CITY OF SALEM, OREGON
DEPARTMENT OF PUBLIC WORKS
WILLOW LAKE WATER POLLUTION CONTROL FACILITY

2020

BIOSOLIDS PROGRAM

ANNUAL REPORT

Reporting Period: January 1, 2020 - December 31, 2020

PREPARED FOR

OREGON DEPARTMENT OF ENVIRONMENTAL QUALITY

NPDES Permit Number 101145

Section 1
Table of Contents

Section 2
City & Contractor
Information

Section 3
Certification Statements

Section 4
2020
Annual Biosolids Report

Section 5
Tables

Section 6
Application Site Reports

Section 7
Updated Biosolids Spill Plan

Section 2:
City of Salem & Contractor Information

CITY OF SALEM AND CONTRACTOR INFORMATION

Name and address of person(s) performing biosolids reuse activities for Willow Lake Water Pollution Control Facility:

Willow Lake Water Pollution Control Facility
5915 Windsor Island Road North
Salem, OR 97303

Contacts: Jue Zhao, Wastewater Division Manager **Phone:** 503-588-3480
Mark Stevenson, Residuals & Hauled Waste Supervisor **Phone:** 503-763-3479

Ossprey LLC.	**Service:**	Summer Cake Application
PO Box 980	**Contact:**	Fanny Etzel
Jefferson OR 97325	**Phone:**	360-225-9094

Horner Enterprises Inc	**Service:**	Winter Long Distance Hauling
PO Box 442	**Contact:**	Jay Horner
Sweet Home OR 97386	**Phone:**	541-979-2099

Tribeca Transport LLC.	**Service:**	Summer Augment Cake Liquid & Transport & Application
1415 Port Way	**Contact:**	Eric Thwaites
Woodland WA 98674	**Phone:**	360-518-0041

Goodman Sanitation Inc.	**Service:**	Winter Application
931 NE Harlow Rd	**Contact:**	Alex Mauck
Troutdale OR 97060	**Phone:**	503-666-2280

Section 3:
Signed Certification Statements

2020
CERTIFICATION STATEMENT: CITY OF SALEM

1. Facility Identification

Facility Name:	**Willow Lake Water Pollution Control Facility**
Ownership:	City of Salem, Oregon (Municipality)
Address:	5915 Windsor Island Road North Salem, OR 97303
Telephone Number:	(503) 588-6380
Facility Contacts:	Jue Zhao Wastewater Services Division Manager Mark Stevenson Residuals and Hauled Waste Manager
Ownership Director:	Mr. Peter Fernandez Public Works Director 555 Liberty St. SE, Room 325 Salem, OR 97310-3503 (503) 588-6008

2. Reporting Period: January 1, 2020- December 31, 2020

3. NPDES Permit Number: 101145 (Renewed on November 18, 2004)

4. Facility Status: Preparer of Biosolids

5. Biosolids Production: **3582.41** Dry Tons
3249.25 Metric Tons

6. Final Utilization Method: Land Application by Preparer and Contractor

7. Certification:
I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons directly responsible for gathering the information submitted, it is to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information.

1-25-2021

Jue Zhao
Wastewater Services Division Manager
Date Signed

1-25-2021

Mark Stevenson
Residuals and Hauled Waste Manager
Date Signed

Certification Statement for Pathogen and VAR Requirements

POTW Willow Lake Water Pollution Control Facility

Source Name: Anaerobically Digested Dewatered Biosolids

Source Period: 01-Jan-2020 to 31-Dec-2020

I certify, under penalty of law, that the information used to determine compliance with the Class B Pathogen Reduction requirements in 40 CRF part 503.32(b)(3) Appendix B, PSRP Condition 3-(anaerobic digestion) and the Vector Attraction Reduction requirements in 40 CRF part 503.33(b)(2)-(anaerobic digestion) was prepared under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gathered and evaluated this information.

Mark E Stevenson 1-25-2021

Mark Stevenson, Residuals and Hauled Waste Manager Date

I certify, under penalty of law, that all Class B biosolids land applied have met the above-mentioned Pathogen and Vector Attraction Reduction requirements. I also certify that all Class B biosolids were land applied at agronomic rates. I am aware that there are significant penalties for false certification including the possibility of fine and imprisonment.

Mark E Stevenson 1-25-2021

Mark Stevenson, Residuals and Hauled Waste Manager Date

Certification Statements for Site Management Requirements

Class B biosolids are subject to management practice restrictions specified in 503.14. These requirements are consistent with Salem'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 after January 1, 2020, reveals pollutant concentrations fall well within 503.13(b)(3), Table 3 limits. Records of all biosolids applied to the sites have been maintained by both the City and the biosolids applicator. Presently zinc is the limiting metal and the calculated site life at current application rates is approximately 436 years.

The following certification statements are required from the biosolids applicator, City of Salem, Willow Lake Water Pollution Control Facility (WLWPCF).

"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 direction and supervision of the City of Salem 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."

Mark E Stevenson 1-25-2021

Mark Stevenson, Residuals and Hauled Waste Manager 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 direction and supervision of the City of Salem 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."

Mark E Stevenson 1-25-2021

Mark Stevenson, Residuals and Hauled Waste Manager Date

Certification Statement for Pathogen and VAR Requirements

POTW Willow Lake Water Pollution Control Facility

Source Name: Anaerobically- Digested Liquid Biosolids

Source Period: 01-Jan-2020 to 31-Dec-2020

I certify, under penalty of law, that the information used to determine compliance with the Class B Pathogen Reduction requirements in 40 CRF part 503.32(b)(3) Appendix B, PSRP Condition 3-(anaerobic digestion) and the Vector Attraction Reduction requirements in 40 CRF part 503.33(b)(2)-(anaerobic digestion) was prepared under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gathered and evaluated this information.

Mark E Stevenson 1-25-2021

Mark Stevenson, Residuals and Hauled Waste Manager Date

I certify, under penalty of law, that all Class B biosolids land applied have met the above-mentioned Pathogen and Vector Attraction Reduction requirements. I also certify that all Class B biosolids were land applied at agronomic rates. I am aware that there are significant penalties for false certification including the possibility of fine and imprisonment.

Mark E Stevenson 1-25-2021

Mark Stevenson, Residuals and Hauled Waste Manager Date

Section 4:
2020 Annual Biosolids Report

State of Oregon
Department of Environmental Quality
700 NE Multnomah St. Suite 600, Portland, OR 97232

DEQ use only

Wastewater Solids and Biosolids Annual Report
Part I: Wastewater solids production and disposition

Part I: Must be completed by all domestic wastewater facilities.

A. REPORTING PERIOD

1. This report is for biosolids produced during the calendar year: 2020

B. PERMIT INFORMATION

1. Permit Type (select one): ■ NPDES or ☐ WPCF | DEQ File No.: 78140
   DEQ Permit No.: 101145 | EPA Permit No.: ORL026409

C. FACILITY INFORMATION

1. Legal name of facility: Willow Lake Water Pollution Control Facility

2. **Physical address**
   Street Address: 5915 Windsor Island Road N
   City: Salem | State: OR | Zip code: 97303

3. **Mailing address** ■ Same as physical address.
   Mailing Address:
   City: | State: | Zip code:

4. **Facility Type (check all that apply)**
   - ■ Major or Tier 1 facility (design flow of 1 mgd or greater, or serving a population of 10,000 or greater)
   - ☐ Minor or Tier 2 facility (design flow less than 1 mgd or serving a population less than 10,000)
   - ☐ Class I wastewater treatment facility (i.e., facility with a pre-treatment program)
   - ☐ Biosolids only facility
   - ☐ Lagoon treatment system
   - ☐ Other, please specify:

D. CONTACT INFORMATION

1. **Responsible official**
   Name: Jue Zhao | Title: Wastewater Plant Manager
   Email Address: jzhao@cityofsalem.net | Telephone: 503-588-6380
   Mailing Address: 5915 Windsor Island Road N.
   City: Salem | State: OR | Zip code: 97303

2. **Biosolids contact** ☐ Same as responsible official
   Name: Mark Stevenson | Title: Residuals and Hauled Waste Supervisor
   Email Address: mstevenson@cityofsalem.net | Telephone: 503-763-3479
   Mailing Address: 5915 Windsor Island Road N.
   City: Salem | State: OR | Zip code: 97303

E. WASTEWATER SOLIDS RECEIVED

Please indicate if you received wastewater solids or hauled from other facilities for processing.

Did you receive wastewater solids or hauled waste from other facilities? ■ **Yes** ☐ **N0**

If you received unprocessed wastewater solids, please list sources below. All weight values should be reported in US tons. (US ton= 2,000 lbs) Attach additional pages if necessary.

	Name	Type	Quantity	Units (choose one)	% solids
1.	City of Aurora	☐ septage ■ sludge	200,000	■ gallons ☐ wet tons ☐ dry tons	1.74%
		☐ septage ☐ sludge		☐ gallons ☐ wet tons ☐ dry tons	0.00%
		☐ septage ☐ sludge		☐ gallons ☐ wet tons ☐ dry tons	0.00%
		☐ septage ☐ sludge		☐ gallons ☐ wet tons ☐ dry tons	0.00%
		☐ septage ☐ sludge		☐ gallons ☐ wet tons ☐ dry tons	0.00%

F. WASTEWATER SOLIDS TREATMENT PROCESSES

Please indicate the solids treatment processes used at your facility (mark all that apply)

	Thickening technology	Stabilization Technology	Dewatering technology
1.	■ Gravity ☐ DAF ☐ Centrifugation ■ Other: Rotaing Drum Thickner	☐ Aerobic digestion ■ Anaerobic digestion ☐ Lime stabilization ☐ ATAD ☐ Composting ☐ Thermal ☐ Lagoon ☐ Other:	☐ Belt press ☐ Plate and frame press ☐ Screw press ■ Centrifuge ☐ Vacuum filter ☐ Drying beds ☐ Heat drying ☐ Other:

$$Dry\ tons = \text{wet tons x \%solids} \qquad Dry\ tons = \frac{(gal\ x\ \%solids\ x\ 8.34)}{100}\ x0.0005$$

G. WASTEWATER SOLIDS DISPOSITION

Please indicate how wastewater solids were managed at your facility. Please specify reporting units. *All weight values should be reported in US tons. US ton.= 2,000 lbs*

	Disposition of wastewater solids	Quantity (choose one)			% solids
1.	■ Treated and land applied, sold, or given-away as biosolids or biosolids-derived products	Gallons	Wet tons	Dry Tons 3582.41	25.00%
2.	☐ Sent to landfill. Name:	Gallons	Wet tons	Dry Tons	0.00%
3.	☐ Sent to another permitted facility for treatment. Name:	Gallons	Wet tons	Dry Tons	0.00%
4.	☐ Long-term storage at treatment facility (e.g., lagoon, drying bed, etc.)*	Gallons	Wet tons	Dry Tons	0.00%
5.	☐ Other. Please specify:	Gallons	Wet tons	Dry Tons	0.00%

* If you operate a lagoon system and do not have accurate data on the quantity of solids in your lagoon, please check the box for long-term storage, but you may leave the quantity and other information blank.

H. LAGOON SYSTEM OPERATION and MAINTENANCE

	The following section is required for facilities that operate wastewater treatment lagoons.
1.	A survey of wastewater solids have been completed within the last year: ☐ Y ☐ N
2.	In what year were solids last removed from the lagoon:
3.	When do you estimate the next solids removal? Select only one of the following: ☐ Within the next calendar year ☐ Within the next 5 years ☐ Greater than 5 years from present

I. SIGNATURE OF LEGALLY AUTHORIZED REPRESENTATIVE

I certify that the information in this report is true and correct to the best of my knowledge and belief. Information and records used or referenced with this report will be maintained and made available to the Oregon Department of Environmental Quality on request.

Signature	Title	Date
	Wastewater Plant Manager	1/28/2021

Print Name: Jue Zhao

State of Oregon
Department of Environmental Quality
700 NE Multnomah St. Suite 600, Portland, OR 97232

DEQ use only

Wastewater Solids and Biosolids Annual Report
Part II: Biosolids production and quality

Part II: Must be completed by facilities that produced Class A or Class B biosolids for land application, or sold or gave away biosolids derived products for distribution and marketing.

J. BIOSOLIDS PRODUCTION and DISPOSITION

Please specify quantity (in dry US tons) of finished biosolids stored or produced at your facility.

		Class A	Class B
1.	Produced during reporting period		3582.41
	Total biosolids production	0	0

Please indicate how finished biosolids were managed (i.e., land applied, sold, stored, or other).

		Class A	Class B
2.	Land applied in bulk to agricultural land		2837.41
	Land applied in bulk to forest land		
	Land applied in bulk to reclamation site		
	Land applied in bulk to a public contact site (e.g., park, roadside golf course)		
	Sold or given away as feedstock for a biosolids-derived product		
	Sold or given away in bags or other containers		
	Carried-over into next year (i.e., onsite storage)		745
	Sent to landfill		
	Other, please specify:		
	Total biosolids disposition (add above lines)	0	3582.41

K. BIOSOLIDS SAMPLING

Select your facility's minimum regulatory monitoring frequency (select only one box):

1.

Monitoring frequency	☐ Once per year	☐ Once per quarter (four times per year)	■ Once per 60 days (six times per year)	☐ Once per month (12 times per year)
Metric tons	<290	290 > 1,500	1,500 > 15,000	≥ 15,000
US Tons	<319	319 > 1,650	1,650 > 16,500	≥ 16,500

2. **Provide details on compliance sampling.**

Sample type - Annual - Quarterly - 60 days - Monthly	Class	Processes (select all that apply)			Sampling date: Pollutants	Sampling date: Nutrients
Monthly	☐ A ■ B	☐ Aerobic dig. ■ Anaerobic dig. ☐ Compost	☐ Air-dried ☐ Heat dried ☐ Lagoon	☐ Alkaline stabil. ☐ Soil prod/blend ☐ Other	1/31/20	1/31/20
Monthly	☐ A ■ B	☐ Aerobic dig. ■ Anaerobic dig. ☐ Compost	☐ Air-dried ☐ Heat dried ☐ Lagoon	☐ Alkaline stabil. ☐ Soil prod/blend ☐ Other	2/28/20	2/28/20
Monthly	☐ A ■ B	☐ Aerobic dig. ■ Anaerobic dig. ☐ Compost	☐ Air-dried ☐ Heat dried ☐ Lagoon	☐ Alkaline stabil. ☐ Soil prod/blend ☐ Other	3/31/20	3/31/20
Monthly	☐ A ■ B	☐ Aerobic dig. ■ Anaerobic dig. ☐ Compost	☐ Air-dried ☐ Heat dried ☐ Lagoon	☐ Alkaline stabil. ☐ Soil prod/blend ☐ Other	4/30/20	4/30/20
Monthly	☐ A ■ B	☐ Aerobic dig. ■ Anaerobic dig. ☐ Compost	☐ Air-dried ☐ Heat dried ☐ Lagoon	☐ Alkaline stabil. ☐ Soil prod/blend ☐ Other	5/31/20	5/31/20
Monthly	☐ A ■ B	☐ Aerobic dig. ■ Anaerobic dig. ☐ Compost	☐ Air-dried ☐ Heat dried ☐ Lagoon	☐ Alkaline stabil. ☐ Soil prod/blend ☐ Other	6/30/20	6/30/20
Monthly	☐ A ■ B	☐ Aerobic dig. ■ Anaerobic dig. ☐ Compost	☐ Air-dried ☐ Heat dried ☐ Lagoon	☐ Alkaline stabil. ☐ Soil prod/blend ☐ Other	7/31/20	7/31/20
Monthly	☐ A ■ B	☐ Aerobic dig. ■ Anaerobic dig. ☐ Compost	☐ Air-dried ☐ Heat dried ☐ Lagoon	☐ Alkaline stabil. ☐ Soil prod/blend ☐ Other	8/31/20	8/31/20
Monthly	☐ A ■ B	☐ Aerobic dig. ■ Anaerobic dig. ☐ Compost	☐ Air-dried ☐ Heat dried ☐ Lagoon	☐ Alkaline stabil. ☐ Soil prod/blend ☐ Other	9/30/20	9/30/20
Monthly	☐ A ■ B	☐ Aerobic dig. ■ Anaerobic dig. ☐ Compost	☐ Air-dried ☐ Heat dried ☐ Lagoon	☐ Alkaline stabil. ☐ Soil prod/blend ☐ Other	10/31/20	10/31/20
60 days	☐ A ■ B	☐ Aerobic dig. ■ Anaerobic dig. ☐ Compost	☐ Air-dried ☐ Heat dried ☐ Lagoon	☐ Alkaline stabil. ☐ Soil prod/blend ☐ Other	11/30/20	11/30/20
60 days	☐ A ■ B	☐ Aerobic dig. ■ Anaerobic dig. ☐ Compost	☐ Air-dried ☐ Heat dried ☐ Lagoon	☐ Alkaline stabil. ☐ Soil prod/blend ☐ Other		

L. BIOSOLIDS POLLUTANT MONITORING

Report pollutant monitoring data from collected samples. Express results in mg/kg (ppm) based on dry wt. Please attach laboratory reports for results only. No lab QA/QC.

Biosolid Type: Class A ☐ Class B ■

Sample type - Annual - Quarterly - 60 days - Monthly	Average Pollutant Concentrations								
	As (mg/kg)	**Cd (mg/kg)**	**Cu (mg/kg)**	**Pb (mg/kg)**	**Hg (mg/kg)**	**Mo (mg/kg)**	**Ni (mg/kg)**	**Se (mg/kg)**	**Zn (mg/kg)**
Monthly	11.30	1.56	343	17.7	.40	5.74	13.4	10.33	991
Monthly	8.70	1.42	319	17.0	1.05	5.14	12.5	11.66	839
Monthly	8.80	1.43	335	17.6	0.88	5.12	13.5	11.55	836
Monthly	7.60	1.61	351	17.9	0.77	5.35	13.6	11.67	923
Monthly	10.00	1.66	365	18.3	0.80	5.38	13.4	11.04	952
Monthly	9.00	1.65	347	18.1	0.80	5.26	13.9	8.55	963
Monthly	11.0	1.84	211	19.8	0.59	5.87	14.6	10.29	1072
Monthly	11.10	1.81	355	21.3	0.55	6.04	13.8	12.59	1087
Monthly	10.9	1.53	341	17.4	0.73	6.11	16.6	6.06	1199
Monthly	3.27	0.57	84	13.4	0.44	7.13	16.6	4.61	577
60 days	6.67	1.53	343	17.4	0.88	7.20	17.2	3.21	1185
60 days									
Annual Mean	8.94	1.51	3.09	17.8	0.72	5.85	14.5	9.23	966
Table 1[1] Ceiling conc.	75	85	4300	840	57	75	420	100	7500
Table 3[2] Pollutant conc.	41	39	1500	300	17	N/A	420	100	2800

1

[1] 40 CFR § 503.13 Table 1 – Ceiling concentrations. Samples with pollutant concentrations that exceed the Table 1 limits are not eligible for land application and must be disposed by other means.

[2] 40 CFR § 503.13 Table 3 – Pollutant Concentrations. Samples with pollutant concentrations that exceed the Table 3 limits are subject to cumulative pollutant loading rates in 40 CFR § 503.13 Table 2. Annual and cumulative pollutant additions to land application sites must be submitted with the annual report.

M. BIOSOLIDS NUTRIENT MONITORING

Report nutrient monitoring data from collected samples. Express results in mg/kg (ppm) based on dry weight, except where otherwise noted. *Please attach laboratory reports for results only. No lab QA/QC.*

Biosolid Type: Class A ☐ Class B ■

	Sample type	Average Nutrient Concentrations							
1.	- Annual - Quarterly - 60 days - Monthly	TKN (mg/kg)	NO_3-N (mg/kg)	NH_4-N (mg/kg)	P (mg/kg)	K (mg/kg)	pH (S.U.)	Total solids (%)	F. coli MPN ☐ CFU ☐
	Monthly	61666	3.4	8650	15363	1520	8.24	25.06	
	Monthly	58897		8961	14336	1591	7.99	24.92	
	Monthly	58379		8918	14597	1625	8.58	24.80	
	Monthly	60876		8980	15242	1576	8.10	24.62	
	Monthly	58849	1.0	9387	15471	1604	8.55	24.74	
	Monthly	88731		42946	20341	1468	7.79	13.65	
	Monthly	89792	2.0	43497	20205	4980	7.65	24.92	
	Monthly	88283		40601	19614	4663	7.43	13.92	
	Monthly	85438		36508	21071	1500	7.86	13.96	
	Monthly	76133		37371	15125	1630	7.86	13.77	
	60 days	60426	8.0	8384	15115	1590	8.28	24.85	
	60 days			8938				24.26	
	Annual Mean	71588	3.6	21928	16953	2168	8.03	21.12	

N. BIOSOLIDS PATHOGEN REDUCTION MONITORING and RECORDS

Identify alternative(s) used to meet Class A or Class B pathogen reduction (PR): 40 CFR §503.32
Attach documentation on pathogen reduction.

1.

Class A Alternatives	Class B Alternatives
Biosolids have been tested for (select one or both): ☐ fecal coliform ☐ salmonella	☐ Alternative 1: Monitoring of fecal coliform as the geometric mean of the density of fecal coliform of seven representative samples (select option met): ☐ < 2 million Most Probable Number (MPN) per gram of solids (dry wt. basis) ☐ < 2 million Colony Forming Units (CFU) per gram of total solids (dry wt. basis)
☐ Alternative 1: Thermally treated biosolids ☐ Alternative 2: Biosolids treated in a high pH-high temperature process ☐ Alternative 3: Biosolids treated in other processes that meet enteric virus and helminth ova criteria. ☐ Alternative 4: Biosolids treated in unknown processes that meet enteric virus and helminth ova criteria. ☐ Alternative 5: Use of a Process to Further Reduce Pathogens (PFRP) (select all that apply) ☐ (a) Composting ☐ (b) Heat drying ☐ (c) Heat treatment ☐ (d) Thermophilic aerobic digestion ☐ (e) Beta ray irradiation ☐ (f) Gamma ray irradiation ☐ (g) Pasteurization ☐ Alternative 6: Use of a Process equivalent to a PFRP. Identify:	☐ Alternative 2: Biosolids treated in one of the Processes to Significantly Reduce Pathogens (PSRP) described below: ☐ (a) Aerobic digestion ☐ (b) Air drying ■ (c) Anaerobic digestion ☐ (d) Composting ☐ (e) Lime stabilization ☐ Alternative 3: Biosolids treated in a process that is equivalent to a PSRP. Identify:

O. BIOSOLIDS VECTOR ATTRACTION REDUCTION and RECORDS

Identify option(s) used to meet vector attraction reduction (VAR): 40 CFR §503.33
Attach documentation demonstrating compliance.

1.

In-plant options:

- ■ Option 1: 38% reduction in volatile solids content. Select method used for determining volatile solids reduction:
  - ☐ Full mass balance equation
  - ☐ Approximate mass balance equation
  - ■ Van Kleeck equation
  - ☐ Volatile solids loss across all sewage sludge treatment processes
- ☐ Option 2: Bench-scale anaerobic digestion for 40 additional days at 30 °C to 37 °C.
- ☐ Option 3: Bench-scale aerobic digestion for 30 additional days at 20 °C.
- ☐ Option 4: SOUR at 20 °C. (Only for material <2% solids with no dilution.)
- ☐ Option 5: Aerobic treatment for at least 14 days over 40 °C with an average temperature of over 45 °C.
- ☐ Option 6: Alkali addition to raise pH to at least 12 at 25 °C and maintain a pH ≥ 12 for 2 hours and a pH ≥ 11.5 for 22 more hours.
- ☐ Option 7: Drying with no unstabilized (primary) solids to at least 75% solids.
- ☐ Option 8: Drying with unstabilized (primary) solids to at least 90% solids.

Site management options:

- ☐ Option 9: Injection with no biosolids present on land surface 1 hour after injection. (Class A biosolids only: Injection within 8 hours of pathogen reduction.)
- ☐ Option 10: Incorporation within 6 hours of application. (Class A biosolids only: Incorporation within 8 hours of pathogen reduction.)

2. **If VAR was met through Option 1, a 38% reduction in volatile solids, report the average reduction percentage found.**

Biosolid Type	Average Volatile Solid Reduction
Class A	0.00%
Class B	67.50%
	0.00%
	0.00%

P. VIOLATIONS OF 40 CFR §503 or OAR CHAPTER 340 DIVISION 50

Did any violations of 40 CFR §503 or OAR Chapter 340 Division 50 occur during the reporting period?

- ☐ No.
- ■ Yes. Provide a detailed description of the violation(s) and remedial actions taken to prevent reoccurrences in the future. If this was a spill, please include the OARS report #.

1.)Land applying biosolids within the set backs(On Gross #7 site, the biosolids were staged and land applied within 50' set back
2.)Exceeded nitrogen loading rate on Gross #7 site. Corrective action taken to review all site authorizations with staff and contract haulers to ensure biosolids are applied correctly, and disc harrow staging area to even out nitrogen loading in that area.

Q. SUMMARY OF PART II ATTACHMENTS

Information DEQ requests with all annual reports:

1.
- ☒ Analytical laboratory reports for pollutant monitoring. **No lab QA/QC**
- ☒ Analytical laboratory reports for nutrient monitoring. **No lab QA/QC**
- ☒ Documentation to demonstrate compliance with pathogen reduction requirements.
- ☒ Documentation to demonstrate compliance with vector attraction reduction requirements.

Information required if pollutants in Section L exceed Table 3 values:

2.
- ☐ Annual and cumulative pollutant additions to land application sites, if any pollutant concentration exceeds the Table 3 values.

Optional and supplemental information:

3.
- ☐ Other information on changes to solids handling or land application site management.
- ☐ Other information on biosolids violations and remedial actions.
- ☐ Other. Please specify:

R. SIGNATURE OF LEGALLY AUTHORIZED REPRESENTATIVE

I certify, under penalty of law, that the information that will be used to determine compliance with the pathogen requirements in 40 CFR §503.32 (identified in Section P of this report) and the vector attraction reduction requirements in 40 CFR §503.33 (identified in Section Q of this report) was prepared under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate this information. I am aware that there are significant penalties for false certification including the possibility of fine and imprisonment.

Signature	Title	Date
	Waste Water Treat.Division Manager	2/2/2021

Print Name: Jue Zhao

State of Oregon
Department of Environmental Quality
700 NE Multnomah St. Suite 600, Portland, OR 97232

DEQ use only

Wastewater Solids and Biosolids Annual Report
Part III: Biosolids land application site information

Part III: Must be completed by facilities that land applied Class B biosolids during the reporting period. Add additional pages as needed.

S. LAND APPLICATION SITE INFORMATION

	Site ID	Owner (Last Name)	Location, PLSS (Township, Range, Section, Tax Lot)	Crop(s)	Appl. rate (lbs N/ac)	Total applied (DT/site)*	Total area applied (acres)	Was site applied to the previous year?	Soil test**
1.	Etzel 4A	Etzel	T9S,R2W,SECT17,TL 01800	W.OR HAY	102.31	83.16	33	■ Yes ☐ No	x
2.	Etzel 4A	Etzel	T9S,R2W,SECT17,TL 01800	W.OR HAY	31.15	25.41	33	■ Yes ☐ No	x
3.	Elam (1-F)	Elam	T8S,R2W,Sect.21,TL 501-1401	W.OR HAY	105.561	45.39	17	■ Yes ☐ No	x
4.	Elam (17acre)	Elam	T8S,R2W,Sect.21,TL 501-1401	W.OR HAY	125.23	41.21	13	■ Yes ☐ No	x
5.	Elam Bricker	Elam	T8S,R2W,Sect22, TL 900	W.OR HAY	141.16	83.79	57	■ Yes ☐ No	x
6.	Elam Cook	Elam	T9S,R2W,Sect9, TL 600 & 800	W.OR HAY	121.90	240	78	■ Yes ☐ No	x
7.	G.Rouse 2	Rouse	T9S,R2W,Sect7, TL 1300	W.OR HAY	117.77	20.86	7	☐ Yes ■ No	x
8.	G.Rouse 3	Rouse	T9S,R2W,Sect7, TL 1300	W.OR HAY	115.27	20.57	17	■ Yes ☐ No	x
9.	G.Rouse 4	Rouse	T9S,R2W,Sect7, TL 1400	W.OR HAY	122.46	43.40	14	☐ Yes ■ No	x
10.	G.Rouse 5	Rouse	T9S,R2W,Sect7, TL 1300	W.OR HAY	120.47	122	40	■ Yes ☐ No	x
11.	J. Gross 3	Gross	T8S,R2W,Sect22, TL 00100	P.Rygrass	120.61	152.50	50	■ Yes ☐ No	x
12.	J. Gross 8	Gross	T9S,R2W,Sect32, TL #1200	A.Rygrass	99.21	185.74	74	■ Yes ☐ No	x
13.	J. Gross 11	Gross	T8S,R2W,Sect17, TL #00700	P.Rygrass	109.72	250.20	90	■ Yes ☐ No	x
14.	Orton 1	Orton	T8S,R2W,Sect31&32, TL 600700&800	W.OR HAY	99.4	151.80	60	■ Yes ☐ No	x
15.	Filbin #5	M.Filbin	T2S,R13,Sec.26&35,TL477	East/Or/Pasture	49.73	104.55	85	■ Yes ☐ No	☐

Attach additional pages as required to report on all sites that received class B biosolids during the reporting period.

* Please report in units of dry US tons (US ton = 2,000 lbs)
** Please attach laboratory report showing sample results only. No lab QA/QC.

State of Oregon
Department of Environmental Quality
700 NE Multnomah St. Suite 600, Portland, OR 97232

DEQ use only

Wastewater Solids and Biosolids Annual Report
Part III: Biosolids land application site information

Part III: Must be completed by facilities that land applied Class B biosolids during the reporting period. Add additional pages as needed.

	S. LAND APPLICATION SITE INFORMATION								
	Site ID	Owner (Last Name)	Location, PLSS (Township, Range, Section, Tax Lot)	Crop(s)	Appl. rate (lbs N/ac)	Total applied (DT/site)*	Total area applied (acres)	Was site applied to the previous year?	Soil test**
16.	Elam (22 acre)	Elam	T8,2W,Sect 21, TL0501&1401	W. OR. HAY	139.45	31.90	22	■ Yes ☐ No	x
17.	Klopf 1-5-6	T.Klofestein	T6S,R2W,SEC 34,TL 1400	Tall Fescue	73.32	22.80	33	☐ Yes ■ No	x
18.	Glassey	M.Glassey	T6S,R3E,SEC13,TL200	W. OR. HAY	104.19	5.45	5	☐ Yes ■ No	x
19.	Gross 6	J.Gross	T9S,R3W,Sec32,TL600	A.Rye Grass	118.77	75.0	25	☐ Yes ■ No	x
20.	Gross 7	J.Gross	T9S,R3W,Sec32,TL700	A.Rye Grass	120.03	240.16	79	☐ Yes ■ No	x
21.	Sandau 4	D. Sandau	T7S,2W,Sec26-27,TL 200	Pern. Rye Grass	100.17	139.15	55	☐ Yes ■ No	x
22.	Molly's Place	R. Harvey	T4S,R13E,Sec2,TL 500	E. OR. HAY	95.3	180.18	78	☐ Yes ■ No	x
23.	Hanna East	R. Harvey	T5S,R13E,Sec3&4,TL 400	Winter Wheat	100.14	518.70	210	☐ Yes ■ No	x
24.	Gray 1	D.Gray	T8S,R6W,Sec26,TL1700	W. OR. HAY	84.03	53.25	25	☐ Yes ■ No	x
								☐ Yes ☐ No	☐
								☐ Yes ☐ No	☐
								☐ Yes ☐ No	☐
								☐ Yes ☐ No	☐
								☐ Yes ☐ No	☐
								☐ Yes ☐ No	☐

Attach additional pages as required to report on all sites that received class B biosolids during the reporting period.

* Please report in units of dry US tons (US ton = 2,000 lbs)

** Please attach laboratory report showing sample results only. No lab QA/QC.

T. SUMMARY OF PART III ATTACHMENTS

	Information required with some annual reports:
1.	☒ Additional copies of Table S for additional land application. ☐ Analytical results from soil testing
	Example of documentation held by the permittee and available upon request:
2.	☐ Additional land application site information. ☐ Figures showing where biosolids were applied. ☐ Nitrogen loading calculations

U. SIGNATURE OF LEGALLY AUTHORIZED REPRESENTATIVE

I certify, under penalty of law, that the information that will be used to determine compliance with the site restrictions in Sec. 503.32(b)(5) for each site on which Class B sewage sludge was applied was prepared under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate this information. I am aware that there are significant penalties for false certification including the possibility of fine and imprisonment.

Signature	Title	Date
	WW treatment division manger	1/29/2021

Print Name: Jue zhao

2020
ANNUAL BIOSOLIDS REPORT

Introduction:

The City of Salem owns a municipal sewage collection system and two wastewater treatment facilities, the Willow Lake Water Pollution Control Facility (WLWPCF) and the River Road Wet Weather Treatment Facility (RRWWTF), that are operated under the National Pollutant Discharge Elimination System Permit Number 101145, Department of Environmental Quality (DEQ) File No. 78140.
The WLWPCF provides wastewater treatment for a population of approximately 229,000, including Salem, Keizer, Turner, and unincorporated parts of Marion County. In 2020, total annual rainfall recorded at the WLWPCF was 26.60 inches. The annual wastewater flow totaled 12.52 billion gallons.

Septage is accepted at a receiving facility located at the Septic Receiving Station at the Salem Airport approximately 11 miles from the WLWPCF. The facility received an annual total **of** 24,937,700 gallons of septage which was conveyed to the WLWPCF for treatment.

Salem also manages an Environmental Protection Agency (EPA) approved pretreatment program which oversees 42 permitted dischargers including several categorical industries (see Table 1: 2020 City of Salem - Permitted Industries).

The WLWPCF conducts land application of biosolids on local, authorized sites from early spring through October each year. During the winter months and periods of local inclement weather, dewatered biosolids were hauled to authorized sites in Eastern Oregon for land application or stored onsite to be land applied on local, authorized sites during the summer season.

Wastewater Processing Systems

The WLWPCF is sited on 40 acres between the City of Keizer's urban growth boundary and the Willamette River in Marion County, Oregon. The facility is designed for an average dry weather flow of 35 million gallons per day (mgd). Plant upgrades completed in 2010 increased the design peak wet weather flow to 155 MGD. Treated effluent is discharged to the Willamette River at River Mile 78.4. Wastewater treatment processes include mechanical screening, primary and secondary treatment, sludge thickening, anaerobic digestion, solids dewatering, chlorine disinfection, and dechlorination. The facility can operate in a variety of secondary treatment modes, including trickling filter, conventional air activated sludge, and trickling filter/air activated sludge. These secondary treatment processes provide flexibility for wide variations in Biochemical Oxygen Demand (BOD) resulting from increased loading rates during vegetable canning season.

The RRWWTF is sited at River Road Park approximately 4 miles upstream from the WLWPCF on the 72-inch interceptor. The RRWWTF is designed to receive flows which exceed the hydraulic capacity of WLWPCF. Utilizing interceptor diversion gates for flow control, the facility provides secondary ttreatment and disinfection for excessive flows during storm events. The RRWWTF is designed for a nominal daily flow of 50 MGD and a peak hour flow of 60 mgd. Treated effluent is discharged to the Willamette River at River Mile 82.6.

The RRWWTF treatment processes include fine screening, high rate clarification (HRC) utilizing polymer and micro-sand for coagulation, and Ultraviolet (UV) disinfection. Influent flow is passed through screening channels prior to coagulation treatment. Solids in excess of 6 mm in diameter are returned to the 72-inch interceptor sewer for transport to the WLWPCF.

The City's treatment plant staff works collectively to prevent Sanitary Sewer Overflows (SSOs) by utilizing flow routing options for optimum conveyance and effective treatment capacity. The combined design peak wet weather flow for the WLWPCF and the RRWWTF is 205 MGD.

Solids Treatment Processes:
Solids from primary treatment processes are thickened in one of three gravity thickeners. Solids from secondary treatment are thickened by Rotating Drum Thickeners. Typically, solids are thickened to approximately five percent prior to mesophilic primary/secondary anaerobic digestion. The south digester facility is composed of two gas-mixed, fixed cover, primary digesters which overflow to two secondary digesters. The north digester facility is composed of two mechanically mixed, fixed cover, primary digesters which overflow to a floating dome, secondary digester. The digester facilities produce gas that provides fuel for the cogeneration system. Each primary digester is externally heated with coiled heat exchangers using a modified hot water loop from the cogeneration system. Boilers are connected to the heat loop as a redundant auxiliary heat source.

Annual Digester Feed Gallons:
The WLWPCF produced a total of 34,082,996 gallons of thickened primary and secondary sludge in 2020 which were fed to the primary digesters. The primary and secondary sludge flow streams were divided between the north and south digester facilities using magnetic flow meters and automated feed valves. Approximately 51 percent of the treatment plant's solids production was stabilized in the larger south primary digesters while the north facility received 47.9 percent (see Table 6: 2020 Digester Balance: In Versus Out). The remaining 0.4 percent of the digester volumes consists of received sludge from other municipal wastewater treatment facilities.

Contracted Sludge and Waste Products Received:
In 2020, the WLWPCF received sludge and biosolids products from one (1) other municipal wastewater treatment facilities in Oregon, each constituting 0.6 percent or less of the total digester volume, as follows:

- A total of 200,000 gallons of aerobic digested biosolids and waste activated sludge from Aurora in all months in 2020 except February.

These solids were received, sampled, and sent directly to the digesters. Pumping was scheduled to facilitate a standard 60/40 flow split between the two (North and South) digester complexes using the automated feed valves. Volatile solids concentrations were very similar to Salem's and within the typical range of domestic biosolids at about 80 percent of total solids.

Design organic loading on the primary digesters is approximately 0.23 pounds volatile solids/day/cubic feet of digester volume. The average organic loading on the primary digesters in 2020 was 0.052 volatile pounds/day/cubic feet of digester volume. This figure reflects the calculated sum of received and produced solids entering the primary digesters (see Table 2: 2020 Digester Volatile Feed Pounds).

Class B Biosolids – Pathogen Reduction:
All biosolids produced in 2020 met the Class B Pathogen Reduction requirements as specified in 40 CFR §503.32(b) (3), Appendix B: Processes to Significantly Reduce Pathogens (PSRP), Item 3, which states: Anaerobic digestion - Sewage sludge is treated in the absence of air for a specific Mean Cell Residence Time (MCRT) at a specific temperature. Values for the MCRT and temperature shall be between 15 days at 35 to 55 degrees Celsius and 60 days at 15 degrees Celsius (see signed Certification Statements in Section 2).

The annual average MCRT (four primary digesters) was 58.7 days and ranged between 42.6 and 86.0 days at an average temperature of 98.8 degrees Fahrenheit or 37.1 degrees Celsius (see Table 3: 2020 Digester Performances: Monthly and Annual Averages).

Class B Biosolids – Vector Attraction Reduction (VAR :
All biosolids produced in 2020 met the Class B Vector Attraction Reduction (VAR) requirements as specified in 40 CFR §503.33(b) (1) which states: The mass of volatile solids in the sewage sludge shall be reduced by a minimum of 38 percent (see signed Certification Statements in Section 2).
The average volatile solids reduction rate in the digesters ranged between 64.3 and 73.0 percent (see Table 4: 2020 Volatile Solids Reduction: Monthly and Annual Averages).

Biosolids Analyses:
Samples of liquid, centrifuge dewatered and BFP dewatered biosolids were composited separately and analyzed for pollutants listed in 40 CFR §503.13, Table 1, and for Total Solids, Total Volatile Solids, pH, and nutrients, including Total Kjeldahl Nitrogen (TKN), Nitrate-nitrogen (NO_3-N), Ammonia-nitrogen (NH_3-N), Phosphorus (P), and Potassium (K). During the months that each biosolids product was generated, the biosolids sampling and analyses were conducted monthly or more often than the frequency of once per 60 days that is required in 40 CFR §503.16, Table 1, and is based on the annual amount of biosolids applied to the land. All biosolids analyses were performed in-house (see Tables 5a, 5b and 5c: 2020 Monthly Biosolids Analyses).

Raw digester feed and received solids were analyzed for total solids and total volatile solids daily. Primary digester feed rates and temperatures were also recorded daily. Primary digester alkalinity and pH were measured three times per week. Monthly averages were used to calculate total volatile solids reduction.

When producing dewatered products, biosolids samples (centrate, pressate, feed solids, and dewatered product) were collected every four hours. During local liquid application, biosolids samples were taken when filling the tanker trucks.

Biosolids Production Quantity:
A total of 38,281,810 gallons of digested biosolids were utilized to produce centrifuge dewatered, and liquid biosolids products in 2020. The volume and proportions of each product were:

- Centrifuge dewatered biosolids: 36,727,810 gallons (95.94%)
- Liquid biosolids: 1,544,000 gallons (4.06 %) (See Table 6: 2020 Digester Balance: In Versus Out)

Based on the monthly composite sample analyses which were used to calculate monthly dry ton values for these biosolids products, a total of 3582.41 dry tons was produced in 2020.

Dewatered Biosolids Production and Polymer Costs:
Details of Salem's dewatered biosolids production in 2020, including polymer dosages, capture rates and costs, are provided in Table 8: 2020 Centrifuge. Average daily total solids concentrations for the various flow streams (centrate, production, feed solids, and dewatered product) were used to estimate polymer costs in Table 8 rather than the monthly composite sample results. The combined polymer cost for dewatered biosolids (Centrifuge) production in 2020 was $409,208.

Biosolids Application, Storage and Disposal Quantities:
Salem land applied a total of 2,837.41 dry tons of biosolids on a total of 696 acres in 2020. These totals were comprised of 24 applications of Class B biosolids (liquid and dewatered) on all or part of 24 DEQ-authorized sites in hay, grass seed and pasture. Amounts that were land applied in 2020 included:

- 803.43 dry tons of centrifuge dewatered biosolids were applied in 2020 on 373 acres at eastern Oregon application sites.
- 1,869.47 dry tons of centrifuge dewatered biosolids applied on 693 acres locally in 2020
- 164.51 dry tons of liquid biosolids applied on 131acres in 2020.

There were 745 dry tons of Biosolids stored on site in 2020 at WLWPCF to be carried over for local land application into the 2021 application season.

Biosolids Application Rates and Nutrient Loads:
The WLWPCF certifies that all biosolids products were applied to the DEQ-authorized sites in 2020 at rates consistent with the allowable rates of plant available nitrogen (PAN) specified in the DEQ site authorization letters (see signed Certification Statements in Section 2). Site restrictions identified in the DEQ site authorization letters specifically and those outlined in 40 CFR §503.32 (b) (5) were also followed.

Liquid biosolids were applied using 6,000-gallon pressurized tanker trucks at application rates pre-approved by the DEQ. The average annual application rate of 1.20 dry tons per acre yielded an average of 114.78 pounds of PAN per acre.

Dewatered biosolids were transported to sites using tarp-covered semi-end dump trailers. Dewatered product was applied using a tractor and manure spreader. The average annual application rate of 2.77 dry tons per acre provided approximately 102.25 pounds of PAN per acre.

