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

2021

BIOSOLIDS PROGRAM

ANNUAL REPORT

Reporting Period: January 1, 2021- December 31, 2021

PREPARED FOR

OREGON DEPARTMENT OF ENVIRONMENTAL QUALITY

NPDES Permit Number 101145

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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:** 503-588-6380

Horner Enterprises Inc	**Service:**	Summer Mid Distance Hauling Cake Application
PO Box 442 Sweet Home OR 97386	**Contact:** **Phone:**	Jay Horner 541-979-2099

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

January 5, 2022

Jay Horner
Horner Enterprises
P.O. Box 442
Sweet Home, Or 97386

SUBJECT: **Biosolids Program Certification Statement Signatures**

Dear Jay:

The City of Salem is required to submit an annual report to the Environmental Protection Agency and the Department of Environmental Quality describing biosolids activities throughout the year. This annual report requires signed certifications for pathogen reduction and vector attraction reduction from Willow Lake Wastewater Treatment Plant, the preparer of biosolids, and signed certifications for site management practices from Horner Inc, the applier of biosolids.

Please sign the enclosed site management certification form and return the signed form (either by mail or email) on or before January 15, 2022, so that I can have the annual report ready for the City's review by the end of the month.

Your cooperation is appreciated. Please let me know if you have any questions or comment. I can be reached directly at 503-763-3479 or at mstevenson@cityofsalem.net.

Sincerely,

Mark Stevenson
Residuals & Hauled Waste Supervisor

Enclosure: Certification Statement
By Certified Mail
cc: Files

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, 2021, 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 Horner Enterprises Inc. 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 transporter and applicator, Horner Enterprises Inc :

"I certify, under penalty of law, that the site management practices in 503.14 and the site restrictions in 503.32(b)(5) have been met. This determination has been made under 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."

Jay Horner — 1-10-2022

Name (Representing Horner Enterprises Inc.) — 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."

Jay Horner — 1-10-2022

Name (Representing Horner Enterprises Inc.) — Date

CITY OF Salem AT YOUR SERVICE

Public Works Department

555 Liberty Street SE / Room 325 • Salem OR 97301-3513 • Phone 503-588-6211 • Fax 503-588-6025

January 4, 2022

Eric Thwaites
Chief Operations Officer
Tribeca Transport LLC
1415 Port Way
Woodland WA 98674

SUBJECT: **Biosolids Program Certification Statement Signatures**

Dear Eric:

The City of Salem is required to submit an annual report to the Environmental Protection Agency and the Department of Environmental Quality describing biosolids activities throughout the year. This annual report requires signed certifications for pathogen reduction and vector attraction reduction from Willow Lake Wastewater Treatment Plant, the preparer of biosolids, and signed certifications for site management practices from Tribeca Transport LLC, the applier of biosolids.

Please sign the enclosed site management certification form and return the signed form (either by mail or email) on or before January 15, 2022, so that I can have the annual report ready for the City's review by the end of the month.

Your cooperation is appreciated. Please let me know if you have any questions or comment. I can be reached directly at 503-763-3479 or at mstevenson@cityofsalem.net.

Sincerely,

Mark Stevenson
Residuals & Hauled Waste Supervisor

Enclosure: Certification Statement
By Certified Mail
cc: Files

Transportation and Utility Operations
1410 20th Street SE / Building 2
Salem OR 97302-1209
Phone 503-588-6063
Fax 503-588-6480

Parks Operations
1460 20th Street SE / Building 14
Salem OR 97302-1209
Phone 503-588-6336
Fax 503-588-6305

Willow Lake Water Pollution Control Facility
5915 Windsor Island Road N
Keizer OR 97303-6179
Phone 503-588-6380
Fax 503-588-6387

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, 2021, 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 Tribeca Transport LLC. 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 transporter and applicator, Tribeca Transport LLC.:

"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."

Name (Representing Tribeca LLC.) Date 1/20/2022

"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."

Name (Representing Tribeca LLC.) Date 1/20/2022

Section 3:
Signed Certification Statements

2021
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 Supervisor
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, 2021- December 31, 2021

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

4. Facility Status: Preparer of Biosolids

5. Biosolids Production: **3675.42** Dry Tons
3334.29 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.

Jue Zhao — Date Signed: 2/15/2022
Wastewater Services Division Manager

Mark Stevenson — Date Signed: 2/15/2022
Residuals and Hauled Waste Supervisor

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, 2021, 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 Stevenson 1/28/2022

Mark Stevenson, Residuals and Hauled Waste Supervisor 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 Stevenson 1/28/2022

Mark Stevenson, Residuals and Hauled Waste Supervisor Date

Certification Statement for Pathogen and VAR Requirements

POTW Willow Lake Water Pollution Control Facility

Source Name: Anaerobically-Digested Dewatered Biosolids

Source Period: 01-Jan-2021 to 31-Dec-2021

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 Stevenson 1/28/2022

Mark Stevenson, Residuals and Hauled Waste Supervisor 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 Stevenson 1/28/2022

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-2021 to 31-Dec-2021

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 Stevenson 1/28/2022

Mark Stevemson, Residuals and Hauled Waste Supervisor 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 Stevenson 1/28/2022

Mark Stevenson, Residuals and Hauled Waste Supervisor Date

Section 4:
2021 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: 2021

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 Rd 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: Waste Water Plant Manager	
	Email Address: jzhao@cityofsalem.net	Telephone: 503-588-6380	
	Mailing Address: 5915 Windsor Island Rd. 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: 503-588-6380	
	Mailing Address: 5915 Windsor Island Rd. 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, Or	☐ septage ☒ sludge	343,000	☒ gallons ☐ wet tons ☐ dry tons	1.00%
		☐ 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%
		☐ 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: Rotating 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 3039.42	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 636	23.00%
5.	☐ Other. Please specify:	Gallons	Wet tons	Dry Tons	

* 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.	
	Waste Water Plant Manager	2/10/2022
	Signature	Title	Date
	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			
1.	**Please specify quantity (in dry US tons) of finished biosolids stored or produced at your facility.**		
		Class A	**Class B**
	Produced during reporting period		3675.42
	Total biosolids production	0	0
2.	**Please indicate how finished biosolids were managed (i.e., land applied, sold, stored, or other).**		
		Class A	**Class B**
	Land applied in bulk to agricultural land		3039.42
	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)		636
	Sent to landfill		
	Other, please specify:		
	Total biosolids disposition (add above lines)	0	3675.42

K. BIOSOLIDS SAMPLING

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

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
60 days	☐ A ■ B	☐ Aerobic dig. ■ Anaerobic dig. ☐ Compost ☐ Air-dried ☐ Heat dried ☐ Lagoon ☐ Alkaline stabil. ☐ Soil prod/blend ☐ Other	1/31/21	1/31/21
Click Arrow	☐ A ☐ B	☐ Aerobic dig. ☐ Anaerobic dig. ☐ Compost ☐ Air-dried ☐ Heat dried ☐ Lagoon ☐ Alkaline stabil. ☐ Soil prod/blend ☐ Other		
60 days	☐ A ■ B	☐ Aerobic dig. ■ Anaerobic dig. ☐ Compost ☐ Air-dried ☐ Heat dried ☐ Lagoon ☐ Alkaline stabil. ☐ Soil prod/blend ☐ Other	3/31/21	3/31/21
Click Arrow	☐ A ☐ B	☐ Aerobic dig. ☐ Anaerobic dig. ☐ Compost ☐ Air-dried ☐ Heat dried ☐ Lagoon ☐ Alkaline stabil. ☐ Soil prod/blend ☐ Other		
60 days	☐ A ■ B	☐ Aerobic dig. ■ Anaerobic dig. ☐ Compost ☐ Air-dried ☐ Heat dried ☐ Lagoon ☐ Alkaline stabil. ☐ Soil prod/blend ☐ Other	5/31/21	5/31/21
Click Arrow	☐ A ☐ B	☐ Aerobic dig. ☐ Anaerobic dig. ☐ Compost ☐ Air-dried ☐ Heat dried ☐ Lagoon ☐ Alkaline stabil. ☐ Soil prod/blend ☐ Other		
60 days	☐ A ■ B	☐ Aerobic dig. ■ Anaerobic dig. ☐ Compost ☐ Air-dried ☐ Heat dried ☐ Lagoon ☐ Alkaline stabil. ☐ Soil prod/blend ☐ Other	7/31/21	7/31/21
Click Arrow	☐ A ☐ B	☐ Aerobic dig. ☐ Anaerobic dig. ☐ Compost ☐ Air-dried ☐ Heat dried ☐ Lagoon ☐ Alkaline stabil. ☐ Soil prod/blend ☐ Other		
60 days	☐ A ■ B	☐ Aerobic dig. ■ Anaerobic dig. ☐ Compost ☐ Air-dried ☐ Heat dried ☐ Lagoon ☐ Alkaline stabil. ☐ Soil prod/blend ☐ Other	9/30/21	9/30/21
Click Arrow	☐ A ☐ B	☐ Aerobic dig. ☐ Anaerobic dig. ☐ Compost ☐ Air-dried ☐ Heat dried ☐ Lagoon ☐ Alkaline stabil. ☐ Soil prod/blend ☐ Other		
60 days	☐ A ■ B	☐ Aerobic dig. ■ Anaerobic dig. ☐ Compost ☐ Air-dried ☐ Heat dried ☐ Lagoon ☐ Alkaline stabil. ☐ Soil prod/blend ☐ Other	11/30/21	11/30/21
Click Arrow	☐ 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	Average Pollutant Concentrations								
	- Annual - Quarterly - 60 days - Monthly	**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)**
1	60 days	2.0	1.25	300	21.7	3.69	5.71	16.4	4.99	1100
	Click Arrow									
	60 days	1.6	0.95	251	17.0	0.34	4.59	16.0	5.38	756
	Click Arrow									
	60 days	1.7	1.06	318	17.4	0.63	8.29	12.7	5.18	939
	Click Arrow									
	60 days	1.9	1.24	331	16.8	0.61	8.06	11.1	5.06	1013
	Click Arrow									
	60 days	1.9	1.21	434	16.1	0.86	7.75	14.4	4.14	1149
	Click Arrow									
	60 days	1.5	1.34	328	16.9	0.76	7.43	12.9	3.67	1226
	Click Arrow									
	Annual Mean	1.77	1.17	327	17.64	1.15	6.97	13.9	4.74	1030
	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] 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 ☐
	60 days	59775	0.4	8895	14897	1994	8.03	24.65	
	Click Arrow								
	60 days	58111	0.9	9598	14287	1558	8.27	25.03	
	Click Arrow								
	60 days	88304	1.1	44589	20006	5659	7.92	13.12	
	Click Arrow								
	60 days	98098	0.5	45122	18605	5354	7.8	13.01	
	Click Arrow								
	60 days	58156	1.7	8174	12876	1432	8.4	25.02	
	Click Arrow								
	60 days	57786	2.0	8032	12575	1550	8.4	23.38	
	Click Arrow								
	Annual Mean	70038	1.09	20735	15541	2924	8.14	20.7	

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	55.90%
	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 #.

