), or Maynard.Ben@deq.state.or.us (e).

Sincerely,

Ben Maynard, Natural Resources Specialist
Water Quality Program, Biosolids and Industrial Solids Land Application
Oregon Department of Environmental Quality, Northwest Region-Portland

cc: Judy Johndohl, Water Quality Division, Headquarters, DEQ
Elizabeth Hutchison, Pendleton Office, Eastern Region, DEQ
K & S Madison, Inc.
29299 Madison Road
Echo, Oregon 97826
Umatilla County Health Department
216 SE 4th Street
Pendleton, OR 97801

DEQ-DC1

Oregon
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Northwest Region Portland Office
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June 23, 2006

MARK P RONAYNE BIOSOLIDS PROGRAM MANAGER
COLUMBIA BOULEVARD WASTEWATER TREATMENT PLANT
CITY OF PORTLAND
5001 NORTH COLUMBIA BOULEVARD
PORTLAND OR 97203-2098

Re: WQ-SDS-Multnomah County
Columbia Boulevard WWTP
City of Portland Oregon
Biosolids Land Application
Authorization Amendment
K & S Madison, Inc., New Portland Land
Application Site
TL5000 (SEPO); S22; T3N; R27E WM
Umatilla County
TL5600; S27; T3N; R27E WM
Umatilla County
TL1700 (C&EPO); S28 and S29 (EPO); T3N
R27E WM Morrow County
File No. 70725
NPDES Permit No. 100807

Dear Mr. Ronayne:

As per your latest request of June 9, 2006, the New Portland Land Application Site authorization issued by the Department of Environmental Quality (Department) on April 26, 2005, and amended on July 8, 2005 is further amended to include the option of alternating between a dryland soft winter wheat crop and a dryland canola crop on portions of the site described above (not including Section 29). The proposed agronomic application rate for both crops is 70 lbs. of plant available nitrogen (PAN) per acre per year.

This agronomic rate is slightly below the rate for the dryland soft winter wheat crop (75 lbs. of PAN per acre per year) and slightly above the rate for dryland canola (60 lbs. of PAN per acre per year). The criteria for choosing the crop to be planted is based on the soil moisture content at the start of the growing season with dryland canola planted when the soil moisture content is relatively high and dryland wheat planted when the soil moisture content is relatively low.

Due to the variability of crop rotation and crop agronomic needs, the Department requests that soil nitrate testing be conducted and results reported to the Department (via the City's biosolids annual report) on an annual basis.

All applicable requirements of the Department's site authorization letter of April 26, 2005, and amendment letter dated July 8, 2005, remain in effect.

If you have any questions regarding this authorization amendment, please contact Ben Maynard at 503.229.5050 (o), 503.229.6957 (f), or Maynard.Ben@deq.state.or.us (e).

Sincerely,

Bruce W. Henderson

Bruce W. Henderson
Biosolids Specialist
Northwest Region

cc: Judy Johndohl, Water Quality Division, Headquarters, DEQ
Ben Maynard, Portland Office, NWR, DEQ
Elizabeth Hutchison, Pendleton Office, Eastern Region, DEQ
K & S Madison, Inc.
29299 Madison Road
Echo, Oregon 97826
Morrow County Health Department
PO Box 799
Heppner, OR 97836
Umatilla County Health Department
216 SE 4th Street
Pendleton, OR 97801

DEQ-DC1

Oregon
Theodore Kulongoski, Governor

Department of Environmental Quality
Northwest Region Portland Office
2020 SW 4th Avenue, Suite 400
Portland, OR 97201-4987
(503) 229-5263
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December 23, 2005

MARK P RONAYNE BIOSOLIDS PROGRAM MANAGER
COLUMBIA BOULEVARD WASTEWATER TREATMENT PLANT
CITY OF PORTLAND
5001 NORTH COLUMBIA BOULEVARD
PORTLAND OR 97203-2098

Re: WQ-SDS-Multnomah County
Columbia Boulevard WWTP
City of Portland
Biosolids Land Application Amendment to
all City of Portland Authorized Sites on
the Madison Farms
K& S Madison, Inc.
Morrow & Umatilla Counties
File No. 70725
NPDES Permit No. 100807

Dear Mr. Ronayne:

At your request, by letter dated October 24, 2005, the City of Portland biosolids land application site authorizations located on the Madison Farms in Morrow and Umatilla Counties are amended by the Department of Environmental Quality (Department) to allow biosolids application on land with ground slopes up to 45%.

As an example, for Sections 27, 28 & 29; Township 3 North; Range 27 East Willamette Meridian in Morrow and Umatilla Counties, the amendment adds about 56.18 hectares (138.83 acres) of steep slope area to the authorized sites.

All other applicable conditions of the Department issued biosolids land application site authorizations for the City of Portland on the Madison Farms remain in effect.

It is understood that the City of Portland and K& S Madison, Inc. will conduct a monitoring program in areas of the Madison Farms with steep slopes that have had several biosolids applications, one biosolids application and no biosolids application. Monitoring will include soil samples for determination plant available nitrogen and forage samples for determination of plant nutrients.

Results of the monitoring will be reported to the Department in the City of Portland's annual biosolids reports or by other special reports. The results of the monitoring program may be used to modify biosolids land application practices in areas of the Madison Farms with steep slopes.

If you have any questions regarding this biosolids land application amendment, please contact me at 503.229.5616 (o) (503.229.6957 (f); Henderson.Bruce@deq.state.or.us (e)).

Sincerely,

Bruce W. Henderson

Bruce W. Henderson
Biosolids Specialist
Northwest Region

cc: Judy Johndohl, Water Quality, Headquarters, DEQ
Elizabeth Hutchison, Eastern Region, Pendleton Office, DEQ
Paul Kennedy, Western Region, Roseburg Office, DEQ
Kent Madison; K & S Madison, Inc.; HC 70 Box 301; Echo, OR 97826
Dave Arguello; CWS; 3125 SE River Road; Hillsboro OR 97123
Mark D Johnston; Willow Lake WWTF; City of Salem;
5915 Windsor Island Rd North; Salem OR 97303

DEQ-DC1

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December 20, 2005

MARK P RONAYNE BIOSOLIDS PROGRAM MANAGER
COLUMBIA BOULEVARD WASTEWATER TREATMENT PLANT
CITY OF PORTLAND
5001 NORTH COLUMBIA BOULEVARD
PORTLAND OR 97203-2098

Re: WQ-SDS-Multnomah County
Columbia Boulevard WWTP
City of Portland
Biosolids Land Application Amendment to
Reauthorization/Authorization
K & S Madison, Inc. Site
S11,12,14,15,22-26,34-36;T3N;R27E
and S6,7,19;T3N;R28E WM
Umatilla County
File No. 70725
NPDES Permit No. 100807

Dear Mr. Ronayne:

It has come to the attention of the Department of Environmental Quality (Department) that the agronomic application rate requirements for City of Portland authorized biosolids land application sites on the Madison Farms are inconsistent. Specifically, the stated agronomic application rate in condition 6. of the Department's letter dated March 8, 1995, for City of Portland biosolids application sites for dryland pasture on the Madison Farms is inconsistent with the agronomic application rate requirements stated on other biosolids site authorizations for dryland pasture on the Madison Farms. The general biosolids application rate on the Madison Farms for dryland pasture is 150 lbs plant available nitrogen (PAN) per acre per year while the March 8, 1995, letter gives an application rate of 115 lbs. PAN per acre per year.

Therefore, the Department is amending condition 6. of the March 8, 1995, site authorization letter to be 150 lbs. PAN per acre per year. In keeping with the allowed application rate on other City of Portland biosolids land application sites with dryland pasture on the Madison Farms, a maximum of 300 lbs. PAN can be applied within any two year period. The amount of biosolids that can be applied per acre is dependent upon the PAN content of the biosolids and is not limited to the 5 dry tons per acre that is specified in condition 6. of the March 8, 1995, letter.

All other conditions of the March 8, 1995, biosolids land application site authorization letter for the City of Portland on the Madison Farms remain in effect.

If you have any questions regarding this authorization/reauthorization amendment, please contact me at 503.229.5616 (o) (503.229.6957 (f); Henderson.Bruce@deq.state.or.us (e)).

Sincerely,

Bruce W. Henderson

Bruce W. Henderson
Biosolids Specialist
Northwest Region

Attachment A
cc: Judy Johndohl, Water Quality, Headquarters, DEQ
Elizabeth Hutchison, Eastern Region, Pendleton Office, DEQ
Kent Madison
K & S Madison, Inc.
HC 70 Box 301
Echo, OR 97826

DEQ-DC1

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July 8, 2005

MARK P RONAYNE BIOSOLIDS PROGRAM MANAGER
COLUMBIA BOULEVARD WASTEWATER TREATMENT PLANT
CITY OF PORTLAND
5001 NORTH COLUMBIA BOULEVARD
PORTLAND OR 97203-2098

Re: WQ-SDS-Multnomah County
Columbia Boulevard WWTP
City of Portland Oregon
Biosolids Land Application
Authorization Amendment
K & S Madison, Inc., New Portland Land
Application Site
TL5000 (SEPO); S22; T3N; R27E WM
Umatilla County
TL1700 (CPO); S29 (EPO); T3N
R27E WM Morrow County
File No. 70725
NPDES Permit No. 100807

Dear Mr. Ronayne:

As per your request of June 7, 2005, the New Portland Land Application Site authorization issued by the Department of Environmental Quality (Department) on April 26, 2005, is amended to include the two additional areas described above. Both areas are contiguous with areas authorized by the Department letter of April 26, 2005.

The first area, located within the southeast corner of Tax Lot 5000 in Umatilla County, has 11.25 hectares (ha) (27.8 acres) and is to be managed for both dryland wheat and dryland pasture crops. The second area is located within the central part of Tax Lot 1700 in Morrow County and lies immediately east of land authorized by the Department to the City of Salem for biosolids land application and immediately west of land authorized by the Department to the City of Portland for biosolids land application. This area has 8.11 ha (20.05 acres) and is to be managed for dry pasture crop.

All applicable requirements of the Department's site authorization letter of April 26, 2005, apply to these two additional areas.

If you have any questions regarding this authorization amendment, please contact me at 503.229.5616 or by FAX at 503.229.6957.

Sincerely,

Bruce W. Henderson

Bruce W. Henderson
Biosolids Specialist
Northwest Region

cc: Judy Johndohl, Water Quality Division, Headquarters, DEQ
Elizabeth Hutchison, Pendleton Office, Eastern Region, DEQ
Paul Kennedy, Roseburg Office, Western Region, DEQ
Dave Arguello, Reuse Manager, CWS
3125 SE River Road
Hillsboro, OR 97123
Mark Johnston, Residuals Manager, Willow Lake WWTF, City Of Salem
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K & S Madison, Inc.
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April 26, 2005

MARK P RONAYNE BIOSOLIDS PROGRAM MANAGER
COLUMBIA BOULEVARD WASTEWATER TREATMENT PLANT
CITY OF PORTLAND
5001 NORTH COLUMBIA BOULEVARD
PORTLAND OR 97203-2098

Re: WQ-SDS-Multnomah County
Columbia Boulevard WWTP
City of Portland Oregon
Biosolids Land Application
Authorization
K & S Madison, Inc., New Portland Land
Application Site
TL5600; S27; T3N; R27E WM
Umatilla County
TL1700 (EPO); S28 and S29 (EPO); T3N
R27E WM Morrow County
File No. 70725
NPDES Permit No. 100807

Dear Mr. Ronayne:

I evaluated the proposed K & S Madison, Inc. site with you and others on December 19, 2001, to determine if the site would be suitable for the land application of anaerobically digested dewatered biosolids cake from the Columbia Boulevard WWTF in Portland, Oregon. You have recently confirmed that there have been no changes to the site that would affect biosolids land application since the time of the site evaluation.

On April 1, 2005, you provided the Department of Environmental Quality (Department) with a request for authorization to land apply biosolids to an approximate 433.9 hectare (ha) (1071.4 acre) non-irrigated winter wheat and pasture site on the 1053.88 ha (2604.18 acre) property (referenced above).

The site has areas with a winter wheat crop in Section 27, Umatilla County, and Section 28, Morrow County. The site also has areas with dryland pasture crop in Sections 28 and 29 in Morrow County. You plan to convert the winter wheat area to dryland pasture crop in the future.

The biosolids application site excludes areas within the boundaries of the site (Section 27in Umatilla County and Section 28 and the east part of Section 29 in Morrow County) with unsuitable soil conditions (shallow depth to hardpan, steep slopes, and stony conditions) and the area in Section 28 with a stock well. Additionally, a small part of the site is not suitable for biosolids land application due to the location of access roadways and staging areas.

The request included information characterizing soils, topography, biosolids, crop, crop management, annual available nitrogen loading (agronomic loading rate), documentation of public notification, and a signed agreement between the City of Portland (City) and Shannon Madison, the property co-owner.

Based upon evaluation of the site and the information submitted, I am pleased to advise you that the K & S Madison, Inc. site described above is approved for the year-round application of digested dewatered biosolids cake provided:

1. Biosolids processing and handling will comply with Oregon biosolids rules and guidelines (OAR 340-50-005 to OAR 340-50-080) and all other applicable statutes, rules and regulations including the federal biosolids regulations (40 CFR Part 503).

2. Biosolids volatile solids shall be reduced by 38% or more via anaerobic digestion prior to land application.

3. Based on the City's cake biosolids analysis summary for year 2004, existing crop, topographic and soil conditions of the field, up to 168 kilograms (kg) of available plant available nitrogen (PAN) (about 107 cubic meters (m^3) of biosolids cake or 11.2 metric tons (Mg) of dry biosolids) per ha per year for non-irrigated pasture can be applied to areas of the site acceptable for receiving biosolids.

   This application rate is the equivalent, in English units, to 150 pounds of plant available nitrogen (about 56.5 cubic yards of biosolids cake or 5.0 tons of dry biosolids) per acre per year. The average thickness of full agronomic rate application of biosolids is 1.1 centimeters (0.42 inches).

   The following assumptions have been used to determine the biosolids land application rates: ammonia volatilization rate of 60%, first year organic nitrogen mineralization rate of 30%, and cake bulk density of 0.485.

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For the dryland winter wheat crop, the application rate discussed above is to be divided by two: 84 kg/ ha (75 lb/ acre) of PAN.

It should be noted that for the dryland pasture crop areas where biosolids application is planned for every other year, a total of 336 kg/ha (300 lb/acre) PAN can be applied at a site within the same calendar year.

Changes in biosolids characteristics or cropping practices will necessitate appropriate adjustments in the application rate to maintain nitrogen loadings consistent with crop demands.

4. If other sources of nitrogen will be applied to the field, the biosolids application rate must be reduced so that commercial, animal manure or green chop nitrogen plus biosolids nitrogen does not exceed the agronomic loading rate of any field within the site.

   Areas of the Madison Farm used for the land application of City of Salem and CleanWater Services (CWS) of Washington County biosolids and any reuse industrial wastewater shall be kept separate from the site of City biosolids land application. This includes the staging areas (landings) used by Salem and CWS.

5. Biosolids land application shall cease on areas of the site with ground slopes exceeding 12% when the ground surface is frozen or snow covered. Application can resume on these areas as soon as the ground surface has thawed and the soil has sufficiently dried.

6. A 60-day interval shall follow the application of biosolids prior to grazing livestock on any field or feeding harvested crops from biosolids areas to animals.

7. Public access to the site shall be restricted for at least 12 months after biosolids land application has ceased.

8. Biosolids land application is authorized on a year-round basis. However, care should be taken to avoid wet soil conditions, particularly in concave areas, at time of application.

9. Biosolids land application shall be via cake spreader.

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10. Biosolids shall not be stored at the site for more than 21 days prior to land application. For storage beyond 21 days, prior Department authorization is required.

11. A minimum setback of 61 m (200 feet) shall be maintained from all wells and other water sources. This includes the stock well located within Section 28 in Morrow County. Also, as described in the City's biosolids site authorization application submittal (received April 1, 2005); areas with ground slopes exceeding 40%, with shallow depths to hardpan and with stony soil are not suitable biosolids land application.

12. During the transport of the cake biosolids from Portland to the K & S Madison, Inc. site in Morrow County, the material shall be tarp covered, or equivalent, to prevent wind blow. Also, the bed of the truck and trailer hauling the cake biosolids shall be capable of containing any potential leachate from the cake biosolids. Additionally, the tailgate of the hauling truck and trailer shall be securely fastened to prevent the possibility of the tailgate coming open during transport of cake biosolids.

13. Immediately following land application, the biosolids truck operator shall clean off (at the application site) areas of equipment coated with biosolids to prevent biosolids from spilling onto public highways.

14. In the event of a spill, the City's truck driver shall clean up any spillage of biosolids. For spills of biosolids that cannot be completely cleaned up, the City and the Department shall jointly determine the best methods to mitigate public health and environmental concerns.

15. Notify the Department within one hour of any spill of more than 0.19 m3 (0.25 cubic yards) or of other threats to the environment that may occur. Failure to provide timely notification may be considered cause for taking enforcement action against the City. To report a spill to the Department contact the Oregon Emergency Response System (OERS). The telephone number of OERS is 1-800-452-0311 (24 hour service).

16. In the event an odor problem is reported to the Department after biosolids has been land applied at the New Portland Site, the City and the Department shall jointly determine the best method to mitigate the odor concern.

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17. The City shall maintain daily records for the biosolids land application site which indicate (on a field map grid system) where, when, and how much biosolids the City or the City's land application agent has applied to a particular site.

18. Site records shall indicate the date, location and amount of biosolids applied, segments of each field that received biosolids, amount of nutrients applied to each area receiving biosolids, the dates of harvest and the type of crop grown. The City shall maintain the above listed data and make that data available to the Department for review upon request.

19. The Department shall have the right to (at reasonable times): enter the City's place of biosolids land application and record keeping to review biosolids management operations and records, obtain copies of any records required under the terms of this authorization and the City's biosolids management plan, inspect any monitoring equipment required under this authorization, inspect any collection, transport, or land application vehicles, and obtain any photographic documentation or evidence deemed appropriate.

20. The City shall provide Department with an annual summary of biosolids processing and land application activities at the K & S Madison, Inc. site. The summary should be part of an annual report submitted to the Department by February 19th of each year following the yearly reporting period.

21. The Department may impose any additional restrictions or conditions deemed necessary to assure adequate biosolids management. Any variations from the City's Department approved biosolids management plan and this authorization letter must receive prior written approval from the Department.

DEQ-DC1

22. This authorization is subject to revocation should health hazards, environmental degradation, or nuisance conditions develop as a result of inadequate biosolids treatment or site management. This authorization is considered to be part of your approved biosolids management plan. Therefore, if operations are not conducted in accordance with terms specified under this authorization, the Department will initiate an enforcement action, which may lead to the assessment of a civil penalty.

If you have any questions regarding this authorization, please contact me at 503.229.5616 or by FAX at 503.229.6957.

Sincerely,

Bruce W. Henderson

Bruce W. Henderson
Biosolids Specialist
Northwest Region

cc: Judy Johndohl, Water Quality Division, Headquarters, DEQ
Elizabeth Hutchison, Pendleton Office, Eastern Region, DEQ
Dave Arguello, Reuse Manager, CWS
3125 SE River Road
Hillsboro, OR 97123
Mark Johnston, Residuals Manager, Willow Lake WWTF, City Of Salem
5915 Windson Island Road North
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Oregon
Theodore Kulongoski, Governor

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January 7, 2005

MARK P RONAYNE BIOSOLIDS PROGRAM MANAGER
COLUMBIA BOULEVARD WASTEWATER TREATMENT PLANT
CITY OF PORTLAND
5001 NORTH COLUMBIA BOULEVARD
PORTLAND OR 97204

Re: WQ-SDS-Multnomah County
Columbia Boulevard WWTP
City of Portland
Biosolids Land Application Amendment
K & S Madison, Inc. Site
S 1, 11, 12, 13, 14, 15, 22, 23, 24, 25, 26, 34, 35 & 36; T3N; R27E; WM & S 6, 7, 18 & 19; T3N; R28E; WM
Umatilla County
File No. 70725
NPDES Permit No. 100807

Dear Mr. Ronayne:

This letter is in response to your request of January 5, 2005, for site authorization amendment for the above described site. The amendment request is for the amendment of conditions 6 and 7 of the Department of Environmental Quality letter dated June 26, 1998. Conditions 6 and 7 of the biosolids site authorization letter require the City of Portland to apply biosolids at a maximum annual agronomic rate of 150 lbs of plant available nitrogen per acre

Conditions 6 and 7 of the biosolids site authorization letter are amended to allow up to 300 pounds plant available nitrogen per acre in a one year period; provided at least two growing seasons elapse prior to biosolids reamendment and soil sampling below the rooting zone (24 to 36 inches) confirms soil nitrate nitrogen levels fall below 10 mg/kg.

All other applicable requirements of the original Department site authorization (dated June 26, 1998), the site authorization amendment (dated December 24, 2003 - withdrawal of Condition 3), the City of Portland Biosolids Management Plan and the current federal and state regulations (40 CFR Part 503 and Chapter 340 Division 50, respectively) are to be followed.

If you have any questions regarding this site authorization amendment, please contact me at 503.229.5616 (o); 503.229.6957 (f); or Henderson.Bruce@deq.state.or.us (e).

Sincerely,

Bruce W. Henderson

Bruce W. Henderson
Biosolids Specialist
Northwest Region

cc: Judy Johndohl, Water Quality Division, Headquarters, DEQ
Elizabeth Hutchison, Eastern Region, Pendleton Office, DEQ
Kent Madison
K & S Madison, Inc.
29299 Madison Road
Echo, OR 97826
Umatilla County Health Department
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216 SE 4th Street
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DEQ-DC1

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Theodore Kulongoski, Governor

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December 24, 2003

MARK P RONAYNE BIOSOLIDS PROGRAM MANAGER
COLUMBIA BOULEVARD WASTEWATER TREATMENT PLANT
CITY OF PORTLAND
5001 NORTH COLUMBIA BOULEVARD
PORTLAND OR 97204

Re: WQ-SDS-Multnomah County
Columbia Boulevard WWTP
City of Portland
Biosolids Land Application Amendment
K & S Madison, Inc. Site
S11,12,14,15,22-26,34-36;T3N;R27E
and S6,7,19;T3N;R28E WM
Umatilla County
File No. 70725
NPDES Permit No. 100807

Dear Mr. Ronayne:

This letter is in response to your request for site authorization amendment for the above described site (letter dated December 16, 2003). The amendment request is for the withdrawal of Condition 3 of the Department of Environmental Quality letter dated June 26, 1998.

Condition 3 of the biosolids site authorization letter for the above described site required the City of Portland to implement the trace dioxin and furan (CDD/CDF) management policy specified under the Oregon State Health Division's advisory (January 15, 1991). Please refer to the enclosed letter from Mark Ronayne of the City of Portland biosolids program, dated December 16, 2003, for further details concerning the request for site authorization amendment.

The site authorization is amended to withdraw Condition 3 of the Department of Environmental Quality letter dated June 26, 1998.

All other applicable requirements of the original Department site authorization (dated June 26, 1998) and the current federal and state regulations (40 CFR Part 503 and Chapter 340 Division 50, respectively) are to be followed.

If you have any questions regarding this site authorization amendment, please contact me at 503.229.5616 (FAX: 503.229.6957; e-mail: Henderson.Bruce@deq.state.or.us).

Sincerely,

Bruce W. Henderson

Bruce W. Henderson
Biosolids Specialist
Northwest Region

Enc: City of Portland letter dated December 16, 2003

cc: Judy Johndohl, Water Quality Division, Headquarters, DEQ
Elizabeth Hutchison, Eastern Region, Pendleton Office, DEQ
Kent Madison
K & S Madison, Inc.
29299Madison Road
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Oregon
John A. Kitzhaber, M.D., Governor

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December 29, 2000

MARK RONAYNE BIOSOLIDS COORDINATOR
CITY OF PORTLAND COLUMBIA BLVD WASTEWATER TREATMENT FACILITY
5001 N COLUMBIA BLVD
PORTLAND OR 97202

Re: WQ-SDS-Multnomah County
Columbia Boulevard WWTP
City of Portland
Biosolids Land Application Amendment of
March 8, 1995 Site Authorization
K & S Madison, Inc. Farm Site
S34 (SWPO); T3N; R27E WM Umatilla County
(Circle 48); and other areas of the Madison
Farms previously authorized by the
Department's letter of March 8, 1995 within
Umatilla County
File No. 70725/A
NPDES Permit No. 101505

Dear Mr. Ronayne:

This communication is to acknowledge receipt of your application for biosolids site authorization amendment dated December 12, 2000. The application requests an amendment to the Department of Environmental Quality's (Department) March 8, 1995, Biosolids Land Application Site Authorization Letter for the Madison Farms in Umatilla County, Oregon.

The proposed site authorization amendment consists of two parts. First, it proposes increasing the overall area in Umatilla County which could be amended with Portland biosolids from 1,717 hectares (ha), (4,243 acres) to 1,922 ha (4,749.2acres). Aerial adjustments reflect recent GPS measurements of the area actually available for Portland biosolids amendment as described in the City's letter of December 12, 2000. The actual land area available for receiving biosolids in each section is denoted in Table 1 of the City's application for site authorization amendment.

Second, the proposal requests Department authorization for the application of biosolids to 68.8 ha (170 acres) in the southwest portion of Section 34, Township 3 North, Range 27 East, Willamette Meridian of Umatilla County. Madison Farms designate this area, which has not previously received biosolids, as Circle 48. The area, with natural ground slopes of ≤12%, would be managed for irrigated pasture. The biosolids agronomic application rate within Circle 48, based on irrigated pasture, would be 280 kilograms plant available nitrogen per ha (250 lb./acre).

The Department authorizes Portland biosolids to be land applied on areas indicated in Table 1, referenced above, provided all applicable provisions in the Federal and State rules and regulations, the City's approved biosolids management plan, and the Department's March 8, 1995, and July 9, 1999, site authorization letters, except as amended herein, remain in effect. Further, the Department authorizes the application of biosolids within Circle 48, provided biosolids are applied within the agronomic rate for irrigated pasture, as referenced above.

As described in the City's letter of June 4, 1999, neutron probes will be used to assure that over irrigation does not occur at the site and soil monitoring will occur to assure that no more than 10 mg/kg of nitrate occurs in the subsoil of the site. In addition, it is noted that an ephemeral drainage swale is located within Circle 48. Biosolids land application should cease if surface water is noted within the swale.

For further information concerning this matter, please contact Bruce Henderson at 503.229.5616 (FAX: 503.229.6957; email: Henderson.Bruce@deq.state.or.us).

Sincerely,

Bruce W. Henderson

Bruce W. Henderson
Biosolids Specialist
Northwest Region

enc.: Table 1

cc: Mark Cullington, Water Quality Division, Headquarters, DEQ
Barbara Sellers, Water Quality, Eastern Region, Pendleton Office, DEQ
Kent Madison
K & S Madison, Inc.
29299Madison Road
Echo, OR 97826
Umatilla County Health Department
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216 SE 4th Street
Pendleton, OR 97801

Table 1: Madison Farms Portland Biosolids Amendment Areas				
Township 3 North, Range 27, East, Willamette Meridian				
Section	DEQ Authorized Acres	Actual Acres Amended	Net Difference (Acres)	Potential Acres Available for Amendment
1	23	29.3	+6.3	86.5
11	113	114.8	+1.8	141.6
12	117	136.1	+19.1	136.1
13	224	157.6	-66.4	157.6
14	292	279.8	-12.2	279.8
15[1]	579	565.3	+13.7	565.3
22	613	622.3	+9.3	640
23[2]	480	488.6	+8.6	500
24[3]	306	319.4	+13.4	326.9
25	125	119.3	-5.7	172
26	398	385	-13	407
34	281	267.9	-13.1	438.8
35	456	484	+28	484
36	69	80.5	+11.5	80.5
Township 3 North, Range 28, East, Willamette Meridian				
6	30	33	+3	52.3
7	43	52.5	+9.5	52.5
18	42	49.1	+7.1	90.7
19	42	39.5	-2.5	76.9
Total	4,233	4,224	-9.0	4,749.2

[1]Biosolids were actually land applied to 256 acres as of September 27, 2000.

[2]Approximately 207 acres were not amended in 2000 since the soil nitrate nitrogen levels beneath the rooting zone (24" to 36") exceeded 10 mg/kg. Areas with higher nitrogen levels will receive no further biosolids amendment until soil testing demonstrates NO_3-N levels in that zone are below 10 mg/kg.

[3]This area includes an 88-acre unit that has been authorized for irrigated pasture (Circle 28). Currently the entire site is managed as dryland pasture.

Oregon
John A. Kitzhaber, M.D., Governor

Department of Environmental Quality
Northwest Region Portland Office
2020 SW 4th Avenue, Suite 400
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December 9, 1999

MARK P RONAYNE BIOSOLIDS PROGRAM MANAGER
COLUMBIA BOULEVARD WASTEWATER TREATMENT PLANT
CITY OF PORTLAND
5001 NORTH COLUMBIA BOULEVARD
PORTLAND OR 97204

Re: WQ-SDS-Multnomah County
Columbia Boulevard WWTP
City of Portland
Biosolids Land Application
Authorization
Mike McArthur (Klondike Lane/F1) Site
TL3600; S12 (SE¼); T1N; R17E &
TL700; S07 (SW¼); T1N; R18E WM
Sherman County
File No. 70725
NPDES Permit No. 100807

Dear Mr. Ronayne:

As you are aware, I evaluated the proposed Mike McArthur site with Bill Fasth and Gregg Baird of Agri-Tech, Inc. (ATI) on November 18, 1999, to determine if the site would be suitable for the land application of anaerobically digested dewatered biosolids cake from the Columbia Boulevard WWTF in Portland, Oregon.

On December 9, 1999, ATI, representing the City of Portland (City), provided the Department with a completed request for authorization to land apply biosolids to a 85.0 hectare (ha) (210 acre) dryland winter wheat site on the 85.3 ha (210.66 acre) McArthur property (referenced above).

The site consists of two tax lots. Tax Lot 3600 has 56.9 ha (140.5 acre) of dryland winter wheat suitable for biosolids land application on the 57.0 ha (140.94 acre) property and Tax Lot 700 has 28.1 ha (69.5 acre) of dryland winter wheat suitable for biosolids land application on the 28.2 ha (69.72 acre) property.

The request included information characterizing soils, topography, biosolids, crop, crop management, annual available nitrogen application (agronomic application rate), public notice, and a signed agreement between ATI and the representative of the property owners, Mike McArthur of Klondike, Inc. The owners of record are Virginia Laughlin and others.

Based upon our evaluation of the site and the information submitted, I am pleased to advise you that the Mike McArthur site described above is authorized for the year-round application of digested dewatered biosolids cake provided:

1. Biosolids processing and handling will comply with Oregon biosolids rules and guidelines (OAR 340-50-005 to OAR 340-50-080) and all other applicable statutes, rules and regulations including the federal biosolids regulations (40 CFR Part 503).

2. Biosolids volatile solids shall be reduced by 38% or more via anaerobic digestion prior to land application.

3. Based on the City's cake biosolids analyses contained within the site authorization submittal dated December 3, 1999, (assuming a 30% organic nitrogen mineralization rate, a 60% ammonia volatilization rate, and a 0.485 specific gravity), existing crop, topographic and soil conditions of the field, up to 84.1 kilograms (kg) of available nitrogen (about 49.7 cubic meters (m^3) of biosolids cake, 4.6 metric tons (Mg) of dry biosolids, or an average thickness of 0.5 centimeter (cm)) per ha per year for dryland winter wheat can be applied to areas of the site acceptable for receiving biosolids. This is the equivalent, in English units, to 75 pounds of available nitrogen (about 26.3 cubic yards of biosolids cake, 2.03 tons of dry biosolids, or an average thickness of 0.2 inch) per acre per year.

   Changes in biosolids characteristics or cropping practices will necessitate appropriate adjustments in the application rate to maintain nitrogen application consistent with crop demands.

4. If other sources of nitrogen will be applied to the field, the biosolids application rate must be reduced so that commercial, animal manure or green chop nitrogen plus biosolids nitrogen does not exceed the agronomic loading rate of any field within the site.

5. Biosolids shall be applied at rates up to, but not exceeding, the agronomic application rate for the crop.

6. A 30-day interval shall follow the application of biosolids prior to harvesting any food crops (not for direct human consumption) or fiber crops.

7. Public access to the site shall be restricted for at least 12 months after biosolids land application has ceased.

8. Biosolids land application is authorized on a year-round basis. Care should be taken to avoid wet soil conditions, particularly in concave areas, at time of application.

9. Biosolids land application shall be via cake spreader.

10. Biosolids shall not be stored at the site for more than 14 days prior to land application. For storage beyond 14 days, prior Department authorization is required.

11. A minimum setback of 61-m (200 feet) shall be maintained from all wells and other water sources and points of biosolids land application. This includes the residential well located to the east of the east boundary of site. Also, a minimum 8-m (25-foot) setback shall be maintained from the top of the cutbank adjacent to the industrial development located along the southeast corner of the site and points of biosolids land application.

12. During the transport of the cake biosolids from Portland to the land application site in Sherman County, the material shall be tarp covered, or equivalent, to prevent wind blow. Also, the bed of the truck and trailer hauling the cake biosolids shall be capable of containing any potential leachate from the cake biosolids. Additionally, the tailgate of the hauling truck and trailer shall be securely fasted to prevent the possibility of the tailgate coming open during transport of cake biosolids.

13. Immediately following land application, the biosolids truck operator shall clean off (at the application site) areas of equipment coated with biosolids to prevent biosolids from spilling onto public highways.

14. In the event of a spill, the City's truck driver shall clean up any spillage of biosolids. Spillages, which cannot be completely cleaned up, must be covered with dry lime and posted where appropriate.

15. The Department shall be notified within one hour of any spills of more than 0.19 m3 (0.25 cubic yard) or other threats to the environment that may occur. Failure to provide timely notification may be considered cause for taking enforcement action against the City. Department notification should be made by contacting the Oregon Emergency Response System (OERS). The telephone number of OERS is 1-800-452-0311 (24 hour service).

16. In the event an odor problem is reported to the Department after biosolids has been land applied at the Mike McArthur site, the City/ATI and the Department shall jointly determine the best method to mitigate the odor concern.

17. The City/ATI shall maintain daily records for the biosolids land application site which indicate (on a field map grid system) where, when, and how much biosolids was land applied to a particular site.

18. Site records shall indicate the date, location and amount of biosolids applied, segments of each field that received biosolids, amount of nutrients applied to each area receiving biosolids, and the type of crop grown. These data shall be maintained by the City/ATI and be made available to the Department for review upon request.

19. The Department shall have the right to (at reasonable times): enter the City's/ATI's place of biosolids land application and record keeping to review biosolids management operations and records, obtain copies of any records required under the terms of this authorization and the City's biosolids management plan, inspect any monitoring equipment required under this authorization, inspect any collection, transport, or land application vehicles, and obtain any photographic documentation or evidence deemed appropriate.

20. The City/ATI shall provide Department with an annual summary of biosolids processing and land application activities at the Guy Weedman site. The summary should be part of an annual report submitted to the Department by February 19th of each year following the yearly reporting period.

21. The Department may impose any additional restrictions or conditions deemed necessary to assure adequate biosolids management. Any variations from the City's Department approved biosolids management plan and this authorization letter must receive prior written approval from the Department.

22. This authorization is subject to revocation should health hazards, environmental degradation, or nuisance conditions develop as a result of inadequate biosolids treatment or site management. This authorization is considered to be part of your approved biosolids management plan. Therefore, if operations are not conducted in accordance with terms specified under this authorization, the Department will initiate an enforcement action, which may lead to the assessment of a civil penalty.

If you have any questions regarding this authorization, please contact me at 503.229.5616 (FAX at 503.229.6957; e-mail at Henderson.Bruce@deq.state.or.us).

Sincerely,

Bruce W. Henderson

Bruce W. Henderson
Biosolids Specialist
Northwest Region

cc: Doug Peters, Water Quality Division, Headquarters, DEQ
Dick Nichols, Bend Office, Eastern Region, DEQ
Bill Fasth, Agri-Tech, Inc.
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December 9, 1999

MARK P RONAYNE BIOSOLIDS PROGRAM MANAGER
COLUMBIA BOULEVARD WASTEWATER TREATMENT PLANT
CITY OF PORTLAND
5001 NORTH COLUMBIA BOULEVARD
PORTLAND OR 97204

Re: WQ-SDS-Multnomah County
Columbia Boulevard WWTP
City of Portland
Biosolids Land Application
Authorization
Guy Weedman (Gosson Lane/F1) Site
TL3102; S20 (N½); T1N; R18E WM
Sherman County
File No. 70725
NPDES Permit No. 100807

Dear Mr. Ronayne:

As you are aware, I evaluated the proposed Guy Weedman site with Bill Fasth and Gregg Baird of Agri-Tech, Inc. (ATI) and Larry Brown of the Bend Office of the Department of Environmental Quality (Department) on November 18, 1999, to determine if the site would be suitable for the land application of anaerobically digested dewatered biosolids cake from the Columbia Boulevard WWTF in Portland, Oregon.

On December 9, 1999, ATI, representing the City of Portland (City), provided the Department with a completed request for authorization to land apply biosolids to a 127.1 hectare (ha) (314 acre) dryland winter wheat site on the 127.3 ha (314.62 acre) Weedman property (referenced above).

The request included information characterizing soils, topography, biosolids, crop, crop management, annual available nitrogen application (agronomic application rate), public notice information, and a signed agreement between ATI and the representative of the property owner, Guy Weedman of Weedman Brothers, Inc. The owners of record are John and Wanda Hilderbrand.

Based upon our evaluation of the site and the information submitted, I am pleased to advise you that the Guy Weedman site described above is authorized for the year-round application of digested dewatered biosolids cake provided:

1. Biosolids processing and handling will comply with Oregon biosolids rules and guidelines (OAR 340-50-005 to OAR 340-50-080) and all other applicable statutes, rules and regulations including the federal biosolids regulations (40 CFR Part 503).

2. Biosolids volatile solids shall be reduced by 38% or more via anaerobic digestion prior to land application.

3. Based on the City's cake biosolids analyses contained within the site authorization submittal dated December 3, 1999, (assuming a 30% organic nitrogen mineralization rate, a 60% ammonia volatilization rate, and a 0.485 specific gravity), existing crop, topographic and soil conditions of the field, up to 84.1 kilograms (kg) of available nitrogen (about 49.7 cubic meters (m^3) of biosolids cake, 4.6 metric tons (Mg) of dry biosolids, or an average thickness of 0.5 centimeter (cm)) per ha per year for dryland winter wheat can be applied to areas of the site acceptable for receiving biosolids. This is the equivalent, in English units, to 75 pounds of available nitrogen (about 26.3 cubic yards of biosolids cake, 2.03 tons of dry biosolids, or an average thickness of 0.2 inch) per acre per year.

   Changes in biosolids characteristics or cropping practices will necessitate appropriate adjustments in the application rate to maintain nitrogen application consistent with crop demands.

4. If other sources of nitrogen will be applied to the field, the biosolids application rate must be reduced so that commercial, animal manure or green chop nitrogen plus biosolids nitrogen does not exceed the agronomic loading rate of any field within the site.

5. Biosolids shall be applied at rates up to, but not exceeding, the agronomic application rate for the crop.

6. A 30-day interval shall follow the application of biosolids prior to harvesting any food crops (not for direct human consumption) or fiber crops.

7. Public access to the site shall be restricted for at least 12 months after biosolids land application has ceased.

8. Biosolids land application is authorized on a year-round basis. Care should be taken to avoid wet soil conditions, particularly in concave areas, at time of application.

9. Biosolids land application shall be via cake spreader.

10. Biosolids shall not be stored at the site for more than 14 days prior to land application. For storage beyond 14 days, prior Department authorization is required.

11. A minimum setback of 61-m (200 feet) shall be maintained from all wells and other water sources and points of biosolids land application. Also, a minimum 15-m (50-foot) setback shall be maintained from the road culvert along Sandon Lane at the west site perimeter and points of biosolids land application.

12. During the transport of the cake biosolids from Portland to the land application site in Sherman County, the material shall be tarp covered, or equivalent, to prevent wind blow. Also, the bed of the truck and trailer hauling the cake biosolids shall be capable of containing any potential leachate from the cake biosolids. Additionally, the tailgate of the hauling truck and trailer shall be securely fasted to prevent the possibility of the tailgate coming open during transport of cake biosolids.

13. Immediately following land application, the biosolids truck operator shall clean off (at the application site) areas of equipment coated with biosolids to prevent biosolids from spilling onto public highways.

14. In the event of a spill, the City's truck driver shall clean up any spillage of biosolids. Spillages, which cannot be completely cleaned up, must be covered with dry lime and posted where appropriate.

15. The Department shall be notified within one hour of any spills of more than 0.19 m3 (0.25 cubic yard) or other threats to the environment that may occur. Failure to provide timely notification may be considered cause for taking enforcement action against the City. Department notification should be made by contacting the Oregon Emergency Response System (OERS). The telephone number of OERS is 1-800-452-0311 (24 hour service).

16. In the event an odor problem is reported to the Department after biosolids has been land applied at the Guy Weedman site, the City/ATI and the Department shall jointly determine the best method to mitigate the odor concern.

17. The City/ATI shall maintain daily records for the biosolids land application site which indicate (on a field map grid system) where, when, and how much biosolids was land applied to a particular site.

18. Site records shall indicate the date, location and amount of biosolids applied, segments of each field that received biosolids, amount of nutrients applied to each area receiving biosolids, and the type of crop grown. These data shall be maintained by the City/ATI and be made available to the Department for review upon request.

19. The Department shall have the right to (at reasonable times): enter the City's/ATI's place of biosolids land application and record keeping to review biosolids management operations and records, obtain copies of any records required under the terms of this authorization and the City's biosolids management plan, inspect any monitoring equipment required under this authorization, inspect any collection, transport, or land application vehicles, and obtain any photographic documentation or evidence deemed appropriate.

20. The City/ATI shall provide Department with an annual summary of biosolids processing and land application activities at the Guy Weedman site. The summary should be part of an annual report submitted to the Department by February 19th of each year following the yearly reporting period.

21. The Department may impose any additional restrictions or conditions deemed necessary to assure adequate biosolids management. Any variations from the City's Department approved biosolids management plan and this authorization letter must receive prior written approval from the Department.

22. This authorization is subject to revocation should health hazards, environmental degradation, or nuisance conditions develop as a result of inadequate biosolids treatment or site management. This authorization is considered to be part of your approved biosolids management plan. Therefore, if operations are not conducted in accordance with terms specified under this authorization, the Department will initiate an enforcement action, which may lead to the assessment of a civil penalty.

If you have any questions regarding this authorization, please contact me at 503.229.5616 (FAX at 503.229.6957; e-mail at Henderson.Bruce@deq.state.or.us).

Sincerely,

Bruce W. Henderson

Bruce W. Henderson
Biosolids Specialist
Northwest Region

cc: Doug Peters, Water Quality Division, Headquarters, DEQ
Dick Nichols, Bend Office, Eastern Region, DEQ
Bill Fasth, Agri-Tech, Inc.
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July 9, 1999

MARK RONAYNE BIOSOLIDS COORDINATOR
CITY OF PORTLAND COLUMBIA BLVD WASTEWATER TREATMENT FACILITY
5001 N COLUMBIA BLVD
PORTLAND OR 97202

Re: WQ-SDS-Multnomah County
Columbia Boulevard WWTP
City of Portland
Biosolids Land Application Amendment of
March 8, 1995 Site Authorization
K & S Madison, Inc. Farm Site
S24 (NEPO); T3N; R27E and
S19 (NWPO); T3N; R28E WM
Umatilla County
File No. 70725/A
NPDES Permit No. 101505

Dear Mr. Ronayne:

This communication is to acknowledge receipt of your letter dated June 4, 1999 requesting an amendment to the Department of Environmental Quality's (Department) March 8, 1995, Biosolids Land Application Site Authorization Letter for the Madison Farms in Umatilla County, Oregon.

The proposed site authorization amendment is for the application of cake biosolids from Portland's Columbia Boulevard Wastewater Treatment Facility to 35.6 hectares (ha) (88 acre) of land converted from dry land pasture to deficit pasture irrigation. The proposed irrigation circle lies within the northeast part of Section 24 (27.9 ha (~69 acre)) and the northwest part of Section 19 (7.7 ha (~19 acre)) of the property described above.

The agronomic application of biosolids for the converted pasture land is proposed to increase from a dry land pasture rate of 168 kilograms (kg) per ha (150 LB per acre) to an irrigated pasture rate of 280 kg per ha (250 LB per acre) of plant available nitrogen per year. Also, there is a possibility of establishing alfalfa for mechanical harvest instead of pasture within the irrigation circle.

Recycled Paper

In accordance with your request, the site authorization for the above referenced property is amended. Please note that all-applicable provisions of Federal and State regulations, the City's Biosolids Management Plan and the Department' Site Authorization letter of March 8, 1995, are in effect for the converted 35.6 ha of the site.

As described in the City's letter of June 4, 1999, neutron probes will be used to assure that over irrigation does not occur at the site and soil monitoring will occur to assure that no more than 10 mg/kg of nitrate occurs in the subsoil of the site. Also, if the irrigated circle is to be converted to alfalfa production, the City will request a further amendment to the Department's site authorization letter.

For further information concerning this matter, please contact Bruce Henderson at 503.229.5616.

Sincerely,

Bruce W. Henderson

Bruce W. Henderson
Biosolids Specialist
Northwest Region

cc: Doug Peters, Water Quality Division, Headquarters, DEQ

Joni Hammond, Eastern Region, Pendleton Office, DEQ

Kent Madison
K & S Madison, Inc.
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June 26, 1998

MARK P RONAYNE BIOSOLIDS PROGRAM MANAGER
COLUMBIA BOULEVARD WASTEWATER TREATMENT PLANT
CITY OF PORTLAND
5001 NORTH COLUMBIA BOULEVARD
PORTLAND OR 97204

Re: WQ-SDS-Multnomah County
Columbia Boulevard WWTP
City of Portland
Biosolids Land Application
Reauthorization/Authorization
Modification
K & S Madison, Inc. Site
S11,12,14,15,22-26,34-36;T3N;R27E
and S6,7,19;T3N;R28E WM
Umatilla County
File No. 70725
NPDES Permit No. 100807

Dear Mr. Ronayne:

At your request, as per your letter dated April 13, 1998,and as per your phone communication of May 26,1998, the biosolids site authorization letter of March 8, 1995, and the subsequent site authorization modification letter dated May 21, 1998, on property described in the attached table, is modified, as of July 1, 1998, to reflect new information on the mineralization rate of the organic component of available nitrogen of the City's biosolids, minor changes in total authorized area for land application and changes in site soil sampling

The mineralization rate is assumed to be 30% for the first year and 8% for the second year. Also, it is the intent of the City to apply biosolids on a biannual basis at a rate of 11.2 dry metric tons (Mg) per hectare (ha) (5 dry tons per acre) per application. This will result in a biannual application rate of total of available nitrogen ranging between about 154 kg per ha (for waste activated solids) to 170 kg per ha (for primary solids) (137 lb. per acre to 152 lb. per acre).

The first two paragraphs below and Items 1,4, 6, 7, 17 and 22 of the original site authorization letter of March 8, 1995, are modified to reflect the information discussed above.. Also, the total area authorized by the Department for biosolids land application is modified to reflect minor changes in the size of adjacent pivot irrigation circles, the withdrawal from land application of small, irregular areas lying between pivot irrigation circles and land taken out of production due to residential development. Additionally, metric SI units are added to the letter where appropriate.

As you are aware, I evaluated additional acreage for the City of Portland's biosolids land application program, a 248 ha (613 acre) area in Section 22, Township 3N, Range 27E, WM, in Umatilla County (excluding 10.9 ha (27 acres) at the southeast corner of the Section) with you and Kent Madison of K & S Madison, Inc. (KSMI), on October 11, 1994. The site in question was evaluated to determine if it would be suitable for the surface application of dewatered (belt pressed cake) anaerobically digested biosolids from Portland's Columbia Boulevard wastewater treatment plant (CBWWTP).

On January 25, 1995, the City provided the Department of Environmental Quality (Department) with a request for authorization to surface apply biosolids to the proposed 248 ha (613 acre) area. The City's proposal included information characterizing soils, topography, biosolids, crop, crop management, annual available nitrogen loading (agronomic loading rate), verification of public notification (via an informational letter sent to interested parties), and a signed agreement between the City and Madison Farms, Inc. In addition, Portland requested reauthorization to surface apply cake biosolids to other areas of Umatilla County where DEQ had previously authorized the City to land apply its biosolids (i.e., 1,457 ha (3,600 acres) - Department authorization letter dated September 14, 1989).

Properties (1,713 ha (4,233 acres) total) that the Department has determined to be suitable for the land application of the City of Portland's biosolids (dryland pasture sites) are referenced above.

Based upon evaluation of the site and the information submitted, I am pleased to advise you that the K & S Madison, Inc. properties described above are approved for the surface application of dewatered (belt-pressed cake) anaerobically digested biosolids, provided:

1. Biosolids processing and handling will comply with Oregon biosolids rules and guidelines (Oregon Administrative Rules (OAR) Chapter 340 Division 50) and all other applicable statutes, rules and federal regulations including the federal biosolids regulations (40 CFR Part 503).

2. Biosolids volatile solids shall be reduced by 38% or more via anaerobic digestion prior to land spreading.

3. The trace dioxin and furan (CDD/CDF) management policy specified under the Oregon State Health Division's advisory (January 15, 1991) to DEQ for the subject properties shall be implemented in all areas which are amended with the City's biosolids.

4. Biosolids polychlorinated biphenyls (PCBs) concentrations shall not exceed 50 mg/kg. If PCBs exceed 10 mg/kg, plant tissue monitoring shall be conducted to demonstrate that forage concentrations do not exceed 0.2 ppm before further livestock grazing in the affected area(s) is authorized.

5. Biosolids shall be applied evenly throughout the land application areas.

6. Based on the City's biosolids available nitrogen content over a two growing season period and assumed physical characteristic (Total Solids content of 20% and specific gravity of about 0.485), existing crop, topographic and soil conditions of the site, up to 168 kilograms (kg) of available nitrogen (116 cubic meters (m^3) of biosolids cake or 11.2 Mg of dry biosolids) per ha(150 lb. of available nitrogen (61 cubic yards ($yd.^3$) of biosolids cake or 5 tons of dry biosolids) per acre) per year for non-irrigated pasture can be applied to areas of the site acceptable for receiving biosolids.

7. If other sources of nitrogen will be applied to the field, the total application rate must be adjusted so that the total available nitrogen does not exceed 168 kg per ha (150 lb. per acre) per year.

8. No biosolids land application shall occur on areas where slopes exceed 12% when the ground surface is frozen or snow covered. Biosolids application in those areas can resume as soon as the ground surface has thawed and the soil has sufficiently dried to allow reasonable operation of land application equipment.

9. Areas of the site with slopes exceeding 30% are generally not suitable for biosolids land application. However, in non or poorly vegetated areas subject to wind erosion where ground slopes range from 30% to 35%, a one-time-only biosolids application not exceeding the rate of 22.4 Mg per ha (10 dry tons per acre) (i.e., twice the normal application rate) is permissible.

10. Pending land application, biosolids may be temporarily stock piled in staging areas agreed upon by Madison Farms, Inc. and the City for up to three weeks.

11. A 60-day minimum period shall occur between the time that biosolids are applied to sites and grazing or animal feed crop harvesting from biosolids amended areas commences.

12. Public access to the site shall be restricted for at least 12 months after biosolids land spreading has ceased.

13. Biosolids land application is authorized on a year-round basis.

14. Biosolids land application shall be via cake spreader.

15. The 80.9 ha (200 acre) buffer area from Westland Canal and biosolids land application areas at the north site perimeter (within the northeast portion of the site - Section 6 of Township 3N, Range 28E, and Sections 1 and 2 of Township 3N, Range 27E), as shown on the submitted site map dated February 15, 1995, is to be maintained as a biosolids-free area during all future biosolids land applications.

16. A minimum setback of 61 m (200 feet) shall be maintained from all wells and other water sources and areas amended by biosolids.

17. Immediately following biosolids off loading operations, the biosolids transport truck operator shall clean off (at the biosolids staging site) equipment coated with biosolids to prevent biosolids from spilling onto public highways.

18. In the event of a biosolids spill, the truck driver working as the City of Portland's contract agent shall immediately oversee the cleanup of any spill in accordance with the City of Portland's biosolids spill response plan.

19. The Department's Northwest Region Office shall be notified within 24 hours of any biosolids spills of more than 0.19 m^3(¼ $yd.^3$) or other threats to the environment that may occur. Failure to provide notification within the 24 hour period may be considered cause for taking enforcement action against the City. Notification should be made through the Oregon Emergency Response System (OERS). The telephone number of OERS is 1-800-452-0311 (24 hour service).

20. In the event an odor problem is reported to the Department after biosolids have been land applied, the City and DEQ will jointly determine the best method to mitigate the odor concern.

21. The City shall maintain daily records adequate to describe all temporary biosolids storage and land application activities which indicate (on a field map grid system) where, when, and how much (cubic yards) biosolids were land applied to a particular site.

22. Site records shall indicate the date, location and amount of biosolids (weight) applied, amount of nutrients (available nitrogen, phosphorus, and potassium) applied (per unit area) to each area amended with biosolids, and the type of crop grown.

    In addition, during periods of the year when biosolids are land applied, the City shall maintain data that characterizes the biosolids concentration of PCBs, dioxins and furans. These data shall be maintained by the City and be made available to the Department for review upon request.

23. The Department shall have the right to (at reasonable times): enter the City's place(s) of record keeping to review biosolids management operations and records; obtain copies of any records required under the terms of this authorization and the City's biosolids management plan; inspect any monitoring equipment required under this authorization; inspect any collection, transport, or land application vehicles; and obtain any photographic documentation or evidence deemed appropriate.

24. The City shall provide DEQ a yearly summary of biosolids processing and land application activities in its annual biosolids management report.

25. The Department may impose any additional restrictions or conditions deemed necessary to assure adequate biosolids management. Any variations from the City's DEQ approved biosolids management plan and this authorization letter must receive prior written approval from the Northwest Region Office.

26. This authorization is subject to revocation should health hazards, environmental degradation, or nuisance conditions develop as a result of inadequate biosolids treatment or site management. This authorization is considered to be part of the City of Portland's approved biosolids management plan. If operations are not conducted in accordance with terms specified under this authorization, the Department will initiate an enforcement action which may lead to the assessment of a civil penalty.

If you have any questions regarding this authorization, please contact me at 229-5616.

Sincerely,

Bruce W. Henderson

Bruce W. Henderson
Biosolids Specialist
Northwest Region

cc: Doug Peters, Water Quality Division, Headquarters, DEQ
Joni Hammond, Eastern Region, Pendleton Office, DEQ
Kent Madison
K & S Madison, Inc.
29299Madison Road
Echo, OR 97826

Madison Farms Acreage Authorized for Portland Biosolids Land Application, 1998					
Section[1&2]	DEQ[3&4] Authorized Acreage	Section	DEQ Authorized Acreage	Section	DEQ Authorized Acreage
1	23	14	292	24	306
6	30	15	579	25	125
7	43	18	42	26	398
11	113	19	42	34	281
12	117	22	613	35	456
13	224	23	480	36	69

[1]Sections 1, 11, 12, 13, 14, 15, 22, 23, 24, 25, 26, 34, 35 and 36 are located in Township 3 North, Range 27 East, Willamette Meridian and Sections 6, 7, 18, and 19 are located in Township 3 North, Range 28, East Willamette Meridian in Umatilla County Oregon.

[2]Portions of Sections 23, 26, 34 and 35 (1,104 acres) are managed as CRP lands; segments of Sections 1, 6, 7, 11 and 12 (263 acres) are managed as wildlife habitat; and areas in Sections 12, 13, 14, 15, 18, 19, 22, 23, 24, 25, 35 and 36 (2,866 acres) are managed as dryland pasture.

[3]DEQ has authorized Portland biosolids land application on 4,233 acres.

[4]To express acreage as hectares, multiply by 0.405.