The total pounds of nutrients applied to the fields in 2020 were:

- 122,352.64 pounds of PAN
- 85,468.51 pounds of P
- 10,950.14 pounds of K

Application Site Management:
Setback distances, restrictions and site management conditions are specified in the DEQ authorization letters for each site that received biosolids through land application. The WLWPCF Biosolids Program staff use a Global Positioning System (GPS) to accurately measure acreage and to mark setbacks or buffer zones around wells, structures, surface water features, roads, and property lines. A minimum setback of 50 feet to surface waters is required, as is a setback of 200 feet to wells. Application site worksheets and maps were completed daily for each site during land application. Biosolids Program staff and augment contract service staff carry route maps and a copy of the DEQ site authorization letters when in transport to application sites and during field applications.

Soil samples collected from the sites each year are analyzed for percent organic matter, pH, cation (Ca, Mg, Na and K) concentrations, cation exchange capacity (CEC), NO_3-N, and available P (using the Bray 1 or "weak" Bray method). Domestic wells on the sites and on adjoining properties are analyzed for NO3-N as requested by property owner(s). To date, the City's monitoring of site soils and wells on properties adjacent to Salem's authorized sites have not revealed any problems related to the beneficial reuse of biosolids via land application at agronomic rates.

The results of soil and well testing is included in the reports to farmers along with an estimate of the economic value of biosolids applications. In 2020, these values were based on prices for fuel and fertilizers obtained from Valley Agronomics LLC in Mt. Angel, Oregon on January 5, 2021 for average 2020 Fuel and Fertilizer prices, and an assumed hourly wage of $14 for labor (see Section 5: Application Site Reports). In 2020, the WLWPCF Biosolids Program saved its participating farmers a total of $96,907.89

Biosolids Spill Incidents:
The City of Salem's Biogro Program had no biosolids spill incidents in 2020.

Anticipated Biosolids Production and Acreage Requirements For 2020:
Salem anticipates very little change concerning biosolids production and acreage requirements in 2021. Annual biosolids production is anticipated to fall within the range of 3,100 and 3,400 dry tons.

The City of Salem has moved all BioSolids Application to local fields, and no longer Transporting and Applying in Eastern Oregon. Salem is in the process of acquiring more local land to accommodate the BioSolids production for 2021.

Section 5: Tables

Table 1: City of Salem - 2020 Permitted Industries				
Business Name	**Address**	**Standard**	**Category**	**NAICS Description**
Ace Septic Tank Service	10980 Portland Rd NE	40 CFR Part 403	Septic	Septic Tank and Related Services
Angels Toilets Co LLC	368 W Locust ST	40 CFR Part 403	Septic	Septic Tank and Related Services
Bennett Septic Service	38544 S Hardy RD, Molalla	40 CFR Part 403	Septic	Septic Tank and Related Services
Best Pots Inc	100 41st Ave SE, Albany	40 CFR Part 403	Septic	Septic Tank and Related Services
Best Septic, Inc.	110 N Clevland ST, Eugene	40 CFR Part 403	Septic	Septic Tank and Related Services
Better Portable Toilets Inc	1048 Old Salem RD NE, Albany	40 CFR Part 403	Septic	Septic Tank and Related Services
Buck's Sanitary Service	3980 W 12th Ave, Eugene	40 CFR Part 403	Septic	Septic Tank and Related Services
Capital Chrome & Precision Grinding	1520 Hickory St NE	40 CFR Part 413	ZDCM	Electroplating, Plating, Polishing, Anodizing, and Coloring
Capital Recycling & Disposal	1890 16th St. SE	40 CFR Part 413	SIU	Soilid Waste Collection
Carl's Septic LLC	810 Mule Deer ST NW	40 CFR Part 403	Septic	Septic Tank and Related Services
Carl's Septic Tank Cleaning	6329 Stageline Ln SE	40 CFR Part 403	Septic	Septic Tank and Related Services
Clinkscales Portable Toilets	421 W Main St, Molalla	40 CFR Part 403	Septic	Septic Tank and Related Services
Divert Inc	950 SE Jackson ST	40 CFR Part 433	SIU	Resource recovery; environmental sustainability
Ennis-Flint	1675 Commercial St NE	40 CFR Part 433	SIU	Thermoplastic Manufacturing, Paint Production and Glass
Farmers Septic Company	15127 Evans Valley Rd, Silverton	40 CFR Part 403	Septic	Septic Tank and Related Services
Garmin AT Inc	2345 Turner Rd SE	40 CFR Part 433	ZDCM	Search, Detection, Navigation, Guidance, Aeronautical, and Nautical System and Instrument Manufacturing
Honest Drain Solutions LLC	23325 S Ward CT, Oregon City	40 CFR Part 403	Septic	Septic Tank and Related Services
Honey Bucket	1685 McGilchrist St SE	40 CFR Part 403	Septic	Septic Tank and Related Services
Hopson Services LLC	40195 N Dogwood RD, Millcity	40 CFR Part 403	Septic	Septic Tank and Related Services
ISA Corporation	3787 Fairview Industrial Dr SE	40 CFR Part 428	SIU	Surgical Appliance and Supplies Manufacturing
JALM LLC	924 Meadow Drive, Molalla	40 CFR Part 403	Septic	Farm and Labor Contractor
Kerr Concentrates Inc	2340 Hyacinth St NE	40 CFR Part 403	SIU	Flavoring Syrup and Concentrate Manufacturing
Kettle Foods Inc	3125 Kettle Ct SE	40 CFR Part 403	SIU	Other Snack Food Manufacturing
LRI Landfill	31317 Neridian E, Graham WA	40 CFR Part 403	SIU	Soilid Waste Landfill
McMinnville Pumping LLC	743 NE 5TH ST	40 CFR Part 403	Septic	Septic Tank and Related Services
Meduri Farms Inc	3985 Portland Rd NE	40 CFR Part 403	SIU	Frozen Fruit, Juice, and Vegetable Manufacturing
Norpac 8	2325 Madrona Ave SE	40 CFR Part 403	SIU	Frozen Fruit, Juice, and Vegetable Manufacturing
Northwest Septic Service	Otis, OR	40 CFR Part 403	Septic	Septic Tank and Related Services
Oregon Portable Toilets LLC	10255 Portland Rd NE	40 CFR Part 403	Septic	Septic Tank and Related Services
Oregon Cherry Growers	1520 Woodrow St NE	40 CFR Part 403	SIU	Fruit and Vegetable Canning
Oregon Fruit Products	150 Patterson St NW	40 CFR Part 403	SIU	Fruit and Vegetable Canning
Oregon Sewer and Drain	839 Industrial Way NE, Silverton	40 CFR Part 403	Septic	Septic Tank and Related Services
Owens Septic Service	349 59th S.E.	40 CFR Part 403	Septic	Septic Tank and Related Services
Pacific Coast Producers	1520 Woodrow StreetN.E, Salem	40 CFR Part 403	SIU	Fruit and Vegetable Canning
Oregon State Penitentiary	2605 State St	40 CFR Part 403	SIU	Correctional Institutions
Packaging Corporation of America	2121 Madrona Ave SE	40 CFR Part 403	SIU	Corrugated containers and packaging supplies
REsys Inc	4560 Ridge Dr NE	40 CFR Part 403	SIU	Other Commercial and Service Industry Machinery Manufacturing
RainSweet East Plant	1460 Sunnyview Rd NE	40 CFR Part 403	SIU	Frozen Fruit, Juice, and Vegetable Manufacturing
RainSweet West Plant	740 Bassett St NW	40 CFR Part 403	SIU	Frozen Fruit, Juice, and Vegetable Manufacturing
Recology Organics, Aumsville	8712 Aumsville Hwy SE	40 CFR Part 403	SIU	Compost Manufacturing
River City Environmental	5410 NE 109th Ave, Portland	40 CFR Part 403	Septic	Septic Tank and Related Services
Riverbend Landfill Waste Management	13469 SW Hwy 18, McMinnville	40 CFR Part 403	SIU	Solid Waste Landfill
Roto Rooter (Sewer Service) Plumbing & Service Co	2715 19th St SE	40 CFR Part 403	Septic	Septic Tank and Related Services
SAIF Corporation	400 High St. SE	40 CFR Part 403	SIU	Other Commercial and Service Industry Machinery Manufacturing
Salem Health Regional Laboratory	3300 State St	40 CFR Part 403	SIU	Medical Laboratories
Salem Health Patient Care Bldg A	890 Oak St SE	40 CFR Part 403	SIU	General Medical and Surgical Hospitals
SeQuential Pacific Biodiesel	4735 Turner Rd SE	40 CFR Part 403	SIU	Petroleum Refineries
Seneca Foods dba Truitt Family Foods - East	1105 Front St NE	40 CFR Part 403	SIU	Fruit and Vegetable Canning
Seneca Foods Corp./dba Truitt Brothers Inc. WEST	556 Murlark Ave NW	40 CFR Part 403	SIU	Perishable Prepared Food Manufacturing
Valley Landfills Inc Republic Services	28972 Coffin Butte Rd	40 CFR Part 403	SIU	Solid Waste Landfill
Ventura Foods LLC	3371 Portland Rd NE	40 CFR Part 403	SIU	Fats and Oils Refining and Blending
Yamasa Corporation	3500 Fairview Industrial Dr SE	40 CFR Part 403	SIU	Mayonnaise, Dressing, and Other Prepared Sauce Manufacturing
Yaquina Bay Fruit Processors LLC	2828 Cherry Ave NE	40 CFR Part 433	SIU	Fruit and Vegetable Canning

Source - cityofsalem.net (Environmental Services-Pretreatment Program page (01/23/2019)

Table 2: 2020 Digester Volatile Feed Pounds

Date	North Digester Feed Vol Lbs	North Digester Feed Vol Lbs - Aurora	South Digester Feed Vol LBS	South Digester Feed Vol Lbs - Aurora	Total Volatile Feed Pounds
Jan-20	441,647	455	670,880	683	1,113,665
Feb-20	373,199		610,412		983,611
Mar-20	435,268	1,082	646,648	1,623	1,084,622
Apr-20	415,007	436	629,111	654	1,045,208
May-20	411,957	1,383	626,256	2,075	1,041,671
Jun-20	368,840	412	540,938	618	910,808
Jul-20	361,017	1,013	540,307	1,520	903,857
Aug-20	359,030	249	541,561	373	901,212
Sep-20	350,070	1,833	531,885	2,749	886,537
Oct-20	344,955	945	519,180	1,417	866,497
Nov-20	298,967	696	458,953	1,044	759,660
Dec-20	307,089	1,041	459,936	1,562	769,629
Total	4,467,046	9,546	6,776,067	14,319	11,266,977
Avg Vol Lbs/Day/Cuft Ratio	**0.048**	**0.00010**	**0.055**	**0.00012**	**0.052**

Source: Hach WIMS - Bioedge Digester Performance Report
Source: Hach WIMS - Aurora Sludge
NPD 1 & 2 = 256,000 cubic feet
SPD 1&2 = 336,000 cubic feet
365 Days/Year

NOTE: In 2018, WLWPCF received solids from the Aurora Wastewater Treatment Plant. Received gallons were fed to the Primary Digesters via automatic valves to achieve split feed flows of 40% and 60% to the North and South Digesters, respectively.

Table 3: 2020 Digester Performance: Monthly and Annual Averages

Date	NPD1 Detention Time (Days)	NPD2 Detention Time (Days)	SPD1 Detention Time (Days)	SPD2 Detention Time (Days)	NPD1 Temp (*F)	NPD2 Temp (*F)	SPD1 Temp (*F)	SPD2 Temp (*F)
Jan-20	51.8	51.2	46.4	45.3	98.3	98.5	98.5	98.4
Feb-20	54.9	51.8	47.7	46.2	98.3	98.1	97.1	97.0
Mar-20	52.3	52.1	47.3	47.9	98.5	98.3	98.5	98.6
Apr-20	53.6	53.1	47.7	47.6	98.6	98.4	98.5	98.4
May-20	57.3	56.8	51.2	50.4	98.5	98.6	98.3	98.4
Jun-20	63.0	65.5	58.6	58.6	98.4	97.0	98.6	98.5
Jul-20	64.3	63.7	57.9	57.8	99.3	98.6	98.4	98.4
Aug-20	50.5	47.6	42.6	45.2	98.8	98.2	98.3	98.4
Sep-20	69.2	65.4	59.2	60.9	98.4	98.3	98.2	98.2
Oct-20	72.5	68.7	62.5	64.4	98.8	98.3	98.2	98.5
Nov-20	79.5	80.9	70.6	70.0	98.5	98.3	96.5	98.2
Dec-20	77.5	86.0	70.2	70.3	98.7	98.6	98.3	99.4
Maximum	79.5	86.0	70.6	70.3	99.3	98.6	98.6	99.4
Minimum	50.5	47.6	42.6	45.2	98.3	97.0	96.5	97.0
Average	62.2	61.9	55.2	55.4	98.5	98.3	99.7	98.5

Source: Hach WIMS - BIOEDGE Digester Performance Report

NPD 1 & 2 = 0.9336 MG each

SPD 1 & 2 = 1.2617 MG each

365 Days/Year

Note: This table includes gallons received from the Aurora Wastewater Treatment Plant in 2020 which were fed to the Primary Digesters via automatic valves to achieve split feed flows of 40% and 60% to the North and South Digesters, respectively.

Table 4: 2020 Volatile Solids Reduction: Monthly and Annual Averages

Date	North Digester Feed Vol Lbs - Produced	North Digester Feed Vol Lbs - Received Aurora	South Digester Feed Vol Lbs - Produced	South Digester Feed Vol Lbs - Received Aurora	Biogro Vol Reduction %	CENT Vol Reduction %
Jan-20	441,647	455	670,880	683		64.3%
Feb-20	373,199		610,412			69.5%
Mar-20	415,007	1,082	629,111	1,623		71.6%
Apr-20	529,433	436	637,387	654		68.0%
May-20	411,957	1,383	626,256	2,075		68.1%
Jun-20	368,840	412	540,938	618	69.5%	72.3%
Jul-20	361,017	1,013	540,307	1,520	58.4%	71.5%
Aug-20	359,030	249	541,561	373	57.6%	66.3%
Sep-20	350,070	1,833	531,885	2,749	57.3%	69.5%
Oct-20	344,955	945	519,180	1,417	61.0%	73.0%
Nov-20	298,967	696	458,953	1,044		70.9%
Dec-20	307,089	1,041	459,936	1,562		68.0%
Total	4,561,211	9,546	6,766,806	14,319		
Maximum	529,433	1,833	670,880	2,749	69.5%	73.0%
Minimum	298,967	249	458,953	373	57.3%	64.3%
Average	380,101	868	563,901	1,302	60.8%	69.4%

Source: Hach WIMS - BIOEDGE Digester Performance Report: Monthly & Annual Averages including Aurora Sludge

Source: Hach WIMS - Aurora Sludge

Note: This table includes volatile solids pounds received from the Aurora Wastewater Treatment Plants in 2019. Received pounds of volatile solids were calculated using the plant standard split feed flow of 40% and 60% to the North and South Primary Digesters, respectively.

Table 5a: 2020 Monthly Biosolids Analyses - Centrifuge Dewatered Biosolids

Tests	Units	Method	Month												
			Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Average
Total Solids	%	2540B	25.06	24.92	24.80	24.62	24.74	25.01	25.49	25.47	25.51	25.21	24.85	24.26	**25.00**
Volatile Solids	%	2540E	16.52	16.10	16.21	17.17	17.17	17.00	16.68	106.73	16.55	16.52	16.68	16.17	**24.13**
Volatile Reduction	%							72.1							**72.1**
pH	std units	4500H+B	8.24	7.99	8.58	8.10	8.55	8.17	7.88	7.83	8.27	8.28	8.31		**8.20**
TKN	mg/kg	4500-N-B	61666	58897	58379	60876	58849	61136	59872	58582	60181	60227.00	60426		**59917**
Ammonia Nitrogen	mg/kg	4500-NH3 B	8650	8961	8918	8980	9387	8813	8758	8627	8095	8290	8384	8938	**8733**
Nitrate Nitrogen	mg/kg	352.1	3.4		2.7		1.0		1.4			1.2	8.0		**3.0**
Phosphorus	mg/kg	365.3	15363	14336	14597	15242	15471	15324	15673	14566	14234	15125	15115		**15004**
Potassium	mg/kg	200.7	1520	1591	1625	1576	1604	1468	1438	1379	1600	1630	1590		**1547**
Arsenic	mg/kg	200.7	11.30	8.70	8.80	7.60	10.00	8.70	8.0	12.3	6.9	6.92	6.67		**8.72**
Cadmium	mg/kg	200.7	11.56	1.42	1.43	1.61	1.66	1.71	1.83	1.81	1.68	0.85	1.53		**2.46**
Chromium	mg/kg	200.7	47.0	50.0	101.0	162.0	108.0	68.0	48.0	36.0	48.6	42.3	41.1		**68.4**
Copper	mg/kg	200.7	343	319	335	351	365	369	397	395	362	\368	343		**358**
Lead	mg/kg	200.7	17.7	17.0	17.6	17.9	18.3	19.1	20.9	20.5	18.6	18.2	17.4		**18.5**
Mercury	mg/kg	245.1	0.40	1.05	0.88	0.77	0.80	0.69	0.80	0.52	0.52	0.44	0.88		**0.70**
Molybdenum	mg/kg	200.7	5.74	5.14	5.12	5.35	5.38	5.22	5.7	6.1	6.5	7.13	7.20		**5.87**
Nickel	mg/kg	200.7	13.4	12.5	13.5	13.6	13.4	13.8	15.0	14.3	20.9	16.6	17.2		**14.9**
Selenium	mg/kg	200.7	10.3	11.7	11.6	11.67	11.0	8.9	10.7	13.5	5.9	2.9	3.2		**9.22**
Silver	mg/kg	200.7	5.00	4.10	4.30	4.80	3.90	3.30	3.4	3.7	3.1	3.43	5.48		**4.05**
Zinc	mg/kg	200.7	991	839	836	923	952	981	1085	1120	1287	577	1185		**980**

Source: Hach WIMS - Biosolids Annual Summary Report

Table 5b: 2020 Monthly Biosolids Analyses - Liquid Biosolids

Tests	Units	Method	Month												
			Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Average
Total Solids	%	2540B						2.24	2.27	2.36	2.41	2.32			**2.32**
Volatile Solids	%	2540E						1.59	1.63	1.68	1.72	1.69			**1.66**
Volatile Reduction	%														
pH	std units	4500H+B						7.41	7.41	7.43	7.45	7.43			**7.43**
TKN	mg/kg	4500-N-B						116325	119712	117984	110694	107992			**114541**
Ammonia Nitrogen	mg/kg	4500-NH3 B						77078	78235	72574	64920	66452			**71852**
Nitrate Nitrogen	mg/kg	352.1							2.6			3.3			**3.0**
Phosphorus	mg/kg	365.3						25357	24736	24661	21071	15125			**22190**
Potassium	mg/kg	200.7						8549	8522	7947					**8339**
Arsenic	mg/kg	200.7						9.30	11.00	9.90	14.90	2.9			**9.60**
Cadmium	mg/kg	200.7						1.58	1.85	1.80	1.38	0.85			**1.49**
Chromium	mg/kg	200.7						69.4	48.5	34.5	37.3				**47.4**
Copper	mg/kg	200.7						325	373	355	320	168			**308**
Lead	mg/kg	200.7						17.1	18.6	22.1	16.2	8.5			**16.5**
Mercury	mg/kg	245.1						0.89	0.59	0.57	0.93	0.44			**0.68**
Molybdenum	mg/kg	200.7						5.30	6.00	6.00	5.74				**5.76**
Nickel	mg/kg	200.7						13.9	14.2	13.2	14.2				**13.9**
Selenium	mg/kg	200.7						8.2	9.9	11.6	6.19	6.3			**8.5**
Silver	mg/kg	200.7						4.60	2.70	3.40	2.32				**3.26**
Zinc	mg/kg	200.7						944	1072	1087	1199	577			**976**

Source: Hach WIMS - Biosolids Annual Summary Report

Table 6: 2020 Digester Balance: In Versus Out

MONTH	N1 AVG GAL	N2 AVG GAL	AVG DAILY GAL	MONTHLY TOTAL NPD GALLONS	S1 AVG GAL	S2 AVG GAL	AVG DAILY GAL	MONTHLY TOTAL SPD GALLONS	TOTAL - RECEIVED AURORA	COMBINED TOTAL DIG. GALS	TOTAL BIOGRO GAL OUT	TOTAL CENT GAL OUT	TOTAL GALLONS OUT
Jan-20	18,277	18,449	36,726	1,138,490	27,556	28,224	55,780	1,729,182	11,000	2,878,672		2,858,940	2,858,940
Feb-20	15,159	18,360	33,519	972,049	29,963	27,725	57,688	1,585,949		2,557,998		3,507,840	3,507,840
Mar-20	18,068	17,935	36,003	1,123,380	27,020	26,708	53,728	1,665,560	24,000	2,812,940		3,700,770	3,700,770
Apr-20	17,737	23,967	41,704	5,861,151	27,007	27,061	54,068	1,622,049	12,000	7,495,200		3,389,810	3,389,810
May-20	16,588	16,768	33,356	1,034,057	25,185	25,501	50,686	1,571,261	24,000	2,629,318		2,978,810	2,978,810
Jun-20	15,306	14,822	30,128	903,844	22,074	22,122	44,196	1,325,876	12,000	2,241,720	366,000	2,888,130	3,254,130
Jul-20	15,018	15,213	30,231	937,165	22,751	28,873	51,624	1,402,813	24,000	2,363,978	672,000	2,615,010	3,287,010
Aug-20	19,539	20,614	40,153	1,244,749	31,002	29,545	60,547	1,876,939	9,000	3,130,688	282,000	3,012,880	3,294,880
Sep-20	14,009	14,944	28,953	868,613	22,379	21,602	43,981	1,319,306	36,000	2,223,919	120,000	2,786,490	2,906,490
Oct-20	13,425	14,080	27,505	852,673	20,894	20,491	41,385	1,282,960	12,000	2,147,633	114,000	3,015,910	3,129,910
Nov-20	12,239	12,183	24,422	732,660	18,739	18,747	37,486	1,124,598	12,000	1,869,258		2,877,610	2,877,610
Dec-20	12,605	12,032	24,637	763,748	18,703	18,197	36,900	1,143,924	24,000	1,931,672		3,095,610	3,095,610
2020		**MIN**	**24,422**	**732,660**		**MIN**	**36,900**	**1,124,598**	**9,000**	**1,869,258**	**114,000**	**2,615,010**	**2,858,940**
		MAX	**41,704**	**5,861,151**		**MAX**	**60,547**	**1,876,939**	**36,000**	**7,495,200**	**672,000**	**3,700,770**	**3,700,770**
		AVG	**32,278**	**1,369,382**		**AVG**	**49,006**	**1,470,868**	**18,182**	**2,856,916**	**310,800**	**3,060,651**	**3,190,151**
			TOTAL	**16,432,579**			**TOTAL**	**17,650,417**	**200,000**	**34,282,996**	**1,554,000**	**36,727,810**	**38,281,810**
	% OF TOTAL GALLONS IN			**47.9%**	**% OF TOTAL GALLONS IN**			**51.5%**	**0.6%**	**% OF TOTAL GALLONS OUT**	**4.06%**	**95.94%**	**100.0%**

Source: Hach WIMS: O-Primary Digester & O-Solids Handling Feeder Sheets
Source: Hach WIMS - Aurora Sludge

TABLE 7: 2020 BIOSOLIDS PRODUCTS HAULED				
MONTH	CENT. WET TONS	CENT. DRY TONS	LIQUID GALLONS	LIQUID DRY TONS
JAN	418.27	104.82		
FEB	0.00	0.00		
MAR	0.00	0.00		
APR	919.34	226.34		
MAY	2,024.06	500.75		
JUN	741.42	185.36	366,000	34.19
JUL	692.10	176.42	672,000	63.61
AUG	4,240.31	1,080.01	282,000	27.75
SEP	1,161.90	296.40	120,000	12.06
OCT	349.00	87.98	114,000	11.03
NOV	0.00	0.00		
DEC	0.00	0.00		
TOTAL	**10,546.40**	**2,658.07**	**1,554,000.00**	**148.64**
TOT. DRY TONS	**CENT. DRY TONS**		**LIQUID DRY TONS**	
2,806.71	**2,658.07**		**148.64**	
% OF TOTAL DRY TONS	**94.70%**		**5.30%**	

2020 Monthly % Total Solids		
MONTH	CENT	LIQ
JAN	25.06%	
FEB	24.92%	
MAR	24.80%	
APR	24.62%	
MAY	24.74%	
JUN	25.00%	2.24%
JUL	25.49%	2.27%
AUG	25.47%	2.36%
SEP	25.51%	2.41%
OCT	25.21%	2.32%
NOV	24.85%	
DEC	24.26%	

Source: Daily Data Entry Spreadsheet

Table 8: 2020 Centrifuge Production

21 Inch Centrifuge

Month	Feed Gal: Million Gals	Total Poly Gal	Poly Cost	Dig Feed: Avg TS %	Avg Poly Lbs Per Dry Ton Feed	Avg Poly Cost Per Dry Ton Feed	Cake: Avg TS %	Average Centrifuge Capture Rate
1-Jan-20	2.8589	2584.8	$32,258	2.09%	91.8	$132.19	25.06%	90.80%
1-Feb-20	3.5078	3060.2	$38,192	2.14%	86.1	$123.99	24.92%	89.60%
1-Mar-20	3.7008	3060.2	$38,192	2.10%	91.6	$131.97	24.80%	90.00%
1-Apr-20	3.3898	3073.9	$38,363	2.08%	91.0	$131.00	24.62%	90.40%
1-May-20	2.9788	2662.2	$33,225	2.12%	87.7	$126.28	24.74%	88.70%
1-Jun-20	2.8881	2571.1	$32,087	2.14%	86.3	$124.21	25.01%	87.50%
1-Jul-20	2.6150	2343.7	$29,249	2.19%	83.4	120.06	25.49%	87.30%
1-Aug-20	3.0129	2703.0	$33,733	2.29%	81.7	117.63	25.47%	87.30%
1-Sep-20	2.7865	2590.5	$32,329	2.32%	83.1	119.73	25.51%	90.10%
1-Oct-20	3.0159	2741.7	$34,216	2.27%	86.1	$123.99	25.21%	91.50%
1-Nov-20	2.8776	2649.9	$33,070	2.24%	86.3	$124.33	24.85%	91.00%
1-Dec-20	3.0956	2747.8	$34,293	2.15%	85.3	$122.80	24.26%	90.70%
MIN	**2.62**	**2,344**	**$29,249**	**2.08%**	**81.7**	**$117.63**	**24.26%**	**87.30%**
MAX	**3.70**	**3,074**	**$38,363**	**2.32%**	**91.8**	**$132.19**	**25.51%**	**91.50%**
AVG	**3.06**	**2,732**	**$34,101**	**2.18%**	**86.7**	**$124.85**	**24.99%**	**89.58%**
TOTAL	**36.73**	**32,789**	**$409,208**					

Poly Cost @ $12.48/gal

Source: OPS SQL: O-Solids Handling & BFP & CENTRIFUGE Polymer Usage & Cost Reports

Source: OPS SQL: O-Solids Handling CENTRIFUGE Polymer Usage & Cost Reports
NOTE: Table 7 utilizes the averaged daily solids concentrations (feed-cake-centrate) for poly cost/dry ton calculations

Centrifuge - K290 FLX @ 264 gal/tote @ 8.67 lbs/gal

Table 9a: 2020 Site Totals: Application - Storage

Acreage & Biosolids: Totals & Averages Applied	Acres Total	Dry Tons/Acre Average	Dry Tons/Site Total	PAN Lbs/Acre Average	PAN Lbs/Site Total	Phosphorus Lbs/Site Total	Potassium Lbs/Site Total
Liquid Sites	**131**	**1.20**	**164.51**	**114.78**	**15,802.66**	**7,133.07**	**2,514.32**
Dewatered Sites	**1066**	**2.77**	**2,672.90**	**102.25**	**106,549.98**	**78,335.44**	**8,435.82**
Remaining Staged at on sitye winter storage			745				
Totals & Averages	**1197**	**1.98**	**3582.41**	**108.51**	**122,352.64**	**85,468.51**	**10,950.14**
Source: Daily Data Entry Spreadsheet			2837.41				

Table 9b: 2020 Site Totals - Acreage, Tonnage & Nutrient Values of Liquid Biosolids Applied

No.	Liquid Sites	Transport Dates	Use	Acres	Dry Tons Per Acre	Dry Tons Per Site	PAN Lbs Per Acre	PAN Lbs Per Site	Phosphorus Lbs Per Acre	Phosphorus Lbs Per Site	Potassium Lbs Per Acre	Potassium Lbs Per Site	Total Cost Savings Fert-Fuel-Labor
1	Elam-Bricker (1_G)	01-20 to 08-06	Western Orego	57	1.47	83.79	141.16	8,046.12	63.72	3,631.85	22.46	1,280.18	$6,063.31
2	D. Elam 1 (1_F)	16-20 to 08-06	Western Orego	22	1.45	31.90	139.45	3,067.90	62.95	1,384.81	22.19	488.13	$2,357.87
3	G. Rouse 3 (3_P)	/2020 to 09/02	Western Orego	17	1.21	20.57	115.77	1,968.09	52.26	888.37	18.42	313.14	$1,495.25
4	T. Klopfenstein 1-5-6 (1_M)	30-18 to 09-26	Tall Fescue	30	0.76	22.80	73.32	2,199.60	33.10	992.88	11.67	349.98	$1,714.85
5	M. Glassey	9/2020 to 8/24	Western Orego	5	1.09	5.45	104.19	520.95	47.03	235.16	16.58	82.89	$520.26
Liquid Sites Totals and Averages				**Total**	**Average**	**Total**	**Average**	**Total**	**Average**	**Total**	**Average**	**Total**	**Total**
				131	**1.20**	**164.51**	**114.78**	**15,802.66**	**51.81**	**7,133.07**	**18.26**	**2,514.32**	**$12,151.54**

Table 9c: 2020 Site Totals - Acreage, Tonnage & Nutrient Values of Dewatered Biosolids Applied

No.	Dewatered Cake Sites	Transport Dates	Use	Acres	Dry Tons Per Acre	Dry Tons Per Site	PAN Lbs Per Acre	PAN Lbs Per Site	Phosphorus Lbs Per Acre	Phosphorus Lbs Per Site	Potassium Lbs Per Acre	Potassium Lbs Per Site	Total Cost Savings Fert-Fuel-Labor
1	Filbin Field #5(5_A)	/2020 to 01/27/	Eastern Orego	85	1.23	104.55	49.73	4,227.05	36.23	3,079.23	3.87	329.30	$3,946.02
2	D. Elam 1 (1_F)(17 acre)	2020 to 07/27/2	Western Orego	17	2.67	45.39	105.51	1,793.67	79.47	1,350.93	8.42	143.22	$1,625.80
3	D. Elam 1 (1_F)(13acre)	/2020 to 07/27/	Western Orego	13	3.17	41.21	125.23	1,627.99	94.16	1,224.14	10.00	129.99	$1,465.97
4	Elam/Cook	9/2020 to 9/8/2	Western Orego	78	3.08	240.24	121.92	9,509.76	91.83	7,162.36	9.73	759.30	$8,571.50
5	G. Rouse 2 (2_M)	/2020 to 07/09	Western Orego	7	2.98	20.86	117.77	824.39	88.70	620.91	9.40	65.82	$744.01
6	G.Rouse 4 (4_J)	12-18 to 06-18	Western Orego	14	3.10	43.40	122.46	1,714.44	92.23	1,291.27	9.78	136.89	$1,545.07
7	G.Rouse 5(5_J)	8/2020 to 6/29/	Western Orego	40	3.05	122.00	120.47	4,818.80	90.73	3,629.25	9.62	384.75	$4,345.16
8	W. Orton 1 (1_R)	7/2020 to 8/24/	Western Orego	60	2.53	151.80	99.94	5,996.40	75.27	4,516.23	7.98	478.78	$5,447.72
9	J. Gross 7 (1_A)	/2020 to 08/07	Annual Ryegra	79	3.04	240.16	120.03	9,482.37	90.40	7,141.94	9.58	757.14	$8,551.91
10	J. Gross 6 (1_A)	/2020 to 08/13	Annual Ryegra	25	3.00	75.00	118.77	2,969.25	89.46	2,236.44	9.48	237.09	$2,679.00
11	J. Gross 3 (3_C)	/2020 to 08/13	Annual Ryegra	50	3.05	152.50	120.61	6,030.50	90.84	4,542.07	9.63	481.52	$5,476.33
12	J. Gross 8 (1_E)	/2020 to 08/31	Annual Ryegra	74	2.51	185.74	99.21	7,341.54	74.72	5,529.17	7.92	586.16	$6,671.74
13	J. Gross 11 (1_H)	/2020 to 10/05	Perennial Rye	90	2.78	250.20	109.72	9,874.80	82.64	7,437.29	8.76	788.45	$10,318.73
14	D. Eztel 4A (1_D)	/2020 to 05/12	Western Orego	33	2.52	83.16	102.31	3,376.23	74.53	2,459.51	7.97	263.03	$3,013.28
15	D. Eztel 4A (1_D)	/2020 to 08/12	Western Orego	33	0.77	25.41	31.15	1,027.95	22.69	748.79	2.43	80.08	$1,008.53
16	Sandau Field 1 (1_A)	/2020 to 08/17	Perennial Rye	55	2.53	139.15	100.17	5,509.35	75.44	4,149.46	8.00	439.90	$5,004.71
17	Harvey"s Molly's Place	/2020 to 04/27	Eastern Orego	78	2.31	180.18	93.53	7,295.34	68.14	5,314.65	7.29	568.36	$6,537.84
18	Harvey Hanna East	8/2020 to 6/10/	Winter Wheat	210	2.47	518.70	100.14	21,029.40	68.19	14,319.52	7.80	1,638.30	$18,786.47
19	D.Gray	/2020 to 9/16/2	Western Orego	25	2.13	53.25	84.03	2,100.75	63.29	1,582.28	6.71	167.74	$1,168.09
Dewatered Biosolids Sites Totals and Averages				**Total**	**Average**	**Total**	**Average**	**Total**	**Average**	**Total**	**Average**	**Total**	**Total**
				1066	**2.77**	**2672.90**	**102.25**	**106,549.98**	**76.26**	**78,335.44**	**8.13**	**8,435.82**	**$96,907.89**

Section 6:
Application Site Reports

January 30, 2021

David Gray
17250 Bridgeport Rd
Dallas, Or 97338

SUBJECT: **Biosolids Land Application**

Dear Mr. Gray:

The City of Salem's Biosolids Program is pleased to present you with data and information on biosolids land application in 2020. This past year there was a total of 53.15 dry tons of Class B biosolids land applied to a total of 25 acres at the sites known as David Gray Field, The biosolids product you received in 2020 was Centrifuge Cake Biosolids..

Enclosed please find the site and land application worksheets, the daily application maps, the soil monitoring reports, and a table showing the concentrations of regulated pollutants in the biosolids products generated by Willow Lake Water Pollution Control Facility. These results remain well below the allowable limits.

As a courtesy, the City has used the following costs for fuel and commercial fertilizers obtained from Valley Agronomics LLC in Mt. Angel, Oregon on January 5, 2021, and labor to estimate the savings you may have incurred by electing to use the City's biosolids product(s):

- Off-road bulk diesel at $1.762 per gallon and a usage rate of four gallons per hour.

- Commercial fertilizer costs for:

    a) Nitrogen (as Urea) 46-0-0 at $365/ton or $0.18/lb: ($0.18/0.46) = $0.40/lb N
    b) Phosphorus (as P_2O_5) 0-45-0 at $600/ton or $0.30/lb: ($0.30/0.45) = $0.58/lb P
    c) Potassium (as K_2O) 0-0-60 at $475/ton or $0.24/lb: ($0.24/0.60) = $0.40/lb K

- Land application labor at 5.3 acres per hour and a pay rate of $14 per hour.

Based on these costs, your estimated savings from using Biosolids Centrifuge Cake product in 2020 was $1,168.09:

On behalf of the City of Salem's Biosolids Program, thank you for your continued support. I will be contacting you in the spring about pre-season soil sampling and to discuss your needs for the 2021 crop season. If you have any questions, please feel free to contact me at 503-763-3479 or mstevenson@cityofsalem.net.

Sincerely,

Mark Stevenson
Residuals and Hauled Waste Supervisor

SM/VR:X:\010-ADMINISTRATION\Correspondence\Bio Solids\2017\2016 Jensen Farms Biosolids Application_Letter_012417_Final.docx
Enclosures:

1. Site Worksheets
2. Land Application Worksheets
3. Daily Application Maps
4. Soil Monitoring Report
5. Table of Pollutant Concentrations in Biosolids Products

By Certified Mail
cc: File: Chrono

APPLICATION SITE WORKSHEET: 2020

Application Dates: October 15, 2020

Farm & Field Number: D. Gray FIELD

Biosolids Product: Centrifuge Cake

DEQ Maximum Nitrogen Application Rate: 100 Pounds per Acre/10.12 Wet Tons per acre

Acreage: 25 Acres

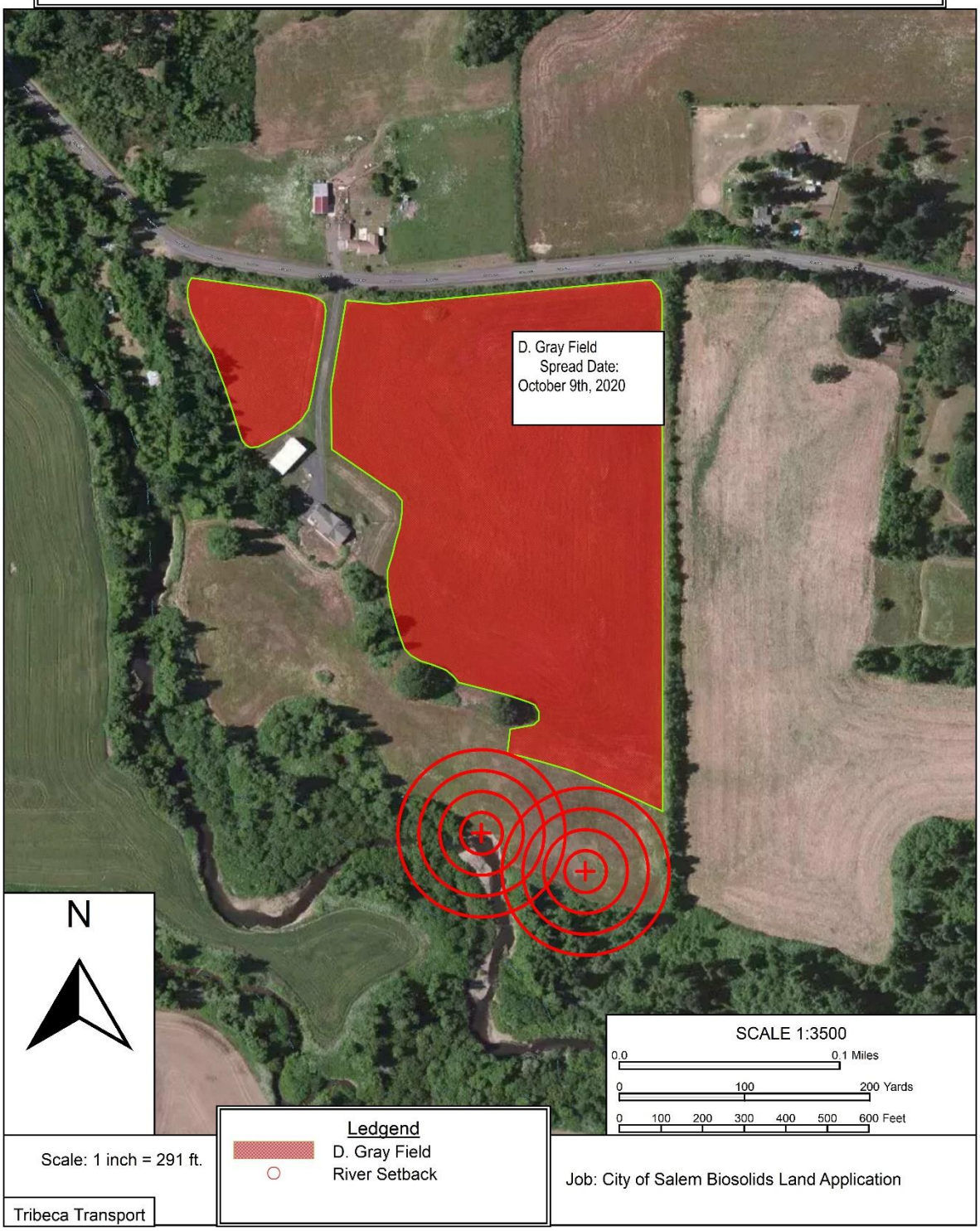
Distance to Field: 25 miles

Best Route To Field

Turn onto Lockhaven Dr. N.
Turn right onto River Rd. N., Slight right onto River Rd N. to stay on River Rd. N.
Slight left onto Commercial St. NE, Slight right to stay on Commercial St. NE
Use the right 2 lanes to turn right onto Marion St. NE
Continue onto OR-22 W., Use the left lane to stay on OR-22 W.
Slight left on OR-223 S.
Use the left 2 lanes to turn left onto S. Main St.
0.4 miles, Turn right on SW Washington St.
6.2 miles, Turn left onto OR-223/SW Fairview Ave./S Kings Valley Hwy. (Signs for Falls City)
1.2 miles, Turn right onto Bridgeport Rd. Go approximately 1 mile and destination will be on the left.

Field Input and Recommendations: Buffers: 200 ft of drinking water source 50 foot buffer at roadside and ditches.