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
[signature]	WW Treatment Division Manager	2/14/2022

Print Name: Joe 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.	Elam-Bricker (1)	Elam	T8S,R2W,Sect.22,TL 900	Oregon Hay	110.17	64.41	57	■ Yes ☐ No	x
2.	D. Elam 1 (1_F)	Elam	T8S,R2W,Sect.21,TL 501-1401	Oregon Hay	103.91	52.24	49	■ Yes ☐ No	x
3.	Elam/Cook	Elam	T9S,R2W,Sect.9TL 600 & 800	Oregon Hay	114.71	226.98	78	■ Yes ☐ No	x
4.	G, Rouse 1	Rouse	T9S,R2W,Sect.7,TL 1300	Oregon Hay	99.00	62.75	25	☐ Yes ■ No	x
5.	G. Rouse 2 (2-M)	Rouse	T9S,R2W,Sect.7,TX 1300	Oregon Hay	117.77	21.49	7	■ Yes ☐ No	x
6.	G. Rouse 3(3_M)	Rouse	T9S,R2W,Sect.7,TL 1300	Oregon Hay	117.77	52.19	17	☐ Yes ■ No	x
7.	G.Rouse 4 (4_J)	Rouse	T9S,R2W,Sect.7,TL 1400	Oregon Hay	122.46	36.84	12	■ Yes ☐ No	x
8.	G.Rouse 5(5_J)	Rouse	T9S,R2W,Sect.7,TL 1300	Oregon Hay	120.47	114.76	38	■ Yes ☐ No	x
9.	Otrton 1	Orton	T8S,R5W,Sect.31&32,600,700 & 800	Oregon Hay	99.67	151.80	60	■ Yes ☐ No	x
10.	Gross 4A	Gross	T9S,Range3W,Sec21,TL 400,500,600	Annual Rygrass	101.17	220.16	86	☐ Yes ■ No	x
11.	Mason Rd	Gross	T10S, R 3W, Section 10; Tax Lot 1700	Annual Rygrass	99.76	149.27	59	☐ Yes ■ No	x
12.	Talbot Rd	Gross	T 9S, Range 3W, Section 28; Tax Lot 800	Annual Rygrass	99.59	43.56	18	☐ Yes ■ No	x
13.	Dimond Hill	McCormick	T15S, R 4W, Section 11; Tax Lot # 1200	Perenial Rygras:	94.83	108	45	☐ Yes ■ No	x
14.	Substation	McCormick	T14S, R4W,S 35; TL # 1200,1202,1300	Perenial Ryegra	98.56	395	158	☐ Yes ■ No	x
15.	Creek Bend	McCormick	T13S, R4W, S27; Tax Lot # 300	Perenial Rygras:	94.22	229.44	96	☐ Yes ■ No	x
	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	Etzel 4A	Etzel	T9S,R2W,Sect17,TL 01800	Oregon Hay	100.24	83.82	33	■ Yes ☐ No	x
17	Etzel 1A	Etzel	T8S, R 2W, S35 Tax Lots 700 &800	Oregon Hay	91.72	139.20	60	☐ Yes ■ No	☐
18	Cooper Hallow	Riddell	T 8S, Range 5W, Section 17; Tax Lot 300	Annual Rygrass	100.06	467.36	184	☐ Yes ■ No	x
19	Gray	Gray	T8S,Range6W,Sec26,TL 1700	Oregon Hay	98.13	62.75	25	■ Yes ☐ No	☐
20	Rock Hill B	Manning	T12S, R2W, Sec 31 Tax Lot # 200&300	Annual Rygrass	100.20	355.60	140	☐ Yes ■ No	x
21								☐ Yes ☐ No	☐
22								☐ Yes ☐ No	☐
23								☐ Yes ☐ No	☐
24								☐ Yes ☐ No	☐
								☐ 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

1.	**Information required with some annual reports:**
	☒ Additional copies of Table S for additional land application.
	☒ Analytical results from soil testing
2.	**Example of documentation held by the permittee and available upon request:**
	☐ 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 manager	2/14/2022

Print Name: Jue Zhao

2021
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 2021, total annual rainfall recorded at the WLWPCF was 44.98 inches. The annual wastewater flow totaled 14.56 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** 31,570,289 gallons of septage which was conveyed to the WLWPCF for treatment.

Salem also manages an Environmental Protection Agency (EPA) approved pretreatment program which oversees 52 permitted dischargers including several categorical industries (see Table 1: 2021 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 are 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 treatment 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 75 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 36,513,442 gallons of thickened primary and secondary sludge in 2021 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 59.7 percent of the treatment plant's solids production was stabilized in the larger south primary digesters while the north facility received 40.0 percent (see Table 6: 2021 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 2021 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 343,000 gallons of aerobic digested biosolids and waste activated sludge from Aurora in all months in 2021 except January and December

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 2021 was 0.062 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: 2021 Digester Volatile Feed Pounds).

Class B Biosolids – Pathogen Reduction

All biosolids produced in 2021 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 41 days and ranged between 33.1 and 61.0 days at an average temperature of 98.4 degrees Fahrenheit or 36.9 degrees Celsius (see Table 3: 2021 Digester Performances: Monthly and Annual Averages).

Class B Biosolids – Vector Attraction Reduction (VAR)

All biosolids produced in 2021 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 47.0 and 67.0 percent (see Table 4: 2021 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, and 5b: 2021 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, 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 41,073,594 gallons of digested biosolids were utilized to produce centrifuge dewatered, and liquid biosolids products in 2021. The volume and proportions of each product were:

- Centrifuge dewatered biosolids: 39,867,594 gallons (97.06%)
- Liquid biosolids: 1,206,000 gallons (2.94%) (See Table 6: 2021Digester 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 3686.42 dry tons was produced in 2021

Dewatered Biosolids Production and Polymer Costs

Details of Salem's dewatered biosolids production in 2021, including polymer dosages, capture rates and costs, are provided in Table 8: 2021Centrifuge. 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 2021 was $437,946

Biosolids Application, Storage and Disposal Quantities

Salem land applied a total of 3,039.42 dry tons of biosolids on a total of 1,247 acres in 2021. These totals were comprised of 20 applications of Class B biosolids (liquid and dewatered) on all or part of 20 DEQ-authorized sites in hay, grass seed and pasture. Amounts that were land applied in 2021 included:

- 2,922.77 dry tons of centrifuge dewatered biosolids applied on 1,141 acres locally in 2021
- 116.65 dry tons of liquid biosolids applied on 106 acres in 2021.

There were 647 dry tons of Biosolids stored on site in 2021 at WLWPCF to be carried over for local land application into the 2022 application season.

Biosolids Application Rates and Nutrient Loads

The WLWPCF certifies that all biosolids products were applied to the DEQ-authorized sites in 2021 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 1.10 dry tons per acre yielded an average of 107.04 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 2.69 dry tons per acre provided approximately 104.36 pounds of PAN per acre.

The total pounds of nutrients applied to the fields in 2021were:

- 112,601.58 pounds of PAN
- 81,215.46 pounds of P
- 10,228,83 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.

Biosolids Spill Incidents

The City of Salem's Biogro Program had no biosolids spill incidents in 2021.

Anticipated Biosolids Production and Acreage Requirements For 2021

Salem anticipates little change concerning biosolids production and acreage requirements in 2022. Annual biosolids production is anticipated to fall within the range of 3,400 and 3,800 dry tons.

Section 5: Tables

Table 1: City of Salem - 2021 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
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
Shinsegae Foods Inc.	1965 Claxter Rd.	40 CFR Part 403	SIU	Food Manufacture
Speedy Septic	23020 SE Eagle Creek Rd. Eagle Creek, Or	40 CFR Part 403	Septic	Septic Tank and Related Services
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 (01/23/2022)

Table 2: 2021 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	423,510		638,841		1,062,351
Feb-20	377,089	734	584,907	1,101	963,831
Mar-20	436,167	269	680,326	404	1,117,166
Apr-20	450,061	1,859	657,141	2,788	1,111,848
May-20	457,284	3,005	686,141	4,508	1,150,938
Jun-20	462,802	3,014	656,326	3,154	1,125,297
Jul-20	459,598	1,039	690,497	1,558	1,152,692
Aug-20	397,119	736	592,178	1,103	991,136
Sep-20	446,359	375	653,476	563	1,100,774
Oct-20	477,299	334	669,861	501	1,147,995
Nov-20	516,605	154	778,078	231	1,295,068
Dec-20	479,030		720,915		1,199,945
Total	5,382,923	11,519	8,008,687	15,912	13,419,041
Avg Vol Lbs/Day/Cuft Ratio	**0.058**	**0.00012**	**0.065**	**0.00013**	**0.062**

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 2021, 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: 2021 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-21	37.3	37.3	33.9	33.9	98.5	98.6	98.4	98.3
Feb-21	46.7	46.7	42.4	42.4	98.6	98.2	98.7	98.4
Mar-21	39.4	39.4	35.8	35.8	98.9	98.8	98.4	98.4
Apr-21	39.6	39.6	35.9	35.9	98.5	98.7	99.0	98.7
May-21	36.5	36.5	33.1	33.1	98.5	98.1	98.5	98.4
Jun-21	44.2	44.2	40.1	40.1	98.7	98.7	98.7	98.5
Jul-21	44.6	44.6	40.4	40.4	98.5	98.4	98.5	98.4
Aug-21	41.8	41.8	37.9	37.9	98.7	98.5	98.6	98.7
Sep-21	37.6	37.6	34.1	34.1	98.4	97.6	97.6	97.5
Oct-21	60.1	60.1	54.5	54.5	98.4	98.4	98.4	98.3
Nov-21	46.1	46.1	41.8	41.8	98.3	98.3	98.1	98.0
Dec-21	42.0	42.0	38.1	38.1	98.3	98.4	98.1	98.1
Maximum	60.1	60.1	54.5	54.5	98.9	98.8	99.0	98.7
Minimum	36.5	36.5	33.1	33.1	98.3	97.6	97.6	97.5
Average	43.0	43.0	39.0	39.0	98.5	98.4	98.4	98.3

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 2021 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: 2021 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	DIG FD Vol Reduction %
Jan-21	423,510		638,841		48.1%
Feb-21	377,089	734	584,907	1,101	63.3%
Mar-21	436,167	269	680,326	404	67.3%
Apr-21	453,061	1,859	657,141	2,788	67.0%
May-21	457,284	3,005	686,141	4,508	61.4%
Jun-21	462,802	3,014	656,326	3,154	56.0%
Jul-21	459,598	1,039	690,497	1,558	51.1%
Aug-21	397,119	736	592,178	1,103	48.3%
Sep-21	446,359	375	653,476	563	46.9%
Oct-21	477,299	334	669,861	501	57.7%
Nov-21	516,605	154	778,078	231	52.8%
Dec-21	479,030		720,915		49.6%
Total	5,385,923	11,519	8,008,687	15,912	
Maximum	516,605	3,014	778,078	4,508	67.3%
Minimum	377,089	154	584,907	231	46.9%
Average	448,827	1,152	667,391	1,591	55.8%