Orego

April 1, 1997

DEPARTMENT
ENVIRONMENT
QUALITY

NORTHWEST REGIC

MARK RONAYNE BIOSOLIDS COORDINATOR
CITY OF PORTLAND
COLUMBIA BLVD WASTEWATER TREATMENT PLANT
5001 N COLUMBIA BLVD
PORTLAND OR 97202

Re: WQ-Multnomah County
Columbia Blvd & Tryon Creek Wastewater
Treatment Plants
NPDES Permit Nos. 100807 & 101012
File Nos. 70725 & 70735

Dear Mr. Ronayne:

This letter is to acknowledge receipt of the 1996 Biosolids Annual Report and Biosolids Management Plan update from the City of Portland for the Columbia Blvd and Tryon Creek Wastewater Treatment Plants. We appreciate receiving this information. The information you have supplied will be used to update the DEQ biosolids data management system, which will in turn help support Oregon's delegation application to the Environmental Protection Agency Region 10. Once the report is reviewed, you may be contacted if the reviewer has any questions or comments.

DEQ would also like to let you know about the 1997 EPA Biosolids Awards Program for beneficial reuse. This is the 10th year of this award program with four categories that projects can be nominated under. These four categories include:

Operating Projects, in both large (> 5MGD) and small (≤ 5MGD) sizes;
Technology Innovation or Development;
Research Activities; and Public Acceptance.

Further information on the awards program can be obtained from Doug Peters at 503.229.6442

Sincerely,

Bruce W. Henderson

Bruce W. Henderson
Biosolids Specialist
Northwest Region

cc: Doug Peters, Water Quality Division, Headquarters, DEQ

John A. Kitzhaber
Governor

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Portland, OR 97201-1987
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TTY (503) 229-5471

DEQ-1

Oregon

DEPARTMENT OF ENVIRONMENTAL QUALITY

NORTHWEST REGION

December 24, 1996

MARK P RONAYNE BIOSOLIDS MANAGEMENT PROGRAM MANAGER
CITY OF PORTLAND BUREAU OF ENVIRONMENTAL SERVICES
COLUMBIA BOULEVARD WASTEWATER TREATMENT PLANT
5001 NORTH COLUMBIA BOULEVARD
PORTLAND OR 97204

Re: WQ-SDS-Multnomah County
Columbia Boulevard WWTP
City of Portland
Biosolids Land Application Plan Approval
File No. 70725
NPDES Permit No. 100807

Dear Mr. Ronayne:

The Department of Environmental Quality (Department) has examined the biosolids land application plan that was submitted by the City of Portland on December 18, 1996. The plan was submitted as part of the City's NPDES permit renewal application of March 22, 1996. We are pleased to advise you that the land application is approved. The plan reflects policy adopted by the Department's Biosolids Technical Advisory Committee on June 14, 1994. The policy relates to the interpretation and implementation of 40 CFR Part 501.15 and addresses land application plan requirements stipulated under Oregon Administrative Rules (OAR 340-50-031(7)).

Please feel free to contact me at 229-5616 if you have questions concerning this approval.

Sincerely,

Bruce W. Henderson

Bruce W. Henderson
Biosolids Specialist
Northwest Region

cc: Doug Peters, Water Quality Division, Headquarters, DEQ
Joni Hammond, Eastern Region, Pendleton Office, DEQ
Kent Madison, K & S Madison, Inc.
HC 70 Box 301, Echo, OR 97826

John A. Kitzhaber
Governor



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DEQ-1

Oregon

DEPARTMENT O
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QUALITY

NORTHWEST REGIO

April 30, 1996

MARK RONAYNE BIOSOLIDS COORDINATOR
COLUMBIA BOULEVARD WASTEWATER TREATMENT PLANT
CITY OF PORTLAND
5001 NORTH COLUMBIA BOULEVARD
PORTLAND OR 97204

Re: WQ-SDS-Multnomah County
Columbia Boulevard WWTP
City of Portland
Biosolids Management Plan Addendum
Department Authorization
K & S Madison, Inc. Site
Umatilla County
File No. 70725
NPDES Permit No. 100807

Dear Mr. Ronayne:

In reference to your letter of April 23, 1996, the Department of Environmental Quality (Department) authorizes the addendum to the City of Portland's (City) Biosolids Management Plan (BSMP) for the short-term research and demonstration windrow compost pilot project at the Madison Farms in Umatilla County, Oregon. The pilot project is to take place on a biosolids land application staging area within the biosolids land application site previously authorized by the Department. The composting operation is to be performed by K & S Madison, Inc. of Madison Farms at Echo, Oregon.

With the exception of storage of biosolids at the site beyond the normal allowed period, all provisions of the federal biosolids regulations (40 CFR Part 503), state biosolids regulations (OAR 340 50), the City's BSMP, and the Department's site authorization are to be followed.

John A. Kitzhaber
Governor

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DEQ-1

The composted biosolids produced during the project are to be land applied on Department authorized areas at the Madison Farms. The staging area to be used for composting has a depth to the groundwater level of at least 300 feet and is located at least ½ mile from the nearest residence. Given the semi-arid climate and remoteness of the proposed composting site, leachate and odor problems resulting from the pilot project are not anticipated.

The Department requests that the City furnish a map showing the location of the proposed composting site at its earliest convenience, and include a full report of the composting operation with the next biosolids annual report. If you have any questions regarding this matter, please contact me at 229-5616.

Sincerely,

Bruce W. Henderson

Bruce W. Henderson
Biosolids Specialist
Northwest Region

cc: Doug Peters, Water Quality Division, Headquarters, DEQ
Joni Hammond, Eastern Region, Pendleton Office, DEQ
Kent Madison, K & S Madison, Inc.
HC 70 Box 301, Echo, OR 97826

Oregon

DEPARTMENT O
ENVIRONMENTA
QUALITY

NORTHWEST REGIO

March 15, 1996

MARK RONAYNE
COLUMBIA BOULEVARD WASTEWATER TREATMENT PLANT
CITY OF PORTLAND
5001 NORTH COLUMBIA BOULEVARD
PORTLAND OR 97204

Re: WQ-SDS-Multnomah County
Columbia Boulevard WWTP
City of Portland
Biosolids Land Application
Reauthorization
K & S Madison, Inc. Site
S12,13&14;T3N;R27E and S18;T3N;R28E WM
Umatilla County
File No. 70725
NPDES Permit No. 100807

Dear Mr. Ronayne:

In reference to your letter of March 14, 1996, the Department of Environmental Quality (Department) reauthorizes 344 acres for the beneficial use land application of City of Portland (City) dewatered, anaerobically digested cake biosolids. The reauthorized site consists of dryland pasture located between designated irrigation circles on four adjacent sections of the Madison Farms located near Echo, Oregon in Umatilla County.

The site consists of 63 acres on Section 12, 224 acres on Section 13, and 15 acres on Section 14 of Township 3 North, Range 27 East, WM, and 42 acres on Section 18 of Township 3 North, Range 28 East, WM.

As stated in your letter:

* The Madison Farms site was originally authorized by the Department for the biosolids land application of the City.

* The site was most recently authorized by the Department for biosolids land application to the Unified Sewerage Agency of Washington County (USA). Within the attached Memorandum of Understanding between K & S Madison, Inc., the City of Portland, and USA, USA agrees to relinquish its authorization for biosolids land application at the site to enable the Department to authorize the site for use by the City of Portland.

John A. Kitzhaber
Governor

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DEQ-1

* The City agrees to withhold biosolids land application at the site for a minimum of one year from the time of the last biosolids land application by USA.

* The City and K & S Madison, Inc. agree to manage the site in accordance with Conditions 1 to 26 of the Department's March 8, 1995, reauthorization/authorization letter for the City's biosolids land application on the Madison Farms.

If you have any questions regarding this site reauthorization, please contact me at 229-5616.

Sincerely,

Bruce W. Henderson

Bruce W. Henderson
Biosolids Specialist
Northwest Region

cc: Doug Peters, Water Quality Division, Headquarters, DEQ
Joni Hammond, Eastern Region, Pendleton Office, DEQ
Dave Arguello, Plant Supervisor, Biosolids Reuse
Unified Sewerage Agency
3125 SE River Road, Hillsboro, OR 97123
Kent Madison, K & S Madison, Inc.
HC 70 Box 301, Echo, OR 97826

Oregon

DEPARTMENT OF
ENVIRONMENTAL
QUALITY

NORTHWEST REGION

November 8, 1995

MARK RONAYNE
COLUMBIA BOULEVARD WASTEWATER TREATMENT PLANT
CITY OF PORTLAND
5001 NORTH COLUMBIA BOULEVARD
PORTLAND OR 97204

Re: WQ-SDS-Multnomah County
Columbia Boulevard WWTP
City of Portland
Biosolids Land Application
Authorization Amendment
K & S Madison, Inc. Site
S1,26&35;T3N;R27E WM
Umatilla County
File No. 70725
NPDES Permit No. 100807

Dear Mr. Ronayne:

In reference to your letters of October 20, 1995, and November 1, 1995, the Department of Environmental Quality (Department) amends the site authorization letter of March 8, 1995, for the above referenced property, as follows:

* The authorization of 26 acres of dryland pasture, located within Section 1, Township 3N, Range 27E WM., for the surface application of cake biosolids from Portland's Columbia Boulevard WWTP. This area, which was not authorized under the Department's March 8, 1995, letter, was included within the overall 4,212 acres that was authorized by that letter. The required buffer zone between the biosolids application area and the Westland Canal, to the north, is to be maintained.

* The authorization of an additional 94 acres of dryland pasture, located within Section 26, Township 3N, Range 27E WM, and an additional 21 acres of dryland pasture, located within Section 35, Township 3N, Range 27E WM, for the surface application of cake biosolids from Portland's Columbia Boulevard WWTP.

  These areas were formerly reserved as part of three proposed pivot irrigation circles (two within Section 26). However, with the downsizing of the proposed irrigation circles, located within the east and northeast portions of the two sections, respectively, these dryland pasture areas are now available for biosolids application.

John A. Kitzhaber
Governor

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DEQ-1

* The revised area of the Department's site authorization on the Madison Farms for the surface application of Portland biosolids is 4,333 acres (formerly 4,212 acres). This figure reflects the addition of 115 acres from the three proposed pivot irrigation circles, described above, and an additional 6 acre adjustment due to remeasurement of the area of the previously authorized site.

Also, within your letter of November 1, 1995, you requested Department approval to land apply biosolids, at the authorized annual full application rate of 5 dry tons per acre, to the same areas twice within one calendar year. The Department's interpretation of the term "year" is from growing season to growing season. Therefore, the Department has no objection to the proposed biosolids application plan, provided that the application rate does not exceed the authorized full application rate within any one growing season.

It should be noted that all other provisions of the Department's site authorization letter of March 8, 1995, remain in effect. If you have any questions regarding this site authorization amendment, please contact me at 229-5616.

Sincerely,

Bruce W. Henderson

Bruce W. Henderson
Biosolids Specialist
Northwest Region

enc: City of Portland letters of October 20, 1995, and November 1, 1995
cc: Bijan Pour, Water Quality Division, Headquarters, DEQ
Joni Hammond, Eastern Region, Pendleton Office, DEQ
Kent Madison
K & S Madison, Inc.
HC 70 Box 301
Echo, OR 97826

Oregon

DEPARTMENT
ENVIRONMENTAL
QUALITY

NORTHWEST REGION

November 8, 1995

MARK RONAYNE
COLUMBIA BOULEVARD WASTEWATER TREATMENT PLANT
CITY OF PORTLAND
5001 NORTH COLUMBIA BOULEVARD
PORTLAND OR 97204

Re: WQ-SDS-Multnomah County
Columbia Boulevard WWTP
City of Portland
Biosolids Land Application
Reauthorization
K & S Madison, Inc. Site
S12,13&14;T3N;R27E and S18;T3N;R28E WM
Umatilla County
File No. 70725
NPDES Permit No. 100807

Dear Mr. Ronayne:

In reference to your letter of March 14, 1996, the Department of Environmental Quality (Department) reauthorizes 344 acres for the beneficial use land application of City of Portland (City) dewatered, anaerobically digested cake biosolids. The reauthorized site consists of dryland pasture located between designated irrigation circles on four adjacent sections of the Madison Farms located near Echo, Oregon in Umatilla County.

The site consists of 63 acres on Section 12, 224 acres on Section 13, and 15 acres on Section 14 of Township 3 North, Range 27 East, WM, and 42 acres on Section 18 of Township 3 North, Range 28 East, WM.

As stated in your letter:

* "The Madison Farms site was originally authorized by the Department for the biosolids land application of the City.

* The site was most recently authorized by the Department for biosolids land application to the Unified Sewerage Agency of Washington County (USA). Within the attached Memorandum of Understanding between K & S Madison, Inc., the City of Portland, and USA, USA agrees to relinquish its authorization for biosolids land application at the site to enable the Department to authorize the site for use by the City of Portland.

John A. Kitzhaber
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DEQ-1

* The City agrees to withhold biosolids land application at the site for a minimum of one year from the time of the last biosolids land application by USA.

* The City and K & S Madison, Inc. agree to manage the site in accordance with Conditions 1 to 26 of the Department's March 8, 1995, reauthorization/authorization letter for the City's biosolids land application on the Madison Farms.

If you have any questions regarding this site reauthorization, please contact me at 229-5616.

Sincerely,

Bruce W. Henderson
Biosolids Specialist
Northwest Region

cc: Doug Peters, Water Quality Division, Headquarters, DEQ
Joni Hammond, Eastern Region, Pendleton Office, DEQ
Dave Arguello, Plant Supervisor, Biosolids Reuse
Unified Sewerage Agency
3125 SE River Road, Hillsboro, OR 97123
Kent Madison, K & S Madison, Inc.
HC 70 Box 301, Echo, OR 97826

Oregc

September 8, 1995

DEPARTMENT
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QUALITY

NORTHWEST REGI

ANN GARDNER AND MARK RONAYNE
CITY OF PORTLAND
5001 N COLUMBIA BLVD
PORTLAND OR 97212

Re: Biosolids Application at Madison Farms, and
Dioxin Application Criteria

Dear Ms. Gardner and Mr. Ronayne:

On August 22, 1995, I sent Ms. Gardner a letter which reviewed past meetings and correspondence relating to the application of biosolids on Madison Farms. This letter further requested the timely submittal of a report describing solids handling for 1994. I received a phone message from Mr. Ronayne requesting clarification on a couple of issues. From the message Mr. Ronayne left, I gather that the City takes exception to the the dioxin threshold being interpreted as a maximum, and is unclear about the reporting request.

As you are aware, we discussed at length the disagreement about how the compliance and reporting periods should be associated with the 285 ppt. dioxin limit. I recognize the City of Portland's concern that this value was intended to be represented as a long term average. As discussed in the August 22nd letter, the Oregon State Health Division believes the 285 ppt. dioxin level to be an absolute maximum. Based on input from Mr. Ronayne obtained during a subsequent meeting between DEQ and the City, the Department agreed to identify the 285 ppt. dioxin level as a quarterly sample as described in the City's management plan.

We have discussed the 285 ppt. dioxin limit at length. As you are aware, I personally discussed the derivation of this value with your consultant, Dr. Paul Rodgers, who conducted the original risk assessment. Although I agree that the derivation of the 285 ppt. is consistent with a long term average, there is little documentation on how the risk assessment was converted into a regulatory guidance limit. Also, as we discussed, stochastic methods exist for converting a long term value into quarterly or monthly values that can be used consistently with monthly or quarterly monitoring data. Further, from the data that Mr. Ronayne supplied, and as we discussed, it appears that the quarterly monitoring values are below the 285 ppt. dioxin level.

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During our previous meetings we agreed that there were substantive issues with the risk assessment. It is the Department's understanding that the City will be reviewing the risk assessment. It is reasonable to expect the result of the risk assessment review to modify the 285 ppt. dioxin value. As part of this review it will be prudent to define and document how any conversions from long term average values into regulatory limits are accomplished. Since the quarterly data suggest compliance with the 285 ppt. limit, and since the City has unilaterally undertaken review of the risk assessment, it appears that the appropriate time to debate methods for conversion of the results of a risk assessment into regulatory limits is following completion of the review.

The second issue raised by Mr. Ronayne was the reporting request. The Department has received complaints from an individual representing local concerns. As with all complaints, the Department takes seriously those issues raised. Our response will depend in part on a review of the 1994 biosolids activities report. I anticipate receipt of this report in the immediate future.

Sincerely

Robert P. Baumgartner, Manager
WQ Technical Services Section
Northwest Region

Ore

March 8, 1995

DEPARTM
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NORTHWEST

ANN GARDNER
COLUMBIA BOULEVARD WASTEWATER TREATMENT PLANT
CITY OF PORTLAND
5001 NORTH COLUMBIA BOULEVARD
PORTLAND OR 97204

Re: WQ-SDS-Multnomah County
Columbia Boulevard WWTP
City of Portland
Biosolids Land Application
Reauthorization/Authorization
K & S Madison, Inc. Site
S11,12,14,15,22-26,34-36;T3N;R27E
and S6,7,19;T3N;R28E WM
Umatilla County
File No. 70725
NPDES Permit No. 100807

Dear Ms. Gardner:

As you are aware, I evaluated additional acreage for the City of Portland's biosolids land application program, a 612 acre area in Section 22, Township 3N, Range 27E, WM, in Umatilla County (excluding 28 acres at the southeast corner of the Section) with you and Kent Madison of K & S Madison, Inc. (KSMI), on October 11, 1994. The site in question was evaluated to determine if it would be suitable for the surface application of dewatered (belt pressed cake) anaerobically digested biosolids from Portland's Columbia Boulevard wastewater treatment plant (CBWWTP).

On January 25, 1995, the City provided the Department of Environmental Quality (Department) with a request for authorization to surface apply biosolids to the proposed 612 acre area. The City's proposal included information characterizing soils, topography, biosolids, crop, crop management, annual available nitrogen loading (agronomic loading rate), verification of public notification (via an informational letter sent to interested parties), and a signed agreement between the City and Madison Farms, Inc. In addition, Portland requested reauthorization to surface apply cake biosolids to other areas of Umatilla County where DEQ had previously authorized to the City to land apply its biosolids (i.e., 3,600 acres - Department authorization letter dated September 14, 1989).

Properties (4,212 acres total) that the Department has determined to be suitable for the land application of the City of Portland's biosolids (dryland pasture sites) are referenced above.

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DEQ-1

Based upon evaluation of the site and the information submitted, I am pleased to advise you that the K & S Madison, Inc. properties described above are approved for the surface application of dewatered (belt-pressed cake) anaerobically digested biosolids, provided:

1. Biosolids processing and handling will comply with Oregon biosolids rules and guidelines (OAR 340-50-005 to OAR 340-50-080) and all other applicable statutes, rules and federal regulations including 40 CFR Part 503, subparts A, B, and D and 40 CFR Part 501.15.

2. Biosolids volatile solids shall be reduced by 38% or more via anaerobic digestion prior to land spreading.

3. The trace dioxin and furan (CDD/CDF) management policy specified under the Oregon State Health Division's advisory (January 15, 1991; Attachment A) to DEQ for the subject properties shall be implemented in all areas which are amended with the City's biosolids.

4. Biosolids polychlorinated biphenyls (PCBs) concentrations shall not exceed 50 mg/kg. If PCBs exceed 10 mg/kg, plant tissue monitoring shall be conducted to demonstrate that forage concentrations do not exceed 0.2 ppm.

5. Biosolids shall be applied evenly throughout the land application areas.

6. Based on the City's biosolids analyses, site use (dryland pasture), topographic and soil properties of areas available for solids amendment, up to 5 dry tons of biosolids (about 115 lbs. available nitrogen) per acre per year can be applied to the properties in question in areas which are acceptable (as described hereunder) for receiving biosolids. Changes in biosolids characteristics or cropping practices may necessitate adjustments in the biosolids application rate to maintain a total nitrogen loading that does not exceed crop demands.

   To address concerns regarding the potential for nitrate migration (leaching out of the crop root zone), a compliance monitoring system shall be maintained based on soil sampling and testing. The City shall report to the Department on the methods of soil sampling and testing to be used. Records of soil sampling and testing shall be kept by the City and be made available to the Department upon request. Also, soil test data shall be included with the City's annual biosolids report to the Department.

7. If other sources of nitrogen will be applied to the field, the total application rate must be adjusted so that the total available nitrogen does not exceed 115 lbs. per acre per year.

8. No biosolids land application shall occur on site areas where ground slopes exceed 12% when the ground surface is frozen or snow covered. Biosolids application in those areas can resume as soon as the ground surface has thawed and the soil has sufficiently dried to allow reasonable operation of land application equipment.

9. Areas of the site with ground slopes exceeding 30% are generally not suitable for biosolids land application. However, in non or poorly vegetated areas subject to wind erosion where ground slopes range from 30% to 35%, a one-time-only biosolids application not exceeding the rate of 10 dry tons per acre (i.e., twice the normal application rate) is permissible.

10. Pending land application, biosolids may be temporarily stock piled in staging areas agreed upon by Madison Farms, Inc. and the City, for up to three weeks.

11. A 60-day minimum period shall occur between the time that biosolids are applied to sites and grazing or animal feed crop harvesting from biosolids amended areas commences.

12. Public access to the site shall be restricted for at least 12 months after biosolids land spreading has ceased.

13. Biosolids land application is authorized on a year-round basis.

14. Biosolids land application shall be via cake spreader.

15. The 200 acre buffer area from Westland Canal and biosolids land application areas at the north site perimeter (within the northeast portion of the site - Section 6 of Township 3N, Range 28E, and Sections 1 and 2 of Township 3N, Range 27E), as shown on the submitted site map dated February 15, 1995, is to be maintained as a biosolids-free area during all future biosolids land applications.

16. A minimum setback of 200 feet shall be maintained from all wells and other water sources and areas amended by biosolids.

17. Immediately following land spreading, the biosolids truck operator shall clean off (at the application site) areas of equipment coated with biosolids to prevent biosolids from spilling onto public highways.

18. In the event of a biosolids spill, the truck driver working as the City of Portland's contract agent shall immediately oversee the cleanup of any spill in accordance with the City of Portland's biosolids spill response plan.

19. The Department's Northwest Region Office (229-5263) shall be notified within 24 hours of any biosolids spills of more than ¼ cubic yard or other threats to the environment that may occur. Failure to provide notification within the 24 hour period may be considered cause for taking enforcement action against the City. Spills that occur after normal working hours shall be reported to the Oregon Emergency Response System (OERS). The telephone number of OERS is 1-800-452-0311.

20. In the event an odor problem is reported to the Department after biosolids has been land applied, the City and DEQ will jointly determine the best method to mitigate the odor concern.

21. The City shall maintain daily records adequate to describe all temporary biosolids storage and land application activities which indicate (on a field map grid system) where, when, and how much (cubic yards) biosolids were land applied to a particular site.

22. Site records shall indicate the date, location and amount of biosolids (dry tons and cubic yards) applied, pounds of nutrients (available nitrogen, phosphorus, and potassium) applied (per acre) to each area amended with biosolids, and the type of crop grown.

    In addition, during periods of the year when biosolids are land applied, the City shall maintain monthly data that characterizes the biosolids concentration of PCBs, dioxins and furans. These data shall be maintained by the City and be made available to the Department for review upon request.

23. The Department shall have the right to (at reasonable times): enter the City's place(s) of record keeping to review biosolids management operations and records; obtain copies of any records required under the terms of this authorization and the City's biosolids management plan; inspect any monitoring equipment required under this authorization; inspect any collection, transport, or land application vehicles; and obtain any photographic documentation or evidence deemed appropriate.

24. The City shall provide DEQ a yearly summary of biosolids processing and land application activities in its annual biosolids management report.

25. The Department may impose any additional restrictions or conditions deemed necessary to assure adequate biosolids management. Any variations from the City's DEQ approved biosolids management plan and this authorization letter must receive prior written approval from the Northwest Region Office.

26. This authorization is subject to revocation should health hazards, environmental degradation, or nuisance conditions develop as a result of inadequate biosolids treatment or site management. This authorization is considered to be part of the City of Portland's approved biosolids management plan. If operations are not conducted in accordance with terms specified under this authorization, the Department will initiate an enforcement action which may lead to the assessment of a civil penalty.

If you have any questions regarding this authorization, please contact me at 229-5616.

Sincerely,

Bruce W. Henderson

Bruce W. Henderson
Biosolids Specialist
Northwest Region

Attachment A
cc: Mark Ronayne, Water Quality Division, Headquarters, DEQ
Don Caldwell, Eastern Region, Pendleton Office, DEQ
Kent Madison
K & S Madison, Inc.
HC 70 Box 301
Echo, OR 97826
Steve Wilson
Brown and Caldwell
9620 SW Barbur Boulevard
Portland, OR 97219-6041

Department of Human Resources
HEALTH DIVISION
1400 SW 6th AVENUE, PORTLAND, OREGON 97201
(503) 229-5552
TDD-NONVOICE: (503) 229-5497
FAX (503) 229-6462

JAN 22 1991
ENVIRONMENTAL SERVICES

January 15, 1991

TO: Lydia Taylor, DEQ

FROM: Laurence R. Foster, M.D.
Acting Health Officer

SUBJECT: Uses of Sludge and Compost Produced by the City of Portland Sewage Treatment Plant

The City of Portland has asked the Oregon Health Division to advise it, from a public health protection point of view, regarding the uses of sludge and compost produced by the City's sewage treatment plant. The stimulus for this request was a report in May, 1990 from the U.S. Environmental Protection Agency to the City that one sample of sludge and one of compost had been found to have dioxin levels higher than those found in similar materials from sewage treatment plants elsewhere in the country. The samples had been collected in May, 1989. The dioxin level found in sludge was 62 part per trillion expressed in 2,3,7,8 TCDD toxic equivalent factors (TEF); the level found in compost was 196 ppt.

The Health Division agreed to provide this advice after completion of two tasks by the City: 1) Extensive additional sampling of both compost and sludge to better characterize the dioxin and furan contamination levels of both products; and, 2) completing a risk assessment through a contractor who is expert in dioxin risk assessment issues.

Although testing must be continued to monitor changes over time, much has been completed. The results are attached in Appendix A. The risk assessment was completed on October 19, 1990 by Limno-Tech, Inc. and ICF/Clement, under contract with the City and with input from the Health Division, the Oregon Department of Environmental Quality, and EPA, Region X. A copy of their report attached as Appendix B. This report is dated October 19, 1990, but it contains revisions added on in December and includes a table of TEF Concentration Action Levels based upon the Limno-Tech risk assessment results.

The following are the Health Division's recommendations, based upon the above mentioned information. These are recommendations only. Formal approval of any sludge and compost disposition plans must, of course, be given by the Department of Environmental Quality. These recommendations are based solely on our consideration of dioxin and furan contamination of compost and sludge. The Division is not aware of other significant chemical or bacteriologic contaminants of these products that are not already controlled by appropriate regulations. An addendum with comments on these recommendations is found in Appendix C.

1. The City should continue its current efforts to identify all sources of dioxin contamination of incoming sewage and eliminate or reduce to the greatest extent possible all such contamination.

2. The City should continue to monitor, on a quarterly basis, dioxin levels in any new compost or sludge produced. A final characterization will be completed and based on the high resolution results of the 6 samples currently under analysis. The City will continue to monitor lagoon dredging on the following basis: monthly composite, low resolution for Octa/Hepta dioxins only, quarterly composite, high resolution of all dioxins/furans.

3. Sludge may be applied to range and pasture land used for grazing beef animals as long as the following conditions apply:

   a. The total TCDD TEF concentration not exceed 285 ppt.

   b. The proportional contribution of each homologue to the TEF remains within 20% of the value used for the October, 1990 risk assessment. If the contribution changes more than that for any homologue, the risk assessment should be recalculated using the newly observed concentrations for all homologues. The sludge with these significantly different homologue concentration patterns can be applied if the calculated risk does not exceed $1x10^{-6}$.

   c. The calves to be sold for beef should graze for not more than two months on the land to which sludge has been applied.

4. Sludge with a TEF concentration exceeding 285 ppt should be applied to grazing land only under special procedures designed to assure that the amount of dioxin ingested by the animals to be slaughtered for beef not exceed that estimated for the application described above. This could include procedures such as plowing the sludge into the ground and postponing grazing on the land for several years. Such procedures should be approved by the DEQ.

5. Sludge should not be applied to land used for raising hay, other forage or for grazing dairy cattle unless the dioxin TEF is less than 21.5 ppt.

6. Compost may be used for landscape purposes according to the following guidelines:

   a. If the dioxin TEF concentration is less than 285 ppt, both retail and bulk sales may be made. The retail package must, for product packaged after July 1, 1991, contain the following statement: "Although this product meets all standards set by federal and state agencies, Garden Care should not be used for vegetable gardening to avoid incidental ingestion. Garden Care is for ornamental gardens ONLY, such as flowers, shrubs, lawns, indoor and outdoor potted plants, planter boxes, and trees." The invoice for every bulk sale of compost must be accompanied by the same statement.

   b. If the dioxin TEF concentration is between 285 and 600 ppt, all marketing and distribution will be limited to bulk sales. The invoice for every bulk sale of compost must be accompanied by the statement shown in item (6) (a). Maximum effort will be made to distribute compost to public sector markets including landfill cover, parks and golf courses, and limited access landscape areas. All bulk users will be required to sign a statement that they will use the compost only for landscape purposes. City employees and city contract employees who are regularly in contact with compost will be provided gloves. Commercial buyers of compost will be informed that they should provide their workers with gloves.

   c. All distribution of compost will be suspended if the dioxin TEF concentration exceeds 600 ppt.

7. Compost or sludge should not be applied to land to be used for raising vegetables for human consumption.

MR

CC Bob Rieck
1120 SW Fifth Avenue, Room 400
Portland OR 97204

RECEIVED
JAN 22 1991
ENVIRONMENTAL SERVICES

Department of Environmental Quality

811 S.W. SIXTH AVENUE, PORTLAND, OREGON 97204 PHONE (503) 229-5696

May 18, 1987

R. W. Peterson, Director of Wastewater Operations
City of Portland
Bureau of Environmental Services
1120 S.W. 5th Avenue
Portland, OR 97204-1972

Re: WQ-SDS; City of Portland
Sludge Management Plan
Approval; Columbia Boulevard &
Tryon Creek STPs;
Source Files: 70725 & 70735,
Multnomah County

Dear Mr. Peterson:

The Department is pleased to advise you that the City of Portland's sludge management plan is approved provided:

1. At least 1,000 lbs. hydrated lime (calcium hydroxide) or quicklime (calcium oxide) remain available at the Tryon Creek and Columbia Boulevard wastewater treatment plants at all times for use as a disinfectant/deodorant in the event an accidental sludge spill should occur during digester off-loading or other sludge handling activities;

2. At least 100 lbs. hydrated lime or quicklime remain available at all times on each non-pressurized tank truck the City uses to convey primary digested and raw secondary sludges from the Tryon Creek sewage treatment facility to the Columbia Boulevard wastewater treatment plant and dump trucks used to transport digested sludge from Columbia Boulevard sewage treatment plant to the City's land application sites. The lime products are to be used as a disinfectant/deodorant in case an accidental sludge spill occurs;

3. The City of Portland shall notify the Department's Northwest Region Office in writing and obtain written Department approval before any changes in sludge application site occur or before in-plant modifications are made which would significantly affect the nature of the City's sludge;

4. The City of Portland proposes to compost 75% or more, (8,370 dry tons/yr) of its anaerobically digested sludge from the Columbia Boulevard sewage treatment facility (Attachment A) and up to 25% (2,790 dry tons per year) Portland's Columbia Boulevard treatment plant sludge will be land applied at one of the City's DEQ authorized land application sites. Before making any significant changes in the sludge handling practices, Portland needs to apprise the Department of intended modifications and amend its sludge management plan as appropriate;

5. Compost derived from Portland's sludge will be marketed under contract (Agreement 20400) by North American Soils, Inc. The City shall maintain records which track all compost sales. Records shall indicate the date of sale and indentify the name and address of the compost purchaser. This information shall be made available to the Department upon request;

6. Land application of sludge to Portland's Tygh Valley sites shall occur according to the terms specified under the Department's May 7, 1987 site authorization letter (Attachments B and C). The City of Portland shall oversee all sludge land application activities provided by White River Ranch bi-weekly during the period of each year that belt-press sludge is being land applied. Both the City and the City's contractor shall maintain records which indicate when, where and how much sludge was applied to each particular area indicated in the City's Tygh Valley site submittal document to DEQ (Attachment B). Portland shall provide the Department with a report summarizing its sludge land application activities annually by October 31;

7. Sludge transfer and application activities shall be identified on Discharge Monitoring Reports (DMR) required under the City's Tryon Creek and Columbia Boulevard National Pollutant Discharge Elimination System (NPDES) permits; and

8. The City of Portland will promptly provide the Department's Northwest Region and Water Quality Division offices with updated sludge management operation inventory data at the end of each calendar year. Data will be used to help complete an annual inventory of Oregon's sludge activities for EPA.

A summary of the City of Portland's sludge management operation is presented in the Attachment A. Characteristics of Tygh Valley land application sites, site agronomic loading rate and forecasted site life and the Department's Tygh Valley site authorization letter appear as Attachments B and C respectively. Actual sludge application rates may require adjustment if sludge thickening processes or sludge chemical characteristics change.

If the City of Portland has any questions concerning sludge management plan approval or future inventory update needs, feel free to contact Mark Ronayne 229-6442.

Sincerely,

Richard J. Nichols
Administrator
Water Quality Division

RJN:c
WC2020
Attachments: A. The City of Portland Sludge Management Plan Elements
B. Agronomic Loading and Site Life Calculations
C. Tygh Valley land Application Site Authorization Conditions
cc: Northwest Region, DEQ
Central Region, DEQ

APPENDIX B
BIOSOLIDS PROGRAM DESCRIPTION/CERTIFICATION STATEMENTS

APPENDIX B
BIOSOLIDS PROGRAM DESCRIPTION/CERTIFICATION STATEMENTS

BIOSOLIDS LAND APPLICATION

Section 1. Biosolids generator requirements, 503.17(a)(5):

Blended anaerobically digested primary and secondary biosolids and predigested lagoon stabilized biosolids met biosolids land application ceiling concentration limits specified in 503.13(b)(1), Class B pathogen requirements listed under in 503.32(b)(2)(ii) and minimum vector attraction reduction criteria defined under 503.33(b)(1). Prior to land application, biosolids were monitored on a minimum frequency of once/month to determine trace inorganic pollutant concentration levels and document that minimum federal pathogen and vector attraction reduction requirements were met. Monitoring data is reported to EPA Region X annually by February 19 that accounts for the previous calendar years' biosolids production and use activities.

Class B pathogen reduction requirements were met through anaerobic digestion [503.32(b)(2) (ii)]. Vector attraction reduction was met via 38 percent volatile solids reduction pursuant to 503.33(b)(1).

The following certification is required from the biosolids generator:

"I certify, under penalty of the law, that the Class B pathogen requirements in 503.32 (b)(2) (ii) and vector attraction reduction requirements in 503.33(b)(1) were met. 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 pathogen requirements and vector attraction reduction requirements were met. I am aware that there are significant penalties for false certification including the possibility of fine and imprisonment."

Signed by: _____

Printed name: Greg Charr

Title: Biosolids Program Manager

Date: 1/14/19

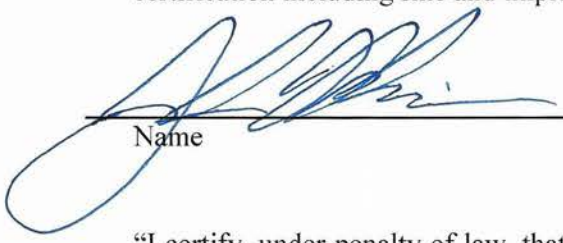
BIOSOLIDS LAND APPLICATION
Madison Biosolids, Inc.

Section 2. Biosolids applicator requirements, 503.17:

Class B biosolids are subject to management practice restrictions specified in 503.14. These requirements are consistent with Portland's DEQ approved site authorization and management plan conditions. Site restrictions [(503.32 (b)(5)] are met by limiting public access and controlling agricultural practices. In addition, records of cumulative metals additions are maintained under 503.13(a)(2)(i) to assure that regulated trace inorganic pollutant additions do not exceed 503.13(b)(2), Table 2 limits. Monitoring of biosolids produced throughout 2018 revealed pollutant concentrations fall well within 503.13(b)(3), Table 3 limits. Records of all biosolids applied to the site have been maintained by both the City and the land owner/biosolids applicator Madison Biosolids, Inc.)

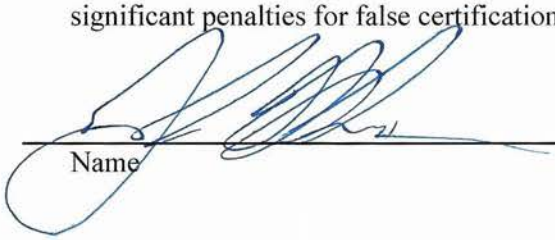
The following certification statements are required from the biosolids applicator, Madison Biosolids, Inc.:

"I certify, under penalty of law, that the site management practices in 503.14 and the site restrictions in 503.32(b)(5) have been met. 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 and site restrictions have been met. I am aware that there are significant penalties for false certification including fine and imprisonment."



Name 1-9-19 Date

"I certify, under penalty of law, that the requirements to obtain information in 503.12(e)(2) have been met for each site on which bulk Class B biosolids (sewage sludge) are 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 requirements to obtain information have been met. I am aware that there are significant penalties for false certification including fine and imprisonment."



Name 1-9-19 Date

APPENDIX C
COLUMBIA BOULEVARD WASTEWATER TREATMENT PLANT SOLIDS HISTORY

Table C-1. Chronology of CBWTP Solids Use and Disposal-1952 to 2018

- **1952 to 1970**…mouth of back-bottom slough extending off the south side of the Columbia Slough diked off (16-acre area in the footprint of the present secondary wastewater treatment works, Fred J. Early pad, and first-stage digester complex) and used to accumulate solids.

- **1964 to 1968**…small private business with drying unit dried and packaged solids retrieved from the lagoon. Materials were bagged and sold as a fertilizer.

- **1970**…the Triangle Lake Lagoon was developed immediately north of the Columbia Slough across for the mechanical plant. Solids from the 16-acre lagoon were removed and placed in the new lagoon, enabling the secondary plant to expand in the footprint of the old lagoon.

- **1970 to 1986**…old-pre-1970's solids and more recent solids accumulated in the Triangle Lake Lagoon to the extent perimeter walls around the lagoon needed to be raised twice to prevent solids from exceeding the capacity of the structure.

- **1974 to 1975**…Two Porteous heat treatment units were placed in the basement of the current solids processing building…they were operated for about nine months and the operation was abandoned due to the generation of intense, foul smells. The system was intended to be used in conjunction with a solids incinerator, which was never developed since EPA would not approve its construction.

- **1975 to 1980**…Hauled anaerobically digested solids to Terminal 6 where they were land applied via big gun irrigation cannon to dredge sand to stabilize sand and facilitate the development of a vegetative cover. Solids were disked in after application.

- **1982 and 1983** …10,100 dry tons of dewatered solids removed from the northern end of the Triangle Lake lagoon were trucked to the St John's landfill where they were beneficially used as intermediate cell cover. Lagoon perimeter dikes were raised during this operation.

- **1983**…11,950 dry tons of solids were removed under contract via drag line and clam shovel and trucked to the White River Ranch in Tygh Valley where they were land applied to pasture at DEQ authorized agronomic rates.

- **1984 to 1999**…Taulman-Weiss within vessel composters were operated, resulting in the production of what eventually became classified as Class A biosolids compost. Some lagoon solids and some contemporary digested primary solids and small quantities of digested waste activated solids were sent to that operation. Compost was sold to local soil blenders, landscapers and homeowners under the name Garden Care™. Compost was initially marketed under contract by the Taulman Company (Atlanta, GA) in both bagged and bulk form. Later another private vendor (North American Soils) marketed the product and eventually the City assumed responsibility for product marketing and distribution. Composting ceased in 1999 due to high operation and maintenance costs. During the era that the composter operated, roughly 25% of the City's annual solids production was composted.

- **1986**… 3,300 dry tons solids were removed from the lagoon, dewatered and trucked under contract to Hayden Island where they were broadcast on DEQ authorized non-irrigated pasture at agronomic rates. This practice was abandoned after it was discovered that solids were not being distributed within DEQ authorized agronomic rates.

- **1987**…1,061 dry tons solids were removed from the lagoon, dewatered and trucked to the White River Ranch where they were applied to dryland pasture.

- **1987**…1,445 dry tons of lagoon solids were moved to St. John's landfill and beneficially used via incorporation into soils as a final cell cover material.

- **1988**…4,457 dry tons lagoon solids were removed under contract by drag line clam shovel and trucked to Deer Island (Columbia County) for land application on pasture, feed corn, alfalfa, wheat, clover and oats. This practice was abandoned because the contractor failed to apply solids at an agronomic rate.

- **1990 and 1991**…11,496 dry tons of solids were removed from the Triangle Lake Lagoon, railed (as a slurry) to the Hinkle area and beneficially recycled at agronomic rates (via tanker nurse truck surface application) to Madison Ranches dry land pasture (Umatilla County) by Biosystems Management International. During 1990, 601 dry tons solids were removed from Digester 2 and disposed at the St. John's Landfill in north Portland.

- **1992**… 8,470 dry tons of older, more highly contaminated legacy solids from the Triangle Lake Lagoon were dewatered and co-disposed at the Roosevelt Regional Landfill (Rabanco, Landfill, Klickitat County, Washington) via contract (Ty Ross Trucking).

- **1992 to 2018**…January 20, 1992 to December 31, 2018, 376,864.6 dry tons of Triangle Lake Lagoon and contemporary digested solids processed at the CBWTP were blended, dewatered via belt filter presses, trucked (under contract to Gresham Transfer, Inc.) to Madison Ranches or Sherman County (beginning June 28, 2010) and beneficially recycled (via land application under contract with Madison Biosolids, Inc.) to dryland pasture, dryland wheat & canola, and irrigated wheat and canola (see expanded chronology-1990 to 2018). Total tonnage also includes the 11,495.57 dry tons applied at Madison Ranches as a liquid via BMI nurse truck.

- **2018**…October 20, 2018 to December 31, 2018, 1,206 dry tons of solids from the Triangle Lake lagoon were dewatered under contract by Synagro and hauled to the Wasco County Landfill for final disposal.

EXPANDED CHRONOLOGY
1990 TO 2018

INTRODUCTION

Between 1990 and the end of December 31, 2018, 420,241.6 dry tons of biosolids and lagoon derived sludges were exported from the CBWTP (Table C-2). Ninety percent of those solids (376,864.6 dry tons; Tables C-2 & C-3) were beneficially recycled via land application at Madison Ranches and Sherman County while 8% (33,100 dry tons; Tables C-2 & C-4) of the solids were used to make high quality Garden Care™ compost, which was marketed as a landscaping and soil amendment in the Portland metropolitan area from 1990 to 1999. 2 percent (10,277 dry tons) of the solids (Tables C-2 & C-5) produced during this era were landfilled due to their trace contaminant (lead, cadmium, Thorium 232, dioxin, dibenzofuran & PCBs) levels or due to their need for rapid removal from Triangle Lake.

LAGOON SOLIDS REMOVAL ACTIVITIES

The quality of solids has improved substantially since the CBWTP initiated operations in 1952. Most solids produced by the original primary treatment plant were stored in a 16-acre lagoon that once occupied the site where the secondary plant is located. Those solids were generated in an era which predated bans on the sale and manufacture of PCBs, halogenated pesticides and the beginning of the City's source control program. Thus, trace inorganic and organic contaminant levels in these solids were considerably higher than they are today.

To accommodate secondary plant construction, a second, 37-acre lagoon was constructed immediately across the Columbia Slough from the mechanical plant in 1970 (Section 9). Historical solids which occupied the original 16-acre lagoon were deposited in the new “Triangle Lake Lagoon” once its construction was completed. For the past 36 years, the lagoon has been used to store solids and solids side streams generated at the CBWTP since 1970 as well as pre-1970 solids.

Between 1976 and 1978, approximately 50,000 cubic yards of sludge were removed from the northern portion of the lagoon. In addition, lagoon dikes were raised, piping was added and modified, and dredge anchors were installed. From 1982 to 1983, frequent dredging of the lagoon occurred. The dredged material was beneficially used as intermediate cell cover at the St. John’s Landfill. Between 1984 and 1989, small, unrecorded quantities of solids from the Triangle Lake Lagoon were composted. Composting of these materials was discontinued due to their low amount of readily degradable organic matter and relatively high trace contaminant level.

In spite of enlarging its overall storage capacity by extending perimeter dike heights and occasional removal of solids from the lagoon to maintain storage volume, solids accumulation in the lagoon reached crisis levels by 1989. The City commissioned CH2M Hill to assess lagoon solids levels and quality in 1988. CH2M Hill sampled Triangle Lake solids from August 1988 through January 1989. Elevated levels of lead, cadmium and PCBs were detected in some lagoon regions.

In April 1989, CH2M Hill completed a ***Lagoon Sludge Utilization Report,*** which estimated that approximately 81,300 dry tons (396 acre-feet) of solids were stored in the Triangle Lake Lagoon. The report advised roughly 62,900 dry tons of solids could be removed from the lagoon under the first phase (solids withdrawal) of a two-stage lagoon rehabilitation capital improvement project without disrupting the integrity of dike walls or the lagoon's bottoms. Solids removal was necessary to accommodate lagoon lining (necessary to avert possible leaching to groundwater) and reconstruction (to better facilitate its use for short term solids/processing stream storage).

After the 1989 survey, lagoon solids were removed via cranes equipped with clam shovels and dredges. Between April 9, 1990 and July 8, 1991, 11,495.57 dry tons were removed from the lagoon and land applied at Madison Ranches in north central Oregon via a contract with Biosystems Management International (BMI) under the initial phase of the lagoon rehabilitation project (Tables C-2 & C-3). This project was discontinued on July 8, 1991, due to BMI's inability to perform according to contract specifications. No additional lagoon solids removal occurred until January 11, 1992. Between January 11, 1992 and July 19, 1992, the City removed and dewatered an additional 8,470 dry tons of solids that survey data and historical records suggested were the most highly contaminated with trace inorganic and organic chemicals (negatively impacting their potential for beneficial land application) (Tables C-2 & C-3). These solids were trucked under contract (Ty Ross Trucking) and disposed in the Rabanco Landfill in Klickitat County, Washington. On July 20, 1992, the City commenced blending solids dredged from the lagoon (≈ 60%) with contemporary biosolids. These products were dewatered (belt filter presses); trucked (Gresham Transfer, Inc.) to Madison Ranches under contract; and surface spread over dryland pasture, dryland wheat and irrigated wheat and canola by a contract applier (Madison Biosolids, Inc.) (Tables C-2 & C-3). Land application in Sherman County began in the summer of 2010 as the result of a Biosolids Use Services RFP.

Approximately 52,288 dry tons solids present at the beginning of the lagoon solids removal CIP in 1990 (83%) had been removed by December 31, 1996; and roughly 58,790 (93%) were removed by December 31, 1997. CIP-related lagoon solids removal operations concluded June 30, 1998. At that point, it was estimated that 63,307 dry tons solids had been withdrawn under the lagoon CIP. Since that time, sidestreams (digested TWAS from Digesters 7 and 8, digester cleanings and filtrates from solids dewatering and thickening operations) accumulated in the lagoon. See Section 9 for description of lagoon reconstruction project and description of monofilling of accumulated solids.

In 2018, Synagro was retained to dewater and remove accumulated solids from the Triangle Lake Lagoon at the CBWTP. 1,206 dry tons of solids were sent to the Wasco County Landfill in The Dalles, OR in 2018. See Section 9.

Table C-2. CBWTP Sludge and Biosolids Exports-January 1, 1990 to December 31, 2018			
Year[1]	Annual Production (dry tons/year)		
	Land Application[2&3]	Compost[4]	Landfill[5]
1990	6,932.08[b] (57,994.7)	4,430[e] (35,436)	601[s] (2,827)
1991	4,563.49[b] (46,612.5)	4,806.92 (40,500)[e]	
1992	5,555.95[d] (25,366.29)	4,270 (35,575)	8,470[r] (38,494)
1993	11,841[d] (59,188.02)	4,871 (47,851)	
1994	16,746.7[d] (79,769.02)	3,128 (48,068)	
1995	17,399.7[d] (80,852.2)	2,670 (46,068)	
1996	17,838.5[d] (78,798.83)	2,920 (40,530)	
1997	18,582.9[d] (85,031.7)	3,089 (40,530)	
1998	13,308.1[d] (68,428.09)	2,502.8 (20,635)	
1999	12,938.5[d] (68,151.75)	411.3 (8,946)	
2000	14,217.5[d] (78,187.63)		
2001	13,318.1[d] (77,403.94)		
2002	12,937.2[d] (70,477.94)		
2003	12,736.5[d] (68,351.5)		
2004	12,730.8[d] (59,058.5)		
2005	13,710.9[d] (69,455.3)		
2006	13,826.5[d] (70,282.3)		
2007	15,161[d] (77,461.1)		
2008	14,598.3[d] (70,445.61)		
2009	15,312.2[d] (69,459.36)		
2010	14,826.72[d] (70,444.81)		
2011	14,005[d] (69,625)		
2012	15,767[d] (68,301)		
2013	13,516[d] (70,173)		
2014	14,236[d] (66,553)		
2015	14,103[d] (72,323)		
2016	10,833[d] (55,256)		
2017	7,392[d] (37,114)		
2018	7,930[d] (47,632)		1,206[w] (6,262)
All Years	376,864.6[d] (1,918,198.1)	33,100 (364,139)	10,277 (47,583)

[1]Values depict solids exported from the CBWTP through December 31, 2018.
[2]Upper value indicates dry tons exported from the CBWTP (including the Triangle Lake Lagoon) in calendar year and lower value denotes the corresponding number of wet tons.
[3]During 1990 and 1991, 100% of the solids exported to land application were lagoon-derived; from 1992 to mid-1998, approximately 60% of the solids exported and land applied were lagoon-derived while the remainder were from current digestion sources; and after July 1, 1998, exported solids were a combination of lagoon-derived and contemporary solids.
[4]Upper value represents the number of dry tons dewatered cake used in the composting process during the year and lower number indicates cubic yards compost produced during year. No compost was produced after May 5, 1999.
[5]Upper value denotes dry tons and lower value wet tons.
[b]Era when 100% lagoon solids were removed from the Triangle Lake Lagoon, railed (as a slurry) and surface spread on dryland Madison Ranches forage via tanker nurse truck by Biosystems Management International.
[d]Period when solids were removed from the Triangle Lake Lagoon (City operated dredges), blended with contemporary digested solids, dewatered (CBWTP belt filter presses), trucked (Gresham Transfer, Inc.) to Madison Ranches or Sherman County (beginning 2010) and surface applied (Madison Biosolids, Inc.) to dryland pasture, dryland wheat or irrigated wheat or canola.
[e]Estimate.
[s]Represents dry tons solids removed from Digester 2 that were disposed at the St. John's Landfill in Portland.
[r]Indicates dry tons solids removed from the Triangle Lake Lagoon and disposed at the Rabanco Landfill in Klickitat County, Washington.
[w]Indicates dry tons solids removed from the Triangle Lake Lagoon, dewatered by Synagro, and disposed at the Wasco County Landfill.

Table C-3. Bulk Class B Biosolids Land Application -1990 to December 31, 2018			
ERA[1]	**Dry tons**	**Wet tons**	**Dry pounds**
BMI[2]	11,495.57	104,607.2	22,991,140
Dewatered cake[3]	365,369.03	1,918,198.1	730,738,060
Total	376,864.6	2,022,805.3	753,729,200

[1]In April 1989, CH2M Hill completed a "***Lagoon Sludge Utilization***" report that estimated approximately 81,300 dry tons of solids were stored in the Triangle Lake Lagoon. The report advised 62,900 dry tons of solids could be removed from the lagoon under the first phase of a capital improvement project without disrupting the integrity of the lagoon's bottoms and dikes. On April 9, 1990, lagoon solids removal was initiated under CIP funding. Approximately 52,288 dry tons lagoon solids (83%) were removed by December 31, 1996 and roughly 58,790 (93%) were removed by December 31, 1997. CIP-related lagoon solids removal operations concluded June 30, 1998. At that point, it was estimated that 63,307 dry tons solids had been removed under the lagoon CIP. Since that time, sidestreams (digested TWAS from Digesters 7 and 8, digester cleanings, and filtrates from solids dewatering and thickening operations) have accumulated in the lagoon at a rate faster than solids are being removed under the operating budget. During the CIP dredging project, approximately 60% of the solids exported and land applied at Madison Farms were from the lagoon. After that time, solids sent to Madison Ranches and Sherman County have been lagoon-derived while remaining solids originated from contemporary sources.

[2]BMI= Biosystems Management International. Between April 9, 1990 and July 8, 1991, 11,495.57 dry tons of solids were removed from the Triangle Lake Lagoon (under Contract 25810 executed October 9, 1989) via barge mounted cranes (2) equipped with clam shovels; piped into watertight, pressurized, 23,980 gallon hopper cars staged at a Union Pacific rail spur (SE of the lagoon near Union Carbide); railed (up to 14 cars daily seven days per week) via Union Pacific approximately 185 miles east to an offloading spur near Hinkle, Oregon; pumped from rail cars into 7,200 gallon tractor pulled tankers; trucked six miles to Madison Ranches; and surfaced applied via Caterpillar drawn tankers (equipped with large rubber tires and adjustable apertures and spreader plates which facilitated uniform distribution over an eight to ten feet width) on DEQ authorized dryland pasture where slopes were <15% and the depth to salt cemented pans exceeded 20"; at rates that were limited by either cadmium content (<0.446 lb. Cd/ac/yr.) or nitrogen content (150 lb. PAN/ac. ≈ 5.6 dry tons per acre per year). The project was discontinued on July 8, 1991 due to BMI's inability to perform per contract specifications (after >60% of the contract life, BMI had become financially insolvent, removed personnel and equipment from its operation and removed only approximately 23 percent of the lagoon solids specified via contract). No further lagoon solids removal occurred between July 8, 1991 and the commencement of solids removal and landfilling actions on January 11, 1992.

[3]Includes solids removed from the Triangle Lake Lagoon and blended with contemporary solids, dewatered via belt filter presses; trucked (via contracts with Gresham Transfer, Inc.) to Madison Ranches and Sherman County and land applied (via contract with Madison Biosolids, Inc.) at rates up to five dry tons per acre per year; effective January 20, 1992 through December 31, 2018. See footnote 1 for additional details.

Table C-4. CBWTP Biosolids Compost Production-1990 to 1999[1&2]					
Year	**Biosolids Used (dry tons)**	**Compost Produced (Yd^3)**	**Year**	**Biosolids Used (dry tons)**	**Compost Produced (Yd^3)**
1990	4,430[e]	35,436	1995	2,670	46,068
1991	4,807	40,500[e]	1996	2,920	40,507
1992	4,270	35,575	1997	3,089	40,530
1993	4,871	47,851	1998	2,503	20,635
1994	3,128	48,405	1999	411	8,946
Total biosolids used to make compost (1990 to 1999): **33,100** dry tons Total compost produced (1990 to 1999): **356,453** yd^3					

[1]Historical records quantifying the mass of solids composted and the corresponding volume of product generated are unavailable between 1984 and the end of 1989.

[2]In 1984, BES began operating an $11,400,000 (original contract amount) Taulman-Weiss within-vessel composter that was designed to process a biosolids throughput of 60 dry tons per day. Compost designers anticipated the composter would handle at least 75% of the new solids produced at the CBWTP. The composter was operated until May 5, 1999. During 1990 to 1999, the composter typically received 8 to 15 dry tons of biosolids daily, since higher loading rates compromised product quality and substantially increased operation and maintenance costs. Primary anaerobically digested biosolids and occasional small quantities of anaerobically digested secondary biosolids were mixed with recycled biosolids compost and fir or hemlock sawdust. The ratio of biosolids to compost bulking agent was approximately 1 to 1.2 (yd^3 biosolids: yd^3 bulking agent) on a volumetric basis and 4 to 1 (tons of biosolids: tons of bulking agent) on a weight mix basis. Biosolids were composted for > 10 days and underwent curing for > 10 days. The combination of active composting and curing generally exceeded two months during the later years operation when loading rates were generally less than 25% of design. Compost generated by the process met State and EPA "exceptional quality" specifications. It was marketed (predominately in bulk form) to commercial soil blenders and landscapers, landscape nurseries and the general public. In 1984, the City entered into a multi-year marketing and distribution program contract with the Taulman Company. Compost was marketed by the Taulman Company d.b.a. North American Soils until July 1992. During 1990 and 1991, bulk sales accounted for 96% of the compost sold while the remaining product, Garden Care™, was marketed in bagged form via retail landscape and garden supply businesses. The Taulman Company canceled their contract with Portland in 1992 based on product quality concerns (high dioxin/dibenzofuran and radioactive Thorium 232 concentrations). Bag product operations concluded at that time. The City let a new, five-year contract to a private vendor (North American Soils) who continued to market Garden Care™ compost products in bulk form from the CBWTP. Some compost was mixed with other ingredients (e.g., perolite, finely screened bark and pumice) and sold to commercial nurseries as a potting soil mix during this period. The City assumed responsibility for compost marketing operations July 5, 1997, after North American Soils' sales contract expired. The majority of compost produced after that date (≈ 96%) was sold by the City in bulk lots at roughly six-week intervals on a wholesale bid basis. Small quantities of compost (≈ 4%) were sold to local citizens on weekends. Due to economic considerations (the cost of producing and beneficially recycling compost was more than twice the cost of recycling bulk Class B biosolids via land application at Madison Farms) composting operations were discontinued in early 1999. The last feed of biosolids to compost bio-reactors occurred on February 28, 1999 and the final batch of finished compost was removed from compost cure reactors on May 5, 1999. All compost was marketed by October 5, 1999.