D. Gray Field Completion Map



City of Salem Spreader Track Sheet - Field: D. Gray

Total Tons Delivered: 212.6

Estimated Loads based on 15 tons per spreader load:

Date	Operator	Loads Spread	EST tons spread
10/9/2020	GB	14	212.6
		Total Tons Spread	212.60

David Gray

FIELD IDENTIFICATION: D. Gray	
OWNER: David Gray	
LOCATION: TOWNSHIP: T9S RANGE: R2W SECTION: 17	
START DATE: 10/7/2020	
STOP DATE: 10/9/2020	
CROP: Perennial Ryegrass	
TOTAL ACREAGE:	25

DEWATERED BIOSOLIDS APPLICATION RATE INFORMATION	
PERMITTED APPLICATION RATE (PAN POUNDS PER ACRE)	100
DRY TONS BIOSOLIDS PER ACRE	2.53
WET TONS BIOSOLIDS PER ACRE	10.12

TARGET APPLICATION RATE (PAN POUNDS PER ACRE)	100
DRY TONS BIOSOLIDS PER ACRE	2.53
WET TONS BIOSOLIDS PER ACRE	10.12
TOTAL WET TONS TO COMPLETE FIELD	253.00
DATE: Field Finished:9-16-2020	**212.60**
TOTAL WET TONS REMAINING	40.40

FINAL APPLICATION RATE INFORMATION	
FINAL APPLICATION RATE (PAN POUNDS PER ACRE)	84.03
PAN (TOTAL POUNDS APPLIED)	2,100.82
PHOSPHORUS (TOTAL POUNDS APPLIED)	1,582.28
POTASSIUM (TOTAL POUNDS APPLIED)	167.74
TOTAL WET TONS APPLIED	**212.60**
TOTAL DRY TONS APPLIED	53.15
DRY TONS BIOSOLIDS PER ACRE	2.13
WET TONS BIOSOLIDS PER ACRE	8.50

BIOSOLIDS ANALYSIS INFORMATION 2020 AVERAGED DATA (Cent)(Jan-April)	
TOTAL SOLIDS (MG/KG)*	25.00
ORGANIC NITROGEN (MG/KG)	51,082
INORGANIC NITROGEN (NH4+NO3) (MG/KG)	8,877
TKN (MG/KG)	59,959
PHOSPHORUS (MG/KG)	14,885
POTASSIUM (MG/KG)	1,578
pH	8.23
ARSENIC (MG/KG)	9.10
CADMIUM (MG/KG)	4.01
CHROMIUM (MG/KG)	90.00
COPPER (MG/KG)	351
LEAD (MG/KG)	17.60
MERCURY (MG/KG)	0.78
MOLYBDENUM (MG/KG)	5.34
NICKEL (MG/KG)	13.3
SELENIUM (MG/KG)	11.3
SILVER (MG/KG)	4.6
ZINC (MG/KG)	897
1ST YEAR MINERALIZATION RATE	0.30
LIQUID INORGANIC NITROGEN AVAILABILITY FACTOR	0.50
POUNDS OF ORG N AVAILABLE/DRY TON APPLIED	30.65
POUNDS OF INORG N AVAILABLE/DRY TON APPLIED	8.88
POUNDS OF (P.A.N.)/.DRY TON	39.53

Soil Monitoring Report - 2020

Site: D. Gray
Field: Gray

Sample Date: 10/7/2020

Parameter	Result	Units
Nitrate-Nitrogen (NO3-N)	1	mg/kg
Available Phosphorus (P)	17	mg/kg
Total Potassium (K)	89	mg/kg
Sulfate-Sulfur (SO4-S)	6	mg/kg
Organic Matter	5.4	%
pH	5.5	-

City of Salem's Biosolid Products
Pollutant Concentrations
Average of Monthly Analytical Results
2020

Pollutant Parameter	Biogro™ Liquid	Centrifuge (CENT) Cake	EPA 40 CFR §503.13(b)(3) Pollutant Concentration Limits
Arsenic (As)	9.6	8.72	41
Cadmium (Cd)	1.49	2.46	39
Chromium (Cr)	47.4	68.4	-
Copper (Cu)	308	358	1500
Lead (Pb)	16.5	18.5	300
Mercury (Hg)	0.68	0.7	17
Molybdenum (Mo)	5.76	5.87	-
Nickel (Ni)	13.9	14.9	420
Selenium (Se)	8.5	9.22	100
Zinc (Zn)	976	980	2800
*All units in mg/kg			

January 30, 2021

David Elam
Elam Farms Inc.
6802 Ogle Street SE
Salem OR 97317

SUBJECT: **Biosolids Land Application**

Dear Mr. Elam:

The City of Salem's Biosolids Program is pleased to present you with data and information on biosolids land application in 2020. This past year there was a total of 442.52 dry tons of Class B biosolids land applied to a total of 187 acres at the sites known as D. Elam 1, Elam-Bricker, and Elam Cook. The biosolids products you received in 2020 were Biogro™ liquid and Centrifuge cake.

Enclosed please find the site and land application worksheets, the daily application maps, the soil monitoring reports, and a table showing the concentrations of regulated pollutants in the biosolids products generated by Willow Lake Water Pollution Control Facility. These results remain well below the allowable limits.

As a courtesy, the City has used the following costs for 2020 fuel and commercial fertilizers obtained from Valley Agronomics LLC in Mt. Angel, Oregon on January 5, 2021, and labor to estimate the savings you may have incurred by electing to use the City's biosolids product(s):

- Off-road bulk diesel at $1.762 per gallon and a usage rate of four gallons per hour.

- Commercial fertilizer costs for:
  a) Nitrogen (as Urea) 46-0-0 at $365/ton or $0.18/lb: ($0.18/0.46) = $0.40/lb N
  b) Phosphorus (as P_2O_5) 0-45-0 at $600/ton or $0.30/lb: ($0.30/0.45) = $0.58/lb P
  c) Potassium (as K_2O) 0-0-60 at $475/ton or $0.24/lb: ($0.24/0.60) = $0.40/lb K

- Land application labor at 5.3 acres per hour and a pay rate of $14 per hour.

Based on these costs, your estimated savings from using the Biogro™ liquid and Belt Filter Press products in 2020 were as follows:

D. Elam 1	$5449.64
Elam-Bricker	$6063.31
Elam/Cook	$8,571.50
Total:	$20,084.44

On behalf of the City of Salem's Biosolids Program, thank you for your continued support. I will be contacting you in the spring about pre-season soil sampling and to discuss your needs for the 2021 crop season. If you have any questions, please feel free to contact me at 503-763-3479 or mstevenson@cityofsalem.net.

Sincerely,

Mark Stevenson
Residuals and Hauled Waste Supervisor

SM/VR:X:\010-ADMINISTRATION\Correspondence\Bio Solids\2017\2016 Elam Farms Biosolids Application_Letter_012417_Final.docx
Enclosures:

1. Site Worksheets—D. Elam 1 and Elam-Bricker
2. Land Application Worksheets—D. Elam 1 and Elam-Bricker
3. Daily Application Maps—D. Elam 1 and Elam-Bricker
4. Soil Monitoring Reports—D. Elam 1 and Elam-Bricker
5. Table of Pollutant Concentrations in Biosolids Products

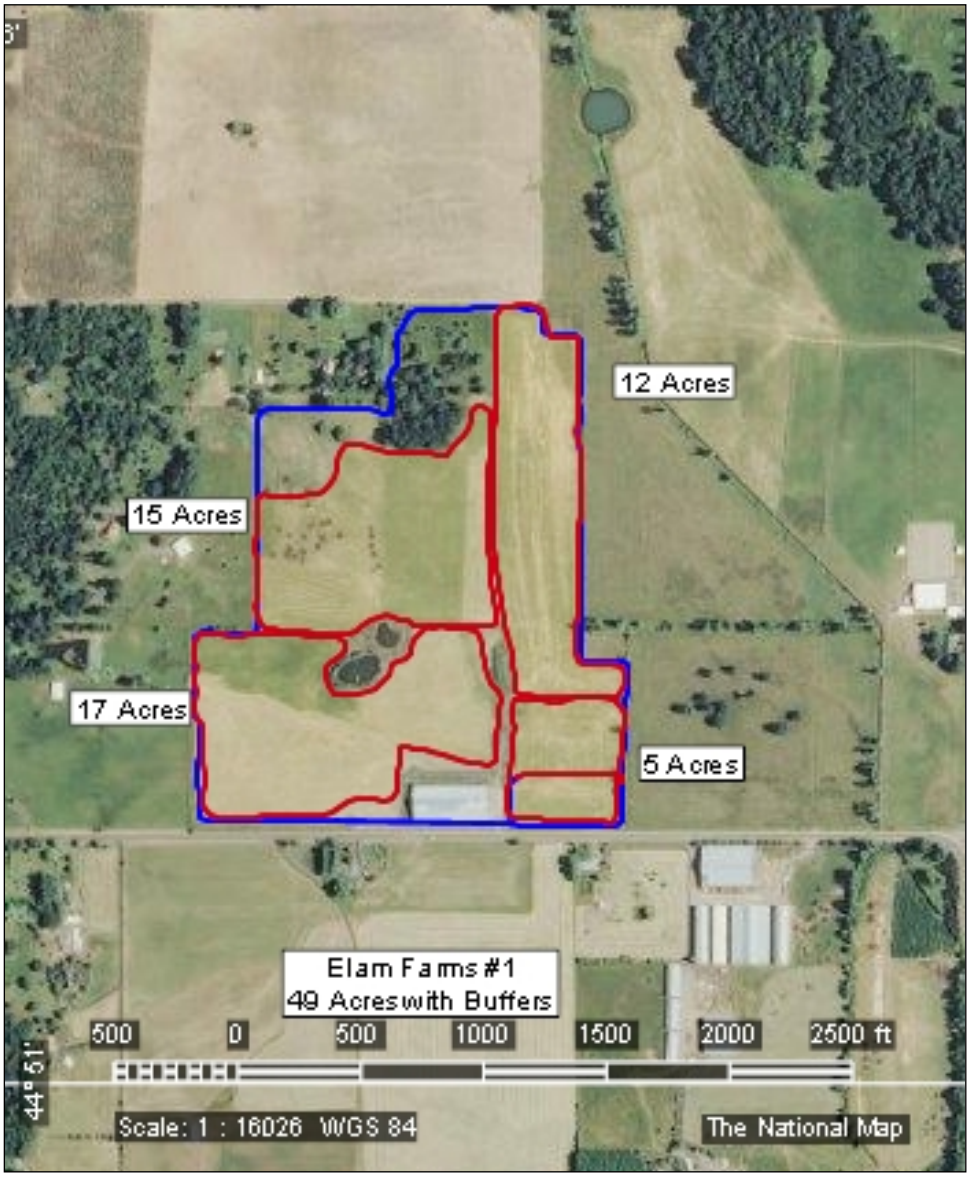
By Certified Mail
cc: File: Chrono

APPLICATION SITE WORKSHEET: 2020

Application Dates: 08-03-2020

Soil Sample Collected:	07-17-2020	Domestic Well Sample Collected:	No

Site and Application Identification: D. Elam 1 (1_E) & (1_F) Biosolids Product: Liquid & Centrifuge Cake DEQ Nitrogen Application Authorization: 120 lbs PAN per Acre (Western Oregon Hay/Pasture) Application Rate =12.4 WT/Acre Acreage: 22 acres + 27 acres (see map)
Distance: 20 miles Route To Field: East on Lockhaven, Turn right onto I-5 southbound. Turn east onto Highway 22. Take Joseph Road exit. Turn left onto Aumsville Highway, turn right on Witzel Road, and turn left on Ogle Road. Field is on the left.
Field Input and Recommendations: 200 foot buffer at domestic wells. 50 ft buffer from ditch along Ogle Road and at pond.



Tribeca Transport

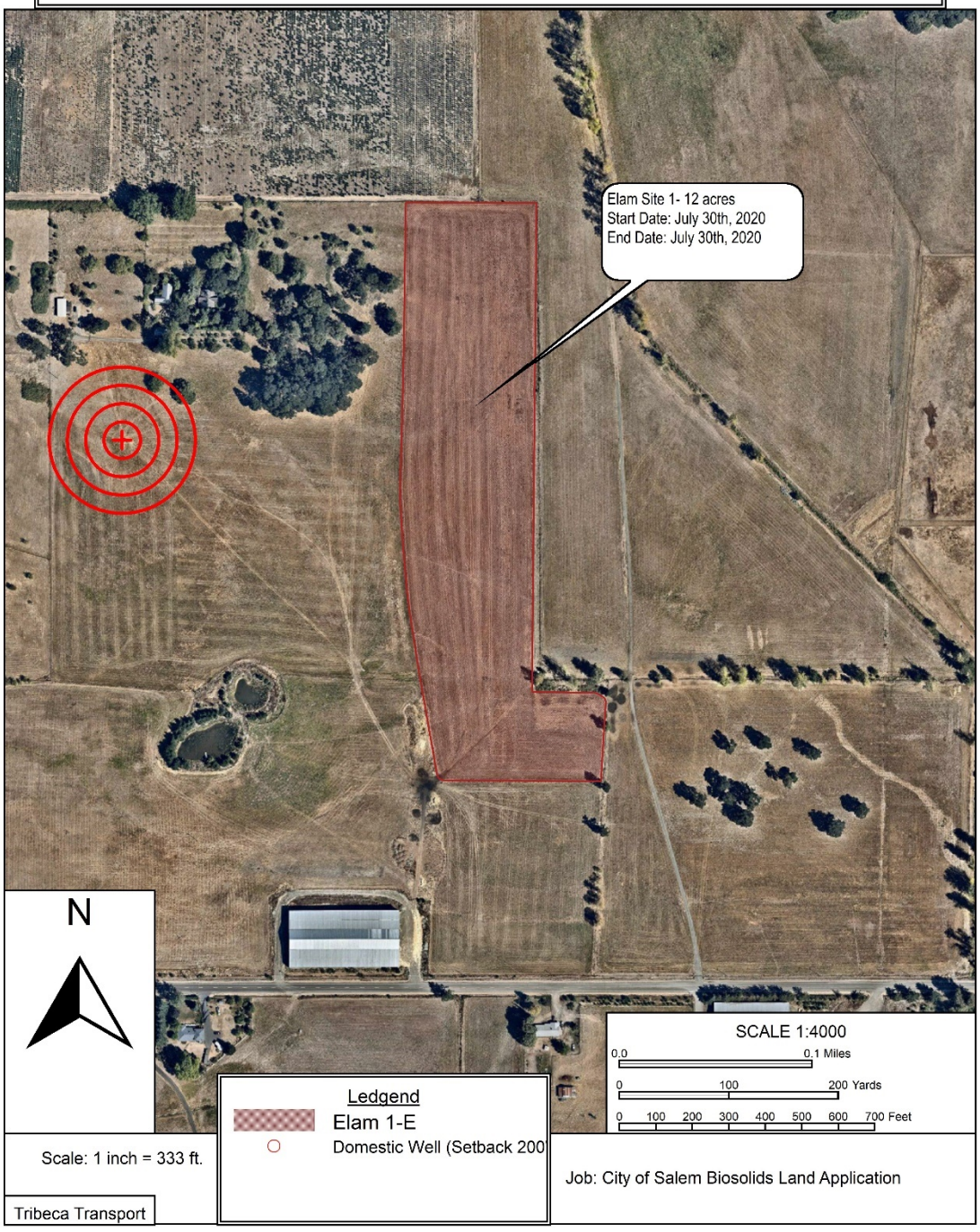
City of Salem Spreader Track Sheet - Field Elam Site 1 - 12 acres

Total Tons Delivered: 168.11 WT

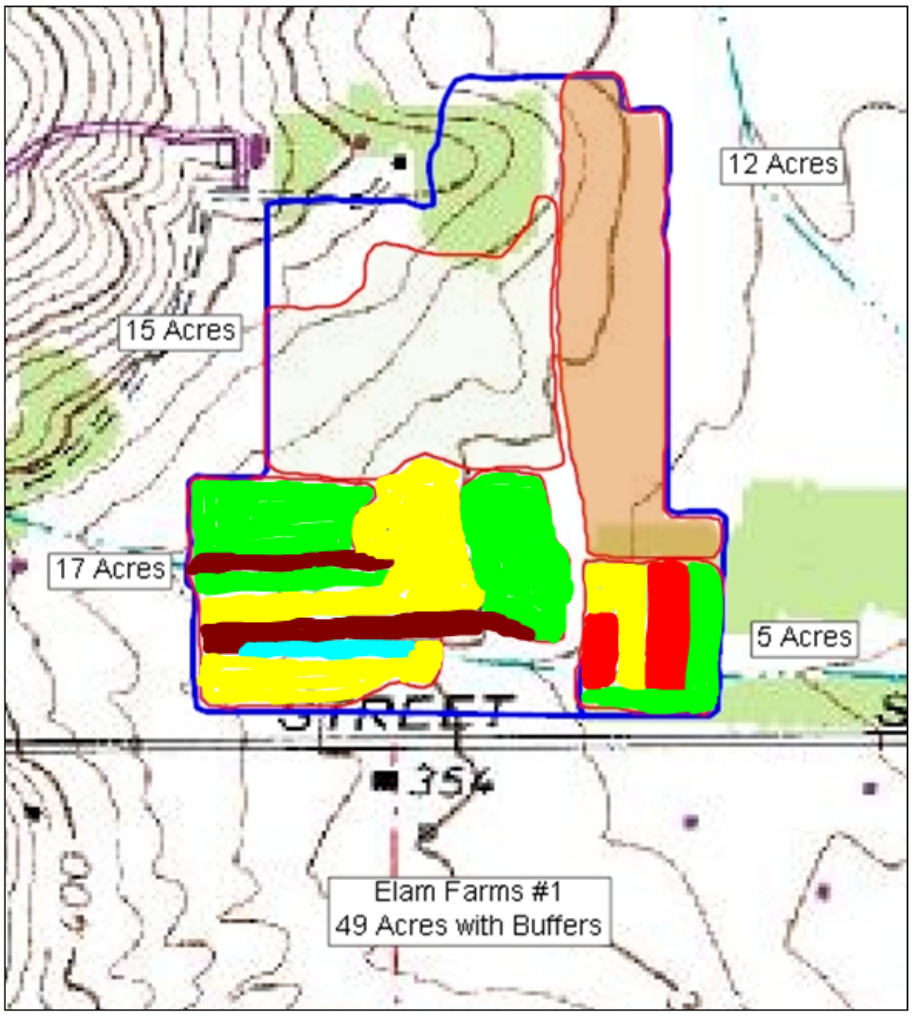
Estimated Loads based on 15 tons per spreader load:

Date	Operator	Loads Spread	EST tons spread
7/30/2020	GB	12	168.11
		Total Tons Spread	168.11

ELAM Site-1 Field - 12 Acres



2020
D. ELAM 1
DAILY APPLICATION MAP



Date	Tanker Loads	Gallons Applied	Color
7/16/2020	6	36,000	Green
7/17/2020	4	24,000	Red
7/20/2020	5	30,000	Yellow
7/21/2020	2	12,000	Blue
7/22/2020	6	36,000	Red
7/23/2020	5	30,000	Green
7/24/2020	2	12,000	Brown
7/27/2020	7	42,000	Green
7/28/2020	9	54,000	Yellow
7/29/2020	6	36,000	Green
8/6/2020	1	6,000	Red
Total	**53**	**318,000**	

Tribeca Transport

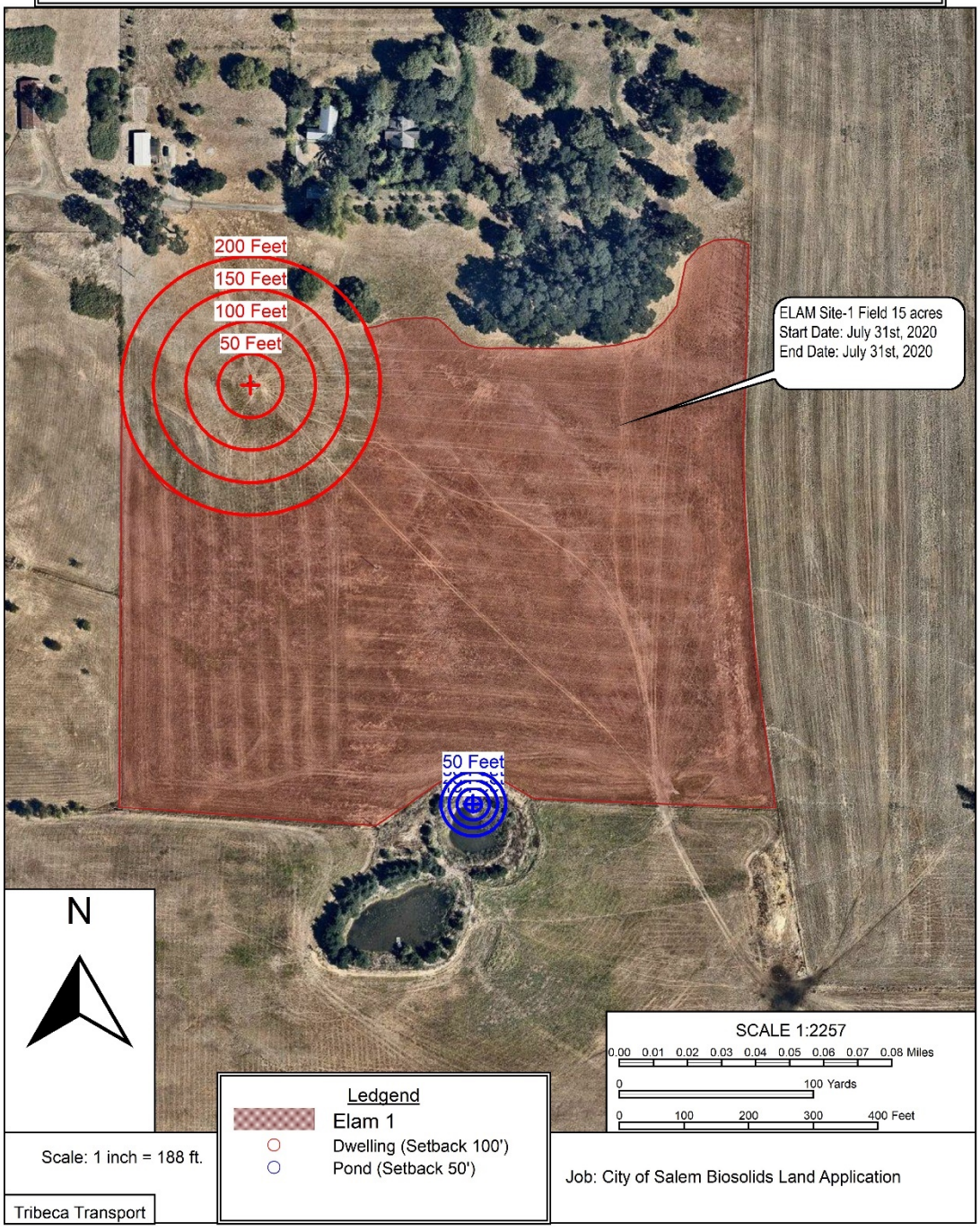
City of Salem Spreader Track Sheet - Field Elam Site 1 - 15 acres

Total Tons Delivered: 185.22 WT

Estimated Loads based on 15 tons per spreader load:

Date	Operator	Loads Spread	EST tons spread
7/31/2020	GB	13	185.22
		Total Tons Spread	185.22

ELAM Site-1 Field - 15 Acres



APPLICATION SITE WORKSHEET: 2020

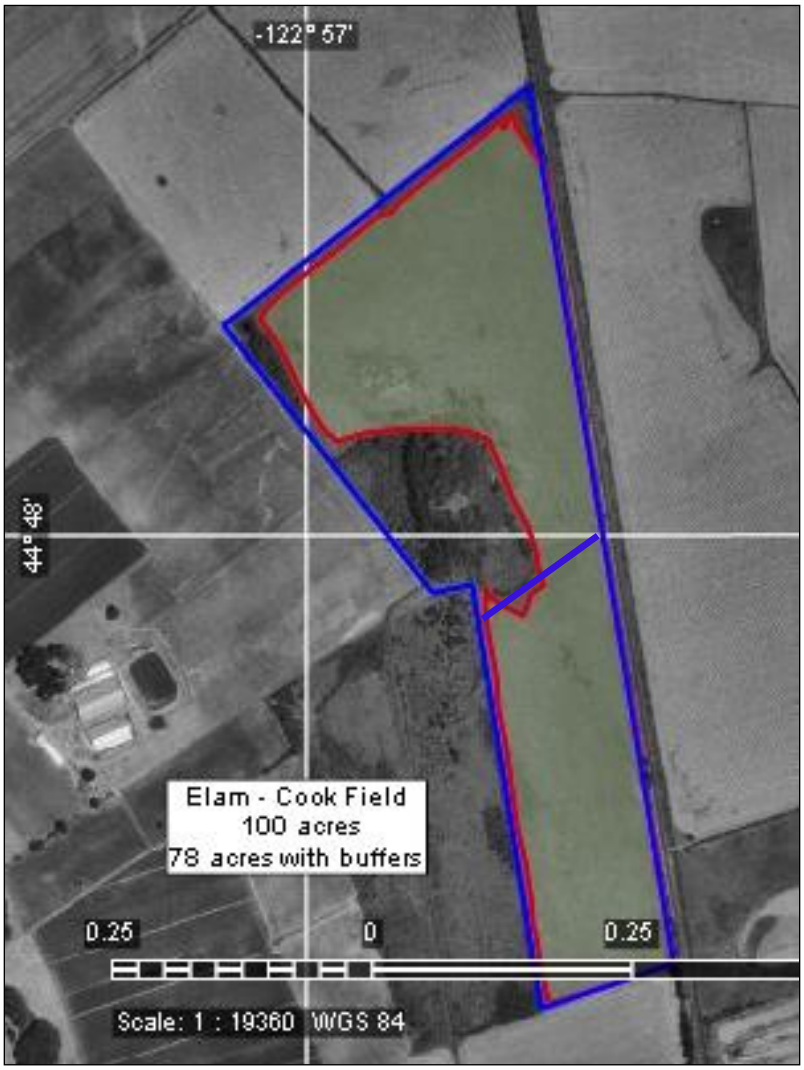
Application Dates: 09-14-2020

Soil Sample Collected: 05-09-2020 Domestic Well Sample Collected: No

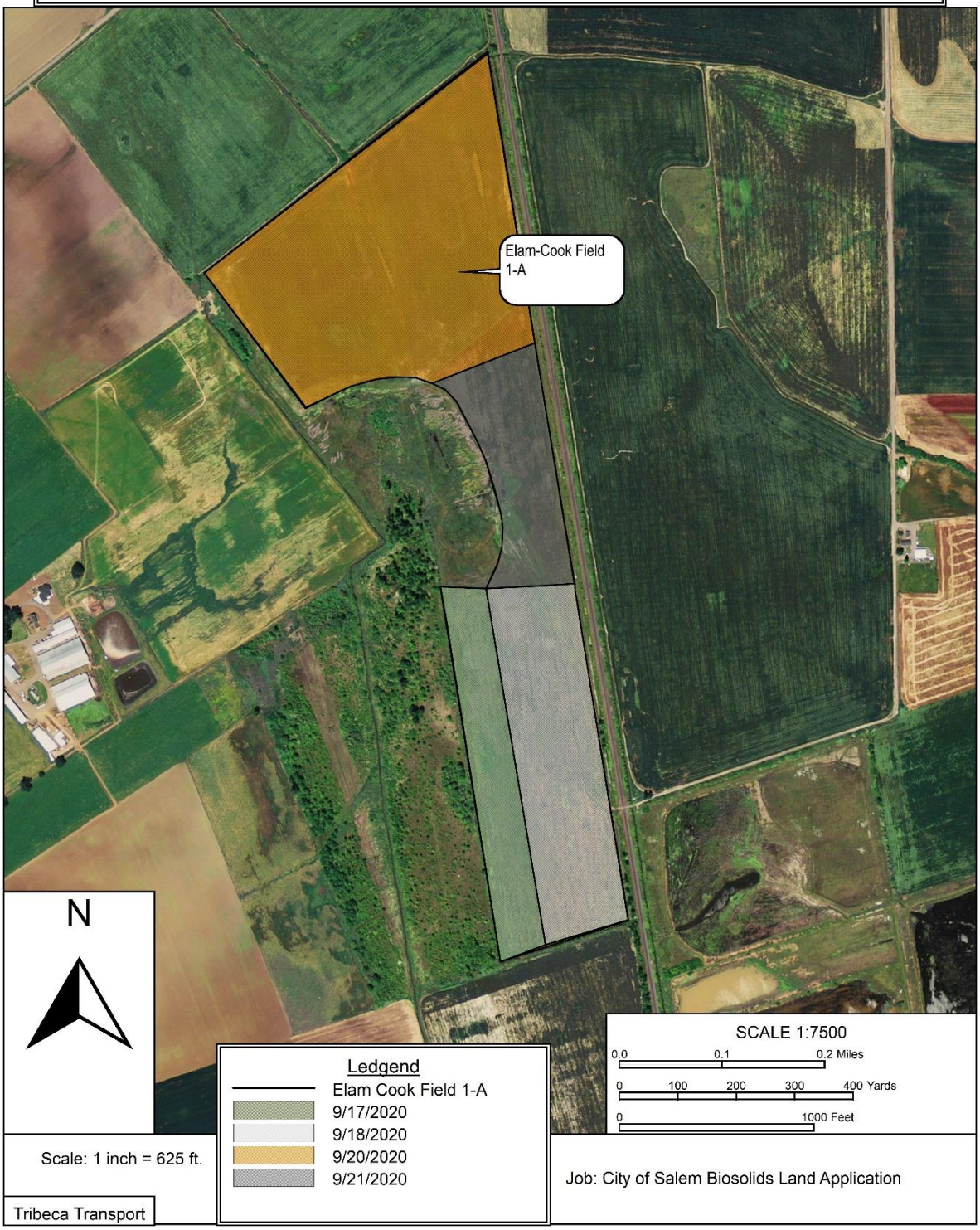
Site and Application Identification: Elam-Cook Field (1_A)
Biosolids Product: BFP Cake
DEQ Nitrogen Application Authorization: 120 lbs PAN per Acre (Western Oregon Hay/Pasture)
Acreage: Total of 78 Acres, Application Rate is 12.4 WT/Acre

Distance: 4 miles from Irma's Storage
Route To Field:
East on Lockhaven, right onto I-5 southbound. Take Sunnyside/Turner exit off I-5 and head east on Delaney Rd. Take right on Turner Rd. (3rd St.), then left on Denver St. and right on Marian Rd. Just after road veers to southeast, take right on Cook Rd. which becomes Duck Flat Rd. Field is at the end of the road, just over the railroad tracks.

Field Input and Recommendations:
50 foot buffer at roads and ditches. 200 foot buffer at domestic wells and residences.



Elam Cook Field 1-A Completion Map



Scale: 1 inch = 625 ft.

Tribeca Transport

Job: City of Salem Biosolids Land Application

City of Salem Spreader Track Sheet - Field: Elam Cook Field (1-A)

Total Tons Delivered: 982

Estimated Loads based on 15 tons per spreader load:

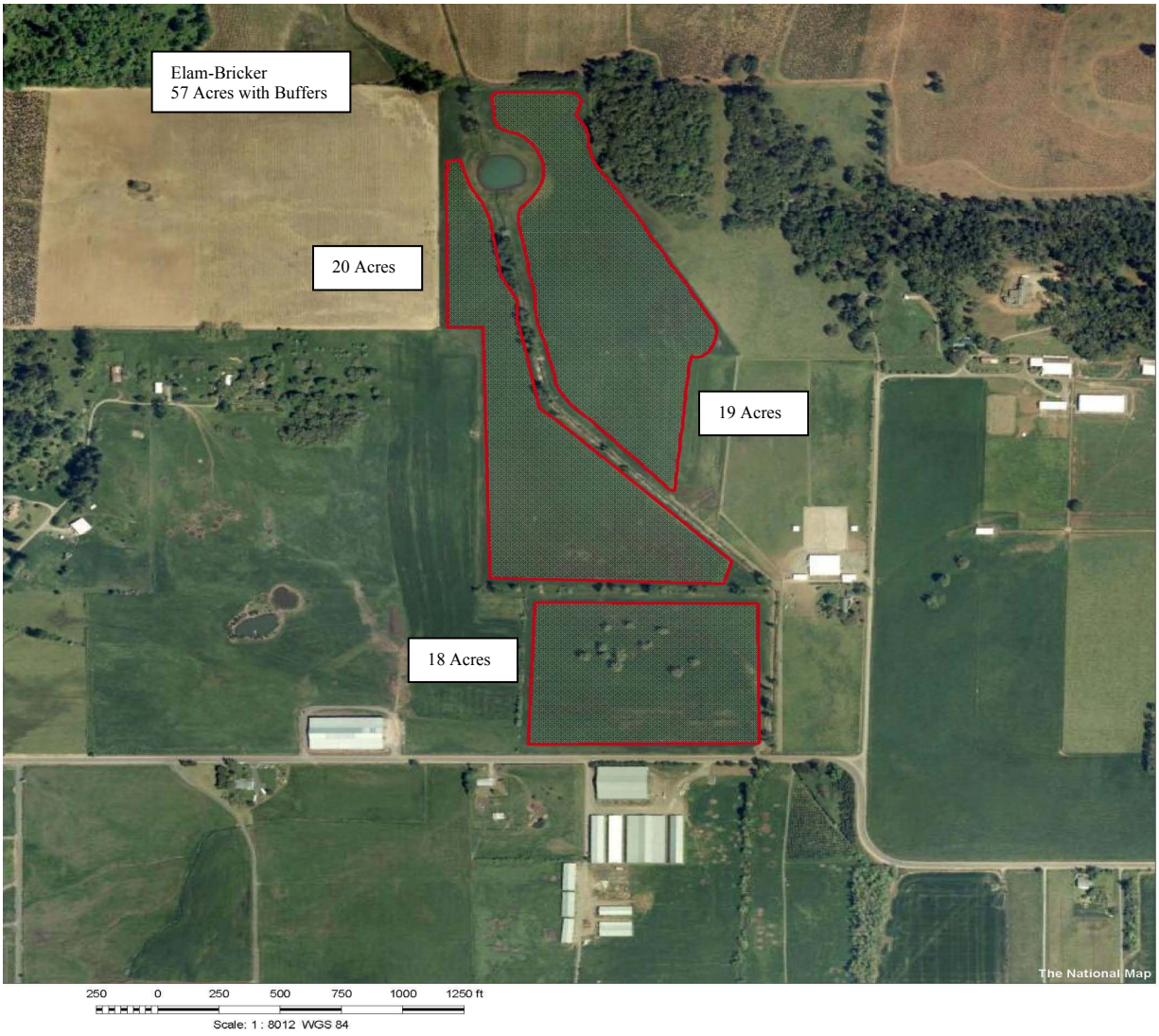
Date	Operator	Loads Spread	EST tons spread
9/17/2020	MK	10	150
9/18/2020	MK	25	375
9/20/2020	MK	18	270
9/21/2020	RW	13	187
		Total Tons Spread	982.00

APPLICATION SITE WORKSHEET: 2020

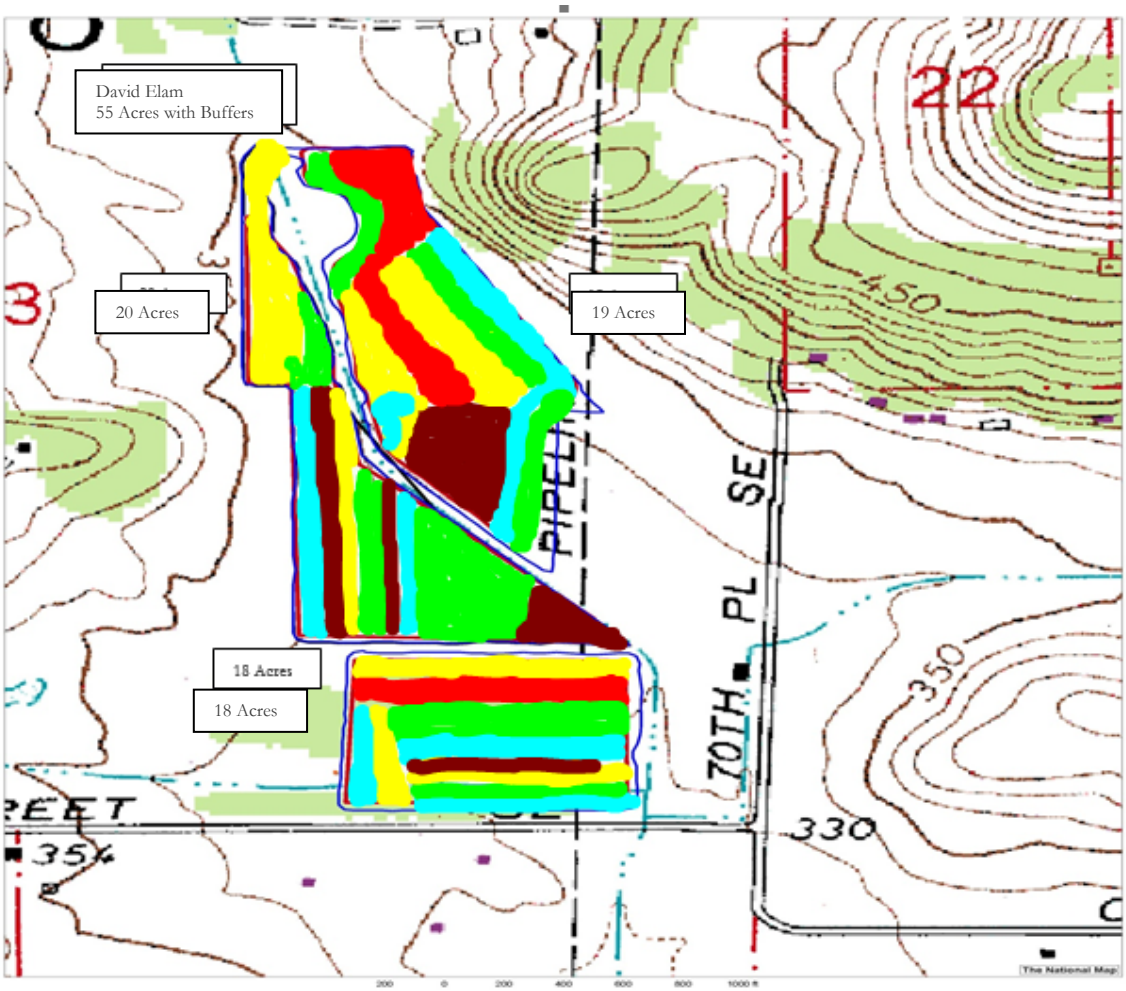
Application Dates:06-01-2020 to 08-05-2020

Soil Sample Collected: 05-27-2020 Domestic Well Sample Collected: No

Site and Application Identification: **Elam-Bricker (1_G)** Biosolids Product: Liquid & BFP Cake DEQ Nitrogen Application Authorization: 120 lbs PAN per Acre Acreage: Total of 57 acres
Distance: 19 miles Route To Field: East on Lockhaven, South on I-5. Take Kuebler Exit turn east. Turn right on Turner Road. Just past Turner turn left on Witzel Road. Turn left on 70th Ave. There are several ways into field.
Field Input and Recommendations: 200 foot buffer at domestic wells and residences. 50 foot buffer from ditches, roads, and waterways.