Source: Hach WIMS - BIOEDGE Digester Performance Report 2021: 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 2021. 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,

Table 5a: 2021 Monthly Biosolids Analyses - Centrifuge Dewatered Biosolids

Tests	Units	Method	Month						
			Jan	Mar	May	July	Sept	Nov	Average
Total Solids	%	2540B	24.65	25.03	24.27	24.12	25.02	23.38	**24.41**
Volatile Solids	%	2540E	15.77	15.54	16.24	16.30	16.60	15.68	**16.02**
Volatile Reduction	%								**#DIV/0!**
pH	std units	4500H+B	8.03	8.27	8.44	8.18	8.36	8.4	**8.28**
TKN	mg/kg	4500-N-B	59775	58111	57708	61157	58156	57786	**58782**
Ammonia Nitrogen	mg/kg	4500-NH3 B	8895	9598	9260	8575	8174	8032	**8756**
Nitrate Nitrogen	mg/kg	352.1	0.4	0.9	2.1	0.4	1.7	2.0	**1.3**
Phosphorus	mg/kg	365.3	14897	14287	13772	13294	12876	12575	**13617**
Potassium	mg/kg	200.7	1994	1558	1447	1309	1432	1550	**1548**
Arsenic	mg/kg	200.7	2.00	1.60	1.80	1.9	1.9	1.50	**1.78**
Cadmium	mg/kg	200.7	1.25	0.95	1.10	1.38	1.21	1.34	**1.21**
Chromium	mg/kg	200.7	36.0	32.0	36.0	29.0	30.0	74.0	**39.5**
Copper	mg/kg	200.7	300	251	309	355	434	328	**330**
Lead	mg/kg	200.7	21.7	17.0	17.7	17.9	16.1	16.9	**17.9**
Mercury	mg/kg	245.1	3.69	0.34	0.66	0.71	0.86	0.76	**1.17**
Molybdenum	mg/kg	200.7	5.71	4.59	7.68	7.7	7.8	7.43	**6.81**
Nickel	mg/kg	200.7	16.4	16.0	13.8	11.8	14.4	12.9	**14.2**
Selenium	mg/kg	200.7	5.0	5.4	4.7	4.6	4.1	3.7	**4.56**
Silver	mg/kg	200.7	7.30	4.90	12.80	11.9	10.0	7.80	**9.12**
Zinc	mg/kg	200.7	1100	756	924	1096	1149	1226	**1042**

Source: Hach WIMS - Biosolids Annual Summary Report

Table 5b: 2021 Monthly Biosolids Analyses -Liquid Biosolids

Tests	Units	Method	Month						
			Jan	Mar	May	July	Sept	Nov	Average
Total Solids	%	2540B			1.97	1.90			**1.94**
Volatile Solids	%	2540E			1.42	1.39			**1.41**
Volatile Reduction	%								**#DIV/0!**
pH	std units	4500H+B			7.40	7.41			**7.41**
TKN	mg/kg	4500-N-B			118899	135039			**126969**
Ammonia Nitrogen	mg/kg	4500-NH3 B			79918	81669			**80794**
Nitrate Nitrogen	mg/kg	352.1			0.1	0.5			**0.3**
Phosphorus	mg/kg	365.3			26239	23916			**25078**
Potassium	mg/kg	200.7			9870	9398			**9634**
Arsenic	mg/kg	200.7			1.60	1.9			**1.75**
Cadmium	mg/kg	200.7			1.02	1.09			**1.06**
Chromium	mg/kg	200.7			31.9	25.1			**28.5**
Copper	mg/kg	200.7			327	307			**317**
Lead	mg/kg	200.7			17.0	15.7			**16.4**
Mercury	mg/kg	245.1			0.60	0.50			**0.55**
Molybdenum	mg/kg	200.7			8.90	8.4			**8.65**
Nickel	mg/kg	200.7			11.5	10.4			**11.0**
Selenium	mg/kg	200.7			5.7	5.6			**5.63**
Silver	mg/kg	200.7			12.80	9.1			**10.95**
Zinc	mg/kg	200.7			953	930			**942**

Arsenic Cand Copper lead mercury Moly Nickel selenium Zink

		As	Cd	Cu	PB	Hg	Mo	Ni	Se	Zn	TKN	NO3-N	NH4-N	P	K	pH	TS %
	January	2.00	1.25	300	21.7	3.69	5.71	16.4	4.99	1100	59775	0.4	8895	14897	1994	8.03	24.65
	March	1.60	0.95	251	17.0	0.34	4.59	16.0	5.38	756	58111	0.9	9598	14287	1558	8.27	25.03
Liquid/Cake AVG Out	May	1.70	1.06	318	17.4	0.63	8.29	12.7	5.18	939	88304	1.1	44589	20006	5659	7.92	13.12
	July	1.9	1.24	331	16.8	0.61	8.06	11.1	5.06	1013	98098	0.5	45122	18605	5354	7.80	13.01
	September	1.9	1.21	434	16.1	0.86	7.75	14.4	4.14	1149	58156	1.70	8174	12876	1432	8.40	25.02
	November	1.50	1.34	328	16.9	0.76	7.43	12.9	3.67	1226	57786	2.0	8032	12575	1550	8.40	23.38
	Annual Mean	**1.77**	**1.17**	**327**	**17.64**	**1.15**	**6.97**	**13.9**	**4.74**	**1030**	**70038**	**1.09**	**20735**	**15541**	**2924**	**8.14**	**20.70**
VAR Average		#REF!				12.90											

Table 6: 2021 Digester Balance: In Versus Out

MONTH	MONTHLY TOTAL NPD GALLONS	MONTHLY TOTAL SPD GALLONS	TOTAL - RECEIVED AURORA	COMBINED TOTAL DIG. GALS	TOTAL BIOGRO GAL OUT	TOTAL CENT GAL OUT	TOTAL GALLONS OUT
Jan-21	1,101,728	1,662,835		2,764,563		3,876,690	3,876,690
Feb-21	986,400	1,532,941	24,000	2,543,341		3,096,460	3,096,460
Mar-21	1,167,263	1,829,589	12,000	3,008,852		3,669,700	3,669,700
Apr-21	1,268,049	1,830,738	49,000	3,147,787		3,652,760	3,652,760
May-21	1,358,549	2,040,480	60,000	3,249,287	156,000	3,810,350	3,966,350
Jun-21	1,271,584	1,782,033	60,000	3,113,617	708,000	2,563,740	3,271,740
Jul-21	1,272,985	1,912,380	48,000	3,233,365	222,000	3,023,770	3,245,770
Aug-21	1,140,443	1,698,519	30,000	2,868,962	120,000	3,338,930	3,458,930
Sep-21	1,214,722	1,774,904	24,000	3,013,626		3,846,024	3,846,024
Oct-21	1,168,848	1,750,312	24,000	2,943,160		2,406,899	2,406,899
Nov-21	1,362,123	2,052,759	12,000	3,426,882		3,140,212	3,140,212
Dec-21	1,277,284	1,922,716		3,200,000		3,442,059	3,442,059
MIN	**986,400**	**1,532,941**	**12,000**	**2,543,341**	**120,000**	**2,406,899**	**2,406,899**
MAX	**1,362,123**	**2,052,759**	**60,000**	**3,426,882**	**708,000**	**3,876,690**	**3,966,350**
AVG	**1,215,832**	**1,815,851**	**34,300**	**3,042,787**	**301,500**	**3,322,300**	**3,422,800**
TOTAL	**14,589,978**	**21,790,206**	**343,000**	**36,513,442**	**1,206,000**	**39,867,594**	**41,073,594**
% TOT. GL. OUT	**40.0%**	**59.7%**	**0.9%**	**% OF TOTAL GALLONS OUT**	**2.94%**	**97.06%**	**100.0%**

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

TABLE 7: 2021 BIOSOLIDS PRODUCTS HAULED				
MONTH	CENT. WET TONS	CENT. DRY TONS	LIQUID GALLONS	LIQUID DRY TONS
JAN				
FEB				
MAR				
APR				
MAY	582.00	146.61	156,000.00	15.09
JUN	1,045.00	263.24	708,000	68.49
JUL	2,784.00	701.29	222,000	21.48
AUG	2,843.00	716.15	120,000	11.61
SEP	3,569.00	899.03		
OCT	799.00	201.27		
NOV		0.00		
DEC		0.00		
TOTAL	**11,622.00**	**2,927.58**	**1,206,000.00**	**116.67**

TOT. DRY TONS	CENT. DRY TONS	LIQUID DRY TONS
3,044.26	**2,927.58**	**116.67**
% OF TOTAL DRY TONS	**96.17%**	**3.83%**

2021 Monthly % Total Solids		
MONTH	CENT	LIQ
JAN		
FEB		
MAR		
APR		
MAY	25.19%	2.32%
JUN	25.19%	2.32%
JUL	25.19%	2.32%
AUG	25.19%	2.32%
SEP	25.19%	
OCT	25.19%	
NOV		
DEC		

Source: Daily Data Entry Spreadsheet

NOTE:Used 25.19% for Cake % total solids and 2.32% for liquid total % hauled. These percentages is what was used on the field site application work sheets derived from Sept-Dec.2020 analysis and percentages to determine field applications for 2021

Table 8: 2021 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	
1/1/2021	3.8800	3456.8	$43,141	2.19%	84.7	$121.95	24.65%	91.00%	
2/1/2021	3.0965	2601.5	$32,467	2.27%	77.4	$111.50	24.78%	92.10%	
3/1/2021	3.6697	3243.5	$40,479	2.21%	83.6	$120.38	25.03%	89.00%	
4/1/2021	3.6500	3355.0	$41,870	2.07%	92.4	$133.06	24.80%	89.30%	
5/1/2021	3.7200	3511.0	$43,817	1.95%	98.5	$141.90	24.27%	89.80%	
6/1/2021	2.4600	2298.0	$28,679	1.83%	104.4	$150.38	23.17%	91.30%	**Poly Cost @ $12.48/gal**
7/1/2021	3.0200	2758.0	$34,420	1.93%	98.7	142.06	24.10%	90.60%	
8/1/2021	3.3400	2975.0	$37,128	1.99%	92.2	132.77	24.10%	90.20%	
9/1/2021	3.8500	3124.0	$38,988	2.05%	83.3	119.95	25.02%	91.10%	
10/1/2021	2.4100	2094.0	$26,133	2.04%	82.7	$119.04	24.68%	91.90%	
11/1/2021	3.1400	2704.0	$33,746	1.99%	90.3	$130.03	23.38%	92.60%	
12/1/2021	3.4400	2971.0	$37,078	1.94%	92.9	$133.78	22.73%	92.90%	
MIN	**2.41**	**2,094**	**$26,133**	**1.83%**	**77.4**	**$111.50**	**22.73%**	**89.00%**	
MAX	**3.88**	**3,511**	**$43,817**	**2.27%**	**104.4**	**$150.38**	**25.03%**	**92.90%**	
AVG	**3.31**	**2,924**	**$36,495**	**2.04%**	**90.1**	**$129.73**	**24.23%**	**90.98%**	
TOTAL	**39.68**	**35,092**	**$437,946**						