[e]Value is an estimate.

Table C-5. Solids Exported from CBWTP to Landfill-January 1990 to December 31, 2018[1]			
Solids Origin	**Dry tons**	**Wet tons**	**Dry pounds**
Digester[2]	601	2,827	1,202,000
Triangle Lake Lagoon[3,4]	9,676	44,756	19,352,000
Total	10,277	47,583	20,554,000

[1]Excludes grit & screenings and collection system sediments, digester spoils (sand, grit, rags, plastics), as well as domestic garbage generated via normal plant operations that were transferred from the CBWTP to landfill.

[2]Due to the discovery of high radioactive Thorium 232 levels (>8 to 13.2 pCi/g) in Digester 2 solids (which resulted from industrial discharges), June 15 to 21, 1991, under DEQ authorization, 654,000 gallons of solids were evacuated from the digester, dewatered via belt filter presses, and co-disposed at the St. John's Landfill. After that time, extensive cleaning and monitoring of the collection system near the industry indicated future Thorium 232 loading to the CBWTP would be appreciably reduced.

[3]Between January 11, 1992 and July 19, 1992 CBWTP operators removed (dredges) and dewatered (belt filter presses) older, more highly contaminated (lead, cadmium, dioxins/dibenzofurans and PCBs) solids from the Triangle Lake Lagoon. Dewatered lagoon solids (Avg. 22 % TS) were trucked (4 to 6 trucks daily carrying a payload averaging 34 wet tons) from the CBWTP to the Roosevelt Regional Landfill (Klickitat County, Washington) via contract (Ty Ross Trucking). They were co-disposed with other RCRA subtitle D wastes. This operation occurred between the closure of the BMI contract (July 8,1991) and resumption of biosolids land application activities at Madison Farms (July 20, 1992).

[4]Beginning October 20, 2018, Synagro was retained by the City to dewater and haul excess solids from the Triangle Lake Lagoon. In 2018, all solids were directed to the Wasco County Landfill in The Dalles, OR.

APPENDIX D

FIRST-STAGE DIGESTED BIOSOLIDS
PRIORITY INORGANICS/HALIDES
PAH-SIM
PRIORITY ORGANICS

LAND APPLIED BIOSOLIDS
PRIORITY INORGANICS/HALIDES
PAH-SIM
PRIORITY ORGANICS

MADISON RANCHES SOILS
PRIORITY INORGANICS

SHERMAN COUNTY BACKGROUND SOILS
PRIORITY INORGANICS

SYNAGRO LAGOON BIOSOLIDS DATA

DATA-2018

First Stage Digested Biosolids
Data 2018

Section 405(d)(2)(c) of the Clean Water Act requires federal biosolids regulations (40 CFR Part 503) to be reviewed every two years to identify toxic pollutants for regulation. Under Round III rulemaking, EPA considered 803 candidate chemicals and eventually narrowed that group to 40 compounds, which were subjected to human and ecological receptors exposure and hazzard screening assessment. After completing their exposure risk screening assessment, EPA identified 15 chemicals for further consideration. The agency intends to complete a national survey of the occurance of those pollutants. A risk assessment will be conducted to determine which trace contaminents, if any, require further regulation in land applied biosolids.

For biosolids land application, the group chemicals of interest include:

> **Accetone, anthracene, barium, beryllium, carbon disulfide, 4-chloroaniline, diazinon, flouranthene, manganese, methal ethyl ketone, nitrate, nitrite, phenol pyrene and silver.**

During 2018, Portland analyzed it's first-stage anaerobically digested biosolids to determine the occurance and concentration of a number of Round III analytes of interest to EPA and the general public. 2018 data characterizing this is included in this section.

Expanded Metals and Halides CB-D5

From: 1/1/2018
To: 12/31/2018

			Concentration (mg/kg)																											
		Complete	Aluminum	Antimony	Arsenic	Barium	Beryllium	Boron	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Molybdenum	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Tin	Titanium	Vanadium	Zinc	Bromide	Chloride	Fluoride
Feb 18	W18B034-0	☑	13200	3.91	4.06	213	0.33	22.8	1.54	50.5	8.39	233	26400	51.6	7890	509	7.8	50.4	9340	3.24	3.47	2800	0.1*	24	1320	53	908	36*	1700	360*
May 18	W18E067-0	☑	14100	3.58	3.71	219	0.38	28.9	1.93	59.3	7.68	253	24200	44.1	7390	573	8.8	48.6	8370	3.36	3.07	3150	0.1*	34	1280	49	949	52*	2000	520*
Aug 18	W18H048-0	☑	7800	3.69	3.62	170	1.02	34.2	1.95	41.3	5.98	236	15700	33.2	6440	429	9.5	34.3	12100	4.57	3.18	23500	1.02*	27	747	35	906	38*	3000	380*
Nov 18	W18K044-0	☑	11800	3.96	4.70	191	0.42	26.9	1.88	44.7	8.17	266	20300	59	5590	371	9.9	39.4	9340	4.11	6.16	2730	0.417*	27	1250	52	1030	40*	1600	400*
Average			11725	3.79	4.02	198	0.54	28.2	1.82	48.95	7.56	247	21650	47	6828	471	9.0	43.2	9788	3.82	3.97	8045	0.41	28	1149	47	948	42	2075	415

Historical Priority Metals Scan

	Concentration (mg/kg)																											
	Aluminum	**Antimony**	**Arsenic**	**Barium**	**Beryllium**	**Boron**	**Cadmium**	**Chromium**	**Cobalt**	**Copper**	**Iron**	**Lead**	**Magnesium**	**Manganese**	**Molybdenum**	**Nickel**	**Potassium**	**Selenium**	**Silver**	**Sodium**	**Thallium**	**Tin**	**Titanium**	**Vanadium**	**Zinc**	**Bromide**	**Chloride**	**Fluoride**
1998 Average			3.85				5.42	68.50		383		133			7.9	39.2		4.20							832			
1999 Average			3.35				4.38	67.80		382		89			8.1	36.0		3.78	33.30						627			
2000 Average			3.84				4.03	78.00		378		102			10.3	42.0		4.47	36.00						897			
2001 Average			3.85				4.16	77.00		418		93			12.6	40.8		5.02	30.90						904			
2002 Average	16800	3.71	3.37	271	0.25	39.2	3.87	74.20	6.71	387	18600	108	7873	343	11.9	42.5		4.92	27.80		0.14	54	1123		850	28	2425	278
2003 Average	17200	3.10	4.90	253	0.27	34.5	3.36	66.60	6.44	409	19050	91	8513	331	11.5	48.5		5.64	25.00		0.13	49	1265		928	23	1950	225
2004 Average	17850	3.20	3.73	270	0.36	37.5	3.04	72.80	7.65	362	20850	89	7095	339	13.5	44.0		4.52	24.70		0.12	64	1076		907	23	2350	230
2005 Average	17850	3.48	4.41	239	0.33	37.0	2.82	59.10	8.09	384	19375	107	7160	292	14.3	48.8		4.93	18.60		0.15	49	987		921	23	2350	230
2006 Average	16550	3.15	3.20	234	0.29	31.8	2.65	57.50	7.07	325	18175	85	7803	297	12.7	44.3		4.27	18.60		0.13	54	965		880	39	2345	385
2007 Average	13850	3.55	3.96	239	0.33	31.8	2.91	61.60	7.31	316	18675	81	7120	326	12.6	44.6		5.13	18.00		0.16	34	1223		884	30	2650	295
2008 Average	13125	4.16	4.05	289	0.26	32.5	3.15	74.80	8.26	338	18700	95	5733	323	16.6	49.8		4.90	14.10		0.10	32	1123		1041	40	2295	399
2009 Average	12425	3.75	3.68	276	0.28	24.5	2.57	61.40	8.46	309	19475	90	7303	583	13.3	42.0		4.43	11.20		0.14	32	1048		922	27	1550	330
2010 Average	12875	3.38	4.06	234	0.30	26.3	2.77	54.33	7.56	313	20025	78	7418	470	10.7	42.6	11225	4.63	12.33		0.09	31	1205		938	30	1850	303
2011 Average	14075	3.91	3.88	280	0.31	26.3	2.57	61.37	8.28	322	20750	147	6800	514	12.7	44.4	11075	4.25	10.72		0.10	36	1210		1096	34	2225	343
2012 Average	13600	4.39	4.49	245	0.28	27.0	2.41	60.05	8.16	312	22875	79	7408	379	11.2	45.9	10060	4.07	8.55	3268	0.10	35	1183	61	899	40	2200	397
2013 Average	12625	4.08	3.72	223	0.26	37.3	2.50	65.10	8.01	320	20200	68	7913	387	13.3	41.2	10430	4.50	8.01	3393	0.10	42	1051	60	991	30	2350	180
2014 Average	13850	4.35	4.95	220	0.32	35.3	2.06	70.35	8.46	289	25100	64	7088	366	13.0	40.8	9323	3.37	5.83	3248	0.11	33	1360	64	915	36	2425	343
2015 Average	12450	3.79	5.23	198	0.29	31.9	1.85	57.70	8.26	276	23350	60	8093	399	12.6	41.0	10215	3.50	5.23	7768	0.11	27	1238	59	847	38	2625	378
2016 Average	11923	3.52	3.87	252	0.29	29.7	1.71	48.15	7.79	241	23875	50	6993	446	8.7	49.6	10155	4.20	4.09	3680	0.10	27	1109	50	825	31	2375	325
2017 Average	12388	3.41	3.83	195	0.30	26.5	1.59	41.63	7.91	223	24925	51	6823	515	7.6	37.1	9985	3.18	4.76	3500	0.10	21	1183	55	783	28	2125	287
2018 Average	11725	3.79	4.02	198	0.54	28.2	1.82	48.95	7.56	247	21650	47	6828	471	9.0	43.2	9788	3.82	3.97	8045	0.41	28	1149	47	948	42	2075	415

PAH Results for CB-D5

From: **1/1/2018**
To: **12/31/2018**

			Concentration (µg/kg)																	
Sample	**Lab Tracking #**	**Complete**	**2-Methylnaphthal**	**Acenaphthene**	**Acenaphthylene**	**Anthracene**	**Benzo-a-Anthracene**	**Benzo-a-Pyrene**	**Benzo-b-Fluoranthene**	**Benzo-e-Pyrene**	**Benzo-g,h,i-Perylene**	**Benzo-k,j-Fluoranthene**	**Chrysene**	**Dibenzo-a,h-Anthracene**	**Fluoranthene**	**Fluorene**	**Indeno-1,2,3-c,d-Pyrene**	**Naphthalene**	**Phenanthrene**	**Pyrene**
Q1 2018	W18C105-01	☑	96	130	29	120	290	250	350	250	290	120	410	50	770	160	200	54	670	940
Q2 2018	W18E067-01	☑	80	40	19	29	74	84	89	55	62	29	91	25	140	44	57	72	120	190
Q3 2018	W18H048-01	☑	110	79	19	33	57	53	60	36	39	40	65	15*	130	72	270	83	200	150
Q4 2018	W18K044-01	☑	79	96	27*	40	100	110	130	160	170	51	140	27*	190	47	73	71	260	450

* - Reported at Detection Limit

Sample	Lab Tracking #	Complete	Concentration (µg/kg)																	
			2-Methylnaphthal	Acenaphthene	Acenaphthylene	Anthracene	Benzo-a-Anthracene	Benzo-a-Pyrene	Benzo-b-Fluoranthene	Benzo-e-Pyrene	Benzo-g,h,i-Perylene	Benzo-k,j-Fluoranthene	Chrysene	Dibenzo-a,h-Anthracene	Fluoranthene	Fluorene	Indeno-1,2,3-c,d-Pyrene	Naphthalene	Phenanthrene	Pyrene
Average			91	86	24	56	130	124	157	125	140	60	177	29	308	81	150	70	313	433

2/1/2018 CB-D5 Sample W18C105-01 collected as Belt Press Cake. February Digester 5 sample, W18B034 hold time exceeded for subcontract lab on analysis of PAHs, PCBs, Pesticides, Semi-volatiles.

Historical PAH Results

	Concentration (µg/kg)																	
	2-Methylnaphthal	Acenaphthene	Acenaphthylene	Anthracene	Benzo-a-Anthracene	Benzo-a-Pyrene	Benzo-b-Fluoranthene	Benzo-e-Pyrene	Benzo-g,h,i-Perylene	Benzo-k,j-Fluoranthene	Chrysene	Dibenzo-a,h-Anthracene	Fluoranthene	Fluorene	Indeno-1,2,3-c,d-Pyrene	Naphthalene	Phenanthrene	Pyrene
2004 Average		100	62	126	98	103	125	50	97	73	51	33	240	92	55	755	339	396
2005 Average		443	666	271	190	210	118	138	206	112	178	271	422	277	124	929	1,078	1,194
2006 Average	745	83	62	60	72	82	63	59	60	56	87	100	141	123	52	302	328	201
2007 Average	1,001	70	64	68	74	80	90	59	67	66	89	103	125	84	63	349	238	219
2008 Average	846	75	46	62	85	89	98	91	72	71	96	109	184	106	70	410	284	164
2009 Average	679	87	47	68	78	90	86	86	84	70	104	61	197	126	72	413	302	217
2010 Average	176	58	30	48	59	58	67	42	45	44	72	60	136	59	45	151	189	162
2011 Average	489	84	25	42	48	48	44	41	37	41	59	40	109	87	36	296	183	136
2012 Average	494	77	63	50	71	73	87	65	78	79	101	69	176	96	52	316	228	209
2013 Average	645	72	40	62	56	54	44	40	57	46	79	29	154	74	37	278	205	142
2014 Average	445	66	52	43	59	58	67	49	37	51	85	60	122	62	50	206	190	158
2015 Average	550	206	202	199	208	206	205	50	200	203	212	206	250	207	204	320	283	280
2016 Average	88	49	24	101	55	74	102	85	104	21	82	30	145	45	159	169	228	310
2017 Average	92	49	23	98	82	146	130	108	265	64	107	54	155	50	263	102	198	398
2018 Average	91	86	24	56	130	124	157	125	140	60	177	29	308	81	150	70	313	433

Results prior to 2011 indicate MRLs on an as received basis. Results beginning in 2011 indicate MRLs on a dry weight basis

* - Reported at Detection Limit

Biosolids Priority Organics

2018

W18C105	Sample from Bet Press Cake (Pesticides, PCB's, Semi-Volatiles, PAHs)	1-week (3/8 - 3/14)	3/8/2018
W18E053	Liquid Sample from D-5 (Pesticides, PCB's, Semi-Volatiles, PAHs)	1-week (5/1 - 5/7)	May-18
W18H061	Liquid Sample from D-5 (Pesticides, PCB's, Semi-Volatiles, PAHs)	1-week (8/1 - 8/7)	Aug-18
W18K061	Liquid Sample from D-5 (Pesticides, PCB's, Semi-Volatiles, PAHs)	1-week (11/1 - 11/7)	Nov-18

City of Portland
Water Pollution Control Laboratory
6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656
ORELAP Certification ID 4023

LABORATORY ANALYSIS REPORT

Project:	**Pretreatment Program CBWTP NPDES**	Client:	Industrial Source Control
Work Order:	**W18C105**	Project Mgr:	Angela Henderson
Received:	3/15/18 8:38		
Submitted By:	CBWTP/Lab		

Sample	Laboratory ID	Matrix	Type	Sample Collection Date Start	End	Qualifier
CB BPC Comp-Quarterly	W18C105-01	Biosolid	Composite, 1 week	03/08/18 00:00	03/14/18 23:59	

CB BPC Comp-Quarterly : W18C105-01

Analyte	Result	Units	MRL	Dil.	Batch	Prepared	Analyzed	Method	Qualifier
General Chemistry									
Cyanide	**2.94**	mg/kg dry	0.50		B18C251	03/20/18	03/20/18	SM 4500-CN E	M4
Total solids	**19.8**	% W/W	0.01		B18C203	03/15/18	03/16/18	SM 2540G	
Total Metals									
Total Metals by ICPMS									
Antimony	**3.89**	mg/kg dry	0.100	20	B18C222	03/16/18	03/20/18	EPA 6020	
Arsenic	**4.14**	mg/kg dry	0.500	20	B18C222	03/16/18	03/20/18	EPA 6020	
Beryllium	**0.399**	mg/kg dry	0.100	20	B18C222	03/16/18	03/20/18	EPA 6020	
Cadmium	**1.83**	mg/kg dry	0.100	20	B18C222	03/16/18	03/20/18	EPA 6020	
Chromium	**54.1**	mg/kg dry	0.500	20	B18C222	03/16/18	03/20/18	EPA 6020	
Copper	**271**	mg/kg dry	0.200	20	B18C222	03/16/18	03/20/18	EPA 6020	
Lead	**60.6**	mg/kg dry	0.100	20	B18C222	03/16/18	03/20/18	EPA 6020	
Mercury	**0.637**	mg/kg dry	0.0100	20	B18C222	03/16/18	03/20/18	EPA 6020	M3
Nickel	**51.2**	mg/kg dry	0.200	20	B18C222	03/16/18	03/20/18	EPA 6020	
Selenium	**4.72**	mg/kg dry	1.00	20	B18C222	03/16/18	03/20/18	EPA 6020	
Silver	**3.77**	mg/kg dry	0.100	20	B18C222	03/16/18	03/20/18	EPA 6020	
Thallium	**0.102**	mg/kg dry	0.100	20	B18C222	03/16/18	03/20/18	EPA 6020	
Zinc	**1090**	mg/kg dry	0.500	20	B18C222	03/16/18	03/20/18	EPA 6020	
Polychlorinated Biphenyls (PCBs)									
PCB Aroclors by GC-ECD									
Aroclor 1016/1242	<50.5	ug/kg dry	50.5	1	B18C365	03/26/18	04/02/18	EPA 8082	
Aroclor 1221	<101	ug/kg dry	101	1	B18C365	03/26/18	04/02/18	EPA 8082	
Aroclor 1232	<50.5	ug/kg dry	50.5	1	B18C365	03/26/18	04/02/18	EPA 8082	
Aroclor 1248	<50.5	ug/kg dry	50.5	1	B18C365	03/26/18	04/02/18	EPA 8082	
Aroclor 1254	<50.5	ug/kg dry	50.5	1	B18C365	03/26/18	04/02/18	EPA 8082	
Aroclor 1260	<50.5	ug/kg dry	50.5	1	B18C365	03/26/18	04/02/18	EPA 8082	
Surrogate	***Result***		***Expected***	***%Rec***	***Limits(%)***				
Tetrachloro-m-xylene	*34.2*	ug/kg dry	*50.5*	*68%*	*54.6-118*	*B18C365*	*03/26/18*	*04/02/18*	*EPA 8082*	
Decachlorobiphenyl	*22.1*	ug/kg dry	*50.5*	*44%*	*44.5-151*	*B18C365*	*03/26/18*	*04/02/18*	*EPA 8082*	*SU1*

Reported: 06/26/18 08:37

The results in this report apply only to the samples analyzed. Qualifiers and case narrative comments are essential to interpretation of the analytical results. Report reproductions and/or data summaries without qualifiers and comments are incomplete.

Jennifer Shackelford

Jennifer Shackelford, Laboratory Coordinator QA/QC

Semivolatile Organic Compounds by GC/MS

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

Client:	Portland, City of	**Service Request:**	K1802505
Project:	Pretreatment Program CBWTP NPDES/W18C105	**Date Collected:**	03/14/18 23:59
Sample Matrix:	Soil	**Date Received:**	03/16/18 09:15
Sample Name:	W18C105-01	**Units:**	ug/Kg
Lab Code:	K1802505-001	**Basis:**	Dry

Low Level Semivolatile Organic Compounds by GC/MS

Analysis Method: 8270D
Prep Method: EPA 3541

Analyte Name	Result		MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
1,2,4-Trichlorobenzene	ND	U	640	170	5	03/29/18 20:10	3/28/18	
1,2-Dichlorobenzene	ND	U	640	160	5	03/29/18 20:10	3/28/18	
1,3-Dichlorobenzene	ND	U	640	150	5	03/29/18 20:10	3/28/18	
1,4-Dichlorobenzene	ND	U	640	160	5	03/29/18 20:10	3/28/18	
2,4,5-Trichlorophenol	ND	U	640	200	5	03/29/18 20:10	3/28/18	
2,4,6-Trichlorophenol	ND	U	640	200	5	03/29/18 20:10	3/28/18	
2,4-Dichlorophenol	ND	U	640	170	5	03/29/18 20:10	3/28/18	
2,4-Dimethylphenol	ND	U	3200	410	5	03/29/18 20:10	3/28/18	
2,4-Dinitrophenol	ND	U	13000	1900	5	03/29/18 20:10	3/28/18	
2,4-Dinitrotoluene	ND	U	640	160	5	03/29/18 20:10	3/28/18	
2,6-Dinitrotoluene	ND	U	640	190	5	03/29/18 20:10	3/28/18	
2-Chloronaphthalene	ND	U	640	210	5	03/29/18 20:10	3/28/18	
2-Chlorophenol	ND	U	640	200	5	03/29/18 20:10	3/28/18	
4,6-Dinitro-2-methylphenol	ND	U	6400	2500	5	03/29/18 20:10	3/28/18	
2-Methylnaphthalene	**190**	**J**	640	180	5	03/29/18 20:10	3/28/18	
2-Methylphenol	ND	U	640	270	5	03/29/18 20:10	3/28/18	
2-Nitroaniline	ND	U	1300	210	5	03/29/18 20:10	3/28/18	
2-Nitrophenol	ND	U	640	260	5	03/29/18 20:10	3/28/18	
3,3'-Dichlorobenzidine	ND	U	6400	270	5	03/29/18 20:10	3/28/18	
3-Nitroaniline	ND	U	1300	280	5	03/29/18 20:10	3/28/18	
4-Bromophenyl Phenyl Ether	ND	U	640	200	5	03/29/18 20:10	3/28/18	
4-Chloro-3-methylphenol	ND	U	640	190	5	03/29/18 20:10	3/28/18	
4-Chloroaniline	ND	U	640	170	5	03/29/18 20:10	3/28/18	
4-Chlorophenyl Phenyl Ether	ND	U	640	210	5	03/29/18 20:10	3/28/18	
4-Methylphenol	ND	U	640	290	5	03/29/18 20:10	3/28/18	
4-Nitroaniline	ND	U	1300	250	5	03/29/18 20:10	3/28/18	
4-Nitrophenol	ND	U	6400	490	5	03/29/18 20:10	3/28/18	
Acenaphthene	ND	U	640	210	5	03/29/18 20:10	3/28/18	
Acenaphthylene	ND	U	640	170	5	03/29/18 20:10	3/28/18	
Anthracene	ND	U	640	210	5	03/29/18 20:10	3/28/18	
Benz(a)anthracene	ND	U	640	230	5	03/29/18 20:10	3/28/18	
Benzo(a)pyrene	ND	U	640	230	5	03/29/18 20:10	3/28/18	
Benzo(b)fluoranthene	**330**	**J**	640	220	5	03/29/18 20:10	3/28/18	
Benzo(g,h,i)perylene	ND	U	640	240	5	03/29/18 20:10	3/28/18	
Benzo(k)fluoranthene	ND	U	640	260	5	03/29/18 20:10	3/28/18	
Benzoic Acid	ND	U	25000	6200	5	03/29/18 20:10	3/28/18	
Benzyl Alcohol	ND	U	1300	320	5	03/29/18 20:10	3/28/18	
Bis(2-chloroethoxy)methane	ND	U	640	180	5	03/29/18 20:10	3/28/18	
Bis(2-chloroethyl) Ether	ND	U	640	200	5	03/29/18 20:10	3/28/18	
Bis(2-ethylhexyl) Phthalate	**26000**		6400	570	5	03/29/18 20:10	3/28/18	
Butyl Benzyl Phthalate	**670**		640	240	5	03/29/18 20:10	3/28/18	
Chrysene	**320**	**J**	640	270	5	03/29/18 20:10	3/28/18	
Dibenz(a,h)anthracene	ND	U	640	200	5	03/29/18 20:10	3/28/18	

Client:	Portland, City of	**Service Request:**	K1802505
Project:	Pretreatment Program CBWTP NPDES/W18C105	**Date Collected:**	03/14/18 23:59
Sample Matrix:	Soil	**Date Received:**	03/16/18 09:15
Sample Name:	W18C105-01	**Units:**	ug/Kg
Lab Code:	K1802505-001	**Basis:**	Dry

Low Level Semivolatile Organic Compounds by GC/MS

Analysis Method: 8270D
Prep Method: EPA 3541

Analyte Name	Result		MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Dibenzofuran	ND	U	640	220	5	03/29/18 20:10	3/28/18	
Diethyl Phthalate	ND	U	640	240	5	03/29/18 20:10	3/28/18	
Dimethyl Phthalate	ND	U	640	260	5	03/29/18 20:10	3/28/18	
Di-n-butyl Phthalate	**320**	**J**	1300	310	5	03/29/18 20:10	3/28/18	
Di-n-octyl Phthalate	**1700**	**X**	640	210	5	03/29/18 20:10	3/28/18	
Fluoranthene	**680**		640	240	5	03/29/18 20:10	3/28/18	
Fluorene	ND	U	640	210	5	03/29/18 20:10	3/28/18	
Hexachlorobenzene	ND	U	640	210	5	03/29/18 20:10	3/28/18	
Hexachlorobutadiene	ND	U	640	200	5	03/29/18 20:10	3/28/18	
Hexachlorocyclopentadiene	ND	U	3200	260	5	03/29/18 20:10	3/28/18	
Hexachloroethane	ND	U	640	160	5	03/29/18 20:10	3/28/18	
Indeno(1,2,3-cd)pyrene	**1500**	**X**	640	210	5	03/29/18 20:10	3/28/18	
Isophorone	ND	U	640	180	5	03/29/18 20:10	3/28/18	
Naphthalene	ND	U	640	190	5	03/29/18 20:10	3/28/18	
Nitrobenzene	ND	U	640	220	5	03/29/18 20:10	3/28/18	
N-Nitrosodi-n-propylamine	ND	U	640	210	5	03/29/18 20:10	3/28/18	
N-Nitrosodiphenylamine	ND	U	640	210	5	03/29/18 20:10	3/28/18	
Pentachlorophenol (PCP)	ND	U	6400	340	5	03/29/18 20:10	3/28/18	
Phenanthrene	**620**	**J**	640	230	5	03/29/18 20:10	3/28/18	
Phenol	ND	U	1900	200	5	03/29/18 20:10	3/28/18	
Pyrene	**680**		640	240	5	03/29/18 20:10	3/28/18	
Bis(1-chloroisopropyl) Ether	ND	U	640	180	5	03/29/18 20:10	3/28/18	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
2,4,6-Tribromophenol	67	10 - 124	03/29/18 20:10	
2-Fluorobiphenyl	63	35 - 105	03/29/18 20:10	
2-Fluorophenol	55	22 - 85	03/29/18 20:10	
Nitrobenzene-d5	68	10 - 84	03/29/18 20:10	
Phenol-d6	63	39 - 109	03/29/18 20:10	
p-Terphenyl-d14	80	30 - 102	03/29/18 20:10	

Analytical Report

Client:	Portland, City of	**Service Request:**	K1802505
Project:	Pretreatment Program CBWTP NPDES/W18C105	**Date Collected:**	03/14/18 23:59
Sample Matrix:	Soil	**Date Received:**	03/16/18 09:15
Sample Name:	W18C105-01	**Units:**	ug/Kg
Lab Code:	K1802505-001	**Basis:**	Dry

Polynuclear Aromatic Hydrocarbons

Analysis Method: 8270D SIM
Prep Method: EPA 3546

Analyte Name	Result		MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Naphthalene	**54**	**D**	49	4.6	2	04/04/18 17:12	3/27/18	
2-Methylnaphthalene	**96**	**D**	49	3.7	2	04/04/18 17:12	3/27/18	
1-Methylnaphthalene	**98**	**D**	49	3.7	2	04/04/18 17:12	3/27/18	
Acenaphthylene	**29**	**JD**	49	2.8	2	04/04/18 17:12	3/27/18	
Acenaphthene	**130**	**D**	49	3.0	2	04/04/18 17:12	3/27/18	
Fluorene	**160**	**D**	49	5.6	2	04/04/18 17:12	3/27/18	
Phenanthrene	**670**	**D**	49	5.8	2	04/04/18 17:12	3/27/18	
Anthracene	**120**	**D**	49	2.9	2	04/04/18 17:12	3/27/18	
Fluoranthene	**770**	**D**	49	6.2	2	04/04/18 17:12	3/27/18	
Pyrene	**940**	**D**	49	3.2	2	04/04/18 17:12	3/27/18	
Benz(a)anthracene	**290**	**D**	49	2.3	2	04/04/18 17:12	3/27/18	
Chrysene	**410**	**D**	49	3.1	2	04/04/18 17:12	3/27/18	
Benzo(b)fluoranthene	**350**	**D**	49	2.9	2	04/04/18 17:12	3/27/18	
Benzo(k)fluoranthene	**120**	**D**	49	2.4	2	04/04/18 17:12	3/27/18	
Benzo(e)pyrene	**240**	**D**	49	2.9	2	04/04/18 17:12	3/27/18	
Benzo(a)pyrene	**250**	**D**	49	3.8	2	04/04/18 17:12	3/27/18	
Indeno(1,2,3-cd)pyrene	**200**	**D**	49	3.6	2	04/04/18 17:12	3/27/18	
Dibenz(a,h)anthracene	**50**	**D**	49	2.3	2	04/04/18 17:12	3/27/18	
Benzo(g,h,i)perylene	**290**	**D**	49	4.0	2	04/04/18 17:12	3/27/18	

Surrogate Name		% Rec	Control Limits	Date Analyzed	Q
Fluorene-d10	**D**	76	38 - 104	04/04/18 17:12	
Fluoranthene-d10	**D**	84	39 - 109	04/04/18 17:12	
p-Terphenyl-d14	**D**	92	38 - 113	04/04/18 17:12	

Semivolatile Organic Compounds by GC

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

Analytical Report

Client:	Portland, City of	**Service Request:**	K1802505
Project:	Pretreatment Program CBWTP NPDES/W18C105	**Date Collected:**	03/14/18 23:59
Sample Matrix:	Soil	**Date Received:**	03/16/18 09:15
Sample Name:	W18C105-01	**Units:**	ug/Kg
Lab Code:	K1802505-001	**Basis:**	Dry

Organochlorine Pesticides

Analysis Method: 8081B
Prep Method: EPA 3546

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
alpha-BHC	ND Ui	23	15	5	03/31/18 14:04	3/26/18	
beta-BHC	ND U	23	6.2	5	03/31/18 14:04	3/26/18	
gamma-BHC (Lindane)	ND Ui	68	68	5	03/31/18 14:04	3/26/18	
delta-BHC	ND Ui	23	15	5	03/31/18 14:04	3/26/18	
Heptachlor	ND Ui	31	31	5	03/31/18 14:04	3/26/18	
Aldrin	ND Ui	54	54	5	03/31/18 14:04	3/26/18	
Heptachlor Epoxide	ND U	23	16	5	03/31/18 14:04	3/26/18	
gamma-Chlordane	ND Ui	23	21	5	03/31/18 14:04	3/26/18	
Endosulfan I	ND U	23	8.5	5	03/31/18 14:04	3/26/18	
alpha-Chlordane	ND U	23	9.4	5	03/31/18 14:04	3/26/18	
Dieldrin	ND U	23	5.1	5	03/31/18 14:04	3/26/18	
4,4'-DDE	ND U	23	9.2	5	03/31/18 14:04	3/26/18	
Endrin	ND U	23	7.4	5	03/31/18 14:04	3/26/18	
Endosulfan II	ND Ui	27	27	5	03/31/18 14:04	3/26/18	
4,4'-DDD	ND U	23	14	5	03/31/18 14:04	3/26/18	
Endrin Aldehyde	ND Ui	63	63	5	03/31/18 14:04	3/26/18	
Endosulfan Sulfate	ND U	23	23	5	03/31/18 14:04	3/26/18	
4,4'-DDT	ND Ui	54	54	5	03/31/18 14:04	3/26/18	
Endrin Ketone	ND U	23	11	5	03/31/18 14:04	3/26/18	
Methoxychlor	ND Ui	48	48	5	03/31/18 14:04	3/26/18	
Toxaphene	ND Ui	3400	3400	5	03/31/18 14:04	3/26/18	

Surrogate Name		% Rec	Control Limits	Date Analyzed	Q
Tetrachloro-m-xylene	**D**	112	70 - 130	03/31/18 14:04	
Decachlorobiphenyl	**D**	71	70 - 130	03/31/18 14:04	

City of Portland
Water Pollution Control Laboratory
6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656
ORELAP Certification ID 4023

LABORATORY ANALYSIS REPORT

Project:	**Pretreatment Program CBWTP NPDES**	Client:	Industrial Source Control
Work Order:	**W18E053**	Project Mgr:	Angela Henderson
Received:	5/8/18 8:40		
Submitted By:	CBWTP/Lab		

Sample	Laboratory ID	Matrix	Type	Sample Collection Date Start	End	Qualifier
CB BPC Comp-Quarterly	W18E053-01	Biosolid	Composite, 1 week	05/01/18 00:00	05/07/18 23:59	

Analyte	Result	Units	MRL	Dil.	Batch	Prepared	Analyzed	Method	Qualifier
CB BPC Comp-Quarterly : W18E053-01									
General Chemistry									
Cyanide	**3.28**	mg/kg dry	0.49		B18E250	05/17/18	05/17/18	SM 4500-CN E	M4
Total solids	**20.1**	% W/W	0.01		B18E126	05/09/18	05/10/18	SM 2540G	
Total Metals									
Total Metals by ICPMS									
Antimony	**4.02**	mg/kg dry	0.100	20	B18E134	05/09/18	05/09/18	EPA 6020	
Arsenic	**4.34**	mg/kg dry	0.500	20	B18E134	05/09/18	05/09/18	EPA 6020	
Beryllium	**0.424**	mg/kg dry	0.100	20	B18E134	05/09/18	05/09/18	EPA 6020	
Cadmium	**1.93**	mg/kg dry	0.100	20	B18E134	05/09/18	05/09/18	EPA 6020	
Chromium	**62.9**	mg/kg dry	0.500	20	B18E134	05/09/18	05/09/18	EPA 6020	
Copper	**269**	mg/kg dry	0.200	20	B18E134	05/09/18	05/09/18	EPA 6020	
Lead	**47.6**	mg/kg dry	0.100	20	B18E134	05/09/18	05/09/18	EPA 6020	
Mercury	**0.607**	mg/kg dry	0.0100	20	B18E134	05/09/18	05/09/18	EPA 6020	M3
Nickel	**51.4**	mg/kg dry	0.200	20	B18E134	05/09/18	05/09/18	EPA 6020	
Selenium	**4.15**	mg/kg dry	1.00	20	B18E134	05/09/18	05/09/18	EPA 6020	
Silver	**3.52**	mg/kg dry	0.100	20	B18E134	05/09/18	05/09/18	EPA 6020	
Thallium	**0.102**	mg/kg dry	0.100	20	B18E134	05/09/18	05/09/18	EPA 6020	
Zinc	**1020**	mg/kg dry	0.500	20	B18E134	05/09/18	05/09/18	EPA 6020	
CB BPC Comp-Quarterly : W18E053-01RE1									

Reported: 07/10/18 13:38

The results in this report apply only to the samples analyzed. Qualifiers and case narrative comments are essential to interpretation of the analytical results. Report reproductions and/or data summaries without qualifiers and comments are incomplete.

Jennifer Shackelford

Jennifer Shackelford, Laboratory Coordinator QA/QC

City of Portland
Water Pollution Control Laboratory
6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656
ORELAP Certification ID 4023

Project:	**Pretreatment Program CBWTP NPDES**	Client:	Industrial Source Control
Work Order:	**W18E053**	Received:	05/08/18 08:40

Analyte	Result	Units	MRL	Dil.	Batch	Prepared	Analyzed	Method	Qualifier
Polychlorinated Biphenyls (PCBs)									
PCB Aroclors by GC-ECD									
Aroclor 1016/1242	<47.2	ug/kg dry	47.2	1	B18E121	05/09/18	05/14/18	EPA 8082	
Aroclor 1221	<94.4	ug/kg dry	94.4	1	B18E121	05/09/18	05/14/18	EPA 8082	
Aroclor 1232	<47.2	ug/kg dry	47.2	1	B18E121	05/09/18	05/14/18	EPA 8082	
Aroclor 1248	<47.2	ug/kg dry	47.2	1	B18E121	05/09/18	05/14/18	EPA 8082	
Aroclor 1254	<47.2	ug/kg dry	47.2	1	B18E121	05/09/18	05/14/18	EPA 8082	
Aroclor 1260	<47.2	ug/kg dry	47.2	1	B18E121	05/09/18	05/14/18	EPA 8082	
Surrogate	***Result***		***Expected***	***%Rec***	***Limits(%)***				
Tetrachloro-m-xylene	*32.5*	ug/kg dry	*47.2*	*69%*	*54.6-118*	*B18E121*	*05/09/18*	*05/14/18*	*EPA 8082*	
Decachlorobiphenyl	*18.3*	ug/kg dry	*47.2*	*39%*	*44.5-151*	*B18E121*	*05/09/18*	*05/14/18*	*EPA 8082*	*SU8*

Qualifiers

M3	Inconsistent results for matrix QC (duplicates and/or matrix spikes) indicate non-homogeneous sample matrix. Sample results should be considered estimates.
M4	Based on low matrix spike recovery, the sample result may be a low estimate due to matrix interference.
SU8	Low surrogate recovery is due to matrix interference.

Definitions

DET	Analyte Detected	ND	Analyte Not Detected at or above the reporting limit
MRL	Method Reporting Limit	MDL	Method Detection Limit
NR	Not Reportable	dry	Sample results reported on a dry weight basis
% Rec.	Percent Recovery	RPD	Relative Percent Difference
*	This analyte is not certified under NELAP		

Reported: 07/10/18 13:38

Jennifer Shackelford

Jennifer Shackelford, Laboratory Coordinator QA/QC

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Semivolatile Organic Compounds by GC/MS

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

Client:	Portland, City of	**Service Request:**	K1804403
Project:	Pretreatment Program CBWTP NPDES/W18E053	**Date Collected:**	05/07/18 23:59
Sample Matrix:	Soil	**Date Received:**	05/10/18 13:00
Sample Name:	W18E053-01	**Units:**	mg/Kg
Lab Code:	K1804403-001	**Basis:**	Dry

Semivolatile Organic Compounds by GC/MS

Analysis Method: 8270D
Prep Method: EPA 3541

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
1,2,4-Trichlorobenzene	ND U	13	0.43	10	06/26/18 04:22	5/16/18	
1,2-Dichlorobenzene	ND U	13	0.69	10	06/26/18 04:22	5/16/18	
1,2-Diphenylhydrazine	ND U	13	0.54	10	06/26/18 04:22	5/16/18	*
1,3-Dichlorobenzene	ND U	13	0.69	10	06/26/18 04:22	5/16/18	
1,4-Dichlorobenzene	ND U	13	0.69	10	06/26/18 04:22	5/16/18	
2,4,5-Trichlorophenol	ND U	13	0.69	10	06/26/18 04:22	5/16/18	
2,4,6-Trichlorophenol	ND U	13	0.54	10	06/26/18 04:22	5/16/18	
2,4-Dichlorophenol	ND U	13	0.62	10	06/26/18 04:22	5/16/18	
2,4-Dimethylphenol	ND U	13	0.58	10	06/26/18 04:22	5/16/18	*
2,4-Dinitrophenol	ND U	76	4.3	10	06/26/18 04:22	5/16/18	*
2,4-Dinitrotoluene	ND U	13	0.58	10	06/26/18 04:22	5/16/18	
2,6-Dinitrotoluene	ND U	13	0.62	10	06/26/18 04:22	5/16/18	
2-Chloronaphthalene	ND U	13	0.39	10	06/26/18 04:22	5/16/18	
2-Chlorophenol	ND U	13	0.38	10	06/26/18 04:22	5/16/18	
2-Methyl-4,6-dinitrophenol	ND U	76	5.4	10	06/26/18 04:22	5/16/18	
2-Nitrophenol	ND U	13	0.54	10	06/26/18 04:22	5/16/18	
3,3'-Dichlorobenzidine	ND U	13	1.1	10	06/26/18 04:22	5/16/18	*
4-Bromophenyl Phenyl Ether	ND U	13	0.46	10	06/26/18 04:22	5/16/18	
4-Chloro-3-methylphenol	ND U	13	0.65	10	06/26/18 04:22	5/16/18	
4-Chloroaniline	ND U	13	0.54	10	06/26/18 04:22	5/16/18	
4-Chlorophenyl Phenyl Ether	ND U	13	0.62	10	06/26/18 04:22	5/16/18	
4-Nitrophenol	ND U	76	5.8	10	06/26/18 04:22	5/16/18	
Benzidine	ND U	76	17	10	06/26/18 04:22	5/16/18	*
Bis(2-chloroethoxy)methane	ND U	13	0.43	10	06/26/18 04:22	5/16/18	
Bis(2-chloroethyl) Ether	ND U	13	0.46	10	06/26/18 04:22	5/16/18	
Bis(2-ethylhexyl) Phthalate	**11 J**	13	0.73	10	06/26/18 04:22	5/16/18	
Butyl Benzyl Phthalate	ND U	13	0.62	10	06/26/18 04:22	5/16/18	*
Dibenzofuran	ND U	13	0.46	10	06/26/18 04:22	5/16/18	
Diethyl Phthalate	ND U	13	0.54	10	06/26/18 04:22	5/16/18	
Dimethyl Phthalate	ND U	13	0.62	10	06/26/18 04:22	5/16/18	
Di-n-butyl Phthalate	ND U	13	0.46	10	06/26/18 04:22	5/16/18	
Di-n-octyl Phthalate	ND U	13	0.92	10	06/26/18 04:22	5/16/18	
Fluoranthene	ND U	13	0.43	10	06/26/18 04:22	5/16/18	
Fluorene	ND U	13	0.50	10	06/26/18 04:22	5/16/18	
Hexachlorobenzene	ND U	13	0.58	10	06/26/18 04:22	5/16/18	
Hexachlorobutadiene	ND U	13	0.54	10	06/26/18 04:22	5/16/18	
Hexachlorocyclopentadiene	ND U	13	0.46	10	06/26/18 04:22	5/16/18	
Hexachloroethane	ND U	13	0.85	10	06/26/18 04:22	5/16/18	
Indeno(1,2,3-cd)pyrene	ND U	13	1.5	10	06/26/18 04:22	5/16/18	
Isophorone	ND U	13	0.54	10	06/26/18 04:22	5/16/18	
Naphthalene	ND U	13	0.54	10	06/26/18 04:22	5/16/18	
Nitrobenzene	ND U	13	1.0	10	06/26/18 04:22	5/16/18	
N-Nitrosodimethylamine	ND U	76	0.96	10	06/26/18 04:22	5/16/18	

Client:	Portland, City of	**Service Request:**	K1804403
Project:	Pretreatment Program CBWTP NPDES/W18E053	**Date Collected:**	05/07/18 23:59
Sample Matrix:	Soil	**Date Received:**	05/10/18 13:00
Sample Name:	W18E053-01	**Units:**	mg/Kg
Lab Code:	K1804403-001	**Basis:**	Dry

Semivolatile Organic Compounds by GC/MS

Analysis Method: 8270D
Prep Method: EPA 3541

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
N-Nitrosodi-n-propylamine	ND U	13	0.73	10	06/26/18 04:22	5/16/18	
N-Nitrosodiphenylamine	ND U	13	0.69	10	06/26/18 04:22	5/16/18	
Pentachlorophenol	ND U	76	5.0	10	06/26/18 04:22	5/16/18	
Phenanthrene	ND U	13	0.39	10	06/26/18 04:22	5/16/18	
Phenol	ND U	13	0.73	10	06/26/18 04:22	5/16/18	
Pyrene	ND U	13	0.54	10	06/26/18 04:22	5/16/18	
2,2'-Oxybis(1-chloropropane)	ND U	13	0.54	10	06/26/18 04:22	5/16/18	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
2,4,6-Tribromophenol	22	20 - 123	06/26/18 04:22	
2-Fluorobiphenyl	31	32 - 104	06/26/18 04:22	*
2-Fluorophenol	18	20 - 83	06/26/18 04:22	*
Nitrobenzene-d5	28	29 - 116	06/26/18 04:22	*
Phenol-d6	18	26 - 106	06/26/18 04:22	*
Terphenyl-d14	41	37 - 133	06/26/18 04:22	

Analytical Report

Client:	Portland, City of	**Service Request:**	K1804403
Project:	Pretreatment Program CBWTP NPDES/W18E053	**Date Collected:**	05/07/18 23:59
Sample Matrix:	Soil	**Date Received:**	05/10/18 13:00
Sample Name:	W18E053-01	**Units:**	ug/Kg
Lab Code:	K1804403-001	**Basis:**	Dry

Polynuclear Aromatic Hydrocarbons

Analysis Method: 8270D SIM
Prep Method: EPA 3546

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Naphthalene	**35**	26	2.4	1	05/25/18 10:34	5/21/18	
2-Methylnaphthalene	**41**	26	1.9	1	05/25/18 10:34	5/21/18	
Acenaphthylene	**19** J	26	1.5	1	05/25/18 10:34	5/21/18	
Acenaphthene	**48**	26	1.6	1	05/25/18 10:34	5/21/18	
Fluorene	**93**	26	3.0	1	05/25/18 10:34	5/21/18	
Phenanthrene	**540**	26	3.1	1	05/25/18 10:34	5/21/18	
Anthracene	**100**	26	1.5	1	05/25/18 10:34	5/21/18	
Fluoranthene	**730**	26	3.3	1	05/25/18 10:34	5/21/18	
Pyrene	**910**	26	1.7	1	05/25/18 10:34	5/21/18	
Benz(a)anthracene	**270**	26	1.2	1	05/25/18 10:34	5/21/18	
Chrysene	**410**	26	1.6	1	05/25/18 10:34	5/21/18	
Benzo(b)fluoranthene	**320**	26	1.5	1	05/25/18 10:34	5/21/18	
Benzo(k)fluoranthene	**110**	26	1.3	1	05/25/18 10:34	5/21/18	
Benzo(e)pyrene	**240**	26	1.5	1	05/25/18 10:34	5/21/18	
Benzo(a)pyrene	**230**	26	2.0	1	05/25/18 10:34	5/21/18	
Indeno(1,2,3-cd)pyrene	**190**	26	1.9	1	05/25/18 10:34	5/21/18	
Dibenz(a,h)anthracene	**41**	26	1.2	1	05/25/18 10:34	5/21/18	
Benzo(g,h,i)perylene	**270**	26	2.1	1	05/25/18 10:34	5/21/18	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Fluorene-d10	72	38 - 104	05/25/18 10:34	
Fluoranthene-d10	82	39 - 109	05/25/18 10:34	
p-Terphenyl-d14	88	38 - 113	05/25/18 10:34	

Semivolatile Organic Compounds by GC

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

Analytical Report

Client:	Portland, City of	**Service Request:**	K1804403
Project:	Pretreatment Program CBWTP NPDES/W18E053	**Date Collected:**	05/07/18 23:59
Sample Matrix:	Soil	**Date Received:**	05/10/18 13:00
Sample Name:	W18E053-01	**Units:**	ug/Kg
Lab Code:	K1804403-001	**Basis:**	Dry

Organochlorine Pesticides

Analysis Method: 8081B
Prep Method: EPA 3546

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
alpha-BHC	ND U	4.6	1.4	1	06/06/18 23:42	5/18/18	
beta-BHC	ND U	4.6	1.3	1	06/06/18 23:42	5/18/18	
gamma-BHC (Lindane)	ND U	4.6	1.5	1	06/06/18 23:42	5/18/18	
delta-BHC	ND U	4.6	1.3	1	06/06/18 23:42	5/18/18	
Heptachlor	ND U	4.6	1.8	1	06/06/18 23:42	5/18/18	
Aldrin	ND Ui	86	86	1	06/06/18 23:42	5/18/18	
Heptachlor Epoxide	ND U	4.6	3.1	1	06/06/18 23:42	5/18/18	
gamma-Chlordane	ND U	4.6	1.8	1	06/06/18 23:42	5/18/18	
Endosulfan I	ND U	4.6	1.7	1	06/06/18 23:42	5/18/18	
alpha-Chlordane	ND U	4.6	1.9	1	06/06/18 23:42	5/18/18	
Dieldrin	ND U	4.6	1.1	1	06/06/18 23:42	5/18/18	
4,4'-DDE	ND U	4.6	1.9	1	06/06/18 23:42	5/18/18	
Endrin	ND U	4.6	1.5	1	06/06/18 23:42	5/18/18	
Endosulfan II	ND Ui	14	14	1	06/06/18 23:42	5/18/18	
4,4'-DDD	ND U	4.6	2.8	1	06/06/18 23:42	5/18/18	
Endrin Aldehyde	ND Ui	18	18	1	06/06/18 23:42	5/18/18	
Endosulfan Sulfate	ND U	4.6	4.6	1	06/06/18 23:42	5/18/18	
4,4'-DDT	ND U	4.6	2.8	1	06/06/18 23:42	5/18/18	
Endrin Ketone	ND U	4.6	2.1	1	06/06/18 23:42	5/18/18	
Methoxychlor	ND U	4.6	3.3	1	06/06/18 23:42	5/18/18	
Toxaphene	ND U	460	160	1	06/06/18 23:42	5/18/18	
Chlordane	ND U	46	22	1	06/06/18 23:42	5/18/18	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Tetrachloro-m-xylene	72	70 - 130	06/06/18 23:42	
Decachlorobiphenyl	170	70 - 130	06/06/18 23:42	*

City of Portland
Water Pollution Control Laboratory
6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656
ORELAP Certification ID 4023

LABORATORY ANALYSIS REPORT

Project:	**Pretreatment Program CBWTP NPDES**	Client:	Industrial Source Control
Work Order:	**W18H061**	Project Mgr:	Angela Henderson
Received:	8/9/18 7:40		
Submitted By:	CBWTP		

Sample	Laboratory ID	Matrix	Type	Sample Collection Date Start	End	Qualifier
CB BPC Comp-Quarterly	W18H061-01	Biosolid	Composite, 1 week	08/01/18 00:00	08/07/18 23:59	

Analyte	Result	Units	MRL	Dil.	Batch	Prepared	Analyzed	Method	Qualifier
CB BPC Comp-Quarterly : W18H061-01									
General Chemistry									
Cyanide	**5.58**	mg/kg dry	1.32		B18H201	08/14/18	08/14/18	SM 4500-CN E	M4
Total solids	**15.0**	% W/W	0.01		B18H146	08/09/18	08/10/18	SM 2540G	
Total Metals									
Total Metals by ICPMS									
Antimony	**4.39**	mg/kg dry	0.100	20	B18H149	08/10/18	08/10/18	EPA 6020	
Arsenic	**4.11**	mg/kg dry	0.500	20	B18H149	08/10/18	08/10/18	EPA 6020	
Beryllium	**0.382**	mg/kg dry	0.100	20	B18H149	08/10/18	08/10/18	EPA 6020	
Cadmium	**2.30**	mg/kg dry	0.100	20	B18H149	08/10/18	08/10/18	EPA 6020	
Chromium	**53.3**	mg/kg dry	0.500	20	B18H149	08/10/18	08/10/18	EPA 6020	
Copper	**284**	mg/kg dry	0.200	20	B18H149	08/10/18	08/10/18	EPA 6020	
Lead	**42.1**	mg/kg dry	0.100	20	B18H149	08/10/18	08/10/18	EPA 6020	
Mercury	**0.876**	mg/kg dry	0.0100	20	B18H149	08/10/18	08/10/18	EPA 6020	
Nickel	**42.3**	mg/kg dry	0.200	20	B18H149	08/10/18	08/10/18	EPA 6020	
Selenium	**5.26**	mg/kg dry	1.00	20	B18H149	08/10/18	08/10/18	EPA 6020	
Silver	**4.25**	mg/kg dry	0.100	20	B18H149	08/10/18	08/10/18	EPA 6020	
Thallium	<0.100	mg/kg dry	0.100	20	B18H149	08/10/18	08/10/18	EPA 6020	
Zinc	**1080**	mg/kg dry	0.500	20	B18H149	08/10/18	08/10/18	EPA 6020	
Polychlorinated Biphenyls (PCBs)									
PCB Aroclors by GC-ECD									
Aroclor 1016/1242	<63.8	ug/kg dry	63.8	1	B18H131	08/09/18	08/13/18	EPA 8082	
Aroclor 1221	<128	ug/kg dry	128	1	B18H131	08/09/18	08/13/18	EPA 8082	
Aroclor 1232	<63.8	ug/kg dry	63.8	1	B18H131	08/09/18	08/13/18	EPA 8082	
Aroclor 1248	<63.8	ug/kg dry	63.8	1	B18H131	08/09/18	08/13/18	EPA 8082	
Aroclor 1254	<63.8	ug/kg dry	63.8	1	B18H131	08/09/18	08/13/18	EPA 8082	
Aroclor 1260	<63.8	ug/kg dry	63.8	1	B18H131	08/09/18	08/13/18	EPA 8082	
Surrogate	***Result***		***Expected***	***%Rec***	***Limits(%)***				
Tetrachloro-m-xylene	*49.1*	ug/kg dry	*63.8*	*77%*	*54.6-118*	*B18H131*	*08/09/18*	*08/13/18*	*EPA 8082*
Decachlorobiphenyl	*34.7*	ug/kg dry	*63.8*	*54%*	*44.5-151*	*B18H131*	*08/09/18*	*08/13/18*	*EPA 8082*

Reported: 09/17/18 08:52

The results in this report apply only to the samples analyzed. Qualifiers and case narrative comments are essential to interpretation of the analytical results. Report reproductions and/or data summaries without qualifiers and comments are incomplete.