2020
ELAM-BRICKER
CAKE DAILY APPLICATION MAP



Liquid Application

Date	Number of Tankers	Gallons Applied	Color
6/1/2020	5	30,000	Blue
6/2/2020	5	30,000	Red
6/3/2020	9	54,000	Yellow
6/4/2020	9	54,000	Green
6/5/2020	4	24,000	Blue
6/8/2020	9	54,000	Red
6/11/2020	5	30,000	Red
6/25/2020	1	6,000	Yellow
6/29/2020	8	48,000	Blue
6/30/2020	6	36,000	Green
7/1/2020	6	36,000	Yellow
7/2/2020	7	42,000	Red
7/3/2020	3	18,000	Green
7/6/2020	8	48,000	Yellow
7/7/2020	5	30,000	Red
7/8/2020	4	24,000	Green
7/9/2020	6	36,000	Blue
7/10/2020	1	6,000	Brown

7/13/2020	7	42,000	Yellow
7/14/2020	4	24,000	Green
7/15/2020	5	30,000	Blue
7/16/2020	2	12,000	Yellow
7/30/2020	6	36,000	Green
8/3/2020	6	36,000	Blue
8/4/2020	3	18,000	Red
8/5/2020	5	30,000	Green
Total	**139**	**834,000**	**--**

D. ELAM 1

FIELD IDENTIFICATION: D. ELAM 1 (1_F)	
OWNER: DAVID ELAM	
LOCATION; TOWNSHIP: T8S RANGE: R2W SECTION: 21	
START DATE: 07-16-2020	
STOP DATE: 8-6-2020	
CROP: Western Oregon Hay	
TOTAL ACREAGE:	22

BIOSOLIDS LIQUID APPLICATION RATE INFORMATION	
PERMITTED APPLICATION RATE (PAN POUNDS PER ACRE)	120
DRY TONS BIOSOLIDS PER ACRE	1.25
GALLONS BIOSOLIDS PER ACRE	12,448
TANKERS PER ACRE	2.07
ACTUAL DISTANCE IN FEET (L-L 1150 RPM 37 FEET WIDE = 600 ft)	567

TARGET APPLICATION RATE (PAN POUNDS PER ACRE)	120
DRY TONS BIOSOLIDS PER ACRE	1.25
GALLONS BIOSOLIDS PER ACRE	12,448
TANKERS PER ACRE	2.07
TRUCK APPLICATION DISTANCE IN FEET (34 FEET WIDE)	618
TOTAL NUMBER OF TANKERS TO COMPLETE FIELD	46
DATE: Field Finished 8-6-2020	**53**
NUMBER OF TANKERS REMAINING FOR TARGET APPLICATION	(7)

FINAL APPLICATION RATE	
PAN POUNDS PER ACRE	139.45
PAN (TOTAL POUNDS APPLIED)	3,067.90
PHOSPHORUS (TOTAL POUNDS APPLIED)	1,384.81
POTASSIUM (TOTAL POUNDS APPLIED)	488.13
TOTAL GALLONS TO FIELD	**318,000**
DRY TONS PER SITE	31.96
DRY TONS PER ACRE	1.45

BIOSOLIDS ANALYSIS INFORMATION 2019 AVERAGED DATA (LIQUID)	
TOTAL SOLIDS (MG/KG)	2.41
ORGANIC NITROGEN (MG/KG)	47,871
INORGANIC NITROGEN (NH4) (MG/KG)	67,275
TKN (MG/KG)	115,146
PHOSPHOURUS (MG/KG)	21,666
POTASSIUM (MG/KG)	7,637
pH	7.35
ARSENIC (MG/KG)	6.00
CADMIUM (MG/KG)	1.42
CHROMIUM (MG/KG)	32.90
COPPER (MG/KG)	341
LEAD (MG/KG)	19.20
MERCURY (MG/KG)	0.48
MOLYBDENUM (MG/KG)	5.66
NICKEL (MG/KG)	15.20
SELENIUM (MG/KG)	7.1
SILVER (MG/KG)	4.6
ZINC (MG/KG)	980
1ST YEAR MINERALIZATION RATE	0.30
LIQUID INORGANIC NITROGEN AVAILABILITY FACTOR	0.50
POUNDS OF ORG N AVAILABLE/DRY TON APPLIED	28.72
POUNDS OF INORG N AVAILABLE/DRY TON APPLIED	67.28
POUNDS OF (P.A.N.)/.DRY TON	96.00

D. Elam - Cook

FIELD IDENTIFICATION: D. ELAM Cook Field(1_A)	
OWNER: DAVID ELAM	
LOCATION; TOWNSHIP: T9S RANGE: R2W SECTION: 9	
START DATE: 7/29/2020	
STOP DATE: 9-8-2020	
CROP: Western Oregon Hay	
TOTAL ACREAGE:	78

DEWATERED BIOSOLIDS APPLICATION RATE INFORMATION	
PERMITTED APPLICATION RATE (PAN POUNDS PER ACRE)	120
DRY TONS BIOSOLIDS PER ACRE	3.04
WET TONS BIOSOLIDS PER ACRE	12.39

TARGET APPLICATION RATE (PAN POUNDS PER ACRE)	120
DRY TONS BIOSOLIDS PER ACRE	3.04
WET TONS BIOSOLIDS PER ACRE	12.39
TOTAL WET TONS TO COMPLETE FIELD	966.55
DATE: Field Finished: 9/8/2020	**982.00**
TOTAL WET TONS REMAINING	(15.45)

FINAL APPLICATION RATE INFORMATION	
FINAL APPLICATION RATE (PAN POUNDS PER ACRE)	121.92
PAN (TOTAL POUNDS APPLIED)	9,509.61
PHOSPHORUS (TOTAL POUNDS APPLIED)	7,162.36
POTASSIUM (TOTAL POUNDS APPLIED)	759.30
TOTAL WET TONS APPLIED	**982.00**
TOTAL DRY TONS APPLIED	240.59
DRY TONS BIOSOLIDS PER ACRE	3.08
WET TONS BIOSOLIDS PER ACRE	12.59

BIOSOLIDS ANALYSIS INFORMATION 2020 AVERAGED DATA (Cent)(Jan-April)	
TOTAL SOLIDS (MG/KG)	24.50
ORGANIC NITROGEN (MG/KG)	51,082
INORGANIC NITROGEN (NH4) (MG/KG)	8,877
TKN (MG/KG)	59,959
PHOSPHORUS (MG/KG)	14,885
POTASSIUM (MG/KG)	1,578
pH	8.23
ARSENIC (MG/KG)	9.10
CADMIUM (MG/KG)	4.01
CHROMIUM (MG/KG)	90.00
COPPER (MG/KG)	351
LEAD (MG/KG)	17.60
MERCURY (MG/KG)	0.78
MOLYBDENUM (MG/KG)	5.34
NICKEL (MG/KG)	13.3
SELENIUM (MG/KG)	11.3
SILVER (MG/KG)	4.6
ZINC (MG/KG)	897
1ST YEAR MINERALIZATION RATE	0.30
LIQUID INORGANIC NITROGEN AVAILABILITY FACTOR	0.50
POUNDS OF ORG N AVAILABLE/DRY TON APPLIED	30.65
POUNDS OF INORG N AVAILABLE/DRY TON APPLIED	8.88
POUNDS OF (P.A.N.)/.DRY TON	39.53

ELAM-BRICKER

FIELD IDENTIFICATION: ELAM-BRICKER (1_G)	
LOCATION; TOWNSHIP: T8S RANGE: R2W SECTION: 22	
START DATE: 06-01-2020	
STOP DATE: 8-5-2020	
CROP: Western Oregon Hay	
TOTAL ACREAGE:	57

BIOSOLIDS LIQUID APPLICATION RATE INFORMATION	
PERMITTED APPLICATION RATE (PAN POUNDS PER ACRE)	120
DRY TONS BIOSOLIDS PER ACRE	1.25
GALLONS BIOSOLIDS PER ACRE	12,448
TANKERS PER ACRE	2.07
ACTUAL DISTANCE IN FEET (L-L 1150 RPM 37 FEET WIDE = 600 ft)	567

TARGET APPLICATION RATE (PAN POUNDS PER ACRE)	120
DRY TONS BIOSOLIDS PER ACRE	1.25
GALLONS BIOSOLIDS PER ACRE	12,448
TANKERS PER ACRE	2.07
TRUCK APPLICATION DISTANCE IN FEET (34 FEET WIDE)	618
TOTAL NUMBER OF TANKERS TO COMPLETE FIELD	118
DATE: Field Finished 8-5-2020	**139**
NUMBER OF TANKERS REMAINING FOR TARGET APPLICATION	(21)

FINAL APPLICATION RATE	
PAN POUNDS PER ACRE	141.16
PAN (TOTAL POUNDS APPLIED)	8,045.99
PHOSPHORUS (TOTAL POUNDS APPLIED)	3,631.85
POTASSIUM (TOTAL POUNDS APPLIED)	1,280.18
TOTAL GALLONS TO FIELD	**834,000**
DRY TONS PER SITE	83.81
DRY TONS PER ACRE	1.47

BIOSOLIDS ANALYSIS INFORMATION	
2019 AVERAGED DATA (LIQUID)	
TOTAL SOLIDS (MG/KG)	2.41
ORGANIC NITROGEN (MG/KG)	47,871
INORGANIC NITROGEN (NH4) (MG/KG)	67,275
TKN (MG/KG)	115,146
PHOSPHOURUS (MG/KG)	21,666
POTASSIUM (MG/KG)	7,637
pH	7.35
ARSENIC (MG/KG)	6.00
CADMIUM (MG/KG)	1.42
CHROMIUM (MG/KG)	32.90
COPPER (MG/KG)	341
LEAD (MG/KG)	19.20
MERCURY (MG/KG)	0.48
MOLYBDENUM (MG/KG)	5.66
NICKEL (MG/KG)	15.20
SELENIUM (MG/KG)	7.1
SILVER (MG/KG)	4.6
ZINC (MG/KG)	980
1ST YEAR MINERALIZATION RATE	0.30
LIQUID INORGANIC NITROGEN AVAILABILITY FACTOR	0.50
POUNDS OF ORG N AVAILABLE/DRY TON APPLIED	28.72
POUNDS OF INORG N AVAILABLE/DRY TON APPLIED	67.28
POUNDS OF (P.A.N.)/.DRY TON	96.00

Soil Monitoring Report (0-12inch) - 2020

Site: Dave Elam
Field: D. Elam 1

Sample Date: 7/16/2020

Parameter	Result	Units
Nitrate-Nitrogen (NO3-N)	3	mg/kg
Available Phosphorus (P)	82	mg/kg
Total Potassium (K)	137	mg/kg
Sulfate-Sulfur (SO4-S)	12	mg/kg
Organic Matter	7.2	%
pH	5.4	-

Soil Monitoring Report (0-12inch) - 2020

Site: Dave Elam
Field: Elam /cook

Sample Date: 7/23/2020

Parameter	Result	Units
Nitrate-Nitrogen (NO3-N)	5	mg/kg
Available Phosphorus (P)	37	mg/kg
Total Potassium (K)	163	mg/kg
Sulfate-Sulfur (SO4-S)	10	mg/kg
Organic Matter	4.8	%
pH	5.3	-

Soil Monitoring Report (0 - 12inch) - 2020

Site: Dave Elam
Field: Elam-Bricker

Sample Date: 5/27/2020

Parameter	Result	Units
Nitrate-Nitrogen (NO3-N)	3	mg/kg
Available Phosphorus (P)	6	mg/kg
Total Potassium (K)	66	mg/kg
Sulfate-Sulfur (SO4-S)	33	mg/kg
Organic Matter	6.6	%
pH	4.6	-

Soil Monitoring Report (12 - 24inch) - 2020

Site: Dave Elam
Field: Elam-Bricker

Sample Date: 5/27/2020

Parameter	Result	Units
Nitrate-Nitrogen (NO3-N)	1	mg/kg
Available Phosphorus (P)	2	mg/kg
Total Potassium (K)	44	mg/kg
Sulfate-Sulfur (SO4-S)	18	mg/kg
Organic Matter	6.4	%
pH	5.4	-

City of Salem's Biosolid Products
Pollutant Concentrations
Average of Monthly Analytical Results
2020

Pollutant Parameter	Biogro™ Liquid	Centrifuge (CENT) Cake	EPA 40 CFR §503.13(b)(3) Pollutant Concentration Limits
Arsenic (As)	9.6	8.72	41
Cadmium (Cd)	1.49	2.46	39
Chromium (Cr)	47.4	68.4	-
Copper (Cu)	308	358	1500
Lead (Pb)	16.5	18.5	300
Mercury (Hg)	0.68	0.7	17
Molybdenum (Mo)	5.76	5.87	-
Nickel (Ni)	13.9	14.9	420
Selenium (Se)	8.5	9.22	100
Zinc (Zn)	976	980	2800
*All units in mg/kg			

January 30, 2021

David Etzel
Etzel Farms
PO Box 741
Turner OR 97392

SUBJECT: **Biosolids Land Application**

Dear Mr. Etzel:

The City of Salem's Biosolids Program is pleased to present you with data and information on biosolids land application in 2020. This past year there was 108.65 dry tons of Class B biosolids land applied to 33 acres at the site known as Etzel 4A. The biosolids product you received in 2020 was Centrifuge Cake. The city applied twice in 2020, 1st application was at 100 PAN/ acre and the 2nd was at 30 PAN/acre

Enclosed please find the site and land application worksheets, the daily application map, and a table showing the concentrations of regulated pollutants in the biosolids products generated by Willow Lake Water Pollution Control Facility. These results remain well below the allowable limits.

As a courtesy, the City has used the following costs for fuel and commercial fertilizers obtained from Valley Agronomics LLC in Mt. Angel, Oregon on December 20, 2020, and labor to estimate the savings you may have incurred by electing to use the City's biosolids product(s):

- Off-road bulk diesel at $1.762 per gallon and a usage rate of four gallons per hour.

- Commercial fertilizer costs for:
  a) Nitrogen (as Urea) 46-0-0 at $365/ton or $0.18/lb: ($0.18/0.46) = $0.40/lb N
  b) Phosphorus (as P_2O_5) 0-45-0 at $600/ton or $0.30/lb: ($0.30/0.45) = $0.58/lb P
  c) Potassium (as K_2O) 0-0-60 at $475/ton or $0.24/lb: ($0.24/0.60) = $0.40/lb K

- Land application labor at 5.3 acres per hour and a pay rate of $14 per hour.

Based on these costs, your estimated savings from using Centrifuge cake products in 2020 were **$4021.82**.

On behalf of the City of Salem's Biosolids Program, thank you for your continued support. I will be contacting you in the spring about pre-season soil sampling and to discuss your needs for the 2021 crop season. If you have any questions, please feel free to contact me at 503-763-3479 or mstevenson@cityofsalem.net.

Sincerely,

Mark Stevenson
Residuals and Hauled Waste Supervisor

SM/VR:X:\010-ADMINISTRATION\Correspondence\Bio Solids\2017\2016 W Orton 1 Biosolids Application_Letter_012417_Final.docx
Enclosures:

1. Site Worksheet
2. Land Application Worksheets
3. Daily Application Map
4. Table of Pollutant Concentrations in Biosolids Products

By Certified Mail
cc: File: Chrono

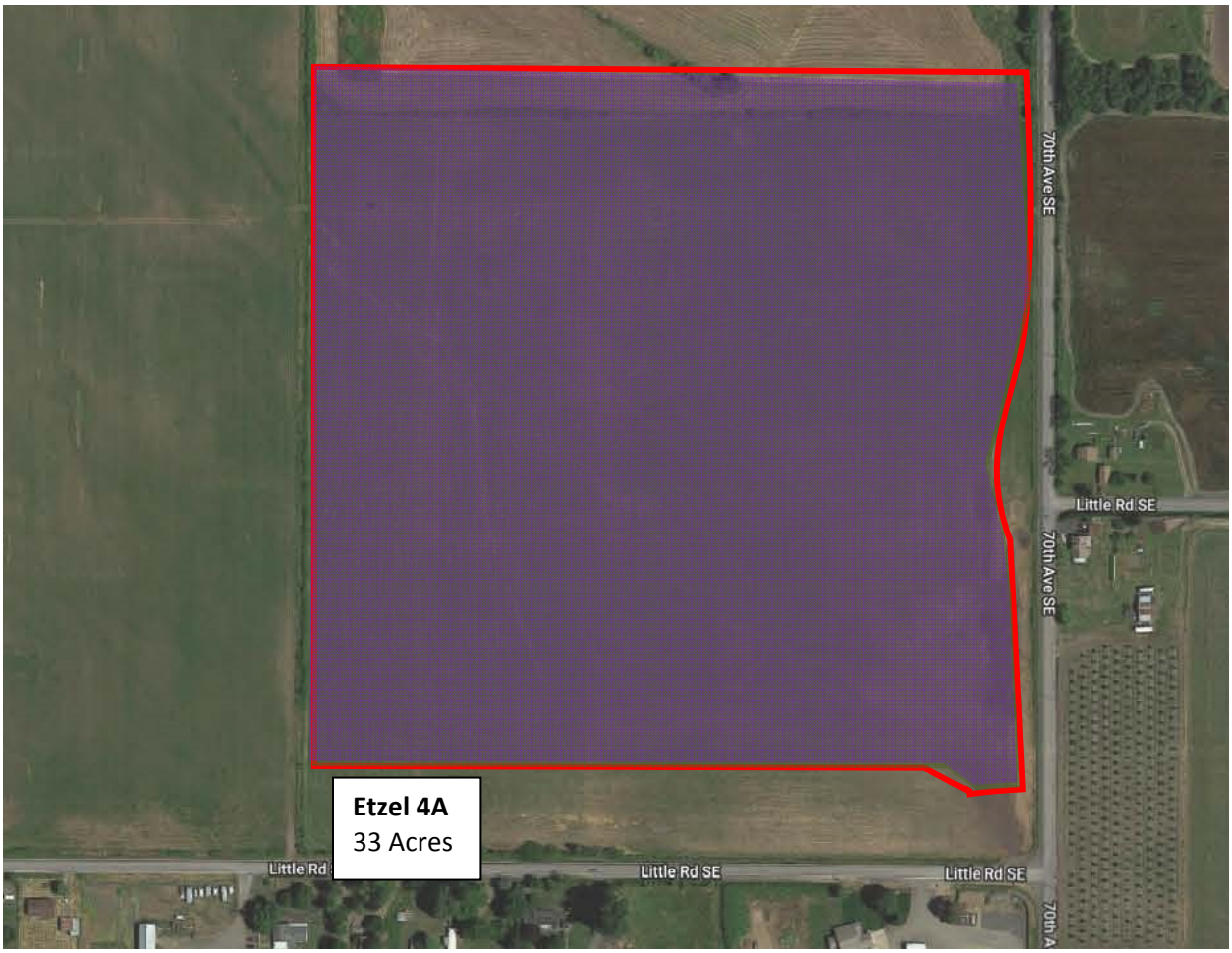
APPLICATION SITE WORKSHEET: 2020

Application Dates: August 2020

Soil Sample Collected:	05-14-2020	Domestic Well Sample Collected:	No

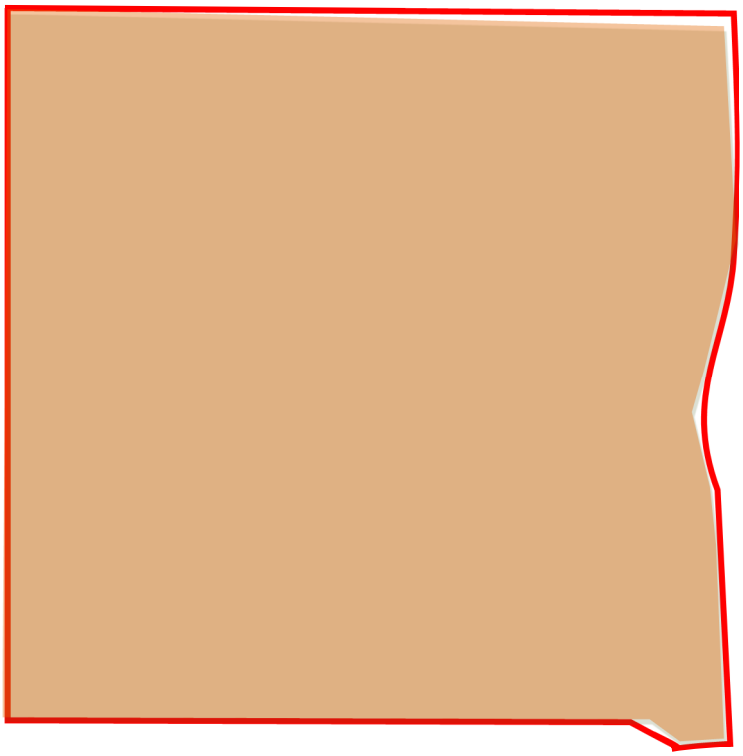
Site and Application Identification: Etzel 4A Biosolids Product: Liquid and Belt Filter Press Cake DEQ Nitrogen Application Authorization: 100 lbs PAN per Acre Acreage: 33 Acres
Distance: 18 miles Route To Field: I-5 South to Kuebler Exit. Right on Turner Road, south through Turner. South on Marion Road. Left on Little and Right into Etzel 4A.
Field Input and Recommendations: 50 ft buffer from ditch. 200 foot buffer at dwellings and domestic wells.

2020 Etzel Field 4A Daily Application Map



Date	Tons/load @15.1859tons per load	Wet Tons Applied	Color
05/14/2020	22	334.09	Purple
Total	22	334.09	

2020
Etzel Field 4A Daily Application Map



Etzel 4A
33 Acres

Date	Tons/load @16.4716tons per load	Wet Tons Applied	Color
08/27/2020	5.5	90.56	Orange
Total	5.5	90.56	

Etzel Farms - Etzel 4A

FIELD IDENTIFICATION: Etzel 4A (1_D)	
OWNER: Dave Etzel	
LOCATION: TOWNSHIP: T9S RANGE: R2W SECTION: 17	
START DATE: 5/6/2020	
STOP DATE: 5/12/2020	
CROP: Western Oregon Hay	
TOTAL ACREAGE:	33

DEWATERED BIOSOLIDS APPLICATION RATE INFORMATION	
PERMITTED APPLICATION RATE (PAN POUNDS PER ACRE)	100
DRY TONS BIOSOLIDS PER ACRE	2.47
WET TONS BIOSOLIDS PER ACRE	9.90

TARGET APPLICATION RATE (PAN POUNDS PER ACRE)	100
DRY TONS BIOSOLIDS PER ACRE	2.47
WET TONS BIOSOLIDS PER ACRE	9.90
TOTAL WET TONS TO COMPLETE FIELD	326.54
DATE: As of 5/12/2020	**334.09**
TOTAL WET TONS REMAINING	(7.55)

FINAL APPLICATION RATE INFORMATION	
FINAL APPLICATION RATE (PAN POUNDS PER ACRE)	102.31
PAN (TOTAL POUNDS APPLIED)	3,376.25
PHOSPHORUS (TOTAL POUNDS APPLIED)	2,459.51
POTASSIUM (TOTAL POUNDS APPLIED)	263.03
TOTAL WET TONS APPLIED	**334.09**
TOTAL DRY TONS APPLIED	83.29
DRY TONS BIOSOLIDS PER ACRE	2.52
WET TONS BIOSOLIDS PER ACRE	10.12

BIOSOLIDS ANALYSIS INFORMATION	
Jan-March 2020 DATA AVERAGES (CENT)	
TOTAL SOLIDS (MG/KG)	24.93
ORGANIC NITROGEN (MG/KG)	52823
INORGANIC NITROGEN (NH4) (MG/KG)	8843
TKN (MG/KG)	61666
PHOSPHORUS (MG/KG)	14765
POTASSIUM (MG/KG)	1579
pH	8.27
ARSENIC (MG/KG)	9.6
CADMIUM (MG/KG)	4.80
CHROMIUM (MG/KG)	66
COPPER (MG/KG)	332
LEAD (MG/KG)	17.4
MERCURY (MG/KG)	0.78
MOLYBDENUM (MG/KG)	5.33
NICKEL (MG/KG)	13.1
SELENIUM (MG/KG)	11.18
SILVER (MG/KG)	4.5
ZINC (MG/KG)	889
1ST YEAR MINERALIZATION RATE	0.30
LIQUID INORGANIC NITROGEN AVAILABILITY FACTOR	0.50
POUNDS OF ORG N AVAILABLE/DRY TON APPLIED	31.69
POUNDS OF INORG N AVAILABLE/DRY TON APPLIED	8.84
POUNDS OF (P.A.N.)/.DRY TON	40.54

Etzel Farms - Etzel 4A

FIELD IDENTIFICATION: Etzel 4A (1_D)	
OWNER: Dave Etzel	
LOCATION: TOWNSHIP: T9S RANGE: R2W SECTION: 17	
START DATE: 8/11/2020	
STOP DATE: 8/12/2020	
CROP: Western Oregon Hay	
TOTAL ACREAGE:	33

DEWATERED BIOSOLIDS APPLICATION RATE INFORMATION	
PERMITTED APPLICATION RATE (PAN POUNDS PER ACRE)	100
DRY TONS BIOSOLIDS PER ACRE	2.47
WET TONS BIOSOLIDS PER ACRE	8.81

TARGET APPLICATION RATE (PAN POUNDS PER ACRE)	30
DRY TONS BIOSOLIDS PER ACRE	0.74
WET TONS BIOSOLIDS PER ACRE	2.64
TOTAL WET TONS TO COMPLETE FIELD	87.22
DATE: As of 8/12/2020	**90.56**
TOTAL WET TONS REMAINING	(3.34)

FINAL APPLICATION RATE INFORMATION	
FINAL APPLICATION RATE (PAN POUNDS PER ACRE)	31.15
PAN (TOTAL POUNDS APPLIED)	1,027.88
PHOSPHORUS (TOTAL POUNDS APPLIED)	748.79
POTASSIUM (TOTAL POUNDS APPLIED)	80.08
TOTAL WET TONS APPLIED	**90.56**
TOTAL DRY TONS APPLIED	25.36
DRY TONS BIOSOLIDS PER ACRE	0.77
WET TONS BIOSOLIDS PER ACRE	2.74

BIOSOLIDS ANALYSIS INFORMATION	
Jan-March 2020 DATA AVERAGES (CENT)	
TOTAL SOLIDS (MG/KG)	28.00
ORGANIC NITROGEN (MG/KG)	52823
INORGANIC NITROGEN (NH4) (MG/KG)	8843
TKN (MG/KG)	61666
PHOSPHORUS (MG/KG)	14765
POTASSIUM (MG/KG)	1579
pH	8.27
ARSENIC (MG/KG)	9.6
CADMIUM (MG/KG)	4.80
CHROMIUM (MG/KG)	66
COPPER (MG/KG)	332
LEAD (MG/KG)	17.4
MERCURY (MG/KG)	0.78
MOLYBDENUM (MG/KG)	5.33
NICKEL (MG/KG)	13.1
SELENIUM (MG/KG)	11.18
SILVER (MG/KG)	4.5
ZINC (MG/KG)	889
1ST YEAR MINERALIZATION RATE	0.30
LIQUID INORGANIC NITROGEN AVAILABILITY FACTOR	0.50
POUNDS OF ORG N AVAILABLE/DRY TON APPLIED	31.69
POUNDS OF INORG N AVAILABLE/DRY TON APPLIED	8.84
POUNDS OF (P.A.N.)/.DRY TON	40.54

Soil Monitoring Report - 2020

Site: Dave Etzel

Field: Etzel 4A soil depth 0-12"

Sample Date: 5/1/2020

Parameter	Result	Units
Nitrate-Nitrogen (NO3-N)	20	mg/kg
Available Phosphorus (P)	158	mg/kg
Total Potassium (K)	307	mg/kg
Sulfate-Sulfur (SO4-S)	21	mg/kg
Organic Matter	8.9	%
pH	6.2	-

City of Salem's Biosolid Products
Pollutant Concentrations
Average of Monthly Analytical Results
2020

Pollutant Parameter	Biogro™ Liquid	Centrifuge (CENT) Cake	EPA 40 CFR §503.13(b)(3) Pollutant Concentration Limits
Arsenic (As)	9.6	8.72	41
Cadmium (Cd)	1.49	2.46	39
Chromium (Cr)	47.4	68.4	-
Copper (Cu)	308	358	1500
Lead (Pb)	16.5	18.5	300
Mercury (Hg)	0.68	0.7	17
Molybdenum (Mo)	5.76	5.87	-
Nickel (Ni)	13.9	14.9	420
Selenium (Se)	8.5	9.22	100
Zinc (Zn)	976	980	2800
*All units in mg/kg			

January 30, 2021

Mike Filbin
Filbin Ranches
61906 Dufur Gap Rd.
Dufur OR 97021

SUBJECT: **Biosolids Land Application**

Dear Mr. Filbin:

The City of Salem's Biosolids Program is pleased to present you with data and information on biosolids land application in 2020. This past year there was 104.27 dry tons of Class B biosolids land applied to 85.0 acres at the sites known as Filbin Field #5. The biosolids product you received in 2020 was Centrifuge Cake Biosolids.

Enclosed please find the site and land application worksheets, the daily application map, and a table showing that the concentrations of regulated pollutants in the biosolids products generated by the City's Willow Lake Water Pollution Control Facility.

As a courtesy, the City has used the following costs for fuel and commercial fertilizers obtained from Valley Agronomics LLC in Mt. Angel, Oregon on January 5, 2021, and labor to estimate the savings you may have incurred by electing to use the City's biosolids product(s):

- Off-road bulk diesel at $1.762 per gallon and a usage rate of four gallons per hour.
\
- Commercial fertilizer costs for:
-
    a) Nitrogen (as Urea) 46-0-0 at $365/ton or $0.18/lb: ($0.18/0.46) = $0.40/lb N
    b) Phosphorus (as P_2O_5) 0-45-0 at $600/ton or $0.30/lb: ($0.30/0.45) = $0.58/lb P
    c) Potassium (as K_2O) 0-0-60 at $475/ton or $0.24/lb: ($0.24/0.60) = $0.40/lb K

- Land application labor at 5.3 acres per hour and a pay rate of $14 per hour.

Based on these costs, your estimated savings from using the Biosolids Centrifuge Cake product in 2020 were as follows:

Filbin Field #5 **$3,946.02**

On behalf of the City of Salem's Biosolids Program, thank you for your support. If you have any questions, please feel free to contact me by phone at 503-763-3479 or by email at mstenenson@cityofsalem.net.

Sincerely,

Mark Stevenson
Residuals and Hauled Waste Manager

CMS/SM:X:\040-BIOGRO\ANNUAL REPORTS\2016\SITE APPLICATION\W. ORTON\2016 W. ORTON 1 Biosolids Application Letter.docx
Enclosures:

1. Site Worksheets – Filbin Field 5
2. Land Application Worksheets – Filbin Field 5
3. Table of Pollutant Concentrations in Biosolids Products

cc: File

APPLICATION SITE WORKSHEET: 2020

Application Dates: 01/02//2020 to 01/27/2020

Soil Sample Collected: none Domestic Well Sample Collected: none

Farm & Field Number: Filbin Field 5 (5_A)
Biosolids Product: Centrifuge Biosolids Cake
DEQ Maximum Nitrogen Application Rate: 100 PAN/Acre; 10.58 wet tons/acre
Crop: Eastern Oregon Pasture
Acreage: Total for application - 277 acres

Distance to Field: 149 miles

Route To Field:

Turn right on Windsor Island Road when leaving the Willow Lake Facility. Left on Lockhaven Road. Continue onto I-5 North bound for 39 miles. Keep right to stay on I-5 for one mile then take exit 300 to merge onto I-84 towards the Dalles, stay on I-84 for 85 miles and take exit 87 onto US-197 Towards Dufur Bend. Follow US-197 for 21 miles and take right onto Tygh Ridge Road. The field is located on the east side of HWY 197 north of Tygh Ridge Raod. There is a house at the bottom of the field, enter the field through the driveway. The staging area (in case there is a need for storage away from the field due to being inaccessible) is right above Tygh Ridge Rd. at the corner of Tygh Ridge Rd. and Hwy 197.

Field Input and Recommendations:

50 ft buffer roads, roadside ditches. 200 feet from domestic wells and residences.

Mike Filbin - Field #5

FIELD IDENTIFICATION: Filbin Field (5_A)	
MANAGER: Mike Filbin	
LOCATION; TOWNSHIP: T2S RANGE: R13E SECTION: 1 &2	
START DATE: 1/2/2020	
STOP DATE: 1/27/2020	
CROP: Eastern Oregon Pasture	
TOTAL ACREAGE:	85

DEWATERED BIOSOLIDS APPLICATION RATE INFORMATION	
PERMITTED APPLICATION RATE (PAN POUNDS PER ACRE)	100
DRY TONS BIOSOLIDS PER ACRE	2.47
WET TONS BIOSOLIDS PER ACRE	9.90

TARGET APPLICATION RATE (PAN POUNDS PER ACRE)	50
DRY TONS BIOSOLIDS PER ACRE	1.23
WET TONS BIOSOLIDS PER ACRE	4.95
TOTAL WET TONS TO COMPLETE FIELD	420.55
DATE : As of 2-22-19	**418.27**
TOTAL WET TONS REMAINING	2.28

FINAL APPLICATION RATE INFORMATION	
FINAL APPLICATION RATE (PAN POUNDS PER ACRE)	49.73
PAN (TOTAL POUNDS APPLIED)	4,226.96
PHOSPHORUS (TOTAL POUNDS APPLIED)	3,079.23
POTASSIUM (TOTAL POUNDS APPLIED)	329.30
TOTAL WET TONS APPLIED	**418.27**
TOTAL DRY TONS APPLIED	104.27
DRY TONS BIOSOLIDS PER ACRE	1.23
WET TONS BIOSOLIDS PER ACRE	4.92

BIOSOLIDS ANALYSIS INFORMATION	
Jan-March 2020 DATA AVERAGES (CENT)	
TOTAL SOLIDS (MG/KG)*	24.93
ORGANIC NITROGEN (MG/KG)	52823
INORGANIC NITROGEN (NH4+NO3) (MG/KG)	8843
TKN (MG/KG)	61666
PHOSPHORUS (MG/KG)	14765
POTASSIUM (MG/KG)	1579
pH	8.27
ARSENIC (MG/KG)	9.6
CADMIUM (MG/KG)	4.80
CHROMIUM (MG/KG)	66
COPPER (MG/KG)	332
LEAD (MG/KG)	17.4
MERCURY (MG/KG)	0.78
MOLYBDENUM (MG/KG)	5.33
NICKEL (MG/KG)	13.1
SELENIUM (MG/KG)	11.18
SILVER (MG/KG)	4.5
ZINC (MG/KG)	889
1ST YEAR MINERALIZATION RATE	0.30
LIQUID INORGANIC NITROGEN AVAILABILITY FACTOR	0.50
POUNDS OF ORG N AVAILABLE/DRY TON APPLIED	31.69
POUNDS OF INORG N AVAILABLE/DRY TON APPLIED	8.84
POUNDS OF (P.A.N.)/.DRY TON	40.54

* weighted average

City of Salem's Biosolid Products
Pollutant Concentrations
Average of Monthly Analytical Results
2020

Pollutant Parameter	Biogro™ Liquid	Centrifuge (CENT) Cake	EPA 40 CFR §503.13(b)(3) Pollutant Concentration Limits
Arsenic (As)	9.6	8.72	41
Cadmium (Cd)	1.49	2.46	39
Chromium (Cr)	47.4	68.4	-
Copper (Cu)	308	358	1500
Lead (Pb)	16.5	18.5	300
Mercury (Hg)	0.68	0.7	17
Molybdenum (Mo)	5.76	5.87	-
Nickel (Ni)	13.9	14.9	420
Selenium (Se)	8.5	9.22	100
Zinc (Zn)	976	980	2800
*All units in mg/kg			

January 30, 2021

Mike Glassey
9275 River Road
Salem, Or 97303

SUBJECT: **Biosolids Land Application**

Dear Mr. Glassey:

The City of Salem's Biosolids Program is pleased to present you with data and information on biosolids land application in 2020. This past year there was 5.43 dry tons of Class B biosolids land applied to5 acres at the site known as M. Glassey Field. The biosolids product you received in 2020 was liquid biosolids.

Enclosed please find the site and land application worksheets, the daily application map, and a table showing the concentrations of regulated pollutants in the biosolids products generated by Willow Lake Water Pollution Control Facility. These results remain well below the allowable limits.

As a courtesy, the City has used the following costs for fuel and commercial fertilizers obtained from Valley Agronomics LLC in Mt. Angel, Oregon on December 20, 2020, and labor to estimate the savings you may have incurred by electing to use the City's biosolids product(s):

- Off-road bulk diesel at $1.762 per gallon and a usage rate of four gallons per hour.
- Commercial fertilizer costs for:

    a) Nitrogen (as Urea) 46-0-0 at $365/ton or $0.18/lb: ($0.18/0.46) = $0.40/lb N
    b) Phosphorus (as P_2O_5) 0-45-0 at $600/ton or $0.30/lb: ($0.30/0.45) = $0.58/lb P
    c) Potassium (as K_2O) 0-0-60 at $475/ton or $0.24/lb: ($0.24/0.60) = $0.40/lb K

- Land application labor at 5.3 acres per hour and a pay rate of $14 per hour.

Based on these costs, your estimated savings from using liquid biosolds products in 2020 were $520.26.

On behalf of the City of Salem's Biosolids Program, thank you for your continued support. I will be contacting you in the spring about pre-season soil sampling and to discuss your needs for the 2021 crop season. If you have any questions, please feel free to contact me at 503-763-3479 or mstevenson@cityofsalem.net.

Sincerely,

Mark Stevenson
Residuals and Hauled Waste Supervisor

SM/VR:X:\010-ADMINISTRATION\Correspondence\Bio Solids\2017\2016 W Orton 1 Biosolids Application_Letter_012417_Final.docx
Enclosures:

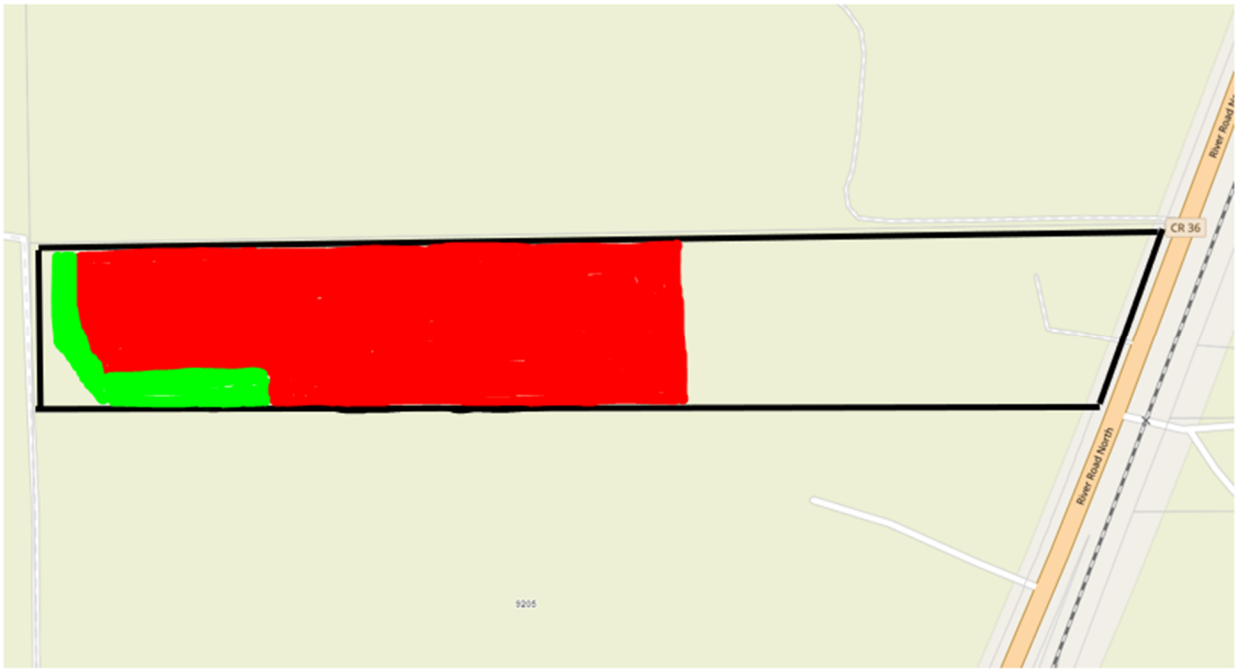
1. Site Worksheet
2. Land Application Worksheets
3. Daily Application Map
4. Table of Pollutant Concentrations in Biosolids Products

By Certified Mail
cc: File: Chrono

Glassey Work Sheet

Directions From Willow Lake Water Pollution Control Facility
To M. Glassey Field #1 Turn right on Windsor Island Road when leaving the Willow Lake Facility. Left on Lockhaven Road. Left on River Road. Continue past Broolake road, and field on west side. Turn left on Goulet driveway (9305 River Road) and go straight to end of driveway and field entrance will be on the left side.
Net Acreage
8.5 acres with buffers, 9.8 acres without buffers

Glassey Daily Application Map 2020



Date	Number of Tankers	Gallons Applied	Color
7/29/2020	2	12,000	Green
8/24/2020	8	48,000	Red
TOTAL	**10**	**60,000**	

Mike Glassey

FIELD IDENTIFICATION: Glassey	
OWNER: Mike Glassey	
LOCATION; TOWNSHIP: 6S RANGE: 3E SECTION: 13 Tax Lot 200	
START DATE: 07-29-2020	
STOP DATE:	
CROP: Oregon Pasture grass	
TOTAL ACREAGE:	5

BIOSOLIDS LIQUID APPLICATION RATE INFORMATION	
PERMITTED APPLICATION RATE (PAN POUNDS PER ACRE)	100
DRY TONS BIOSOLIDS PER ACRE	1.04
GALLONS BIOSOLIDS PER ACRE	10,374
TANKERS PER ACRE	1.73
ACTUAL DISTANCE IN FEET (L-L 1150 RPM 37 FEET WIDE = 600 ft)	681

TARGET APPLICATION RATE (PAN POUNDS PER ACRE)	100
DRY TONS BIOSOLIDS PER ACRE	1.04
GALLONS BIOSOLIDS PER ACRE	10,374
TANKERS PER ACRE	1.73
TRUCK APPLICATION DISTANCE IN FEET (34 FEET WIDE)	741
TOTAL NUMBER OF TANKERS TO COMPLETE FIELD	9
DATE: Field Finished	**9**
NUMBER OF TANKERS REMAINING FOR TARGET APPLICATION	(0)

FINAL APPLICATION RATE	
PAN POUNDS PER ACRE	104.19
PAN (TOTAL POUNDS APPLIED)	520.96
PHOSPHORUS (TOTAL POUNDS APPLIED)	235.16
POTASSIUM (TOTAL POUNDS APPLIED)	82.89
TOTAL GALLONS TO FIELD	**54,000**
DRY TONS PER SITE	5.43
DRY TONS PER ACRE	1.09

BIOSOLIDS ANALYSIS INFORMATION	
2019 AVERAGED DATA (LIQUID)	
TOTAL SOLIDS (MG/KG)	2.41
ORGANIC NITROGEN (MG/KG)	47,871
INORGANIC NITROGEN (NH4) (MG/KG)	67,275
TKN (MG/KG)	115,146
PHOSPHOURUS (MG/KG)	21,666
POTASSIUM (MG/KG)	7,637
pH	7.35
ARSENIC (MG/KG)	6.00
CADMIUM (MG/KG)	1.42
CHROMIUM (MG/KG)	32.90
COPPER (MG/KG)	341
LEAD (MG/KG)	19.20
MERCURY (MG/KG)	0.48
MOLYBDENUM (MG/KG)	5.66
NICKEL (MG/KG)	15.20
SELENIUM (MG/KG)	7.1
SILVER (MG/KG)	4.6
ZINC (MG/KG)	980
1ST YEAR MINERALIZATION RATE	0.30
LIQUID INORGANIC NITROGEN AVAILABILITY FACTOR	0.50

Soil Monitoring Report - 2020

Site: M.; Glassey
Field: Glassey

Sample Date: 7/28/2020

Parameter	Result	Units
Nitrate-Nitrogen (NO3-N)	1	mg/kg
Available Phosphorus (P)	107	mg/kg
Total Potassium (K)	133	mg/kg
Sulfate-Sulfur (SO4-S)	4	mg/kg
Organic Matter	2.9	%
pH	5.3	-

City of Salem's Biosolid Products
Pollutant Concentrations
Average of Monthly Analytical Results
2020

Pollutant Parameter	Biogro™ Liquid	Centrifuge (CENT) Cake	EPA 40 CFR §503.13(b)(3) Pollutant Concentration Limits
Arsenic (As)	9.6	8.72	41
Cadmium (Cd)	1.49	2.46	39
Chromium (Cr)	47.4	68.4	-
Copper (Cu)	308	358	1500
Lead (Pb)	16.5	18.5	300
Mercury (Hg)	0.68	0.7	17
Molybdenum (Mo)	5.76	5.87	-
Nickel (Ni)	13.9	14.9	420
Selenium (Se)	8.5	9.22	100
Zinc (Zn)	976	980	2800
*All units in mg/kg			

January 30, 2021

Jimmy Gross
13384 Jorgenson Road
Jefferson OR 97352

SUBJECT: **Biosolids Land Application**

Dear Mr. Gross:

The City of Salem's Biosolids Program is pleased to present you with data and information on biosolids land application in 2020. This past year there was a total of 903.15 dry tons of Class B biosolids land applied to a total of 318 acres at the sites known as J. Gross Fields 3, 6, 7, 8, and 11. The biosolids product you received in 2020 was Centrifuge Cake.

Enclosed please find the site and land application worksheets, the daily application maps, the soil monitoring reports, and a table showing the concentrations of regulated pollutants in the biosolids products generated by Willow Lake Water Pollution Control Facility. These results remain well below the allowable limits.

As a courtesy, the City has used the following costs for fuel and commercial fertilizers obtained from Valley Agronomics LLC in Mt. Angel, Oregon on January 5, 2021, and labor to estimate the savings you may have incurred by electing to use the City's biosolids product(s):

- Off-road bulk diesel at $1.762 per gallon and a usage rate of four gallons per hour.
- Commercial fertilizer costs for:

  a) Nitrogen (as Urea) 46-0-0 at $365/ton or $0.18/lb: ($0.18/0.46) = $0.40/lb N
  b) Phosphorus (as P_2O_5) 0-45-0 at $600/ton or $0.30/lb: ($0.30/0.45) = $0.58/lb P
  c) Potassium (as K_2O) 0-0-60 at $475/ton or $0.24/lb: ($0.24/0.60) = $0.40/lb K

- Land application labor at 5.3 acres per hour and a pay rate of $14 per hour.

Based on these costs, your estimated savings from using Biosolids Centrifuge and Belt Filter Press Cake product in 2020 were as follows:

J. Gross Field 3	$5,476.33
J. Gross Field 6	$2,679.00
J. Gross Field 7	$8,551.91
J. Gross Field 8	$6,671.74
J. Gross Field 11	$10,318.73
Total:	$33,699.01

On behalf of the City of Salem's Biosolids Program, thank you for your continued support. I will be contacting you in the spring about pre-season soil sampling and to discuss your needs for the 2021 crop season. If you have any questions, please feel free to contact me at 503-763-3479 or mstevenson@cityofsalem.net.