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: 2021 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	**106**	**1.10**	**116.65**	**107.04**	**11,371.28**	**5,177.96**	**1,945.88**
Dewatered Sites	**1141**	**2.69**	**2,922.77**	**104.36**	**101,230.30**	**76,037.50**	**8,282.95**
Remaining Staged at on site winter storage			636				
Totals & Averages	**1247**	**1.89**	**3675.42**	**105.70**	**112,601.58**	**81,215.46**	**10,228.83**

Source: Daily Data Entry Spreadsheet 3039.42

Table 9b: 2021 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)	05-24-21 to 07-09-2021	Western Oregon Hay/I	57	1.13	64.41	110.17	6,279.69	50.17	2,859.47	18.85	1,074.59	$6,435.02
2	D. Elam 1 (1_F)	06-15-21 to 06-28-2021	Western Oregon Hay/I	49	1.07	52.24	103.91	5,091.59	47.32	2,318.49	17.78	871.29	$7,919.24
Liquid Sites Totals and Averages				**Total**	**Average**	**Total**	**Average**	**Total**	**Average**	**Total**	**Average**	**Total**	**Total**
				106	**1.10**	**116.65**	**107.04**	**11,371.28**	**48.74**	**5,177.96**	**18.32**	**1,945.88**	**$14,354.26**

Table 9c: 2021 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
3	Elam/Cook	6/29/2021 to7/7/2021	Western Oregon Hay/I	78	2.91	226.98	114.71	8,947.38	86.18	6,721.65	9.34	728.61	$13,248.76
4	G, Rouse 1 (1 M)	5/17/2021 to 5/19/2021	Western Oregon Hay/I	25	2.51	62.75	99.00	2,475.00	74.37	1,859.29	8.06	201.54	$3,682.01
5	G. Rouse 2 (2_M)	6/21/2021 to 0 6-21-2021	Western Oregon Hay/I	7	3.07	21.49	121.15	848.05	91.01	637.09	12.19	85.30	$1,253.77
6	G. Rouse 3(3_M)	6/23/2021 to 6-25-2021	Western Oregon Hay	17	3.07	52.19	120.97	2,056.49	90.88	1,544.93	9.85	167.47	$2,957.24
7	G.Rouse 4 (4_J)	6-23-2021 to 6-21-2021	Western Oregon Hay/I	12	3.07	36.84	121.21	1,454.52	91.06	1,092.69	9.87	118.45	$1,140.57
8	G.Rouse 5(5_J)	06-07-2021 to 06-09-202	Western Oregon Hay/I	38	3.02	114.76	119.19	4,529.22	89.54	3,402.58	9.71	368.83	$4,620.30
9	W. Orton 1 (1_R)	07/08/2021 to 8/25/2021	Western Oregon Hay/I	60	2.53	151.80	99.67	5,980.20	74.88	4,492.50	8.12	486.98	$8,894.59
10	J. Gross 4 (4_A)	07/12/2021 to 07/21/2021	Annual Ryegrass	86	2.56	220.16	101.17	8,700.62	76.00	6,535.75	8.24	708.46	$12,933.47
11	J. Gross -Masson Field	07/21/2021 to 07/28/2021	Annual Ryegrass	59	2.53	149.27	99.76	5,885.84	74.94	4,421.55	8.12	479.29	$8,753.84
12	J. Gross -Talbot Field	07/13/2021to 07/22/2021	Annual Ryegrass	18	2.52	45.36	99.59	1,792.62	74.81	1,346.63	8.11	145.97	$2,666.23
13	McCormic -Dimond Hill	08/21/2021 to 08/25/2021	Annual Ryegrass	45	2.40	108.00	94.83	4,267.35	71.24	3,205.68	7.72	347.49	$6,357.85
14	McCormic - Substation	08/06/2021 to 08/21/2021	Perennial Ryegrass	158	2.50	395.00	98.56	15,572.48	74.04	11,698.70	8.03	1,268.12	$23,170.79
15	McCormic - Creek Bend	08/25/2021 to 09/01/2021	Perennial Ryegrass	96	2.39	229.44	94.22	9,045.12	70.78	6,795.04	7.67	736.57	$13,479.73
16	D. Eztel 4A (1_D)	05/26/2021 to 05/29/2021	Western Oregon Hay/I	33	2.54	83.82	100.24	3,307.92	75.30	2,484.96	8.16	269.36	$4,918.95
17	D. Eztel 1	09/24/2021 to 09/26/2021	Western Oregon Hay/I	60	2.32	139.20	91.72	5,503.20	68.91	4,134.30	7.47	448.15	$8,209.47
18	Riddle - Cooper Hollow	09/04/2021 to 09/20/2021	Annual Ryegrass	184	2.54	467.36	100.06	18,411.04	75.17	13,831.39	8.15	1,499.29	$27,380.73
19	D.Gray	09/21/2021 to 9/23/2021	Western Oregon Hay/I	25	2.51	62.75	98.13	2,453.25	73.31	1,832.77	8.92	223.07	$3,651.91
20	Manniing - Rock Hill	09/21/2021 to 10/07/2021	Annual Ryegrass	140	2.54	355.60	100.20	14,028.00	75.28	10,538.53	8.16	1,142.35	$20,861.18
Dewatered Biosolids Sites Totals and Averages				**Total**	**Average**	**Total**	**Average**	**Total**	**Average**	**Total**	**Average**	**Total**	**Total**
				1141	**2.69**	**2922.77**	**104.36**	**101,230.30**	**78.38**	**76,037.50**	**8.69**	**8,282.95**	**$168,181.42**

Section 6:
Application Site Reports

David Gray

FIELD IDENTIFICATION: D. Gray	
OWNER: JIMMY GROSS	
LOCATION: TOWNSHIP: T9S RANGE: R2W SECTION: 17	
START DATE: 9/21/2021	
STOP DATE: 9-23-2021	
CROP: Western Or Hay	
TOTAL ACREAGE:25	25

DEWATERED BIOSOLIDS APPLICATION RATE INFORMATION	
PERMITTED APPLICATION RATE (PAN POUNDS PER ACRE)	100
DRY TONS BIOSOLIDS PER ACRE	2.56
WET TONS BIOSOLIDS PER ACRE	10.31

TARGET APPLICATION RATE (PAN POUNDS PER ACRE)	100
DRY TONS BIOSOLIDS PER ACRE	2.56
WET TONS BIOSOLIDS PER ACRE	10.31
TOTAL WET TONS TO COMPLETE FIELD	257.64
DATE: Field Finished: 9-25-2021	**252.82**
TOTAL WET TONS REMAINING	4.82

FINAL APPLICATION RATE INFORMATION	
FINAL APPLICATION RATE (PAN POUNDS PER ACRE)	98.13
PAN (TOTAL POUNDS APPLIED)	2,453.28
PHOSPHORUS (TOTAL POUNDS APPLIED)	1,832.77
POTASSIUM (TOTAL POUNDS APPLIED)	223.07
TOTAL WET TONS APPLIED	**252.82**
TOTAL DRY TONS APPLIED	62.80
DRY TONS BIOSOLIDS PER ACRE	2.51
WET TONS BIOSOLIDS PER ACRE	10.11

BIOSOLIDS ANALYSIS INFORMATION	
2021 AVERAGED DATA (Ccnt)(Jan-Mar)	
TOTAL SOLIDS (MG/KG)*	24.84
ORGANIC NITROGEN (MG/KG)	49696
INORGANIC NITROGEN (NH4+N03) (MG/KG)	9247
TKN (MG/KG)	58943
PHOSPHORUS (MG/KG)	14592
POTASSIUM (MG/KG)	1776
pH	6.96
ARSENIC (MG/KG)	**1.8**
CADMIUM (MG/KG)	**1.1**
CHROMIUM (MG/KG)	34.00
COPPER (MG/KG)	276
LEAD (MG/KG)	19.40
MERCURY (MG/KG)	2.02
MOLYBDENUM (MG/KG)	5.15
NICKEL (MG/KG)	16.20
SELENIUM (MG/KG)	5.19
SILVER (MG/KG)	6.10
ZINC (MG/KG)	928
1ST YEAR MINERALIZATION RATE	0.30
LIQUID INORGANIC NITROGEN AVAILABILITY FACTOR	0.50
POUNDS OF ORG N AVAILABLE/DRY TON APPLIED	29.82
POUNDS OF INORG N AVAILABLE/DRY TON APPLIED	9.25
POUNDS OF (P.A.N.)/.DRY TON	39.06

GRAY APPLICATION SITE WORKSHEET: 2021

Application Dates:

Farm & Field Number: D. Gray FIELD

Biosolids Product: Centrifuge Cake

DEQ Maximum Nitrogen Application Rate: 100 Pounds per Acre/10.06 Wet Tons per acre

Total Wet Tons needed =252

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.

SITE:	Gray Farm	TOTAL ACRES:	25.00
START DATE	9/23/2021		
ENDING DATE:	9/24/2021		
TOTAL TONS:	256.94		
% SOLIDS:	25.00%	BULK DENSITY (LB/YD3):	1215.00

DATE	UNIT #1 SPDR LDS	DAILY SPDR LDS	TOTAL SPDR LDS
9/23/2021	12	12.00	12.00
9/24/2021	16	16.00	28.00

ELAM-BRICKER

FIELD IDENTIFICATION: ELAM-BRICICER (1_G)