Jennifer Shackelford

Jennifer Shackelford, Laboratory Coordinator QA/QC

Semivolatile Organic Compounds by GC/MS

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

Client:	Portland, City of	**Service Request:**	K1807485
Project:	Pretreatment Program CBWTP NPDES/W18H061	**Date Collected:**	08/07/18 00:00
Sample Matrix:	Biosolids Solids	**Date Received:**	08/09/18 13:10
Sample Name:	W18H061-01	**Units:**	mg/Kg
Lab Code:	K1807485-001	**Basis:**	Dry

Semivolatile Organic Compounds by GC/MS

Analysis Method: 8270D
Prep Method: EPA 3541

Analyte Name	Result		MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
1,2,4-Trichlorobenzene	ND	U	17	0.58	10	08/16/18 13:23	NA	
1,2-Dichlorobenzene	ND	U	17	0.94	10	08/16/18 13:23	NA	
1,2-Diphenylhydrazine	ND	U	17	0.73	10	08/16/18 13:23	NA	*
1,3-Dichlorobenzene	ND	U	17	0.94	10	08/16/18 13:23	NA	
1,4-Dichlorobenzene	ND	U	17	0.94	10	08/16/18 13:23	NA	
2,4,5-Trichlorophenol	ND	U	17	0.94	10	08/16/18 13:23	NA	
2,4,6-Trichlorophenol	ND	U	17	0.73	10	08/16/18 13:23	NA	
2,4-Dichlorophenol	ND	U	17	0.84	10	08/16/18 13:23	NA	
2,4-Dimethylphenol	ND	U	17	0.78	10	08/16/18 13:23	NA	
2,4-Dinitrophenol	ND	U	100	5.8	10	08/16/18 13:23	NA	
2,4-Dinitrotoluene	ND	U	17	0.78	10	08/16/18 13:23	NA	*
2,6-Dinitrotoluene	ND	U	17	0.84	10	08/16/18 13:23	NA	
2-Chloronaphthalene	ND	U	17	0.52	10	08/16/18 13:23	NA	
2-Chlorophenol	ND	U	17	0.52	10	08/16/18 13:23	NA	
2-Methyl-4,6-dinitrophenol	ND	U	100	7.3	10	08/16/18 13:23	NA	
2-Nitrophenol	ND	U	17	0.73	10	08/16/18 13:23	NA	
3,3'-Dichlorobenzidine	ND	U	17	1.5	10	08/16/18 13:23	NA	
4-Bromophenyl Phenyl Ether	ND	U	17	0.63	10	08/16/18 13:23	NA	
4-Chloro-3-methylphenol	ND	U	17	0.89	10	08/16/18 13:23	NA	
4-Chloroaniline	ND	U	17	0.73	10	08/16/18 13:23	NA	
4-Chlorophenyl Phenyl Ether	ND	U	17	0.84	10	08/16/18 13:23	NA	
4-Nitrophenol	ND	U	100	7.8	10	08/16/18 13:23	NA	
Benzidine	ND	U	100	22	10	08/16/18 13:23	NA	*
Bis(2-chloroethoxy)methane	ND	U	17	0.58	10	08/16/18 13:23	NA	
Bis(2-chloroethyl) Ether	ND	U	17	0.63	10	08/16/18 13:23	NA	
Bis(2-ethylhexyl) Phthalate	**18**		17	0.99	10	08/16/18 13:23	NA	*
Butyl Benzyl Phthalate	ND	U	17	0.84	10	08/16/18 13:23	NA	
Dibenzofuran	ND	U	17	0.63	10	08/16/18 13:23	NA	*
Diethyl Phthalate	ND	U	17	0.73	10	08/16/18 13:23	NA	
Dimethyl Phthalate	ND	U	17	0.84	10	08/16/18 13:23	NA	
Di-n-butyl Phthalate	**5.7**	**J**	17	0.63	10	08/16/18 13:23	NA	
Di-n-octyl Phthalate	ND	U	17	1.3	10	08/16/18 13:23	NA	
Fluoranthene	**12**	**J**	17	0.58	10	08/16/18 13:23	NA	
Fluorene	ND	U	17	0.68	10	08/16/18 13:23	NA	
Hexachlorobenzene	ND	U	17	0.78	10	08/16/18 13:23	NA	
Hexachlorobutadiene	ND	U	17	0.73	10	08/16/18 13:23	NA	
Hexachlorocyclopentadiene	ND	U	17	0.63	10	08/16/18 13:23	NA	
Hexachloroethane	ND	U	17	1.2	10	08/16/18 13:23	NA	
Indeno(1,2,3-cd)pyrene	ND	U	17	2.1	10	08/16/18 13:23	NA	
Isophorone	ND	U	17	0.73	10	08/16/18 13:23	NA	
Naphthalene	ND	U	17	0.73	10	08/16/18 13:23	NA	
Nitrobenzene	ND	U	17	1.4	10	08/16/18 13:23	NA	
N-Nitrosodimethylamine	ND	U	100	1.3	10	08/16/18 13:23	NA	

Client:	Portland, City of	**Service Request:**	K1807485
Project:	Pretreatment Program CBWTP NPDES/W18H061	**Date Collected:**	08/07/18 00:00
Sample Matrix:	Biosolids Solids	**Date Received:**	08/09/18 13:10
Sample Name:	W18H061-01	**Units:**	mg/Kg
Lab Code:	K1807485-001	**Basis:**	Dry

Semivolatile Organic Compounds by GC/MS

Analysis Method: 8270D
Prep Method: EPA 3541

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
N-Nitrosodi-n-propylamine	ND U	17	0.99	10	08/16/18 13:23	NA	
N-Nitrosodiphenylamine	ND U	17	0.94	10	08/16/18 13:23	NA	*
Pentachlorophenol	ND U	100	6.8	10	08/16/18 13:23	NA	
Phenanthrene	ND U	17	0.52	10	08/16/18 13:23	NA	
Phenol	ND U	17	0.99	10	08/16/18 13:23	NA	
Pyrene	ND U	17	0.73	10	08/16/18 13:23	NA	
2,2'-Oxybis(1-chloropropane)	ND U	17	0.73	10	08/16/18 13:23	NA	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
2,4,6-Tribromophenol	29	20 - 123	08/16/18 13:23	
2-Fluorobiphenyl	44	32 - 104	08/16/18 13:23	
2-Fluorophenol	26	20 - 83	08/16/18 13:23	
Nitrobenzene-d5	32	29 - 116	08/16/18 13:23	
Phenol-d6	28	26 - 106	08/16/18 13:23	
Terphenyl-d14	42	37 - 133	08/16/18 13:23	

Analytical Report

Client:	Portland, City of	**Service Request:**	K1807485
Project:	Pretreatment Program CBWTP NPDES/W18H061	**Date Collected:**	08/07/18 00:00
Sample Matrix:	Biosolids Solids	**Date Received:**	08/09/18 13:10
Sample Name:	W18H061-01	**Units:**	ug/Kg
Lab Code:	K1807485-001	**Basis:**	Dry

Polynuclear Aromatic Hydrocarbons

Analysis Method: 8270D SIM
Prep Method: EPA 3546

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Naphthalene	**30** **J**	35	3.3	1	08/18/18 12:41	8/13/18	
2-Methylnaphthalene	**39**	35	2.6	1	08/18/18 12:41	8/13/18	
Acenaphthylene	**20** **J**	35	2.0	1	08/18/18 12:41	8/13/18	
Acenaphthene	**47**	35	2.1	1	08/18/18 12:41	8/13/18	
Fluorene	**94**	35	4.0	1	08/18/18 12:41	8/13/18	
Phenanthrene	**640**	35	4.2	1	08/18/18 12:41	8/13/18	
Anthracene	**110**	35	2.1	1	08/18/18 12:41	8/13/18	
Fluoranthene	**750**	35	4.4	1	08/18/18 12:41	8/13/18	
Pyrene	**960**	35	2.3	1	08/18/18 12:41	8/13/18	
Benz(a)anthracene	**290**	35	1.7	1	08/18/18 12:41	8/13/18	
Chrysene	**430**	35	2.2	1	08/18/18 12:41	8/13/18	
Benzo(b)fluoranthene	**310**	35	2.1	1	08/18/18 12:41	8/13/18	
Benzo(k)fluoranthene	**120**	35	1.7	1	08/18/18 12:41	8/13/18	
Benzo(e)pyrene	**210**	35	2.1	1	08/18/18 12:41	8/13/18	
Benzo(a)pyrene	**250**	35	2.7	1	08/18/18 12:41	8/13/18	
Indeno(1,2,3-cd)pyrene	**200**	35	2.6	1	08/18/18 12:41	8/13/18	
Dibenz(a,h)anthracene	**41**	35	1.7	1	08/18/18 12:41	8/13/18	
Benzo(g,h,i)perylene	**250**	35	2.8	1	08/18/18 12:41	8/13/18	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Fluorene-d10	72	38 - 104	08/18/18 12:41	
Fluoranthene-d10	82	39 - 109	08/18/18 12:41	
p-Terphenyl-d14	90	38 - 113	08/18/18 12:41	

Semivolatile Organic Compounds by GC

ALS Environmental—Jacksonville Laboratory
9143 Philips Highway, Suite 200, Jacksonville, FL 32256
Phone (904)739-2277 Fax (904)739-2011
www.alsglobal.com

Analytical Report

Client:	Portland, City of	**Service Request:**	K1807485
Project:	Pretreatment Program CBWTP NPDES/W18H061	**Date Collected:**	NA
Sample Matrix:	Biosolids Solids	**Date Received:**	NA
Sample Name:	Batch QC	**Units:**	ug/Kg
Lab Code:	J1805761-008	**Basis:**	Dry

Organochlorine Pesticides by Gas Chromatography

Analysis Method: 8081A
Prep Method: EPA 3546

Analyte Name	Result	PQL	MDL	Dil.	Date Analyzed	Date Extracted	Q
4,4'-DDD	0.705 U	1.78	0.705	1	09/04/18 19:04	8/21/18	
4,4'-DDE	0.777 U	1.78	0.777	1	09/04/18 19:04	8/21/18	
4,4'-DDT	1.17 U	1.78	1.17	1	09/04/18 19:04	8/21/18	
Aldrin	0.779 U	1.78	0.779	1	09/04/18 19:04	8/21/18	
alpha-BHC	0.544 U	1.78	0.544	1	09/04/18 19:04	8/21/18	
alpha-Chlordane	0.578 U	1.78	0.578	1	09/04/18 19:04	8/21/18	
beta-BHC	0.572 U	1.78	0.572	1	09/04/18 19:04	8/21/18	
Chlordane	11.2 U	35.5	11.2	1	09/04/18 19:04	8/21/18	
delta-BHC	0.572 U	1.78	0.572	1	09/04/18 19:04	8/21/18	
Dieldrin	0.933 U	1.78	0.933	1	09/04/18 19:04	8/21/18	
Endosulfan I	0.769 U	1.78	0.769	1	09/04/18 19:04	8/21/18	
Endosulfan II	1.10 U	1.78	1.10	1	09/04/18 19:04	8/21/18	
Endosulfan Sulfate	1.05 U	1.78	1.05	1	09/04/18 19:04	8/21/18	
Endrin	1.30 U	1.78	1.30	1	09/04/18 19:04	8/21/18	
Endrin Aldehyde	1.05 U	1.78	1.05	1	09/04/18 19:04	8/21/18	
Endrin Ketone	0.838 U	1.78	0.838	1	09/04/18 19:04	8/21/18	
gamma-BHC (Lindane)	1.12 U	1.78	1.12	1	09/04/18 19:04	8/21/18	
gamma-Chlordane	0.572 U	1.78	0.572	1	09/04/18 19:04	8/21/18	
Heptachlor	1.12 U	1.78	1.12	1	09/04/18 19:04	8/21/18	
Heptachlor Epoxide	0.892 U	1.78	0.892	1	09/04/18 19:04	8/21/18	
Methoxychlor	0.757 U	3.55	0.757	1	09/04/18 19:04	8/21/18	
Toxaphene	13.5 U	35.5	13.5	1	09/04/18 19:04	8/21/18	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Decachlorobiphenyl	75	32 - 170	09/04/18 19:04	
Tetrachloro-m-xylene	90	10 - 147	09/04/18 00:00	

Client:	Portland, City of	**Service Request:**	K1807485
Project:	Pretreatment Program CBWTP NPDES/W18H061	**Date Collected:**	08/07/18 00:00
Sample Matrix:	Biosolids Solids	**Date Received:**	08/09/18 13:10
Sample Name:	W18H061-01	**Units:**	ug/Kg
Lab Code:	K1807485-001	**Basis:**	Dry

Organochlorine Pesticides by Gas Chromatography

Analysis Method: 8081A
Prep Method: EPA 3546

Analyte Name	Result	PQL	MDL	Dil.	Date Analyzed	Date Extracted	Q
4,4'-DDD	13.8 U	34.6	13.8	1	08/28/18 03:29	8/21/18	
4,4'-DDE	15.2 U	34.6	15.2	1	08/28/18 03:29	8/21/18	
4,4'-DDT	22.8 U	34.6	22.8	1	08/28/18 03:29	8/21/18	
Aldrin	15.2 U	34.6	15.2	1	08/28/18 03:29	8/21/18	
alpha-BHC	10.6 U	34.6	10.6	1	08/28/18 03:29	8/21/18	
alpha-Chlordane	11.3 U	34.6	11.3	1	08/28/18 03:29	8/21/18	
beta-BHC	11.2 U	34.6	11.2	1	08/28/18 03:29	8/21/18	
Chlordane	218 U	691	218	1	08/28/18 03:29	8/21/18	
delta-BHC	11.2 U	34.6	11.2	1	08/28/18 03:29	8/21/18	
Dieldrin	18.2 U	34.6	18.2	1	08/28/18 03:29	8/21/18	
Endosulfan I	15.0 U	34.6	15.0	1	08/28/18 03:29	8/21/18	
Endosulfan II	21.3 U	34.6	21.3	1	08/28/18 03:29	8/21/18	
Endosulfan Sulfate	20.3 U	34.6	20.3	1	08/28/18 03:29	8/21/18	
Endrin	25.3 U	34.6	25.3	1	08/28/18 03:29	8/21/18	
Endrin Aldehyde	20.3 U	34.6	20.3	1	08/28/18 03:29	8/21/18	
Endrin Ketone	16.4 U	34.6	16.4	1	08/28/18 03:29	8/21/18	
gamma-BHC (Lindane)	21.8 U	34.6	21.8	1	08/28/18 03:29	8/21/18	
gamma-Chlordane	11.2 U	34.6	11.2	1	08/28/18 03:29	8/21/18	
Heptachlor	21.8 U	34.6	21.8	1	08/28/18 03:29	8/21/18	
Heptachlor Epoxide	17.4 U	34.6	17.4	1	08/28/18 03:29	8/21/18	
Methoxychlor	14.8 U	69.1	14.8	1	08/28/18 03:29	8/21/18	
Toxaphene	261 U	691	261	1	08/28/18 03:29	8/21/18	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Decachlorobiphenyl	54	32 - 170	08/28/18 00:00	
Tetrachloro-m-xylene	0 *	10 - 147	08/28/18 03:29	*

City of Portland
Water Pollution Control Laboratory
6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656
ORELAP Certification ID 4023

LABORATORY ANALYSIS REPORT

Project:	**Pretreatment Program CBWTP NPDES**	Client:	Industrial Source Control
Work Order:	**W18K061**	Project Mgr:	Angela Henderson
Received:	11/8/18 8:35		
Submitted By:	CBWTP		

Sample	Laboratory ID	Matrix	Type	Sample Collection Date Start	End	Qualifier
CB BPC Comp-Quarterly	W18K061-01	Biosolid	Composite, 1 week	11/01/18 00:00	11/07/18 23:59	
CB BPC_SYN Comp-Quarterly	W18K061-02	Biosolid	Composite, 1 week	11/01/18 00:00	11/07/18 23:59	

Analyte	Result	Units	MRL	Dil.	Batch	Prepared	Analyzed	Method	Qualifier
General Chemistry									
Total Cyanide									
CB BPC Comp-Quarterly : W18K061-01									
Cyanide	**4.74**	mg/kg dry	0.59		B18K165	11/13/18	11/13/18	SM 4500-CN E	
CB BPC_SYN Comp-Quarterly : W18K061-02									
Cyanide	**6.94**	mg/kg dry	4.23		B18K165	11/13/18	11/13/18	SM 4500-CN E	
Total Solids									
CB BPC Comp-Quarterly : W18K061-01									
Total solids	**16.2**	% W/W	0.01		B18K122	11/09/18	11/10/18	SM 2540G	
CB BPC_SYN Comp-Quarterly : W18K061-02									
Total solids	**18.9**	% W/W	0.01		B18K122	11/09/18	11/10/18	SM 2540G	
Total Metals									
Total Metals by ICPMS									
CB BPC Comp-Quarterly : W18K061-01									
Antimony	**4.54**	mg/kg dry	0.337	20	B18K104	11/08/18	11/08/18	EPA 6020	M4
Arsenic	**4.68**	mg/kg dry	0.055	20	B18K104	11/08/18	11/08/18	EPA 6020	
Beryllium	**0.411**	mg/kg dry	0.337	20	B18K104	11/08/18	11/08/18	EPA 6020	
Cadmium	**2.23**	mg/kg dry	0.337	20	B18K104	11/08/18	11/08/18	EPA 6020	
Chromium	**51.2**	mg/kg dry	0.675	20	B18K104	11/08/18	11/08/18	EPA 6020	
Copper	**308**	mg/kg dry	0.437	20	B18K104	11/08/18	11/08/18	EPA 6020	
Lead	**60.7**	mg/kg dry	0.055	20	B18K104	11/08/18	11/08/18	EPA 6020	
Mercury	**0.689**	mg/kg dry	0.00546	20	B18K104	11/08/18	11/08/18	EPA 6020	
Nickel	**43.5**	mg/kg dry	0.437	20	B18K104	11/08/18	11/08/18	EPA 6020	
Selenium	**4.52**	mg/kg dry	1.09	20	B18K104	11/08/18	11/08/18	EPA 6020	
Silver	**6.88**	mg/kg dry	0.337	20	B18K104	11/08/18	11/08/18	EPA 6020	
Thallium	<0.337	mg/kg dry	0.337	20	B18K104	11/08/18	11/08/18	EPA 6020	
Zinc	**1160**	mg/kg dry	1.09	20	B18K104	11/08/18	11/08/18	EPA 6020	

Reported: 01/10/19 13:06

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Jennifer Shackelford

Jennifer Shackelford, Laboratory Coordinator QA/QC

City of Portland
Water Pollution Control Laboratory
6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656
ORELAP Certification ID 4023

Project:	**Pretreatment Program CBWTP NPDES**	Client:	Industrial Source Control
Work Order:	**W18K061**	Received:	11/08/18 08:35

Analyte	Result	Units	MRL	Dil.	Batch	Prepared	Analyzed	Method	Qualifier
Total Metals									
Total Metals by ICPMS									
CB BPC_SYN Comp-Quarterly : W18K061-02									
Antimony	**3.91**	mg/kg dry	0.306	20	B18K104	11/08/18	11/08/18	EPA 6020	M4
Arsenic	**4.87**	mg/kg dry	0.058	20	B18K104	11/08/18	11/08/18	EPA 6020	
Beryllium	**0.346**	mg/kg dry	0.306	20	B18K104	11/08/18	11/08/18	EPA 6020	
Cadmium	**2.41**	mg/kg dry	0.306	20	B18K104	11/08/18	11/08/18	EPA 6020	
Chromium	**54.7**	mg/kg dry	0.612	20	B18K104	11/08/18	11/08/18	EPA 6020	
Copper	**334**	mg/kg dry	0.462	20	B18K104	11/08/18	11/08/18	EPA 6020	
Lead	**59.3**	mg/kg dry	0.058	20	B18K104	11/08/18	11/08/18	EPA 6020	
Mercury	**0.590**	mg/kg dry	0.00578	20	B18K104	11/08/18	11/08/18	EPA 6020	
Nickel	**40.8**	mg/kg dry	0.462	20	B18K104	11/08/18	11/08/18	EPA 6020	
Selenium	**4.98**	mg/kg dry	1.16	20	B18K104	11/08/18	11/08/18	EPA 6020	
Silver	**5.69**	mg/kg dry	0.306	20	B18K104	11/08/18	11/08/18	EPA 6020	
Thallium	<0.306	mg/kg dry	0.306	20	B18K104	11/08/18	11/08/18	EPA 6020	
Zinc	**1080**	mg/kg dry	1.16	20	B18K104	11/08/18	11/08/18	EPA 6020	
Polychlorinated Biphenyls (PCBs)									
PCB Aroclors by GC-ECD									
CB BPC Comp-Quarterly : W18K061-01									
Aroclor 1016/1242	<56.9	ug/kg dry	56.9	1	B18K169	11/14/18	11/15/18	EPA 8082	
Aroclor 1221	<114	ug/kg dry	114	1	B18K169	11/14/18	11/15/18	EPA 8082	
Aroclor 1232	<56.9	ug/kg dry	56.9	1	B18K169	11/14/18	11/15/18	EPA 8082	
Aroclor 1248	<56.9	ug/kg dry	56.9	1	B18K169	11/14/18	11/15/18	EPA 8082	
Aroclor 1254	**57.9**	ug/kg dry	56.9	1	B18K169	11/14/18	11/15/18	EPA 8082	
Aroclor 1260	<56.9	ug/kg dry	56.9	1	B18K169	11/14/18	11/15/18	EPA 8082	
Surrogate	***Result***		***Expected***	***%Rec***	***Limits(%)***				
Tetrachloro-m-xylene	*43.6*	ug/kg dry	*56.9*	*77%*	*54.6-118*	*B18K169*	*11/14/18*	*11/15/18*	*EPA 8082*	
Decachlorobiphenyl	*18.6*	ug/kg dry	*56.9*	*33%*	*44.5-151*	*B18K169*	*11/14/18*	*11/15/18*	*EPA 8082*	*SU1*
CB BPC_SYN Comp-Quarterly : W18K061-02									
Aroclor 1016/1242	<52.2	ug/kg dry	52.2	1	B18K169	11/14/18	11/15/18	EPA 8082	
Aroclor 1221	<104	ug/kg dry	104	1	B18K169	11/14/18	11/15/18	EPA 8082	
Aroclor 1232	<52.2	ug/kg dry	52.2	1	B18K169	11/14/18	11/15/18	EPA 8082	
Aroclor 1248	<52.2	ug/kg dry	52.2	1	B18K169	11/14/18	11/15/18	EPA 8082	
Aroclor 1254	**67.4**	ug/kg dry	52.2	1	B18K169	11/14/18	11/15/18	EPA 8082	
Aroclor 1260	<52.2	ug/kg dry	52.2	1	B18K169	11/14/18	11/15/18	EPA 8082	
Surrogate	***Result***		***Expected***	***%Rec***	***Limits(%)***				
Tetrachloro-m-xylene	*38.1*	ug/kg dry	*52.2*	*73%*	*54.6-118*	*B18K169*	*11/14/18*	*11/15/18*	*EPA 8082*	
Decachlorobiphenyl	*29.7*	ug/kg dry	*52.2*	*57%*	*44.5-151*	*B18K169*	*11/14/18*	*11/15/18*	*EPA 8082*	

Reported: 01/10/19 13:06

Jennifer Shackelford

Jennifer Shackelford, Laboratory Coordinator QA/QC

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Semivolatile Organic Compounds by GC/MS

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

Client:	Portland, City of	**Service Request:**	K1811030
Project:	Pretreatment Program CBWTP NPDES/W18K061	**Date Collected:**	11/07/18 23:59
Sample Matrix:	Biosolids Solids	**Date Received:**	11/09/18 13:40
Sample Name:	W18K061-01	**Units:**	mg/Kg
Lab Code:	K1811030-001	**Basis:**	Dry

Semivolatile Organic Compounds by GC/MS

Analysis Method: 8270D
Prep Method: EPA 3541

Analyte Name	Result		MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
1,2,4-Trichlorobenzene	ND	U	31	1.1	5	12/11/18 11:44	11/12/18	
1,2-Dichlorobenzene	ND	U	31	1.8	5	12/11/18 11:44	11/12/18	
1,2-Diphenylhydrazine	ND	U	31	1.4	5	12/11/18 11:44	11/12/18	
1,3-Dichlorobenzene	ND	U	31	1.8	5	12/11/18 11:44	11/12/18	
1,4-Dichlorobenzene	ND	U	31	1.8	5	12/11/18 11:44	11/12/18	
2,4,5-Trichlorophenol	ND	U	31	1.8	5	12/11/18 11:44	11/12/18	
2,4,6-Trichlorophenol	ND	U	32	1.4	5	12/11/18 11:44	11/12/18	
2,4-Dichlorophenol	ND	U	31	1.6	5	12/11/18 11:44	11/12/18	
2,4-Dimethylphenol	ND	U	31	1.5	5	12/11/18 11:44	11/12/18	
2,4-Dinitrophenol	ND	U	190	11	5	12/11/18 11:44	11/12/18	
2,4-Dinitrotoluene	ND	U	31	1.5	5	12/11/18 11:44	11/12/18	
2,6-Dinitrotoluene	ND	U	31	1.6	5	12/11/18 11:44	11/12/18	
2-Chloronaphthalene	ND	U	31	0.95	5	12/11/18 11:44	11/12/18	
2-Chlorophenol	ND	U	31	0.94	5	12/11/18 11:44	11/12/18	
2-Methyl-4,6-dinitrophenol	ND	U	190	14	5	12/11/18 11:44	11/12/18	
2-Nitrophenol	ND	U	32	1.4	5	12/11/18 11:44	11/12/18	
3,3'-Dichlorobenzidine	ND	U	31	2.6	5	12/11/18 11:44	11/12/18	*
4-Bromophenyl Phenyl Ether	ND	U	31	1.2	5	12/11/18 11:44	11/12/18	
4-Chloro-3-methylphenol	ND	U	31	1.7	5	12/11/18 11:44	11/12/18	
4-Chloroaniline	ND	U	31	1.4	5	12/11/18 11:44	11/12/18	
4-Chlorophenyl Phenyl Ether	ND	U	31	1.6	5	12/11/18 11:44	11/12/18	
4-Nitrophenol	ND	U	190	15	5	12/11/18 11:44	11/12/18	
Benzidine	ND	U	190	40	5	12/11/18 11:44	11/12/18	*
Bis(2-chloroethoxy)methane	ND	U	31	1.1	5	12/11/18 11:44	11/12/18	
Bis(2-chloroethyl) Ether	ND	U	31	1.2	5	12/11/18 11:44	11/12/18	
Bis(2-ethylhexyl) Phthalate	**27**	**J**	31	1.9	5	12/11/18 11:44	11/12/18	
Butyl Benzyl Phthalate	ND	U	31	1.6	5	12/11/18 11:44	11/12/18	
Dibenzofuran	ND	U	31	1.2	5	12/11/18 11:44	11/12/18	
Diethyl Phthalate	ND	U	31	1.4	5	12/11/18 11:44	11/12/18	
Dimethyl Phthalate	ND	U	31	1.6	5	12/11/18 11:44	11/12/18	
Di-n-butyl Phthalate	ND	U	31	1.2	5	12/11/18 11:44	11/12/18	
Di-n-octyl Phthalate	ND	U	32	2.3	5	12/11/18 11:44	11/12/18	
Fluoranthene	**6.3**	**J**	31	1.1	5	12/11/18 11:44	11/12/18	
Fluorene	ND	U	31	1.3	5	12/11/18 11:44	11/12/18	
Hexachlorobenzene	ND	U	31	1.5	5	12/11/18 11:44	11/12/18	*
Hexachlorobutadiene	ND	U	31	1.4	5	12/11/18 11:44	11/12/18	
Hexachlorocyclopentadiene	ND	U	32	1.2	5	12/11/18 11:44	11/12/18	*
Hexachloroethane	ND	U	31	2.1	5	12/11/18 11:44	11/12/18	
Indeno(1,2,3-cd)pyrene	ND	U	32	3.7	5	12/11/18 11:44	11/12/18	
Isophorone	ND	U	31	1.4	5	12/11/18 11:44	11/12/18	
Naphthalene	ND	U	31	1.4	5	12/11/18 11:44	11/12/18	
Nitrobenzene	ND	U	31	2.5	5	12/11/18 11:44	11/12/18	
N-Nitrosodimethylamine	ND	U	190	2.4	5	12/11/18 11:44	11/12/18	

Analytical Report

Client:	Portland, City of	**Service Request:**	K1811030
Project:	Pretreatment Program CBWTP NPDES/W18K061	**Date Collected:**	11/07/18 23:59
Sample Matrix:	Biosolids Solids	**Date Received:**	11/09/18 13:40
Sample Name:	W18K061-01	**Units:**	mg/Kg
Lab Code:	K1811030-001	**Basis:**	Dry

Semivolatile Organic Compounds by GC/MS

Analysis Method: 8270D
Prep Method: EPA 3541

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
N-Nitrosodi-n-propylamine	ND U	31	1.9	5	12/11/18 11:44	11/12/18	
N-Nitrosodiphenylamine	ND U	31	1.8	5	12/11/18 11:44	11/12/18	
Pentachlorophenol	ND U	190	13	5	12/11/18 11:44	11/12/18	*
Phenanthrene	ND U	31	0.95	5	12/11/18 11:44	11/12/18	
Phenol	ND U	31	1.9	5	12/11/18 11:44	11/12/18	
Pyrene	ND U	31	1.4	5	12/11/18 11:44	11/12/18	
2,2'-Oxybis(1-chloropropane)	ND U	31	1.4	5	12/11/18 11:44	11/12/18	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
2,4,6-Tribromophenol	53	20 - 123	12/11/18 11:44	
2-Fluorobiphenyl	48	32 - 104	12/11/18 11:44	
2-Fluorophenol	38	20 - 83	12/11/18 11:44	
Nitrobenzene-d5	49	29 - 116	12/11/18 11:44	
Phenol-d6	45	26 - 106	12/11/18 11:44	
Terphenyl-d14	66	37 - 133	12/11/18 11:44	

Client:	Portland, City of	**Service Request:**	K1811030
Project:	Pretreatment Program CBWTP NPDES/W18K061	**Date Collected:**	11/07/18 23:59
Sample Matrix:	Biosolids Solids	**Date Received:**	11/09/18 13:40
Sample Name:	W18K061-02	**Units:**	mg/Kg
Lab Code:	K1811030-002	**Basis:**	Dry

Semivolatile Organic Compounds by GC/MS

Analysis Method: 8270D
Prep Method: EPA 3541

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
1,2,4-Trichlorobenzene	ND U	28	0.93	5	12/11/18 12:25	11/12/18	
1,2-Dichlorobenzene	ND U	28	1.6	5	12/11/18 12:25	11/12/18	
1,2-Diphenylhydrazine	ND U	28	1.2	5	12/11/18 12:25	11/12/18	
1,3-Dichlorobenzene	ND U	28	1.6	5	12/11/18 12:25	11/12/18	
1,4-Dichlorobenzene	ND U	28	1.6	5	12/11/18 12:25	11/12/18	
2,4,5-Trichlorophenol	ND U	28	1.6	5	12/11/18 12:25	11/12/18	
2,4,6-Trichlorophenol	ND U	28	1.2	5	12/11/18 12:25	11/12/18	
2,4-Dichlorophenol	ND U	28	1.4	5	12/11/18 12:25	11/12/18	
2,4-Dimethylphenol	ND U	28	1.3	5	12/11/18 12:25	11/12/18	
2,4-Dinitrophenol	ND U	170	9.3	5	12/11/18 12:25	11/12/18	
2,4-Dinitrotoluene	ND U	28	1.3	5	12/11/18 12:25	11/12/18	
2,6-Dinitrotoluene	ND U	28	1.4	5	12/11/18 12:25	11/12/18	
2-Chloronaphthalene	ND U	28	0.85	5	12/11/18 12:25	11/12/18	
2-Chlorophenol	ND U	28	0.84	5	12/11/18 12:25	11/12/18	
2-Methyl-4,6-dinitrophenol	ND U	170	12	5	12/11/18 12:25	11/12/18	
2-Nitrophenol	ND U	28	1.2	5	12/11/18 12:25	11/12/18	
3,3'-Dichlorobenzidine	ND U	28	2.3	5	12/11/18 12:25	11/12/18	*
4-Bromophenyl Phenyl Ether	ND U	28	1.1	5	12/11/18 12:25	11/12/18	
4-Chloro-3-methylphenol	ND U	28	1.5	5	12/11/18 12:25	11/12/18	
4-Chloroaniline	ND U	28	1.2	5	12/11/18 12:25	11/12/18	
4-Chlorophenyl Phenyl Ether	ND U	28	1.4	5	12/11/18 12:25	11/12/18	
4-Nitrophenol	ND U	170	13	5	12/11/18 12:25	11/12/18	
Benzidine	ND U	170	36	5	12/11/18 12:25	11/12/18	*
Bis(2-chloroethoxy)methane	ND U	28	0.93	5	12/11/18 12:25	11/12/18	
Bis(2-chloroethyl) Ether	ND U	28	1.1	5	12/11/18 12:25	11/12/18	
Bis(2-ethylhexyl) Phthalate	**15 J**	28	1.6	5	12/11/18 12:25	11/12/18	
Butyl Benzyl Phthalate	ND U	28	1.4	5	12/11/18 12:25	11/12/18	
Dibenzofuran	ND U	28	1.1	5	12/11/18 12:25	11/12/18	
Diethyl Phthalate	ND U	28	1.2	5	12/11/18 12:25	11/12/18	
Dimethyl Phthalate	ND U	28	1.4	5	12/11/18 12:25	11/12/18	
Di-n-butyl Phthalate	ND U	28	1.1	5	12/11/18 12:25	11/12/18	
Di-n-octyl Phthalate	ND U	28	2.1	5	12/11/18 12:25	11/12/18	
Fluoranthene	ND U	28	0.93	5	12/11/18 12:25	11/12/18	
Fluorene	ND U	28	1.1	5	12/11/18 12:25	11/12/18	
Hexachlorobenzene	ND U	28	1.3	5	12/11/18 12:25	11/12/18	*
Hexachlorobutadiene	ND U	28	1.2	5	12/11/18 12:25	11/12/18	
Hexachlorocyclopentadiene	ND U	28	1.1	5	12/11/18 12:25	11/12/18	*
Hexachloroethane	ND U	28	1.9	5	12/11/18 12:25	11/12/18	
Indeno(1,2,3-cd)pyrene	ND U	28	3.3	5	12/11/18 12:25	11/12/18	
Isophorone	ND U	28	1.2	5	12/11/18 12:25	11/12/18	
Naphthalene	ND U	28	1.2	5	12/11/18 12:25	11/12/18	
Nitrobenzene	ND U	28	2.2	5	12/11/18 12:25	11/12/18	
N-Nitrosodimethylamine	ND U	170	2.2	5	12/11/18 12:25	11/12/18	

Analytical Report

Client:	Portland, City of	**Service Request:**	K1811030
Project:	Pretreatment Program CBWTP NPDES/W18K061	**Date Collected:**	11/07/18 23:59
Sample Matrix:	Biosolids Solids	**Date Received:**	11/09/18 13:40
Sample Name:	W18K061-02	**Units:**	mg/Kg
Lab Code:	K1811030-002	**Basis:**	Dry

Semivolatile Organic Compounds by GC/MS

Analysis Method: 8270D
Prep Method: EPA 3541

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
N-Nitrosodi-n-propylamine	ND U	28	1.6	5	12/11/18 12:25	11/12/18	
N-Nitrosodiphenylamine	ND U	28	1.6	5	12/11/18 12:25	11/12/18	
Pentachlorophenol	ND U	170	11	5	12/11/18 12:25	11/12/18	*
Phenanthrene	ND U	28	0.85	5	12/11/18 12:25	11/12/18	
Phenol	ND U	28	1.6	5	12/11/18 12:25	11/12/18	
Pyrene	ND U	28	1.2	5	12/11/18 12:25	11/12/18	
2,2'-Oxybis(1-chloropropane)	ND U	28	1.2	5	12/11/18 12:25	11/12/18	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
2,4,6-Tribromophenol	20	20 - 123	12/11/18 12:25	
2-Fluorobiphenyl	20	32 - 104	12/11/18 12:25	*
2-Fluorophenol	19	20 - 83	12/11/18 12:25	*
Nitrobenzene-d5	29	29 - 116	12/11/18 12:25	
Phenol-d6	17	26 - 106	12/11/18 12:25	*
Terphenyl-d14	32	37 - 133	12/11/18 12:25	*

Analytical Report

Client:	Portland, City of	**Service Request:**	K1811030
Project:	Pretreatment Program CBWTP NPDES/W18K061	**Date Collected:**	11/07/18 23:59
Sample Matrix:	Biosolids Solids	**Date Received:**	11/09/18 13:40
Sample Name:	W18K061-01	**Units:**	ug/Kg
Lab Code:	K1811030-001	**Basis:**	Dry

Polynuclear Aromatic Hydrocarbons

Analysis Method: 8270D SIM
Prep Method: EPA 3546

Analyte Name	Result		MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Naphthalene	**91**		32	3.0	1	12/10/18 07:15	11/14/18	
2-Methylnaphthalene	**120**		32	2.4	1	12/10/18 07:15	11/14/18	
Acenaphthylene	**54**	**X**	32	1.8	1	12/10/18 07:15	11/14/18	
Acenaphthene	**110**		32	1.9	1	12/10/18 07:15	11/14/18	
Fluorene	**230**		32	3.6	1	12/10/18 07:15	11/14/18	
Phenanthrene	**890**		32	3.7	1	12/10/18 07:15	11/14/18	
Anthracene	**180**		32	1.9	1	12/10/18 07:15	11/14/18	
Fluoranthene	**1000**		32	4.0	1	12/10/18 07:15	11/14/18	
Pyrene	**1600**		32	2.0	1	12/10/18 07:15	11/14/18	
Benz(a)anthracene	**370**		32	1.5	1	12/10/18 07:15	11/14/18	
Chrysene	**510**		32	2.0	1	12/10/18 07:15	11/14/18	
Benzo(b)fluoranthene	**510**		32	1.9	1	12/10/18 07:15	11/14/18	
Benzo(k)fluoranthene	**170**		32	1.5	1	12/10/18 07:15	11/14/18	
Benzo(e)pyrene	**280**		32	1.9	1	12/10/18 07:15	11/14/18	
Benzo(a)pyrene	**360**		32	2.4	1	12/10/18 07:15	11/14/18	
Indeno(1,2,3-cd)pyrene	**280**		32	2.3	1	12/10/18 07:15	11/14/18	
Dibenz(a,h)anthracene	**52**		32	1.5	1	12/10/18 07:15	11/14/18	
Benzo(g,h,i)perylene	**310**		32	2.5	1	12/10/18 07:15	11/14/18	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Fluorene-d10	74	38 - 104	12/10/18 07:15	
Fluoranthene-d10	75	39 - 109	12/10/18 07:15	
p-Terphenyl-d14	79	38 - 113	12/10/18 07:15	

Analytical Report

Client:	Portland, City of	**Service Request:**	K1811030
Project:	Pretreatment Program CBWTP NPDES/W18K061	**Date Collected:**	11/07/18 23:59
Sample Matrix:	Biosolids Solids	**Date Received:**	11/09/18 13:40
Sample Name:	W18K061-02	**Units:**	ug/Kg
Lab Code:	K1811030-002	**Basis:**	Dry

Polynuclear Aromatic Hydrocarbons

Analysis Method: 8270D SIM
Prep Method: EPA 3546

Analyte Name	Result		MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Naphthalene	**79**	**X**	28	2.7	1	12/10/18 07:41	11/14/18	
2-Methylnaphthalene	**130**	**X**	28	2.1	1	12/10/18 07:41	11/14/18	
Acenaphthylene	**59**	**X**	28	1.6	1	12/10/18 07:41	11/14/18	
Acenaphthene	**78**		28	1.7	1	12/10/18 07:41	11/14/18	
Fluorene	**140**	**X**	28	3.2	1	12/10/18 07:41	11/14/18	
Phenanthrene	**700**		28	3.3	1	12/10/18 07:41	11/14/18	
Anthracene	**140**		28	1.7	1	12/10/18 07:41	11/14/18	
Fluoranthene	**910**		28	3.6	1	12/10/18 07:41	11/14/18	
Pyrene	**1400**		28	1.8	1	12/10/18 07:41	11/14/18	
Benz(a)anthracene	**290**		28	1.3	1	12/10/18 07:41	11/14/18	
Chrysene	**440**		28	1.8	1	12/10/18 07:41	11/14/18	
Benzo(b)fluoranthene	**400**		28	1.7	1	12/10/18 07:41	11/14/18	
Benzo(k)fluoranthene	**130**		28	1.4	1	12/10/18 07:41	11/14/18	
Benzo(e)pyrene	**240**		28	1.7	1	12/10/18 07:41	11/14/18	
Benzo(a)pyrene	**250**		28	2.2	1	12/10/18 07:41	11/14/18	
Indeno(1,2,3-cd)pyrene	**200**		28	2.1	1	12/10/18 07:41	11/14/18	
Dibenz(a,h)anthracene	**39**		28	1.3	1	12/10/18 07:41	11/14/18	
Benzo(g,h,i)perylene	**270**		28	2.3	1	12/10/18 07:41	11/14/18	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Fluorene-d10	73	38 - 104	12/10/18 07:41	
Fluoranthene-d10	86	39 - 109	12/10/18 07:41	
p-Terphenyl-d14	88	38 - 113	12/10/18 07:41	

Semivolatile Organic Compounds by GC

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

Client:	Portland, City of	**Service Request:**	K1811030
Project:	Pretreatment Program CBWTP NPDES/W18K061	**Date Collected:**	11/07/18 23:59
Sample Matrix:	Biosolids Solids	**Date Received:**	11/09/18 13:40
Sample Name:	W18K061-01	**Units:**	ug/Kg
Lab Code:	K1811030-001	**Basis:**	Dry

Organochlorine Pesticides

Analysis Method: 8081B
Prep Method: EPA 3546

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
alpha-BHC	ND U	6.0	1.8	1	12/11/18 23:33	11/13/18	
beta-BHC	ND Ui	81	81	1	12/11/18 23:33	11/13/18	
gamma-BHC (Lindane)	ND U	6.0	1.9	1	12/11/18 23:33	11/13/18	
delta-BHC	ND U	6.0	1.7	1	12/11/18 23:33	11/13/18	
Heptachlor	ND Ui	17	17	1	12/11/18 23:33	11/13/18	
Aldrin	ND U	6.0	3.6	1	12/11/18 23:33	11/13/18	
Heptachlor Epoxide	ND U	6.0	4.0	1	12/11/18 23:33	11/13/18	
gamma-Chlordane	ND U	6.0	2.3	1	12/11/18 23:33	11/13/18	
Endosulfan I	ND U	6.0	2.2	1	12/11/18 23:33	11/13/18	
alpha-Chlordane	ND U	6.0	2.5	1	12/11/18 23:33	11/13/18	
Dieldrin	ND U	6.0	1.4	1	12/11/18 23:33	11/13/18	
4,4'-DDE	ND U	6.0	2.4	1	12/11/18 23:33	11/13/18	
Endrin	ND U	6.0	2.0	1	12/11/18 23:33	11/13/18	
Endosulfan II	ND U	6.0	4.2	1	12/11/18 23:33	11/13/18	
4,4'-DDD	ND Ui	23	23	1	12/11/18 23:33	11/13/18	
Endrin Aldehyde	ND U	6.0	5.3	1	12/11/18 23:33	11/13/18	
Endosulfan Sulfate	ND U	6.0	5.9	1	12/11/18 23:33	11/13/18	
4,4'-DDT	ND Ui	35	35	1	12/11/18 23:33	11/13/18	
Endrin Ketone	ND Ui	29	29	1	12/11/18 23:33	11/13/18	
Methoxychlor	ND U	6.0	4.3	1	12/11/18 23:33	11/13/18	
Toxaphene	ND U	600	210	1	12/11/18 23:33	11/13/18	
Chlordane	ND U	60	29	1	12/11/18 23:33	11/13/18	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Tetrachloro-m-xylene	91	70 - 130	12/11/18 23:33	
Decachlorobiphenyl	111	70 - 130	12/11/18 23:33	

Analytical Report

Client:	Portland, City of	**Service Request:**	K1811030
Project:	Pretreatment Program CBWTP NPDES/W18K061	**Date Collected:**	11/07/18 23:59
Sample Matrix:	Biosolids Solids	**Date Received:**	11/09/18 13:40
Sample Name:	W18K061-02	**Units:**	ug/Kg
Lab Code:	K1811030-002	**Basis:**	Dry

Organochlorine Pesticides

Analysis Method: 8081B
Prep Method: EPA 3546

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
alpha-BHC	ND Ui	11	11	1	12/12/18 00:09	11/13/18	
beta-BHC	ND Ui	110	110	1	12/12/18 00:09	11/13/18	
gamma-BHC (Lindane)	ND U	5.5	1.7	1	12/12/18 00:09	11/13/18	
delta-BHC	ND U	5.5	1.6	1	12/12/18 00:09	11/13/18	
Heptachlor	ND Ui	30	30	1	12/12/18 00:09	11/13/18	
Aldrin	ND U	5.5	3.2	1	12/12/18 00:09	11/13/18	
Heptachlor Epoxide	ND U	5.5	3.6	1	12/12/18 00:09	11/13/18	
gamma-Chlordane	ND U	5.5	2.1	1	12/12/18 00:09	11/13/18	
Endosulfan I	ND U	5.5	2.1	1	12/12/18 00:09	11/13/18	
alpha-Chlordane	ND U	5.5	2.3	1	12/12/18 00:09	11/13/18	
Dieldrin	ND U	5.5	1.2	1	12/12/18 00:09	11/13/18	
4,4'-DDE	ND U	5.5	2.2	1	12/12/18 00:09	11/13/18	
Endrin	ND U	5.5	1.8	1	12/12/18 00:09	11/13/18	
Endosulfan II	ND U	5.5	3.8	1	12/12/18 00:09	11/13/18	
4,4'-DDD	ND Ui	58	58	1	12/12/18 00:09	11/13/18	
Endrin Aldehyde	ND U	5.5	4.9	1	12/12/18 00:09	11/13/18	
Endosulfan Sulfate	ND U	5.5	5.4	1	12/12/18 00:09	11/13/18	
4,4'-DDT	ND U	5.5	3.4	1	12/12/18 00:09	11/13/18	
Endrin Ketone	ND Ui	36	36	1	12/12/18 00:09	11/13/18	
Methoxychlor	ND U	5.5	3.9	1	12/12/18 00:09	11/13/18	
Toxaphene	ND U	550	190	1	12/12/18 00:09	11/13/18	
Chlordane	ND U	55	26	1	12/12/18 00:09	11/13/18	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Tetrachloro-m-xylene	136	70 - 130	12/12/18 00:09	*
Decachlorobiphenyl	139	70 - 130	12/12/18 00:09	*

Land Applied Biosolids
Data 2018

Section 405(d)(2)(c) of the Clean Water Act requires federal biosolids regulations (40 CFR Part 503) to be reviewed every two years to identify toxic pollutants for regulation. Under Round III rulemaking, EPA considered 803 candidate chemicals and eventually narrowed that group to 40 compounds, which were subjected to human and ecological receptors exposure and hazzard screening assessment. After completing their exposure risk screening assessment, EPA identified 15 chemicals for further consideration. The agency intends to complete a national survey of the occurance of those pollutants. A risk assessment will be conducted to determine which trace contaminents, if any, require further regulation in land applied biosolids.

For biosolids land application, the group chemicals of interest include:

> **Accetone, anthracene, barium, beryllium, carbon disulfide, 4-chloroaniline, diazinon, flouranthene, manganese, methal ethyl ketone, nitrate, nitrite, phenol pyrene and silver.**

During 2018, Portland analyzed it's land applied biosolids to determine the occurance and concentration of a number of Round III analytes of interest to EPA and the general public. 2018 data characterizing this is included in this section.

Expanded Metals and Halides BPC

From: 1/1/2018
To: 12/31/2018

			Concentration (mg/kg)																											
		Complete	Aluminum	Antimony	Arsenic	Barium	Beryllium	Boron	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Molybdenum	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Tin	Titanium	Vanadium	Zinc	Bromide	Chloride	Fluoride
Feb 18	W18C003-0	☑	14900	3.86	4.62	230	0.34	18.8	1.92	55.8	8.53	289	26700	58.7	6830	634	9.1	53.4	2180	3.77	4.55	661	0.11	31	1270	55	1080	5.4*	190	54*
May 18	W18F004-0	☑	14500	6.69	4.42	236	0.40	21.8	2.18	68.5	8.25	284	26900	54.1	5920	629	10.2	61.0	2000	4.77	4.06	665	0.1*	42	1220	53	1060	5.5*	210	55*
Aug 18	W18I002-01	☑	9650	4.39	4.08	196	0.67	24.0	2.30	51.2	7.48	295	19500	39.5	7410	534	10.9	45.0	2390	5.14	4.11	717	0.67	31	991	45	1070	6.8*	280	68*
Nov 18	W18L003-0	☑	11700	4.61	4.77	219	0.35	21.7	2.39	45.4	7.63	314	22500	72.3	5700	449	11.3	40.2	2390	4.77	8.53	707	0.349*	34	1030	61	1220	6*	250	60*
Average			12688	4.89	4.47	220	0.44	21.6	2.20	55.23	7.97	296	23900	56.2	6465	562	10.4	49.9	2240	4.61	5.31	688	0.31	34	1128	53	1108	6	233	59

Historical Priority Metals Scan

	Concentration (mg/kg)																											
	Aluminum	**Antimony**	**Arsenic**	**Barium**	**Beryllium**	**Boron**	**Cadmium**	**Chromium**	**Cobalt**	**Copper**	**Iron**	**Lead**	**Magnesium**	**Manganese**	**Molybdenum**	**Nickel**	**Potassium**	**Selenium**	**Silver**	**Sodium**	**Thallium**	**Tin**	**Titanium**	**Vanadium**	**Zinc**	**Bromide**	**Chloride**	**Fluoride**
2001 Average			4.24				6.46			535		161			13.8	46.6	2650	5.72							1031			
2002 Average	19675	4.49	4.22	358	0.32	29.7	7.62		8.43	537	22100	225	7368	422	14.2	51.5	2466	5.64			0.12	81	1250		1151	6	233	56
2003 Average	20775	4.32	5.60	354	0.33	31.5	6.84		8.40	541	23025	183	7453	413	14.4	57.8	2668	6.41			0.11	73	1258		1211	6	280	55
2004 Average	21775	4.12	4.46	350	0.41	32.7	5.54		8.98	493	23800	155	6750	395	16.7	53.8	2478	5.59			0.15	83	1209		1223	5	228	47
2005 Average	18058	4.21	4.78	334	0.39	29.2	4.39		8.79	498	19125	143	5175	352	18.7	54.0	2735	6.14			0.14	71	901		1159	5	265	53
2006 Average	20525	4.43	4.09	334	0.52	25.8	5.18		7.88	455	21525	162	6918	366	15.9	54.9	2629	5.36			0.61	75	1049		1138	6	263	56
2007 Average	17325	5.31	4.66	335	0.37	25.7	5.49		8.79	462	22350	174	7258	386	15.8	57.1	2383	6.32			0.12	56	1323		1194	5	273	52
2008 Average	15800	5.26	4.34	350	0.34	25.6	5.81		9.07	449	21550	201	7478	390	17.2	60.0	2360	5.31			0.34	46	1168		1249	5	260	50
2009 Average	16000	5.02	4.05	374	0.36	20.6	5.03		9.53	417	23325	163	7445	566	15.3	53.4	2620	4.83	18.65		0.11	48	1290		1172	5	203	48
2010 Average	16040	3.63	3.69	275	0.37	16.0	4.75	24.70	9.16	344	23860	149	7814	513	11.2	47.2	2490	4.26	19.64	559	0.14	46	1294	75	1006	6	190	51
2011 Average	15950	4.77	4.24	350	0.39	20.6	5.34		10.03	424	31275	183	7895	590	14.9	58.0	2493	5.03	25.13		0.14	59	1273		1273	5	173	50
2012 Average	16000	5.14	4.29	296	0.36	19.9	3.98	80.55	9.63	375	25775	167	11738	480	13.3	54.7	2223	3.94	14.00	582	0.11	44	1290	68	1079	5	148	50
2013 Average	14650	4.69	4.08	256	0.30	27.4	2.96	75.60	9.75	380	22925	80	7625	445	15.3	49.5	2295	5.72	10.04	642	0.10	47	1155	70	1155	5	233	50
2014 Average	15400	4.53	5.15	240	0.36	23.8	2.69	76.52	9.41	338	28075	77	7343	411	14.0	44.7	2238	3.70	7.97	625	0.12	36	1368	72	1054	5	195	50
2015 Average	14100	4.54	5.36	224	0.32	22.1	2.69	68.02	8.85	335	25900	89	7398	452	14.8	41.9	2335	4.73	7.53	767	0.13	37	1215	66	1010	5	238	50
2016 Average	13190	3.92	4.51	277	0.32	22.4	2.16	59.07	8.88	301	25075	66	6235	500	11.4	44.5	2015	4.84	5.39	667	0.11	32	1091	60	996	5	200	28
2017 Average	15450	4.06	4.81	238	0.41	21.5	1.93	51.05	9.03	268	28050	63	5678	609	9.1	47.1	2173	4.02	4.11	738	0.13	27	1353	66	969	6	183	55
2018 Average	12688	4.89	4.47	220	0.44	21.6	2.20	55.23	7.97	296	23900	56	6465	562	10.4	49.9	2240	4.61	5.31	688	0.31	34	1128	53	1108	6	233	59

PAH Results for BPC

From: **1/1/2018**
To: **12/31/2018**

			Concentration (µg/kg)																	
Sample	**Lab Tracking #**	**Complete**	**2-Methylnaphthal**	**Acenaphthene**	**Acenaphthylene**	**Anthracene**	**Benzo-a-Anthracene**	**Benzo-a-Pyrene**	**Benzo-b-Fluoranthene**	**Benzo-e-Pyrene**	**Benzo-g,h,i-Perylene**	**Benzo-k,j-Fluoranthene**	**Chrysene**	**Dibenzo-a,h-Anthracene**	**Fluoranthene**	**Fluorene**	**Indeno-1,2,3-c,d-Pyrene**	**Naphthalene**	**Phenanthrene**	**Pyrene**
Q1 2018	W18C003-01	☑	83	77	37	83	150	350	410	140	200	28*	240	23	470	100	130	61	140	750
Q2 2018	W18F004-01	☑	88	120	40*	130	310	280	390	270	310	100	440	61	810	160	240	52*	630	950
Q3 2018	W18I002-01	☑	120	84	26	95	230	180	240	170	180	89	320	32	610	110	150	65	580	720
Q4 2018	W18L003-01	☑	80	79	15	91	220	180	240	160	160	75	290	30	560	110	140	41	530	660

* - Reported at Detection Limit

Sample	Lab Tracking #	Complete	Concentration (µg/kg)																	
			2-Methylnaphthal	Acenaphthene	Acenaphthylene	Anthracene	Benzo-a-Anthracene	Benzo-a-Pyrene	Benzo-b-Fluoranthene	Benzo-e-Pyrene	Benzo-g,h,i-Perylene	Benzo-k,j-Fluoranthene	Chrysene	Dibenzo-a,h-Anthracene	Fluoranthene	Fluorene	Indeno-1,2,3-c,d-Pyrene	Naphthalene	Phenanthrene	Pyrene
Average			93	90	30	100	228	248	320	185	213	73	323	37	613	120	165	55	470	770

Historical PAH Results

	Concentration (µg/kg)																	
	2-Methylnaphthal	Acenaphthene	Acenaphthylene	Anthracene	Benzo-a-Anthracene	Benzo-a-Pyrene	Benzo-b-Fluoranthene	Benzo-e-Pyrene	Benzo-g,h,i-Perylene	Benzo-k,j-Fluoranthene	Chrysene	Dibenzo-a,h-Anthracene	Fluoranthene	Fluorene	Indeno-1,2,3-c,d-Pyrene	Naphthalene	Phenanthrene	Pyrene
2004 Average		705	255	634	627	603	564	395	459	321	709	167	1,744	701	304	529	2,933	2,778
2005 Average		2,433	1,786	2,024	1,240	1,792	912	901	829	921	1,128	168	3,868	1,426	398	1,189	7,993	11,258
2006 Average	1,915	490	130	799	592	660	552	507	529	374	806	148	1,338	670	417	331	2,473	2,393
2007 Average	2,346	443	161	488	479	552	508	507	460	409	665	186	1,114	561	438	784	1,626	1,274
2008 Average	3,288	684	276	701	685	807	755	599	671	600	950	301	1,575	761	669	1,083	2,203	1,745
2009 Average	1,405	201	47	275	272	296	261	283	278	218	381	71	653	362	207	484	1,050	802
2010 Average	375	81	30	95	113	153	216	193	160	135	152	62	238	101	155	150	381	318
2011 Average	446	118	118	142	120	118	118	118	130	118	155	118	215	138	118	145	295	323
2012 Average	436	133	131	146	163	166	151	143	133	131	228	131	336	213	133	166	433	426
2013 Average	1,173	258	143	370	263	210	180	190	315	175	423	143	688	288	175	303	900	798
2014 Average	1,033	335	325	343	493	790	790	646	790	790	530	790	665	380	795	383	898	978
2015 Average	1,133	210	149	190	355	335	393	310	370	323	388	199	775	273	305	340	890	1,013
2016 Average	215	176	47	210	305	798	475	248	280	172	438	52	963	195	228	150	1,095	1,398
2017 Average	132	133	35	133	268	243	328	250	290	121	428	51	773	173	205	60	763	953
2018 Average	93	90	30	100	228	248	320	185	213	73	323	37	613	120	165	55	470	770

Results prior to 2011 indicate MRLs on an as received basis. Results beginning in 2011 indicate MRLs on a dry weight basis

* - Reported at Detection Limit

Land Applied Biosolids
Priority Organics
2018

Sample ID #			Sample Period
W18C003	**Belt Press Cake to Truck** **(Pesticides, PCB's, Semi-Volatiles, PAH's)**	Monthly	Feb-18
W18F004	**Belt Press Cake to Truck** **(Pesticides, PCB's, Semi-Volatiles, PAH's)**	Monthly	May-18
W18I002	**Belt Press Cake to Truck** **(Pesticides, PCB's, Semi-Volatiles, PAH's)**	Monthly	Aug-18
W18L003	**Belt Press Cake to Truck** **(Pesticides, PCB's, Semi-Volatiles, PAH's)**	Monthly	Nov-18
W18B004	**Sample from Belt Press Cake** **(Volatile Organic Compounds)**	Grab	**2/1/2018**
W18D249	**Sample from Belt Press Cake** **(Volatile Organic Compounds)**	Grab	**4/30/2018**
W18H016	**Sample from Belt Press Cake** **(Volatile Organic Compounds)**	Grab	**8/2/2018**
W18K057	**Sample from Belt Press Cake** **(Volatile Organic Compounds)**	Grab	**11/8/2018**

City of Portland
Water Pollution Control Laboratory
6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656
ORELAP Certification ID 4023

LABORATORY ANALYSIS REPORT

Project:	**CBWTP Biosolids**	Client:	Wastewater Group
Work Order:	**W18C003**	Project Mgr:	Greg Charr
Received:	3/1/18 8:15		
Submitted By:	CBWTP/Lab		

Sample	Laboratory ID	Matrix	Type	Sample Collection Date Start	End	Qualifier
CB BPC 1-30 day/qtr comp	W18C003-01	Biosolid	Composite, 1 month	02/01/18 00:00	02/28/18 23:59	

CB BPC 1-30 day/qtr comp : W18C003-01

Analyte	Result	Units	MRL	Dil.	Batch	Prepared	Analyzed	Method	Qualifier
General Chemistry									
pH	**7.5**	pH Units	0.1		B18C091	03/07/18	03/07/18	EPA 9045	
Total solids	**18.3**	% W/W	0.01		B18C011	03/01/18	03/02/18	SM 2540G	
Volatile solids	**58.9**	% W/W	0.01		B18C011	03/01/18	03/02/18	SM 2540G	
Nutrients									
Ammonia-nitrogen	**7980**	mg/kg dry	544	20	B18C001	03/01/18	03/07/18	EPA 350.1	
Bromide	<5.4	mg/kg dry	5.4	1	B18C013	03/01/18	03/06/18	EPA 300.0	
Chloride	**190**	mg/kg dry	54	1	B18C013	03/01/18	03/06/18	EPA 300.0	
Fluoride	<54	mg/kg dry	54	1	B18C013	03/01/18	03/06/18	EPA 300.0	
Nitrate-nitrogen	<5.4	mg/kg dry	5.4	1	B18C013	03/01/18	03/06/18	EPA 300.0	
Total Kjeldahl nitrogen (TKN)	**49600**	mg/kg dry	4200	40	B18C003	03/01/18	03/06/18	EPA 351.2	
Total Metals									
Total Metals by ICPMS									
Aluminum	**14900**	mg/kg dry	10.0	20	B18C104	03/08/18	03/12/18	EPA 6020	
Antimony	**3.85**	mg/kg dry	0.100	20	B18C104	03/08/18	03/12/18	EPA 6020	
Arsenic	**4.62**	mg/kg dry	0.500	20	B18C104	03/08/18	03/12/18	EPA 6020	
Barium	**230**	mg/kg dry	0.500	20	B18C104	03/08/18	03/12/18	EPA 6020	
Beryllium	**0.336**	mg/kg dry	0.100	20	B18C104	03/08/18	03/12/18	EPA 6020	
Boron	**18.8**	mg/kg dry	0.500	20	B18C104	03/08/18	03/12/18	EPA 6020	
Cadmium	**1.92**	mg/kg dry	0.100	20	B18C104	03/08/18	03/12/18	EPA 6020	
Chromium	**55.8**	mg/kg dry	0.500	20	B18C104	03/08/18	03/12/18	EPA 6020	
Cobalt	**8.53**	mg/kg dry	0.200	20	B18C104	03/08/18	03/12/18	EPA 6020	
Copper	**289**	mg/kg dry	0.200	20	B18C104	03/08/18	03/12/18	EPA 6020	
Iron	**26700**	mg/kg dry	10.0	20	B18C104	03/08/18	03/12/18	EPA 6020	
Lead	**58.7**	mg/kg dry	0.100	20	B18C104	03/08/18	03/12/18	EPA 6020	
Manganese	**634**	mg/kg dry	0.200	20	B18C104	03/08/18	03/12/18	EPA 6020	
Mercury	**0.713**	mg/kg dry	0.0100	20	B18C104	03/08/18	03/12/18	EPA 6020	
Molybdenum	**9.14**	mg/kg dry	0.100	20	B18C104	03/08/18	03/12/18	EPA 6020	
Nickel	**53.4**	mg/kg dry	0.200	20	B18C104	03/08/18	03/12/18	EPA 6020	
Selenium	**3.77**	mg/kg dry	1.00	20	B18C104	03/08/18	03/12/18	EPA 6020	M3

Reported: 04/19/18 10:17

The results in this report apply only to the samples analyzed. Qualifiers and case narrative comments are essential to interpretation of the analytical results. Report reproductions and/or data summaries without qualifiers and comments are incomplete.