Sincerely,

Mark Stevenson
Residuals and Hauled Waste Supervisor

SM/VR:X:\010-ADMINISTRATION\Correspondence\Bio Solids\2017\2016 Jensen Farms Biosolids Application_Letter_012417_Final.docx
Enclosures:

1. Site Worksheets—J. Gross Fields, 3, 6, 7, 8, and 11
2. Land Application Worksheets— J. Gross Fields, 3, 6, 7, 8, and 11
3. Daily Application Maps— J. Gross Fields ,3, 6, 7, 8, and 11
4. Soil Monitoring Reports— J. Gross Fields , 3, 6, 7, 8, and 11
5. Table of Pollutant Concentrations in Biosolids Products

By Certified Mail
cc: File: Chrono

APPLICATION SITE WORKSHEET: 2020

Application Dates

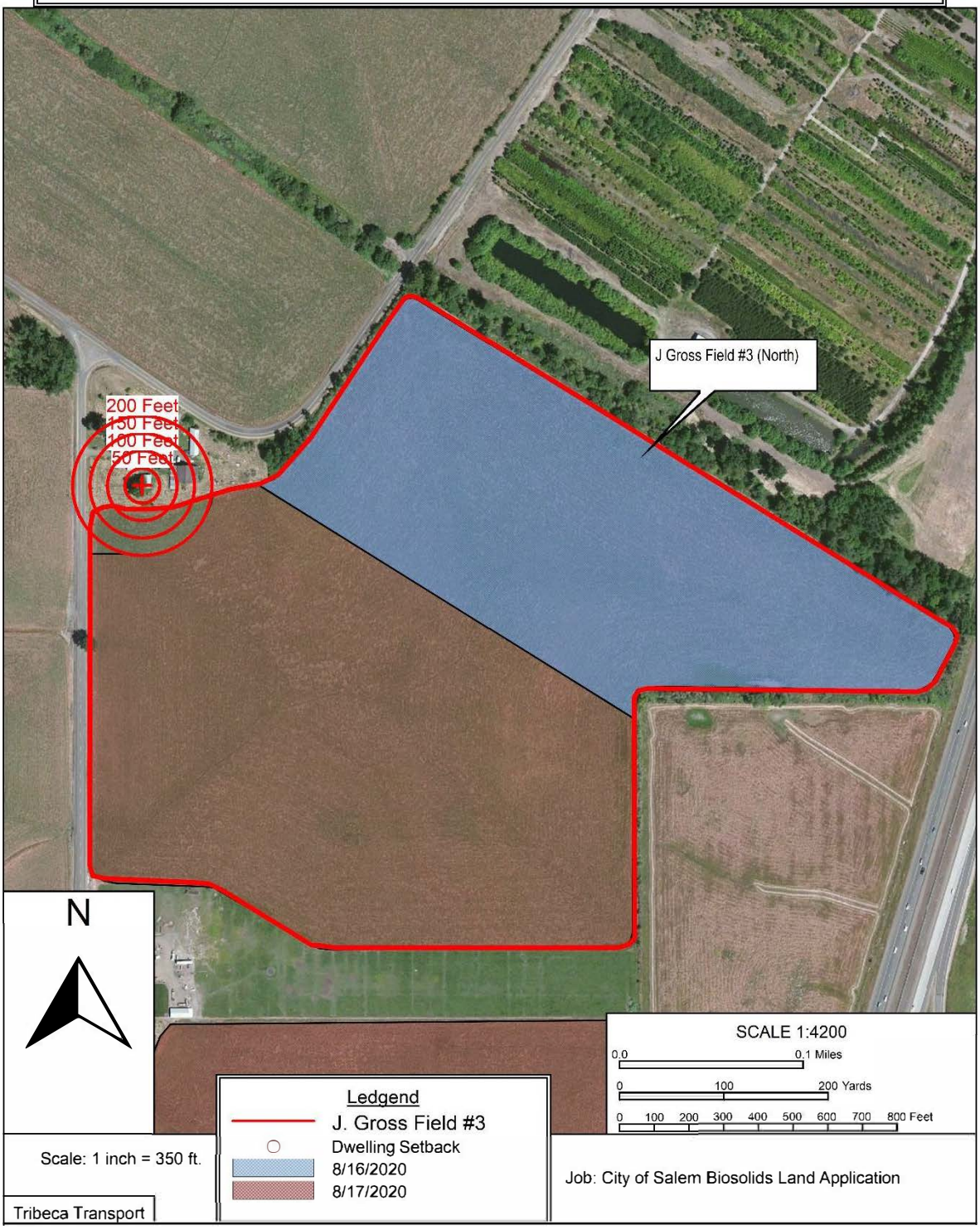
Soil Sample Collected: 7-22-2020 Domestic Well Sample Collected: NA

Farm & Field Number: J. Gross 3(NORTH FIELD)
Biosolids Product: BFP Cake and Liquid Biosolids
DEQ Maximum Nitrogen Application Rate: 120 Pounds per Acre/10.84 Wet Tons per acre
Acreage: 55 Acres
Distance to Field: 23 miles

Best Route To Field: East on Lockhaven, South on I-5 to Exit 242 (Talbot Rd.). Follow loop around to the stop sign. Turn left on Talbot Road. Turn right on Jorgenson Road. Turn into the Gross Farm Shops, For South Field enter field between barn on left and shed on right. Watch the dip at the gate. Drive Slowly. North Field, turn left into field just when entering the Farm Yard

Field Input and Recommendations:. Buffers: 200 ft at North West corner (for house). 50 foot buffer at roadside ditches.

J. Gross Field #3 (North) Completion Map



City of Salem Spreader Track Sheet - Field: J Gross #3			
Total Tons Delivered: 544.9			
	Estimated Loads based on 15 tons per spreader load:		-
Date	Operator	Loads Spread	EST tons spread
8/16/2020	RW	17	255
8/17/2020	RW	20	289.9
		Total Tons Spread	544.90

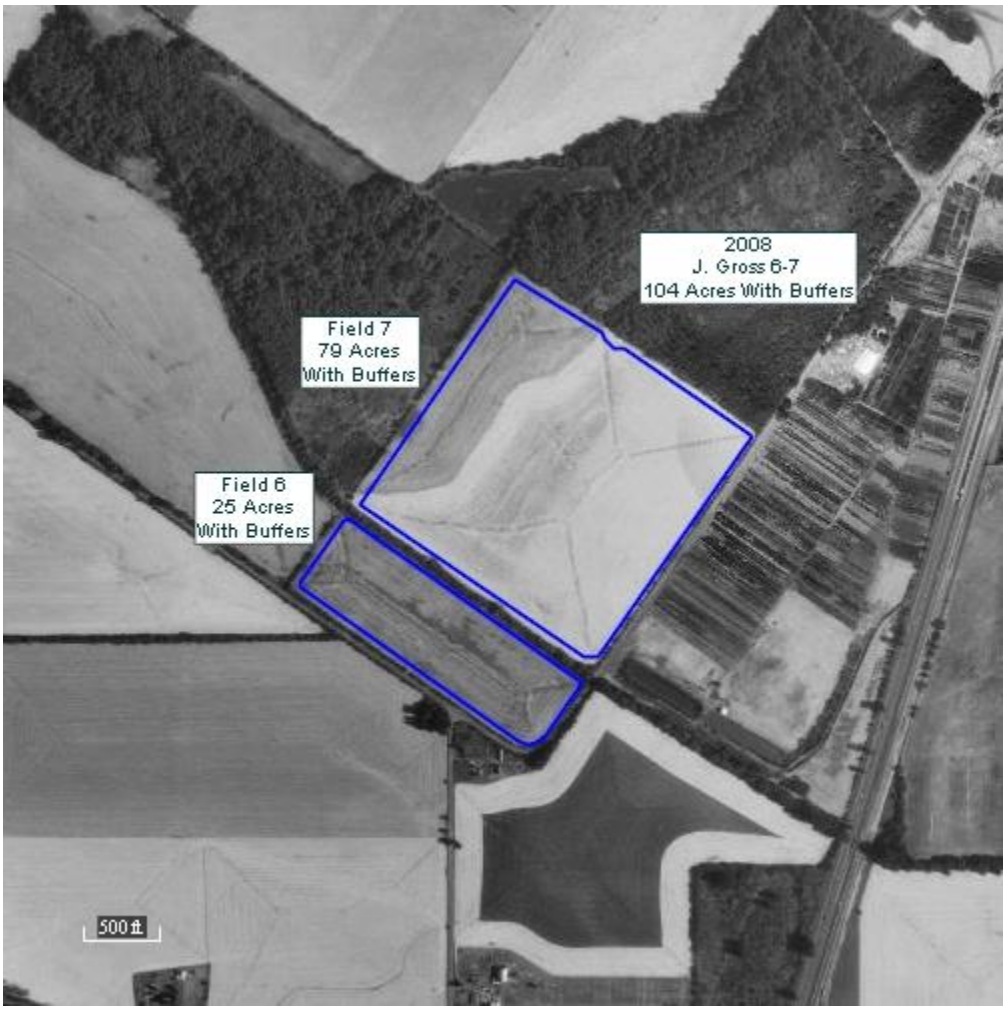
APPLICATION SITE WORKSHEET: 2020

Application Dates: Field 6 – 08-03-2020 to 08-04-2020
Field 7 – 08-04-2020 to 08-07-2020

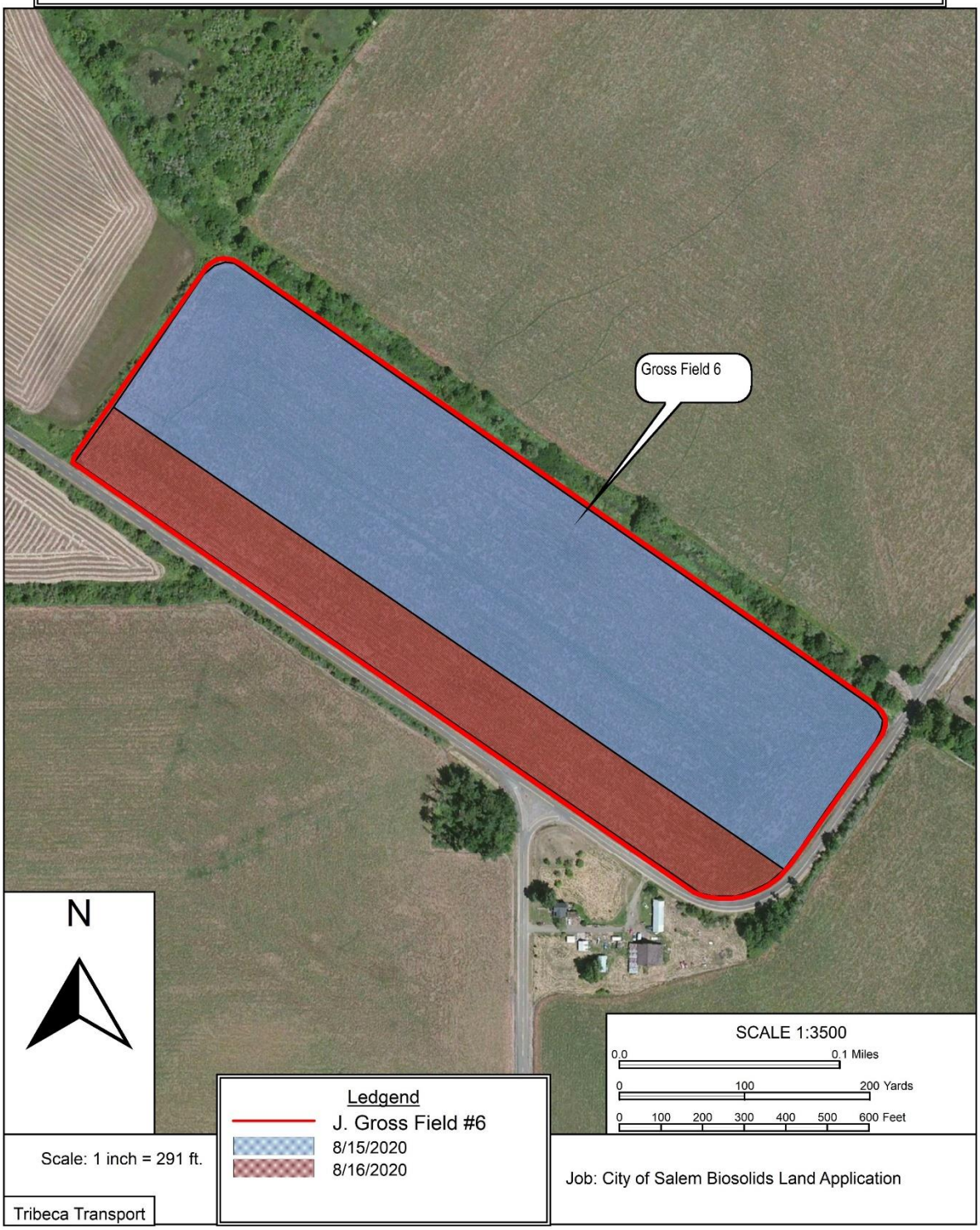
Soil Sample Collected: 7/23/2020 7/23/2020

Domestic Well Sample Collected: NA

Site and Application Identification: J. Gross 6-7 (1_A) Biosolids Product: BFP Cake DEQ Nitrogen Application Authorization: 120 lbs PAN per Acre/ 10.84 WT/Acre Acreage: About 104 Acres
Distance: 21 miles Route To Field: East on Lockhaven, South on I-5 to Exit 242 (Talbot Road). Follow loop around to stop sign. Turn left on Talbot Road. Turn right on Jorgenson Road. Turn left or right on Wintel Road for access to Field 6 or 7. Turn into Field 7 just after the white bridge.
Field Input and Recommendations: 50 ft buffer from water ways and roads. 200 foot buffer at domestic wells.

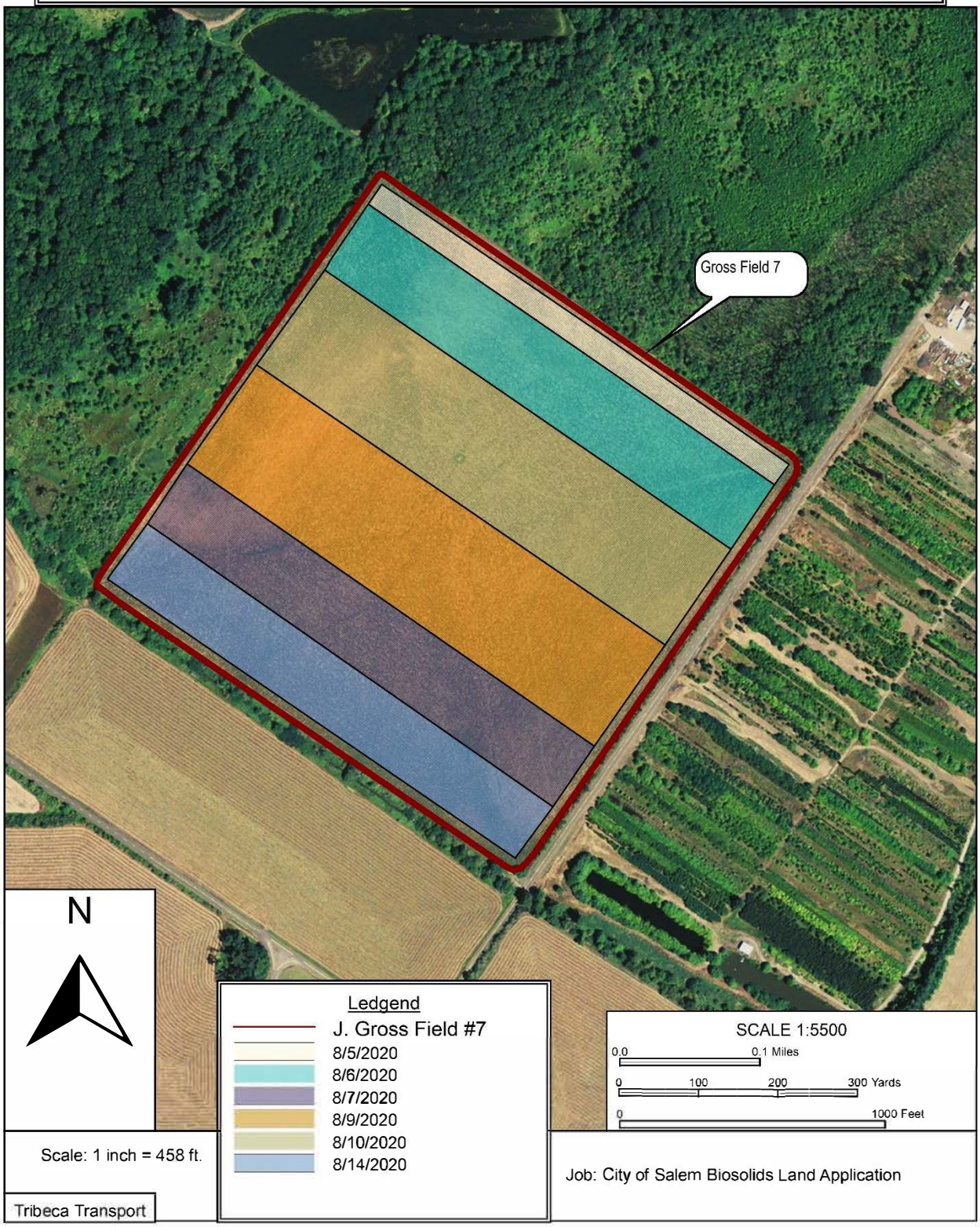


J. Gross Field #6 Completion Map



City of Salem Spreader Track Sheet - Field: J Gross #6			
Total Tons Delivered: 268.30			
	Estimated Loads based on 15 tons per spreader load:		-
Date	Operator	Loads Spread	EST tons spread
8/15/2020	MK	14	210
8/16/2020	MK	4	58.3
		Total Tons Spread	268.30

J. Gross Field #7 Completion Map



City of Salem Spreader Track Sheet - Field: J Gross #7			
Total Tons Delivered: 856.80			
	Estimated Loads based on 15 tons per spreader load:		-
Date	Operator	Loads Spread	EST tons spread
8/5/2020	RW	3	45
8/6/2020	RW	12	180
8/7/2020	GB	9	135
8/9/2020	MK	13	195
8/10/2020	RW	13	195
8/14/2020	MK	8	106.8
		Total Tons Spread	856.80

APPLICATION SITE WORKSHEET: 2020

Application Dates: 8/24/2020

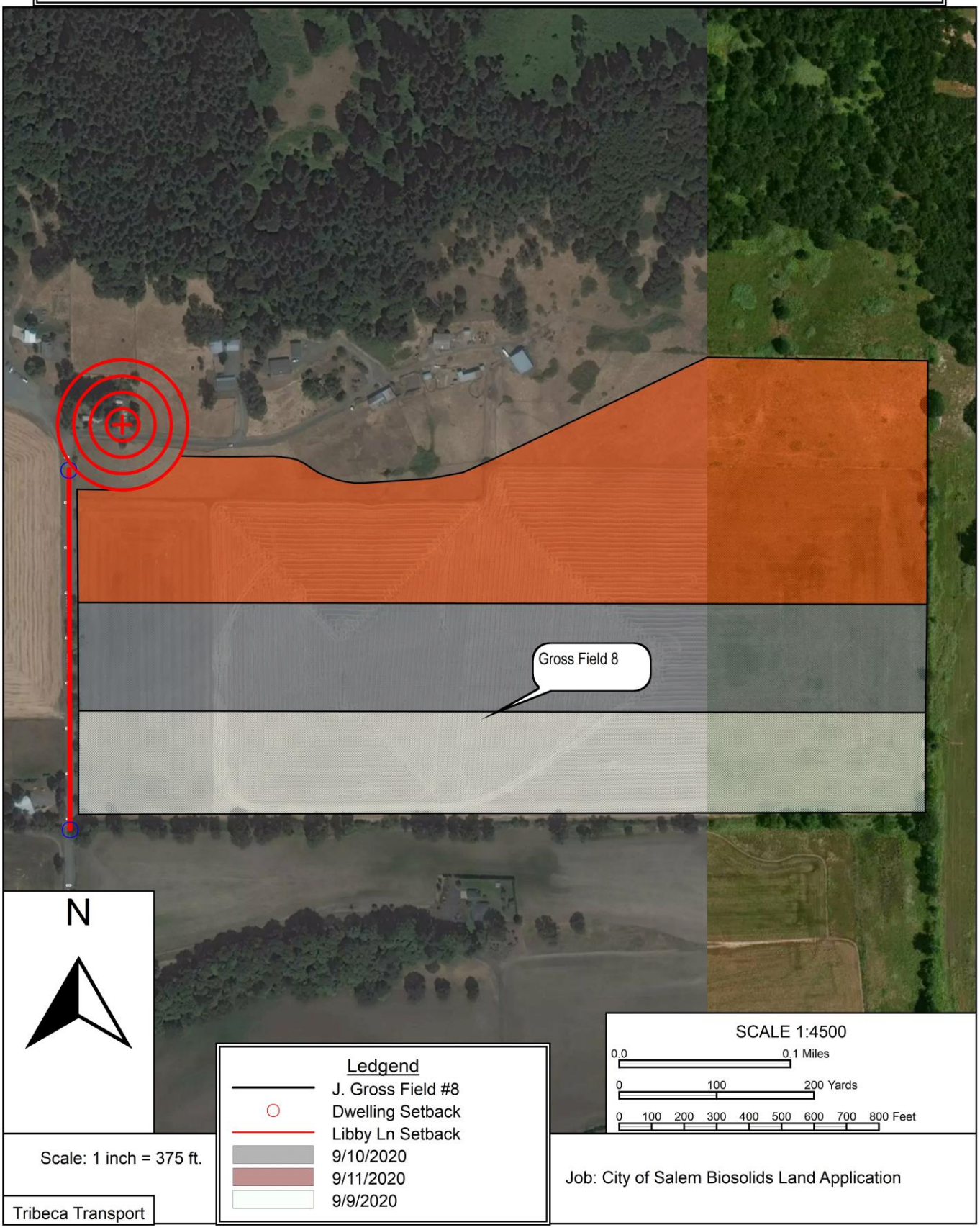
Soil Sample Collected: 08-14-2020 Domestic Well Sample Collected:

Farm & Field Number: J. Gross Field 8 (8_A)
Biosolids Product: BFP, CENT and Liquid Biosolids
DEQ Maximum Nitrogen Application Rate: Ryegrass: 100 lbs per acre
Application Rate:9.04 wet tons/acre
Crop: Annual Ryegrass 74 acres
Acreage: Total 79 acres

Distance to Field: 26.7 miles
Route to Field:
Turn right on Windsor Island Road when leaving the Willow Lake Facility. Left on Lockhaven Road. Continue onto I-5 Southbound for 14.8 miles. Take exit 244 towards Jefferson, turn left onto OR-164 and continue for 5.3 miles. After entering Jefferson, turn right onto E North Ave and continue for 0.2 miles then take a slight left onto Marion Rd SE. Continue on Marion Rd for 2.58 miles and take a left on Libby Lane. Go on gravel road for 0.45 mile and field entrance to the is towards the end of the road on the right side.

Field Input and Recommendations:
50 ft buffer roads, roadside ditches. 200 feet from domestic wells and residences.

J. Gross Field #8 Completion Map



Scale: 1 inch = 375 ft.

Tribeca Transport

Job: City of Salem Biosolids Land Application

City of Salem Spreader Track Sheet - Field: Gross #8

Total Tons Delivered: 663.32

Estimated Loads based on 15 tons per spreader load:

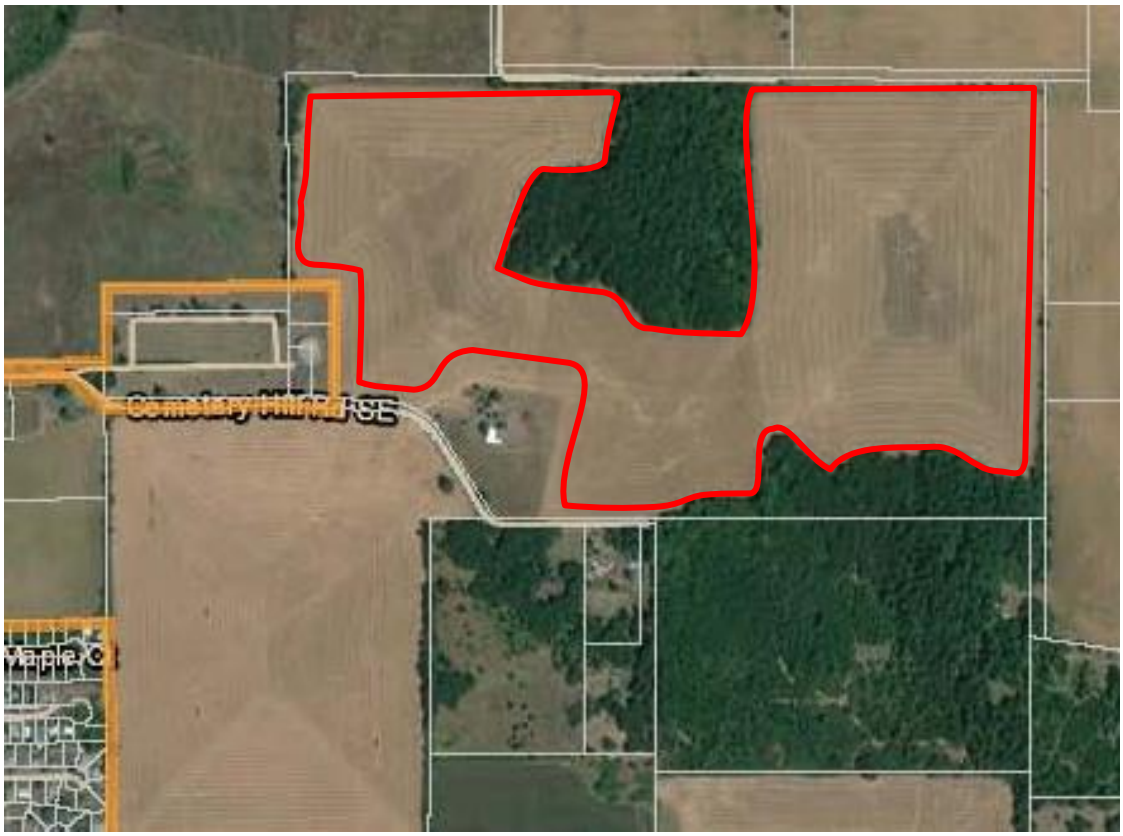
Date	Operator	Loads Spread	EST tons spread
9/9/2020	GB	9	135
9/10/2020	MK	10	150
9/11/2020	GB	25	378.32
		Total Tons Spread	663.32

APPLICATION SITE WORKSHEET: 2020

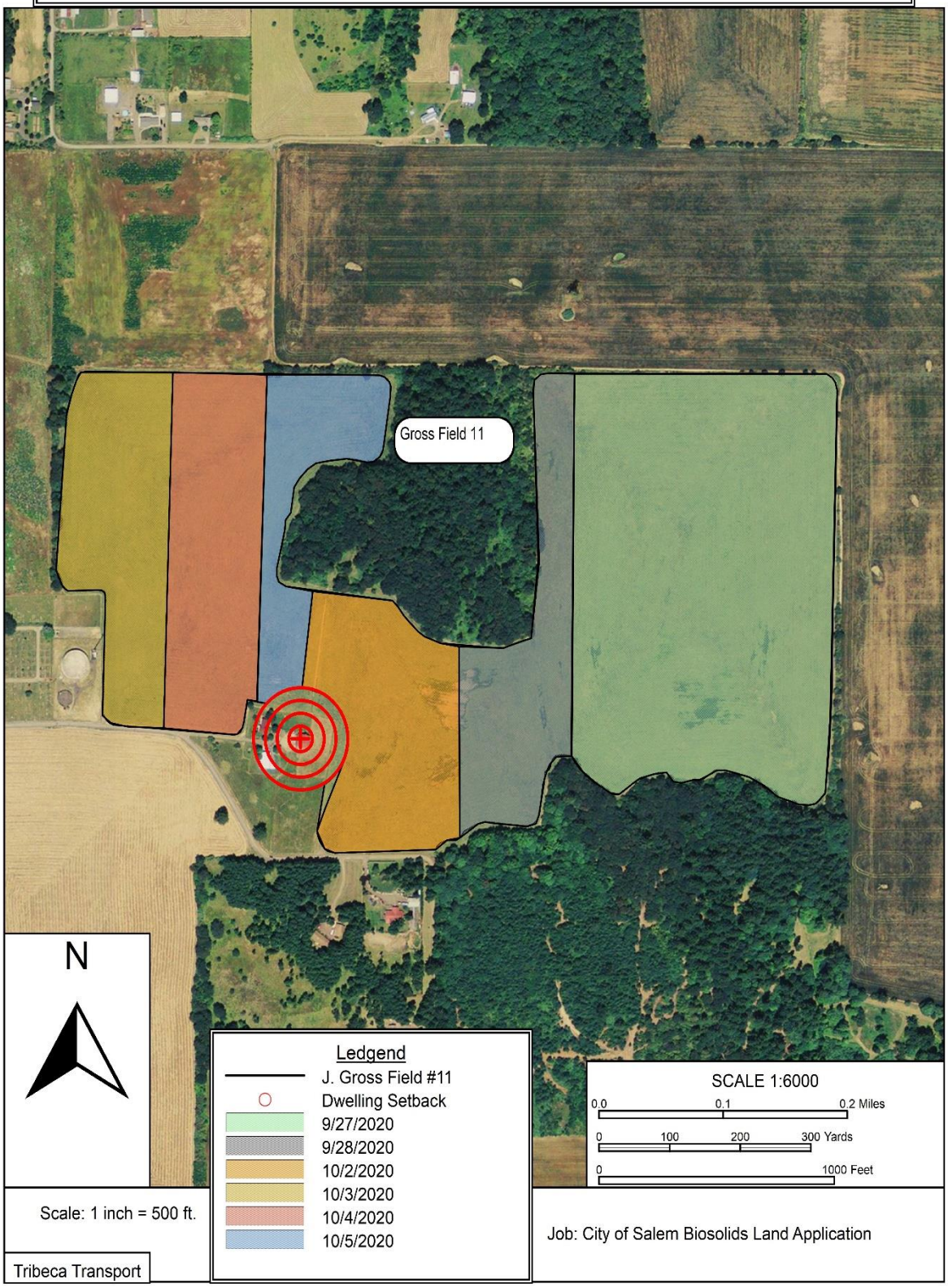
Application Dates: 09-25-2020

Soil Sample Collected: 08-17-20 Domestic Well Sample Collected: NA

Farm & Field Number: J. Gross Field 11 (11_A) Biosolids Product: BFP, CENT and Liquid Biosolids DEQ Maximum Nitrogen Application Rate: Perennial Ryegrass 120 lbs per acre Crop: Perennial Ryegrass 95 acres Acreage: Total 90 acres Application Rate:12.14 WT/Acre
Distance to Field: 24.3 miles Route To Field: Turn right on Windsor Island Road when leaving the Willow Lake Facility. Left on Lockhaven Road. Continue onto I-5 North bound for 14.8 miles. Take exit 244 towards Jefferson, turn left onto OR-164 and continue for 5.3 miles. Turn left onto E North Ave and continue for 0.2 miles then take a right onto Cemetery Hill Rd SE after 0.8 miles you will arrive at the entrance of the field.
Field Input and Recommendations: 50 ft buffer roads, roadside ditches. 200 feet from domestic wells and residences.



J. Gross Field #11 Completion Map



City of Salem Spreader Track Sheet - Field: Gross 11

Total Tons Delivered: 1000

Estimated Loads based on 15 tons per spreader load:

Date	Operator	Loads Spread	EST tons spread
9/27/2020	MK	25	375
9/28/2020	MK	8	120
10/2/2020	MK	12	180
10/3/2020	MK	9	135
10/4/2020	MK	7	105
10/5/2020	RW	6	85
		Total Tons Spread	1000.00

Jimmy Gross - J. Gross Field 3 North Field (CENT)

FIELD IDENTIFICATION: J. GROSS 3 (3_C)	
OWNER: Jimmy Gross	
LOCATION; TOWNSHIP: T8S RANGE: R2W SECTION: 22	
START DATE: 8-11-2020	
STOP DATE: 8-13-2020	
CROP: Perennial Ryegrass	
TOTAL ACREAGE:	50

DEWATERED BIOSOLIDS APPLICATION RATE INFORMATION	
PERMITTED APPLICATION RATE (PAN POUNDS PER ACRE)	120
DRY TONS BIOSOLIDS PER ACRE	3.04
WET TONS BIOSOLIDS PER ACRE	10.84

TARGET APPLICATION RATE (PAN POUNDS PER ACRE)	120
DRY TONS BIOSOLIDS PER ACRE	3.04
WET TONS BIOSOLIDS PER ACRE	10.84
TOTAL WET TONS TO COMPLETE FIELD	542.14
DATE: Field Finished: 8-13-2020	**544.90**
TOTAL WET TONS REMAINING	(2.76)

FINAL APPLICATION RATE INFORMATION	
FINAL APPLICATION RATE (PAN POUNDS PER ACRE)	120.61
PAN (TOTAL POUNDS APPLIED)	6,030.59
PHOSPHORUS (TOTAL POUNDS APPLIED)	4,542.07
POTASSIUM (TOTAL POUNDS APPLIED)	481.52
TOTAL WET TONS APPLIED	**544.90**
TOTAL DRY TONS APPLIED	152.57
DRY TONS BIOSOLIDS PER ACRE	3.05
WET TONS BIOSOLIDS PER ACRE	10.90

BIOSOLIDS ANALYSIS INFORMATION	
2020 AVERAGED DATA (Cent)(Jan-April)	
TOTAL SOLIDS (MG/KG)*	28.00
ORGANIC NITROGEN (MG/KG)	51,082
INORGANIC NITROGEN (NH4+NO3) (MG/KG)	8,877
TKN (MG/KG)	59,959
PHOSPHORUS (MG/KG)	14,885
POTASSIUM (MG/KG)	1,578
pH	8.23
ARSENIC (MG/KG)	9.10
CADMIUM (MG/KG)	4.01
CHROMIUM (MG/KG)	90.00
COPPER (MG/KG)	351
LEAD (MG/KG)	17.60
MERCURY (MG/KG)	0.78
MOLYBDENUM (MG/KG)	5.34
NICKEL (MG/KG)	13.3
SELENIUM (MG/KG)	11.3
SILVER (MG/KG)	4.6
ZINC (MG/KG)	897
1ST YEAR MINERALIZATION RATE	0.30
LIQUID INORGANIC NITROGEN AVAILABILITY FACTOR	0.50
POUNDS OF ORG N AVAILABLE/DRY TON APPLIED	30.65
POUNDS OF INORG N AVAILABLE/DRY TON APPLIED	8.88
POUNDS OF (P.A.N.)/.DRY TON	39.53

Jimmy Gross - J. Gross Field 6(CENT)

FIELD IDENTIFICATION: J. GROSS 6	
OWNER: JIMMY GROSS	
LOCATION: TOWNSHIP: T9S RANGE: R2W SECTION: 32	
START DATE: 08-03-2020	
STOP DATE: 08-12-2020	
CROP: Perrenial Ryegrass	
TOTAL ACREAGE:	25

DEWATERED BIOSOLIDS APPLICATION RATE INFORMATION	
PERMITTED APPLICATION RATE (PAN POUNDS PER ACRE)	120
DRY TONS BIOSOLIDS PER ACRE	3.04
WET TONS BIOSOLIDS PER ACRE	10.84

TARGET APPLICATION RATE (PAN POUNDS PER ACRE)	120
DRY TONS BIOSOLIDS PER ACRE	3.04
WET TONS BIOSOLIDS PER ACRE	10.84
TOTAL WET TONS TO COMPLETE FIELD	271.07
DATE: Field Finished:8/12/2020	**268.30**
TOTAL WET TONS REMAINING	2.77

FINAL APPLICATION RATE INFORMATION	
FINAL APPLICATION RATE (PAN POUNDS PER ACRE)	118.77
PAN (TOTAL POUNDS APPLIED)	2,969.37
PHOSPHORUS (TOTAL POUNDS APPLIED)	2,236.44
POTASSIUM (TOTAL POUNDS APPLIED)	237.09
TOTAL WET TONS APPLIED	**268.30**
TOTAL DRY TONS APPLIED	75.12
DRY TONS BIOSOLIDS PER ACRE	3.00
WET TONS BIOSOLIDS PER ACRE	10.73

BIOSOLIDS ANALYSIS INFORMATION	
2020 AVERAGED DATA (Cent)(Jan-April)	
TOTAL SOLIDS (MG/KG)*	28.00
ORGANIC NITROGEN (MG/KG)	51,082
INORGANIC NITROGEN (NH4+NO3) (MG/KG)	8,877
TKN (MG/KG)	59,959
PHOSPHORUS (MG/KG)	14,885
POTASSIUM (MG/KG)	1,578
pH	8.23
ARSENIC (MG/KG)	9.10
CADMIUM (MG/KG)	4.01
CHROMIUM (MG/KG)	90.00
COPPER (MG/KG)	351
LEAD (MG/KG)	17.60
MERCURY (MG/KG)	0.78
MOLYBDENUM (MG/KG)	5.34
NICKEL (MG/KG)	13.3
SELENIUM (MG/KG)	11.3
SILVER (MG/KG)	4.6
ZINC (MG/KG)	897
1ST YEAR MINERALIZATION RATE	0.30
LIQUID INORGANIC NITROGEN AVAILABILITY FACTOR	0.50
POUNDS OF ORG N AVAILABLE/DRY TON APPLIED	30.65
POUNDS OF INORG N AVAILABLE/DRY TON APPLIED	8.88
POUNDS OF (P.A.N.)/.DRY TON	39.53

Jimmy Gross - J. Gross Field 7(Cent)

FIELD IDENTIFICATION: J. GROSS 7	
OWNER: Justin GROSS	
LOCATION: TOWNSHIP: T9S RANGE: R2W SECTION: 32	
START DATE: 8-03-2020	
STOP DATE: 8-7-2020	
CROP: Perennial Ryegrass	
TOTAL ACREAGE:	79

DEWATERED BIOSOLIDS APPLICATION RATE INFORMATION	
PERMITTED APPLICATION RATE (PAN POUNDS PER ACRE)	120
DRY TONS BIOSOLIDS PER ACRE	3.04
WET TONS BIOSOLIDS PER ACRE	10.84

TARGET APPLICATION RATE (PAN POUNDS PER ACRE)	120
DRY TONS BIOSOLIDS PER ACRE	3.04
WET TONS BIOSOLIDS PER ACRE	10.84
TOTAL WET TONS TO COMPLETE FIELD	856.57
DATE: Field Finished: 8/7/2020	**856.80**
TOTAL WET TONS REMAINING	(0.23)

FINAL APPLICATION RATE INFORMATION	
FINAL APPLICATION RATE (PAN POUNDS PER ACRE)	120.03
PAN (TOTAL POUNDS APPLIED)	9,482.49
PHOSPHORUS (TOTAL POUNDS APPLIED)	7,141.94
POTASSIUM (TOTAL POUNDS APPLIED)	757.14
TOTAL WET TONS APPLIED	**856.80**
TOTAL DRY TONS APPLIED	239.90
DRY TONS BIOSOLIDS PER ACRE	3.04
WET TONS BIOSOLIDS PER ACRE	10.85

BIOSOLIDS ANALYSIS INFORMATION	
2020 AVERAGED DATA (Cent)(Jan-April)	
TOTAL SOLIDS (MG/KG)*	28.00
ORGANIC NITROGEN (MG/KG)	51,082
INORGANIC NITROGEN (NH4+NO3) (MG/KG)	8,877
TKN (MG/KG)	59,959
PHOSPHORUS (MG/KG)	14,885
POTASSIUM (MG/KG)	1,578
pH	8.23
ARSENIC (MG/KG)	9.10
CADMIUM (MG/KG)	4.01
CHROMIUM (MG/KG)	90.00
COPPER (MG/KG)	351
LEAD (MG/KG)	17.60
MERCURY (MG/KG)	0.78
MOLYBDENUM (MG/KG)	5.34
NICKEL (MG/KG)	13.3
SELENIUM (MG/KG)	11.3
SILVER (MG/KG)	4.6
ZINC (MG/KG)	897
1ST YEAR MINERALIZATION RATE	0.30
LIQUID INORGANIC NITROGEN AVAILABILITY FACTOR	0.50
POUNDS OF ORG N AVAILABLE/DRY TON APPLIED	30.65
POUNDS OF INORG N AVAILABLE/DRY TON APPLIED	8.88
POUNDS OF (P.A.N.)/.DRY TON	39.53

Jimmy Gross - J. Gross Field 8 (CENT)

FIELD IDENTIFICATION: J. GROSS 8	
OWNER: JIMMY GROSS	
LOCATION: TOWNSHIP: T9S RANGE: R2W SECTION: 32	
START DATE: 08-26-2020	
STOP DATE:	
CROP: Perrenial Ryegrass	
TOTAL ACREAGE:	74

DEWATERED BIOSOLIDS APPLICATION RATE INFORMATION	
PERMITTED APPLICATION RATE (PAN POUNDS PER ACRE)	100
DRY TONS BIOSOLIDS PER ACRE	2.53
WET TONS BIOSOLIDS PER ACRE	9.04

TARGET APPLICATION RATE (PAN POUNDS PER ACRE)	100
DRY TONS BIOSOLIDS PER ACRE	2.53
WET TONS BIOSOLIDS PER ACRE	9.04
TOTAL WET TONS TO COMPLETE FIELD	668.63
DATE: Field Finished: 8-26-2020	**663.32**
TOTAL WET TONS REMAINING	5.31

FINAL APPLICATION RATE INFORMATION	
FINAL APPLICATION RATE (PAN POUNDS PER ACRE)	99.21
PAN (TOTAL POUNDS APPLIED)	7,341.19
PHOSPHORUS (TOTAL POUNDS APPLIED)	5,529.17
POTASSIUM (TOTAL POUNDS APPLIED)	586.16
TOTAL WET TONS APPLIED	**663.32**
TOTAL DRY TONS APPLIED	185.73
DRY TONS BIOSOLIDS PER ACRE	2.51
WET TONS BIOSOLIDS PER ACRE	8.96

BIOSOLIDS ANALYSIS INFORMATION	
2020 AVERAGED DATA (Cent)(Jan-April)	
TOTAL SOLIDS (MG/KG)*	28.00
ORGANIC NITROGEN (MG/KG)	51,082
INORGANIC NITROGEN (NH4+NO3) (MG/KG)	8,877
TKN (MG/KG)	59,959
PHOSPHORUS (MG/KG)	14,885
POTASSIUM (MG/KG)	1,578
pH	8.23
ARSENIC (MG/KG)	9.10
CADMIUM (MG/KG)	4.01
CHROMIUM (MG/KG)	90.00
COPPER (MG/KG)	351
LEAD (MG/KG)	17.60
MERCURY (MG/KG)	0.78
MOLYBDENUM (MG/KG)	5.34
NICKEL (MG/KG)	13.3
SELENIUM (MG/KG)	11.3
SILVER (MG/KG)	4.6
ZINC (MG/KG)	897
1ST YEAR MINERALIZATION RATE	0.30
LIQUID INORGANIC NITROGEN AVAILABILITY FACTOR	0.50
POUNDS OF ORG N AVAILABLE/DRY TON APPLIED	30.65
POUNDS OF INORG N AVAILABLE/DRY TON APPLIED	8.88
POUNDS OF (P.A.N.)/.DRY TON	39.53

Jimmy Gross - J. Gross Field 11 (CENT)

FIELD IDENTIFICATION: J. GROSS 11 (1_E)	
OWNER: JIMMY GROSS	
LOCATION: TOWNSHIP: T9S RANGE: R2W SECTION: 17	
START DATE: 9/27/2020	
STOP DATE: 10-5-2020	
CROP: Perennial Ryegrass	
TOTAL ACREAGE:	90

DEWATERED BIOSOLIDS APPLICATION RATE INFORMATION	
PERMITTED APPLICATION RATE (PAN POUNDS PER A	120
DRY TONS BIOSOLIDS PER ACRE	3.04
WET TONS BIOSOLIDS PER ACRE	12.14

ARGET APPLICATION RATE (PAN POUNDS PER ACR	120
DRY TONS BIOSOLIDS PER ACRE	3.04
WET TONS BIOSOLIDS PER ACRE	12.14
TOTAL WET TONS TO COMPLETE FIELD	1,092.95
DATE: Field Finished: 10-25-2020	**999.30**
TOTAL WET TONS REMAINING	93.65

FINAL APPLICATION RATE INFORMATION	
FINAL APPLICATION RATE (PAN POUNDS PER ACRE)	109.72
PAN (TOTAL POUNDS APPLIED)	9,874.63
PHOSPHORUS (TOTAL POUNDS APPLIED)	7,437.29
POTASSIUM (TOTAL POUNDS APPLIED)	788.45
TOTAL WET TONS APPLIED	**999.30**
TOTAL DRY TONS APPLIED	249.83
DRY TONS BIOSOLIDS PER ACRE	2.78
WET TONS BIOSOLIDS PER ACRE	11.10

BIOSOLIDS ANALYSIS INFORMATION	
2020 AVERAGED DATA (Cent)(Jan-April)	
TOTAL SOLIDS (MG/KG)*	25.00
ORGANIC NITROGEN (MG/KG)	51,082
INORGANIC NITROGEN (NH4+NO3) (MG/KG)	8,877
TKN (MG/KG)	59,959
PHOSPHORUS (MG/KG)	14,885
POTASSIUM (MG/KG)	1,578
pH	8.23
ARSENIC (MG/KG)	9.10
CADMIUM (MG/KG)	4.01
CHROMIUM (MG/KG)	90.00
COPPER (MG/KG)	351
LEAD (MG/KG)	17.60
MERCURY (MG/KG)	0.78
MOLYBDENUM (MG/KG)	5.34
NICKEL (MG/KG)	13.3
SELENIUM (MG/KG)	11.3
SILVER (MG/KG)	4.6
ZINC (MG/KG)	897
1ST YEAR MINERALIZATION RATE	0.30
LIQUID INORGANIC NITROGEN AVAILABILITY FACTO	0.50
POUNDS OF ORG N AVAILABLE/DRY TON APPLIED	30.65
POUNDS OF INORG N AVAILABLE/DRY TON APPLIED	8.88
POUNDS OF (P.A.N.)/.DRY TON	39.53

Soil Monitoring Report - 2020

Site: J. Gross
Field: J. Gross 3

Sample Date: 7/23/2020

Parameter	Result	Units
Nitrate-Nitrogen (NO3-N)	19	mg/kg
Available Phosphorus (P)	22	mg/kg
Total Potassium (K)	127	mg/kg
Sulfate-Sulfur (SO4-S)	24	3.7
Organic Matter	4.7	%
pH	5	-

Soil Monitoring Report - 2020

Site: J. Gross
Field: J. Gross 6

Sample Date: 7/23/2020

Parameter	Result	Units
Nitrate-Nitrogen (NO3-N)	2	mg/kg
Available Phosphorus (P)	7	mg/kg
Total Potassium (K)	56	mg/kg
Sulfate-Sulfur (SO4-S)	18	3.7
Organic Matter	4.2	%
pH	4.9	-

Soil Monitoring Report - 2020

Site: J. Gross
Field: J. Gross 7

Sample Date: 7/23/2020

Parameter	Result	Units
Nitrate-Nitrogen (NO3-N)	4	mg/kg
Available Phosphorus (P)	28	mg/kg
Total Potassium (K)	118	mg/kg
Sulfate-Sulfur (SO4-S)	27	3.7
Organic Matter	4	%
pH	4.9	-

Soil Monitoring Report - 2020

Site: J. Gross
Field: J. Gross 8

Sample Date: 8/17/2020

Parameter	Result	Units
Nitrate-Nitrogen (NO3-N)	7	mg/kg
Available Phosphorus (P)	52	mg/kg
Total Potassium (K)	58	mg/kg
Sulfate-Sulfur (SO4-S)	14	3.7
Organic Matter	7	%
pH	5.5	-

Soil Monitoring Report - 2020

Site: J. Gross
Field: J. Gross 11

Sample Date: 8/17/2020

Parameter	Result	Units
Nitrate-Nitrogen (NO3-N)	5	mg/kg
Available Phosphorus (P)	21	mg/kg
Total Potassium (K)	44	mg/kg
Sulfate-Sulfur (SO4-S)	14	3.7
Organic Matter	3.9	%
pH	5.5	-

City of Salem's Biosolid Products
Pollutant Concentrations
Average of Monthly Analytical Results
2020

Pollutant Parameter	Biogro™ Liquid	Centrifuge (CENT) Cake	EPA 40 CFR §503.13(b)(3) Pollutant Concentration Limits
Arsenic (As)	9.6	8.72	41
Cadmium (Cd)	1.49	2.46	39
Chromium (Cr)	47.4	68.4	-
Copper (Cu)	308	358	1500
Lead (Pb)	16.5	18.5	300
Mercury (Hg)	0.68	0.7	17
Molybdenum (Mo)	5.76	5.87	-
Nickel (Ni)	13.9	14.9	420
Selenium (Se)	8.5	9.22	100
Zinc (Zn)	976	980	2800
*All units in mg/kg			

January 30, 2021

Rick Harvey
84033 Highway 216
Tygh Valley OR 97063

SUBJECT: **Biosolids Land Applications**

Dear Mr. Harvey:

The City of Salem's Biosolids Program is pleased to present you with data and information on biosolids land application in 2020. This past year there was a total of 698.75 dry tons of Class B biosolids land applied to a total of 288 acres at the sites known as Molly's Place and Hanna East fields. The biosolids products you received in 2020 were Centrifuge Cake.