LOCATION; TOWNSHIP: T8S RANGE: R2W SECTION: 22
START DATE: 05-24-2021
STOP DATE: 07-09-2021
CROP: Western Oregon Hay

TOTAL ACREAGE:	57

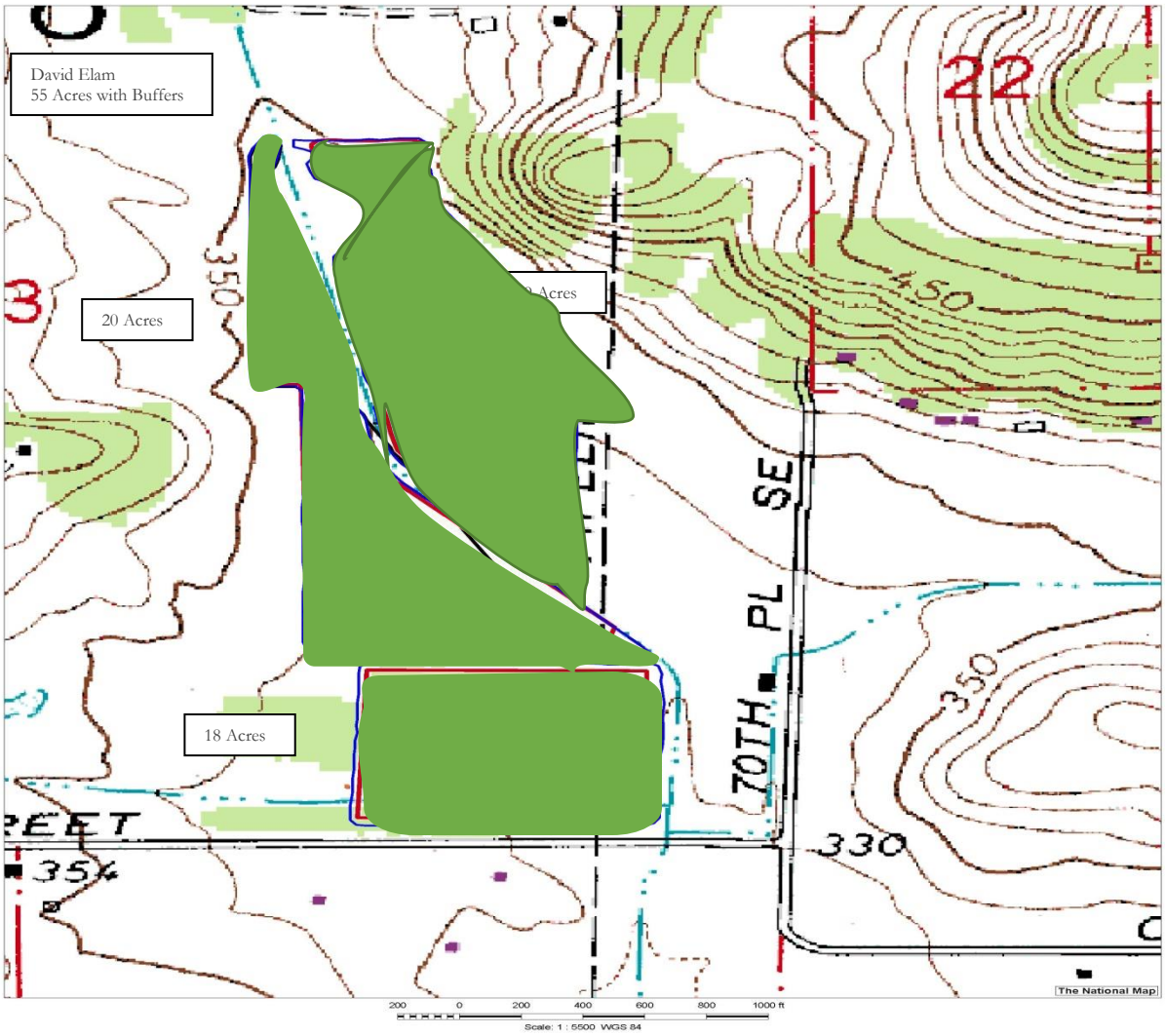
BIOSOLIDS LIQUID APPLICATION RATE INFORMATION	
PERMITTED APPLICATION RATE (PAN POUNDS PER ACRE)	120
DRY TONS BIOSOLIDS PER ACRE	1.23
GALLONS BIOSOLIDS PER ACRE	12,737
TANKERS PER ACRE	2.12
ACTUAL DISTANCE IN FEET (L-L 1150 RPM 37 FEET WIDE = 600 ft)	555

TARGET APPLICATION RATE (PAN POUNDS PER ACRE)	120
DRY TONS BIOSOLIDS PER ACRE	1.23
GALLONS BIOSOLIDS PER ACRE	12,737
TANKERS PER ACRE	2.12
TRUCK APPLICATION DISTANCE IN FEET (34 FEET WIDE)	604
TOTAL NUMBER OF TANKERS TO COMPLETE FIELD	121
DATE: Field Finished: 07/09/2021	III
NUMBER OF TANKERS REMAINING FOR TARGET APPLICATION	10

FINAL APPLICATION RATE	
PAN POUNDS PER ACRE	110.17
PAN (TOTAL POUNDS APPLIED)	6,279.84
PHOSPHORUS (TOTAL POUNDS APPLIED)	2,859.47
POTASSIUM (TOTAL POUNDS APPLIED)	1,074.59
TOTAL GALLONS TO FIELD	666,000
DRY TONS PER SITE	64.43
DRY TONS PER ACRE	1.13

BIOSOLIDS ANALYSIS INFORMATION	
2020 AVERAGED DATA (LIQUID)	
TOTAL SOLIDS (MG/KG)	2.32
ORGANIC NITROGEN (MG/KG)	42,689
INORGANIC NITROGEN (NH4) (MG/KG)	71,852
TKN (MG/KG)	114,541
PHOSPHOURUS (MG/KG)	22,190
POTASSIUM (MG/KG)	8,339
pH	7.35
ARSENIC (MG/KG)	9.60
CADMIUM (MG/KG)	1.49
CHROMIUM (MG/KG)	47.40
COPPER (MG/KG)	308
LEAD (MG/KG)	16.50
MERCURY (MG/KG)	0.68
MOLYBDENUM (MG/KG)	5.76
NICKEL (MG/KG)	13.90
SELENIUM (MG/KG)	8.5
SILVER (MG/KG)	3.3
ZINC (MG/KG)	976
1ST YEAR MINERALIZATION RATE	0.30
LIQUID INORGANIC NITROGEN AVAILABILITY FACTOR	0.50
POUNDS OF ORG N AVAILABLE/DRY TON APPLIED	25.61
POUNDS OF INORG N AVAILABLE/DRY TON APPLIED	71.85
POUNDS OF (P.A.N.)/. DRY TON	97.47

2021
ELAM-BRICKER
CAKE DAILY APPLICATION MAP



Date	Number of Tankers	Gallons Applied
5-24-21	6	36,000
5-25-21	7	42,000
5-26-21	3	18,000
5-27-21	5	30,000
5-31.-21	5	30,000
6-1-21	9	54,000
6-2-21	11	66,000
6-3-21	13	78,000
6-4-21	7	42,000
6-5-21	**4**	**24,000**
6-7-21	**6**	**36,000**
6-10-21	**11**	**66,000**
6-11-21	**7**	**42,000**
6-12-21	**4**	**24,000**
6-28-21	**1**	**6,000**
6-29-21	**2**	**12,000**

7-8-21	**9**	**54,000**
7-9-21	**1**	**6,000**
Total		**666,000 gals**

D. ELAM 1

FIELD IDENTIFICATION: D. ELAM 1 (1_F)	
OWNER: DAVID ELAM	
LOCATION; TOWNSHIP: T8S RANGE: R2W SECTION: 21	
START DATE: 6/15/2021	
STOP DATE: 6/28/2021	
CROP: Western Oregon Hay	
TOTAL ACREAGE:	49

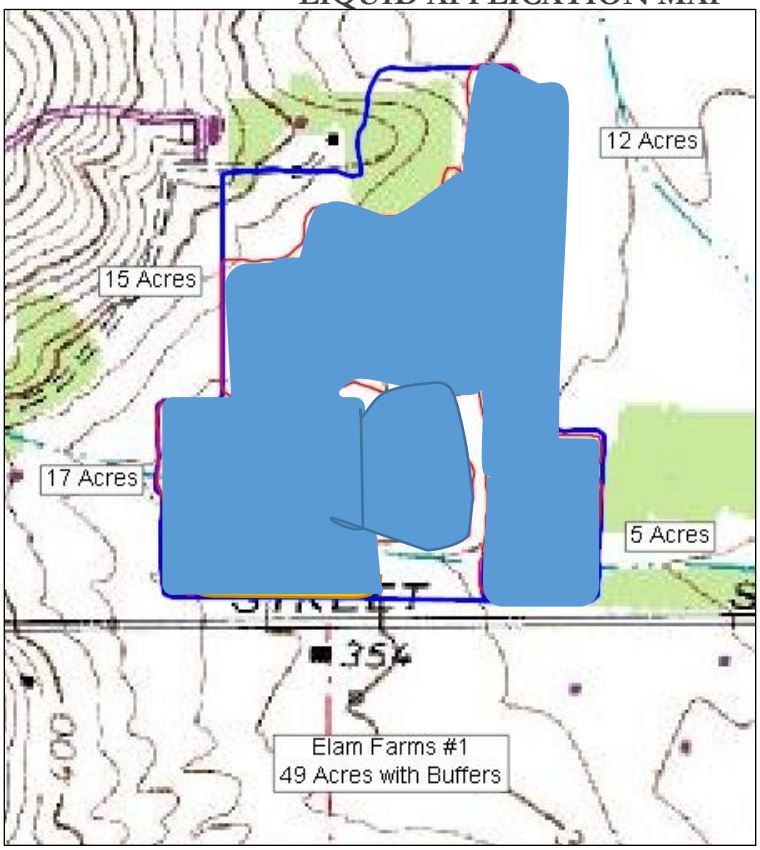
BIOSOLIDS LIQUID APPLICATION RATE INFORMATION	
PERMITTED APPLICATION RATE (PAN POUNDS PER ACRE)	120
DRY TONS BIOSOLIDS PER ACRE	1.23
GALLONS BIOSOLIDS PER ACRE	12,737
TANKERS PER ACRE	2.12
ACTUAL DISTANCE IN FEET (L-L 1150 RPM 37 FEET WIDE = 600 ft)	555

TARGET APPLICATION RATE (PAN POUNDS PER ACRE)	120
DRY TONS BIOSOLIDS PER ACRE	1.23
GALLONS BIOSOLIDS PER ACRE	12,737
TANKERS PER ACRE	2.12
TRUCK APPLICATION DISTANCE IN FEET (34 FEET WIDE)	604
TOTAL NUMBER OF TANKERS TO COMPLETE FIELD	104
DATE: Field Finished 8-6-2020	**90**
NUMBER OF TANKERS REMAINING FOR TARGET APPLICATION	14

FINAL APPLICATION RATE	
PAN POUNDS PER ACRE	103.91
PAN (TOTAL POUNDS APPLIED)	5,091.76
PHOSPHORUS (TOTAL POUNDS APPLIED)	2,318.49
POTASSIUM (TOTAL POUNDS APPLIED)	871.29
TOTAL GALLONS TO FIELD	**540,000**
DRY TONS PER SITE	52.24
DRY TONS PER ACRE	1.07

BIOSOLIDS ANALYSIS INFORMATION	
2020 AVERAGED DATA (LIQUID)	
TOTAL SOLIDS (MG/KG)	2.32
ORGANIC NITROGEN (MG/KG)	42,689
INORGANIC NITROGEN (NH4) (MG/KG)	71,852
TKN (MG/KG)	114,541
PHOSPHOURUS (MG/KG)	22,190
POTASSIUM (MG/KG)	8,339
pH	7.35
ARSENIC (MG/KG)	9.60
CADMIUM (MG/KG)	1.49
CHROMIUM (MG/KG)	47.40
COPPER (MG/KG)	308
LEAD (MG/KG)	16.50
MERCURY (MG/KG)	0.68
MOLYBDENUM (MG/KG)	5.76
NICKEL (MG/KG)	13.90
SELENIUM (MG/KG)	8.5
SILVER (MG/KG)	3.3
ZINC (MG/KG)	976
1ST YEAR MINERALIZATION RATE	0.30
LIQUID INORGANIC NITROGEN AVAILABILITY FACTOR	0.50
POUNDS OF ORG N AVAILABLE/DRY TON APPLIED	25.61
POUNDS OF INORG N AVAILABLE/DRY TON APPLIED	71.85
POUNDS OF (P.A.N.)/.DRY TON	97.47