Jennifer Shackelford

Jennifer Shackelford, Laboratory Coordinator QA/QC

City of Portland
Water Pollution Control Laboratory
6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656
ORELAP Certification ID 4023

Project:	**CBWTP Biosolids**	Client:	Wastewater Group
Work Order:	**W18C003**	Received:	03/01/18 08:15

Analyte	Result	Units	MRL	Dil.	Batch	Prepared	Analyzed	Method	Qualifier
Total Metals									
Total Metals by ICPMS									
Silver	**4.55**	mg/kg dry	0.100	20	B18C104	03/08/18	03/12/18	EPA 6020	
Thallium	**0.109**	mg/kg dry	0.100	20	B18C104	03/08/18	03/12/18	EPA 6020	
Tin	**30.5**	mg/kg dry	0.200	20	B18C104	03/08/18	03/12/18	EPA 6020	
Titanium	**1270**	mg/kg dry	0.200	20	B18C104	03/08/18	03/12/18	EPA 6020	
Vanadium	**55.3**	mg/kg dry	0.100	20	B18C104	03/08/18	03/12/18	EPA 6020	
Zinc	**1080**	mg/kg dry	0.500	20	B18C104	03/08/18	03/12/18	EPA 6020	
Phosphorus*	**18600**	mg/kg dry	10.0	20	B18C104	03/08/18	03/12/18	EPA 6020	
Magnesium*	**6830**	mg/kg dry	10.0	20	B18C104	03/08/18	03/12/18	EPA 6020	
Potassium*	**2180**	mg/kg dry	50.0	20	B18C104	03/08/18	03/12/18	EPA 6020	
Sodium	**661**	mg/kg dry	50.0	20	B18C104	03/08/18	03/12/18	EPA 6020	
Polychlorinated Biphenyls (PCBs)									
PCB Aroclors by GC-ECD									
Aroclor 1016/1242	<52.6	ug/kg dry	52.6	1	B18C094	03/08/18	03/12/18	EPA 8082	
Aroclor 1221	<105	ug/kg dry	105	1	B18C094	03/08/18	03/12/18	EPA 8082	
Aroclor 1232	<52.6	ug/kg dry	52.6	1	B18C094	03/08/18	03/12/18	EPA 8082	
Aroclor 1248	**95.2**	ug/kg dry	52.6	1	B18C094	03/08/18	03/12/18	EPA 8082	AR4
Aroclor 1254	<52.6	ug/kg dry	52.6	1	B18C094	03/08/18	03/12/18	EPA 8082	
Aroclor 1260	<52.6	ug/kg dry	52.6	1	B18C094	03/08/18	03/12/18	EPA 8082	
Surrogate	***Result***		***Expected***	***%Rec***	***Limits(%)***				
Tetrachloro-m-xylene	*34.5*	ug/kg dry	*52.6*	*66%*	*55.1-114*	*B18C094*	*03/08/18*	*03/12/18*	*EPA 8082*	
Decachlorobiphenyl	*21.4*	ug/kg dry	*52.6*	*41%*	*56.3-146*	*B18C094*	*03/08/18*	*03/12/18*	*EPA 8082*	*SU1*

Qualifiers

AR4	PCB quantified as Aroclor 1248 may be a mixture of 1248 and 1254.
M3	Inconsistent results for matrix QC (duplicates and/or matrix spikes) indicate non-homogeneous sample matrix. Sample results should be considered estimates.
SU1	Recovery for one or more surrogate compounds was outside the acceptance range (low). Sample results may be low estimates.

Definitions

DET	Analyte Detected	ND	Analyte Not Detected at or above the reporting limit
MRL	Method Reporting Limit	MDL	Method Detection Limit
NR	Not Reportable	dry	Sample results reported on a dry weight basis
% Rec.	Percent Recovery	RPD	Relative Percent Difference
*	This analyte is not certified under NELAP		

Reported: 04/19/18 10:17

Jennifer Shackelford

Jennifer Shackelford, Laboratory Coordinator QA/QC

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Organochlorine Pesticides

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577- 7222 Fax (360)636- 1068
www.alsglobal.com

Analytical Results

Client:	Portland, City of	**Service Request:**	K1801930
Project:	CBWTP Biosolids/W18C003	**Date Collected:**	02/28/2018
Sample Matrix:	Biosolids solids	**Date Received:**	03/01/2018

Organochlorine Pesticides

Sample Name:	W18C003-01	**Units:**	ug/Kg
Lab Code:	K1801930-001	**Basis:**	Dry
Extraction Method:	EPA 3546	**Level:**	Low
Analysis Method:	8081B		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	U	54	16	10	03/08/18	03/12/18	KWG1801313	
beta-BHC	ND	U	54	15	10	03/08/18	03/12/18	KWG1801313	
gamma-BHC (Lindane)	ND	U	54	17	10	03/08/18	03/12/18	KWG1801313	
delta-BHC	ND	U	54	15	10	03/08/18	03/12/18	KWG1801313	
Heptachlor	ND	U	54	21	10	03/08/18	03/12/18	KWG1801313	
Aldrin	ND	Ui	71	71	10	03/08/18	03/12/18	KWG1801313	
Heptachlor Epoxide	ND	U	54	36	10	03/08/18	03/12/18	KWG1801313	
gamma-Chlordane†	ND	U	54	21	10	03/08/18	03/12/18	KWG1801313	
Endosulfan I	ND	U	54	20	10	03/08/18	03/12/18	KWG1801313	
alpha-Chlordane	ND	U	54	22	10	03/08/18	03/12/18	KWG1801313	
Dieldrin	ND	U	54	12	10	03/08/18	03/12/18	KWG1801313	
4,4'-DDE	ND	U	54	22	10	03/08/18	03/12/18	KWG1801313	
Endrin	ND	U	54	18	10	03/08/18	03/12/18	KWG1801313	
Endosulfan II	ND	U	54	37	10	03/08/18	03/12/18	KWG1801313	
4,4'-DDD	ND	U	54	33	10	03/08/18	03/12/18	KWG1801313	
Endrin Aldehyde	ND	U	54	48	10	03/08/18	03/12/18	KWG1801313	
Endosulfan Sulfate	ND	U	54	53	10	03/08/18	03/12/18	KWG1801313	
4,4'-DDT	ND	Ui	54	40	10	03/08/18	03/12/18	KWG1801313	
Endrin Ketone	ND	U	54	25	10	03/08/18	03/12/18	KWG1801313	
Methoxychlor	**70**	D	54	38	10	03/08/18	03/12/18	KWG1801313	
Toxaphene	ND	Ui	5400	4900	10	03/08/18	03/12/18	KWG1801313	
Chlordane	ND	Ui	540	350	10	03/08/18	03/12/18	KWG1801313	*

* See Case Narrative

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	104	70-130	03/12/18	Acceptable
Decachlorobiphenyl	143	70-130	03/12/18	Outside Control Limits

† Analyte Comments

gamma-Chlordane	For this analyte (CAS Registry No. 5103-74-2), USEPA has corrected the name to be beta-Chlordane, also known as trans-Chlordane.

Comments:

Polynuclear Aromatic Hydrocarbons

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

Analytical Results

Client:	Portland, City of	**Service Request:**	K1801930
Project:	CBWTP Biosolids/W18C003	**Date Collected:**	02/28/2018
Sample Matrix:	Biosolids solids	**Date Received:**	03/01/2018

Polynuclear Aromatic Hydrocarbons

Sample Name:	W18C003-01	**Units:**	ug/Kg
Lab Code:	K1801930-001	**Basis:**	Dry
Extraction Method:	EPA 3546	**Level:**	Low
Analysis Method:	8270D SIM		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**61**		28	2.6	1	03/02/18	03/14/18	KWG1801260	
2-Methylnaphthalene	**83**		28	2.0	1	03/02/18	03/14/18	KWG1801260	
1-Methylnaphthalene	**84**		28	2.0	1	03/02/18	03/14/18	KWG1801260	
Acenaphthylene	**37**		28	1.6	1	03/02/18	03/14/18	KWG1801260	
Acenaphthene	**77**		28	1.7	1	03/02/18	03/14/18	KWG1801260	
Fluorene	**100**		28	3.1	1	03/02/18	03/14/18	KWG1801260	
Phenanthrene	**410**		28	3.2	1	03/02/18	03/14/18	KWG1801260	
Anthracene	**83**		28	1.6	1	03/02/18	03/14/18	KWG1801260	
Fluoranthene	**470**		28	3.5	1	03/02/18	03/14/18	KWG1801260	
Pyrene	**750**		28	1.8	1	03/02/18	03/14/18	KWG1801260	
Benz(a)anthracene	**150**		28	1.3	1	03/02/18	03/14/18	KWG1801260	
Chrysene	**240**		28	1.7	1	03/02/18	03/14/18	KWG1801260	
Benzo(b)fluoranthene†	**410**	X	28	1.6	1	03/02/18	03/14/18	KWG1801260	
Benzo(k)fluoranthene	ND	UX	28	1.3	1	03/02/18	03/14/18	KWG1801260	
Benzo(e)pyrene	**140**		28	1.6	1	03/02/18	03/14/18	KWG1801260	
Benzo(a)pyrene	**350**	X	28	2.1	1	03/02/18	03/14/18	KWG1801260	
Indeno(1,2,3-cd)pyrene	**130**		28	2.0	1	03/02/18	03/14/18	KWG1801260	
Dibenz(a,h)anthracene	**23**	J	28	1.3	1	03/02/18	03/14/18	KWG1801260	
Benzo(g,h,i)perylene	**200**		28	2.2	1	03/02/18	03/14/18	KWG1801260	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	51	38-104	03/14/18	Acceptable
Fluoranthene-d10	62	39-109	03/14/18	Acceptable
Terphenyl-d14	64	38-113	03/14/18	Acceptable

† Analyte Comments

Benzo(b)fluoranthene	This analyte cannot be separated from Benzo(j)fluoranthene.

Comments:

Semi-Volatile Organic Compounds by GC/MS

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

Client:	Portland, City of	**Service Request:**	K1801930
Project:	CBWTP Biosolids/W18C003	**Date Collected:**	02/28/18 23:59
Sample Matrix:	Biosolids Solids	**Date Received:**	03/01/18 12:30
Sample Name:	W18C003-01	**Units:**	mg/Kg
Lab Code:	K1801930-001	**Basis:**	Dry

Semivolatile Organic Compounds by GC/MS

Analysis Method: 8270D
Prep Method: EPA 3541

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
1,2,4-Trichlorobenzene	ND U	13	0.45	10	03/22/18 22:36	3/2/18	
1,2-Dichlorobenzene	ND U	13	0.74	10	03/22/18 22:36	3/2/18	
1,3-Dichlorobenzene	ND U	13	0.74	10	03/22/18 22:36	3/2/18	
1,4-Dichlorobenzene	ND U	13	0.74	10	03/22/18 22:36	3/2/18	
2,4,5-Trichlorophenol	ND U	13	0.74	10	03/22/18 22:36	3/2/18	
2,4,6-Trichlorophenol	ND U	13	0.57	10	03/22/18 22:36	3/2/18	
2,4-Dichlorophenol	ND U	13	0.65	10	03/22/18 22:36	3/2/18	
2,4-Dimethylphenol	ND U	13	0.61	10	03/22/18 22:36	3/2/18	
2,4-Dinitrophenol	ND U	81	4.5	10	03/22/18 22:36	3/2/18	
2,4-Dinitrotoluene	ND U	13	0.61	10	03/22/18 22:36	3/2/18	
2,6-Dinitrotoluene	ND U	13	0.65	10	03/22/18 22:36	3/2/18	
2-Chloronaphthalene	ND U	13	0.41	10	03/22/18 22:36	3/2/18	
2-Chlorophenol	ND U	13	0.41	10	03/22/18 22:36	3/2/18	
2-Methyl-4,6-dinitrophenol	ND U	81	5.7	10	03/22/18 22:36	3/2/18	
2-Methylnaphthalene	ND U	13	0.45	10	03/22/18 22:36	3/2/18	
2-Methylphenol	ND U	13	0.70	10	03/22/18 22:36	3/2/18	
2-Nitroaniline	ND U	13	0.70	10	03/22/18 22:36	3/2/18	
2-Nitrophenol	ND U	13	0.57	10	03/22/18 22:36	3/2/18	
3,3'-Dichlorobenzidine	ND U	13	1.1	10	03/22/18 22:36	3/2/18	
3-Nitroaniline	ND U	13	0.74	10	03/22/18 22:36	3/2/18	
4-Bromophenyl Phenyl Ether	ND U	13	0.49	10	03/22/18 22:36	3/2/18	
4-Chloro-3-methylphenol	ND U	13	0.70	10	03/22/18 22:36	3/2/18	
4-Chloroaniline	ND U	13	0.57	10	03/22/18 22:36	3/2/18	
4-Chlorophenyl Phenyl Ether	ND U	13	0.65	10	03/22/18 22:36	3/2/18	
4-Methylphenol	ND U	13	0.70	10	03/22/18 22:36	3/2/18	
4-Nitroaniline	ND U	81	7.4	10	03/22/18 22:36	3/2/18	
4-Nitrophenol	ND U	81	6.1	10	03/22/18 22:36	3/2/18	
Acenaphthene	ND U	13	0.53	10	03/22/18 22:36	3/2/18	
Acenaphthylene	ND U	13	0.65	10	03/22/18 22:36	3/2/18	
Aniline	ND U	41	0.90	10	03/22/18 22:36	3/2/18	
Anthracene	ND U	13	0.57	10	03/22/18 22:36	3/2/18	
Benz(a)anthracene	ND U	13	0.49	10	03/22/18 22:36	3/2/18	
Benzo(a)pyrene	ND U	13	0.82	10	03/22/18 22:36	3/2/18	
Benzo(b)fluoranthene	ND U	13	0.70	10	03/22/18 22:36	3/2/18	
Benzo(g,h,i)perylene	ND U	13	0.82	10	03/22/18 22:36	3/2/18	
Benzo(k)fluoranthene	ND U	13	0.78	10	03/22/18 22:36	3/2/18	
Benzoic Acid	ND U	81	5.7	10	03/22/18 22:36	3/2/18	
Benzyl Alcohol	ND U	13	0.70	10	03/22/18 22:36	3/2/18	
Bis(2-chloroethoxy)methane	ND U	13	0.45	10	03/22/18 22:36	3/2/18	
Bis(2-chloroethyl) Ether	ND U	13	0.49	10	03/22/18 22:36	3/2/18	
Bis(2-ethylhexyl) Phthalate	**11 J**	13	0.78	10	03/22/18 22:36	3/2/18	
Butyl Benzyl Phthalate	ND U	13	0.65	10	03/22/18 22:36	3/2/18	
Chrysene	ND U	13	0.49	10	03/22/18 22:36	3/2/18	

Analytical Report

Client:	Portland, City of	**Service Request:**	K1801930
Project:	CBWTP Biosolids/W18C003	**Date Collected:**	02/28/18 23:59
Sample Matrix:	Biosolids Solids	**Date Received:**	03/01/18 12:30
Sample Name:	W18C003-01	**Units:**	mg/Kg
Lab Code:	K1801930-001	**Basis:**	Dry

Semivolatile Organic Compounds by GC/MS

Analysis Method: 8270D
Prep Method: EPA 3541

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Dibenz(a,h)anthracene	ND U	13	1.1	10	03/22/18 22:36	3/2/18	
Dibenzofuran	ND U	13	0.49	10	03/22/18 22:36	3/2/18	
Diethyl Phthalate	ND U	13	0.57	10	03/22/18 22:36	3/2/18	
Dimethyl Phthalate	ND U	13	0.65	10	03/22/18 22:36	3/2/18	
Di-n-butyl Phthalate	ND U	13	0.49	10	03/22/18 22:36	3/2/18	
Di-n-octyl Phthalate	ND U	13	0.98	10	03/22/18 22:36	3/2/18	
Fluoranthene	ND U	13	0.45	10	03/22/18 22:36	3/2/18	
Fluorene	ND U	13	0.53	10	03/22/18 22:36	3/2/18	
Hexachlorobenzene	ND U	13	0.61	10	03/22/18 22:36	3/2/18	
Hexachlorobutadiene	ND U	13	0.57	10	03/22/18 22:36	3/2/18	
Hexachlorocyclopentadiene	ND U	13	0.49	10	03/22/18 22:36	3/2/18	
Hexachloroethane	ND U	13	0.90	10	03/22/18 22:36	3/2/18	
Indeno(1,2,3-cd)pyrene	ND U	13	1.6	10	03/22/18 22:36	3/2/18	
Isophorone	ND U	13	0.57	10	03/22/18 22:36	3/2/18	
Naphthalene	ND U	13	0.57	10	03/22/18 22:36	3/2/18	
Nitrobenzene	ND U	13	1.1	10	03/22/18 22:36	3/2/18	
N-Nitrosodimethylamine	ND U	81	1.1	10	03/22/18 22:36	3/2/18	
N-Nitrosodi-n-propylamine	ND U	13	0.78	10	03/22/18 22:36	3/2/18	
N-Nitrosodiphenylamine	ND U	13	0.74	10	03/22/18 22:36	3/2/18	
Pentachlorophenol	ND U	81	5.3	10	03/22/18 22:36	3/2/18	
Phenanthrene	ND U	13	0.41	10	03/22/18 22:36	3/2/18	
Phenol	ND U	13	0.78	10	03/22/18 22:36	3/2/18	
Pyrene	ND U	13	0.57	10	03/22/18 22:36	3/2/18	
2,2'-Oxybis(1-chloropropane)	ND U	13	0.57	10	03/22/18 22:36	3/2/18	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
2,4,6-Tribromophenol	16	20 - 123	03/22/18 22:36	*
2-Fluorobiphenyl	31	32 - 104	03/22/18 22:36	*
2-Fluorophenol	20	20 - 83	03/22/18 22:36	
Nitrobenzene-d5	24	29 - 116	03/22/18 22:36	*
Phenol-d6	22	26 - 106	03/22/18 22:36	*
Terphenyl-d14	32	37 - 133	03/22/18 22:36	*

Client:	Portland, City of	**Service Request:**	K1801930
Project:	CBWTP Biosolids/W18C003	**Date Collected:**	02/28/18 23:59
Sample Matrix:	Biosolids Solids	**Date Received:**	03/01/18 12:30
Sample Name:	W18C003-01	**Units:**	mg/Kg
Lab Code:	K1801930-001	**Basis:**	Dry

Semivolatile Organic Compounds by GC/MS

Analysis Method: 8270D
Prep Method: EPA 3541

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
1,2,4-Trichlorobenzene	ND U	13	0.45	10	04/07/18 22:44	3/29/18	*
1,2-Dichlorobenzene	ND U	13	0.74	10	04/07/18 22:44	3/29/18	*
1,3-Dichlorobenzene	ND U	13	0.74	10	04/07/18 22:44	3/29/18	*
1,4-Dichlorobenzene	ND U	13	0.74	10	04/07/18 22:44	3/29/18	*
2,4,5-Trichlorophenol	ND U	13	0.74	10	04/07/18 22:44	3/29/18	*
2,4,6-Trichlorophenol	ND U	13	0.57	10	04/07/18 22:44	3/29/18	*
2,4-Dichlorophenol	ND U	13	0.66	10	04/07/18 22:44	3/29/18	*
2,4-Dimethylphenol	ND U	13	0.62	10	04/07/18 22:44	3/29/18	*
2,4-Dinitrophenol	ND U	81	4.5	10	04/07/18 22:44	3/29/18	*
2,4-Dinitrotoluene	ND U	13	0.62	10	04/07/18 22:44	3/29/18	*
2,6-Dinitrotoluene	ND U	13	0.66	10	04/07/18 22:44	3/29/18	*
2-Chloronaphthalene	ND U	13	0.41	10	04/07/18 22:44	3/29/18	*
2-Chlorophenol	ND U	13	0.41	10	04/07/18 22:44	3/29/18	*
2-Methyl-4,6-dinitrophenol	ND U	81	5.7	10	04/07/18 22:44	3/29/18	*
2-Methylnaphthalene	ND U	13	0.45	10	04/07/18 22:44	3/29/18	*
2-Methylphenol	ND U	13	0.70	10	04/07/18 22:44	3/29/18	*
2-Nitroaniline	ND U	13	0.70	10	04/07/18 22:44	3/29/18	*
2-Nitrophenol	ND U	13	0.57	10	04/07/18 22:44	3/29/18	*
3,3'-Dichlorobenzidine	ND U	13	1.1	10	04/07/18 22:44	3/29/18	*
3-Nitroaniline	ND U	13	0.74	10	04/07/18 22:44	3/29/18	*
4-Bromophenyl Phenyl Ether	ND U	13	0.49	10	04/07/18 22:44	3/29/18	*
4-Chloro-3-methylphenol	ND U	13	0.70	10	04/07/18 22:44	3/29/18	*
4-Chloroaniline	ND U	13	0.57	10	04/07/18 22:44	3/29/18	*
4-Chlorophenyl Phenyl Ether	ND U	13	0.66	10	04/07/18 22:44	3/29/18	*
4-Methylphenol	ND U	13	0.70	10	04/07/18 22:44	3/29/18	*
4-Nitroaniline	ND U	81	7.4	10	04/07/18 22:44	3/29/18	*
4-Nitrophenol	ND U	81	6.2	10	04/07/18 22:44	3/29/18	*
Acenaphthene	ND U	13	0.53	10	04/07/18 22:44	3/29/18	*
Acenaphthylene	ND U	13	0.66	10	04/07/18 22:44	3/29/18	*
Aniline	ND U	41	0.90	10	04/07/18 22:44	3/29/18	*
Anthracene	ND U	13	0.57	10	04/07/18 22:44	3/29/18	*
Benz(a)anthracene	ND U	13	0.49	10	04/07/18 22:44	3/29/18	*
Benzo(a)pyrene	ND U	13	0.82	10	04/07/18 22:44	3/29/18	*
Benzo(b)fluoranthene	ND U	13	0.70	10	04/07/18 22:44	3/29/18	*
Benzo(g,h,i)perylene	ND U	13	0.82	10	04/07/18 22:44	3/29/18	*
Benzo(k)fluoranthene	ND U	13	0.78	10	04/07/18 22:44	3/29/18	*
Benzoic Acid	ND U	81	5.7	10	04/07/18 22:44	3/29/18	*
Benzyl Alcohol	ND U	13	0.70	10	04/07/18 22:44	3/29/18	*
Bis(2-chloroethoxy)methane	ND U	13	0.45	10	04/07/18 22:44	3/29/18	*
Bis(2-chloroethyl) Ether	ND U	13	0.49	10	04/07/18 22:44	3/29/18	*
Bis(2-ethylhexyl) Phthalate	**31**	13	0.78	10	04/07/18 22:44	3/29/18	*
Butyl Benzyl Phthalate	ND U	13	0.66	10	04/07/18 22:44	3/29/18	*
Chrysene	ND U	13	0.49	10	04/07/18 22:44	3/29/18	*

Client:	Portland, City of	**Service Request:**	K1801930
Project:	CBWTP Biosolids/W18C003	**Date Collected:**	02/28/18 23:59
Sample Matrix:	Biosolids Solids	**Date Received:**	03/01/18 12:30
Sample Name:	W18C003-01	**Units:**	mg/Kg
Lab Code:	K1801930-001	**Basis:**	Dry

Semivolatile Organic Compounds by GC/MS

Analysis Method: 8270D
Prep Method: EPA 3541

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Dibenz(a,h)anthracene	ND U	13	1.1	10	04/07/18 22:44	3/29/18	*
Dibenzofuran	ND U	13	0.49	10	04/07/18 22:44	3/29/18	*
Diethyl Phthalate	ND U	13	0.57	10	04/07/18 22:44	3/29/18	*
Dimethyl Phthalate	ND U	13	0.66	10	04/07/18 22:44	3/29/18	*
Di-n-butyl Phthalate	ND U	13	0.49	10	04/07/18 22:44	3/29/18	*
Di-n-octyl Phthalate	**1.1 J**	13	0.98	10	04/07/18 22:44	3/29/18	*
Fluoranthene	**0.88 J**	13	0.45	10	04/07/18 22:44	3/29/18	*
Fluorene	ND U	13	0.53	10	04/07/18 22:44	3/29/18	*
Hexachlorobenzene	ND U	13	0.62	10	04/07/18 22:44	3/29/18	*
Hexachlorobutadiene	ND U	13	0.57	10	04/07/18 22:44	3/29/18	*
Hexachlorocyclopentadiene	ND U	13	0.49	10	04/07/18 22:44	3/29/18	*
Hexachloroethane	ND U	13	0.90	10	04/07/18 22:44	3/29/18	*
Indeno(1,2,3-cd)pyrene	ND U	13	1.6	10	04/07/18 22:44	3/29/18	*
Isophorone	ND U	13	0.57	10	04/07/18 22:44	3/29/18	*
Naphthalene	ND U	13	0.57	10	04/07/18 22:44	3/29/18	*
Nitrobenzene	ND U	13	1.1	10	04/07/18 22:44	3/29/18	*
N-Nitrosodimethylamine	ND U	81	1.1	10	04/07/18 22:44	3/29/18	*
N-Nitrosodi-n-propylamine	ND U	13	0.78	10	04/07/18 22:44	3/29/18	*
N-Nitrosodiphenylamine	ND U	13	0.74	10	04/07/18 22:44	3/29/18	*
Pentachlorophenol	ND U	81	5.3	10	04/07/18 22:44	3/29/18	*
Phenanthrene	**0.79 J**	13	0.41	10	04/07/18 22:44	3/29/18	*
Phenol	ND U	13	0.78	10	04/07/18 22:44	3/29/18	*
Pyrene	**0.84 J**	13	0.57	10	04/07/18 22:44	3/29/18	*
2,2'-Oxybis(1-chloropropane)	ND U	13	0.57	10	04/07/18 22:44	3/29/18	*

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
2,4,6-Tribromophenol	53	20 - 123	04/07/18 22:44	
2-Fluorobiphenyl	75	32 - 104	04/07/18 22:44	
2-Fluorophenol	51	20 - 83	04/07/18 22:44	
Nitrobenzene-d5	60	29 - 116	04/07/18 22:44	
Phenol-d6	56	26 - 106	04/07/18 22:44	
Terphenyl-d14	70	37 - 133	04/07/18 22:44	

City of Portland
Water Pollution Control Laboratory
6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656
ORELAP Certification ID 4023

LABORATORY ANALYSIS REPORT

Project:	**CBWTP Biosolids**	Client:	Wastewater Group
Work Order:	**W18F004**	Project Mgr:	Greg Charr
Received:	6/1/18 8:35		
Submitted By:	CBWTP		

Sample	Laboratory ID	Matrix	Type	Sample Collection Date Start	End	Qualifier
CB BPC 1-30 day/qtr comp	W18F004-01	Biosolid	Composite, 1 month	05/01/18 00:00	05/31/18 00:00	

CB BPC 1-30 day/qtr comp : W18F004-01

Analyte	Result	Units	MRL	Dil.	Batch	Prepared	Analyzed	Method	Qualifier
General Chemistry									
pH	**7.8**	pH Units	0.1		B18F054	06/02/18	06/02/18	EPA 9045	
Total solids	**18.1**	% W/W	0.01		B18F012	06/02/18	06/03/18	SM 2540G	
Volatile solids	**58.9**	% W/W	0.01		B18F012	06/02/18	06/03/18	SM 2540G	
Nutrients									
Ammonia-nitrogen	**7610**	mg/kg dry	1100	40	B18F094	06/08/18	06/08/18	EPA 350.1	
Bromide	<5.5	mg/kg dry	5.5	1	B18F095	06/08/18	06/08/18	EPA 300.0	
Chloride	**210**	mg/kg dry	55	1	B18F095	06/08/18	06/08/18	EPA 300.0	
Fluoride	<55	mg/kg dry	55	1	B18F095	06/08/18	06/08/18	EPA 300.0	
Nitrate-nitrogen	<5.5	mg/kg dry	5.5	1	B18F095	06/08/18	06/08/18	EPA 300.0	
Total Kjeldahl nitrogen (TKN)	**50400**	mg/kg dry	4290	40	B18F156	06/12/18	06/13/18	EPA 351.2	
Total Metals									
Total Metals by ICPMS									
Aluminum	**14500**	mg/kg dry	10.0	20	B18F103	06/08/18	06/08/18	EPA 6020	
Antimony	**6.69**	mg/kg dry	0.100	20	B18F103	06/08/18	06/08/18	EPA 6020	
Arsenic	**4.42**	mg/kg dry	0.500	20	B18F103	06/08/18	06/08/18	EPA 6020	
Barium	**236**	mg/kg dry	0.500	20	B18F103	06/08/18	06/08/18	EPA 6020	
Beryllium	**0.395**	mg/kg dry	0.100	20	B18F103	06/08/18	06/08/18	EPA 6020	
Boron	**21.8**	mg/kg dry	0.500	20	B18F103	06/08/18	06/08/18	EPA 6020	
Cadmium	**2.18**	mg/kg dry	0.100	20	B18F103	06/08/18	06/08/18	EPA 6020	
Chromium	**68.5**	mg/kg dry	0.500	20	B18F103	06/08/18	06/08/18	EPA 6020	
Cobalt	**8.25**	mg/kg dry	0.200	20	B18F103	06/08/18	06/08/18	EPA 6020	
Copper	**284**	mg/kg dry	0.200	20	B18F103	06/08/18	06/08/18	EPA 6020	
Iron	**26900**	mg/kg dry	10.0	20	B18F103	06/08/18	06/08/18	EPA 6020	
Lead	**54.1**	mg/kg dry	0.100	20	B18F103	06/08/18	06/08/18	EPA 6020	
Manganese	**629**	mg/kg dry	0.200	20	B18F103	06/08/18	06/08/18	EPA 6020	
Mercury	**0.812**	mg/kg dry	0.0100	20	B18F103	06/08/18	06/08/18	EPA 6020	
Molybdenum	**10.2**	mg/kg dry	0.100	20	B18F103	06/08/18	06/08/18	EPA 6020	
Nickel	**61.0**	mg/kg dry	0.200	20	B18F103	06/08/18	06/08/18	EPA 6020	
Selenium	**4.77**	mg/kg dry	1.00	20	B18F103	06/08/18	06/08/18	EPA 6020	

Reported: 07/11/18 14:08

The results in this report apply only to the samples analyzed. Qualifiers and case narrative comments are essential to interpretation of the analytical results. Report reproductions and/or data summaries without qualifiers and comments are incomplete.

Jennifer Shackelford

Jennifer Shackelford, Laboratory Coordinator QA/QC

City of Portland
Water Pollution Control Laboratory
6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656
ORELAP Certification ID 4023

Project:	**CBWTP Biosolids**	Client:	Wastewater Group
Work Order:	**W18F004**	Received:	06/01/18 08:35

Analyte	Result	Units	MRL	Dil.	Batch	Prepared	Analyzed	Method	Qualifier
Total Metals									
Total Metals by ICPMS									
Silver	**4.06**	mg/kg dry	0.100	20	B18F103	06/08/18	06/08/18	EPA 6020	
Thallium	<0.100	mg/kg dry	0.100	20	B18F103	06/08/18	06/08/18	EPA 6020	
Tin	**42.1**	mg/kg dry	0.200	20	B18F103	06/08/18	06/08/18	EPA 6020	
Titanium	**1220**	mg/kg dry	0.200	20	B18F103	06/08/18	06/08/18	EPA 6020	
Vanadium	**52.7**	mg/kg dry	0.100	20	B18F103	06/08/18	06/08/18	EPA 6020	
Zinc	**1060**	mg/kg dry	0.500	20	B18F103	06/08/18	06/08/18	EPA 6020	
Phosphorus*	**18300**	mg/kg dry	10.0	20	B18F103	06/08/18	06/08/18	EPA 6020	
Magnesium*	**5920**	mg/kg dry	10.0	20	B18F103	06/08/18	06/08/18	EPA 6020	
Potassium*	**2000**	mg/kg dry	50.0	20	B18F103	06/08/18	06/08/18	EPA 6020	
Sodium	**665**	mg/kg dry	50.0	20	B18F103	06/08/18	06/08/18	EPA 6020	
Polychlorinated Biphenyls (PCBs)									
PCB Aroclors by GC-ECD									
Aroclor 1016/1242	<55.0	ug/kg dry	55.0	1	B18F034	06/04/18	06/06/18	EPA 8082	
Aroclor 1221	<110	ug/kg dry	110	1	B18F034	06/04/18	06/06/18	EPA 8082	
Aroclor 1232	<55.0	ug/kg dry	55.0	1	B18F034	06/04/18	06/06/18	EPA 8082	
Aroclor 1248	<55.0	ug/kg dry	55.0	1	B18F034	06/04/18	06/06/18	EPA 8082	M4
Aroclor 1254	<55.0	ug/kg dry	55.0	1	B18F034	06/04/18	06/06/18	EPA 8082	
Aroclor 1260	<55.0	ug/kg dry	55.0	1	B18F034	06/04/18	06/06/18	EPA 8082	
Surrogate	***Result***		***Expected***	***%Rec***	***Limits(%)***				
Tetrachloro-m-xylene	*34.8*	ug/kg dry	*55.0*	*63%*	*54.6-118*	*B18F034*	*06/04/18*	*06/06/18*	*EPA 8082*	
Decachlorobiphenyl	*19.2*	ug/kg dry	*55.0*	*35%*	*44.5-151*	*B18F034*	*06/04/18*	*06/06/18*	*EPA 8082*	*SU1*

Qualifiers

M4	Based on low matrix spike recovery, the sample result may be a low estimate due to matrix interference.
SU1	Recovery for one or more surrogate compounds was outside the acceptance range (low). Sample results may be low estimates.

Definitions

DET	Analyte Detected	ND	Analyte Not Detected at or above the reporting limit
MRL	Method Reporting Limit	MDL	Method Detection Limit
NR	Not Reportable	dry	Sample results reported on a dry weight basis
% Rec.	Percent Recovery	RPD	Relative Percent Difference
*	This analyte is not certified under NELAP		

Reported: 07/11/18 14:08

Jennifer Shackelford

Jennifer Shackelford, Laboratory Coordinator QA/QC

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Semi-Volatile Organic Compounds by GC/MS

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

Client:	Portland, City of	**Service Request:**	K1805182
Project:	CBWTP Biosolids/W18F004	**Date Collected:**	06/01/18 00:00
Sample Matrix:	Biosolids Solids	**Date Received:**	06/04/18 13:35
Sample Name:	W18F004-01	**Units:**	mg/Kg
Lab Code:	K1805182-001	**Basis:**	Dry

Semivolatile Organic Compounds by GC/MS

Analysis Method: 8270D
Prep Method: EPA 3541

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
1,2,4-Trichlorobenzene	ND U	26	0.86	10	06/26/18 03:40	6/14/18	
1,2-Dichlorobenzene	ND U	26	1.5	10	06/26/18 03:40	6/14/18	
1,2-Diphenylhydrazine	ND U	26	1.1	10	06/26/18 03:40	6/14/18	
1,3-Dichlorobenzene	ND U	26	1.5	10	06/26/18 03:40	6/14/18	
1,4-Dichlorobenzene	ND U	26	1.5	10	06/26/18 03:40	6/14/18	
2,4,5-Trichlorophenol	ND U	26	1.5	10	06/26/18 03:40	6/14/18	
2,4,6-Trichlorophenol	ND U	26	1.1	10	06/26/18 03:40	6/14/18	
2,4-Dichlorophenol	ND U	26	1.3	10	06/26/18 03:40	6/14/18	
2,4-Dimethylphenol	ND U	26	1.2	10	06/26/18 03:40	6/14/18	
2,4-Dinitrophenol	ND U	160	8.6	10	06/26/18 03:40	6/14/18	*
2,4-Dinitrotoluene	ND U	26	1.2	10	06/26/18 03:40	6/14/18	
2,6-Dinitrotoluene	ND U	26	1.3	10	06/26/18 03:40	6/14/18	
2-Chloronaphthalene	ND U	26	0.78	10	06/26/18 03:40	6/14/18	*
2-Chlorophenol	ND U	26	0.78	10	06/26/18 03:40	6/14/18	
2-Methyl-4,6-dinitrophenol	ND U	160	11	10	06/26/18 03:40	6/14/18	
2-Nitrophenol	ND U	26	1.1	10	06/26/18 03:40	6/14/18	
3,3'-Dichlorobenzidine	ND U	26	2.2	10	06/26/18 03:40	6/14/18	
4-Bromophenyl Phenyl Ether	ND U	26	0.94	10	06/26/18 03:40	6/14/18	
4-Chloro-3-methylphenol	ND U	26	1.4	10	06/26/18 03:40	6/14/18	
4-Chloroaniline	ND U	26	1.1	10	06/26/18 03:40	6/14/18	
4-Chlorophenyl Phenyl Ether	ND U	26	1.3	10	06/26/18 03:40	6/14/18	
4-Nitrophenol	ND U	160	12	10	06/26/18 03:40	6/14/18	
Benzidine	ND U	160	33	10	06/26/18 03:40	6/14/18	*
Bis(2-chloroethoxy)methane	ND U	26	0.86	10	06/26/18 03:40	6/14/18	
Bis(2-chloroethyl) Ether	ND U	26	0.94	10	06/26/18 03:40	6/14/18	
Bis(2-ethylhexyl) Phthalate	**27**	26	1.5	10	06/26/18 03:40	6/14/18	
Butyl Benzyl Phthalate	ND U	26	1.3	10	06/26/18 03:40	6/14/18	
Dibenzofuran	ND U	26	0.94	10	06/26/18 03:40	6/14/18	
Diethyl Phthalate	ND U	26	1.1	10	06/26/18 03:40	6/14/18	
Dimethyl Phthalate	ND U	26	1.3	10	06/26/18 03:40	6/14/18	
Di-n-butyl Phthalate	ND U	26	0.94	10	06/26/18 03:40	6/14/18	
Di-n-octyl Phthalate	ND U	26	1.9	10	06/26/18 03:40	6/14/18	
Fluoranthene	ND U	26	0.86	10	06/26/18 03:40	6/14/18	
Fluorene	ND U	26	1.1	10	06/26/18 03:40	6/14/18	
Hexachlorobenzene	ND U	26	1.2	10	06/26/18 03:40	6/14/18	
Hexachlorobutadiene	ND U	26	1.1	10	06/26/18 03:40	6/14/18	
Hexachlorocyclopentadiene	ND U	26	0.94	10	06/26/18 03:40	6/14/18	
Hexachloroethane	ND U	26	1.8	10	06/26/18 03:40	6/14/18	
Indeno(1,2,3-cd)pyrene	ND U	26	3.1	10	06/26/18 03:40	6/14/18	
Isophorone	ND U	26	1.1	10	06/26/18 03:40	6/14/18	
Naphthalene	ND U	26	1.1	10	06/26/18 03:40	6/14/18	
Nitrobenzene	ND U	26	2.1	10	06/26/18 03:40	6/14/18	
N-Nitrosodimethylamine	ND U	160	2.0	10	06/26/18 03:40	6/14/18	

Client:	Portland, City of	**Service Request:**	K1805182
Project:	CBWTP Biosolids/W18F004	**Date Collected:**	06/01/18 00:00
Sample Matrix:	Biosolids Solids	**Date Received:**	06/04/18 13:35
Sample Name:	W18F004-01	**Units:**	mg/Kg
Lab Code:	K1805182-001	**Basis:**	Dry

Semivolatile Organic Compounds by GC/MS

Analysis Method: 8270D
Prep Method: EPA 3541

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
N-Nitrosodi-n-propylamine	ND U	26	1.5	10	06/26/18 03:40	6/14/18	
N-Nitrosodiphenylamine	ND U	26	1.5	10	06/26/18 03:40	6/14/18	
Pentachlorophenol	ND U	160	11	10	06/26/18 03:40	6/14/18	
Phenanthrene	ND U	26	0.78	10	06/26/18 03:40	6/14/18	
Phenol	ND U	26	1.5	10	06/26/18 03:40	6/14/18	*
Pyrene	ND U	26	1.1	10	06/26/18 03:40	6/14/18	
2,2'-Oxybis(1-chloropropane)	ND U	26	1.1	10	06/26/18 03:40	6/14/18	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
2,4,6-Tribromophenol	50	20 - 123	06/26/18 03:40	
2-Fluorobiphenyl	72	32 - 104	06/26/18 03:40	
2-Fluorophenol	35	20 - 83	06/26/18 03:40	
Nitrobenzene-d5	51	29 - 116	06/26/18 03:40	
Phenol-d6	37	26 - 106	06/26/18 03:40	
Terphenyl-d14	84	37 - 133	06/26/18 03:40	

Polynuclear Aromatic Hydrocarbons

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

Analytical Results

Client:	Portland, City of	**Service Request:**	K1805182
Project:	CBWTP Biosolids/W18F004	**Date Collected:**	06/01/2018
Sample Matrix:	Biosolids solids	**Date Received:**	06/04/2018

Polynuclear Aromatic Hydrocarbons

Sample Name:	W18F004-01	**Units:**	ug/Kg
Lab Code:	K1805182-001	**Basis:**	Dry
Extraction Method:	EPA 3546	**Level:**	Low
Analysis Method:	8270D SIM		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**51**	JD	52	4.9	2	06/08/18	06/14/18	KWG1802883	
2-Methylnaphthalene	**88**	D	52	3.9	2	06/08/18	06/14/18	KWG1802883	
Acenaphthylene	**40**	JD	52	2.9	2	06/08/18	06/14/18	KWG1802883	
Acenaphthene	**120**	D	52	3.1	2	06/08/18	06/14/18	KWG1802883	
Fluorene	**160**	D	52	5.9	2	06/08/18	06/14/18	KWG1802883	
Phenanthrene	**630**	D	52	6.1	2	06/08/18	06/14/18	KWG1802883	
Anthracene	**130**	D	52	3.0	2	06/08/18	06/14/18	KWG1802883	
Fluoranthene	**810**	D	52	6.6	2	06/08/18	06/14/18	KWG1802883	
Pyrene	**950**	D	52	3.4	2	06/08/18	06/14/18	KWG1802883	
Benz(a)anthracene	**310**	D	52	2.4	2	06/08/18	06/14/18	KWG1802883	
Chrysene	**440**	D	52	3.3	2	06/08/18	06/14/18	KWG1802883	
Benzo(b)fluoranthene†	**390**	D	52	3.0	2	06/08/18	06/14/18	KWG1802883	
Benzo(k)fluoranthene	**100**	D	52	2.5	2	06/08/18	06/14/18	KWG1802883	
Benzo(e)pyrene	**270**	D	52	3.0	2	06/08/18	06/14/18	KWG1802883	
Benzo(a)pyrene	**280**	D	52	4.0	2	06/08/18	06/14/18	KWG1802883	
Indeno(1,2,3-cd)pyrene	**240**	D	52	3.8	2	06/08/18	06/14/18	KWG1802883	
Dibenz(a,h)anthracene	**61**	D	52	2.4	2	06/08/18	06/14/18	KWG1802883	
Benzo(g,h,i)perylene	**310**	D	52	4.2	2	06/08/18	06/14/18	KWG1802883	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	79	38-104	06/14/18	Acceptable
Fluoranthene-d10	86	39-109	06/14/18	Acceptable
Terphenyl-d14	91	38-113	06/14/18	Acceptable

† Analyte Comments

Benzo(b)fluoranthene	This analyte cannot be separated from Benzo(j)fluoranthene.

Comments:

Semivolatile Organic Compounds by GC

ALS Environmental—Jacksonville Laboratory
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Analytical Report

Client:	Portland, City of	**Service Request:**	K1805182
Project:	CBWTP Biosolids/W18F004	**Date Collected:**	06/01/18 00:00
Sample Matrix:	Biosolids Solids	**Date Received:**	06/04/18 13:35
Sample Name:	W18F004-01	**Units:**	ug/Kg
Lab Code:	K1805182-001	**Basis:**	Dry

Organochlorine Pesticides by Gas Chromatography

Analysis Method: 8081A
Prep Method: EPA 3546

Analyte Name	Result	PQL	MDL	Dil.	Date Analyzed	Date Extracted	Q
4,4'-DDD	4.84 U	12.2	4.84	1	06/15/18 01:43	6/14/18	*
4,4'-DDE	5.33 U	12.2	5.33	1	06/15/18 01:43	6/14/18	
4,4'-DDT	8.03 U	12.2	8.03	1	06/15/18 01:43	6/14/18	*
Aldrin	5.34 U	12.2	5.34	1	06/15/18 01:43	6/14/18	
alpha-BHC	3.73 U	12.2	3.73	1	06/15/18 01:43	6/14/18	
alpha-Chlordane	3.97 U	12.2	3.97	1	06/15/18 01:43	6/14/18	
beta-BHC	3.93 U	12.2	3.93	1	06/15/18 01:43	6/14/18	
Chlordane	76.7 U	244	76.7	1	06/15/18 01:43	6/14/18	
delta-BHC	3.93 U	12.2	3.93	1	06/15/18 01:43	6/14/18	
Dieldrin	6.41 U	12.2	6.41	1	06/15/18 01:43	6/14/18	
Endosulfan I	5.28 U	12.2	5.28	1	06/15/18 01:43	6/14/18	
Endosulfan II	7.49 U	12.2	7.49	1	06/15/18 01:43	6/14/18	
Endosulfan Sulfate	**37.8**	12.2	7.14	1	06/15/18 00:00	6/14/18	
Endrin	8.89 U	12.2	8.89	1	06/15/18 01:43	6/14/18	
Endrin Aldehyde	7.15 U	12.2	7.15	1	06/15/18 01:43	6/14/18	
Endrin Ketone	5.75 U	12.2	5.75	1	06/15/18 01:43	6/14/18	
gamma-BHC (Lindane)	7.67 U	12.2	7.67	1	06/15/18 01:43	6/14/18	
gamma-Chlordane	3.93 U	12.2	3.93	1	06/15/18 01:43	6/14/18	
Heptachlor	7.67 U	12.2	7.67	1	06/15/18 01:43	6/14/18	
Heptachlor Epoxide	6.12 U	12.2	6.12	1	06/15/18 01:43	6/14/18	
Methoxychlor	5.19 U	24.4	5.19	1	06/15/18 01:43	6/14/18	*
Toxaphene	92.0 U	244	92.0	1	06/15/18 01:43	6/14/18	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Decachlorobiphenyl	89	32 - 170	06/15/18 00:00	
Tetrachloro-m-xylene	93	10 - 147	06/15/18 00:00	

City of Portland
Water Pollution Control Laboratory
6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656
ORELAP Certification ID 4023

LABORATORY ANALYSIS REPORT

Project:	**CBWTP Biosolids**	Client:	Wastewater Group
Work Order:	**W18I002**	Project Mgr:	Greg Charr
Received:	9/1/18 8:45		
Submitted By:	CBWTP		

Sample	Laboratory ID	Matrix	Type	Sample Collection Date Start	End	Qualifier
CB BPC 1-30 day/qtr comp	W18I002-01	Biosolid	Composite, 1 month	08/01/18 00:00	08/31/18 23:59	

CB BPC 1-30 day/qtr comp : W18I002-01

Analyte	Result	Units	MRL	Dil.	Batch	Prepared	Analyzed	Method	Qualifier
General Chemistry									
pH	**7.8**	pH Units	0.1		B18I033	09/04/18	09/04/18	EPA 9045	
Total solids	**14.4**	% W/W	0.01		B18I032	09/04/18	09/05/18	SM 2540G	
Volatile solids	**66.7**	% W/W	0.01		B18I032	09/04/18	09/05/18	SM 2540G	
Nutrients									
Ammonia-nitrogen	**12700**	mg/kg dry	685	20	B18I158	09/13/18	09/17/18	EPA 350.1	
Bromide	<6.8	mg/kg dry	6.8	1	B18I231	09/18/18	09/18/18	EPA 300.0	
Chloride	**280**	mg/kg dry	68	1	B18I231	09/18/18	09/18/18	EPA 300.0	
Fluoride	<68	mg/kg dry	68	1	B18I231	09/18/18	09/18/18	EPA 300.0	
Nitrate-nitrogen	<6.8	mg/kg dry	6.8	1	B18I231	09/18/18	09/18/18	EPA 300.0	
Total Kjeldahl nitrogen (TKN)	**63600**	mg/kg dry	5290	40	B18I179	09/13/18	09/17/18	EPA 351.2	
Total Metals									
Total Metals by ICPMS									
Aluminum	**9650**	mg/kg dry	66.7	20	B18I111	09/11/18	09/11/18	EPA 6020	
Antimony	**4.39**	mg/kg dry	0.667	20	B18I111	09/11/18	09/11/18	EPA 6020	
Arsenic	**4.08**	mg/kg dry	0.480	20	B18I111	09/11/18	09/11/18	EPA 6020	
Barium	**196**	mg/kg dry	3.33	20	B18I111	09/11/18	09/11/18	EPA 6020	
Beryllium	<0.667	mg/kg dry	0.667	20	B18I111	09/11/18	09/11/18	EPA 6020	
Boron	**24.0**	mg/kg dry	3.33	20	B18I111	09/11/18	09/11/18	EPA 6020	
Cadmium	**2.30**	mg/kg dry	0.667	20	B18I111	09/11/18	09/11/18	EPA 6020	
Chromium	**51.2**	mg/kg dry	3.33	20	B18I111	09/11/18	09/11/18	EPA 6020	
Cobalt	**7.48**	mg/kg dry	1.33	20	B18I111	09/11/18	09/11/18	EPA 6020	
Copper	**295**	mg/kg dry	0.192	20	B18I111	09/11/18	09/11/18	EPA 6020	
Iron	**19500**	mg/kg dry	66.7	20	B18I111	09/11/18	09/11/18	EPA 6020	
Lead	**39.5**	mg/kg dry	0.096	20	B18I111	09/11/18	09/11/18	EPA 6020	
Manganese	**534**	mg/kg dry	1.33	20	B18I111	09/11/18	09/11/18	EPA 6020	
Mercury	**0.646**	mg/kg dry	0.00960	20	B18I111	09/11/18	09/11/18	EPA 6020	M2
Molybdenum	**10.9**	mg/kg dry	0.096	20	B18I111	09/11/18	09/11/18	EPA 6020	
Nickel	**45.0**	mg/kg dry	0.192	20	B18I111	09/11/18	09/11/18	EPA 6020	
Selenium	**5.14**	mg/kg dry	0.960	20	B18I111	09/11/18	09/11/18	EPA 6020	

Reported: 10/26/18 12:01

The results in this report apply only to the samples analyzed. Qualifiers and case narrative comments are essential to interpretation of the analytical results. Report reproductions and/or data summaries without qualifiers and comments are incomplete.