Enclosed please find the site and land application worksheets, the daily application maps, and a table showing the concentrations of regulated pollutants in the biosolids products generated by Willow Lake Water Pollution Control Facility. These results remain well below the allowable limits.

As a courtesy, the City has used the following costs for fuel and commercial fertilizers obtained from Valley Agronomics LLC in Mt. Angel, Oregon on December 20, 2020, and labor to estimate the savings you may have incurred by electing to use the City's biosolids product(s):

- Off-road bulk diesel at $1.762 per gallon and a usage rate of four gallons per hour.
- Commercial fertilizer costs for:

  a) Nitrogen (as Urea) 46-0-0 at $365/ton or $0.18/lb: ($0.18/0.46) = $0.40/lb N
  b) Phosphorus (as P_2O_5) 0-45-0 at $600/ton or $0.30/lb: ($0.30/0.45) = $0.58/lb P
  c) Potassium (as K_2O) 0-0-60 at $475/ton or $0.24/lb: ($0.24/0.60) = $0.40/lb K

- Land application labor at 5.3 acres per hour and a pay rate of $14 per hour.

Based on these costs, your estimated savings from Centrifuge Cake

Molly's Place	$6537.84
Hanna East	$18,786.47
Total	$25,324.31

On behalf of the City of Salem's Biosolids Program, thank you for your support. If you have any questions, please feel free to contact me at 503-763-3479 or mstevenson@cityofsalem.net.

Sincerely,

Mark Stevenson
Residuals and Hauled Waste Supervisor

SM/VR:X:\010-ADMINISTRATION\Correspondence\Bio Solids\2017\2016 G Rouse Biosolids Application_Letter_012417_Final.docx
Enclosures:

1. Site Worksheets—Molly's Place, Hanna East
2. Table of Pollutant Concentrations in Biosolids Products

By Certified Mail
cc: File: Chrono

APPLICATION SITE WORKSHEET: 2020

Application Dates: 4/6/20 to 4/20/20

Soil Sample Collected: 9/27/2019 Domestic Well Sample Collected: NA

Farm & Field Number: Harvey's Molly's Place
Biosolids Product: Centrifuge Biosolids Cake
DEQ Maximum Nitrogen Application Rate: 100 PAN/Acre;
Crop: Eastern Oregon Hay
Acreage: Total for application - 81

Distance to Field: 160miles
Route to Field:
Turn right on Windsor Island Road when leaving the Willow Lake Facility. Left on Lockhaven Road. Continue onto I-5 North bound for 39 miles. Keep right to stay on I-5 for one mile then take exit 300 to merge onto I-84 towards the Dalles, stay on I-84 for 85 miles and take exit 87 onto US-197 Towards Dufur Bend. Follow US-197 for 28 miles and take left onto Hwy 216/ Sherars bridge road. The field is located on the right. Continue thru the farm yard and the staging area will be on the right.

Field Input and Recommendations:
50 ft buffer roads, roadside ditches. 200 feet from domestic wells and residences.

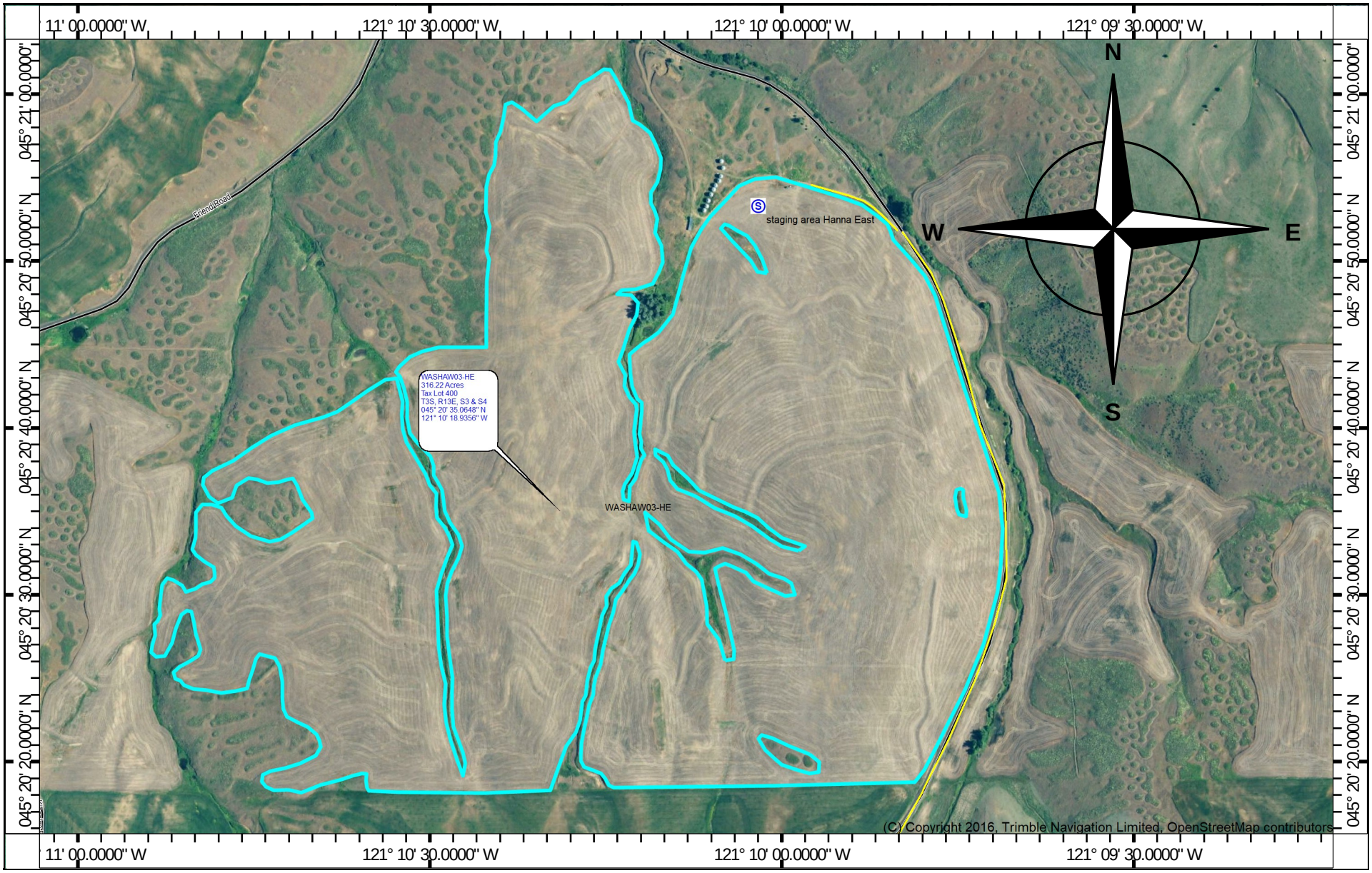
Soil Monitoring Report - 2019

Site: Rick Harvey
Field: Molly's Place

Sample Date: 9/27/2019

Parameter	Result	Units
Nitrate-Nitrogen (NO3-N)	9	mg/kg
Available Phosphorus (P)	19	mg/kg
Total Potassium (K)	195	mg/kg
Sulfate-Sulfur (SO4-S)	10	mg/kg
Organic Matter	3.2	%
pH	5.9	-

DAVE WILSON'S HANNA EAST SITE MAP



DUFUR GAP ROAD

FIELD BORDERS

SCALE 1:10000

0 1000 2000 3000 Feet

0 1000 Yards

0.0 0.1 0.2 0.3 0.4 0.5 0.6 Miles

Soil Monitoring Report - 2019

Site: Rick Harvey
Field: Hanna East

Sample Date: 9/27/2019

Parameter	Result	Units
Nitrate-Nitrogen (NO3-N)	3	mg/kg
Available Phosphorus (P)	26	mg/kg
Total Potassium (K)	310	mg/kg
Sulfate-Sulfur (SO4-S)	9	mg/kg
Organic Matter	2	%
pH	6.3	-

Harvey's/ Molly's Place

FIELD IDENTIFICATION: R. Harvey, Molly's Place	
OWNER: Rick Harvey	
LOCATION; TOWNSHIP: T4S RANGE: R13E SECTION:2	
START DATE: 04-06-2020	
STOP DATE: 4/27/2020	
CROP: Perennial Ryegrass	
TOTAL ACREAGE:	78

DEWATERED BIOSOLIDS APPLICATION RATE INFORMATION	
PERMITTED APPLICATION RATE (PAN POUNDS PER ACRE)	140
DRY TONS BIOSOLIDS PER ACRE	3.45
WET TONS BIOSOLIDS PER ACRE	13.85

TARGET APPLICATION RATE (PAN POUNDS PER ACRE)	100
DRY TONS BIOSOLIDS PER ACRE	2.47
WET TONS BIOSOLIDS PER ACRE	9.90
TOTAL WET TONS TO COMPLETE FIELD	771.83
DATE: Field Finished: 4/27/2020	**721.92**
TOTAL WET TONS REMAINING	49.91

FINAL APPLICATION RATE INFORMATION	
FINAL APPLICATION RATE (PAN POUNDS PER ACRE)	93.53
PAN (TOTAL POUNDS APPLIED)	7,295.60
PHOSPHORUS (TOTAL POUNDS APPLIED)	5,314.65
POTASSIUM (TOTAL POUNDS APPLIED)	568.36
TOTAL WET TONS APPLIED	**721.92**
TOTAL DRY TONS APPLIED	179.97
DRY TONS BIOSOLIDS PER ACRE	2.31
WET TONS BIOSOLIDS PER ACRE	9.26

BIOSOLIDS ANALYSIS INFORMATION	
Jan-March 2020 DATA AVERAGES (CENT)	
TOTAL SOLIDS (MG/KG)*	24.93
ORGANIC NITROGEN (MG/KG)	52823
INORGANIC NITROGEN (NH4+NO3) (MG/KG)	8843
TKN (MG/KG)	61666
PHOSPHORUS (MG/KG)	14765
POTASSIUM (MG/KG)	1579
pH	8.27
ARSENIC (MG/KG)	9.6
CADMIUM (MG/KG)	4.80
CHROMIUM (MG/KG)	66
COPPER (MG/KG)	332
LEAD (MG/KG)	17.4
MERCURY (MG/KG)	0.78
MOLYBDENUM (MG/KG)	5.33
NICKEL (MG/KG)	13.1
SELENIUM (MG/KG)	11.18
SILVER (MG/KG)	4.5
ZINC (MG/KG)	889
1ST YEAR MINERALIZATION RATE	0.30
LIQUID INORGANIC NITROGEN AVAILABILITY FACTOR	0.50
POUNDS OF ORG N AVAILABLE/DRY TON APPLIED	31.69
POUNDS OF INORG N AVAILABLE/DRY TON APPLIED	8.84
POUNDS OF (P.A.N.)/.DRY TON	40.54

Harvey's/ Hanna East

FIELD IDENTIFICATION: R. Harvey, Hanna East	
OWNER: Rick Harvey	
LOCATION; TOWNSHIP: T4S RANGE: R13E SECTION:2	
START DATE: 4/28/2020	
STOP DATE: 6/10/20	
CROP: Winter Wheat	
TOTAL ACREAGE:	210

DEWATERED BIOSOLIDS APPLICATION RATE INFORMATION	
PERMITTED APPLICATION RATE (PAN POUNDS PER ACRE)	100
DRY TONS BIOSOLIDS PER ACRE	2.47
WET TONS BIOSOLIDS PER ACRE	9.90

TARGET APPLICATION RATE (PAN POUNDS PER ACRE)	100
DRY TONS BIOSOLIDS PER ACRE	2.47
WET TONS BIOSOLIDS PER ACRE	9.90
TOTAL WET TONS TO COMPLETE FIELD	2,078.01
DATE: Field Finished 6/10/20	**2,080.94**
TOTAL WET TONS REMAINING	(2.93)

FINAL APPLICATION RATE INFORMATION	
FINAL APPLICATION RATE (PAN POUNDS PER ACRE)	100.14
PAN (TOTAL POUNDS APPLIED)	21,029.61
PHOSPHORUS (TOTAL POUNDS APPLIED)	15,319.52
POTASSIUM (TOTAL POUNDS APPLIED)	1,638.30
TOTAL WET TONS APPLIED	**2,080.94**
TOTAL DRY TONS APPLIED	518.78
DRY TONS BIOSOLIDS PER ACRE	2.47
WET TONS BIOSOLIDS PER ACRE	9.91

BIOSOLIDS ANALYSIS INFORMATION	
Jan-March 2020 DATA AVERAGES (CENT)	
TOTAL SOLIDS (MG/KG)*	24.93
ORGANIC NITROGEN (MG/KG)	52823
INORGANIC NITROGEN (NH4+NO3) (MG/KG)	8843
TKN (MG/KG)	61666
PHOSPHORUS (MG/KG)	14765
POTASSIUM (MG/KG)	1579
pH	8.27
ARSENIC (MG/KG)	9.6
CADMIUM (MG/KG)	4.80
CHROMIUM (MG/KG)	66
COPPER (MG/KG)	332
LEAD (MG/KG)	17.4
MERCURY (MG/KG)	0.78
MOLYBDENUM (MG/KG)	5.33
NICKEL (MG/KG)	13.1
SELENIUM (MG/KG)	11.18
SILVER (MG/KG)	4.5
ZINC (MG/KG)	889
1ST YEAR MINERALIZATION RATE	0.30
LIQUID INORGANIC NITROGEN AVAILABILITY FACTOR	0.50
POUNDS OF ORG N AVAILABLE/DRY TON APPLIED	31.69
POUNDS OF INORG N AVAILABLE/DRY TON APPLIED	8.84
POUNDS OF (P.A.N.)/.DRY TON	40.54

City of Salem's Biosolid Products
Pollutant Concentrations
Average of Monthly Analytical Results
2020

Pollutant Parameter	Biogro™ Liquid	Centrifuge (CENT) Cake	EPA 40 CFR §503.13(b)(3) Pollutant Concentration Limits
Arsenic (As)	9.6	8.72	41
Cadmium (Cd)	1.49	2.46	39
Chromium (Cr)	47.4	68.4	-
Copper (Cu)	308	358	1500
Lead (Pb)	16.5	18.5	300
Mercury (Hg)	0.68	0.7	17
Molybdenum (Mo)	5.76	5.87	-
Nickel (Ni)	13.9	14.9	420
Selenium (Se)	8.5	9.22	100
Zinc (Zn)	976	980	2800
*All units in mg/kg			

January 30, 2021

Ward Rouse
9573 54th Avenue SE
Turner OR 97392

SUBJECT: **Biosolids Land Applications**

Dear Mr. Rouse:

The City of Salem's Biosolids Program is pleased to present you with data and information on biosolids land application in 2020. This past year there was a total of 206.54 dry tons of Class B biosolids land applied to a total of 78 acres at the sites known as G. Rouse Fields, 2, 3, 4, and 5. The biosolids products you received in 2020 were Biogro™ liquid and centrifuge cake.

Enclosed please find the site and land application worksheets, the daily application maps, and a table showing the concentrations of regulated pollutants in the biosolids products generated by Willow Lake Water Pollution Control Facility. These results remain well below the allowable limits.

As a courtesy, the City has used the following costs for fuel and commercial fertilizers obtained from Valley Agronomics LLC in Mt. Angel, Oregon on December 20, 2020, and labor to estimate the savings you may have incurred by electing to use the City's biosolids product(s):

- Off-road bulk diesel at $1.762 per gallon and a usage rate of four gallons per hour.

- Commercial fertilizer costs for:
  a) Nitrogen (as Urea) 46-0-0 at $365/ton or $0.18/lb: ($0.18/0.46) = $0.40/lb N
  b) Phosphorus (as P_2O_5) 0-45-0 at $600/ton or $0.30/lb: ($0.30/0.45) = $0.58/lb P
  c) Potassium (as K_2O) 0-0-60 at $475/ton or $0.24/lb: ($0.24/0.60) = $0.40/lb K

- Land application labor at 5.3 acres per hour and a pay rate of $14 per hour.

Based on these costs, your estimated savings from using Biogro™ liquid centrifuge cake products in 2020 were as follows:

G. Rouse 2	$744.01
G. Rouse 3	$1,495.25
G. Rouse 4	$1,545.07
G. Rouse 5	$4,345.16
Total	**$8,129.50**

On behalf of the City of Salem's Biosolids Program, thank you for your continued support. I will be contacting you in the spring about pre-season soil sampling and to discuss your needs for the 2021 crop season. If you have any questions, please feel free to contact me at 503-763-3479 or mstevenson@cityofsalem.net.

Sincerely,

Mark Stevenson
Residuals and Hauled Waste Supervisor

SM/VR:X:\010-ADMINISTRATION\Correspondence\Bio Solids\2017\2016 G Rouse Biosolids Application_Letter_012417_Final.docx
Enclosures:

1. Site Worksheets—G. Rouse Fields , 2, 3, 4, and 5
2. Land Application Worksheets—G. Rouse Fields 2, 3, 4, and 5
3. Daily Application Maps—G. Rouse Fields , 2, 3, 4, and 5
4. Table of Pollutant Concentrations in Biosolids Products

By Certified Mail
cc: File: Chrono

APPLICATION SITE WORKSHEET: 2020

Application Dates: 08-03-2020

Soil Sample Collected: 7-15-2020 Domestic Well Sample Collected: No

Site and Application Identification: G. Rouse 2 (2_M) Biosolids Product: Liquid DEQ Nitrogen Application Authorization: 120 lbs PAN per Acre (Western Oregon Hay/Pasture)12.39 Wet Tons/Acre Acreage: 7 Acres
Distance: 20 miles Route To Field: East on Lockhaven, South on I-5 to Sunnyside Turner Exit. East to Enchanted Way. South to Cloverdale Road. South on Parish Gap, West on Summit Loop. Field is on the left.
Field Input and Recommendations: Notify Talmadge of application. 50 ft buffer from ditch along Summit Loop. 200 foot buffer at domestic wells.

Tribeca Transport

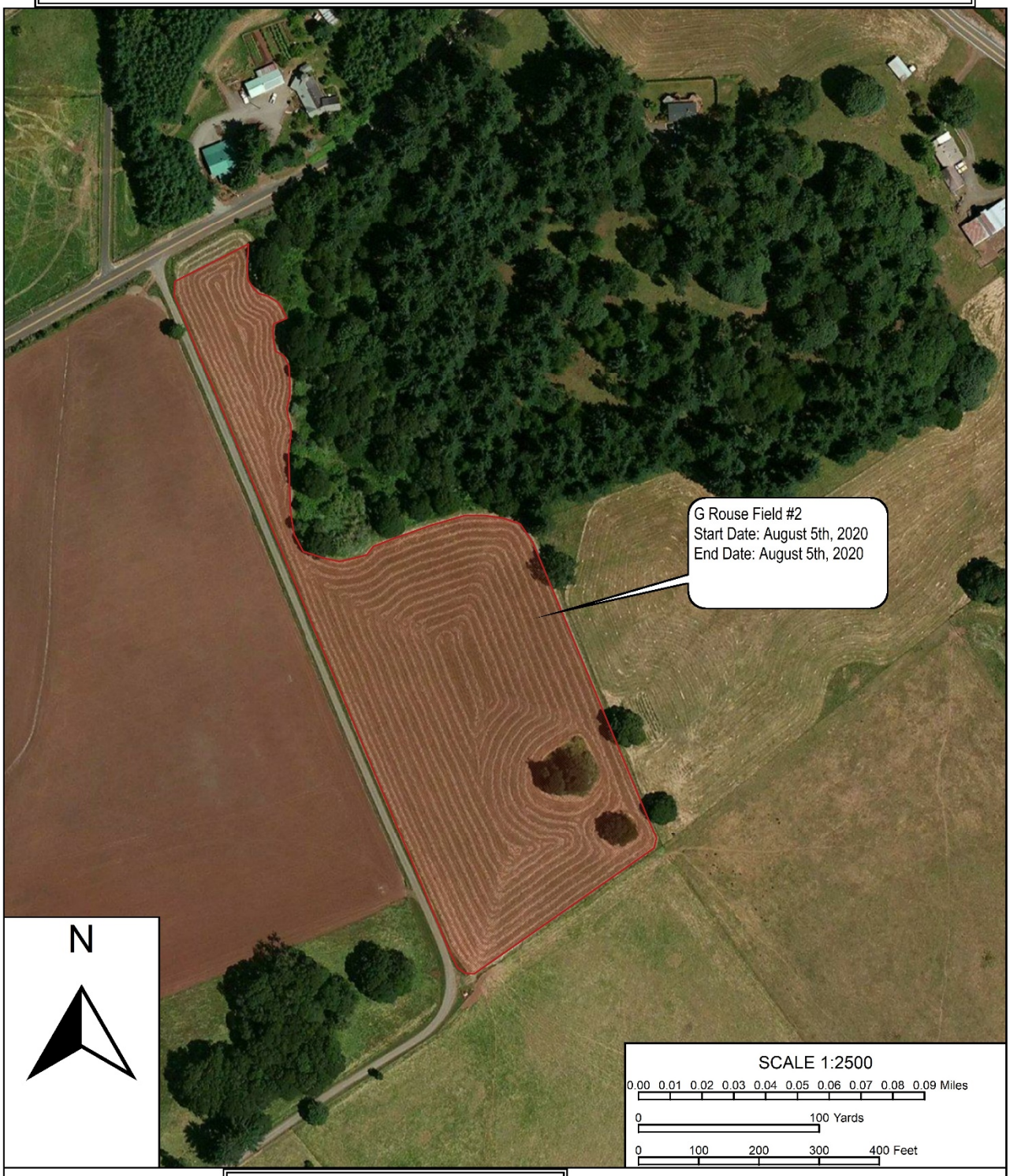
City of Salem Spreader Track Sheet - Field G Rouse #2

Total Tons Delivered: 85.13 WT

Estimated Loads based on 15 tons per spreader load:

Date	Operator	Loads Spread	EST tons spread
8/5/2020	GB	6	85.13
		Total Tons Spread	85.13

G Rouse Field #2



Scale: 1 inch = 208 ft.

Tribeca Transport

Ledgend

G Rouse Field #2

Job: City of Salem Biosolids Land Application

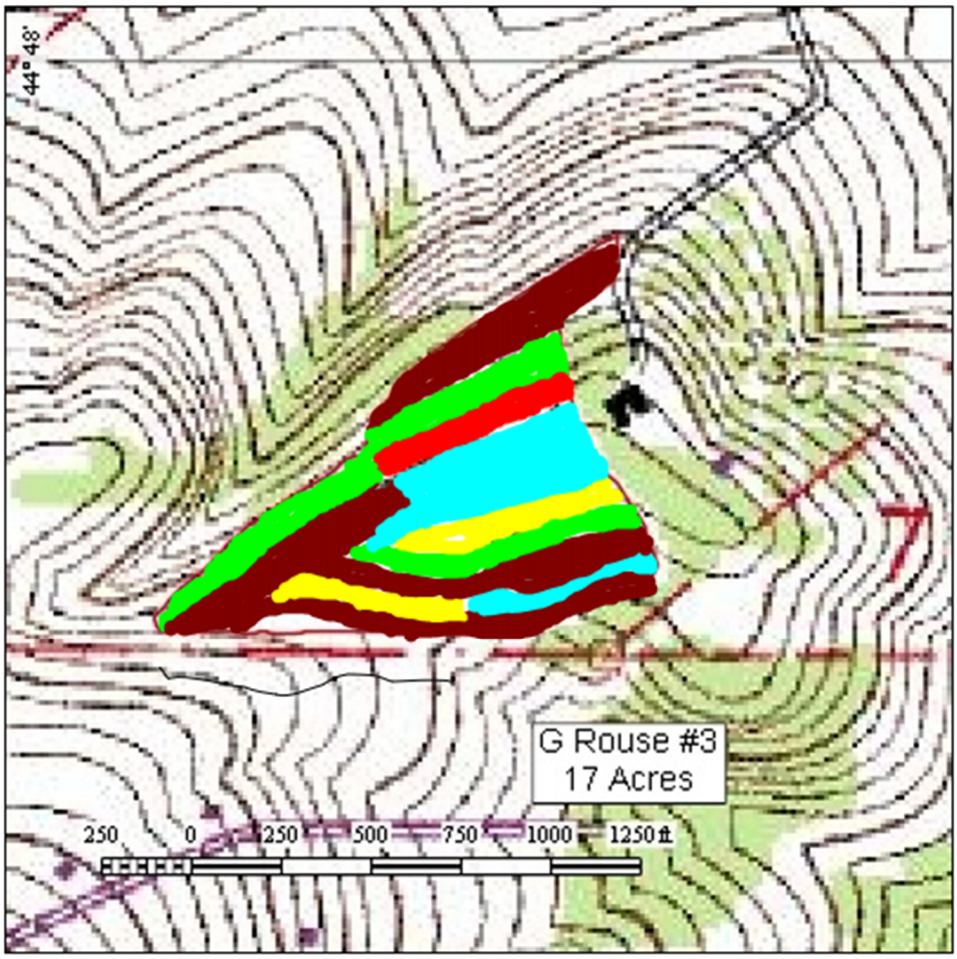
APPLICATION SITE WORKSHEET: 2020

Application Dates 08-06-2020 to 9-2-20

Soil Sample Collected: 5-7-2020 Domestic Well Sample Collected: No

Site and Application Identification: G. Rouse 3 (3_K) Biosolids Product: BFP Cake DEQ Nitrogen Application Authorization: 120 lbs PAN per Acre (Western Oregon Hay/Pasture) Acreage: 17 Acres
Distance: 20 miles Route To Field: East on Lockhaven, South on I-5 to Sunnyside Turner Exit. East to Enchanted Way. South to Cloverdale Road. South on Parish Gap, West on Summit Loop. Field is on the left. Up Garth Rouse Sr.'s driveway behind his home.
Field Input and Recommendations: 200 foot buffer at domestic wells and residences.

2020
G. ROUSE 3
DAILY APPLICATION MAP



Date	Number Of Tankers	Gallons Applied	Color
8/6/2020	3	18,000	Red
8/11/2020	1	6,000	Yellow
8/12/2020	1	6,000	Green
8/17/2020	1	6,000	Blue
8/19/2020	7	42,000	Red
8/20/2020	3	18,000	Green
8/25/2020	1	6,000	Yellow
8/26/2020	6	36,000	Blue

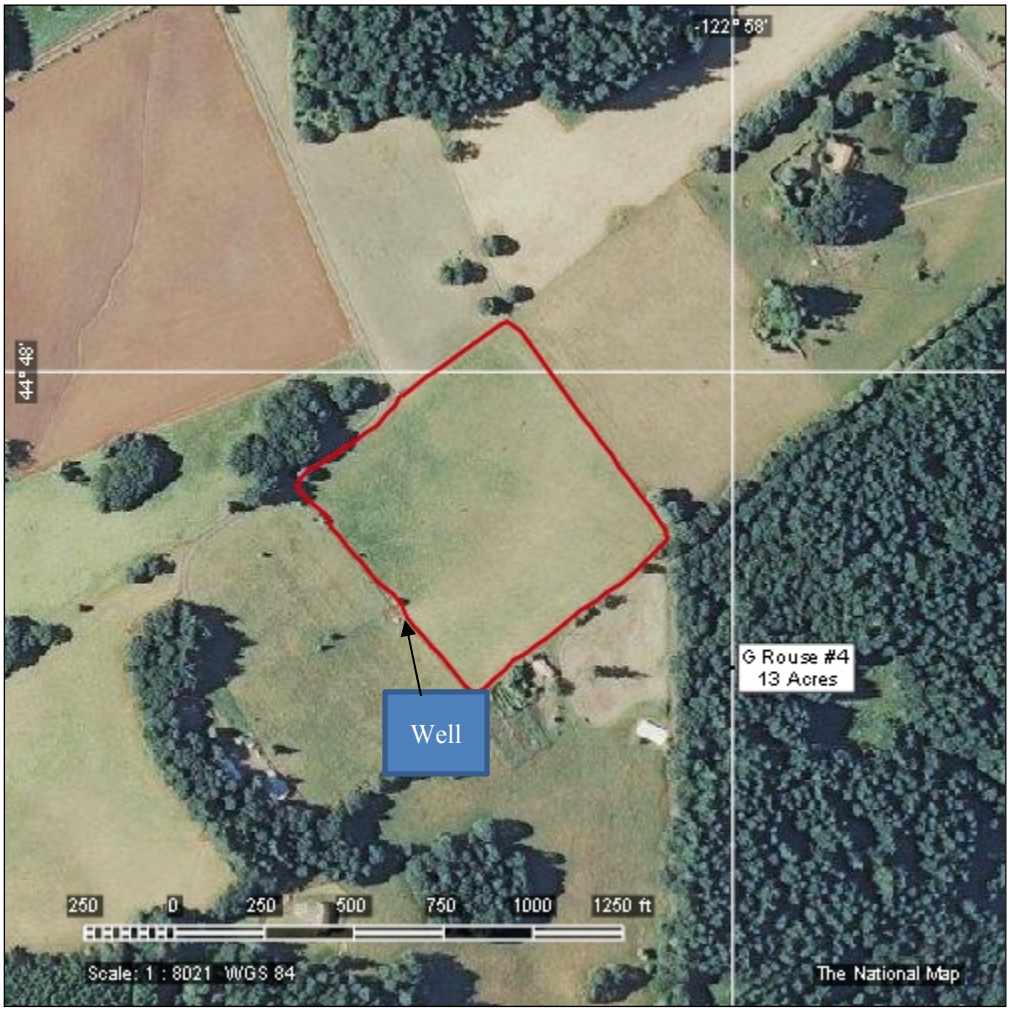
8/31/2020	1	6,000	Red
9/1/2020	8	36,000	Green
9/2/2020	4	24,000	Red
Total	**36**	**204,000**	

APPLICATION SITE WORKSHEET: 2020

Application Dates: 08/03/2020

Soil Sample Collected: 7-15-2020 Domestic Well Sample Collected: No

Site and Application Identification: G. Rouse 4 (4_J) Biosolids Product: BFP Biosolids Cake DEQ Nitrogen Application Authorization: 120 lbs PAN per Acre (Western Oregon Hay/Pasture) 12.39 Wet Tons/Acre Acreage: 13 Acres
Distance: 20 miles Route To Field: East on Lockhaven, South on I-5 to Sunnyside Turner Exit. East to Enchanted Way. South to Cloverdale Road. South on Parish Gap, West on Summit Loop. Field is on the left. South on Garth Rouse Sr.'s driveway at the corner, go straight into field.
Field Input and Recommendations: 200 foot buffer at domestic wells.



Tribeca Transport

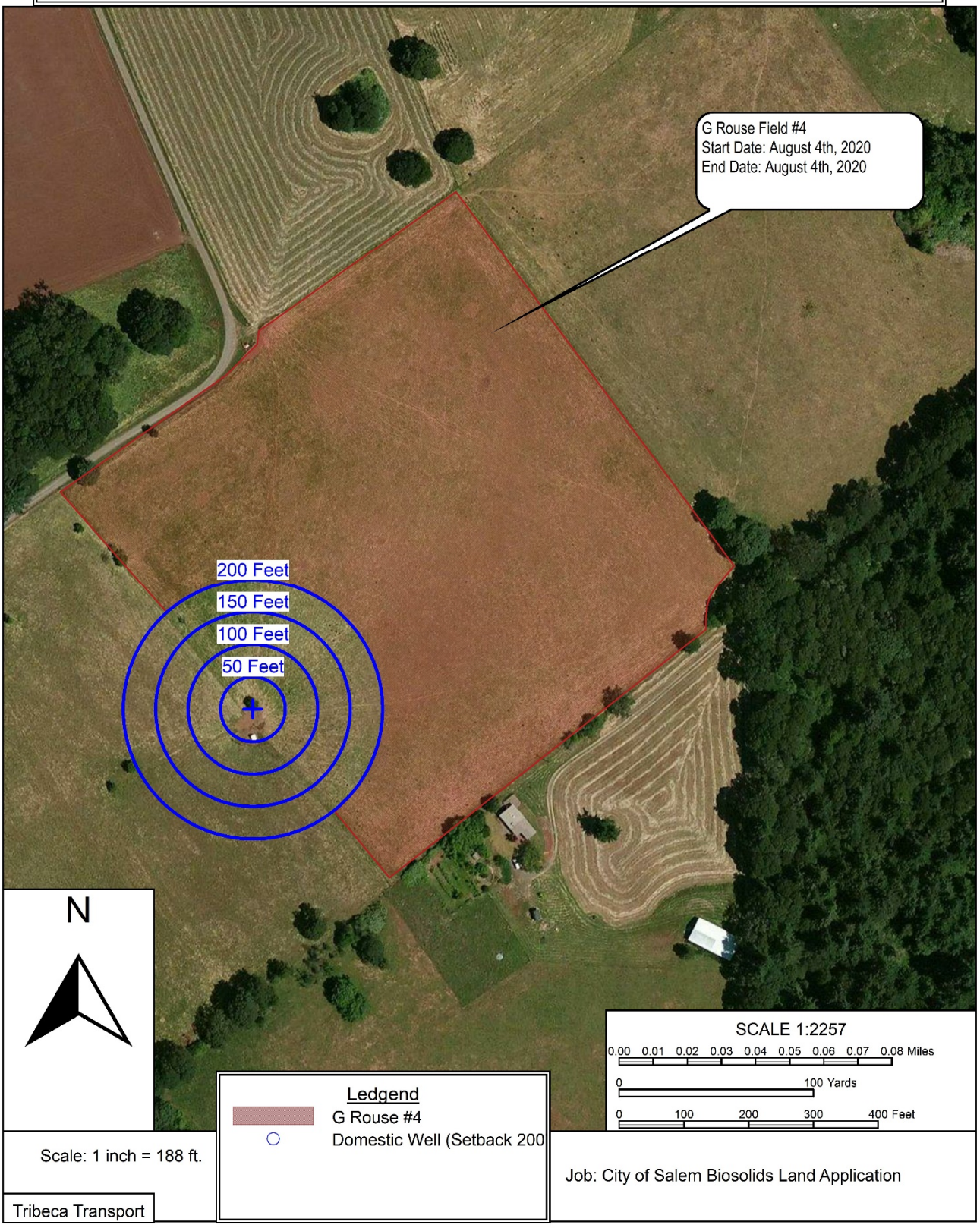
City of Salem Spreader Track Sheet - Field: G Rouse #4

Total Tons Delivered: 177.04 WT

Estimated Loads based on 15 tons per spreader load:

Date	Operator	Loads Spread	EST tons spread
8/4/2020	GB	12	177.04
		Total Tons Spread	177.04

G Rouse Field #4

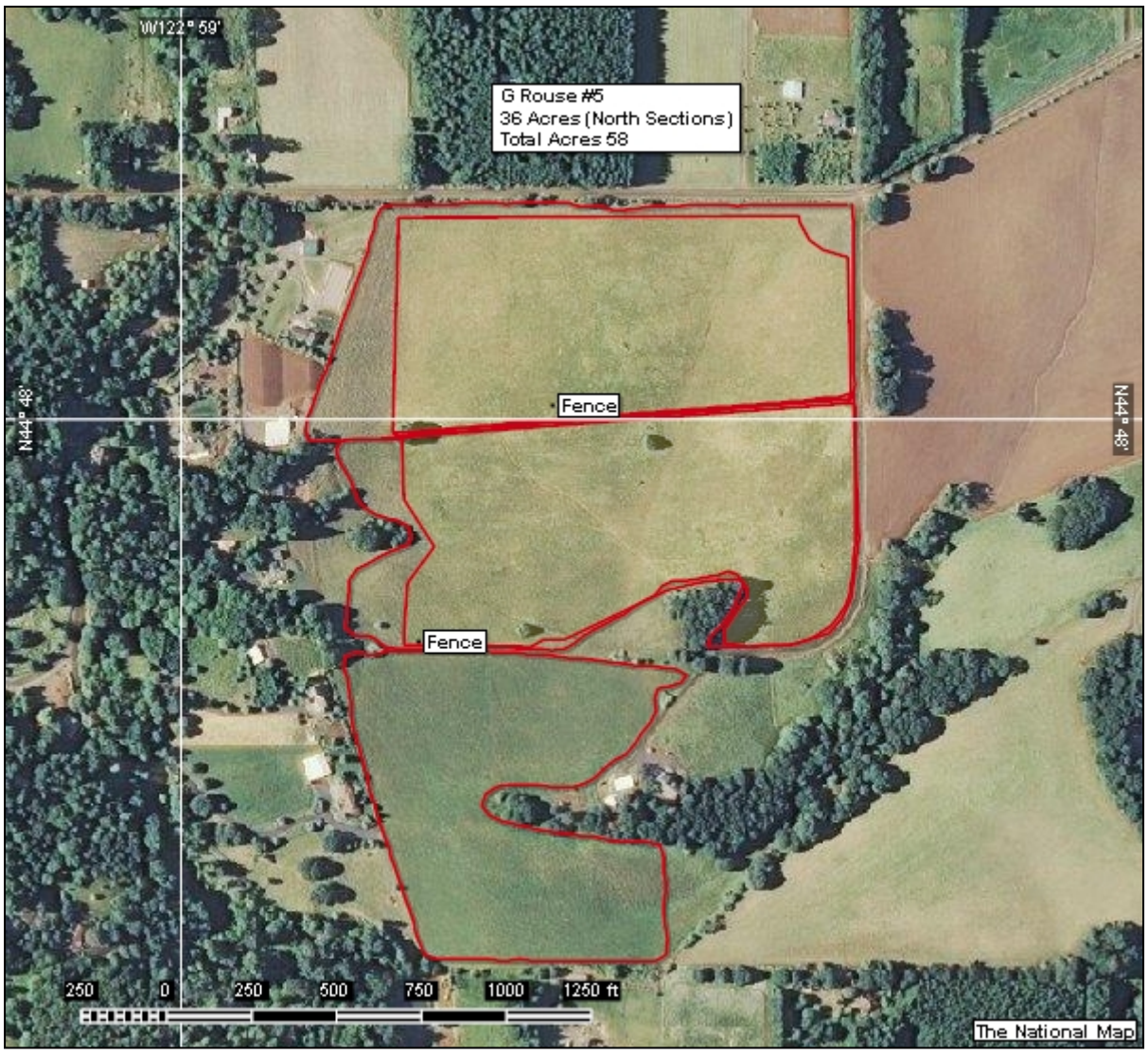


APPLICATION SITE WORKSHEET: 2020

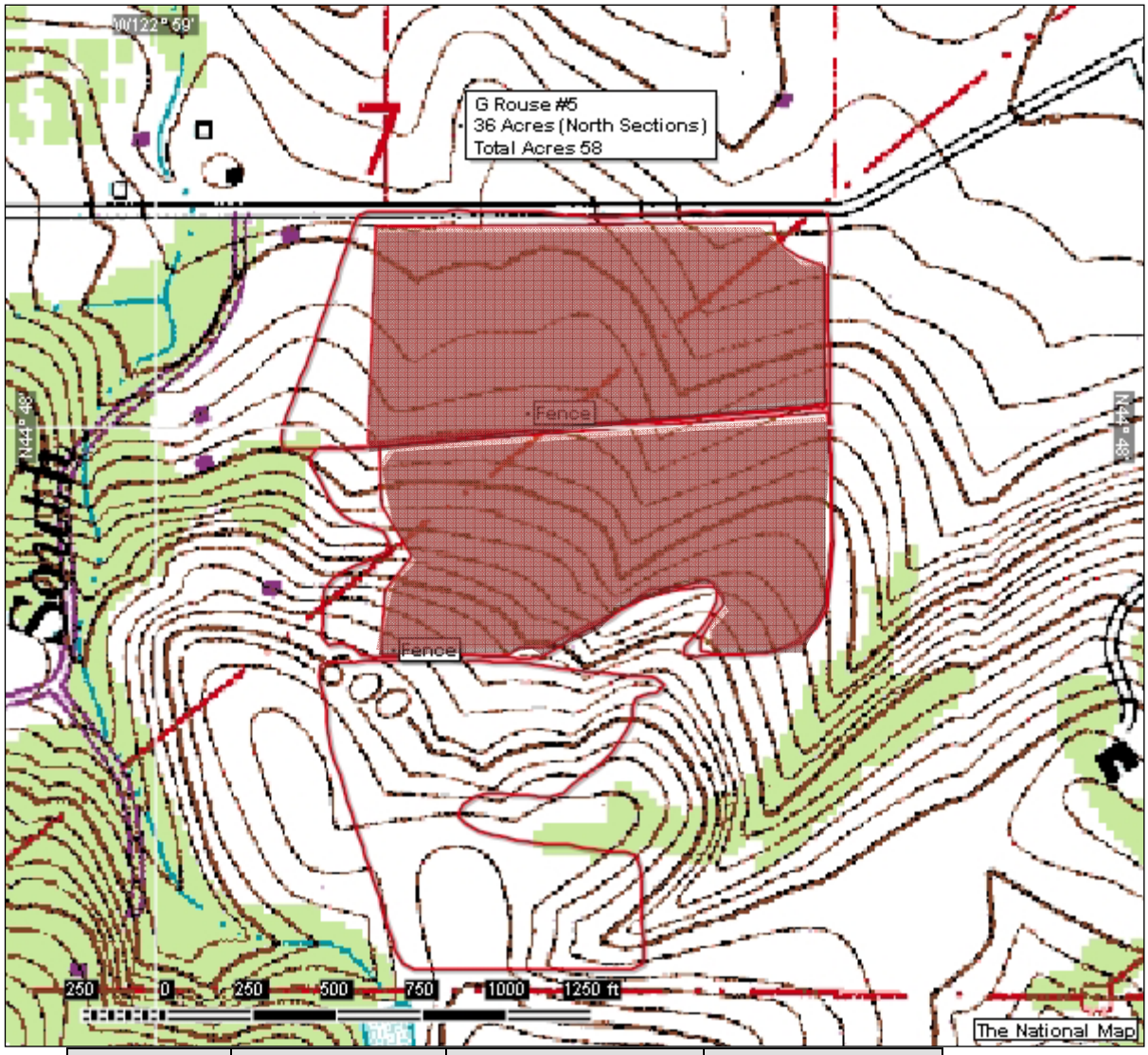
Application Dates: 07-07-2020 to 07-09-2020

Soil Sample Collected: 06-01-20 Domestic Well Sample Collected: No

Site and Application Identification: G. Rouse 5 (5_I) Biosolids Product: BFP Cake DEQ Nitrogen Application Authorization: 120 lbs PAN per Acre (Western Oregon Hay/Pasture) Acreage: 36 Acres
Distance: 20 miles Route To Field: East on Lockhaven, South on I-5 to Sunnyside Turner Exit. East to Enchanted Way. South to Cloverdale Road. South on Parish Gap, West on Summit Loop. Field is on the left. Turn south into Garth Rouse Jr. driveway for access.
Field Input and Recommendations: 200 foot buffer at domestic wells and residences.