2021
D. ELAM 1
LIQUID APPLICATION MAP



2021 Daily Liquid Application

Date	Number of Tankers	Gallons Applied
6-15-21	2	12,000
6-16-21	2	12,000
16-17-21	12	72,000
6-18-21	4	24,000
6-19-21	4	24,000
6-21-21	1	6,000
6-22--21	1	6,000
6-24-21	4	24,000
6-25-21	5	30000
6-26-21	4	24,000
6-28-21	4	24,000
7-9-21	5	30000
7-10-21	5	30,000
7-12-21	2	12,000
7-24-21	3	18,000
7--26-21	4	24,000
7-27-21	**5**	**30,000**
7-28-21	**3**	**18,000**
8-23-21	**8**	**48,000**
8-24-21	**6**	**36,000**
8-30-21	**6**	**36,000**
Total		**540,000 gals**

D. Elam - Cook

FIELD IDENTIFICATION: D. ELAM Cook Field(1_A)	
OWNER: DAVID ELAM	
LOCATION; TOWNSHIP: T9S RANGE: R2W SECTION: 9	
START DATE: 6/29/21	
STOP DATE: 7-7-2021	
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	12.07

TARGET APPLICATION RATE (PAN POUNDS PER ACRE)	120
DRY TONS BIOSOLIDS PER ACRE	3.04
WET TONS BIOSOLIDS PER ACRE	12.07
TOTAL WET TONS TO COMPLETE FIELD	941.43
DATE: Field Finished: 7-7-20211	**899.96**
TOTAL WET TONS REMAINING	41.47

FINAL APPLICATION RATE INFORMATION	
FINAL APPLICATION RATE (PAN POUNDS PER ACRE)	114.71
PAN (TOTAL POUNDS APPLIED)	8,947.66
PHOSPHORUS (TOTAL POUNDS APPLIED)	6,721.65
POTASSIUM (TOTAL POUNDS APPLIED)	728.61
TOTAL WET TONS APPLIED	**899.96**
TOTAL DRY TONS APPLIED	226.70
DRY TONS BIOSOLIDS PER ACRE	2.91
WET TONS BIOSOLIDS PER ACRE	11.54

BIOSOLIDS ANALYSIS INFORMATION	
2020 AVERAGED DATA (Cent)(September-Nov)	
TOTAL SOLIDS (MG/KG)	25.19
ORGANIC NITROGEN (MG/KG)	52022
INORGANIC NITROGEN (NH4) (MG/KG)	8256
TKN (MG/KG)	60278
PHOSPHORUS (MG/KG)	14825
POTASSIUM (MG/KG)	1607
pH	8.27
ARSENIC (MG/KG)	6.8
CADMIUM (MG/KG)	1.35
CHROMIUM (MG/KG)	44
COPPER (MG/KG)	353
LEAD (MG/KG)	18.1
MERCURY (MG/KG)	0.61
MOLYBDENUM (MG/KG)	6.93
NICKEL (MG/KG)	18.2
SELENIUM (MG/KG)	4.01
SILVER (MG/KG)	4.0
ZINC (MG/KG)	1016
1ST YEAR MINERALIZATION RATE	0.30
LIQUID INORGANIC NITROGEN AVAILABILITY FACTOR	0.50
POUNDS OF ORG N AVAILABLE/DRY TON APPLIED	31.21
POUNDS OF INORG N AVAILABLE/DRY TON APPLIED	8.26
POUNDS OF (P.A.N.)/.DRY TON	39.47

APPLICATION SITE WORKSHEET: 2021

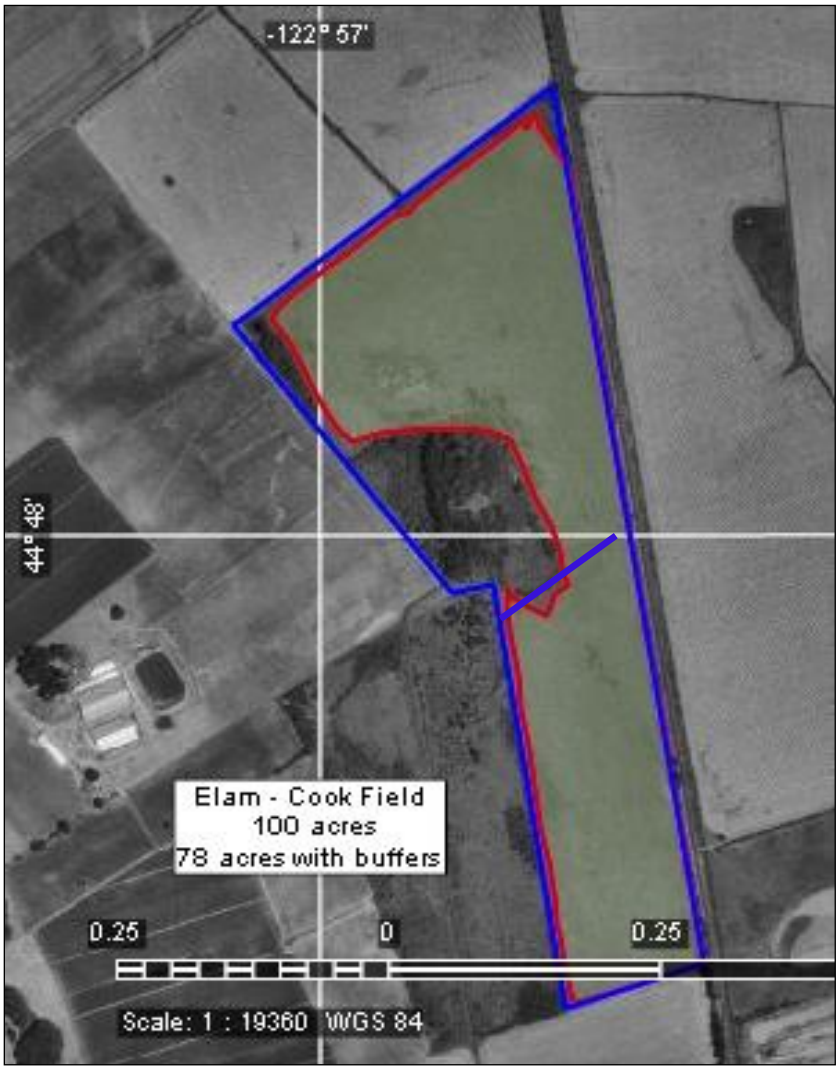
Application Dates: July 16th – 21st

Soil Sample Collected: May'21 Domestic Well Sample Collected: No

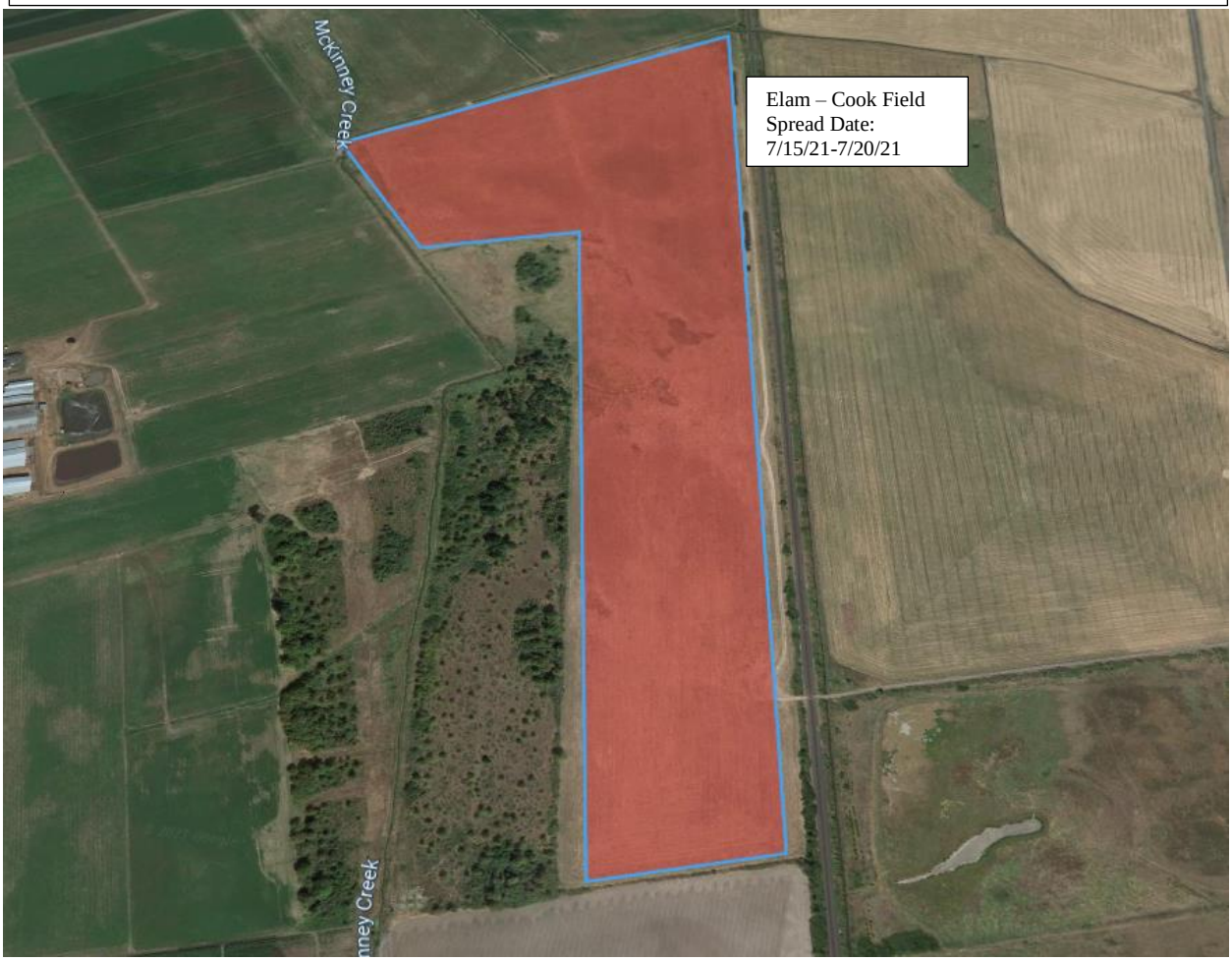
Site and Application Identification: Elam-Cook Field (1_A)
Biosolids Product: BFP Cake
DEQ Nitrogen Application Authorization: 120 lbs PAN per Acre (Western Oregon Hay/Pasture)
Acreage: Total of 78 Acres, Application Rate is 12.07 WT/Acre

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 Completion Map



SITE:	Elam-Cook	TOTAL ACRES:	78.00
START DATE	7/16/2021		
ENDING DATE:	7/21/2021		
TOTAL TONS	900		
% SOLIDS:	25.00%	BULK DENSITY (LB/YD3):	1215.00
	UNIT #1	DAILY	TOTAL
DATE	SPDR LDS	SPDR LDS	SPDR LDS
7/16/2021	12	12.00	12.00
7/19/2021	26	26.00	38.00
7/20/2021	28	28.00	66.00
7/21/2021	15	15.00	81.00