Jennifer Shackelford

Jennifer Shackelford, Laboratory Coordinator QA/QC

City of Portland
Water Pollution Control Laboratory
6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656
ORELAP Certification ID 4023

Project:	**CBWTP Biosolids**	Client:	Wastewater Group
Work Order:	**W18I002**	Received:	09/01/18 08:45

Analyte	Result	Units	MRL	Dil.	Batch	Prepared	Analyzed	Method	Qualifier
Total Metals									
Total Metals by ICPMS									
Silver	**4.11**	mg/kg dry	0.667	20	B18I111	09/11/18	09/11/18	EPA 6020	M2
Thallium	<0.667	mg/kg dry	0.667	20	B18I111	09/11/18	09/11/18	EPA 6020	
Tin	**31.0**	mg/kg dry	1.33	20	B18I111	09/11/18	09/11/18	EPA 6020	
Titanium	**991**	mg/kg dry	0.192	20	B18I111	09/11/18	09/11/18	EPA 6020	
Vanadium	**44.6**	mg/kg dry	0.667	20	B18I111	09/11/18	09/11/18	EPA 6020	
Zinc	**1070**	mg/kg dry	0.480	20	B18I111	09/11/18	09/11/18	EPA 6020	
Phosphorus	**22100**	mg/kg dry	66.7	20	B18I111	09/11/18	09/11/18	EPA 6020	
Magnesium	**7410**	mg/kg dry	66.7	20	B18I111	09/11/18	09/11/18	EPA 6020	
Potassium	**2390**	mg/kg dry	333	20	B18I111	09/11/18	09/11/18	EPA 6020	
Sodium	**717**	mg/kg dry	333	20	B18I111	09/11/18	09/11/18	EPA 6020	
Polychlorinated Biphenyls (PCBs)									
PCB Aroclors by GC-ECD									
Aroclor 1016/1242	<67.5	ug/kg dry	67.5	1	B18I140	09/12/18	09/13/18	EPA 8082	
Aroclor 1221	<135	ug/kg dry	135	1	B18I140	09/12/18	09/13/18	EPA 8082	
Aroclor 1232	<67.5	ug/kg dry	67.5	1	B18I140	09/12/18	09/13/18	EPA 8082	
Aroclor 1248	<67.5	ug/kg dry	67.5	1	B18I140	09/12/18	09/13/18	EPA 8082	
Aroclor 1254	<67.5	ug/kg dry	67.5	1	B18I140	09/12/18	09/13/18	EPA 8082	
Aroclor 1260	<67.5	ug/kg dry	67.5	1	B18I140	09/12/18	09/13/18	EPA 8082	
Surrogate	***Result***		***Expected***	***%Rec***	***Limits(%)***				
Tetrachloro-m-xylene	*66.1*	ug/kg dry	*67.5*	*98%*	*54.6-118*	*B18I140*	*09/12/18*	*09/13/18*	*EPA 8082*
Decachlorobiphenyl	*38.3*	ug/kg dry	*67.5*	*57%*	*44.5-151*	*B18I140*	*09/12/18*	*09/13/18*	*EPA 8082*

Qualifiers

M2	Matrix duplicate precision measurement indicates non-homogeneous sample matrix.

Definitions

DET	Analyte Detected	ND	Analyte Not Detected at or above the reporting limit
MRL	Method Reporting Limit	MDL	Method Detection Limit
NR	Not Reportable	dry	Sample results reported on a dry weight basis
% Rec.	Percent Recovery	RPD	Relative Percent Difference
*	This analyte is not certified under NELAP		

Reported: 10/26/18 12:01

Jennifer Shackelford

Jennifer Shackelford, Laboratory Coordinator QA/QC

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Volatile Organic Compounds by GC/MS

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

Analytical Report

Client:	Portland, City of	**Service Request:**	K1808422
Project:	CBWTP Biosolids/W18I002	**Date Collected:**	08/31/18 23:59
Sample Matrix:	Biosolids Solids	**Date Received:**	09/05/18 11:50
Sample Name:	W18I002-01	**Units:**	mg/Kg
Lab Code:	K1808422-001	**Basis:**	Dry

Volatile Organic Compounds

Analysis Method: 8260C
Prep Method: EPA 5030A/5030B

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Chloromethane	ND U	3.3	0.45	1	09/17/18 16:18	9/17/18	
Vinyl Chloride	ND U	3.3	0.50	1	09/17/18 16:18	9/17/18	
Bromomethane	ND U	3.3	1.1	1	09/17/18 16:18	9/17/18	
Chloroethane	ND U	3.3	1.1	1	09/17/18 16:18	9/17/18	
Acrolein	ND U	140	7.9	1	09/17/18 16:18	9/17/18	
1,1-Dichloroethene (1,1-DCE)	ND U	3.3	0.53	1	09/17/18 16:18	9/17/18	
Carbon Disulfide	ND U	3.3	0.46	1	09/17/18 16:18	9/17/18	
Dichloromethane (Methylene Chloride)	**2.5 J**	14	0.66	1	09/17/18 16:18	9/17/18	
Acrylonitrile	ND U	140	3.5	1	09/17/18 16:18	9/17/18	
trans-1,2-Dichloroethene	ND U	3.3	0.48	1	09/17/18 16:18	9/17/18	
1,1-Dichloroethane (1,1-DCA)	ND U	3.3	0.51	1	09/17/18 16:18	9/17/18	
cis-1,2-Dichloroethene	ND U	3.3	0.44	1	09/17/18 16:18	9/17/18	
Chloroform	ND U	3.3	0.48	1	09/17/18 16:18	9/17/18	
1,1,1-Trichloroethane (TCA)	ND U	3.3	0.50	1	09/17/18 16:18	9/17/18	
Carbon Tetrachloride	ND U	3.3	0.63	1	09/17/18 16:18	9/17/18	
Benzene	ND U	3.3	0.41	1	09/17/18 16:18	9/17/18	
1,2-Dichloroethane (EDC)	ND U	3.3	0.53	1	09/17/18 16:18	9/17/18	
Trichloroethene (TCE)	ND U	3.3	0.66	1	09/17/18 16:18	9/17/18	
1,2-Dichloropropane	ND U	3.3	0.63	1	09/17/18 16:18	9/17/18	
Bromodichloromethane	ND U	3.3	0.60	1	09/17/18 16:18	9/17/18	
2-Chloroethyl Vinyl Ether	ND U	33	1.1	1	09/17/18 16:18	9/17/18	
cis-1,3-Dichloropropene	ND U	3.3	1.2	1	09/17/18 16:18	9/17/18	
4-Methyl-2-pentanone (MIBK)	ND U	140	18	1	09/17/18 16:18	9/17/18	
Toluene	ND U	3.3	0.36	1	09/17/18 16:18	9/17/18	
trans-1,3-Dichloropropene	ND U	3.3	0.45	1	09/17/18 16:18	9/17/18	
1,1,2-Trichloroethane	ND U	3.3	0.92	1	09/17/18 16:18	9/17/18	
Tetrachloroethene (PCE)	ND U	3.3	0.65	1	09/17/18 16:18	9/17/18	
Dibromochloromethane	ND U	3.3	0.92	1	09/17/18 16:18	9/17/18	
Chlorobenzene	ND U	3.3	0.73	1	09/17/18 16:18	9/17/18	
Ethylbenzene	ND U	3.3	0.33	1	09/17/18 16:18	9/17/18	
Bromoform	ND U	3.3	1.1	1	09/17/18 16:18	9/17/18	
1,1,2,2-Tetrachloroethane	ND U	3.3	1.1	1	09/17/18 16:18	9/17/18	

Analytical Report

Client:	Portland, City of	**Service Request:**	K1808422
Project:	CBWTP Biosolids/W18I002	**Date Collected:**	08/31/18 23:59
Sample Matrix:	Biosolids Solids	**Date Received:**	09/05/18 11:50
Sample Name:	W18I002-01	**Units:**	mg/Kg
Lab Code:	K1808422-001	**Basis:**	Dry

Volatile Organic Compounds

Analysis Method: 8260C
Prep Method: EPA 5030A/5030B

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Dibromofluoromethane	119	55 - 132	09/17/18 16:18	
Toluene-d8	119	81 - 124	09/17/18 16:18	
4-Bromofluorobenzene	108	64 - 132	09/17/18 16:18	

Semivolatile Organic Compounds by GC/MS

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Phone (360) 577-7222 Fax (360) 425-9096
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Client:	Portland, City of	**Service Request:**	K1808422
Project:	CBWTP Biosolids/W18I002	**Date Collected:**	08/31/18 23:59
Sample Matrix:	Biosolids Solids	**Date Received:**	09/05/18 11:50
Sample Name:	W18I002-01	**Units:**	mg/Kg
Lab Code:	K1808422-001	**Basis:**	Dry

Semivolatile Organic Compounds by GC/MS

Analysis Method: 8270D
Prep Method: EPA 3541

Analyte Name	Result		MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
1,2,4-Trichlorobenzene	ND	U	83	2.8	5	09/14/18 22:07	9/10/18	
1,2-Dichlorobenzene	ND	U	83	4.6	5	09/14/18 22:07	9/10/18	
1,2-Diphenylhydrazine	ND	U	83	3.6	5	09/14/18 22:07	9/10/18	
1,3-Dichlorobenzene	ND	U	83	4.6	5	09/14/18 22:07	9/10/18	
1,4-Dichlorobenzene	ND	U	83	4.6	5	09/14/18 22:07	9/10/18	
2,4,5-Trichlorophenol	ND	U	83	4.6	5	09/14/18 22:07	9/10/18	
2,4,6-Trichlorophenol	ND	U	83	3.6	5	09/14/18 22:07	9/10/18	
2,4-Dichlorophenol	ND	U	83	4.1	5	09/14/18 22:07	9/10/18	
2,4-Dimethylphenol	ND	U	83	3.8	5	09/14/18 22:07	9/10/18	
2,4-Dinitrophenol	ND	U	500	28	5	09/14/18 22:07	9/10/18	
2,4-Dinitrotoluene	ND	U	83	3.8	5	09/14/18 22:07	9/10/18	
2,6-Dinitrotoluene	ND	U	83	4.1	5	09/14/18 22:07	9/10/18	
2-Chloronaphthalene	ND	U	83	2.6	5	09/14/18 22:07	9/10/18	
2-Chlorophenol	ND	U	83	2.5	5	09/14/18 22:07	9/10/18	
2-Methyl-4,6-dinitrophenol	ND	U	500	36	5	09/14/18 22:07	9/10/18	
2-Nitrophenol	ND	U	83	3.6	5	09/14/18 22:07	9/10/18	
3,3'-Dichlorobenzidine	ND	U	83	6.8	5	09/14/18 22:07	9/10/18	
4-Bromophenyl Phenyl Ether	ND	U	83	3.1	5	09/14/18 22:07	9/10/18	
4-Chloro-3-methylphenol	ND	U	83	4.3	5	09/14/18 22:07	9/10/18	
4-Chloroaniline	ND	U	83	3.6	5	09/14/18 22:07	9/10/18	
4-Chlorophenyl Phenyl Ether	ND	U	83	4.1	5	09/14/18 22:07	9/10/18	
4-Nitrophenol	ND	U	500	38	5	09/14/18 22:07	9/10/18	
Benzidine	ND	U	500	110	5	09/14/18 22:07	9/10/18	*
Bis(2-chloroethoxy)methane	ND	U	83	2.8	5	09/14/18 22:07	9/10/18	
Bis(2-chloroethyl) Ether	ND	U	83	3.1	5	09/14/18 22:07	9/10/18	
Bis(2-ethylhexyl) Phthalate	**15**	**J**	83	4.8	5	09/14/18 22:07	9/10/18	
Butyl Benzyl Phthalate	ND	U	83	4.1	5	09/14/18 22:07	9/10/18	
Dibenzofuran	ND	U	83	3.1	5	09/14/18 22:07	9/10/18	
Diethyl Phthalate	ND	U	83	3.6	5	09/14/18 22:07	9/10/18	
Dimethyl Phthalate	ND	U	83	4.1	5	09/14/18 22:07	9/10/18	
Di-n-butyl Phthalate	ND	U	83	3.1	5	09/14/18 22:07	9/10/18	
Di-n-octyl Phthalate	ND	U	83	6.1	5	09/14/18 22:07	9/10/18	
Fluoranthene	**56**	**J**	84	2.8	5	09/14/18 22:07	9/10/18	
Fluorene	ND	U	83	3.3	5	09/14/18 22:07	9/10/18	
Hexachlorobenzene	ND	U	83	3.8	5	09/14/18 22:07	9/10/18	
Hexachlorobutadiene	ND	U	83	3.6	5	09/14/18 22:07	9/10/18	
Hexachlorocyclopentadiene	ND	U	83	3.1	5	09/14/18 22:07	9/10/18	
Hexachloroethane	ND	U	83	5.6	5	09/14/18 22:07	9/10/18	
Indeno(1,2,3-cd)pyrene	ND	U	83	9.9	5	09/14/18 22:07	9/10/18	
Isophorone	ND	U	83	3.6	5	09/14/18 22:07	9/10/18	
Naphthalene	ND	U	83	3.6	5	09/14/18 22:07	9/10/18	
Nitrobenzene	ND	U	83	6.6	5	09/14/18 22:07	9/10/18	
N-Nitrosodimethylamine	ND	U	500	6.3	5	09/14/18 22:07	9/10/18	

Client:	Portland, City of	**Service Request:**	K1808422
Project:	CBWTP Biosolids/W18I002	**Date Collected:**	08/31/18 23:59
Sample Matrix:	Biosolids Solids	**Date Received:**	09/05/18 11:50
Sample Name:	W18I002-01	**Units:**	mg/Kg
Lab Code:	K1808422-001	**Basis:**	Dry

Semivolatile Organic Compounds by GC/MS

Analysis Method: 8270D
Prep Method: EPA 3541

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
N-Nitrosodi-n-propylamine	ND U	83	4.8	5	09/14/18 22:07	9/10/18	
N-Nitrosodiphenylamine	ND U	83	4.6	5	09/14/18 22:07	9/10/18	
Pentachlorophenol	ND U	500	33	5	09/14/18 22:07	9/10/18	
Phenanthrene	ND U	83	2.6	5	09/14/18 22:07	9/10/18	
Phenol	ND U	83	4.8	5	09/14/18 22:07	9/10/18	
Pyrene	ND U	83	3.6	5	09/14/18 22:07	9/10/18	
2,2'-Oxybis(1-chloropropane)	ND U	83	3.6	5	09/14/18 22:07	9/10/18	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
2,4,6-Tribromophenol	0	20 - 123	09/14/18 22:07	*
2-Fluorobiphenyl	33	32 - 104	09/14/18 22:07	
2-Fluorophenol	18	20 - 83	09/14/18 22:07	*
Nitrobenzene-d5	27	29 - 116	09/14/18 22:07	*
Phenol-d6	23	26 - 106	09/14/18 22:07	*
Terphenyl-d14	51	37 - 133	09/14/18 22:07	

Client:	Portland, City of	**Service Request:**	K1808422
Project:	CBWTP Biosolids/W18I002	**Date Collected:**	08/31/18 23:59
Sample Matrix:	Biosolids Solids	**Date Received:**	09/05/18 11:50
Sample Name:	W18I002-01	**Units:**	ug/Kg
Lab Code:	K1808422-001	**Basis:**	Dry

Polynuclear Aromatic Hydrocarbons

Analysis Method: 8270D SIM
Prep Method: EPA 3546

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Naphthalene	**65**	34	3.2	1	09/19/18 13:31	9/10/18	
2-Methylnaphthalene	**120**	34	2.5	1	09/19/18 13:31	9/10/18	
Acenaphthylene	**26** **J**	34	1.9	1	09/19/18 13:31	9/10/18	
Acenaphthene	**84**	34	2.0	1	09/19/18 13:31	9/10/18	
Fluorene	**110**	34	3.8	1	09/19/18 13:31	9/10/18	
Phenanthrene	**580**	34	4.0	1	09/19/18 13:31	9/10/18	
Anthracene	**95**	34	2.0	1	09/19/18 13:31	9/10/18	
Fluoranthene	**610**	34	4.2	1	09/19/18 13:31	9/10/18	
Pyrene	**720**	34	2.2	1	09/19/18 13:31	9/10/18	
Benz(a)anthracene	**230**	34	1.6	1	09/19/18 13:31	9/10/18	
Chrysene	**320**	34	2.1	1	09/19/18 13:31	9/10/18	
Benzo(b)fluoranthene	**240**	34	2.0	1	09/19/18 13:31	9/10/18	
Benzo(k)fluoranthene	**89**	34	1.6	1	09/19/18 13:31	9/10/18	
Benzo(e)pyrene	**170**	34	2.0	1	09/19/18 13:31	9/10/18	
Benzo(a)pyrene	**180**	34	2.6	1	09/19/18 13:31	9/10/18	
Indeno(1,2,3-cd)pyrene	**150**	34	2.4	1	09/19/18 13:31	9/10/18	
Dibenz(a,h)anthracene	**32** **J**	34	1.6	1	09/19/18 13:31	9/10/18	
Benzo(g,h,i)perylene	**180**	34	2.7	1	09/19/18 13:31	9/10/18	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Fluorene-d10	72	38 - 104	09/19/18 13:31	
Fluoranthene-d10	78	39 - 109	09/19/18 13:31	
p-Terphenyl-d14	82	38 - 113	09/19/18 13:31	

Semivolatile Organic Compounds by GC

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Client:	Portland, City of	**Service Request:**	K1808422
Project:	CBWTP Biosolids/W18I002	**Date Collected:**	08/31/18 23:59
Sample Matrix:	BIOSOLIDS SOLID	**Date Received:**	09/05/18 11:50
Sample Name:	W18I002-01	**Units:**	ug/Kg
Lab Code:	K1808422-001	**Basis:**	Dry

Organochlorine Pesticides

Analysis Method: 8081B
Prep Method: EPA 3546

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
alpha-BHC	ND Ui	32	13	5	09/17/18 18:08	9/10/18	
beta-BHC	ND Ui	32	13	5	09/17/18 18:08	9/10/18	
gamma-BHC (Lindane)	ND U	32	9.8	5	09/17/18 18:08	9/10/18	
delta-BHC	ND U	32	8.9	5	09/17/18 18:08	9/10/18	
Heptachlor	ND U	32	13	5	09/17/18 18:08	9/10/18	
Aldrin	ND U	32	19	5	09/17/18 18:08	9/10/18	
Heptachlor Epoxide	ND U	32	21	5	09/17/18 18:08	9/10/18	
gamma-Chlordane	ND U	32	12	5	09/17/18 18:08	9/10/18	
Endosulfan I	ND U	32	12	5	09/17/18 18:08	9/10/18	
alpha-Chlordane	ND U	32	13	5	09/17/18 18:08	9/10/18	
Dieldrin	ND U	32	7.0	5	09/17/18 18:08	9/10/18	
4,4'-DDE	ND U	32	13	5	09/17/18 18:08	9/10/18	
Endrin	ND U	32	11	5	09/17/18 18:08	9/10/18	
Endosulfan II	ND U	32	22	5	09/17/18 18:08	9/10/18	
4,4'-DDD	ND U	32	19	5	09/17/18 18:08	9/10/18	
Endrin Aldehyde	ND U	32	29	5	09/17/18 18:08	9/10/18	
Endosulfan Sulfate	ND U	32	32	5	09/17/18 18:08	9/10/18	
4,4'-DDT	ND Ui	95	95	5	09/17/18 18:08	9/10/18	
Endrin Ketone	ND U	32	15	5	09/17/18 18:08	9/10/18	
Methoxychlor	ND U	32	23	5	09/17/18 18:08	9/10/18	
Toxaphene	ND U	3200	1100	5	09/17/18 18:08	9/10/18	
Chlordane	ND U	320	160	5	09/17/18 18:08	9/10/18	

Surrogate Name		% Rec	Control Limits	Date Analyzed	Q
Tetrachloro-m-xylene	**D**	122	70 - 130	09/17/18 18:08	
Decachlorobiphenyl	**D**	214	70 - 130	09/17/18 18:08	*

Volatile Organic Compounds by GC/MS

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City of Portland
Water Pollution Control Laboratory
6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656
ORELAP Certification ID 4023

LABORATORY ANALYSIS REPORT

Project:	**CBWTP Biosolids**	Client:	Wastewater Group
Work Order:	**W18L003**	Project Mgr:	Greg Charr
Received:	12/1/18 8:45		
Submitted By:	CBWTP		

Sample	Laboratory ID	Matrix	Type	Sample Collection Date Start	End	Qualifier
CB BPC 1-30 day/qtr comp	W18L003-01	Biosolid	Composite, 1 month	11/01/18 00:00	11/30/18 23:59	
CB BPC SYN 1-30 day comp	W18L003-02	Biosolid	Composite, 1 month	11/01/18 00:00	11/30/18 23:59	

Analyte	Result	Units	MRL	Dil.	Batch	Prepared	Analyzed	Method	Qualifier
General Chemistry									
pH									
CB BPC 1-30 day/qtr comp : W18L003-01									
pH	**7.9**	pH Units	0.1		B18L088	12/06/18	12/06/18	EPA 9045	
CB BPC SYN 1-30 day comp : W18L003-02									
pH	**7.7**	pH Units	0.1		B18L088	12/06/18	12/06/18	EPA 9045	
Total Solids									
CB BPC 1-30 day/qtr comp : W18L003-01									
Total solids	**15.9**	% W/W	0.01		B18L028	12/03/18	12/04/18	SM 2540G	
CB BPC SYN 1-30 day comp : W18L003-02									
Total solids	**18.7**	% W/W	0.01		B18L028	12/03/18	12/04/18	SM 2540G	
Nutrients									
Ammonia-Nitrogen									
CB BPC 1-30 day/qtr comp : W18L003-01									
Ammonia-nitrogen	**10900**	mg/kg dry	596	20	B18L057	12/05/18	12/06/18	EPA 350.1	
CB BPC SYN 1-30 day comp : W18L003-02									
Ammonia-nitrogen	**13700**	mg/kg dry	517	20	B18L057	12/05/18	12/06/18	EPA 350.1	
Bromide									
CB BPC 1-30 day/qtr comp : W18L003-01									
Bromide	<6.0	mg/kg dry	6.0	1	B18L070	12/05/18	12/05/18	EPA 300.0	
CB BPC SYN 1-30 day comp : W18L003-02									
Bromide	**5.4**	mg/kg dry	5.0	1	B18L070	12/05/18	12/05/18	EPA 300.0	
Chloride									
CB BPC 1-30 day/qtr comp : W18L003-01									
Chloride	**250**	mg/kg dry	60	1	B18L070	12/05/18	12/05/18	EPA 300.0	
CB BPC SYN 1-30 day comp : W18L003-02									

Reported: 01/10/19 13:39

The results in this report apply only to the samples analyzed. Qualifiers and case narrative comments are essential to interpretation of the analytical results. Report reproductions and/or data summaries without qualifiers and comments are incomplete.

Jennifer Shackelford

Jennifer Shackelford, Laboratory Coordinator QA/QC

City of Portland
Water Pollution Control Laboratory
6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656
ORELAP Certification ID 4023

Project:	**CBWTP Biosolids**	Client:	Wastewater Group
Work Order:	**W18L003**	Received:	12/01/18 08:45

Analyte	Result	Units	MRL	Dil.	Batch	Prepared	Analyzed	Method	Qualifier
Nutrients									
Chloride									
CB BPC SYN 1-30 day comp : W18L003-02									
Chloride	**330**	mg/kg dry	50	1	B18L070	12/05/18	12/05/18	EPA 300.0	
Fluoride									
CB BPC 1-30 day/qtr comp : W18L003-01									
Fluoride	<60	mg/kg dry	60	1	B18L070	12/05/18	12/05/18	EPA 300.0	
CB BPC SYN 1-30 day comp : W18L003-02									
Fluoride	<50	mg/kg dry	50	1	B18L070	12/05/18	12/05/18	EPA 300.0	
Nitrate									
CB BPC 1-30 day/qtr comp : W18L003-01RE1									
Nitrate-nitrogen	<6.9	mg/kg dry	6.9	1	B18L192	12/05/18	12/20/18	EPA 300.0	
CB BPC SYN 1-30 day comp : W18L003-02RE1									
Nitrate-nitrogen	<5.3	mg/kg dry	5.3	1	B18L192	12/05/18	12/20/18	EPA 300.0	
Total Kjeldahl Nitrogen									
CB BPC 1-30 day/qtr comp : W18L003-01									
Total Kjeldahl nitrogen (TKN)	**58800**	mg/kg dry	4620	40	B18L033	12/03/18	12/04/18	EPA 351.2	
CB BPC SYN 1-30 day comp : W18L003-02									
Total Kjeldahl nitrogen (TKN)	**56500**	mg/kg dry	4190	40	B18L033	12/03/18	12/04/18	EPA 351.2	

Reported: 01/10/19 13:39

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Jennifer Shackelford

Jennifer Shackelford, Laboratory Coordinator QA/QC

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Water Pollution Control Laboratory
6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656
ORELAP Certification ID 4023

Project:	**CBWTP Biosolids**	Client:	Wastewater Group
Work Order:	**W18L003**	Received:	12/01/18 08:45

Total Metals

Total Metals by ICPMS

Analyte	Result	Units	MRL	Dil.	Batch	Prepared	Analyzed	Method	Qualifier
CB BPC 1-30 day/qtr comp : W18L003-01									
Aluminum	**11700**	mg/kg dry	87.4	20	B18L071	12/05/18	12/12/18	EPA 6020	
Antimony	**4.61**	mg/kg dry	0.349	20	B18L071	12/05/18	12/12/18	EPA 6020	
Arsenic	**4.77**	mg/kg dry	0.056	20	B18L071	12/05/18	12/12/18	EPA 6020	
Barium	**219**	mg/kg dry	6.99	20	B18L071	12/05/18	12/12/18	EPA 6020	
Beryllium	<0.349	mg/kg dry	0.349	20	B18L071	12/05/18	12/12/18	EPA 6020	
Boron	**21.7**	mg/kg dry	1.75	20	B18L071	12/05/18	12/12/18	EPA 6020	
Cadmium	**2.39**	mg/kg dry	0.349	20	B18L071	12/05/18	12/12/18	EPA 6020	
Chromium	**45.4**	mg/kg dry	0.699	20	B18L071	12/05/18	12/12/18	EPA 6020	
Cobalt	**7.63**	mg/kg dry	0.349	20	B18L071	12/05/18	12/12/18	EPA 6020	
Copper	**314**	mg/kg dry	0.444	20	B18L071	12/05/18	12/12/18	EPA 6020	
Iron	**22500**	mg/kg dry	87.4	20	B18L071	12/05/18	12/12/18	EPA 6020	
Lead	**72.3**	mg/kg dry	0.056	20	B18L071	12/05/18	12/12/18	EPA 6020	
Manganese	**449**	mg/kg dry	0.699	20	B18L071	12/05/18	12/12/18	EPA 6020	
Mercury	**0.865**	mg/kg dry	0.00556	20	B18L071	12/05/18	12/12/18	EPA 6020	
Molybdenum	**11.3**	mg/kg dry	0.056	20	B18L071	12/05/18	12/12/18	EPA 6020	
Nickel	**40.2**	mg/kg dry	0.444	20	B18L071	12/05/18	12/12/18	EPA 6020	
Selenium	**4.77**	mg/kg dry	1.11	20	B18L071	12/05/18	12/12/18	EPA 6020	
Silver	**8.53**	mg/kg dry	0.349	20	B18L071	12/05/18	12/12/18	EPA 6020	
Thallium	<0.349	mg/kg dry	0.349	20	B18L071	12/05/18	12/12/18	EPA 6020	
Tin	**34.0**	mg/kg dry	0.349	20	B18L071	12/05/18	12/12/18	EPA 6020	
Titanium	**1030**	mg/kg dry	1.11	20	B18L071	12/05/18	12/12/18	EPA 6020	
Vanadium	**61.2**	mg/kg dry	0.699	20	B18L071	12/05/18	12/12/18	EPA 6020	
Zinc	**1220**	mg/kg dry	1.11	20	B18L071	12/05/18	12/12/18	EPA 6020	
Phosphorus	**19100**	mg/kg dry	34.9	20	B18L071	12/05/18	12/12/18	EPA 6020	
Magnesium	**5700**	mg/kg dry	87.4	20	B18L071	12/05/18	12/12/18	EPA 6020	
Potassium	**2390**	mg/kg dry	699	20	B18L071	12/05/18	12/12/18	EPA 6020	
Sodium	**707**	mg/kg dry	349	20	B18L071	12/05/18	12/12/18	EPA 6020	
CB BPC SYN 1-30 day comp : W18L003-02									
Aluminum	**12600**	mg/kg dry	73.1	20	B18L071	12/05/18	12/12/18	EPA 6020	
Antimony	**3.94**	mg/kg dry	0.292	20	B18L071	12/05/18	12/12/18	EPA 6020	
Arsenic	**4.55**	mg/kg dry	0.055	20	B18L071	12/05/18	12/12/18	EPA 6020	
Barium	**229**	mg/kg dry	5.84	20	B18L071	12/05/18	12/12/18	EPA 6020	
Beryllium	**0.336**	mg/kg dry	0.292	20	B18L071	12/05/18	12/12/18	EPA 6020	
Boron	**22.8**	mg/kg dry	1.46	20	B18L071	12/05/18	12/12/18	EPA 6020	
Cadmium	**2.56**	mg/kg dry	0.292	20	B18L071	12/05/18	12/12/18	EPA 6020	
Chromium	**52.0**	mg/kg dry	0.584	20	B18L071	12/05/18	12/12/18	EPA 6020	
Cobalt	**7.52**	mg/kg dry	0.292	20	B18L071	12/05/18	12/12/18	EPA 6020	
Copper	**332**	mg/kg dry	0.437	20	B18L071	12/05/18	12/12/18	EPA 6020	
Iron	**27900**	mg/kg dry	73.1	20	B18L071	12/05/18	12/12/18	EPA 6020	
Lead	**60.7**	mg/kg dry	0.055	20	B18L071	12/05/18	12/12/18	EPA 6020	
Manganese	**762**	mg/kg dry	0.584	20	B18L071	12/05/18	12/12/18	EPA 6020	
Mercury	**0.538**	mg/kg dry	0.00546	20	B18L071	12/05/18	12/12/18	EPA 6020	

Reported: 01/10/19 13:39

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Jennifer Shackelford

Jennifer Shackelford, Laboratory Coordinator QA/QC

City of Portland
Water Pollution Control Laboratory
6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656
ORELAP Certification ID 4023

Project:	**CBWTP Biosolids**	Client:	Wastewater Group
Work Order:	**W18L003**	Received:	12/01/18 08:45

Analyte	Result	Units	MRL	Dil.	Batch	Prepared	Analyzed	Method	Qualifier
Total Metals									
Total Metals by ICPMS									
CB BPC SYN 1-30 day comp : W18L003-02									
Molybdenum	**11.2**	mg/kg dry	0.055	20	B18L071	12/05/18	12/12/18	EPA 6020	
Nickel	**40.9**	mg/kg dry	0.437	20	B18L071	12/05/18	12/12/18	EPA 6020	
Selenium	**4.88**	mg/kg dry	1.09	20	B18L071	12/05/18	12/12/18	EPA 6020	
Silver	**6.18**	mg/kg dry	0.292	20	B18L071	12/05/18	12/12/18	EPA 6020	
Thallium	<0.292	mg/kg dry	0.292	20	B18L071	12/05/18	12/12/18	EPA 6020	
Tin	**32.4**	mg/kg dry	0.292	20	B18L071	12/05/18	12/12/18	EPA 6020	
Titanium	**1040**	mg/kg dry	1.09	20	B18L071	12/05/18	12/12/18	EPA 6020	
Vanadium	**57.3**	mg/kg dry	0.584	20	B18L071	12/05/18	12/12/18	EPA 6020	
Zinc	**1070**	mg/kg dry	1.09	20	B18L071	12/05/18	12/12/18	EPA 6020	
Phosphorus	**31300**	mg/kg dry	29.2	20	B18L071	12/05/18	12/12/18	EPA 6020	
Magnesium	**13400**	mg/kg dry	73.1	20	B18L071	12/05/18	12/12/18	EPA 6020	
Potassium	**2510**	mg/kg dry	584	20	B18L071	12/05/18	12/12/18	EPA 6020	
Sodium	**515**	mg/kg dry	292	20	B18L071	12/05/18	12/12/18	EPA 6020	
Polychlorinated Biphenyls (PCBs)									
PCB Aroclors by GC-ECD									
CB BPC 1-30 day/qtr comp : W18L003-01									
Aroclor 1016/1242	<59.1	ug/kg dry	59.1	1	B18L262	12/18/18	12/19/18	EPA 8082	
Aroclor 1221	<118	ug/kg dry	118	1	B18L262	12/18/18	12/19/18	EPA 8082	
Aroclor 1232	<59.1	ug/kg dry	59.1	1	B18L262	12/18/18	12/19/18	EPA 8082	
Aroclor 1248	<59.1	ug/kg dry	59.1	1	B18L262	12/18/18	12/19/18	EPA 8082	
Aroclor 1254	<59.1	ug/kg dry	59.1	1	B18L262	12/18/18	12/19/18	EPA 8082	
Aroclor 1260	<59.1	ug/kg dry	59.1	1	B18L262	12/18/18	12/19/18	EPA 8082	
Surrogate	***Result***		***Expected***	***%Rec***	***Limits(%)***				
Tetrachloro-m-xylene	*45.7*	ug/kg dry	*59.1*	*77%*	*54.6-118*	*B18L262*	*12/18/18*	*12/19/18*	*EPA 8082*	
Decachlorobiphenyl	*24.7*	ug/kg dry	*59.1*	*42%*	*44.5-151*	*B18L262*	*12/18/18*	*12/19/18*	*EPA 8082*	*SU1*
CB BPC SYN 1-30 day comp : W18L003-02									
Aroclor 1016/1242	<51.8	ug/kg dry	51.8	1	B18L262	12/18/18	12/19/18	EPA 8082	
Aroclor 1221	<104	ug/kg dry	104	1	B18L262	12/18/18	12/19/18	EPA 8082	
Aroclor 1232	<51.8	ug/kg dry	51.8	1	B18L262	12/18/18	12/19/18	EPA 8082	
Aroclor 1248	<51.8	ug/kg dry	51.8	1	B18L262	12/18/18	12/19/18	EPA 8082	
Aroclor 1254	<51.8	ug/kg dry	51.8	1	B18L262	12/18/18	12/19/18	EPA 8082	
Aroclor 1260	<51.8	ug/kg dry	51.8	1	B18L262	12/18/18	12/19/18	EPA 8082	
Surrogate	***Result***		***Expected***	***%Rec***	***Limits(%)***				
Tetrachloro-m-xylene	*34.5*	ug/kg dry	*51.8*	*67%*	*54.6-118*	*B18L262*	*12/18/18*	*12/19/18*	*EPA 8082*	
Decachlorobiphenyl	*21.9*	ug/kg dry	*51.8*	*42%*	*44.5-151*	*B18L262*	*12/18/18*	*12/19/18*	*EPA 8082*	*SU1*

Reported: 01/10/19 13:39

The results in this report apply only to the samples analyzed. Qualifiers and case narrative comments are essential to interpretation of the analytical results. Report reproductions and/or data summaries without qualifiers and comments are incomplete.

Jennifer Shackelford

Jennifer Shackelford, Laboratory Coordinator QA/QC

Organochlorine Pesticides

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577- 7222 Fax (360)636- 1068
www.alsglobal.com

Analytical Results

Client:	Portland, City of	**Service Request:**	K1811863
Project:	CBWTP Biosolids/W18L003	**Date Collected:**	11/30/2018
Sample Matrix:	Biosolids solid	**Date Received:**	12/05/2018

Organochlorine Pesticides

Sample Name:	W18L003-01	**Units:**	ug/Kg
Lab Code:	K1811863-001	**Basis:**	Dry
Extraction Method:	EPA 3546	**Level:**	Low
Analysis Method:	8081B		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	U	5.6	1.7	1	12/10/18	12/25/18	KWG1806391	
beta-BHC	ND	U	5.6	1.6	1	12/10/18	12/25/18	KWG1806391	
gamma-BHC (Lindane)	ND	U	5.6	1.8	1	12/10/18	12/25/18	KWG1806391	
delta-BHC	ND	U	5.6	1.6	1	12/10/18	12/25/18	KWG1806391	
Heptachlor	ND	U	5.6	2.2	1	12/10/18	12/25/18	KWG1806391	
Aldrin	ND	Ui	5.6	5.3	1	12/10/18	12/25/18	KWG1806391	
Heptachlor Epoxide	ND	U	5.6	3.7	1	12/10/18	12/25/18	KWG1806391	
gamma-Chlordane†	ND	U	5.6	2.2	1	12/10/18	12/25/18	KWG1806391	
Endosulfan I	ND	U	5.6	2.1	1	12/10/18	12/25/18	KWG1806391	
alpha-Chlordane	ND	Ui	9.4	9.4	1	12/10/18	12/25/18	KWG1806391	
Dieldrin	ND	U	5.6	1.3	1	12/10/18	12/25/18	KWG1806391	
4,4'-DDE	ND	U	5.6	2.3	1	12/10/18	12/25/18	KWG1806391	
Endrin	ND	U	5.6	1.8	1	12/10/18	12/25/18	KWG1806391	
Endosulfan II	ND	Ui	5.6	4.7	1	12/10/18	12/25/18	KWG1806391	
4,4'-DDD	ND	Ui	11	11	1	12/10/18	12/25/18	KWG1806391	
Endrin Aldehyde	**9.6**	P	5.6	5.0	1	12/10/18	12/25/18	KWG1806391	*
Endosulfan Sulfate	ND	U	5.6	5.6	1	12/10/18	12/25/18	KWG1806391	
4,4'-DDT	ND	Ui	13	13	1	12/10/18	12/25/18	KWG1806391	
Endrin Ketone	ND	Ui	13	13	1	12/10/18	12/25/18	KWG1806391	
Methoxychlor	ND	Ui	25	25	1	12/10/18	12/25/18	KWG1806391	
Toxaphene	ND	Ui	1600	1600	1	12/10/18	12/25/18	KWG1806391	
Chlordane	ND	U	56	27	1	12/10/18	12/25/18	KWG1806391	

* See Case Narrative

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	67	70-130	12/25/18	Outside Control Limits
Decachlorobiphenyl	96	70-130	12/25/18	Acceptable

† **Analyte Comments**

gamma-Chlordane	For this analyte (CAS Registry No. 5103-74-2), USEPA has corrected the name to be beta-Chlordane, also known as trans-Chlordane.

Comments:

Analytical Results

Client:	Portland, City of	**Service Request:**	K1811863
Project:	CBWTP Biosolids/W18L003	**Date Collected:**	11/30/2018
Sample Matrix:	Biosolids solid	**Date Received:**	12/05/2018

Organochlorine Pesticides

Sample Name:	W18L003-02	**Units:**	ug/Kg
Lab Code:	K1811863-002	**Basis:**	Dry
Extraction Method:	EPA 3546	**Level:**	Low
Analysis Method:	8081B		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	U	4.5	1.3	1	12/10/18	12/25/18	KWG1806391	
beta-BHC	ND	U	4.5	1.2	1	12/10/18	12/25/18	KWG1806391	
gamma-BHC (Lindane)	ND	U	4.5	1.4	1	12/10/18	12/25/18	KWG1806391	
delta-BHC	ND	U	4.5	1.3	1	12/10/18	12/25/18	KWG1806391	
Heptachlor	ND	U	4.5	1.8	1	12/10/18	12/25/18	KWG1806391	
Aldrin	ND	Ui	140	140	1	12/10/18	12/25/18	KWG1806391	
Heptachlor Epoxide	ND	U	4.5	3.0	1	12/10/18	12/25/18	KWG1806391	
gamma-Chlordane†	ND	U	4.5	1.7	1	12/10/18	12/25/18	KWG1806391	
Endosulfan I	ND	U	4.5	1.7	1	12/10/18	12/25/18	KWG1806391	
alpha-Chlordane	ND	Ui	11	11	1	12/10/18	12/25/18	KWG1806391	
Dieldrin	ND	U	4.5	0.98	1	12/10/18	12/25/18	KWG1806391	
4,4'-DDE	ND	U	4.5	1.8	1	12/10/18	12/25/18	KWG1806391	
Endrin	ND	U	4.5	1.5	1	12/10/18	12/25/18	KWG1806391	
Endosulfan II	ND	Ui	6.0	6.0	1	12/10/18	12/25/18	KWG1806391	
4,4'-DDD	**9.0**	P	4.5	2.7	1	12/10/18	12/25/18	KWG1806391	
Endrin Aldehyde	ND	Ui	6.1	6.1	1	12/10/18	12/25/18	KWG1806391	*
Endosulfan Sulfate	ND	U	4.5	4.4	1	12/10/18	12/25/18	KWG1806391	
4,4'-DDT	ND	Ui	60	60	1	12/10/18	12/25/18	KWG1806391	
Endrin Ketone	ND	U	4.5	2.0	1	12/10/18	12/25/18	KWG1806391	
Methoxychlor	ND	Ui	41	41	1	12/10/18	12/25/18	KWG1806391	
Toxaphene	ND	Ui	1200	1200	1	12/10/18	12/25/18	KWG1806391	
Chlordane	ND	U	45	22	1	12/10/18	12/25/18	KWG1806391	

* See Case Narrative

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	58	70-130	12/25/18	Outside Control Limits
Decachlorobiphenyl	80	70-130	12/25/18	Acceptable

† **Analyte Comments**

gamma-Chlordane	For this analyte (CAS Registry No. 5103-74-2), USEPA has corrected the name to be beta-Chlordane, also known as trans-Chlordane.

Comments:

Polynuclear Aromatic Hydrocarbons

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

Analytical Results

Client: Portland, City of
Project: CBWTP Biosolids/W18L003
Sample Matrix: Biosolids solid

Service Request: K1811863
Date Collected: 11/30/2018
Date Received: 12/05/2018

Polynuclear Aromatic Hydrocarbons

Sample Name: W18L003-01
Lab Code: K1811863-001

Units: ug/Kg
Basis: Dry

Extraction Method: EPA 3546
Analysis Method: 8270D SIM

Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**41**		30	2.8	1	12/10/18	12/18/18	KWG1806390	
2-Methylnaphthalene	**80**		30	2.2	1	12/10/18	12/18/18	KWG1806390	
Acenaphthylene	**15**	J	30	1.7	1	12/10/18	12/18/18	KWG1806390	
Acenaphthene	**79**		30	1.8	1	12/10/18	12/18/18	KWG1806390	
Fluorene	**110**		30	3.4	1	12/10/18	12/18/18	KWG1806390	
Phenanthrene	**530**		30	3.5	1	12/10/18	12/18/18	KWG1806390	
Anthracene	**91**		30	1.7	1	12/10/18	12/18/18	KWG1806390	
Fluoranthene	**560**		30	3.7	1	12/10/18	12/18/18	KWG1806390	
Pyrene	**660**		30	1.9	1	12/10/18	12/18/18	KWG1806390	
Benz(a)anthracene	**220**		30	1.4	1	12/10/18	12/18/18	KWG1806390	
Chrysene	**290**		30	1.9	1	12/10/18	12/18/18	KWG1806390	
Benzo(b)fluoranthene†	**240**		30	1.7	1	12/10/18	12/18/18	KWG1806390	
Benzo(k)fluoranthene	**75**		30	1.4	1	12/10/18	12/18/18	KWG1806390	
Benzo(e)pyrene	**160**		30	1.7	1	12/10/18	12/18/18	KWG1806390	
Benzo(a)pyrene	**180**		30	2.3	1	12/10/18	12/18/18	KWG1806390	
Indeno(1,2,3-cd)pyrene	**140**		30	2.1	1	12/10/18	12/18/18	KWG1806390	
Dibenz(a,h)anthracene	**30**		30	1.4	1	12/10/18	12/18/18	KWG1806390	
Benzo(g,h,i)perylene	**160**		30	2.4	1	12/10/18	12/18/18	KWG1806390	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	74	38-104	12/18/18	Acceptable
Fluoranthene-d10	85	39-109	12/18/18	Acceptable
Terphenyl-d14	84	38-113	12/18/18	Acceptable

† **Analyte Comments**

Benzo(b)fluoranthene	This analyte cannot be separated from Benzo(j)fluoranthene.

Comments:

Analytical Results

Client: Portland, City of
Project: CBWTP Biosolids/W18L003
Sample Matrix: Biosolids solid

Service Request: K1811863
Date Collected: 11/30/2018
Date Received: 12/05/2018

Polynuclear Aromatic Hydrocarbons

Sample Name: W18L003-02
Lab Code: K1811863-002

Units: ug/Kg
Basis: Dry

Extraction Method: EPA 3546
Analysis Method: 8270D SIM

Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**42**	JD	53	5.0	2	12/10/18	12/18/18	KWG1806390	
2-Methylnaphthalene	**99**	D	53	3.9	2	12/10/18	12/18/18	KWG1806390	
Acenaphthylene	**68**	D	53	3.0	2	12/10/18	12/18/18	KWG1806390	
Acenaphthene	**170**	D	53	3.2	2	12/10/18	12/18/18	KWG1806390	
Fluorene	**160**	D	53	6.0	2	12/10/18	12/18/18	KWG1806390	
Phenanthrene	**550**	D	53	6.2	2	12/10/18	12/18/18	KWG1806390	
Anthracene	**110**	D	53	3.1	2	12/10/18	12/18/18	KWG1806390	
Fluoranthene	**710**	D	53	6.7	2	12/10/18	12/18/18	KWG1806390	
Pyrene	**980**	D	53	3.4	2	12/10/18	12/18/18	KWG1806390	
Benz(a)anthracene	**280**	D	53	2.5	2	12/10/18	12/18/18	KWG1806390	
Chrysene	**390**	D	53	3.3	2	12/10/18	12/18/18	KWG1806390	
Benzo(b)fluoranthene†	**330**	D	53	3.1	2	12/10/18	12/18/18	KWG1806390	
Benzo(k)fluoranthene	**93**	D	53	2.6	2	12/10/18	12/18/18	KWG1806390	
Benzo(e)pyrene	**220**	D	53	3.1	2	12/10/18	12/18/18	KWG1806390	
Benzo(a)pyrene	**220**	D	53	4.0	2	12/10/18	12/18/18	KWG1806390	
Indeno(1,2,3-cd)pyrene	**200**	D	53	3.8	2	12/10/18	12/18/18	KWG1806390	
Dibenz(a,h)anthracene	**34**	JD	53	2.5	2	12/10/18	12/18/18	KWG1806390	
Benzo(g,h,i)perylene	**240**	D	53	4.3	2	12/10/18	12/18/18	KWG1806390	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	79	38-104	12/18/18	Acceptable
Fluoranthene-d10	86	39-109	12/18/18	Acceptable
Terphenyl-d14	85	38-113	12/18/18	Acceptable

† Analyte Comments

Benzo(b)fluoranthene	This analyte cannot be separated from Benzo(j)fluoranthene.

Comments:

Semi-Volatile Organic Compounds by GC/MS

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

Client:	Portland, City of	**Service Request:**	K1811863
Project:	CBWTP Biosolids/W18L003	**Date Collected:**	11/30/18 23:59
Sample Matrix:	Biosolids Solids	**Date Received:**	12/05/18 10:10
Sample Name:	W18L003-01	**Units:**	mg/Kg
Lab Code:	K1811863-001	**Basis:**	Dry

Semivolatile Organic Compounds by GC/MS

Analysis Method: 8270D
Prep Method: EPA 3541

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
1,2,4-Trichlorobenzene	ND U	10	0.34	5	12/13/18 07:08	12/10/18	
1,2-Dichlorobenzene	ND U	10	0.55	5	12/13/18 07:08	12/10/18	
1,2-Diphenylhydrazine	ND U	10	0.43	5	12/13/18 07:08	12/10/18	
1,3-Dichlorobenzene	ND U	10	0.55	5	12/13/18 07:08	12/10/18	
1,4-Dichlorobenzene	ND U	10	0.55	5	12/13/18 07:08	12/10/18	
2,4,5-Trichlorophenol	ND U	10	0.55	5	12/13/18 07:08	12/10/18	
2,4,6-Trichlorophenol	ND U	10	0.43	5	12/13/18 07:08	12/10/18	
2,4-Dichlorophenol	ND U	10	0.49	5	12/13/18 07:08	12/10/18	
2,4-Dimethylphenol	ND U	10	0.46	5	12/13/18 07:08	12/10/18	
2,4-Dinitrophenol	ND U	61	3.4	5	12/13/18 07:08	12/10/18	
2,4-Dinitrotoluene	ND U	10	0.46	5	12/13/18 07:08	12/10/18	
2,6-Dinitrotoluene	ND U	10	0.49	5	12/13/18 07:08	12/10/18	
2-Chloronaphthalene	ND U	10	0.31	5	12/13/18 07:08	12/10/18	
2-Chlorophenol	ND U	10	0.31	5	12/13/18 07:08	12/10/18	
2-Methyl-4,6-dinitrophenol	ND U	61	4.3	5	12/13/18 07:08	12/10/18	
2-Nitrophenol	ND U	10	0.43	5	12/13/18 07:08	12/10/18	
3,3'-Dichlorobenzidine	ND U	10	0.83	5	12/13/18 07:08	12/10/18	
4-Bromophenyl Phenyl Ether	ND U	10	0.37	5	12/13/18 07:08	12/10/18	*
4-Chloro-3-methylphenol	ND U	10	0.52	5	12/13/18 07:08	12/10/18	
4-Chloroaniline	ND U	10	0.43	5	12/13/18 07:08	12/10/18	
4-Chlorophenyl Phenyl Ether	ND U	10	0.49	5	12/13/18 07:08	12/10/18	
4-Nitrophenol	ND U	61	4.6	5	12/13/18 07:08	12/10/18	*
Benzidine	ND U	61	13	5	12/13/18 07:08	12/10/18	*
Bis(2-chloroethoxy)methane	ND U	10	0.34	5	12/13/18 07:08	12/10/18	
Bis(2-chloroethyl) Ether	ND U	10	0.37	5	12/13/18 07:08	12/10/18	
Bis(2-ethylhexyl) Phthalate	**4.7 J**	10	0.58	5	12/13/18 07:08	12/10/18	
Butyl Benzyl Phthalate	ND U	10	0.49	5	12/13/18 07:08	12/10/18	
Dibenzofuran	ND U	10	0.37	5	12/13/18 07:08	12/10/18	
Diethyl Phthalate	ND U	10	0.43	5	12/13/18 07:08	12/10/18	
Dimethyl Phthalate	ND U	10	0.49	5	12/13/18 07:08	12/10/18	
Di-n-butyl Phthalate	ND U	10	0.37	5	12/13/18 07:08	12/10/18	
Di-n-octyl Phthalate	ND U	10	0.73	5	12/13/18 07:08	12/10/18	
Fluoranthene	ND U	10	0.34	5	12/13/18 07:08	12/10/18	
Fluorene	ND U	10	0.40	5	12/13/18 07:08	12/10/18	
Hexachlorobenzene	ND U	10	0.46	5	12/13/18 07:08	12/10/18	*
Hexachlorobutadiene	ND U	10	0.43	5	12/13/18 07:08	12/10/18	
Hexachlorocyclopentadiene	ND U	10	0.37	5	12/13/18 07:08	12/10/18	
Hexachloroethane	ND U	10	0.67	5	12/13/18 07:08	12/10/18	
Indeno(1,2,3-cd)pyrene	ND U	10	1.2	5	12/13/18 07:08	12/10/18	
Isophorone	ND U	10	0.43	5	12/13/18 07:08	12/10/18	
Naphthalene	ND U	10	0.43	5	12/13/18 07:08	12/10/18	
Nitrobenzene	ND U	10	0.79	5	12/13/18 07:08	12/10/18	
N-Nitrosodimethylamine	ND U	61	0.76	5	12/13/18 07:08	12/10/18	

Client:	Portland, City of	**Service Request:**	K1811863
Project:	CBWTP Biosolids/W18L003	**Date Collected:**	11/30/18 23:59
Sample Matrix:	Biosolids Solids	**Date Received:**	12/05/18 10:10
Sample Name:	W18L003-01	**Units:**	mg/Kg
Lab Code:	K1811863-001	**Basis:**	Dry

Semivolatile Organic Compounds by GC/MS

Analysis Method: 8270D
Prep Method: EPA 3541

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
N-Nitrosodi-n-propylamine	ND U	10	0.58	5	12/13/18 07:08	12/10/18	
N-Nitrosodiphenylamine	ND U	10	0.55	5	12/13/18 07:08	12/10/18	
Pentachlorophenol	ND U	61	4.0	5	12/13/18 07:08	12/10/18	*
Phenanthrene	ND U	10	0.31	5	12/13/18 07:08	12/10/18	
Phenol	ND U	10	0.58	5	12/13/18 07:08	12/10/18	
Pyrene	ND U	10	0.43	5	12/13/18 07:08	12/10/18	
2,2'-Oxybis(1-chloropropane)	ND U	10	0.43	5	12/13/18 07:08	12/10/18	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
2,4,6-Tribromophenol	13	20 - 123	12/13/18 07:08	*
2-Fluorobiphenyl	8	32 - 104	12/13/18 07:08	*
2-Fluorophenol	4	20 - 83	12/13/18 07:08	*
Nitrobenzene-d5	6	29 - 116	12/13/18 07:08	*
Phenol-d6	6	26 - 106	12/13/18 07:08	*
Terphenyl-d14	13	37 - 133	12/13/18 07:08	*

Client:	Portland, City of	**Service Request:**	K1811863
Project:	CBWTP Biosolids/W18L003	**Date Collected:**	11/30/18 23:59
Sample Matrix:	Biosolids Solids	**Date Received:**	12/05/18 10:10
Sample Name:	W18L003-02	**Units:**	mg/Kg
Lab Code:	K1811863-002	**Basis:**	Dry

Semivolatile Organic Compounds by GC/MS

Analysis Method: 8270D
Prep Method: EPA 3541

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
1,2,4-Trichlorobenzene	ND U	34	1.2	5	12/13/18 07:49	12/10/18	
1,2-Dichlorobenzene	ND U	34	1.9	5	12/13/18 07:49	12/10/18	
1,2-Diphenylhydrazine	ND U	34	1.5	5	12/13/18 07:49	12/10/18	
1,3-Dichlorobenzene	ND U	34	1.9	5	12/13/18 07:49	12/10/18	
1,4-Dichlorobenzene	ND U	34	1.9	5	12/13/18 07:49	12/10/18	
2,4,5-Trichlorophenol	ND U	34	1.9	5	12/13/18 07:49	12/10/18	
2,4,6-Trichlorophenol	ND U	35	1.5	5	12/13/18 07:49	12/10/18	
2,4-Dichlorophenol	ND U	34	1.7	5	12/13/18 07:49	12/10/18	
2,4-Dimethylphenol	ND U	34	1.6	5	12/13/18 07:49	12/10/18	
2,4-Dinitrophenol	ND U	210	12	5	12/13/18 07:49	12/10/18	
2,4-Dinitrotoluene	ND U	34	1.6	5	12/13/18 07:49	12/10/18	
2,6-Dinitrotoluene	ND U	34	1.7	5	12/13/18 07:49	12/10/18	
2-Chloronaphthalene	ND U	34	1.1	5	12/13/18 07:49	12/10/18	
2-Chlorophenol	ND U	34	1.1	5	12/13/18 07:49	12/10/18	
2-Methyl-4,6-dinitrophenol	ND U	210	15	5	12/13/18 07:49	12/10/18	
2-Nitrophenol	ND U	35	1.5	5	12/13/18 07:49	12/10/18	
3,3'-Dichlorobenzidine	ND U	34	2.9	5	12/13/18 07:49	12/10/18	
4-Bromophenyl Phenyl Ether	ND U	34	1.3	5	12/13/18 07:49	12/10/18	*
4-Chloro-3-methylphenol	ND U	34	1.8	5	12/13/18 07:49	12/10/18	
4-Chloroaniline	ND U	34	1.5	5	12/13/18 07:49	12/10/18	
4-Chlorophenyl Phenyl Ether	ND U	34	1.7	5	12/13/18 07:49	12/10/18	
4-Nitrophenol	ND U	210	16	5	12/13/18 07:49	12/10/18	*
Benzidine	ND U	210	44	5	12/13/18 07:49	12/10/18	*
Bis(2-chloroethoxy)methane	ND U	34	1.2	5	12/13/18 07:49	12/10/18	
Bis(2-chloroethyl) Ether	ND U	34	1.3	5	12/13/18 07:49	12/10/18	
Bis(2-ethylhexyl) Phthalate	**26 J**	34	2.0	5	12/13/18 07:49	12/10/18	
Butyl Benzyl Phthalate	ND U	34	1.7	5	12/13/18 07:49	12/10/18	
Dibenzofuran	ND U	34	1.3	5	12/13/18 07:49	12/10/18	
Diethyl Phthalate	ND U	34	1.5	5	12/13/18 07:49	12/10/18	
Dimethyl Phthalate	ND U	34	1.7	5	12/13/18 07:49	12/10/18	
Di-n-butyl Phthalate	ND U	34	1.3	5	12/13/18 07:49	12/10/18	
Di-n-octyl Phthalate	ND U	35	2.6	5	12/13/18 07:49	12/10/18	
Fluoranthene	ND U	34	1.2	5	12/13/18 07:49	12/10/18	
Fluorene	ND U	34	1.4	5	12/13/18 07:49	12/10/18	
Hexachlorobenzene	ND U	34	1.6	5	12/13/18 07:49	12/10/18	*
Hexachlorobutadiene	ND U	34	1.5	5	12/13/18 07:49	12/10/18	
Hexachlorocyclopentadiene	ND U	35	1.3	5	12/13/18 07:49	12/10/18	
Hexachloroethane	ND U	34	2.3	5	12/13/18 07:49	12/10/18	
Indeno(1,2,3-cd)pyrene	ND U	35	4.1	5	12/13/18 07:49	12/10/18	
Isophorone	ND U	34	1.5	5	12/13/18 07:49	12/10/18	
Naphthalene	ND U	34	1.5	5	12/13/18 07:49	12/10/18	
Nitrobenzene	ND U	34	2.8	5	12/13/18 07:49	12/10/18	
N-Nitrosodimethylamine	ND U	210	2.7	5	12/13/18 07:49	12/10/18	

Analytical Report

Client:	Portland, City of	**Service Request:**	K1811863
Project:	CBWTP Biosolids/W18L003	**Date Collected:**	11/30/18 23:59
Sample Matrix:	Biosolids Solids	**Date Received:**	12/05/18 10:10
Sample Name:	W18L003-02	**Units:**	mg/Kg
Lab Code:	K1811863-002	**Basis:**	Dry

Semivolatile Organic Compounds by GC/MS

Analysis Method: 8270D
Prep Method: EPA 3541

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
N-Nitrosodi-n-propylamine	ND U	34	2.0	5	12/13/18 07:49	12/10/18	
N-Nitrosodiphenylamine	ND U	34	1.9	5	12/13/18 07:49	12/10/18	
Pentachlorophenol	ND U	210	14	5	12/13/18 07:49	12/10/18	*
Phenanthrene	ND U	34	1.1	5	12/13/18 07:49	12/10/18	
Phenol	ND U	34	2.0	5	12/13/18 07:49	12/10/18	
Pyrene	ND U	34	1.5	5	12/13/18 07:49	12/10/18	
2,2'-Oxybis(1-chloropropane)	ND U	34	1.5	5	12/13/18 07:49	12/10/18	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
2,4,6-Tribromophenol	35	20 - 123	12/13/18 07:49	
2-Fluorobiphenyl	34	32 - 104	12/13/18 07:49	
2-Fluorophenol	19	20 - 83	12/13/18 07:49	*
Nitrobenzene-d5	32	29 - 116	12/13/18 07:49	
Phenol-d6	23	26 - 106	12/13/18 07:49	*
Terphenyl-d14	46	37 - 133	12/13/18 07:49	

City of Portland
Water Pollution Control Laboratory
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ORELAP Certification ID 4023

LABORATORY ANALYSIS REPORT

Project:	**Pretreatment Program CBWTP NPDES**	Client:	Industrial Source Control
Work Order:	**W18B004**	Project Mgr:	Angela Henderson
Received:	2/1/18 10:18		
Submitted By:	Field Operations		

Sample	Laboratory ID	Matrix	Type	Sample Collection Date Start	End	Qualifier
CB BPC Grab-Quarterly	W18B004-01	Biosolid	Grab	02/01/18 09:37	02/01/18 09:37	

Analyte	Result	Units	MRL	Dil.	Batch	Prepared	Analyzed	Method	Qualifier
CB BPC Grab-Quarterly : W18B004-01									
General Chemistry									
Total solids	**18.0**	% W/W	0.01		B18B010	02/01/18	02/02/18	SM 2540G	
Volatile Organics									
Volatile Organic Compounds by GCMS									
Acetone	<25100	ug/kg dry	25100	100	B18B003	02/01/18 09:37	02/01/18	EPA 8260	
Benzene	<627	ug/kg dry	627	100	B18B003	02/01/18 09:37	02/01/18	EPA 8260	
Bromobenzene	<1250	ug/kg dry	1250	100	B18B003	02/01/18 09:37	02/01/18	EPA 8260	
Bromochloromethane	<627	ug/kg dry	627	100	B18B003	02/01/18 09:37	02/01/18	EPA 8260	
Bromodichloromethane	<627	ug/kg dry	627	100	B18B003	02/01/18 09:37	02/01/18	EPA 8260	
Bromoform	<627	ug/kg dry	627	100	B18B003	02/01/18 09:37	02/01/18	EPA 8260	
Bromomethane	<1250	ug/kg dry	1250	100	B18B003	02/01/18 09:37	02/01/18	EPA 8260	
2-Butanone	<12500	ug/kg dry	12500	100	B18B003	02/01/18 09:37	02/01/18	EPA 8260	
n-Butylbenzene	<627	ug/kg dry	627	100	B18B003	02/01/18 09:37	02/01/18	EPA 8260	
sec-Butylbenzene	<627	ug/kg dry	627	100	B18B003	02/01/18 09:37	02/01/18	EPA 8260	
tert-Butylbenzene	<627	ug/kg dry	627	100	B18B003	02/01/18 09:37	02/01/18	EPA 8260	
Carbon disulfide	<2510	ug/kg dry	2510	100	B18B003	02/01/18 09:37	02/01/18	EPA 8260	
Carbon tetrachloride	<627	ug/kg dry	627	100	B18B003	02/01/18 09:37	02/01/18	EPA 8260	
Chlorobenzene	<627	ug/kg dry	627	100	B18B003	02/01/18 09:37	02/01/18	EPA 8260	
Chloroethane	<627	ug/kg dry	627	100	B18B003	02/01/18 09:37	02/01/18	EPA 8260	L1
Chloroform	<627	ug/kg dry	627	100	B18B003	02/01/18 09:37	02/01/18	EPA 8260	
Chloromethane	<1250	ug/kg dry	1250	100	B18B003	02/01/18 09:37	02/01/18	EPA 8260	
2-Chlorotoluene	<627	ug/kg dry	627	100	B18B003	02/01/18 09:37	02/01/18	EPA 8260	
4-Chlorotoluene	<627	ug/kg dry	627	100	B18B003	02/01/18 09:37	02/01/18	EPA 8260	
1,2-Dibromo-3-chloropropane	<627	ug/kg dry	627	100	B18B003	02/01/18 09:37	02/01/18	EPA 8260	
Dibromochloromethane	<627	ug/kg dry	627	100	B18B003	02/01/18 09:37	02/01/18	EPA 8260	
1,2-Dibromoethane	<1250	ug/kg dry	1250	100	B18B003	02/01/18 09:37	02/01/18	EPA 8260	
Dibromomethane	<627	ug/kg dry	627	100	B18B003	02/01/18 09:37	02/01/18	EPA 8260	
1,2-Dichlorobenzene	<627	ug/kg dry	627	100	B18B003	02/01/18 09:37	02/01/18	EPA 8260	
1,3-Dichlorobenzene	<627	ug/kg dry	627	100	B18B003	02/01/18 09:37	02/01/18	EPA 8260	
1,4-Dichlorobenzene	<627	ug/kg dry	627	100	B18B003	02/01/18 09:37	02/01/18	EPA 8260	

Reported: 02/08/18 08:08

The results in this report apply only to the samples analyzed. Qualifiers and case narrative comments are essential to interpretation of the analytical results. Report reproductions and/or data summaries without qualifiers and comments are incomplete.