2020
G. ROUSE 5
DAILY APPLICATION MAP



Date	Number of Spreader Loads @ 14.635wet tons/load	Wet Tons Applied	Color
06/29/2020	34	497.59	Red
Total	**34**	**497.59**	

G. ROUSE 2

FIELD IDENTIFICATION: G. ROUSE 2 (2_M)	
OWNER: G. ROUSE	
LOCATION: TOWNSHIP: T9S RANGE: R2W SECTION: 7	
START DATE: 07-07-2020	
Stop Date:07-09-2020 -	
CROP: Western Oregon Hay/Pasture	
TOTAL ACREAGE:	7

DEWATERED BIOSOLIDS APPLICATION RATE INFORMATION	
PERMITTED APPLICATION RATE (PAN POUNDS PER ACRE)	120
DRY TONS BIOSOLIDS PER ACRE	3.04
WET TONS BIOSOLIDS PER ACRE	12.39

TARGET APPLICATION RATE (PAN POUNDS PER ACRE)	120
DRY TONS BIOSOLIDS PER ACRE	3.04
WET TONS BIOSOLIDS PER ACRE	12.39
TOTAL WET TONS TO COMPLETE FIELD	86.74
DATE: Field Finished 07-09-2020	**85.13**
TOTAL WET TONS REMAINING	1.61

FINAL APPLICATION RATE INFORMATION	
FINAL APPLICATION RATE (PAN POUNDS PER ACRE)	117.77
PAN (TOTAL POUNDS APPLIED)	824.39
PHOSPHORUS (TOTAL POUNDS APPLIED)	620.91
POTASSIUM (TOTAL POUNDS APPLIED)	65.82
TOTAL WET TONS APPLIED	**85.13**
TOTAL DRY TONS APPLIED	20.86
DRY TONS BIOSOLIDS PER ACRE	2.98
WET TONS BIOSOLIDS PER ACRE	12.16

BIOSOLIDS ANALYSIS INFORMATION	
2020 AVERAGED DATA (Cent)(Jan-April)	
TOTAL SOLIDS (MG/KG)	24.50
ORGANIC NITROGEN (MG/KG)	51,082
INORGANIC NITROGEN (NH4) (MG/KG)	8,877
TKN (MG/KG)	59,959
PHOSPHORUS (MG/KG)	14,885
POTASSIUM (MG/KG)	1,578
pH	8.23
ARSENIC (MG/KG)	9.10
CADMIUM (MG/KG)	4.01
CHROMIUM (MG/KG)	90.00
COPPER (MG/KG)	351
LEAD (MG/KG)	17.60
MERCURY (MG/KG)	0.78
MOLYBDENUM (MG/KG)	5.34
NICKEL (MG/KG)	13.3
SELENIUM (MG/KG)	11.3
SILVER (MG/KG)	4.6
ZINC (MG/KG)	897
1ST YEAR MINERALIZATION RATE	0.30
LIQUID INORGANIC NITROGEN AVAILABILITY FACTOR	0.50
POUNDS OF ORG N AVAILABLE/DRY TON APPLIED	30.65
POUNDS OF INORG N AVAILABLE/DRY TON APPLIED	8.88
POUNDS OF (P.A.N.)/.DRY TON	39.53

G. ROUSE 3

FIELD IDENTIFICATION: G. ROUSE 3 (3_P)	
OWNER: G. ROUSE	
LOCATION; TOWNSHIP: T9S RANGE: R2W SECTION: 7	
START DATE: 8/6/2020	
STOP DATE: 9/2/2020	
CROP: Western Oregon Hay	
TOTAL ACREAGE:	17

BIOSOLIDS LIQUID APPLICATION RATE INFORMATION	
PERMITTED APPLICATION RATE (PAN POUNDS PER ACRE)	120
DRY TONS BIOSOLIDS PER ACRE	1.25
GALLONS BIOSOLIDS PER ACRE	12,448
TANKERS PER ACRE	2.07
APPLICATION DISTANCE IN FEET (L-L 950 RPM 37 FEET WIDE)	567

TARGET APPLICATION RATE (PAN POUNDS PER ACRE)	120
DRY TONS BIOSOLIDS PER ACRE	1.25
GALLONS BIOSOLIDS PER ACRE	12,448
TANKERS PER ACRE	2.07
TRUCK APPLICATION DISTANCE IN FEET (34 FEET WIDE)	618
TOTAL NUMBER OF TANKERS TO COMPLETE FIELD	35
DATE: Field Finished : 9/2/2020	**36**
NUMBER OF TANKERS REMAINING FOR TARGET APPLICATION	(1)

FINAL APPLICATION RATE	
PAN POUNDS PER ACRE	115.77
PAN (TOTAL POUNDS APPLIED)	1,968.08
PHOSPHORUS (TOTAL POUNDS APPLIED)	888.37
POTASSIUM (TOTAL POUNDS APPLIED)	313.14
TOTAL GALLONS TO FIELD	**204,000**
DRY TONS PER SITE	20.50
DRY TONS PER ACRE	1.21

BIOSOLIDS ANALYSIS INFORMATION 2019 AVERAGED DATA (LIQUID)	
TOTAL SOLIDS (MG/KG)	2.41
ORGANIC NITROGEN (MG/KG)	47,871
INORGANIC NITROGEN (NH4) (MG/KG)	67,275
TKN (MG/KG)	115,146
PHOSPHOURUS (MG/KG)	21,666
POTASSIUM (MG/KG)	7,637
pH	7.35
ARSENIC (MG/KG)	6.00
CADMIUM (MG/KG)	1.42
CHROMIUM (MG/KG)	32.90
COPPER (MG/KG)	341
LEAD (MG/KG)	19.20
MERCURY (MG/KG)	0.48
MOLYBDENUM (MG/KG)	5.66
NICKEL (MG/KG)	15.20
SELENIUM (MG/KG)	7.1
SILVER (MG/KG)	4.6
ZINC (MG/KG)	980
1ST YEAR MINERALIZATION RATE	0.30
LIQUID INORGANIC NITROGEN AVAILABILITY FACTOR	0.50
POUNDS OF ORG N AVAILABLE/DRY TON APPLIED	28.72
POUNDS OF INORG N AVAILABLE/DRY TON APPLIED	67.28
POUNDS OF (P.A.N.)/.DRY TON	96.00

G. ROUSE 4

FIELD IDENTIFICATION: G. ROUSE 4 (4_J)	
OWNER: G. ROUSE	
LOCATION: TOWNSHIP: T9S RANGE: R2W SECTION: 7	
START DATE: 07-02-2020	
STOP DATE: 7-07-2020	
CROP: Western Oregon Hay/Pasture	
TOTAL ACREAGE:	14

DEWATERED BIOSOLIDS APPLICATION RATE INFORMATION	
PERMITTED APPLICATION RATE (PAN POUNDS PER ACRE)	120
DRY TONS BIOSOLIDS PER ACRE	3.04
WET TONS BIOSOLIDS PER ACRE	12.39

TARGET APPLICATION RATE (PAN POUNDS PER ACRE)	120
DRY TONS BIOSOLIDS PER ACRE	3.04
WET TONS BIOSOLIDS PER ACRE	12.39
TOTAL WET TONS TO COMPLETE FIELD	173.48
DATE: Field Finished 7-07-2020	**177.04**
TOTAL WET TONS REMAINING	(3.56)

FINAL APPLICATION RATE INFORMATION	
FINAL APPLICATION RATE (PAN POUNDS PER ACRE)	122.46
PAN (TOTAL POUNDS APPLIED)	1,714.44
PHOSPHORUS (TOTAL POUNDS APPLIED)	1,291.27
POTASSIUM (TOTAL POUNDS APPLIED)	136.89
TOTAL WET TONS APPLIED	**177.04**
TOTAL DRY TONS APPLIED	43.37
DRY TONS BIOSOLIDS PER ACRE	3.10
WET TONS BIOSOLIDS PER ACRE	12.65

BIOSOLIDS ANALYSIS INFORMATION	
2020 AVERAGED DATA (Cent)(Jan-April)	
TOTAL SOLIDS (MG/KG)	24.50
ORGANIC NITROGEN (MG/KG)	51,082
INORGANIC NITROGEN (NH4) (MG/KG)	8,877
TKN (MG/KG)	59,959
PHOSPHORUS (MG/KG)	14,885
POTASSIUM (MG/KG)	1,578
pH	8.23
ARSENIC (MG/KG)	9.10
CADMIUM (MG/KG)	4.01
CHROMIUM (MG/KG)	90.00
COPPER (MG/KG)	351
LEAD (MG/KG)	17.60
MERCURY (MG/KG)	0.78
MOLYBDENUM (MG/KG)	5.34
NICKEL (MG/KG)	13.3
SELENIUM (MG/KG)	11.3
SILVER (MG/KG)	4.6
ZINC (MG/KG)	897
1ST YEAR MINERALIZATION RATE	0.30
LIQUID INORGANIC NITROGEN AVAILABILITY FACTOR	0.50
POUNDS OF ORG N AVAILABLE/DRY TON APPLIED	30.65
POUNDS OF INORG N AVAILABLE/DRY TON APPLIED	8.88
POUNDS OF (P.A.N.)/.DRY TON	39.53

G. ROUSE 5

FIELD IDENTIFICATION: G. ROUSE 5 (5_I)	
OWNER: G. ROUSE	
LOCATION: TOWNSHIP: T9S RANGE: R2W SECTION: 7	
START DATE: 06-18-2020	
STOP DATE:6-29-2020	
CROP: Western Oregon Hay/Pasture	
TOTAL ACREAGE:	40

DEWATERED BIOSOLIDS APPLICATION RATE INFORMATION	
PERMITTED APPLICATION RATE (PAN POUNDS PER ACRE)	120
DRY TONS BIOSOLIDS PER ACRE	3.04
WET TONS BIOSOLIDS PER ACRE	12.39

TARGET APPLICATION RATE (PAN POUNDS PER ACRE)	120
DRY TONS BIOSOLIDS PER ACRE	3.04
WET TONS BIOSOLIDS PER ACRE	12.39
TOTAL WET TONS TO COMPLETE FIELD	495.67
DATE: Field Finished 6/26/2020	**497.59**
TOTAL WET TONS REMAINING	(1.92)

FINAL APPLICATION RATE INFORMATION	
FINAL APPLICATION RATE (PAN POUNDS PER ACRE)	120.47
PAN (TOTAL POUNDS APPLIED)	4,818.62
PHOSPHORUS (TOTAL POUNDS APPLIED)	3,629.25
POTASSIUM (TOTAL POUNDS APPLIED)	384.75
TOTAL WET TONS APPLIED	**497.59**
TOTAL DRY TONS APPLIED	121.91
DRY TONS BIOSOLIDS PER ACRE	3.05
WET TONS BIOSOLIDS PER ACRE	12.44

BIOSOLIDS ANALYSIS INFORMATION	
2020 AVERAGED DATA (Cent)(Jan-April)	
TOTAL SOLIDS (MG/KG)	24.50
ORGANIC NITROGEN (MG/KG)	51,082
INORGANIC NITROGEN (NH4) (MG/KG)	8,877
TKN (MG/KG)	59,959
PHOSPHORUS (MG/KG)	14,885
POTASSIUM (MG/KG)	1,578
pH	8.23
ARSENIC (MG/KG)	9.10
CADMIUM (MG/KG)	4.01
CHROMIUM (MG/KG)	90.00
COPPER (MG/KG)	351
LEAD (MG/KG)	17.60
MERCURY (MG/KG)	0.78
MOLYBDENUM (MG/KG)	5.34
NICKEL (MG/KG)	13.3
SELENIUM (MG/KG)	11.3
SILVER (MG/KG)	4.6
ZINC (MG/KG)	897
1ST YEAR MINERALIZATION RATE	0.30
LIQUID INORGANIC NITROGEN AVAILABILITY FACTOR	0.50
POUNDS OF ORG N AVAILABLE/DRY TON APPLIED	30.65
POUNDS OF INORG N AVAILABLE/DRY TON APPLIED	8.88
POUNDS OF (P.A.N.)/.DRY TON	39.53

Soil Monitoring Report (0 - 12inch) - 2020

Site: Ward Rouse
Field: G. Rouse 1 25 ACRES

Sample Date: 5/1/2020

Parameter	Result	Units
Nitrate-Nitrogen (NO3-N)	8	mg/kg
Available Phosphorus (P)	76	mg/kg
Total Potassium (K)	129	mg/kg
Sulfate-Sulfur (SO4-S)	56	mg/kg
Organic Matter	6.9	%
pH	4.9	-

Soil Monitoring Report (12 - 24inch) - 2020

Site: Ward Rouse
Field: G. Rouse 1 25 Acres

Sample Date: 6/1/2018

Parameter	Result	Units
Nitrate-Nitrogen (NO3-N)	4	mg/kg
Available Phosphorus (P)	5	mg/kg
Total Potassium (K)	105	mg/kg
Sulfate-Sulfur (SO4-S)	54	mg/kg
Organic Matter	4.9	%
pH	5	-

Soil Monitoring Report (0 - 12inch) - 2020

Site: Ward Rouse
Field: G. Rouse 2

Sample Date: 5/7/2020

Parameter	Result	Units
Nitrate-Nitrogen (NO3-N)	54	mg/kg
Available Phosphorus (P)	195	mg/kg
Total Potassium (K)	61	mg/kg
Sulfate-Sulfur (SO4-S)	81	mg/kg
Organic Matter	6.6	%
pH	5.1	-

Soil Monitoring Report (12 - 24inch) - 2020

Site: Ward Rouse
Field: G. Rouse 2

Sample Date: 5/7/2021

Parameter	Result	Units
Nitrate-Nitrogen (NO3-N)	14	mg/kg
Available Phosphorus (P)	11	mg/kg
Total Potassium (K)	35	mg/kg
Sulfate-Sulfur (SO4-S)	58	mg/kg
Organic Matter	4.7	%
pH	5.1	-

Soil Monitoring Report (0 - 12inch) - 2020

Site: Ward Rouse
Field: G. Rouse 3

Sample Date: 5/7/2020

Parameter	Result	Units
Nitrate-Nitrogen (NO3-N)	16	mg/kg
Available Phosphorus (P)	100	mg/kg
Total Potassium (K)	50	mg/kg
Sulfate-Sulfur (SO4-S)	74	mg/kg
Organic Matter	5.6	%
pH	4.8	-

Soil Monitoring Report (12 - 24inch) - 2020

Site: Ward Rouse
Field: G. Rouse 3

Sample Date: 5/7/2020

Parameter	Result	Units
Nitrate-Nitrogen (NO3-N)	19	mg/kg
Available Phosphorus (P)	16	mg/kg
Total Potassium (K)	48	mg/kg
Sulfate-Sulfur (SO4-S)	71	mg/kg
Organic Matter	4.2	%
pH	4.9	-

Soil Monitoring Report (0 - 12inch) - 2020

Site: Ward Rouse
Field: G. Rouse 4

Sample Date: 5/7/2020

Parameter	Result	Units
Nitrate-Nitrogen (NO3-N)	9	mg/kg
Available Phosphorus (P)	25	mg/kg
Total Potassium (K)	46	mg/kg
Sulfate-Sulfur (SO4-S)	57	mg/kg
Organic Matter	6.1	%
pH	4.9	-

Soil Monitoring Report (12 - 24inch) - 2020

Site: Ward Rouse
Field: G. Rouse 4

Sample Date: 5/7/2020

Parameter	Result	Units
Nitrate-Nitrogen (NO3-N)	10	mg/kg
Available Phosphorus (P)	5	mg/kg
Total Potassium (K)	41	mg/kg
Sulfate-Sulfur (SO4-S)	68	mg/kg
Organic Matter	4.6	%
pH	5	-

Soil Monitoring Report (0 - 12inch) - 2020

Site: Ward Rouse
Field: G. Rouse 5

Sample Date: 5/1/2020

Parameter	Result	Units
Nitrate-Nitrogen (NO3-N)	6	mg/kg
Available Phosphorus (P)	23	mg/kg
Total Potassium (K)	102	mg/kg
Sulfate-Sulfur (SO4-S)	70	mg/kg
Organic Matter	5.8	%
pH	4.7	-

Soil Monitoring Report (12 - 24inch) - 2020

Site: Ward Rouse
Field: G. Rouse 5

Sample Date: 5/1/2020

Parameter	Result	Units
Nitrate-Nitrogen (NO3-N)	5	mg/kg
Available Phosphorus (P)	3	mg/kg
Total Potassium (K)	76	mg/kg
Sulfate-Sulfur (SO4-S)	96	mg/kg
Organic Matter	4.5	%
pH	4.8	-

City of Salem's Biosolid Products
Pollutant Concentrations
Average of Monthly Analytical Results
2020

Pollutant Parameter	Biogro™ Liquid	Centrifuge (CENT) Cake	EPA 40 CFR §503.13(b)(3) Pollutant Concentration Limits
Arsenic (As)	9.6	8.72	41
Cadmium (Cd)	1.49	2.46	39
Chromium (Cr)	47.4	68.4	-
Copper (Cu)	308	358	1500
Lead (Pb)	16.5	18.5	300
Mercury (Hg)	0.68	0.7	17
Molybdenum (Mo)	5.76	5.87	-
Nickel (Ni)	13.9	14.9	420
Selenium (Se)	8.5	9.22	100
Zinc (Zn)	976	980	2800
*All units in mg/kg			

January 30, 2021

Dan Sandau
Sandau Enterprises
775 78th Ave. NE
Salem OR 97301

SUBJECT: **Biosolids Land Application**

Dear Mr. Sandau:

The City of Salem's Biosolids Program is pleased to present you with data and information on biosolids land application in 2020. This past year there was 139 dry tons of Class B biosolids land applied to 55 acres at the site known as Sandau 1. The biosolids product you received in 2020 was Centrifuge Cake.

Enclosed please find the site and land application worksheets, the daily application map, and a table showing the concentrations of regulated pollutants in the biosolids products generated by Willow Lake Water Pollution Control Facility. These results remain well below the allowable limits.

As a courtesy, the City has used the following costs for fuel and commercial fertilizers obtained from Valley Agronomics LLC in Mt. Angel, Oregon on January 5, 2021 and labor to estimate the savings you may have incurred by electing to use the City's biosolids product(s):

- Off-road bulk diesel at $1.762 per gallon and a usage rate of four gallons per hour.
- Commercial fertilizer costs for:

    a) Nitrogen (as Urea) 46-0-0 at $365/ton or $0.18/lb: ($0.18/0.46) = $0.40/lb N
    b) Phosphorus (as P_2O_5) 0-45-0 at $600/ton or $0.30/lb: ($0.30/0.45) = $0.58/lb P
    c) Potassium (as K_2O) 0-0-60 at $475/ton or $0.24/lb: ($0.24/0.60) = $0.40/lb K

- Land application labor at 5.3 acres per hour and a pay rate of $14 per hour.

Based on these costs, your estimated savings from using Centrifuge Cake products in 2020 were $5,004.71.

On behalf of the City of Salem's Biosolids Program, thank you for your continued support. I will be contacting you in the spring about pre-season soil sampling and to discuss your needs for the 2021 crop season. If you have any questions, please feel free to contact me at 503-763-3479 or mstevenson@cityofsalem.net.

Sincerely,

Mark Stevenson
Residuals and Hauled Waste Supervisor

SM/VR:X:\010-ADMINISTRATION\Correspondence\Bio Solids\2017\2016 W Orton 1 Biosolids Application_Letter_012417_Final.docx
Enclosures:

1. Site Worksheet
2. Land Application Worksheets
3. Daily Application Map
4. Table of Pollutant Concentrations in Biosolids Products

By Certified Mail
cc: File: Chrono

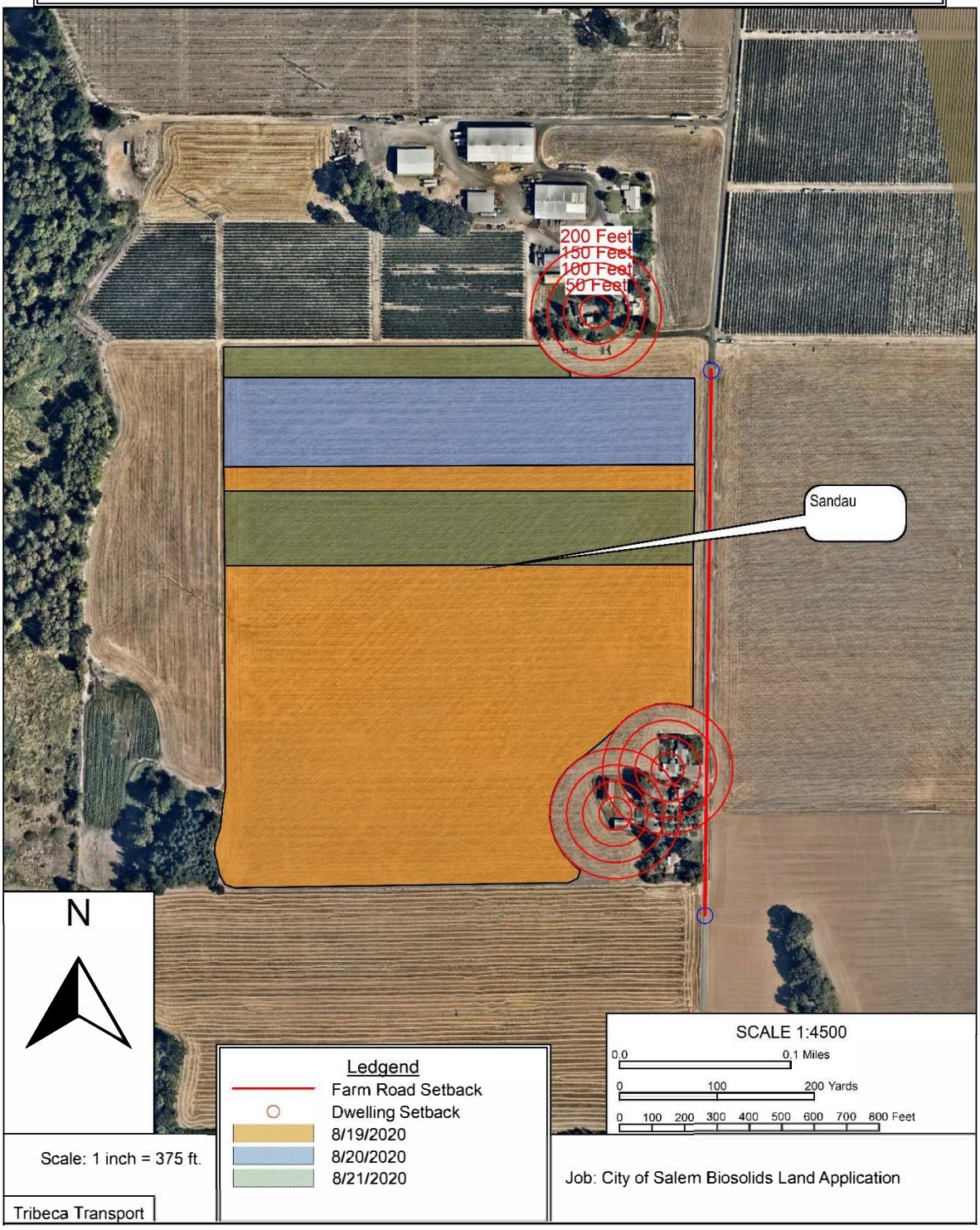
APPLICATION SITE WORKSHEET: 2018

Application Dates: 08-2020

Soil Sample Collected: 8/17/2020 Domestic Well Sample Collected: NA

Farm & Field Number: Sandau Field 1 (1_A) Biosolids Product: BFP and Liquid Biosolids DEQ Maximum Nitrogen Application Rate: Ryegrass: 115 lbs per acre Crop: Perennial Ryegrass 41 acres Acreage: Total 41 acres
Distance to Field: 14 miles Route To Field: South of Windsor Island Road. East on Lockhaven, which turns into Hazelgreen Road. South on Cordon Road. East on State Street. Turn North on 78th ave. Fields begins just after crossing the railroad tracks on the left.
Field Input and Recommendations: 50 ft buffer roads, roadside ditches. 200 feet from domestic wells and residences.

Sandau Completion Map



City of Salem Spreader Track Sheet - Field: Sandau

Total Tons Delivered: 497.8

Estimated Loads based on 15 tons per spreader load:

Date	Operator	Loads Spread	EST tons spread
8/19/2020	RW	16	240
8/20/2020	MK	10	150
8/21/2020	MK	8	107.80
		Total Tons Spread	497.80

D. Sandau #4

FIELD IDENTIFICATION: D. Sandau #4	
OWNER: Dan Sandau	
LOCATION; TOWNSHIP: T7S RANGE: R2W SECTION: 26	
START DATE: 8-14-2020	
STOP DATE:8-17-2020	
CROP: Perennial Ryegrass	
TOTAL ACREAGE:	55

DEWATERED BIOSOLIDS APPLICATION RATE INFORMATION	
PERMITTED APPLICATION RATE (PAN POUNDS PER ACRE)	115
DRY TONS BIOSOLIDS PER ACRE	2.91
WET TONS BIOSOLIDS PER ACRE	10.39

TARGET APPLICATION RATE (PAN POUNDS PER ACRE)	100
DRY TONS BIOSOLIDS PER ACRE	2.53
WET TONS BIOSOLIDS PER ACRE	9.04
TOTAL WET TONS TO COMPLETE FIELD	496.96
DATE: Field Finished: 8-17-2020	**497.80**
TOTAL WET TONS REMAINING	(0.84)

FINAL APPLICATION RATE INFORMATION	
FINAL APPLICATION RATE (PAN POUNDS PER ACRE)	100.17
PAN (TOTAL POUNDS APPLIED)	5,509.32
PHOSPHORUS (TOTAL POUNDS APPLIED)	4,149.46
POTASSIUM (TOTAL POUNDS APPLIED)	439.90
TOTAL WET TONS APPLIED	**497.80**
TOTAL DRY TONS APPLIED	139.38
DRY TONS BIOSOLIDS PER ACRE	2.53
WET TONS BIOSOLIDS PER ACRE	9.05

BIOSOLIDS ANALYSIS INFORMATION	
2020 AVERAGED DATA (Cent)(Jan-April)	
TOTAL SOLIDS (MG/KG)	28.00
ORGANIC NITROGEN (MG/KG)	51,082
INORGANIC NITROGEN (NH4) (MG/KG)	8,877
TKN (MG/KG)	59,959
PHOSPHORUS (MG/KG)	14,885
POTASSIUM (MG/KG)	1,578
pH	8.23
ARSENIC (MG/KG)	9.10
CADMIUM (MG/KG)	4.01
CHROMIUM (MG/KG)	90.00
COPPER (MG/KG)	351
LEAD (MG/KG)	17.60
MERCURY (MG/KG)	0.78
MOLYBDENUM (MG/KG)	5.34
NICKEL (MG/KG)	13.3
SELENIUM (MG/KG)	11.3
SILVER (MG/KG)	4.6
ZINC (MG/KG)	897
1ST YEAR MINERALIZATION RATE	0.30
LIQUID INORGANIC NITROGEN AVAILABILITY FACTOR	0.50
POUNDS OF ORG N AVAILABLE/DRY TON APPLIED	30.65
POUNDS OF INORG N AVAILABLE/DRY TON APPLIED	8.88
POUNDS OF (P.A.N.)/.DRY TON	39.53

Soil Monitoring Report - 2020

Site: Dan Sandau
Field: D. Sandau 4

Sample Date: 8/17/2020

Parameter	Result	Units
Nitrate-Nitrogen (NO3-N)	2	mg/kg
Available Phosphorus (P)	201	mg/kg
Total Potassium (K)	134	mg/kg
Sulfate-Sulfur (SO4-S)	3	mg/kg
Organic Matter	3.9	%
pH	6.2	-

City of Salem's Biosolid Products
Pollutant Concentrations
Average of Monthly Analytical Results
2020

Pollutant Parameter	Biogro™ Liquid	Centrifuge (CENT) Cake	EPA 40 CFR §503.13(b)(3) Pollutant Concentration Limits
Arsenic (As)	9.6	8.72	41
Cadmium (Cd)	1.49	2.46	39
Chromium (Cr)	47.4	68.4	-
Copper (Cu)	308	358	1500
Lead (Pb)	16.5	18.5	300
Mercury (Hg)	0.68	0.7	17
Molybdenum (Mo)	5.76	5.87	-
Nickel (Ni)	13.9	14.9	420
Selenium (Se)	8.5	9.22	100
Zinc (Zn)	976	980	2800
*All units in mg/kg			

January 30.2021

Ted Klopfenstein
13459 Finlay Road
Silverton OR 97381

SUBJECT: **Biosolids Land Application**

Dear Mr. Klopfenstein:

The City of Salem's Biosolids Program is pleased to present you with data and information on biosolids land application in 2020. This past year there was 22.91dry tons of Class B biosolids land applied to 30 acres at the site known as E. Klopfenstein 1-5-6. The biosolids product you received in 2020 was Liquid Biosolids.

Enclosed please find the site and land application worksheets, the daily application map, the soil monitoring report, and a table showing the concentrations of regulated pollutants in the biosolids products generated by Willow Lake Water Pollution Control Facility. These results remain well below the allowable limits.

As a courtesy, the City has used the following costs for fuel and commercial fertilizers obtained from Wilco Agronomy in Mt. Angel, Oregon on January 5, 2021 and labor to estimate the savings you may have incurred by electing to use the City's biosolids product(s):

- Off-road bulk diesel at $1.762 per gallon and a usage rate of four gallons per hour.
- Commercial fertilizer costs for:

  a) Nitrogen (as Urea) 46-0-0 at $365/ton or $0.18/lb: ($0.18/0.46) = $0.40/lb N
  b) Phosphorus (as P_2O_5) 0-45-0 at $600/ton or $0.30/lb: ($0.30/0.45) = $0.58/lb P
  c) Potassium (as K_2O) 0-0-60 at $475/ton or $0.24/lb: ($0.24/0.60) = $0.40/lb K

- Land application labor at 5.3 acres per hour and a pay rate of $14 per hour.

Based on these costs, your estimated savings from using the liquid biosolids in 2020 was $1,714.85.

On behalf of the City of Salem's Biosolids Program, thank you for your continued support. I will be contacting you in the spring about pre-season soil sampling and to discuss your needs for the 2021 crop season. If you have any questions, please feel free to contact me at 503-763-3479 or mstevenson@cityofsalem.net.

Sincerely,

Mark Stevenson
Residuals and Hauled Waste Supervisor

SM/VR:X:\010-ADMINISTRATION\Correspondence\Bio Solids\2017\2016 T Klopfenstein 1-5-6 Biosolids Application_Letter_012417_Final.docx
Enclosures:

1. Site Worksheet
2. Land Application Worksheet
3. Daily Application Map
4. Soil Monitoring Report
5. Table of Pollutant Concentrations in Biosolid Products

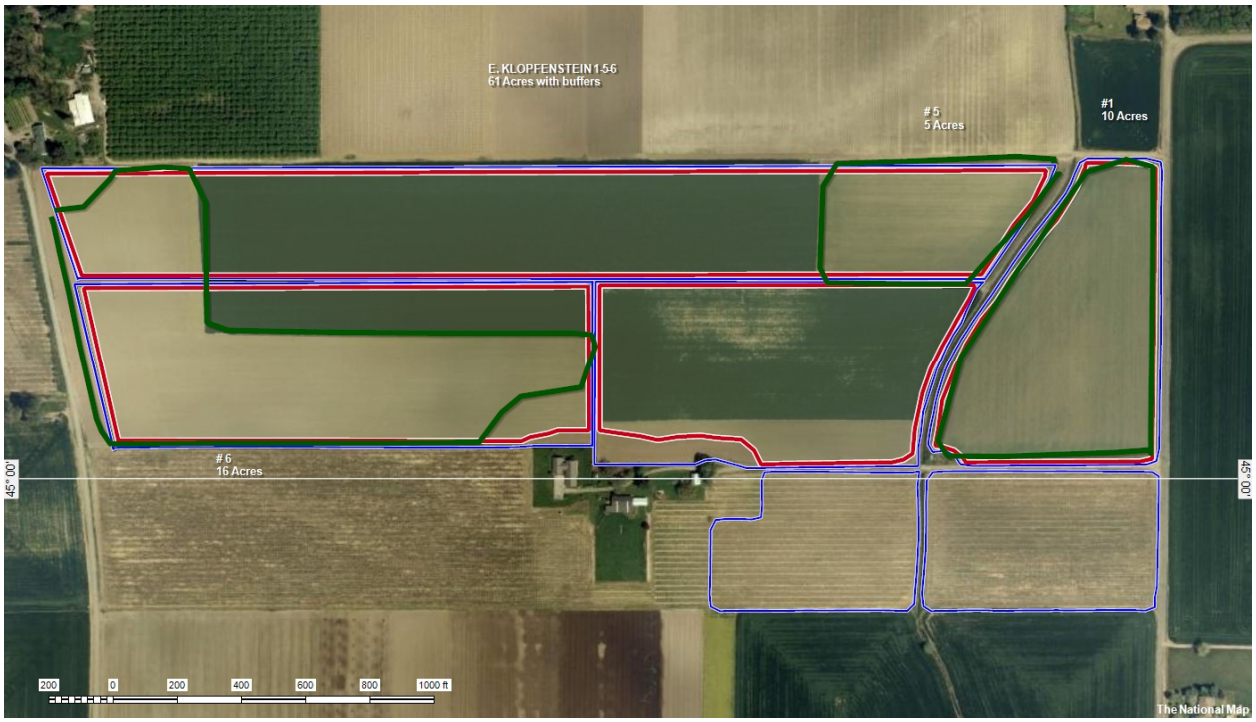
By Certified Mail
cc: File: Chrono

APPLICATION SITE WORKSHEET: 2020

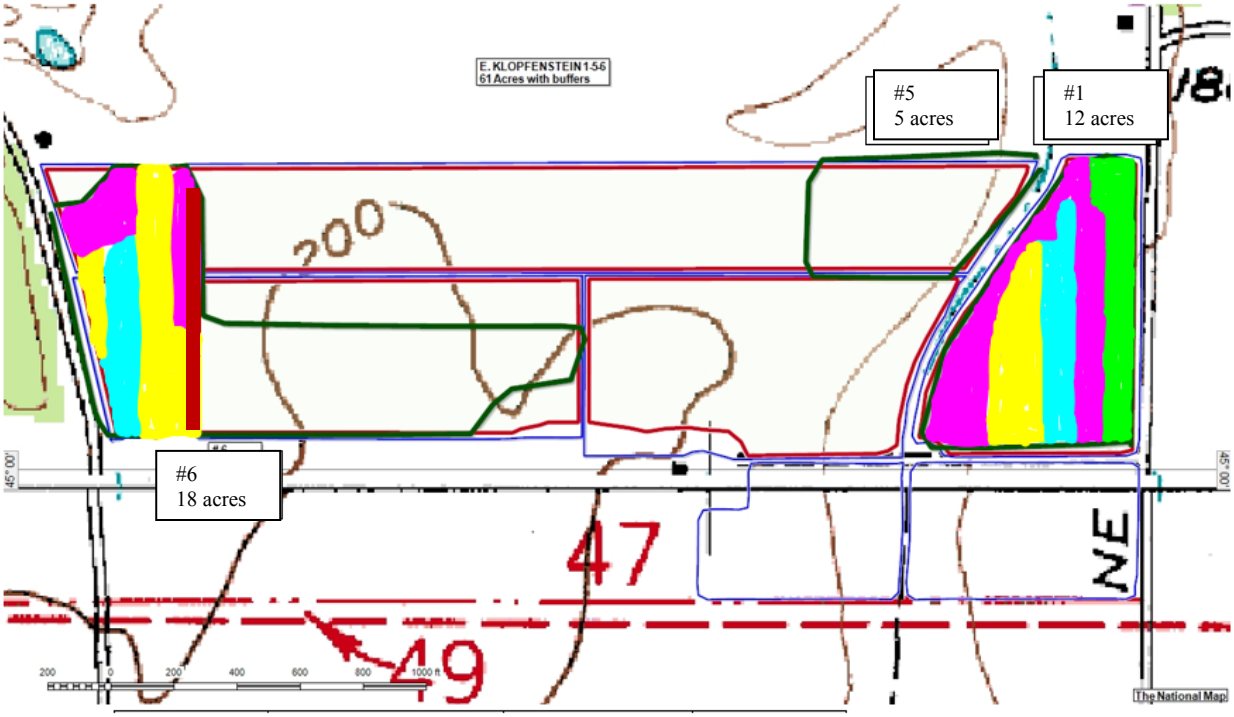
Application Dates: 10-17-2020 to 10-20-2020

Soil Sample Collected:	10-17-2020	Domestic Well Sample Collected:	No

Site and Application Identification: T. Klopfenstein 1-5-6 (1_M) Biosolids Product: BFP cake and liquid DEQ Nitrogen Application Authorization: 140 lbs PAN per Acre (Tall Fescue) Acreage: 15 Acres BFP cake and 16 acres liquid
Distance: 8 miles Route To Field: East on Lockhaven-Hazelgreen. South on 75th. West on Linnette, South on 72nd. Entry points are on NE corner of the field and along Killdeer.
Field Input and Recommendations: 50 ft buffer from ditch. 200 foot buffer at dwellings and domestic wells. No hauling on Sundays.