Soil Monitoring Report (0-12inch) - 2021

Site: Dave Elam
Field: D. Elam 1

Sample Date: 5/13/2021

Parameter	Result	Units
Nitrate-Nitrogen (NO3-N)	10	mg/kg
Available Phosphorus (P)	64	mg/kg
Total Potassium (K)	163	mg/kg
Sulfate-Sulfur (SO4-S)	10	mg/kg
Organic Matter	5.6	%
pH	5.3	-

Soil Monitoring Report (0-12inch) - 2021

Site: Dave Elam
Field: Elam /cook

Sample Date: 5/13/2021

Parameter	Result	Units
Nitrate-Nitrogen (NO3-N)	7	mg/kg
Available Phosphorus (P)	42	mg/kg
Total Potassium (K)	48	mg/kg
Sulfate-Sulfur (SO4-S)	8	mg/kg
Organic Matter	4.2	%
pH	5.5	-

Soil Monitoring Report (0 - 12inch) - 2021

Site: Dave Elam
Field: Elam-Bricker

Sample Date: 5/13/2021

Parameter	Result	Units
Nitrate-Nitrogen (NO3-N)	7	mg/kg
Available Phosphorus (P)	64	mg/kg
Total Potassium (K)	55	mg/kg
Sulfate-Sulfur (SO4-S)	20	mg/kg
Organic Matter	5.7	%
pH	5.3	-

Etzel Farms - Etzel 4A

FIELD IDENTIFICATION: Etzel 4A (1_D)	
OWNER: Dave Etzel	
LOCATION: TOWNSHIP: T9S RANGE: R2W SECTION: 17	
START DATE: 5/26/2021	
STOP DATE: 5/29/2021	
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	2.53
WET TONS BIOSOLIDS PER ACRE	10.06

TARGET APPLICATION RATE (PAN POUNDS PER ACRE)	100
DRY TONS BIOSOLIDS PER ACRE	2.53
WET TONS BIOSOLIDS PER ACRE	10.06
TOTAL WET TONS TO COMPLETE FIELD	331.92
DATE: As of 5/29/2021	**332.71**
TOTAL WET TONS REMAINING	(0.79)

FINAL APPLICATION RATE INFORMATION	
FINAL APPLICATION RATE (PAN POUNDS PER ACRE)	100.24
PAN (TOTAL POUNDS APPLIED)	3,307.90
PHOSPHORUS (TOTAL POUNDS APPLIED)	2,484.96
POTASSIUM (TOTAL POUNDS APPLIED)	269.36
TOTAL WET TONS APPLIED	**332.71**
TOTAL DRY TONS APPLIED	83.81
DRY TONS BIOSOLIDS PER ACRE	2.54
WET TONS BIOSOLIDS PER ACRE	10.08

BIOSOLIDS ANALYSIS INFORMATION	
Sept-Nov 2020 DATA AVERAGES (CENT)	
TOTAL SOLIDS (MG/KG)	25.19
ORGANIC NITROGEN (MG/KG)	52022
INORGANIC NITROGEN (NH4) (MG/KG)	8256
TKN (MG/KG)	60278
PHOSPHORUS (MG/KG)	14825
POTASSIUM (MG/KG)	1607
pH	8.27
ARSENIC (MG/KG)	6.8
CADMIUM (MG/KG)	1.35
CHROMIUM (MG/KG)	44
COPPER (MG/KG)	353
LEAD (MG/KG)	18.1
MERCURY (MG/KG)	0.61
MOLYBDENUM (MG/KG)	6.93
NICKEL (MG/KG)	18.2
SELENIUM (MG/KG)	4.01
SILVER (MG/KG)	4.0
ZINC (MG/KG)	1016
1ST YEAR MINERALIZATION RATE	0.30
LIQUID INORGANIC NITROGEN AVAILABILITY FACTOR	0.50
POUNDS OF ORG N AVAILABLE/DRY TON APPLIED	31.21
POUNDS OF INORG N AVAILABLE/DRY TON APPLIED	8.26
POUNDS OF (P.A.N.)/.DRY TON	39.47

APPLICATION SITE WORKSHEET: 2021

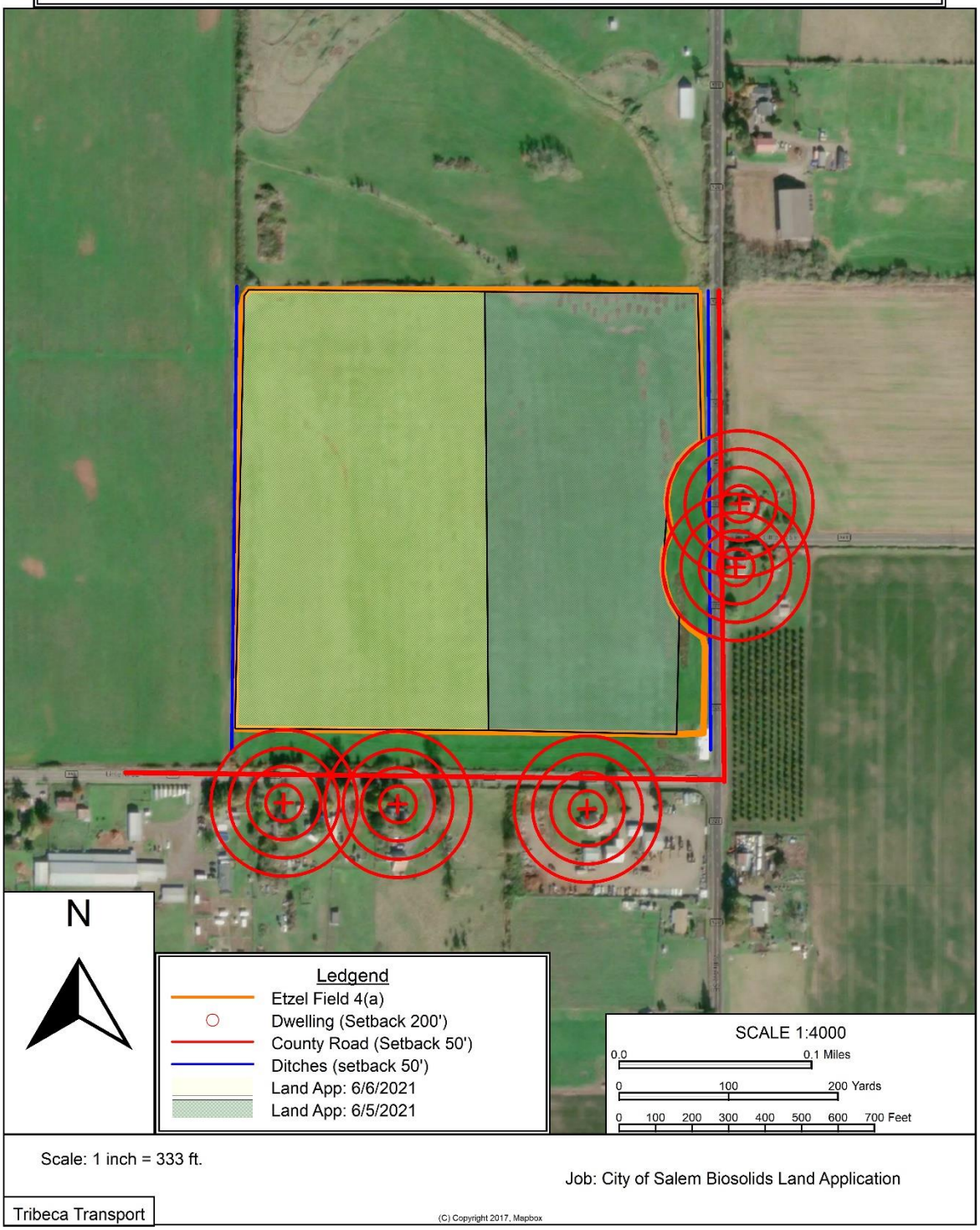
Application Dates: June 2021

Soil Sample Collected:	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. Application Rate at 10.02 Wet Tons/ 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.

Etzel Field 4(A) Completion Map

Etzel Field 4A



Scale: 1 inch = 333 ft.

Job: City of Salem Biosolids Land Application

Tribeca Transport

City of Salem Spreader Track Sheet - Field: Etzel 4(A)

Total Tons Delivered: 332.7 WT

Estimated Loads based on 15 tons per spreader load:

Date	Operator	Loads Spread	EST tons spread
6/5/2021	MK	11	170.5
6/6/2021	MK	11	162.2
		Total Tons Spread	332.70

Etzel Farms - Etzel 1

FIELD IDENTIFICATION: Etzel 1 (1_D)	
OWNER: Dave Etzel	
LOCATION: TOWNSHIP: T9S RANGE: R2W SECTION: 17	
START DATE: 9/24/2021	
STOP DATE: 9/26/2021	
CROP: Western Oregon Hay	
TOTAL ACREAGE:	60

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	10.06

TARGET APPLICATION RATE (PAN POUNDS PER ACRE)	100
DRY TONS BIOSOLIDS PER ACRE	2.53
WET TONS BIOSOLIDS PER ACRE	10.06
TOTAL WET TONS TO COMPLETE FIELD	603.48
DATE: As of 8/12/2020	**553.54**
TOTAL WET TONS REMAINING	49.94

FINAL APPLICATION RATE INFORMATION	
FINAL APPLICATION RATE (PAN POUNDS PER ACRE)	91.72
PAN (TOTAL POUNDS APPLIED)	5,503.46
PHOSPHORUS (TOTAL POUNDS APPLIED)	4,134.30
POTASSIUM (TOTAL POUNDS APPLIED)	448.15
TOTAL WET TONS APPLIED	**553.54**
TOTAL DRY TONS APPLIED	139.44
DRY TONS BIOSOLIDS PER ACRE	2.32
WET TONS BIOSOLIDS PER ACRE	9.23

BIOSOLIDS ANALYSIS INFORMATION	
Sept-Nov 2020 DATA AVERAGES (CENT)	
TOTAL SOLIDS (MG/KG)	25.19
ORGANIC NITROGEN (MG/KG)	52022
INORGANIC NITROGEN (NH4) (MG/KG)	8256
TKN (MG/KG)	60278
PHOSPHORUS (MG/KG)	14825
POTASSIUM (MG/KG)	1607
pH	8.27
ARSENIC (MG/KG)	6.8
CADMIUM (MG/KG)	1.35
CHROMIUM (MG/KG)	44
COPPER (MG/KG)	353
LEAD (MG/KG)	18.1
MERCURY (MG/KG)	0.61
MOLYBDENUM (MG/KG)	6.93
NICKEL (MG/KG)	18.2
SELENIUM (MG/KG)	4.01
SILVER (MG/KG)	4.0
ZINC (MG/KG)	1016
1ST YEAR MINERALIZATION RATE	0.30
LIQUID INORGANIC NITROGEN AVAILABILITY FACTOR	0.50
POUNDS OF ORG N AVAILABLE/DRY TON APPLIED	31.21
POUNDS OF INORG N AVAILABLE/DRY TON APPLIED	8.26
POUNDS OF (P.A.N.)/.DRY TON	39.47

Directions to Field: Etzel 1 Field

East on Lockhaven, South on I-5, Take Kubler exit 252. Turn left on Kubler Blvd.. Turn Right onto Turner Rd. Continue until into Turner onto 3rd St. Turn Left onto Denver St. Continue onto Marion Rd. Continue straight onto Mill Creek Rd. Turn right on 70th and Continue on 70th Ave to little Rd. Turn left onto Little Rd. Continue on Little Rd through left curve and at the right-hand curve go straight onto the field entrance.