Jennifer Shackelford

Jennifer Shackelford, Laboratory Coordinator QA/QC

City of Portland
Water Pollution Control Laboratory
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ORELAP Certification ID 4023

Project:	**Pretreatment Program CBWTP NPDES**	Client:	Industrial Source Control
Work Order:	**W18B004**	Received:	02/01/18 10:18

Analyte	Result	Units	MRL	Dil.	Batch	Prepared	Analyzed	Method	Qualifier
Volatile Organics									
Volatile Organic Compounds by GCMS									
Dichlorodifluoromethane	<627	ug/kg dry	627	100	B18B003	02/01/18 09:37	02/01/18	EPA 8260	
1,1-Dichloroethane	<627	ug/kg dry	627	100	B18B003	02/01/18 09:37	02/01/18	EPA 8260	
1,2-Dichloroethane	<627	ug/kg dry	627	100	B18B003	02/01/18 09:37	02/01/18	EPA 8260	
1,1-Dichloroethene	<627	ug/kg dry	627	100	B18B003	02/01/18 09:37	02/01/18	EPA 8260	
cis-1,2-Dichloroethene	<627	ug/kg dry	627	100	B18B003	02/01/18 09:37	02/01/18	EPA 8260	
trans-1,2-Dichloroethene	<627	ug/kg dry	627	100	B18B003	02/01/18 09:37	02/01/18	EPA 8260	
1,2-Dichloropropane	<627	ug/kg dry	627	100	B18B003	02/01/18 09:37	02/01/18	EPA 8260	
1,3-Dichloropropane	<627	ug/kg dry	627	100	B18B003	02/01/18 09:37	02/01/18	EPA 8260	
2,2-Dichloropropane	<627	ug/kg dry	627	100	B18B003	02/01/18 09:37	02/01/18	EPA 8260	
1,1-Dichloropropene	<627	ug/kg dry	627	100	B18B003	02/01/18 09:37	02/01/18	EPA 8260	
cis-1,3-Dichloropropene	<627	ug/kg dry	627	100	B18B003	02/01/18 09:37	02/01/18	EPA 8260	
trans-1,3-Dichloropropene	<627	ug/kg dry	627	100	B18B003	02/01/18 09:37	02/01/18	EPA 8260	
Ethylbenzene	<627	ug/kg dry	627	100	B18B003	02/01/18 09:37	02/01/18	EPA 8260	
Hexachlorobutadiene	<627	ug/kg dry	627	100	B18B003	02/01/18 09:37	02/01/18	EPA 8260	
2-Hexanone	<6270	ug/kg dry	6270	100	B18B003	02/01/18 09:37	02/01/18	EPA 8260	
Isopropylbenzene	<627	ug/kg dry	627	100	B18B003	02/01/18 09:37	02/01/18	EPA 8260	
4-Isopropyltoluene	<627	ug/kg dry	627	100	B18B003	02/01/18 09:37	02/01/18	EPA 8260	
4-Methyl-2-pentanone (MIBK)	<6270	ug/kg dry	6270	100	B18B003	02/01/18 09:37	02/01/18	EPA 8260	
Methylene chloride	<1250	ug/kg dry	1250	100	B18B003	02/01/18 09:37	02/01/18	EPA 8260	
Naphthalene	<627	ug/kg dry	627	100	B18B003	02/01/18 09:37	02/01/18	EPA 8260	
n-Propylbenzene	<627	ug/kg dry	627	100	B18B003	02/01/18 09:37	02/01/18	EPA 8260	
Styrene	<627	ug/kg dry	627	100	B18B003	02/01/18 09:37	02/01/18	EPA 8260	
1,1,1,2-Tetrachloroethane	<627	ug/kg dry	627	100	B18B003	02/01/18 09:37	02/01/18	EPA 8260	
1,1,2,2-Tetrachloroethane	<627	ug/kg dry	627	100	B18B003	02/01/18 09:37	02/01/18	EPA 8260	
Tetrachloroethene	<627	ug/kg dry	627	100	B18B003	02/01/18 09:37	02/01/18	EPA 8260	
Toluene	<627	ug/kg dry	627	100	B18B003	02/01/18 09:37	02/01/18	EPA 8260	
1,2,3-Trichlorobenzene	<627	ug/kg dry	627	100	B18B003	02/01/18 09:37	02/01/18	EPA 8260	
1,2,4-Trichlorobenzene	<627	ug/kg dry	627	100	B18B003	02/01/18 09:37	02/01/18	EPA 8260	
1,1,1-Trichloroethane	<627	ug/kg dry	627	100	B18B003	02/01/18 09:37	02/01/18	EPA 8260	
1,1,2-Trichloroethane	<627	ug/kg dry	627	100	B18B003	02/01/18 09:37	02/01/18	EPA 8260	
Trichloroethene	<627	ug/kg dry	627	100	B18B003	02/01/18 09:37	02/01/18	EPA 8260	
Trichlorofluoromethane	<627	ug/kg dry	627	100	B18B003	02/01/18 09:37	02/01/18	EPA 8260	L1
1,2,3-Trichloropropane	<627	ug/kg dry	627	100	B18B003	02/01/18 09:37	02/01/18	EPA 8260	
1,2,4-Trimethylbenzene	<627	ug/kg dry	627	100	B18B003	02/01/18 09:37	02/01/18	EPA 8260	
1,3,5-Trimethylbenzene	<627	ug/kg dry	627	100	B18B003	02/01/18 09:37	02/01/18	EPA 8260	
Vinyl acetate	<1250	ug/kg dry	1250	100	B18B003	02/01/18 09:37	02/01/18	EPA 8260	
Vinyl chloride	<627	ug/kg dry	627	100	B18B003	02/01/18 09:37	02/01/18	EPA 8260	
m,p-Xylene	<1250	ug/kg dry	1250	100	B18B003	02/01/18 09:37	02/01/18	EPA 8260	
o-Xylene	<627	ug/kg dry	627	100	B18B003	02/01/18 09:37	02/01/18	EPA 8260	
Surrogate	***Result***		***Expected***	***%Rec***	***Limits(%)***				
Dibromofluoromethane	*49.0*	ug/L	*50.0*	*98%*	*80-120*	*B18B003*	*02/01/18 09:37*	*02/01/18*	*EPA 8260*	

Reported: 02/08/18 08:08

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Jennifer Shackelford

Jennifer Shackelford, Laboratory Coordinator QA/QC

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Water Pollution Control Laboratory
6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656
ORELAP Certification ID 4023

Project:	**Pretreatment Program CBWTP NPDES**	Client:	Industrial Source Control
Work Order:	**W18B004**	Received:	02/01/18 10:18

Analyte	Result	Units	MRL		Dil.	Batch	Prepared	Analyzed	Method	Qualifier
Volatile Organics										
Volatile Organic Compounds by GCMS										
Toluene-d8	*51.3*	ug/L	*50.0*	*103%*	*80-120*	*B18B003*	*02/01/18 09:37*	*02/01/18*	*EPA 8260*	
4-Bromofluorobenzene	*51.0*	ug/L	*50.0*	*102%*	*80-120*	*B18B003*	*02/01/18 09:37*	*02/01/18*	*EPA 8260*	

Qualifiers

L1 Recovery for this analyte in the laboratory control sample was outside the acceptance range (low). Sample results may be low estimates.

Definitions

DET	Analyte Detected	ND	Analyte Not Detected at or above the reporting limit
MRL	Method Reporting Limit	MDL	Method Detection Limit
NR	Not Reportable	dry	Sample results reported on a dry weight basis
% Rec.	Percent Recovery	RPD	Relative Percent Difference
*	This analyte is not certified under NELAP		

Reported: 02/08/18 08:08

Jennifer Shackelford

Jennifer Shackelford, Laboratory Coordinator QA/QC

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City of Portland
Water Pollution Control Laboratory
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ORELAP Certification ID 4023

LABORATORY ANALYSIS REPORT

Project:	**Pretreatment Program CBWTP NPDES**	Client:	Industrial Source Control
Work Order:	**W18D249**	Project Mgr:	Angela Henderson
Received:	4/30/18 13:00		
Submitted By:	Field Operations		

Sample	Laboratory ID	Matrix	Type	Sample Collection Date Start	End	Qualifier
CB BPC Grab-Quarterly	W18D249-01	Biosolid	Grab	04/30/18 12:32	04/30/18 12:32	

Analyte	Result	Units	MRL	Dil.	Batch	Prepared	Analyzed	Method	Qualifier
CB BPC Grab-Quarterly : W18D249-01									
General Chemistry									
Total solids	**18.0**	% W/W	0.01		B18E086	05/06/18	05/07/18	SM 2540G	
Volatile Organics									
Volatile Organic Compounds by GCMS									
Acetone	<12900	ug/kg dry	12900	50	B18E024	04/30/18 12:32	05/02/18	EPA 8260	
Acrolein*	<3220	ug/kg dry	3220	50	B18E024	04/30/18 12:32	05/02/18	EPA 8260	
Acrylonitrile*	<3220	ug/kg dry	3220	50	B18E024	04/30/18 12:32	05/02/18	EPA 8260	
Benzene	<322	ug/kg dry	322	50	B18E024	04/30/18 12:32	05/02/18	EPA 8260	
Bromobenzene	<645	ug/kg dry	645	50	B18E024	04/30/18 12:32	05/02/18	EPA 8260	
Bromochloromethane	<322	ug/kg dry	322	50	B18E024	04/30/18 12:32	05/02/18	EPA 8260	
Bromodichloromethane	<322	ug/kg dry	322	50	B18E024	04/30/18 12:32	05/02/18	EPA 8260	
Bromoform	<322	ug/kg dry	322	50	B18E024	04/30/18 12:32	05/02/18	EPA 8260	
Bromomethane	<645	ug/kg dry	645	50	B18E024	04/30/18 12:32	05/02/18	EPA 8260	
2-Butanone	<6450	ug/kg dry	6450	50	B18E024	04/30/18 12:32	05/02/18	EPA 8260	
n-Butylbenzene	<322	ug/kg dry	322	50	B18E024	04/30/18 12:32	05/02/18	EPA 8260	
sec-Butylbenzene	<322	ug/kg dry	322	50	B18E024	04/30/18 12:32	05/02/18	EPA 8260	
tert-Butylbenzene	<322	ug/kg dry	322	50	B18E024	04/30/18 12:32	05/02/18	EPA 8260	
Carbon disulfide	<1290	ug/kg dry	1290	50	B18E024	04/30/18 12:32	05/02/18	EPA 8260	
Carbon tetrachloride	<322	ug/kg dry	322	50	B18E024	04/30/18 12:32	05/02/18	EPA 8260	
Chlorobenzene	<322	ug/kg dry	322	50	B18E024	04/30/18 12:32	05/02/18	EPA 8260	
Chloroethane	<322	ug/kg dry	322	50	B18E024	04/30/18 12:32	05/02/18	EPA 8260	
2-Chloroethylvinyl ether	<6450	ug/kg dry	6450	50	B18E024	04/30/18 12:32	05/02/18	EPA 8260	
Chloroform	<322	ug/kg dry	322	50	B18E024	04/30/18 12:32	05/02/18	EPA 8260	
Chloromethane	<645	ug/kg dry	645	50	B18E024	04/30/18 12:32	05/02/18	EPA 8260	
2-Chlorotoluene	<322	ug/kg dry	322	50	B18E024	04/30/18 12:32	05/02/18	EPA 8260	
4-Chlorotoluene	<322	ug/kg dry	322	50	B18E024	04/30/18 12:32	05/02/18	EPA 8260	
1,2-Dibromo-3-chloropropane	<322	ug/kg dry	322	50	B18E024	04/30/18 12:32	05/02/18	EPA 8260	
Dibromochloromethane	<322	ug/kg dry	322	50	B18E024	04/30/18 12:32	05/02/18	EPA 8260	
1,2-Dibromoethane	<645	ug/kg dry	645	50	B18E024	04/30/18 12:32	05/02/18	EPA 8260	
Dibromomethane	<322	ug/kg dry	322	50	B18E024	04/30/18 12:32	05/02/18	EPA 8260	

Reported: 05/18/18 11:29

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Jennifer Shackelford

Jennifer Shackelford, Laboratory Coordinator QA/QC

City of Portland
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ORELAP Certification ID 4023

Project:	**Pretreatment Program CBWTP NPDES**	Client:	Industrial Source Control
Work Order:	**W18D249**	Received:	04/30/18 13:00

Analyte	Result	Units	MRL	Dil.	Batch	Prepared	Analyzed	Method	Qualifier
Volatile Organics									
Volatile Organic Compounds by GCMS									
1,2-Dichlorobenzene	<322	ug/kg dry	322	50	B18E024	04/30/18 12:32	05/02/18	EPA 8260	
1,3-Dichlorobenzene	<322	ug/kg dry	322	50	B18E024	04/30/18 12:32	05/02/18	EPA 8260	
1,4-Dichlorobenzene	<322	ug/kg dry	322	50	B18E024	04/30/18 12:32	05/02/18	EPA 8260	
Dichlorodifluoromethane	<322	ug/kg dry	322	50	B18E024	04/30/18 12:32	05/02/18	EPA 8260	
1,1-Dichloroethane	<322	ug/kg dry	322	50	B18E024	04/30/18 12:32	05/02/18	EPA 8260	
1,2-Dichloroethane	<322	ug/kg dry	322	50	B18E024	04/30/18 12:32	05/02/18	EPA 8260	
1,1-Dichloroethene	<322	ug/kg dry	322	50	B18E024	04/30/18 12:32	05/02/18	EPA 8260	
cis-1,2-Dichloroethene	<322	ug/kg dry	322	50	B18E024	04/30/18 12:32	05/02/18	EPA 8260	
trans-1,2-Dichloroethene	<322	ug/kg dry	322	50	B18E024	04/30/18 12:32	05/02/18	EPA 8260	
1,2-Dichloropropane	<322	ug/kg dry	322	50	B18E024	04/30/18 12:32	05/02/18	EPA 8260	
1,3-Dichloropropane	<322	ug/kg dry	322	50	B18E024	04/30/18 12:32	05/02/18	EPA 8260	
2,2-Dichloropropane	<322	ug/kg dry	322	50	B18E024	04/30/18 12:32	05/02/18	EPA 8260	
1,1-Dichloropropene	<322	ug/kg dry	322	50	B18E024	04/30/18 12:32	05/02/18	EPA 8260	
cis-1,3-Dichloropropene	<322	ug/kg dry	322	50	B18E024	04/30/18 12:32	05/02/18	EPA 8260	
trans-1,3-Dichloropropene	<322	ug/kg dry	322	50	B18E024	04/30/18 12:32	05/02/18	EPA 8260	
Ethylbenzene	<322	ug/kg dry	322	50	B18E024	04/30/18 12:32	05/02/18	EPA 8260	
Hexachlorobutadiene	<322	ug/kg dry	322	50	B18E024	04/30/18 12:32	05/02/18	EPA 8260	
2-Hexanone	<3220	ug/kg dry	3220	50	B18E024	04/30/18 12:32	05/02/18	EPA 8260	
Isopropylbenzene	<322	ug/kg dry	322	50	B18E024	04/30/18 12:32	05/02/18	EPA 8260	
4-Isopropyltoluene	**587**	ug/kg dry	322	50	B18E024	04/30/18 12:32	05/02/18	EPA 8260	
4-Methyl-2-pentanone (MIBK)	<3220	ug/kg dry	3220	50	B18E024	04/30/18 12:32	05/02/18	EPA 8260	
Methylene chloride	<645	ug/kg dry	645	50	B18E024	04/30/18 12:32	05/02/18	EPA 8260	
Naphthalene	<322	ug/kg dry	322	50	B18E024	04/30/18 12:32	05/02/18	EPA 8260	
n-Propylbenzene	<322	ug/kg dry	322	50	B18E024	04/30/18 12:32	05/02/18	EPA 8260	
Styrene	<322	ug/kg dry	322	50	B18E024	04/30/18 12:32	05/02/18	EPA 8260	
1,1,1,2-Tetrachloroethane	<322	ug/kg dry	322	50	B18E024	04/30/18 12:32	05/02/18	EPA 8260	
1,1,2,2-Tetrachloroethane	<322	ug/kg dry	322	50	B18E024	04/30/18 12:32	05/02/18	EPA 8260	
Tetrachloroethene	<322	ug/kg dry	322	50	B18E024	04/30/18 12:32	05/02/18	EPA 8260	
Toluene	<322	ug/kg dry	322	50	B18E024	04/30/18 12:32	05/02/18	EPA 8260	
1,2,3-Trichlorobenzene	<322	ug/kg dry	322	50	B18E024	04/30/18 12:32	05/02/18	EPA 8260	
1,2,4-Trichlorobenzene	<322	ug/kg dry	322	50	B18E024	04/30/18 12:32	05/02/18	EPA 8260	
1,1,1-Trichloroethane	<322	ug/kg dry	322	50	B18E024	04/30/18 12:32	05/02/18	EPA 8260	
1,1,2-Trichloroethane	<322	ug/kg dry	322	50	B18E024	04/30/18 12:32	05/02/18	EPA 8260	
Trichloroethene	<322	ug/kg dry	322	50	B18E024	04/30/18 12:32	05/02/18	EPA 8260	
Trichlorofluoromethane	<322	ug/kg dry	322	50	B18E024	04/30/18 12:32	05/02/18	EPA 8260	L1
1,2,3-Trichloropropane	<322	ug/kg dry	322	50	B18E024	04/30/18 12:32	05/02/18	EPA 8260	
1,2,4-Trimethylbenzene	<322	ug/kg dry	322	50	B18E024	04/30/18 12:32	05/02/18	EPA 8260	
1,3,5-Trimethylbenzene	<322	ug/kg dry	322	50	B18E024	04/30/18 12:32	05/02/18	EPA 8260	
Vinyl acetate	<645	ug/kg dry	645	50	B18E024	04/30/18 12:32	05/02/18	EPA 8260	M4
Vinyl chloride	<322	ug/kg dry	322	50	B18E024	04/30/18 12:32	05/02/18	EPA 8260	
m,p-Xylene	<645	ug/kg dry	645	50	B18E024	04/30/18 12:32	05/02/18	EPA 8260	

Reported: 05/18/18 11:29

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Jennifer Shackelford

Jennifer Shackelford, Laboratory Coordinator QA/QC

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Water Pollution Control Laboratory
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ORELAP Certification ID 4023

Project:	**Pretreatment Program CBWTP NPDES**	Client:	Industrial Source Control
Work Order:	**W18D249**	Received:	04/30/18 13:00

Analyte	Result	Units	MRL	Dil.	Batch	Prepared	Analyzed	Method	Qualifier
Volatile Organics									
Volatile Organic Compounds by GCMS									
o-Xylene	<322	ug/kg dry	322	50	B18E024	04/30/18 12:32	05/02/18	EPA 8260	
Surrogate	***Result***		***Expected***	***%Rec***	***Limits(%)***				
Dibromofluoromethane	*49.4*	ug/L	*50.0*	*99%*	*80-120*	*B18E024*	*04/30/18 12:32*	*05/02/18*	*EPA 8260*
Toluene-d8	*49.4*	ug/L	*50.0*	*99%*	*80-120*	*B18E024*	*04/30/18 12:32*	*05/02/18*	*EPA 8260*
4-Bromofluorobenzene	*49.3*	ug/L	*50.0*	*99%*	*80-120*	*B18E024*	*04/30/18 12:32*	*05/02/18*	*EPA 8260*

Qualifiers

L1 Recovery for this analyte in the laboratory control sample was outside the acceptance range (low). Sample results may be low estimates.

M4 Based on low matrix spike recovery, the sample result may be a low estimate due to matrix interference.

Definitions

DET	Analyte Detected	ND	Analyte Not Detected at or above the reporting limit
MRL	Method Reporting Limit	MDL	Method Detection Limit
NR	Not Reportable	dry	Sample results reported on a dry weight basis
% Rec.	Percent Recovery	RPD	Relative Percent Difference
*	This analyte is not certified under NELAP		

Reported: 05/18/18 11:29

Jennifer Shackelford

Jennifer Shackelford, Laboratory Coordinator QA/QC

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LABORATORY ANALYSIS REPORT

Project:	**Pretreatment Program CBWTP NPDES**	Client:	Industrial Source Control
Work Order:	**W18H016**	Project Mgr:	Angela Henderson
Received:	8/2/18 11:01		
Submitted By:	Field Operations		

Sample	Laboratory ID	Matrix	Type	Sample Collection Date Start	End	Qualifier
CB BPC Grab-Quarterly	W18H016-01	Biosolid	Grab	08/02/18 10:45	08/02/18 10:45	

CB BPC Grab-Quarterly : W18H016-01

Analyte	Result	Units	MRL	Dil.	Batch	Prepared	Analyzed	Method	Qualifier
General Chemistry									
Total solids	**15.3**	% W/W	0.01		B18H096	08/07/18	08/08/18	SM 2540G	
Volatile Organics									
Volatile Organic Compounds by GCMS									
Acetone	<14400	ug/kg dry	14400	50	B18H027	08/02/18 10:45	08/02/18	EPA 8260	
Acrolein*	<3590	ug/kg dry	3590	50	B18H027	08/02/18 10:45	08/02/18	EPA 8260	
Acrylonitrile*	<3590	ug/kg dry	3590	50	B18H027	08/02/18 10:45	08/02/18	EPA 8260	
Benzene	<359	ug/kg dry	359	50	B18H027	08/02/18 10:45	08/02/18	EPA 8260	
Bromobenzene	<718	ug/kg dry	718	50	B18H027	08/02/18 10:45	08/02/18	EPA 8260	
Bromochloromethane	<359	ug/kg dry	359	50	B18H027	08/02/18 10:45	08/02/18	EPA 8260	
Bromodichloromethane	<359	ug/kg dry	359	50	B18H027	08/02/18 10:45	08/02/18	EPA 8260	
Bromoform	<359	ug/kg dry	359	50	B18H027	08/02/18 10:45	08/02/18	EPA 8260	
Bromomethane	<718	ug/kg dry	718	50	B18H027	08/02/18 10:45	08/02/18	EPA 8260	V3
2-Butanone	<7180	ug/kg dry	7180	50	B18H027	08/02/18 10:45	08/02/18	EPA 8260	
n-Butylbenzene	<359	ug/kg dry	359	50	B18H027	08/02/18 10:45	08/02/18	EPA 8260	
sec-Butylbenzene	<359	ug/kg dry	359	50	B18H027	08/02/18 10:45	08/02/18	EPA 8260	
tert-Butylbenzene	<359	ug/kg dry	359	50	B18H027	08/02/18 10:45	08/02/18	EPA 8260	
Carbon disulfide	<1440	ug/kg dry	1440	50	B18H027	08/02/18 10:45	08/02/18	EPA 8260	
Carbon tetrachloride	<359	ug/kg dry	359	50	B18H027	08/02/18 10:45	08/02/18	EPA 8260	
Chlorobenzene	<359	ug/kg dry	359	50	B18H027	08/02/18 10:45	08/02/18	EPA 8260	
Chloroethane	<359	ug/kg dry	359	50	B18H027	08/02/18 10:45	08/02/18	EPA 8260	L1
2-Chloroethylvinyl ether	<7180	ug/kg dry	7180	50	B18H027	08/02/18 10:45	08/02/18	EPA 8260	
Chloroform	<359	ug/kg dry	359	50	B18H027	08/02/18 10:45	08/02/18	EPA 8260	
Chloromethane	<718	ug/kg dry	718	50	B18H027	08/02/18 10:45	08/02/18	EPA 8260	
2-Chlorotoluene	<359	ug/kg dry	359	50	B18H027	08/02/18 10:45	08/02/18	EPA 8260	
4-Chlorotoluene	<359	ug/kg dry	359	50	B18H027	08/02/18 10:45	08/02/18	EPA 8260	
1,2-Dibromo-3-chloropropane	<359	ug/kg dry	359	50	B18H027	08/02/18 10:45	08/02/18	EPA 8260	
Dibromochloromethane	<359	ug/kg dry	359	50	B18H027	08/02/18 10:45	08/02/18	EPA 8260	
1,2-Dibromoethane	<718	ug/kg dry	718	50	B18H027	08/02/18 10:45	08/02/18	EPA 8260	
Dibromomethane	<359	ug/kg dry	359	50	B18H027	08/02/18 10:45	08/02/18	EPA 8260	

Reported: 08/24/18 08:40

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Jennifer Shackelford

Jennifer Shackelford, Laboratory Coordinator QA/QC

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Water Pollution Control Laboratory
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ORELAP Certification ID 4023

Project:	**Pretreatment Program CBWTP NPDES**	Client:	Industrial Source Control
Work Order:	**W18H016**	Received:	08/02/18 11:01

Volatile Organics

Volatile Organic Compounds by GCMS

Analyte	Result	Units	MRL	Dil.	Batch	Prepared	Analyzed	Method	Qualifier
1,2-Dichlorobenzene	<359	ug/kg dry	359	50	B18H027	08/02/18 10:45	08/02/18	EPA 8260	
1,3-Dichlorobenzene	<359	ug/kg dry	359	50	B18H027	08/02/18 10:45	08/02/18	EPA 8260	
1,4-Dichlorobenzene	<359	ug/kg dry	359	50	B18H027	08/02/18 10:45	08/02/18	EPA 8260	
Dichlorodifluoromethane	<359	ug/kg dry	359	50	B18H027	08/02/18 10:45	08/02/18	EPA 8260	L1
1,1-Dichloroethane	<359	ug/kg dry	359	50	B18H027	08/02/18 10:45	08/02/18	EPA 8260	
1,2-Dichloroethane	<359	ug/kg dry	359	50	B18H027	08/02/18 10:45	08/02/18	EPA 8260	
1,1-Dichloroethene	<359	ug/kg dry	359	50	B18H027	08/02/18 10:45	08/02/18	EPA 8260	
cis-1,2-Dichloroethene	<359	ug/kg dry	359	50	B18H027	08/02/18 10:45	08/02/18	EPA 8260	
trans-1,2-Dichloroethene	<359	ug/kg dry	359	50	B18H027	08/02/18 10:45	08/02/18	EPA 8260	
1,2-Dichloropropane	<359	ug/kg dry	359	50	B18H027	08/02/18 10:45	08/02/18	EPA 8260	
1,3-Dichloropropane	<359	ug/kg dry	359	50	B18H027	08/02/18 10:45	08/02/18	EPA 8260	
2,2-Dichloropropane	<359	ug/kg dry	359	50	B18H027	08/02/18 10:45	08/02/18	EPA 8260	
1,1-Dichloropropene	<359	ug/kg dry	359	50	B18H027	08/02/18 10:45	08/02/18	EPA 8260	
cis-1,3-Dichloropropene	<359	ug/kg dry	359	50	B18H027	08/02/18 10:45	08/02/18	EPA 8260	
trans-1,3-Dichloropropene	<359	ug/kg dry	359	50	B18H027	08/02/18 10:45	08/02/18	EPA 8260	
Ethylbenzene	<359	ug/kg dry	359	50	B18H027	08/02/18 10:45	08/02/18	EPA 8260	
Hexachlorobutadiene	<359	ug/kg dry	359	50	B18H027	08/02/18 10:45	08/02/18	EPA 8260	
2-Hexanone	<3590	ug/kg dry	3590	50	B18H027	08/02/18 10:45	08/02/18	EPA 8260	
Isopropylbenzene	<359	ug/kg dry	359	50	B18H027	08/02/18 10:45	08/02/18	EPA 8260	
4-Isopropyltoluene	**374**	ug/kg dry	359	50	B18H027	08/02/18 10:45	08/02/18	EPA 8260	
4-Methyl-2-pentanone (MIBK)	<3590	ug/kg dry	3590	50	B18H027	08/02/18 10:45	08/02/18	EPA 8260	
Methylene chloride	<718	ug/kg dry	718	50	B18H027	08/02/18 10:45	08/02/18	EPA 8260	
Naphthalene	<359	ug/kg dry	359	50	B18H027	08/02/18 10:45	08/02/18	EPA 8260	
n-Propylbenzene	<359	ug/kg dry	359	50	B18H027	08/02/18 10:45	08/02/18	EPA 8260	
Styrene	<359	ug/kg dry	359	50	B18H027	08/02/18 10:45	08/02/18	EPA 8260	
1,1,1,2-Tetrachloroethane	<359	ug/kg dry	359	50	B18H027	08/02/18 10:45	08/02/18	EPA 8260	
1,1,2,2-Tetrachloroethane	<359	ug/kg dry	359	50	B18H027	08/02/18 10:45	08/02/18	EPA 8260	
Tetrachloroethene	<359	ug/kg dry	359	50	B18H027	08/02/18 10:45	08/02/18	EPA 8260	
Toluene	<359	ug/kg dry	359	50	B18H027	08/02/18 10:45	08/02/18	EPA 8260	
1,2,3-Trichlorobenzene	<359	ug/kg dry	359	50	B18H027	08/02/18 10:45	08/02/18	EPA 8260	
1,2,4-Trichlorobenzene	<359	ug/kg dry	359	50	B18H027	08/02/18 10:45	08/02/18	EPA 8260	
1,1,1-Trichloroethane	<359	ug/kg dry	359	50	B18H027	08/02/18 10:45	08/02/18	EPA 8260	
1,1,2-Trichloroethane	<359	ug/kg dry	359	50	B18H027	08/02/18 10:45	08/02/18	EPA 8260	
Trichloroethene	<359	ug/kg dry	359	50	B18H027	08/02/18 10:45	08/02/18	EPA 8260	
Trichlorofluoromethane	<359	ug/kg dry	359	50	B18H027	08/02/18 10:45	08/02/18	EPA 8260	L1
1,2,3-Trichloropropane	<359	ug/kg dry	359	50	B18H027	08/02/18 10:45	08/02/18	EPA 8260	
1,2,4-Trimethylbenzene	<359	ug/kg dry	359	50	B18H027	08/02/18 10:45	08/02/18	EPA 8260	
1,3,5-Trimethylbenzene	<359	ug/kg dry	359	50	B18H027	08/02/18 10:45	08/02/18	EPA 8260	
Vinyl acetate	<718	ug/kg dry	718	50	B18H027	08/02/18 10:45	08/02/18	EPA 8260	M4
Vinyl chloride	<359	ug/kg dry	359	50	B18H027	08/02/18 10:45	08/02/18	EPA 8260	
m,p-Xylene	<718	ug/kg dry	718	50	B18H027	08/02/18 10:45	08/02/18	EPA 8260	

Reported: 08/24/18 08:40

Jennifer Shackelford

Jennifer Shackelford, Laboratory Coordinator QA/QC

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City of Portland
Water Pollution Control Laboratory
6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656
ORELAP Certification ID 4023

Project:	**Pretreatment Program CBWTP NPDES**	Client:	Industrial Source Control
Work Order:	**W18H016**	Received:	08/02/18 11:01

Analyte	Result	Units	MRL	Dil.	Batch	Prepared	Analyzed	Method	Qualifier
Volatile Organics									
Volatile Organic Compounds by GCMS									
o-Xylene	<359	ug/kg dry	359	50	B18H027	08/02/18 10:45	08/02/18	EPA 8260	
Surrogate	***Result***		***Expected***	***%Rec***	***Limits(%)***				
Dibromofluoromethane	*42.2*	ug/L	*50.0*	*84%*	*80-120*	*B18H027*	*08/02/18 10:45*	*08/02/18*	*EPA 8260*
Toluene-d8	*44.6*	ug/L	*50.0*	*89%*	*80-120*	*B18H027*	*08/02/18 10:45*	*08/02/18*	*EPA 8260*
4-Bromofluorobenzene	*44.4*	ug/L	*50.0*	*89%*	*80-120*	*B18H027*	*08/02/18 10:45*	*08/02/18*	*EPA 8260*

Qualifiers

L1	Recovery for this analyte in the laboratory control sample was outside the acceptance range (low). Sample results may be low estimates.
M4	Based on low matrix spike recovery, the sample result may be a low estimate due to matrix interference.
V3	Continuing calibration verification was low; sample results for this analyte may be low estimates.

Definitions

DET	Analyte Detected	ND	Analyte Not Detected at or above the reporting limit
MRL	Method Reporting Limit	MDL	Method Detection Limit
NR	Not Reportable	dry	Sample results reported on a dry weight basis
% Rec.	Percent Recovery	RPD	Relative Percent Difference
*	This analyte is not certified under NELAP		

Reported: 08/24/18 08:40

Jennifer Shackelford

Jennifer Shackelford, Laboratory Coordinator QA/QC

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Water Pollution Control Laboratory
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ORELAP Certification ID 4023

LABORATORY ANALYSIS REPORT

Project:	**Pretreatment Program CBWTP NPDES**	Client:	Industrial Source Control
Work Order:	**W18K057**	Project Mgr:	Angela Henderson
Received:	11/8/18 10:33		
Submitted By:	Field Operations		

Sample	Laboratory ID	Matrix	Type	Sample Collection Date Start	End	Qualifier
CB BPC Grab-Quarterly	W18K057-01	Biosolid	Grab	11/08/18 10:08	11/08/18 10:08	
CB BPC Grab-Quarterly	W18K057-02	Biosolid	Grab	11/08/18 10:02	11/08/18 10:02	

Analyte	Result	Units	MRL	Dil.	Batch	Prepared	Analyzed	Method	Qualifier
General Chemistry									
Total Solids									
CB BPC Grab-Quarterly : W18K057-01									
Total solids	**15.8**	% W/W	0.01		B18K148	11/12/18	11/13/18	SM 2540G	
CB BPC Grab-Quarterly : W18K057-02									
Total solids	**19.8**	% W/W	0.01		B18K148	11/12/18	11/13/18	SM 2540G	
Volatile Organics									
Volatile Organic Compounds by GCMS									
CB BPC Grab-Quarterly : W18K057-01									
Acetone	<14600	ug/kg dry	14600	50	B18K111	11/08/18 10:08	11/09/18	EPA 8260	
Acrolein*	<3650	ug/kg dry	3650	50	B18K111	11/08/18 10:08	11/09/18	EPA 8260	V3
Acrylonitrile*	<3650	ug/kg dry	3650	50	B18K111	11/08/18 10:08	11/09/18	EPA 8260	
Benzene	<365	ug/kg dry	365	50	B18K111	11/08/18 10:08	11/09/18	EPA 8260	
Bromobenzene	<729	ug/kg dry	729	50	B18K111	11/08/18 10:08	11/09/18	EPA 8260	
Bromochloromethane	<365	ug/kg dry	365	50	B18K111	11/08/18 10:08	11/09/18	EPA 8260	
Bromodichloromethane	<365	ug/kg dry	365	50	B18K111	11/08/18 10:08	11/09/18	EPA 8260	
Bromoform	<365	ug/kg dry	365	50	B18K111	11/08/18 10:08	11/09/18	EPA 8260	
Bromomethane	<729	ug/kg dry	729	50	B18K111	11/08/18 10:08	11/09/18	EPA 8260	
2-Butanone	<7290	ug/kg dry	7290	50	B18K111	11/08/18 10:08	11/09/18	EPA 8260	
n-Butylbenzene	<365	ug/kg dry	365	50	B18K111	11/08/18 10:08	11/09/18	EPA 8260	
sec-Butylbenzene	<365	ug/kg dry	365	50	B18K111	11/08/18 10:08	11/09/18	EPA 8260	
tert-Butylbenzene	<365	ug/kg dry	365	50	B18K111	11/08/18 10:08	11/09/18	EPA 8260	
Carbon disulfide	<1460	ug/kg dry	1460	50	B18K111	11/08/18 10:08	11/09/18	EPA 8260	
Carbon tetrachloride	<365	ug/kg dry	365	50	B18K111	11/08/18 10:08	11/09/18	EPA 8260	
Chlorobenzene	<365	ug/kg dry	365	50	B18K111	11/08/18 10:08	11/09/18	EPA 8260	
Chloroethane	<365	ug/kg dry	365	50	B18K111	11/08/18 10:08	11/09/18	EPA 8260	
2-Chloroethylvinyl ether	<7290	ug/kg dry	7290	50	B18K111	11/08/18 10:08	11/09/18	EPA 8260	
Chloroform	<365	ug/kg dry	365	50	B18K111	11/08/18 10:08	11/09/18	EPA 8260	
Chloromethane	<729	ug/kg dry	729	50	B18K111	11/08/18 10:08	11/09/18	EPA 8260	
2-Chlorotoluene	<365	ug/kg dry	365	50	B18K111	11/08/18 10:08	11/09/18	EPA 8260	

Reported: 11/27/18 08:19

Jennifer Shackelford

Jennifer Shackelford, Laboratory Coordinator QA/QC

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Water Pollution Control Laboratory
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ORELAP Certification ID 4023

Project:	**Pretreatment Program CBWTP NPDES**	Client:	Industrial Source Control
Work Order:	**W18K057**	Received:	11/08/18 10:33

Volatile Organics

Volatile Organic Compounds by GCMS

CB BPC Grab-Quarterly : W18K057-01

Analyte	Result	Units	MRL	Dil.	Batch	Prepared	Analyzed	Method	Qualifier
4-Chlorotoluene	<365	ug/kg dry	365	50	B18K111	11/08/18 10:08	11/09/18	EPA 8260	
1,2-Dibromo-3-chloropropane	<365	ug/kg dry	365	50	B18K111	11/08/18 10:08	11/09/18	EPA 8260	V3
Dibromochloromethane	<365	ug/kg dry	365	50	B18K111	11/08/18 10:08	11/09/18	EPA 8260	
1,2-Dibromoethane	<729	ug/kg dry	729	50	B18K111	11/08/18 10:08	11/09/18	EPA 8260	
Dibromomethane	<365	ug/kg dry	365	50	B18K111	11/08/18 10:08	11/09/18	EPA 8260	
1,2-Dichlorobenzene	<365	ug/kg dry	365	50	B18K111	11/08/18 10:08	11/09/18	EPA 8260	
1,3-Dichlorobenzene	<365	ug/kg dry	365	50	B18K111	11/08/18 10:08	11/09/18	EPA 8260	
1,4-Dichlorobenzene	<365	ug/kg dry	365	50	B18K111	11/08/18 10:08	11/09/18	EPA 8260	
Dichlorodifluoromethane	<365	ug/kg dry	365	50	B18K111	11/08/18 10:08	11/09/18	EPA 8260	
1,1-Dichloroethane	<365	ug/kg dry	365	50	B18K111	11/08/18 10:08	11/09/18	EPA 8260	
1,2-Dichloroethane	<365	ug/kg dry	365	50	B18K111	11/08/18 10:08	11/09/18	EPA 8260	
1,1-Dichloroethene	<365	ug/kg dry	365	50	B18K111	11/08/18 10:08	11/09/18	EPA 8260	
cis-1,2-Dichloroethene	<365	ug/kg dry	365	50	B18K111	11/08/18 10:08	11/09/18	EPA 8260	
trans-1,2-Dichloroethene	<365	ug/kg dry	365	50	B18K111	11/08/18 10:08	11/09/18	EPA 8260	
1,2-Dichloropropane	<365	ug/kg dry	365	50	B18K111	11/08/18 10:08	11/09/18	EPA 8260	
1,3-Dichloropropane	<365	ug/kg dry	365	50	B18K111	11/08/18 10:08	11/09/18	EPA 8260	
2,2-Dichloropropane	<365	ug/kg dry	365	50	B18K111	11/08/18 10:08	11/09/18	EPA 8260	
1,1-Dichloropropene	<365	ug/kg dry	365	50	B18K111	11/08/18 10:08	11/09/18	EPA 8260	
cis-1,3-Dichloropropene	<365	ug/kg dry	365	50	B18K111	11/08/18 10:08	11/09/18	EPA 8260	
trans-1,3-Dichloropropene	<365	ug/kg dry	365	50	B18K111	11/08/18 10:08	11/09/18	EPA 8260	
Ethylbenzene	<365	ug/kg dry	365	50	B18K111	11/08/18 10:08	11/09/18	EPA 8260	
Hexachlorobutadiene	<365	ug/kg dry	365	50	B18K111	11/08/18 10:08	11/09/18	EPA 8260	
2-Hexanone	<3650	ug/kg dry	3650	50	B18K111	11/08/18 10:08	11/09/18	EPA 8260	V3
Isopropylbenzene	<365	ug/kg dry	365	50	B18K111	11/08/18 10:08	11/09/18	EPA 8260	
4-Isopropyltoluene	**984**	ug/kg dry	365	50	B18K111	11/08/18 10:08	11/09/18	EPA 8260	
4-Methyl-2-pentanone (MIBK)	<3650	ug/kg dry	3650	50	B18K111	11/08/18 10:08	11/09/18	EPA 8260	
Methylene chloride	<729	ug/kg dry	729	50	B18K111	11/08/18 10:08	11/09/18	EPA 8260	
Naphthalene	<365	ug/kg dry	365	50	B18K111	11/08/18 10:08	11/09/18	EPA 8260	V3
n-Propylbenzene	<365	ug/kg dry	365	50	B18K111	11/08/18 10:08	11/09/18	EPA 8260	
Styrene	<365	ug/kg dry	365	50	B18K111	11/08/18 10:08	11/09/18	EPA 8260	
1,1,1,2-Tetrachloroethane	<365	ug/kg dry	365	50	B18K111	11/08/18 10:08	11/09/18	EPA 8260	
1,1,2,2-Tetrachloroethane	<365	ug/kg dry	365	50	B18K111	11/08/18 10:08	11/09/18	EPA 8260	
Tetrachloroethene	<365	ug/kg dry	365	50	B18K111	11/08/18 10:08	11/09/18	EPA 8260	
Toluene	<365	ug/kg dry	365	50	B18K111	11/08/18 10:08	11/09/18	EPA 8260	
1,2,3-Trichlorobenzene	<365	ug/kg dry	365	50	B18K111	11/08/18 10:08	11/09/18	EPA 8260	
1,2,4-Trichlorobenzene	<365	ug/kg dry	365	50	B18K111	11/08/18 10:08	11/09/18	EPA 8260	
1,1,1-Trichloroethane	<365	ug/kg dry	365	50	B18K111	11/08/18 10:08	11/09/18	EPA 8260	
1,1,2-Trichloroethane	<365	ug/kg dry	365	50	B18K111	11/08/18 10:08	11/09/18	EPA 8260	
Trichloroethene	<365	ug/kg dry	365	50	B18K111	11/08/18 10:08	11/09/18	EPA 8260	
Trichlorofluoromethane	<365	ug/kg dry	365	50	B18K111	11/08/18 10:08	11/09/18	EPA 8260	L1
1,2,3-Trichloropropane	<365	ug/kg dry	365	50	B18K111	11/08/18 10:08	11/09/18	EPA 8260	

Reported: 11/27/18 08:19

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Jennifer Shackelford

Jennifer Shackelford, Laboratory Coordinator QA/QC

City of Portland
Water Pollution Control Laboratory
6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656
ORELAP Certification ID 4023

Project:	**Pretreatment Program CBWTP NPDES**	Client:	Industrial Source Control
Work Order:	**W18K057**	Received:	11/08/18 10:33

Analyte	Result	Units	MRL	Dil.	Batch	Prepared	Analyzed	Method	Qualifier
Volatile Organics									
Volatile Organic Compounds by GCMS									
CB BPC Grab-Quarterly : W18K057-01									
1,2,4-Trimethylbenzene	<365	ug/kg dry	365	50	B18K111	11/08/18 10:08	11/09/18	EPA 8260	
1,3,5-Trimethylbenzene	<365	ug/kg dry	365	50	B18K111	11/08/18 10:08	11/09/18	EPA 8260	
Vinyl acetate	<729	ug/kg dry	729	50	B18K111	11/08/18 10:08	11/09/18	EPA 8260	
Vinyl chloride	<365	ug/kg dry	365	50	B18K111	11/08/18 10:08	11/09/18	EPA 8260	
m,p-Xylene	<729	ug/kg dry	729	50	B18K111	11/08/18 10:08	11/09/18	EPA 8260	
o-Xylene	<365	ug/kg dry	365	50	B18K111	11/08/18 10:08	11/09/18	EPA 8260	
Surrogate	***Result***		***Expected***	***%Rec***	***Limits(%)***				
Dibromofluoromethane	*44.4*	ug/L	*50.0*	*89%*	*80-120*	*B18K111*	*11/08/18 10:08*	*11/09/18*	*EPA 8260*	
Toluene-d8	*45.6*	ug/L	*50.0*	*91%*	*80-120*	*B18K111*	*11/08/18 10:08*	*11/09/18*	*EPA 8260*	
4-Bromofluorobenzene	*45.2*	ug/L	*50.0*	*90%*	*80-120*	*B18K111*	*11/08/18 10:08*	*11/09/18*	*EPA 8260*	
CB BPC Grab-Quarterly : W18K057-02									
Acetone	<11800	ug/kg dry	11800	50	B18K111	11/08/18 10:02	11/09/18	EPA 8260	
Acrolein*	<2960	ug/kg dry	2960	50	B18K111	11/08/18 10:02	11/09/18	EPA 8260	V3
Acrylonitrile*	<2960	ug/kg dry	2960	50	B18K111	11/08/18 10:02	11/09/18	EPA 8260	
Benzene	<296	ug/kg dry	296	50	B18K111	11/08/18 10:02	11/09/18	EPA 8260	
Bromobenzene	<591	ug/kg dry	591	50	B18K111	11/08/18 10:02	11/09/18	EPA 8260	
Bromochloromethane	<296	ug/kg dry	296	50	B18K111	11/08/18 10:02	11/09/18	EPA 8260	
Bromodichloromethane	<296	ug/kg dry	296	50	B18K111	11/08/18 10:02	11/09/18	EPA 8260	
Bromoform	<296	ug/kg dry	296	50	B18K111	11/08/18 10:02	11/09/18	EPA 8260	
Bromomethane	<591	ug/kg dry	591	50	B18K111	11/08/18 10:02	11/09/18	EPA 8260	
2-Butanone	<5910	ug/kg dry	5910	50	B18K111	11/08/18 10:02	11/09/18	EPA 8260	
n-Butylbenzene	<296	ug/kg dry	296	50	B18K111	11/08/18 10:02	11/09/18	EPA 8260	
sec-Butylbenzene	<296	ug/kg dry	296	50	B18K111	11/08/18 10:02	11/09/18	EPA 8260	
tert-Butylbenzene	<296	ug/kg dry	296	50	B18K111	11/08/18 10:02	11/09/18	EPA 8260	
Carbon disulfide	<1180	ug/kg dry	1180	50	B18K111	11/08/18 10:02	11/09/18	EPA 8260	
Carbon tetrachloride	<296	ug/kg dry	296	50	B18K111	11/08/18 10:02	11/09/18	EPA 8260	
Chlorobenzene	<296	ug/kg dry	296	50	B18K111	11/08/18 10:02	11/09/18	EPA 8260	
Chloroethane	<296	ug/kg dry	296	50	B18K111	11/08/18 10:02	11/09/18	EPA 8260	
2-Chloroethylvinyl ether	<5910	ug/kg dry	5910	50	B18K111	11/08/18 10:02	11/09/18	EPA 8260	
Chloroform	<296	ug/kg dry	296	50	B18K111	11/08/18 10:02	11/09/18	EPA 8260	
Chloromethane	<591	ug/kg dry	591	50	B18K111	11/08/18 10:02	11/09/18	EPA 8260	
2-Chlorotoluene	<296	ug/kg dry	296	50	B18K111	11/08/18 10:02	11/09/18	EPA 8260	
4-Chlorotoluene	<296	ug/kg dry	296	50	B18K111	11/08/18 10:02	11/09/18	EPA 8260	
1,2-Dibromo-3-chloropropane	<296	ug/kg dry	296	50	B18K111	11/08/18 10:02	11/09/18	EPA 8260	V3
Dibromochloromethane	<296	ug/kg dry	296	50	B18K111	11/08/18 10:02	11/09/18	EPA 8260	
1,2-Dibromoethane	<591	ug/kg dry	591	50	B18K111	11/08/18 10:02	11/09/18	EPA 8260	
Dibromomethane	<296	ug/kg dry	296	50	B18K111	11/08/18 10:02	11/09/18	EPA 8260	
1,2-Dichlorobenzene	<296	ug/kg dry	296	50	B18K111	11/08/18 10:02	11/09/18	EPA 8260	
1,3-Dichlorobenzene	<296	ug/kg dry	296	50	B18K111	11/08/18 10:02	11/09/18	EPA 8260	
1,4-Dichlorobenzene	<296	ug/kg dry	296	50	B18K111	11/08/18 10:02	11/09/18	EPA 8260	
Dichlorodifluoromethane	<296	ug/kg dry	296	50	B18K111	11/08/18 10:02	11/09/18	EPA 8260	

Reported: 11/27/18 08:19

Jennifer Shackelford

Jennifer Shackelford, Laboratory Coordinator QA/QC

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ORELAP Certification ID 4023

Project:	**Pretreatment Program CBWTP NPDES**	Client:	Industrial Source Control
Work Order:	**W18K057**	Received:	11/08/18 10:33

Analyte	Result	Units	MRL	Dil.	Batch	Prepared	Analyzed	Method	Qualifier
Volatile Organics									
Volatile Organic Compounds by GCMS									
CB BPC Grab-Quarterly : W18K057-02									
1,1-Dichloroethane	<296	ug/kg dry	296	50	B18K111	11/08/18 10:02	11/09/18	EPA 8260	
1,2-Dichloroethane	<296	ug/kg dry	296	50	B18K111	11/08/18 10:02	11/09/18	EPA 8260	
1,1-Dichloroethene	<296	ug/kg dry	296	50	B18K111	11/08/18 10:02	11/09/18	EPA 8260	
cis-1,2-Dichloroethene	<296	ug/kg dry	296	50	B18K111	11/08/18 10:02	11/09/18	EPA 8260	
trans-1,2-Dichloroethene	<296	ug/kg dry	296	50	B18K111	11/08/18 10:02	11/09/18	EPA 8260	
1,2-Dichloropropane	<296	ug/kg dry	296	50	B18K111	11/08/18 10:02	11/09/18	EPA 8260	
1,3-Dichloropropane	<296	ug/kg dry	296	50	B18K111	11/08/18 10:02	11/09/18	EPA 8260	
2,2-Dichloropropane	<296	ug/kg dry	296	50	B18K111	11/08/18 10:02	11/09/18	EPA 8260	
1,1-Dichloropropene	<296	ug/kg dry	296	50	B18K111	11/08/18 10:02	11/09/18	EPA 8260	
cis-1,3-Dichloropropene	<296	ug/kg dry	296	50	B18K111	11/08/18 10:02	11/09/18	EPA 8260	
trans-1,3-Dichloropropene	<296	ug/kg dry	296	50	B18K111	11/08/18 10:02	11/09/18	EPA 8260	
Ethylbenzene	<296	ug/kg dry	296	50	B18K111	11/08/18 10:02	11/09/18	EPA 8260	
Hexachlorobutadiene	<296	ug/kg dry	296	50	B18K111	11/08/18 10:02	11/09/18	EPA 8260	
2-Hexanone	<2960	ug/kg dry	2960	50	B18K111	11/08/18 10:02	11/09/18	EPA 8260	V3
Isopropylbenzene	<296	ug/kg dry	296	50	B18K111	11/08/18 10:02	11/09/18	EPA 8260	
4-Isopropyltoluene	<296	ug/kg dry	296	50	B18K111	11/08/18 10:02	11/09/18	EPA 8260	
4-Methyl-2-pentanone (MIBK)	<2960	ug/kg dry	2960	50	B18K111	11/08/18 10:02	11/09/18	EPA 8260	
Methylene chloride	<591	ug/kg dry	591	50	B18K111	11/08/18 10:02	11/09/18	EPA 8260	
Naphthalene	<296	ug/kg dry	296	50	B18K111	11/08/18 10:02	11/09/18	EPA 8260	V3
n-Propylbenzene	<296	ug/kg dry	296	50	B18K111	11/08/18 10:02	11/09/18	EPA 8260	
Styrene	<296	ug/kg dry	296	50	B18K111	11/08/18 10:02	11/09/18	EPA 8260	
1,1,1,2-Tetrachloroethane	<296	ug/kg dry	296	50	B18K111	11/08/18 10:02	11/09/18	EPA 8260	
1,1,2,2-Tetrachloroethane	<296	ug/kg dry	296	50	B18K111	11/08/18 10:02	11/09/18	EPA 8260	
Tetrachloroethene	<296	ug/kg dry	296	50	B18K111	11/08/18 10:02	11/09/18	EPA 8260	
Toluene	<296	ug/kg dry	296	50	B18K111	11/08/18 10:02	11/09/18	EPA 8260	
1,2,3-Trichlorobenzene	<296	ug/kg dry	296	50	B18K111	11/08/18 10:02	11/09/18	EPA 8260	
1,2,4-Trichlorobenzene	<296	ug/kg dry	296	50	B18K111	11/08/18 10:02	11/09/18	EPA 8260	
1,1,1-Trichloroethane	<296	ug/kg dry	296	50	B18K111	11/08/18 10:02	11/09/18	EPA 8260	
1,1,2-Trichloroethane	<296	ug/kg dry	296	50	B18K111	11/08/18 10:02	11/09/18	EPA 8260	
Trichloroethene	<296	ug/kg dry	296	50	B18K111	11/08/18 10:02	11/09/18	EPA 8260	
Trichlorofluoromethane	<296	ug/kg dry	296	50	B18K111	11/08/18 10:02	11/09/18	EPA 8260	L1
1,2,3-Trichloropropane	<296	ug/kg dry	296	50	B18K111	11/08/18 10:02	11/09/18	EPA 8260	
1,2,4-Trimethylbenzene	<296	ug/kg dry	296	50	B18K111	11/08/18 10:02	11/09/18	EPA 8260	
1,3,5-Trimethylbenzene	<296	ug/kg dry	296	50	B18K111	11/08/18 10:02	11/09/18	EPA 8260	
Vinyl acetate	<591	ug/kg dry	591	50	B18K111	11/08/18 10:02	11/09/18	EPA 8260	M4
Vinyl chloride	<296	ug/kg dry	296	50	B18K111	11/08/18 10:02	11/09/18	EPA 8260	
m,p-Xylene	<591	ug/kg dry	591	50	B18K111	11/08/18 10:02	11/09/18	EPA 8260	
o-Xylene	<296	ug/kg dry	296	50	B18K111	11/08/18 10:02	11/09/18	EPA 8260	

Surrogate	***Result***		***Expected***	***%Rec***	***Limits(%)***				
Dibromofluoromethane	*43.9*	ug/L	*50.0*	*88%*	*80-120*	*B18K111*	*11/08/18 10:02*	*11/09/18*	*EPA 8260*
Toluene-d8	*44.8*	ug/L	*50.0*	*90%*	*80-120*	*B18K111*	*11/08/18 10:02*	*11/09/18*	*EPA 8260*
4-Bromofluorobenzene	*45.1*	ug/L	*50.0*	*90%*	*80-120*	*B18K111*	*11/08/18 10:02*	*11/09/18*	*EPA 8260*

Reported: 11/27/18 08:19

The results in this report apply only to the samples analyzed. Qualifiers and case narrative comments are essential to interpretation of the analytical results. Report reproductions and/or data summaries without qualifiers and comments are incomplete.