2020
E. KLOPFENSTEIN 1-5-6
DAILY APPLICATION MAP



Date	Number of Tankers	Total Gallons Applied	Color
9-22-2020	4	24,000	Red
9-23-2020	7	42,000	Yellow
9-28-2020	2	12,000	Green
9-29-2020	7	42,000	Blue
10-5-2020	1	6,000	Blue
10-6-2020	3	18,000	Yellow
10-7-2020	12	72,000	Red
10-8-2020	2	12,000	Green
Total			---

T. Klopfenstein 1-5-6

FIELD IDENTIFICATION: E KLOPFENSTIEN 1-5-6 (1_M)	
OWNER:	
LOCATION; TOWNSHIP: T6S RANGE: R2W SECTION: 34	
START DATE: 09-22-2020	
STOP DATE: 10-8-2020	
CROP: Tall Fescue	
TOTAL ACREAGE:	30

BIOSOLIDS LIQUID APPLICATION RATE INFORMATION	
PERMITTED APPLICATION RATE (PAN POUNDS PER ACRE)	120
DRY TONS BIOSOLIDS PER ACRE	1.25
GALLONS BIOSOLIDS PER ACRE	12,448
TANKERS PER ACRE	2.07
TRUCK APPLICATION DISTANCE IN FEET (L-L 950 RPM 34 FEET W	567

TARGET APPLICATION RATE (PAN POUNDS PER ACRE)	120
DRY TONS BIOSOLIDS PER ACRE	1.25
GALLONS BIOSOLIDS PER ACRE	12,448
TANKERS PER ACRE	2.07
TRUCK APPLICATION DISTANCE IN FEET (34 FEET WIDE)	618
TOTAL NUMBER OF TANKERS TO COMPLETE FIELD	62
DATE: Completed on 10-8-2020	**38**
NUMBER OF TANKERS REMAINING FOR TARGET APPLICATION	24

FINAL APPLICATION RATE	
PAN POUNDS PER ACRE	73.32
PAN (TOTAL POUNDS APPLIED)	2,199.62
PHOSPHORUS (TOTAL POUNDS APPLIED)	992.88
POTASSIUM (TOTAL POUNDS APPLIED)	349.98
TOTAL GALLONS TO FIELD	**228,000**
DRY TONS PER SITE	22.91
DRY TONS PER ACRE	0.76

BIOSOLIDS ANALYSIS INFORMATION	
2019 AVERAGED DATA (LIQUID)	
TOTAL SOLIDS (MG/KG)	2.41
ORGANIC NITROGEN (MG/KG)	47,871
INORGANIC NITROGEN (NH4) (MG/KG)	67,275
TKN (MG/KG)	115,146
PHOSPHOURUS (MG/KG)	21,666
POTASSIUM (MG/KG)	7,637
pH	7.35
ARSENIC (MG/KG)	6.00
CADMIUM (MG/KG)	1.42
CHROMIUM (MG/KG)	32.90
COPPER (MG/KG)	341
LEAD (MG/KG)	19.20
MERCURY (MG/KG)	0.48
MOLYBDENUM (MG/KG)	5.66
NICKEL (MG/KG)	15.20
SELENIUM (MG/KG)	7.1
SILVER (MG/KG)	4.6
ZINC (MG/KG)	980
1ST YEAR MINERALIZATION RATE	0.30
LIQUID INORGANIC NITROGEN AVAILABILITY FACTOR	0.50
POUNDS OF ORG N AVAILABLE/DRY TON APPLIED	28.72
POUNDS OF INORG N AVAILABLE/DRY TON APPLIED	67.28
POUNDS OF (P.A.N.)/.DRY TON	96.00

Soil Monitoring Report - 2020

Site: T. Klopfenstein
Field: T. Klopfenstein 1-6

Sample Date: 10/8/2020

Parameter	Result	Units
Nitrate-Nitrogen (NO3-N)	40	mg/kg
Available Phosphorus (P)	17	mg/kg
Total Potassium (K)	140	mg/kg
Sulfate-Sulfur (SO4-S)	10	3.7
Organic Matter	4.1	%
pH	5.6	-

City of Salem's Biosolid Products
Pollutant Concentrations
Average of Monthly Analytical Results
2020

Pollutant Parameter	Biogro™ Liquid	Centrifuge (CENT) Cake	EPA 40 CFR §503.13(b)(3) Pollutant Concentration Limits
Arsenic (As)	9.6	8.72	41
Cadmium (Cd)	1.49	2.46	39
Chromium (Cr)	47.4	68.4	-
Copper (Cu)	308	358	1500
Lead (Pb)	16.5	18.5	300
Mercury (Hg)	0.68	0.7	17
Molybdenum (Mo)	5.76	5.87	-
Nickel (Ni)	13.9	14.9	420
Selenium (Se)	8.5	9.22	100
Zinc (Zn)	976	980	2800
*All units in mg/kg			

January 30, 2021

Wayne Orton
Orton Farms
6765 Talmadge Road
Independence OR 97351

SUBJECT: **Biosolids Land Application**

Dear Mr. Orton:

The City of Salem's Biosolids Program is pleased to present you with data and information on biosolids land application in 2020
. This past year there was 151.70 dry tons of Class B biosolids land applied to 60 acres at the site known as W. Orton 1. The biosolids product you received in 2020 was Centrifuge Cake Biosolids.

Enclosed please find the site and land application worksheets, the daily application map, and a table showing the concentrations of regulated pollutants in the biosolids products generated by Willow Lake Water Pollution Control Facility. These results remain well below the allowable limits.

As a courtesy, the City has used the following costs for fuel and commercial fertilizers obtained from Valley Agronomics LLC in Mt. Angel, Oregon on January 5, 2021 for average 2020 costs of fertilizer and diesel, and labor to estimate the savings you may have incurred by electing to use the City's biosolids product(s):

- Off-road bulk diesel at $1.762 per gallon and a usage rate of four gallons per hour.

- Commercial fertilizer costs for:
  a) Nitrogen (as Urea) 46-0-0 at $466/ton or $0.23/lb: ($0.23/0.46) = $0.51/lb N
  b) Phosphorus (as P_2O_5) 11-52-0 at $540/ton or $0.27/lb: ($0.27/0.52) = $058/lb P
  c) Potassium (as K_2O) 0-0-60 at $472/ton or $0.24/lb: ($0.24/0.60) = $0.40/lb K

- Land application labor at 5.3 acres per hour and a pay rate of $14 per hour.

Based on these costs, your estimated savings from using Centrafuge cake products in 2020 were $5,447.72

On behalf of the City of Salem's Biosolids Program, thank you for your continued support. I will be contacting you in the spring about pre-season soil sampling and to discuss your needs for the 2021 crop season. If you have any questions, please feel free to contact me at 503-763-3479 or mstevenson@cityofsalem.net.

Sincerely,

Mark Stevenson
Residuals and Hauled Waste Supervisor

SM/VR:X:\010-ADMINISTRATION\Correspondence\Bio Solids\2017\2016 W Orton 1 Biosolids Application_Letter_012417_Final.docx
Enclosures:

1. Site Worksheet
2. Land Application Worksheets
3. Daily Application Map
4. Table of Pollutant Concentrations in Biosolids Products

By Certified Mail
cc: File: Chrono

APPLICATION SITE WORKSHEET: 2020

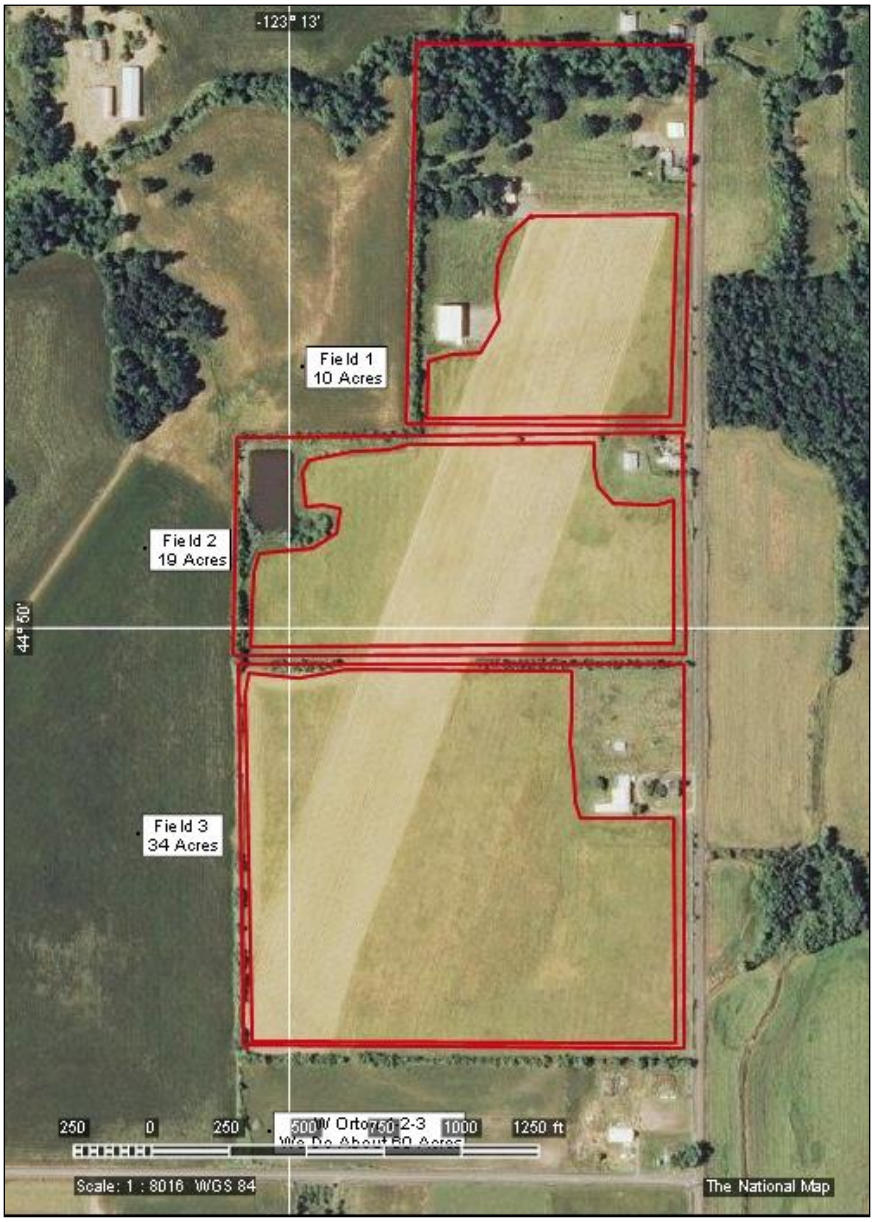
Application Dates: 08-10-2020

Soil Sample Collected: 05-05-2020 Domestic Well Sample Collected: No

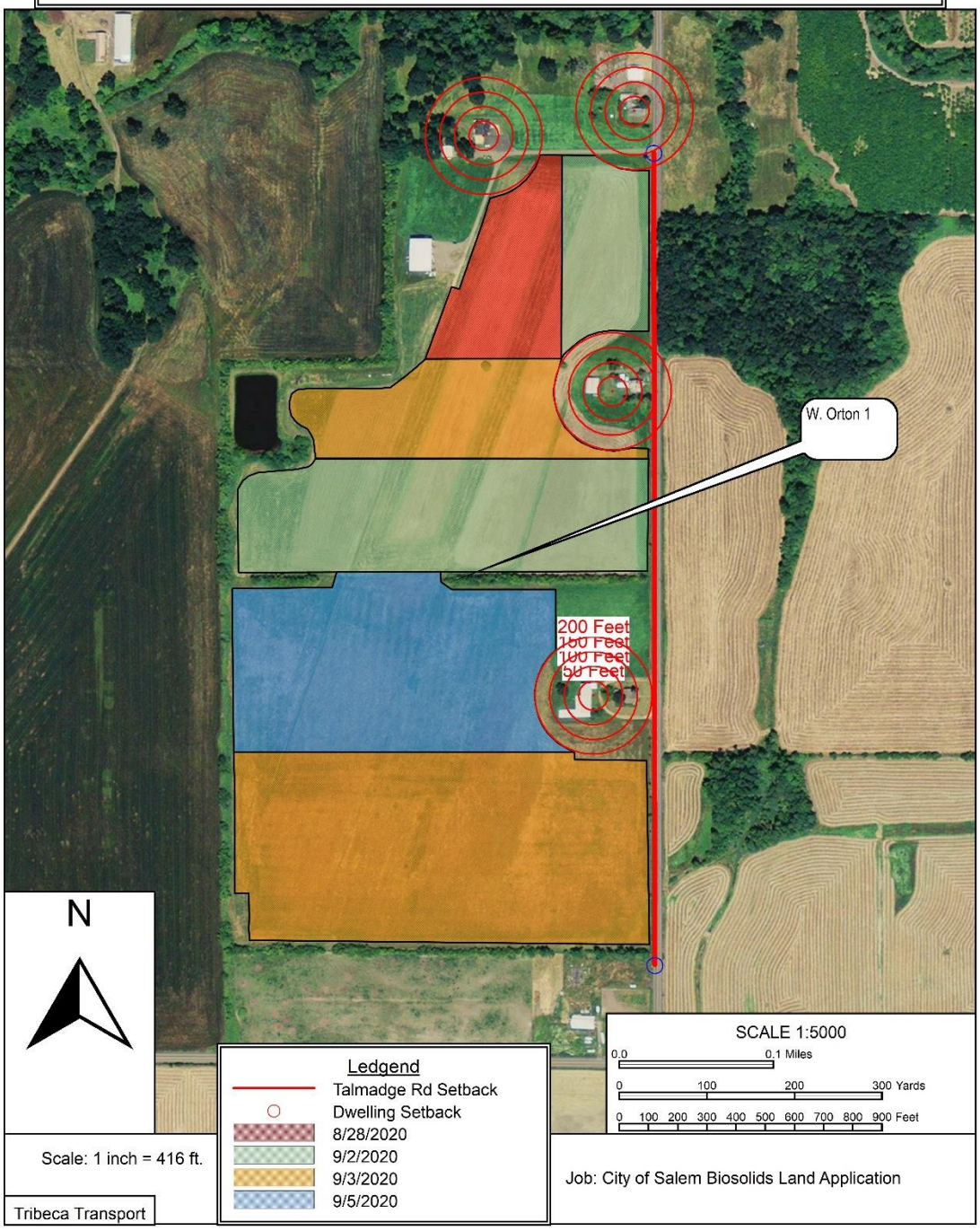
Site and Application Identification: W. Orton 1(1_Q) & (1_R)
Biosolids Product: BFP Cake @ Tract (1_R) 60 Acres
DEQ Nitrogen Application Authorization: 120 lbs PAN per Acre. 9.04 Wet Tons/ Acre
Acreage: 60 Acres

Distance: 20 miles
Route To Field: East on Lockhaven, South on Commercial, west on Hwy 22, over bridge. Turn left (south) on Hwy 99W. Turn left (east) onto Hoffman Rd. Turn right on 16th Street which turns into Talmage Road. The field is on the right. There are several entries into the field. The first is a driveway with a sign that says "Orton Farms"

Field Input and Recommendations:
50 foot buffers at ditches and roads. 200 foot buffer at domestic wells and residences.



W. Orton 1 Completion Map



Scale: 1 inch = 416 ft.

Tribeca Transport

Job: City of Salem Biosolids Land Application

City of Salem Spreader Track Sheet - Field: Orton

Total Tons Delivered: 541.5

Estimated Loads based on 15 tons per spreader load:

Date	Operator	Loads Spread	EST tons spread
8/28/2020	MK	5	75
9/2/2020	RW	10	150
9/3/2020	RW	14	210
9/5/2020	MK	7	106.5
		Total Tons Spread	541.50

W. ORTON 1

FIELD IDENTIFICATION: W. ORTON 1 (1_R)	
OWNER: WAYNE ORTON	
LOCATION; TOWNSHIP: T8S RANGE: R5W SECTION: 31 & 32	
START DATE:08-07-2020	
STOP DATE: 8-24-2020	
CROP: Western Oregon Hay	
TOTAL ACREAGE:	60

DEWATERED BIOSOLIDS APPLICATION RATE INFORMATION	
PERMITTED APPLICATION RATE (PAN POUNDS PER ACRE)	120
DRY TONS BIOSOLIDS PER ACRE	3.04
WET TONS BIOSOLIDS PER ACRE	10.84

TARGET APPLICATION RATE (PAN POUNDS PER ACRE)	100
DRY TONS BIOSOLIDS PER ACRE	2.53
WET TONS BIOSOLIDS PER ACRE	9.04
TOTAL WET TONS TO COMPLETE FIELD	542.14
DATE: Field Finished:8-24-2020	**541.80**
TOTAL WET TONS REMAINING	0.34

FINAL APPLICATION RATE INFORMATION	
FINAL APPLICATION RATE (PAN POUNDS PER ACRE)	99.94
PAN (TOTAL POUNDS APPLIED)	5,996.28
PHOSPHORUS (TOTAL POUNDS APPLIED)	4,516.23
POTASSIUM (TOTAL POUNDS APPLIED)	478.78
TOTAL WET TONS APPLIED	**541.80**
TOTAL DRY TONS APPLIED	151.70
DRY TONS BIOSOLIDS PER ACRE	2.53
WET TONS BIOSOLIDS PER ACRE	9.03

BIOSOLIDS ANALYSIS INFORMATION	
2020 AVERAGED DATA (Cent)(Jan-April)	
TOTAL SOLIDS (MG/KG)*	28.00
ORGANIC NITROGEN (MG/KG)	51,082
INORGANIC NITROGEN (NH4+NO3) (MG/KG)	8,877
TKN (MG/KG)	59,959
PHOSPHORUS (MG/KG)	14,885
POTASSIUM (MG/KG)	1,578
pH	8.23
ARSENIC (MG/KG)	9.10
CADMIUM (MG/KG)	4.01
CHROMIUM (MG/KG)	90.00
COPPER (MG/KG)	351
LEAD (MG/KG)	17.60
MERCURY (MG/KG)	0.78
MOLYBDENUM (MG/KG)	5.34
NICKEL (MG/KG)	13.3
SELENIUM (MG/KG)	11.3
SILVER (MG/KG)	4.6
ZINC (MG/KG)	897
1ST YEAR MINERALIZATION RATE	0.30
LIQUID INORGANIC NITROGEN AVAILABILITY FACTOR	0.50
POUNDS OF ORG N AVAILABLE/DRY TON APPLIED	30.65
POUNDS OF INORG N AVAILABLE/DRY TON APPLIED	8.88
POUNDS OF (P.A.N.)/.DRY TON	39.53

Soil Monitoring Report - 2020 (0-12inch)

Site: W. Orton
Field: W. Orton 1

Sample Date: 5/7/2020

Parameter	Result	Units
Nitrate-Nitrogen (NO3-N)	13	mg/kg
Available Phosphorus (P)	91	mg/kg
Total Potassium (K)	56	mg/kg
Sulfate-Sulfur (SO4-S)	10	mg/kg
Organic Matter	4.2	%
pH	4.9	-

Soil Monitoring Report - 2020 (12 - 24inch)

Site: W. Orton
Field: W. Orton 1

Sample Date: 5/7/2020

Parameter	Result	Units
Nitrate-Nitrogen (NO3-N)	8	mg/kg
Available Phosphorus (P)	44	mg/kg
Total Potassium (K)	61	mg/kg
Sulfate-Sulfur (SO4-S)	6	mg/kg
Organic Matter	2.7	%
pH	5.5	-

City of Salem's Biosolid Products
Pollutant Concentrations
Average of Monthly Analytical Results
2020

Pollutant Parameter	Biogro™ Liquid	Centrifuge (CENT) Cake	EPA 40 CFR §503.13(b)(3) Pollutant Concentration Limits
Arsenic (As)	9.6	8.72	41
Cadmium (Cd)	1.49	2.46	39
Chromium (Cr)	47.4	68.4	-
Copper (Cu)	308	358	1500
Lead (Pb)	16.5	18.5	300
Mercury (Hg)	0.68	0.7	17
Molybdenum (Mo)	5.76	5.87	-
Nickel (Ni)	13.9	14.9	420
Selenium (Se)	8.5	9.22	100
Zinc (Zn)	976	980	2800
*All units in mg/kg			

Section 7: Updated Biosolids Spill Plan

City of Salem
Willow Lake Water Pollution Control Facility
5915 Windsor Island Road North
Salem OR 97303

CITY OF SALEM BIOSOLIDS TRANSPORT SPILL RESPONSE PLAN

BIOGRO™ PROGRAM

Biosolids to Land Application

June 2004
Revised April 2009
Revised January 2011
Revised January 2013
Revised January 2014
Revised February 2015
Revised January 2016
Revised January 2017
Revised January 2018
Revised January 2019
Revised January 2020

CONTENTS

BIOSOLIDS TRANSPORT SPILL RESPONSE PLAN
INFORMATION SHEET

(It is only necessary to dial the last four digits of a number within the city phone system.)

1.	Facility Name:	Willow Lake Water Pollution Control Facility	
	Facility Ownership:	City of Salem, Oregon (Municipality)	
	Address:	5915 Windsor Island Road North Salem, OR 97303	
2.	Facility Contacts:	Jue Zhao Wastewater Division Manager	503-588-6380
		Mark Stevenson Residuals/Hauled Waste Manager	503-588-6380
3.	Public Works Dispatch:		503-588-6333 503-588-6063
4.	Environmental Services:	Nitin Joshi Environmental Compliance Manager	503-588-6647
5.	City Shops:	503-588-6327	
6.	Risk Management:	Marcus Pitts Risk Manager	503-588-6132
7.	Oregon Department of Environmental Quality (ODEQ):		1-800-542-4011
	Local Address:	4026 Fairview Inductrial Dr. SE Salem, OR 97302	
8.	ODEQ Contact:	Paul Kennedy Natural Resource Specialist	1-541-687-7439

GENERAL INFORMATION

Definition of Material

Biosolids are processed organic residual solids from domestic wastewater treatment, containing nitrogen, phosphorus, potassium, trace metals, and some pathogenic (disease-causing) organisms. Willow Lake Water Pollution Control Facility (WLWPCF) biosolids have undergone several processes to significantly reduce pathogens and reduce volatile solids to the extent that they do not attract vectors.

Biosolids being transported are typically 2 to 3 percent total solids for liquids and 16 to 26 percent total solids for cake. The solids in both liquid and cake material contains 10 percent volatile solids and have a pH between 7 and 8.3.

BIOGRO™ Staffing and Equipment

The City of Salem utilizes plant staff and equipment for local hauling of cake and solids during the months of May through October. During these months, BIOGRO™ staffing consists of two full time positions and a Residuals Manager. Plant operators with proper training and license requirements occasionally assist with local transport during the summer months. Work hours are from 0600 to 1430 hours, Monday through Friday, with occasional overtime during the height of canning season in August and September.

Typically, from mid-October through early June when local application is not possible due to wet field conditions, cake product is stored on site in approved storage areas at Willow Lake.

BIOGRO™ Loading and Re-fueling Locations

All BIOGRO™ tankers and trailers are loaded exclusively on site at WLWPCF. The North and South Digester Complexes have liquid loading facilities. The Solids Handling Building has a cake hopper loading facility for belt filter press product. The centrifuge has a discharge screw auger which loads directly into the transport trucks. Willow Lake also has a fuel station and all BIOGRO™ equipment is fueled on site.

BIOGRO™ Transport Equipment

The City of Salem owns and operates the following equipment as part of the BIOGRO™ Program. Each BIOGRO™ vehicle carries a portfolio containing vehicle registration, proof of insurance, accident and spill report forms, a Drivers Spill Notification System Flow Chart and a Biosolids Fact Sheet. Each driver carries a cell phone, and additionally, each vehicle is capable of radio communication with Willow Lake Water Pollution Control Facility and City Dispatch and carries emergency equipment for containment and clean-up of small spills.

LIQUID TRANSPORT EQUIPMENT

Tractors	ID Number	Tankers	ID Number
Freightliner	11430	Beall Trans-liner 6,000 gallons each	
	11104		370
	9973		371
	9974		372

CAKE TRANSPORT EQUIPMENT

Tractors	ID Number	Trailer	ID Number
Freightliner Freightliner	11104 11430	Ravens Semi-End Dump Trailer Approximately 22 wet tons semi-solid product capacity	9703
Freightliner	9974 9973	Waren Semi-End Ejector Trailer Approximately 20 wet tons semi-solid product capacity	10967

CAKE TRANSPORT EQUIPMENT

Dump Trucks	ID Number	Capacity
Freightliner	9983	Approximately 9 wet tons
International	2986	Approximately 9 wet tons
International	4902	Approximately 9 wet tons

BIOGRO™ ROUTE DESCRIPTION

General

Due to the number of application sites, individual route descriptions are impractical to record in the context of the Biosolids Spill Plan. However, route descriptions for all application sites are on file in the Residuals Manager's office at WLWPCF. When applying to local sites, the worksheet for the current site is posted on the board in the BIOGRO™ office. Additionally, BIOGRO™ drivers carry a route description when transporting biosolids to application sites.

Standard Route

Upon leaving WLWPCF, the route is standard for the first several miles. Most application sites lie to the north, south, or east of Willow Lake. The following directions describe the initial route of transport vehicles.

- Turn south from WLWPCF driveway onto Windsor Island Road N.
- Turn east (about two blocks) onto Lockhaven Drive.
  Most sites can be reached from the following routes.

  A. NORTHBOUND SITES can be accessed by turning north onto River Road, Interstate 5, or Highway 99.

  B. SOUTHBOUND SITES can be accessed by turning south onto Interstate 5, or Cordon Road.

  C. EASTBOUND SITES can be accessed by continuing east on Lockhaven Road, which turns into Hazelgreen Road at Highway 99.

IDENTIFICATION OF SENSITIVE AREAS

General

BIOGRO™ liquid and cake products are transported from WLWPCF to various application sites within close proximity to the plant. There are no sensitive areas on the roads described in the Standard Route Description.

IDENTIFICATION OF NATURAL HAZARD AREAS

General

There are no natural hazard areas resulting from inclement weather, along the roads described in the Standard Route Description. The BIOGRO™ hauling program typically runs from May 1 through October 31, Monday through Friday from 0600 - 1430 hours.

Individual application site route descriptions include identification of sensitive areas and natural hazard areas. **Drivers discuss these areas of concern and carry route descriptions when transporting to any application site.**

BIOSOLIDS SPILL NOTIFICATION SYSTEM

General

The Biosolids Spill Notification System is initiated by the driver using either the cell phone or radio communication. If the spill can be cleaned up by the driver, he must contact the Residuals Manager, if available, or as soon as possible afterwards, and inform him of the spill. He must clean up the spill properly and take all materials back to the WLWPCF with the vehicle.

If the spill cannot be cleaned up by the driver, he will contact Dispatch requesting additional equipment and assistance. Dispatch will notify various city departments for the necessary response personnel and equipment. Additionally, Dispatch will relay information concerning the spill to the Residuals Manager, or if unavailable, the Wastewater Treatment Services Manager, or an Operations Shift Supervisor at WLWPCF. *Use the Spill Notification System Flow Chart: Driver Response*.

Every spill, regardless of size or location, shall be considered large enough to initiate the Spill Response Program. A Spill Notification Report Form must be filled out.

If Spill Can Be Contained and Cleaned up by the Driver

- Immediately notify the Residuals Manager. *Use the Spill Notification System Flow Chart: Driver Response*.

- Clean up the spill. Biosolids should be thoroughly removed so that no significant residues remain to be washed into any storm drain or waterway by surface water. Each BIOGRO™ truck is equipped with a shovel and lime for disinfection. Biosolids should be scraped from the surface with a flat edged shovel. Lime should be applied to the spill site for disinfection.

- If the spill is contained on a paved surface, park the truck on the side of the road. Place reflectors and divert traffic around the spill. Any material remaining on the pavement should be absorbed into a compatible material such as sand, diatomaceous earth, or soil.

- If the spill is on the earth's surface, all contaminated dirt should be collected as well. All spilled biosolids must be returned to the BIOGRO™ transport vehicle from which they spilled, or be loaded into another appropriate transport vehicle and returned to WLWPCF.

- Continue the trip if possible, without additional spillage.

- Complete Spill Notification Report Form after returning to WLWPCF.

If Spill *Can Not* Be Contained & Cleaned up by The Driver

- Immediately notify Dispatch via cell phone or truck radio.
- *Use the Spill Notification System Flow Chart: Driver Response*.

- Warn pedestrians and motorists to stay away from the spill area. Direct traffic, if necessary, until police or fire personnel arrive.

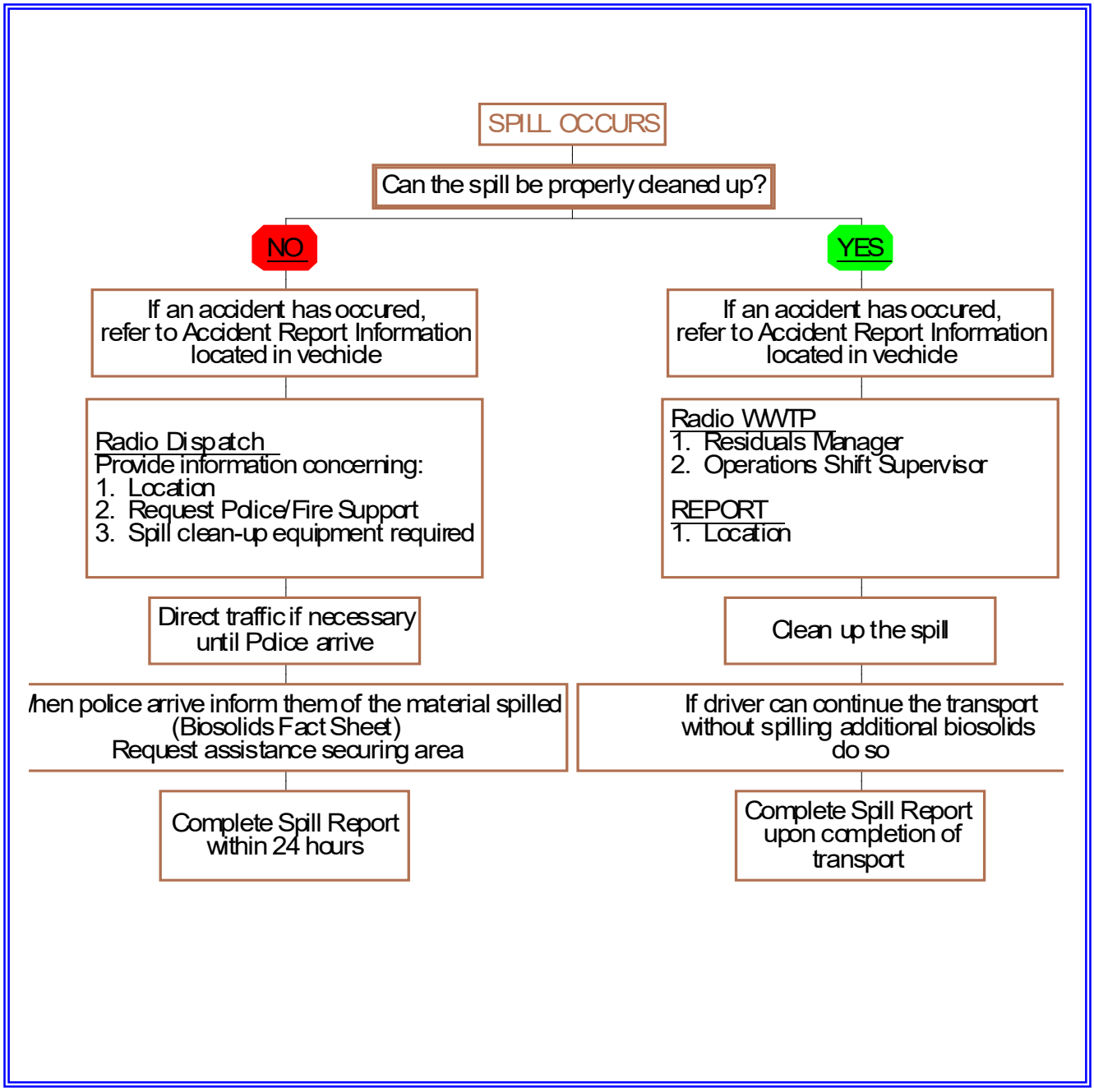
- Inform police or fire personnel of the type of material (Biosolids Fact Sheet) that has been spilled. Request the area to be secured and protected to prevent property damage and personal injury.

- When fire or police personnel can protect area, report back with Residuals Manager.

- Complete Spill Notification Report Form after returning to WLWPCF.

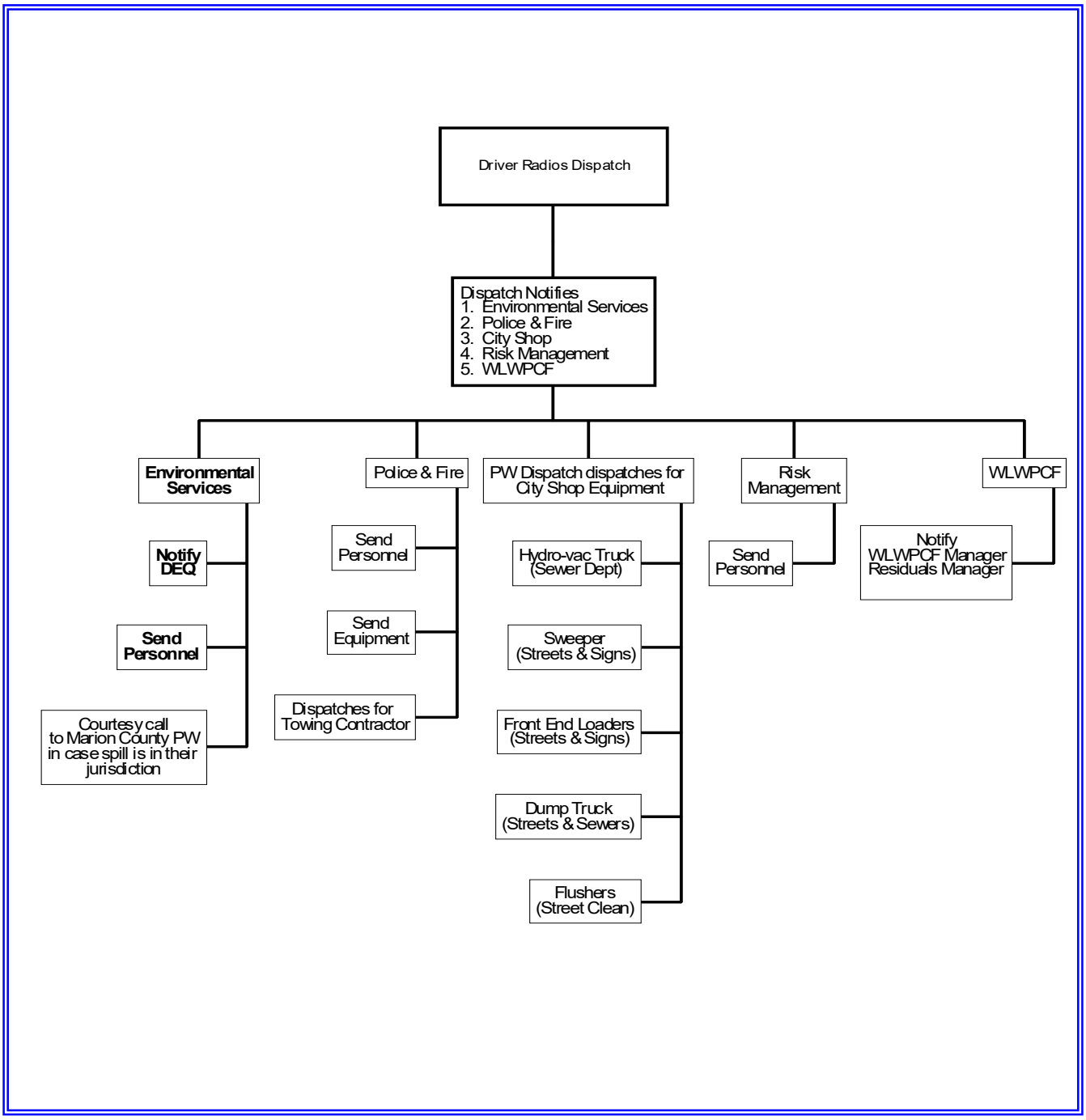
BIOSOLIDS SPILL NOTIFICATION SYSTEM

DRIVER RESPONSE



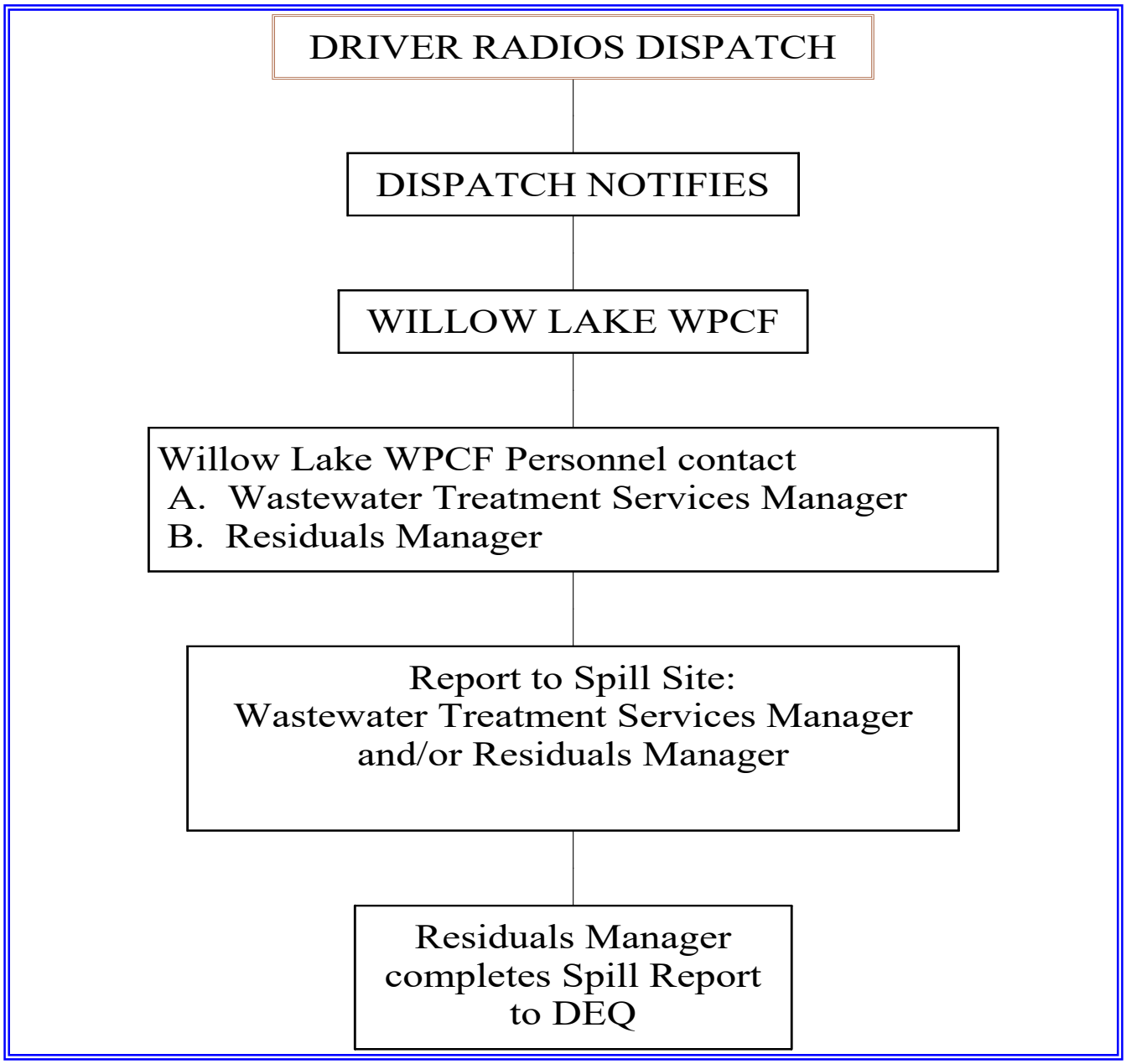
BIOSOLIDS SPILL NOTIFICATION SYSTEM

DISPATCH RESPONSE



BIOSOLIDS SPILL NOTIFICATION SYSTEM

WLWPCF RESPONSE



BIOSOLIDS FACT SHEET

DESCRIPTION:

Biosolids are biologically stabilized residuals derived from secondary treatment of domestic wastewater by the City of Salem's WLWPCF .
These residuals have undergone anaerobic digestion, a controlled process recognized by the Environmental Protection Agency (EPA) and Department of Environmental Quality (DEQ) to make them suitable for transportation and land application. Digestion processes and Biosolids quality is regularly monitored to assure Federal and State pathogen reduction {(40) CFR, part 503.13 (b)(3) & OAR 340-50-26 (2)(b)}, vector attraction {40 CFR part 503.13 (b)(1) & OAR 340-50-26 (2)(c)}, and trace metal pollutants {40 CFR 503.13 (b)(1) & 340-50-026 (2)(a)}levels are within regulatory standards.

The DEQ and EPA actively promote Biosolids recycling via land application. The City of Salem's Biosolids are a recyclable material which improves soil tilth, fertility and stability.

Information on the City of Salem's Biosolids is available upon request from WLWPCF at 503-588-6380.

HANDLING AND PPE REQUIREMENTS:

WLWPCF Biosolids present little threat to hauler or public health and safety. The potential exists for disease-causing microorganisms to remain in the solids transported from the WLWPCF to the land application site. The following Safety Practices shall be observed to minimize exposure:

1. Wash hands before eating, drinking, or smoking.
2. Use waterless disinfectant soap for washing hands when water is not available.
3. Avoid rubbing eyes, nose and mouth after handling or unloading Biosolids.
4. Do not eat, drink, or smoke while loading or unloading Biosolids.
5. Wear gloves during loading and unloading of Biosolids.
6. Wear protective clothing when there is to be more than causal contact with the Biosolids.
7. When clothing or body parts are exposed to Biosolids, wash skin with soap and water, change clothing before leaving the area.
8. Clean and disinfect all cuts or scrapes. Keep wounds protected from contamination.

HAZARDS:

WLWPCF Biosolids are not considered RCRA subtitle C hazardous waste nor are they toxic, biological or radioactive waste. In the event of a spill, call the City of Salem Dispatch at 503-589-2190, or WLWPCF at 503-588-6380.

BIOSOLIDS SPILL NOTIFICATION REPORT FORM

Date _____ Time _____ Name _____

Spill Discovered By: Name _____

Date _____ Time _____

Spill Reported To: (Please put the date/time/initials by those titles that apply)

_____ Dispatch

_____ Residuals Manager _____Wastewater Treatment Services Manager

_____Operations Shift Supervisor _____ Risk Management _____DEQ

Spill Information:

Spill Date _____ Spill Time _____

Spill Clean-up Date _____ Spill Clean-up Time _____

Spill Type: Cake _____ Liquid_____

Amount _____

Location _____

Cause _____

_____

Action(s) Taken_____

_____

_____

LOCATION, TYPE, AND AVAILABILITY OF RESOURCES

General

In the event of a biosolids spill that cannot be cleaned up by the driver, the initial request for equipment, personnel and materials will be made by the driver through Dispatch, who will then contact the WLWPCF Manager and Residuals Manager and forward all necessary information. Various other city departments will be notified as needed or requested for response equipment and personnel.

Response Equipment

The City of Salem's equipment is centrally located at the City Shops and includes:

- Hydro-vac Trucks
- Sweepers
- Flushers
- Dump Trucks
- Loaders

Materials

WLWPCF maintains an inventory of bagged lime on site for emergencies.

Personnel

City personnel assisting in clean up and traffic control would include:

- Environmental Services Personnel
- Risk Management Personnel
- Police and Fire
- Equipment Operators
- WLWPCF Manager
- Residuals Manager

CONTRACTED TRANSPORT COMPANY'S SPILL RESPONSE PLAN(S)

The following contractors have provided Spill Response Plans as part of their contract requirements. These Plans have been reviewed and are currently filed at WLWPCF.

- Tribeca Transport. Woodland, Washington