Jennifer Shackelford

Jennifer Shackelford, Laboratory Coordinator QA/QC

City of Portland
Water Pollution Control Laboratory
6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656
ORELAP Certification ID 4023

Project:	**Pretreatment Program CBWTP NPDES**	Client:	Industrial Source Control
Work Order:	**W18K057**	Received:	11/08/18 10:33

Analyte	Result	Units	MRL	Dil.	Batch	Prepared	Analyzed	Method	Qualifier

Qualifiers

L1	Recovery for this analyte in the laboratory control sample was outside the acceptance range (low). Sample results may be low estimates.
M4	Based on low matrix spike recovery, the sample result may be a low estimate due to matrix interference.
V3	Continuing calibration verification was low; sample results for this analyte may be low estimates.

Definitions

DET	Analyte Detected	ND	Analyte Not Detected at or above the reporting limit
MRL	Method Reporting Limit	MDL	Method Detection Limit
NR	Not Reportable	dry	Sample results reported on a dry weight basis
% Rec.	Percent Recovery	RPD	Relative Percent Difference
*	This analyte is not certified under NELAP		

Reported: 11/27/18 08:19

Jennifer Shackelford

Jennifer Shackelford, Laboratory Coordinator QA/QC

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Madison Farms Soils
Data 2018

Section 405(d)(2)(c) of the Clean Water Act requires federal biosolids regulations (40 CFR Part 503) to be reviewed every two years to identify toxic pollutants for regulation. Under Round III rulemaking, EPA considered 803 candidate chemicals and eventually narrowed that group to 40 compounds, which were subjected to human and ecological receptors exposure and hazzard screening assessment. After completing their exposure risk screening assessment, EPA identified 15 chemicals for further consideration. The agency intends to complete a national survey of the occurance of those pollutants. A risk assessment will be conducted to determine which trace contaminents, if any, require further regulation in land applied biosolids.

For biosolids land application, the group chemicals of interest include:

> **Accetone, anthracene, barium, beryllium, carbon disulfide, 4-chloroaniline, diazinon, flouranthene, manganese, methal ethyl ketone, nitrate, nitrite, phenol pyrene and silver.**

During 2018, Portland analyzed Madison Farms Soils to determine the occurance and concentration of a number of Round III analytes of interest to EPA and the general public. 2018 data characterizing this is included in this section.

Expanded Metals and Halides Madison Farms

From: 1/1/2018
To: 12/31/2018

			Concentration (mg/kg)																												
		Complete	Aluminum	Antimony	Arsenic	Barium	Beryllium	Boron	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Molybdenum	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Tin	Titanium	Vanadium	Zinc	Bromide	Chloride	Fluoride
11/1/2018	Test Unit 1	☑	13400	0.37	2.96	130	0.43	10.0	0.32	17.2	8.67	25	26900	10.7	4690	414	0.8	11.3	2900	1.43*	1.18	359	0.12	3	1810	60	73			
11/1/2018	Test Unit 3	☑	16700	0.44	3.86	170	0.59	12.3	0.29	16.8	9.92	28	27200	11.4	5250	469	0.7	13.6	3250	1.49*	1.12	359	0.13	3	1920	61	69			
11/1/2018	Test Unit 5	☑	18500	0.69	4.51	178	0.71	13.4	0.62	22.6	10.10	36	27200	18.4	5650	499	1.1	15.6	4200	1.58*	1.97	366	0.16	6	1850	60	103			
11/1/2018	Test Unit 8	☑	17700	0.43	3.82	173	0.60	12.3	0.29	16.7	9.58	24	26300	11.2	5280	448	0.6	12.6	3440	1.43	1.17	515	0.13	3	1930	62	69			
11/1/2018	Test Unit 8	☑	17900	0.36	3.88	172	0.57	12.8	0.19	16.4	9.65	17	27300	8.33	5610	472	0.4	12.4	488	1.65*	0.22	488	0.15	1	1980	58	57			
Average			16840	0.46	3.81	165	0.58	12.2	0.34	17.94	9.58	26	26980	12.0	5296	460	0.7	13.1	2856	1.52	1.13	417	0.14	3	1898	60	74			

Historical Priority Metals Scan

	Concentration (mg/kg)																											
	Aluminum	Antimony	Arsenic	Barium	Beryllium	Boron	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Molybdenum	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Tin	Titanium	Vanadium	Zinc	Bromide	Chloride	Fluoride
2010 Average	14300	0.22	2.97	132	0.48	3.4	0.11	14.40	9.73	13	28800	6	5030	456	0.3	11.2		1.00	0.10		0.13	1	1860		55			
2011 Average	18300	0.32	5.05	168	0.55	1.7	0.26	20.00	11.70	25	29300	11	5730	543	0.6	15.9		1.00	0.79		0.16	2	1750		72			
2012 Average	15300	0.18	2.75	153	0.53	1.0	0.12	15.10	12.20	15	29900	7	4970	548	0.3	12.5	3010	1.00	0.10	367	0.13	1	1860	62	55			
2013 Average	15700	0.27	3.58	142	0.56	3.0	0.10	14.20	10.50	15	29500	7	5410	472	0.3	11.8	3690	1.00	0.10	429	0.14	1	1870	58	53			
2014 Average	13500	0.20	2.93	139	0.46	3.8	0.11	14.30	9.54	13	28200	7	4740	453	0.4	11.2	2870	1.00	0.10	350	0.12	1	1750	69	52			
2015 Average	14200	0.26	2.50	136	0.49	4.3	0.10	14.50	9.74	11	27100	6	4710	459	0.4	10.2	3170	1.00	0.10	488	0.12	1	1700	68	50			
2016 Average	20600	0.29	3.38	131	0.56	5.2	0.10	16.10	9.47	12	28900	6	5860	522	0.3	10.6	4670	1.00	0.10	543	0.14	1	1850	71	52			
2017 Average	14400	0.27	3.41	153	0.49	4.3	0.11	14.00	10.40	12	28100	6	4620	491	0.4	10.7	2910	1.00	0.10	491	0.13	1	1890	64	51			
2018 Average	17800	0.40	3.85	173	0.58	12.6	0.24	16.55	9.61	21	26800	10	5445	460	0.5	12.5	1964	1.54	0.70	502	0.14	2	1955	60	63			

Sherman County Soils

Data 2018

Dioxins and Metals Background Testing

Expanded Metals Scan

Sherman County

From: **1/1/2018**
To: **12/31/2018**

					Concentration (mg/kg)																								
				Complete	Aluminum	Antimony	Arsenic	Barium	Beryllium	Boron	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Molybdenum	Nickel	Selenium	Silver	Sodium	Thallium	Tin	Titanium	Vanadium	Zinc
4/10/2018	SC - Field 22	W18D098-01	Hayes	☑	23300	0.29	4.78	163	0.57	4.6	0.12	24.7	10.80	18	32200	8.5	4380	549	0.020	0.45	17.5	1.0*	0.1*	428	0.18	0.89	2110	69	54
4/10/2018	SC - Field 3	W18D098-02	Hilderbrand	☑	21200	0.24	4.16	153	0.60	4.3	0.15	24.6	10.30	19	29500	8.5	3870	529	0.020	0.46	16.6	1.0*	0.1	395	0.17	0.99	1950	66	56
4/10/2018	SC - Field 4	W18D098-03	Hilderbrand	☑	18700	0.23	3.71	143	0.51	4.1	0.14	22.6	9.33	17	27900	7.5	3780	542	0.014	0.42	15.6	1.0*	0.1*	412	0.15	0.77	1870	62	51
4/10/2018	SC - Field 14	W18D098-04	Hayes	☑	20400	0.27	4.16	141	0.56	4.1	0.11	23.6	9.90	17	29100	7.8	4060	500	0.015	0.39	16.9	1.0*	0.1*	422	0.17	0.79	1990	67	49
Average					20900	0.26	4.20	150	0.56	4.3	0.13	23.9	10.08	18	29675	8.1	4023	530	0.017	0.43	16.7	1.0	0.1	414	0.17	0.86	1980	66	52

APPENDIX D CONTINUED

PORTLAND LAGOON BIOSOLIDS

2018

Mean Concentration of Trace Inorganics, Nitrogen Species, Phosphorus, Potassium & Fecal Coliform in Portland Lagoon Bulk Class B Biosolids-2018[1]																	
Month	Parameter															% by Weight	Tons[3&4] Produced
	As	Cd	Cu	Pb	Hg	Mo	Ni	Se	Zn	NO_3-N	NH_3-N	TKN	K	Total P	Fecal[2]		
January																	
February																	
March																	
April																	
May																	
June																	
July																	
August																	
September																	
October																	
November	4.55	2.56	332	60.7	0.590	11.2	40.9	4.88	1,070	5.3	13,700	56,500	2,510	31,300	205,886	n/a	n/a
December	4.87	2.55	340	60.3	0.611	11.5	46.6	4.77	1,110	4.7	7,030	52,900	2,260	31,200	31,182	n/a	n/a
Annual[5] Mean	4.71	2.56	336	60.5	0.601	11.4	43.8	4.83	1,090	5.0	10,365	54,700	2,385	31,250	80,124	n/a	n/a

[1]All numbers represent a dry weight basis; values for federally regulated trace inorganics expressed as mg/kg.
[2]Value represents fecal coliform (No. organisms per gram total solids; dry weight basis). All numbers during a particular month represent a geometric mean of seven or more data points. Annual value represents a geometric mean of all data points.
[3]To convert values to tonnes, multiply tons by 0.90718474.

Bulk Class B Pathogen Reduction Characteristics Lagoon Biosolids-2018			
Month	**Average Digester Temperature (°F)**	**Detention Time (days)**	
		Actual[1&2]	**Required[3]**
January			
February			
March			
April			
May			
June			
July			
August			
September			
October			
November	98.9	16.4	15
December	98.8	18.5	15

[1]Estimate based on net inflow to TWAS Only anaerobic digesters determined by William Park, Engineering Technician III, based on operations records.
[2]Average duration (days) that solids were anaerobically digested in TWAS Only digestion system.
[3]Minimum detention time at digestion operating temperature required for Bulk Class B biosolids pathogen reduction compliance under Part 503.32(b)(3), Appendix B, Processes to Significantly Reduce Pathogens (PSRP), Option 3.

Volatile Solids Reduction Achieved During Solids Digestion& Lagoon Stabilization-2018[1]			
Month	Volatile Solids (%)		Volatile Solids Reduction[2] (%)
	Raw	Digested	
January			
February			
March			
April			
May			
June			
July			
August			
September			
October			
November	77.6	57.0	61.7%
December	76.2	49.8	69.0%

[1]Data characterizing percent solids and percent solids reduction calculations provided by William Park, Engineering Technician III.

[2]Percent volatile solids reduction that occurred during digestion and facultative lagoon stabilization (using the Van Kleeck Method).

Estimated PAN/dry ton in Lagoon Portland Biosolids-2018			
Nitrogen Species (mg/kg)			
NO_3-N	**NH_4-N**	**Organic-N**	**TKN**
5.0	10,365	44,335	54,700
Estimated lb PAN per dry ton in Land Applied Lagoon Portland Biosolids per dry ton[1, 2]			
NO_3-N	**NH_4-N**	**Organic-N**	**Total Available N**
0.01 (0.005)	4.15 (1.88)	26.6 (12.07)	30.76 (13.95)

[1]Upper number indicates lb and lower number denotes kg.

[2]Calculations for determining lb PAN in Portland biosolids to be applied to Sherman County dryland small grains (uses 80% ammonia volatilization and 30% organic nitrogen mineralization rate):

NO_3-N: (2,000 lb./ton) (5.0) mg-NO_3-N/1,000,000 mg TS) = **0.01lb**

NH_4-N: (2,000 lb./ton) (10,365 mg-NH_4-N/1,000,000 mg TS) (0.2) = **4.15 lb**

Org-N: (2,000 lb./ton) (44,335 mg-Org-N/1,000,000 mg TS) (0.3) = **26.6 lb**

PAN: 0.01 lb NO_3-N + 4.15 lb NH_4-N + 26.6 lb Org-N **≈ 30.76 lb.**

[3]At a projected dryland wheat yield of 50 to 65 bu/ac and a required PAN rate of ≈2.4 lb/bu (OSU's recommended nitrogen requirement for the region; FG80), the agronomic loading rate would be in the range of 120 lb/ac to 156 lb/ac to meet wheat fertility needs. The actual quantity of biosolids PAN applied will be adjusted in consideration of pre-seeding soil nitrogen content (to a depth of six feet) prior to biosolids land application.

APPENDIX E

BIOSOLIDS PROGRAM FACT SHEETS
"FROM WASTE TO RESOURCE"-BROCHURE
SHERMAN COUNTY PUBLIC NOTICE
WIND TOWER CONSTRUCTOR NOTICE
FIELD WORKER PROTECTION GUIDELINES
SHERMAN COUNTY PRE-APPLICATION NEIGHBOR NOTIFICATION LETTERS
BENEFICIAL REUSE OF CITY OF PORTLAND BIOSOLIDS

Cadmium in Portland Biosolids

During the treatment of domestic wastewater, cleansed water called effluent is disinfected prior to discharge into the Columbia River. Solids separated from liquid during the treatment process are further processed resulting in a nutrient-rich, recyclable resource called biosolids.

Industrial sources are regulated under wastewater discharge permits which require them to "pretreat" their wastewater to remove "toxic pollutants" before wastewater is discharged to the City's sanitary sewer system. The City has operated an industrial pretreatment program since 1983, which has substantially lowered the concentration of biosolids cadmium and other constituents.

The Environmental Protection Agency (EPA) adopted limits for land applied trace pollutants commonly found in biosolids (see table) after scientists evaluated data on the toxicity of more than 400 organic and inorganic pollutants; pollutant occurrence, fate and effects; and completed a comprehensive risk assessment which considered 14 environmental pathways. Biosolids produced by the Columbia Boulevard Wastewater Treatment Plant that are land applied in eastern Oregon fall well below EPA standards.

Comparison Between EPA Biosolids Pollutant Standards and Portland Biosolids – 2018*

Parameter	EPA Ceiling Limit	Portland Biosolids Content (mg/kg)
Arsenic	75	4.42
Cadmium	85	2.28
Copper	4,300	295
Lead	840	57.2
Mercury	57	0.786
Molybdenum	75	10.58
Nickel	420	47.3
Selenium	100	4.62
Zinc	7,500	1,122

*Weighted mean of Portland biosolids characteristics between January 1, 2018 and December 31, 2018

Under EPA's risk assessment, biosolids cadmium content was limited by Pathway 3, the direct ingestion of biosolids by children. The highly exposed individuals under Pathway 3 were normally children between the ages of one and six that ingested solids from biosolids storage piles or from the soil surface daily for up to five years. In remote agricultural settings like the City's biosolids land application sites, it is highly unlikely that a child younger than six years would be unattended long enough to ingest land applied biosolids.

EPA's risk model assumed that biosolids were not diluted with soil when exposure occurred. The risk assessment was based on a life time exposure to cadmium, which would result in one cancer case per 10,000 highly exposed individuals. This risk level refers to excess cancer risk over and above the background cancer risk in unexposed individuals.

Portland biosolids cadmium levels are well below EPA land application limits (2.28 mg/kg vs. 85 mg/kg).

In contrast to biosolids, many commercially available phosphate fertilizers contain cadmium at levels which are more than 100 mg/kg. In addition, the cadmium contained in these unregulated fertilizer commodities is more bioavailable than that found in biosolids.

ENVIRONMENTAL SERVICES
CITY OF PORTLAND
CLEAN RIVER WORKS

Lead in Portland Biosolids

During the treatment of domestic wastewater, cleansed water called effluent is disinfected prior to discharge into the Columbia River. Solids separated from liquid during the treatment process are further processed resulting in a nutrient-rich, recyclable resource called biosolids.

Industrial sources are regulated under wastewater discharge permits which require them to "pretreat" their wastewater to remove "toxic pollutants" before wastewater is discharged to the City's sanitary sewer system. The City has operated an industrial pretreatment program since 1983, which has substantially lowered the concentration of biosolids lead and other constituents.

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EPA's risk model assumed that biosolids were not diluted with soil when exposure occurred. The 300 mg/kg lead limit selected by the EPA for biosolids was devised to safeguard against lead-related developmental defects in the systems of growing children.

Preliminary research indicates biosolids applied to urban area soils with high lead levels tie up soil lead, lessening its availability for bioaccumulation.

Portland biosolids lead levels (57.2 mg/kg in 2018) are well below EPA land application limits (840 mg/kg).

ENVIRONMENTAL SERVICES
CITY OF PORTLAND
CLEAN RIVER WORKS

Trace Organic Compounds in Portland Biosolids



ENVIRONMENTAL SERVICES
CITY OF PORTLAND
CLEAN RIVER WORKS

Trace amounts of some PCBs (polychlorinated biphenyls), dioxins, and dibenzofurans were detected in Portland biosolids and solids sampled from other sources during a national domestic wastewater treatment works survey conducted by the Environmental Protection Agency (EPA) in 1989. Based on the survey, EPA concluded concentrations of these chemicals in biosolids were so low overall that they would be unlikely to adversely affect the environment and public health but agreed to consider the eventual regulation of dioxins from a variety of sources, including biosolids, in the future.

Since Portland's Columbia Boulevard Wastewater Treatment Plant biosolids contained a higher level of dioxins and dibenzofurans than most other biosolids surveyed under the national study, with assistance from the Oregon State Health Division (OSHD), the Department of Environmental Quality (DEQ) and EPA, in 1990 the City voluntarily conducted a risk assessment to assure that Portland's dryland pasture management practices protected the public health. As a result of the risk assessment, the OSHD recommended that DEQ establish a quarterly mean biosolids dioxin-dibenzofuran pollutant limit of 285 ppt (TEQ). These conditions were removed in the 2011 NPDES permit renewal. Portland land applied biosolids, when last monitored in 2017, contained dioxins-dibenzofurans at 38 ppt (TEQ). Portland biosolids dioxin levels fell to less than 20 ppt (TEQ) as recently as 2016 (17 ppt).

As a safeguard to help assure Portland biosolids amendment activities at land application sites reflect sound management practices, monitoring of soil dioxin and dibenzofuran levels are conducted approximately every 5 years. Trace soil dioxin and dibenzofuran levels in biosolids and non-biosolids amended areas during 2016 suggest land application actions have had little overall affect on the quality of soils at Madison Ranches.

Where biosolids had been applied for over twenty years, levels were approximately 40% (3.26 ppt-TEQ) of the 8.0 ppt (TEQ) national norm.

Since it is conceivable that dioxin affixed to airborne particulates could be transported by wind action, ambient air monitoring was conducted at Madison Ranches in 1991 to determine if measurable quantities of dioxins could be found downwind from Portland biosolids land spreading operations during periods of high winds. No dioxins or dibenzofurans were detected during three separate sampling episodes. Thus, any dioxin movement facilitated by wind action at Madison Ranches is considered insignificant.

Biosolids amendments have effectively checked wind erosion and blowing dust in areas characterized by considerable, on-going air disturbance.

PCBs concentrations in biosolids applied at Madison Ranches are routinely analyzed by the City of Portland. The total detectable PCBs content in biosolids (0.4971 mg/kg during 2018) has been well below the 50 mg/kg limit required under federal regulation and DEQ's 10 mg/kg threshold for testing livestock feed. Total detectable PCBs levels are expected to remain less than 0.5 mg/kg. PCBs levels in soil samples collected in biosolids amended areas of Madison Ranches during 1998 were below detection levels (0.1 mg/kg). Since PCB levels in biosolids applied in recent years has been so low, no additional soil testing occurred in 2018.

Forage grown on biosolids amended pasture which received PCBs at levels which exceeded 10 ppm during 1997 were sampled in 1998 after the first growing season following biosolids amendment to determine if tissue PCBs content exceeded 0.1 mg/kg. Forage tested contained no detectable PCBs.

How Are Biosolids Regulated?

Federal rules regulating production and use of biosolids have been in place since 1979, and the State of Oregon adopted similar rules in 1983. These regulations have been updated and revised several times to protect public health and the environment.

Regulations ensure that sites are well suited to the application of biosolids, that biosolids are applied in appropriate amounts, that there are buffer strips between application areas and water bodies, and that application sites are carefully monitored.

For more information about the City of Portland's Biosolids Program:

Mark Ronayne
503-823-2437

Environmental Services
Columbia Boulevard Wastewater Treatment Plant
5001 North Columbia Boulevard
Portland Oregon 97203

www.enviro.ci.portland.or.us

ENVIRONMENTAL SERVICES
CITY OF PORTLAND
1120 SW Fifth Avenue, Room 1000
Portland Oregon, 97204-1912

Dean Marriott, Director
Dan Saltzman, Commissioner

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From Waste To Resource

Portland's Biosolids Recycling Program



ENVIRONMENTAL SERVICES
CITY OF PORTLAND
CLEAN RIVER WORKS

What Are Biosolids?

Portland's wastewater treatment facility cleans millions of gallons of wastewater each day. The biosolids this process produces are recognized as a valuable soil amendment. Biosolids improve the soil by adding organic matter and nutrients to stimulate healthy plant growth.

How Are Biosolids Produced?

The production of biosolids (see diagram below) begins when wastewater from homes, businesses and industries enters the Columbia Boulevard Wastewater Treatment Plant in Portland (A). Large bar screens remove rocks, rags and other debris (B). These coarse solids are disposed of in a landfill.

The wastewater then passes into settlement basins called primary clarifiers (C), where floatable solids rise to the top and other solids settle to the bottom.

Wastewater from primary clarifiers (C) is pumped to secondary aeration treatment basins (D). At this point, air is introduced to stimulate the growth of microbes that feed on organic material in the wastewater. Wastewater then flows into settlement basins called secondary clarifiers (E), which separate more solids from the liquid.

The liquid produced by secondary treatment is relatively clean water called effluent. The effluent is disinfected before it is discharged to the Columbia River (F). The solids removed from primary and secondary wastewater are stabilized in large, oxygen-deficient tanks called anaerobic digesters (G). The process kills most disease-causing organisms and eliminates odorous organic compounds that attract rodents, flies and other disease-carrying animals.

Why Recycle Biosolids?

Biosolids are too valuable a resource to dispose of in the landfill. Biosolids replenish soil nutrients, improve water retention and reduce erosion. Biosolids produced in Portland are used as a soil amendment to improve livestock forage and to control wind erosion at Madison Farms near Echo, Oregon.

Are Biosolids Safe?

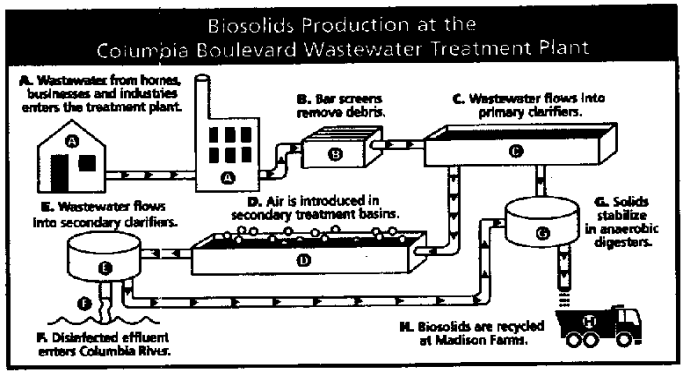
Biosolids produced at Portland's Columbia Boulevard Wastewater Treatment Plant contain nitrogen, phosphorous, sulfur and potassium. Commercial fertilizers contain these same essential plant nutrients. Biosolids also contain small amounts of other important nutrients such as magnesium, manganese, iron, zinc and calcium, which are not usually found in commercial fertilizers.

Biosolids contain traces of metals and organic compounds found in wastewater. Before industries discharge wastewater to Portland's sewage treatment system, they must pretreat it to remove most trace metals, organic compounds and other chemicals. Metals contained in biosolids produced in Portland and applied on agricultural land fall well below the limits set by the U.S. Environmental Protection Agency.

Portland's wastewater treatment process cleans sewage and also produces nutrient-rich, organic biosolids. Recycling biosolids is an important part of preserving the environment and the quality of life in the Pacific Northwest.

Biosolids contain traces of organic compounds such as dioxins, dibenzofurans and polychlorinated biphenyls (PCBs). EPA studies indicate that the concentration of these chemicals is so low that they will not have an adverse impact on the environment and public health.

The City of Portland monitors soil annually at Madison Farms, where biosolids are land applied, to ensure that metals, trace organic compounds and soil nitrates will not adversely impact soil, groundwater or public health.



Will Nitrates In Biosolids Contaminate Groundwater?

Groundwater contamination at Madison Farms is unlikely. The application sites are dry land pasture in upland areas where distance to groundwater exceeds 300 feet and average annual rainfall is between seven and nine inches. No biosolids are applied unless the nitrate nitrogen content immediately below the root zone is within regulatory limits.

PROPOSED NORTHERN SHERMAN COUNTY BIOSOLIDS LAND APPLICATION PROGRAM EXPANSION

Portland biosolids are domestic wastewater processing facility solids that have been treated to meet federal and state quality standards. They are land applied and managed to protect the public health and the environment. Portland biosolids have been successfully applied on 5,456 acres of semi-arid rangeland at Madison Farms near Echo, Oregon for the past 18 years. On-going soil and forage testing conducted by Oregon State University (OSU) has demonstrated that biosolids are a good soil conditioner and fertility source. Their application has greatly enhanced forage, dryland small grains and irrigated canola production, and allowed sustained revegetation of sand blow areas in northern Morrow and Umatilla Counties.

In 1999, the City of Portland received Oregon Department of Environmental Quality (DEQ) authorization to land apply biosolids to dryland small grains at two locations in northern Sherman County. Several farmers located in Townships 1 and 2 North and Ranges 16 to 19, East Willamette Meridian desire to have Portland biosolids land applied on up to 8,500 additional acres of dryland small grains within the townships indicated. Biosolids would be applied by a commercial application company or the farmer owning the land where solids are desired. Biosolids would be applied at OSU agronomic application rates according to site conditions specified in a DEQ issued authorization letter.

To learn more about proposed Sherman County biosolids land application operations or the nature of Portland's biosolids, please call Greg Charr, Biosolids Program Manager at 503-823-2491 (e-mail greg.charr@portlandoregon.gov) or write to the City of Portland, 5001 North Columbia Boulevard, Portland, Oregon 97203.

More information on Portland's biosolids program is online at http://www.portlandonline.com/bes/index.cfm?/index.cfm?&a=41872&c=31031.

Notice to Utility Workers Constructing Wind Power Facilities at Madison Farms

Portland biosolids (processed domestic wastewater solids that meet federal and state criteria which enable them to be land applied on agricultural ground to condition and fertilize soils) have been beneficially recycled at Madison Farms since 1990.

Solids processing at Portland's Columbia Boulevard Wastewater Treatment facility significantly lowers the potential risk of contracting illness from any disease-causing agents (certain pathogenic viruses and bacteria and parasitic protozoans and worms) that might remain following solids treatment. However, as an added safeguard, environmental regulations limit public access to land application sites for a period of one year following solids application. During this time natural environmental factors (desiccation, sun light exposure, competition with other soil microbes, etc.) destroy any pathogens that might remain in applied solids.

Regulations assume farm employees, solids applicators and others who regularly work on private property are informed about added precautions in good hygiene advisable where biosolids have been land applied.

This notice is provided to inform you that some sites where you will be working have probably received biosolids within the past twelve months.

The attached guidelines for field personnel protection should be observed when working in areas at Madison Farms where biosolids have been applied. They are conservative, in the sense that they are designed for persons who actually come into regular contact with biosolids (e.g., solids transporters and appliers) during their day-to-day work routine.

If you have question or would like further information on this topic, feel free to contact Kent Madison (541-376-8107or 541-571-0581/e-mail: kmadison@eoni.com) Mark Ronayne (503-823-2437/e-mail; markr@bes.ci.portland.or.us); Greg Charr (503-823-2491; e-mail gregch@bes.ci.portland.or.us) or Ron Doughten (503-229-5050; doughten.ron@deq.state.or.us).

I have read this statement and agree to follow the accompanying guidelines.

_____ _____

Name Date

Attachment: Hygiene guidance

Guidelines for Biosolids Applier/Field Worker Protection

Although Portland bulk Class B biosolids present little threat to product applier and field worker health and safety, the potential exists for some disease-causing microorganisms to remain in solids transported from the Columbia Boulevard Wastewater Treatment Plant to Madison Ranches and Sherman County. A few common-sense practices should be observed to minimize exposure to any germs that might remain in biosolids, including:

- Wash hands before eating, drinking, or smoking.
- Use water-less soap (hand sanitizers) for hand washing at remote sites where water is not available.
- Avoid rubbing eyes, nose, and mouth after handling biosolids.
- Do not smoke or consume food or drink in biosolids loading or unloading areas.
- Wear gloves during field operations.
- When clothing or body parts are exposed to biosolids, shower and change into clean clothes before leaving work.
- Immediately clean and disinfect abrasions and lacerations. Keep all wounds protected from contamination.

Description of Portland Bulk Class B Biosolids

What Are Portland Bulk Class B Biosolids?

Portland bulk Class B Biosolids (≈ 20% total solids and 80% water) are biologically stabilized residuals derived from the primary and secondary treatment of domestic wastewater at the City of Portland, Oregon's Columbia Boulevard wastewater treatment facility.

The Oregon Environmental Quality Commission (EQC) and the Environmental Protection Agency (EPA) actively promote biosolids recycling via land application. Portland's biosolids are a beneficial recyclable material which improves soil tilth, fertility, and stability.

These residuals have undergone anaerobic digestion, a controlled process recognized by the EPA and the Oregon Department of Environmental Quality (DEQ) to make them suitable for land application. Digestion processes and biosolids quality are regularly monitored to assure Federal and State pathogen *[40 CFR Part 503.32(b)(2) & OAR 340-50-026(2)(b)]*, vector attraction *[40 CFR Part 503.33(b)(1) & OAR 340-50-026(2)(c)]*, and trace pollutant *[40 CFR Part 503.13(b)(1) & OAR 340-50-026(2)(a)]* levels are within regulatory standards.

Test information on Portland biosolids quality, including priority pollutant scan data, is available upon request from the City of Portland (503-823-2491) and DEQ (503-229-5050).

Are Biosolids Considered Hazardous? - No

Portland biosolids are not considered a RCRA Subtitle C hazardous waste nor are they a toxic, biological, or radioactive waste.

Sherman County Pre-Application Neighbor Notification Letter Example

Adjacent Property Owner

July 1, 2010

Re: Notice of intent to apply Portland biosolids on Tax Lot 900, Section 4, Twp. 1 North, Range 18 East, Willamette Meridian & Tax Lot 8600, Section 33, Twp. 2 North, Range 18 East, Willamette Meridian, Sherman County

Beginning on or about August 20, 2010, K&S Madison, Inc. anticipates land applying biosolids produced by the City of Portland on cultivated lands within 626.97 acres managed as dryland small grains in Sherman County (Tax Lot 900, Section 4, Twp. 1 North, Range 18 East, Willamette Meridian and Tax Lot 8600, Section 33, Twp. 2 North, Range 18 East, Willamette Meridian, Sherman County) (see enclosed map).

Bulk Class B biosolids cake produced by the City of Portland's Columbia Boulevard Wastewater Treatment Plant will be applied at Oregon State University (OSU) recognized agronomic rates to enhance soil productivity, reduce erosion and increase small grain production and quality. Biosolids are the nutrient-rich organic materials resulting from the treatment of domestic sewage in a wastewater treatment facility. Biosolids are a beneficial resource, containing essential plant nutrients and organic matter. They are commonly recycled as a fertilizer and soil amendment (see attached fact sheets for additional information on biosolids). Since 1990, Portland biosolids have successfully been applied to improve and maintain soils and stimulate dryland forage and small grains growth production at Madison Farms, approximately 55 miles east of the proposed Sherman County land application site. Portland biosolids were previously applied on Sherman County soft white winter wheat sites within Township 1 North, Range 18 East, Willamette Meridian, Sherman County in 2000.

Biosolids recycling is regulated by both the Environmental Protection Agency (EPA) and the Oregon Department of Environmental Quality (DEQ) to assure protection of public health and the environment. Portland biosolids will be transported to the site in question by trucks via a contract with Gresham Transfer, Inc. (the same contractor who has been moving cement into the area recently to accommodate wind tower development). Biosolids will be land applied by K&S Madison, Inc. on behalf of the City in conformance with a site specific DEQ authorization letter.

A 200 feet buffer will be observed between any well and the nearest point of biosolids application. Similarly, 10 feet buffers will be observed between unpaved county roads (e.g., Beacon Road & Dehler Lane) and application areas.

I will be happy to meet with you at your convenience to answer questions or concerns that you may have about this proposal. If you desire further information on biosolids, their proposed means of application or their regulation, please feel free to contact me at 541-376-8107 or kmadison@eoni.com.

Kent Madison, President

29299 Madison Road
Echo, Oregon 97826

Enclosures (3)

Tribeca Transport

Adjacent Property Owner

December 5, 2018

Re: Notice of intent to apply Portland biosolids on Tax Lots 1300, 1500, & 2400, Sections 7, 12, & 18, Twp. 1 North, Ranges 18 & 19 East, Willamette Meridian, Sherman County

Beginning on or about Jan 2, 2019, Tribeca Transport, Inc. anticipates land applying biosolids produced by the City of Portland on cultivated lands within 376 acres managed as dryland small grains in Sherman County (Tax Lots 1300, 1500, & 2400, Sections 7, 12, & 18, Twp. 1 North, Ranges 18 & 19 East, Willamette Meridian, Sherman County) (see enclosed map).

Bulk Class B biosolids cake produced by the City of Portland's Columbia Boulevard Wastewater Treatment Plant will be applied at Oregon State University (OSU) recognized agronomic rates to enhance soil productivity, reduce erosion and increase small grain production and quality. Biosolids are the nutrient-rich organic materials resulting from the treatment of domestic sewage in a wastewater treatment facility. Biosolids are a beneficial resource, containing essential plant nutrients and organic matter. They are commonly recycled as a fertilizer and soil amendment. Since 2010, City of Portland biosolids have successfully been applied to improve and maintain soils and stimulate dryland small grains productivity in Sherman County.

Biosolids recycling is regulated by both the Environmental Protection Agency (EPA) and the Oregon Department of Environmental Quality (DEQ) to assure protection of public health and the environment. Portland biosolids will be transported to the site in question by trucks via a contract with Synagro Corp. Biosolids will be land applied by Tribeca on behalf of the City in conformance with a site specific DEQ authorization letter.

A 200 ft buffer will be observed between any well or residence and the nearest point of biosolids application. Similarly, 25 ft buffers will be observed between roadways and wind turbine roads (e.g., McDonald Ferry Ln, turbine road “S”) and application areas.

I will be happy to meet with you at your convenience to answer questions or concerns that you may have about this proposal. If you desire further information on biosolids, their proposed means of application or their regulation, please feel free to contact me at (360) 450-1826 or email garrett@tribecatransport.com.

Garrett Behrman, Beneficial Reuse Manager

1415 Port Way
Woodland WA, 98674

Enclosures
cc. Greg Charr, City of Portland

BENEFICIAL REUSE OF CITY OF PORTLAND BIOSOLIDS



The following report summarizes the City of Portland's biosolids land application program at Madison Ranches. The Madison Ranches program has been a successful public-private partnership since 1990. For over two decades the program has provided the City with a stable, sustainable, cost-effective, and environmentally sound method to manage its biosolids. It has also provided numerous environmental and economic benefits to Madison Ranches.

Background:

The City of Portland produces approximately 15,000 dry tons (≈ 75,000 wet tons) of biosolids per year at the Columbia Boulevard Wastewater Treatment Plant (CBWTP). Biosolids are the nutrient-rich by-product of municipal wastewater treatment. The City of Portland treats raw sewage solids (often called sludge) to meet stringent U.S. Environmental Protection Agency (EPA) standards for pathogen reduction, vector attraction reduction, and pollutant levels before they can be classified as biosolids and used beneficially. Further, the biosolids must meet additional Oregon Department of Environmental Quality (DEQ) regulatory requirements, which are included in the City's Biosolids Management Plan and National Pollutant Discharge Elimination System permit.

Since 1990, the City has land-applied biosolids to dryland pasture, dryland small grains, and irrigated small grains at Madison Ranches. Recycling biosolids through land application returns a useful resource to the land. Biosolids are rich in nutrients (e.g., nitrogen) and organic matter that aid the growth of forage and farm crops. Over 90% of biosolids produced in Oregon and Washington are beneficially reused through land application.

The City of Portland once landfilled its biosolids, which is an expensive and unsustainable practice. Beneficial reuse of biosolids frees up finite landfill space and replenishes the soil with valuable nutrients and organic matter. Biosolids can also offset the use of commercial fertilizers, which are produced by fossil fuel-intensive manufacturing processes. And with worldwide concerns over soil erosion and phosphorus availability increasing, biosolids recycling will continue to be a critical part of sustaining our natural systems.

http://world.time.com/2012/12/14/what-if-the-worlds-soil-runs-out/
http://www.susana.org/_resources/documents/default/2-1143-policyreport2010peakphosphate1.pdf

Site Characteristics:

Madison Ranches is located near the town of Echo, OR approximately 200 miles east of Portland. This region of north, central Oregon has a semi-arid climate which experiences approximately 7-9 inches of rainfall per year. This limited precipitation allows for year-round biosolids application. This is a critical factor for the City of Portland - the largest producer of biosolids in the state. The year-round, steady-state biosolids application at Madison Ranches provides unparalleled stability to the City's program. There are no concerns with expensive winter storage options or extended program shutdowns associated with weather conditions. Sites located closer to the CBWTP all experience

these limitations and there continues to be a decreasing trend in available farm land near the Portland Metropolitan area and Willamette Valley for biosolids management and farming in general.

The Madison Ranches site is ideal for land application when it comes to protection of groundwater and surface water. Depth to groundwater at Madison Ranches is approximately 300 ft. Soils at this site also have a cemented soil (caliche) layer that prevents deep leaching from the soil profile. There is also no 100-year floodplain at Madison Ranches (ground that would be inundated with water during a 100-year storm event). Thus, concerns for the movement of nutrients or pollutants from biosolids into the water supply are virtually non-existent at Madison Ranches.

The Madison Ranches property is over 17,000 acres of remote, dryland agriculture. Over 5,000 of these acres have been dedicated to the City of Portland's biosolids land application program through a lease agreement between the City of Portland and Madison Ranches. The Madison Ranches ground is contiguous, Exclusive Farm Use (EFU) property. This provides an important advantage to the City's program. There are no neighbors, businesses, or encroaching properties immediately surrounding biosolids application sites. There are numerous examples throughout the country and even in the Pacific Northwest of biosolids programs that have experienced complaints, protests, or even bans on biosolids application due to their close proximity to neighbors and homeowners as well as concerns over climatic conditions. The following links provide additional insight:

http://www.bendbulletin.com/news/1600378-151/homeowners-raising-a-stink-about-smell-from-sewage
http://www.waheagle.com/story/2011/03/03/news/board-votes-to-limit-biosolid-application/2455.html

The City has worked extensively with Oregon DEQ over the last twenty years to permit the Madison Ranches ground to receive biosolids. Site authorization letters are issued by DEQ regional water quality staff and are required prior to land application at particular sites. The letters specify conditions for land application, including crop requirements, biosolids application rates, seasonal restrictions, setback distances to roads, wells, and water sources, and other pertinent site management information.

Environmental Benefits:

Over the long history of the City's program, Madison Ranches has realized numerous environmental benefits from biosolids land application including forage yield and quality improvements, soil quality improvements, increased beef production capacity, wind erosion suppression, carbon sequestration, and biofuel production.

In a 2008 study, Oregon State University (OSU) explored the effects of annual City of Portland biosolids land application on dryland pasture at Madison Ranches. The results were dramatic. Forage ground that had received biosolids had a 530% increase in grass yield versus non-biosolids amended ground. There was also a noticeable increase in forage *quality* with more shoots and leaves, higher protein content and increased nutrient concentrations in biosolids amended forage. The soil saw similar benefits including increased nutrient concentrations and increased organic matter content. Some of the benefits of organic matter include providing a food source for soil microbes, increasing soil moisture holding capacity, and improving soil structure. The addition of this organic matter has also provided wind erosion suppression benefits by greatly helping to stabilize ground at Madison Ranches which was historically susceptible to sand blows.

The significantly improved forage quantity and quality also greatly benefited the beef production value of the biosolids amended ground. Dryland pasture sites are grazed in the spring time by cattle at Madison Ranches. Madison Biosolids, Inc. has reported that ground that has received the City's biosolids can support up to twenty times (typically 8-12 times) the amount of cattle as non-biosolids amended ground. Beef produced at Madison Ranches also carries the label of *Country Natural Beef*. This designation requires beef to be grown with no hormones, no antibiotics, and humane animal treatment practices.

http://www.countrynaturalbeef.com/

OSU's research on the City of Portland's biosolids program has been summarized by fact sheets provided by the Northwest Biosolids Management Association (NBMA) and can be found at the following Web sites:

http://www.nwbiosolids.org/pubs/BiosolidsGrassSoilFertility.pdf
http://www.nwbiosolids.org/pubs/BiosolidsDrylandYieldWEB.pdf
http://www.nwbiosolids.org/pubs/BiosolidsDrylandSoilFertilityWEB.pdf

Further research conducted by the University of Iowa quantified the carbon footprint associated with the City's land application program at Madison Farms. In an era with concerns about global warming and climate change, the overall carbon footprint is an important environmental consideration for any biosolids management program. The study showed that the amount of fuel used by the trucks hauling the biosolids from the CBWTP to Madison Farms and in the land application equipment equated to approximately 1,250 tons of CO_2 released to the atmosphere per year. Sequestered carbon, however, associated with the increased forage and soil carbon on biosolids amended ground equated to a carbon offset of -8,970 tons of CO_2 per year. Thus, the overall land application program represents a net carbon deficit of -7,720 tons of CO_2 per year. This amount of sequestered carbon is equal to the amount of CO_2 released by the burning of over 600,000 gallons of diesel fuel. In a related study, OSU showed that forage grown on biosolids amended ground releases 8,800 tons of beneficial oxygen annually to the atmosphere.

Madison Ranches Biosolids Program Carbon Accounting:

Fuel for Transport and Application	1,250 tons CO_2/yr
Carbon sequestered in Forage and Soil	-8,970 tons CO_2/yr
Net CO_2	**-7,720 tons CO_2/yr**

Another environmental benefit associated with the City's biosolids program is the "Biosolids to Biodiesel" program at Madison Farms. In addition to dryland pasture, Madison Farms also applies the City's biosolids to dryland and irrigated canola. Madison Farms harvests and crushes the canola seeds to create canola oil. Mashed seed husks are beneficially recycled as a high-quality, high-protein cattle feed. Madison Farms can produce up to 200,000 gallons annually of Oregon grown biodiesel at its on-site biodiesel production facility. The raw canola oil can also be shipped to Sequential Biofuels in Salem, OR. Sequential Biofuels currently provides Oregon grown biodiesel for the City of Portland's own fleet as well as Gresham Transfer, Inc., the City's contracted biosolids hauler. Madison Biosolids, Inc. also utilizes a biodiesel blend of B20 or greater in all of their land application equipment. Madison has run up to B100 in their land application equipment for the City's program at Madison Ranches.

Contractor Experience and Quality of Service:

Biosolids program staff at Madison Biosolids, Inc. have up to twenty years of land application experience. Their level of expertise in land application services is known throughout the Pacific Northwest. Services performed at a top level of service include biosolids loading and spreading, equipment maintenance, soil sampling, GPS mapping and reporting, and invoicing. Madison Biosolids has a long list of satisfied clientele for land application services in Oregon including the City of Portland, City of Salem, Clean Water Services (Washington County), and Oak Lodge Sanitary District (Clackamas County).

The City's current hauling contractor for the Madison Ranches project, Gresham Transfer, Inc. (GTI), also has a proven track record in their commitment to the environment, quality of service, and safety. GTI has recently purchased model year 2012 Peterbilt trucks. These new trucks conform to the latest and most stringent EPA 2010 on-road diesel emissions standards. These standards require diesel engines to emit no more than 0.01 grams per brake horsepower hour (g/bhp-hr) of particulate matter (PM), 0.2 g/bhp-hr of nitrogen oxides (NOx), and 0.14 g/bhp-hr of non-methane hydrocarbons (NMHC) utilizing Diesel Particulate Filters (DPFs) and Selective Catalytic Reduction (SCR). Trucks meeting the 2010 EPA emissions standards are the currently the cleanest burning diesel engines in the world. Gresham Transfer also runs their fleet on the maximum biodiesel blend allowed under their current engine warranties. In addition, GTI utilizes idle reduction equipment which automatically shuts down truck engines after five minutes of idling and uses 100% recycled engine oil. GTI's safety record is also unmatched in the industry. Since 1992, they have hauled over 48,000 loads of biosolids (covering over 18 million road miles) for the City with just one accident/spill on their record (GTI driver was not at fault even in this one incident).

Land Application Safety and Policy Statements:

The safety and benefits of biosolids land application have long been recognized by the U.S. EPA, Oregon's Environmental Quality Commission (EQC) and DEQ, and the FDA.

"The U.S. Environmental Protection Agency (EPA) will actively promote those municipal [biosolids] management practices that provide for the beneficial use of [biosolids] while maintaining or improving environmental quality and protecting public health. To implement this policy, EPA will continue to issue regulations that protect public health and other environmental values" (49 FR 24358).

http://water.epa.gov/polwaste/wastewater/treatment/biosolids/index.cfm
https://www.epa.gov/biosolids/guide-biosolids-risk-assessment-epa-part-503-rule

"The Environmental Quality Commission (EQC) encourages the land application of treated domestic wastewater biosolids, biosolids derived products, and domestic septage which are managed in a manner which protects the public health and maintains or improves environmental quality. These beneficial recyclable materials improve soil tilth, fertility, and stability and their use enhances the growth of agricultural, silvicultural, and horticultural crops" (OAR 340-050-0006).

http://www.deq.state.or.us/wq/biosolids/biosolids.htm

In addition, the National Academy of Sciences (NAS), advisors to the nation on science, engineering, and medicine, has twice reviewed the safety of the U.S. EPA's biosolids regulations and released the following statements in 1996 and 2000:

"The use of these materials in the production of crops for human consumption, when practiced in accordance with federal guidelines and regulations, presents negligible risk to the consumer, to crop production and to the environment." 1996 NAS. Use of Reclaimed Water and Sludge in Food Crop Production.

"There is no documented scientific evidence that the Part 503 rule has failed to protect public health" and "A causal association between biosolids exposure and adverse health outcomes has not been documented." NAS 2000. Biosolids Applied to Land: Advancing Standards and Practices.

https://www.epa.gov/biosolids/epa-response-national-research-council-nrc-report

The Food and Drug Administration (FDA) has also recognized the safety of biosolids land application for food crops in its final rule for produce safety. *"In consultation with EPA, FDA has concluded that adherence to 40 CFR part 503 remains an appropriate approach to the use of biosolids for the growing of covered produce. We continue to believe that these requirements are appropriately protective of public health."*

"FDA, in consultation with EPA, has determined that 40 CFR part 503 remains the most appropriate approach to safe use of sewage sludge biosolids on land involved in the production of covered produce. We point out that the NAS 2002 report (Ref. 177) noted that there is "...no documented evidence to indicate that part 503 has failed to protect public health"; that EPA responded to the NAS review with a 14-point action plan, which it is carrying out; and that under section 405(d)(2)(C) of the CWA, EPA is required to publish a biennial review of part 503 (Ref. 178). FDA concludes that the provisions of 40 CFR part 503 are appropriate standards for protecting public health with respect to the use of sewage sludge biosolids in growing covered produce."

The Implications for Human Health and the Environment of Recycling Biosolids on Agricultural Land. S R Smith Imperial College London. Peer review of scientific knowledge established in February 2008.

"An extensive body of scientific evidence has been generated internationally relating to health, environmental and soil quality aspects of recycling sewage sludge to agricultural soil. The overall conclusion of this review is that recycling sewage sludge on farmland as a soil conditioner and alternative fertilizer resource within current guidelines and controls on agricultural utilization is a safe and sustainable practice."

Some recent concern over the presence of pharmaceuticals, personal care products, and other contaminants of emerging concern in biosolids is discussed in the following publications. Research to date indicates a negligible risk to public health from these types of compounds in land applied biosolids.

http://www.nwbiosolids.org/EventPubs/NWbiosolids_RISKbrochure.pdf
https://www.biocycle.net/2011/08/16/evaluating-exposure-risk-to-trace-organic-chemicals-in-biosolids/

Additionally, in the Pacific Northwest, research at local land grant universities (Oregon State University, the University of Washington, and Washington State University) has demonstrated that biosolids are safe to use and that land application of biosolids benefits a number of crops, including wheat and forage crops.

https://catalog.extension.oregonstate.edu/sites/catalog.extension.oregonstate.edu/files/project/pdf/pnw508_0.pdf
http://faculty.washington.edu/slb/biosolids_basics.html
http://cru.cahe.wsu.edu/CEPublications/FS192E/FS192E.pdf

Regional and national recognition:

The City's program at Madison Ranches has received regional and national recognition for biosolids management excellence. In 2003, the Northwest Biosolids Management Association (NBMA) recognized the City's Madison Farms program with the first-ever *Excellence in Biosolids Management Award* offered by the NBMA. The award went to the City of Portland "for their outstanding efforts in developing and implementing a cost-effective and environmentally beneficial biosolids management program." The EPA has praised the City of Portland's biosolids program for "an outstanding project involving and enhancing the beneficial use of municipal wastewater biosolids." Additionally, Oregon DEQ has recently provided the following statement (2013), "The City of Portland has operated a program for the beneficial reuse of biosolids on agricultural crops and range lands at Madison Farms since 1990. Land applied biosolids have provided valuable organic matter and nutrients to both agricultural crops and pasture. In addition, biosolids from the City of Portland have been used to establish and improve the growth of native vegetation on steep, highly erodible slopes, which reduces soil erosion and preserves valuable top soil. The City of Portland's biosolids program has operated in compliance with state requirements and serves as an example of a well-run program to other biosolids programs within Oregon as well as nationally."

Sherman County Program:

The City of Portland recently diversified its biosolids management program through an extensive Request for Proposals (RFP) process conducted in 2009-2010. The aim of the RFP process was to strengthen, enhance, and diversify the City's current program by exploring a variety of biosolids use options for approximately one-third of the City's biosolids production. As the result of this open and competitive process, Madison Biosolids, Inc. was selected as the successful offeror with a proposal to seasonally land apply (dry weather months only) City of Portland biosolids to dryland small grains in the Wasco area of Sherman County. The Sherman County sites are approximately 80 miles closer to the City of Portland than Madison Ranches, which substantially reduces the City's fuel consumption and program costs.

Sherman County sites have seen many benefits due to the biosolids land application program. Farmers have been able to replace expensive chemical fertilizers such as anhydrous ammonia with biosolids. Biosolids provide a sustainable, slow-release source of nitrogen and other important nutrients (e.g., phosphorus, sulfur, zinc, iron). Biosolids are also an important source of organic matter which enhances soil properties in many ways (improved soil structure and tilth, reduced erosion, increased moisture retention, a food source for essential soil microorganisms/worms). When biosolids replace commercial fertilizers derived from fossil fuels, they also reduce greenhouse gas emissions. It takes the equivalent of approximately 3,000 cubic feet of natural gas to manufacture one ton of commercial fertilizer nitrogen. Farmers in the City's Sherman County program have also reported that crop yields on biosolids amended fields are "as good or better" then fields grown with commercial fertilizers.

Additional information:

http://www.oracwa.org/pdf/biosolids-fact-sheet_3-2012.pdf
http://www.wef.org/WEF_LandAppl_Compost_FactSheet_May2010
http://www.nebiosolids.org/scientific-basis-for-biosolids-use/

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