This field is 50 acres that will be applied on this year

Application Rate is 10.06 wet tons/acre

Wet Tons needed = 500 wet tons

SITE:	Etzel - Little Rd	TOTAL ACRES:	65.00
START DATE	9/30/2021		
ENDING DATE:	10/4/2021		
TOTAL TONS:	553.54		
% SOLIDS:	25.00%	BULK DENSITY (LB/YD3):	1215.00

DATE	UNIT #1 SPDR LDS	DAILY SPDR LDS	TOTAL SPDR LDS
9/30/2021	9	9.00	9.00
10/1/2021	21	21.00	30.00
10/2/2021	15	15.00	45.00
10/4/2021	13	13.00	58.00

Soil Monitoring Report - 2021

Site:	Dave Etzel		
Field:	Etzel 4A	30 acres	soil depth 0-12"
Sample Date:	5/13/2021		

Parameter	Result	Units
Nitrate-Nitrogen (NO3-N)	5	mg/kg
Available Phosphorus (P)	163	mg/kg
Total Potassium (K)	139	mg/kg
Sulfate-Sulfur (SO4-S)	25	mg/kg
Organic Matter	5.9	%
pH	5.4	-

Jimmy Gross - J. Gross Field 4 North Field (CENT)

FIELD IDENTIFICATION: J. GROSS 4 (4_C)	
OWNER: Jimmy Gross	
LOCATION; TOWNSHIP: T8S RANGE: R2W SECTION: 22	
START DATE: 7/12/2021	
STOP DATE: July 21, 2021	
CROP: Perennial Ryegrass	
TOTAL ACREAGE:	86

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	10.06

TARGET APPLICATION RATE (PAN POUNDS PER ACRE)	100
DRY TONS BIOSOLIDS PER ACRE	2.53
WET TONS BIOSOLIDS PER ACRE	10.06
TOTAL WET TONS TO COMPLETE FIELD	864.99
DATE: Field Finished: 7/21/2021	**875.07**
TOTAL WET TONS REMAINING	(10.08)

FINAL APPLICATION RATE INFORMATION	
FINAL APPLICATION RATE (PAN POUNDS PER ACRE)	101.17
PAN (TOTAL POUNDS APPLIED)	8,700.20
PHOSPHORUS (TOTAL POUNDS APPLIED)	6,535.75
POTASSIUM (TOTAL POUNDS APPLIED)	708.46
TOTAL WET TONS APPLIED	**875.07**
TOTAL DRY TONS APPLIED	220.43
DRY TONS BIOSOLIDS PER ACRE	2.56
WET TONS BIOSOLIDS PER ACRE	10.18

BIOSOLIDS ANALYSIS INFORMATION	
2020 AVERAGED DATA (Cent)(Sept-Nov)	
TOTAL SOLIDS (MG/KG)*	25.19
ORGANIC NITROGEN (MG/KG)	52022
INORGANIC NITROGEN (NH4+NO3) (MG/KG)	8256
TKN (MG/KG)	60278
PHOSPHORUS (MG/KG)	14825
POTASSIUM (MG/KG)	1607
pH	8.27
ARSENIC (MG/KG)	6.8
CADMIUM (MG/KG)	1.35
CHROMIUM (MG/KG)	44
COPPER (MG/KG)	353
LEAD (MG/KG)	18.1
MERCURY (MG/KG)	0.61
MOLYBDENUM (MG/KG)	6.93
NICKEL (MG/KG)	18.2
SELENIUM (MG/KG)	4.01
SILVER (MG/KG)	4.0
ZINC (MG/KG)	1016
1ST YEAR MINERALIZATION RATE	0.30
LIQUID INORGANIC NITROGEN AVAILABILITY FACTOR	0.50
POUNDS OF ORG N AVAILABLE/DRY TON APPLIED	31.21
POUNDS OF INORG N AVAILABLE/DRY TON APPLIED	8.26
POUNDS OF (P.A.N.)/.DRY TON	39.47

APPLICATION SITE WORKSHEET: 2021

Application Dates: July 2021

Soil Sample Collected: May 21

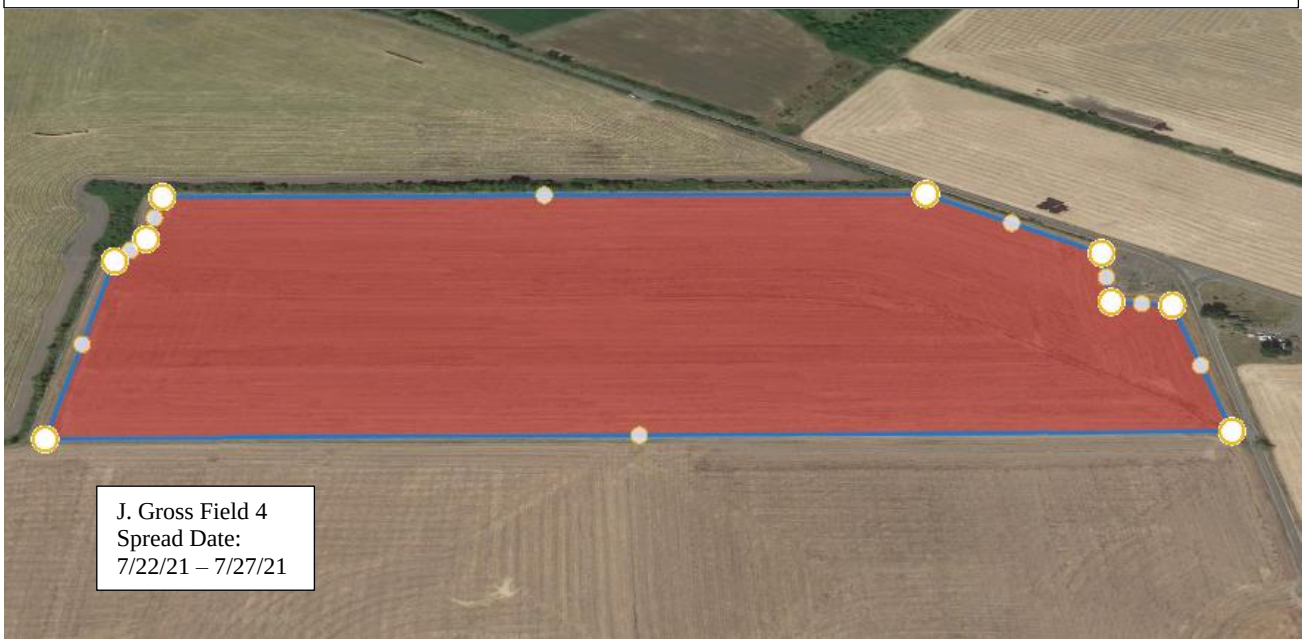
Domestic Well Sample Collected: N/A

Farm & Field Number: J. Gross 4
Biosolids Product: Cake
DEQ Maximum Nitrogen Application Rate: 120 Pounds per Acre.
Application Rate = 10.06 WT/Acre
Acreage: 86 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. Go past the Gross Farm Shops, turn left into field, just opposite a cottonwood tree on right side of the road.

Field Input and Recommendations:
50 foot buffer at roadside ditches.

J. Gross Field 4 Completion Map



SITE:	J. Gross 4	TOTAL ACRES:	86.00
START DATE	7/22/2021		
ENDING DATE:	7/27/2021		
TOTAL TONS	875.1		
% SOLIDS:	25.00%	BULK DENSITY (LB/YD3):	1215.00
	UNIT #1	DAILY	TOTAL
DATE	SPDR LDS	SPDR LDS	SPDR LDS
7/22/2021	17	17.00	17.00
7/23/2021	30	30.00	47.00
7/26/2021	30	30.00	77.00
7/27/2021	3	3.00	80.00

Jimmy Gross - J. Gross Mason Field (Cent)

FIELD IDENTIFICATION: J. GROSS Masson Field	
OWNER: Jimmy GROSS	
LOCATION: TOWNSHIP: T9S RANGE: R2W SECTION: 32	
START DATE: 7/21/2021	
STOP DATE: 7/282021	
CROP: Perennial Ryegrass	
TOTAL ACREAGE:	59

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	10.06

TARGET APPLICATION RATE (PAN POUNDS PER ACRE)	100
DRY TONS BIOSOLIDS PER ACRE	2.53
WET TONS BIOSOLIDS PER ACRE	10.06
TOTAL WET TONS TO COMPLETE FIELD	593.42
DATE: Field Finished: 7-28-2021	**592.00**
TOTAL WET TONS REMAINING	1.42

FINAL APPLICATION RATE INFORMATION	
FINAL APPLICATION RATE (PAN POUNDS PER ACRE)	99.76
PAN (TOTAL POUNDS APPLIED)	5,885.84
PHOSPHORUS (TOTAL POUNDS APPLIED)	4,421.55
POTASSIUM (TOTAL POUNDS APPLIED)	479.29
TOTAL WET TONS APPLIED	**592.00**
TOTAL DRY TONS APPLIED	149.12
DRY TONS BIOSOLIDS PER ACRE	2.53
WET TONS BIOSOLIDS PER ACRE	10.03

BIOSOLIDS ANALYSIS INFORMATION	
2020 AVERAGED DATA (Cent)(Sept-Nov)	
TOTAL SOLIDS (MG/KG)*	25.19
ORGANIC NITROGEN (MG/KG)	52022
INORGANIC NITROGEN (NH4+NO3) (MG/KG)	8256
TKN (MG/KG)	60278
PHOSPHORUS (MG/KG)	14825
POTASSIUM (MG/KG)	1607
pH	8.27
ARSENIC (MG/KG)	6.8
CADMIUM (MG/KG)	1.35
CHROMIUM (MG/KG)	44
COPPER (MG/KG)	353
LEAD (MG/KG)	18.1
MERCURY (MG/KG)	0.61
MOLYBDENUM (MG/KG)	6.93
NICKEL (MG/KG)	18.2
SELENIUM (MG/KG)	4.01
SILVER (MG/KG)	4.0
ZINC (MG/KG)	1016
1ST YEAR MINERALIZATION RATE	0.30
LIQUID INORGANIC NITROGEN AVAILABILITY FACTOR	0.50
POUNDS OF ORG N AVAILABLE/DRY TON APPLIED	31.21
POUNDS OF INORG N AVAILABLE/DRY TON APPLIED	8.26
POUNDS OF (P.A.N.)/.DRY TON	39.47

APPLICATION SITE WORKSHEET: 2021

Application Dates: July 2021

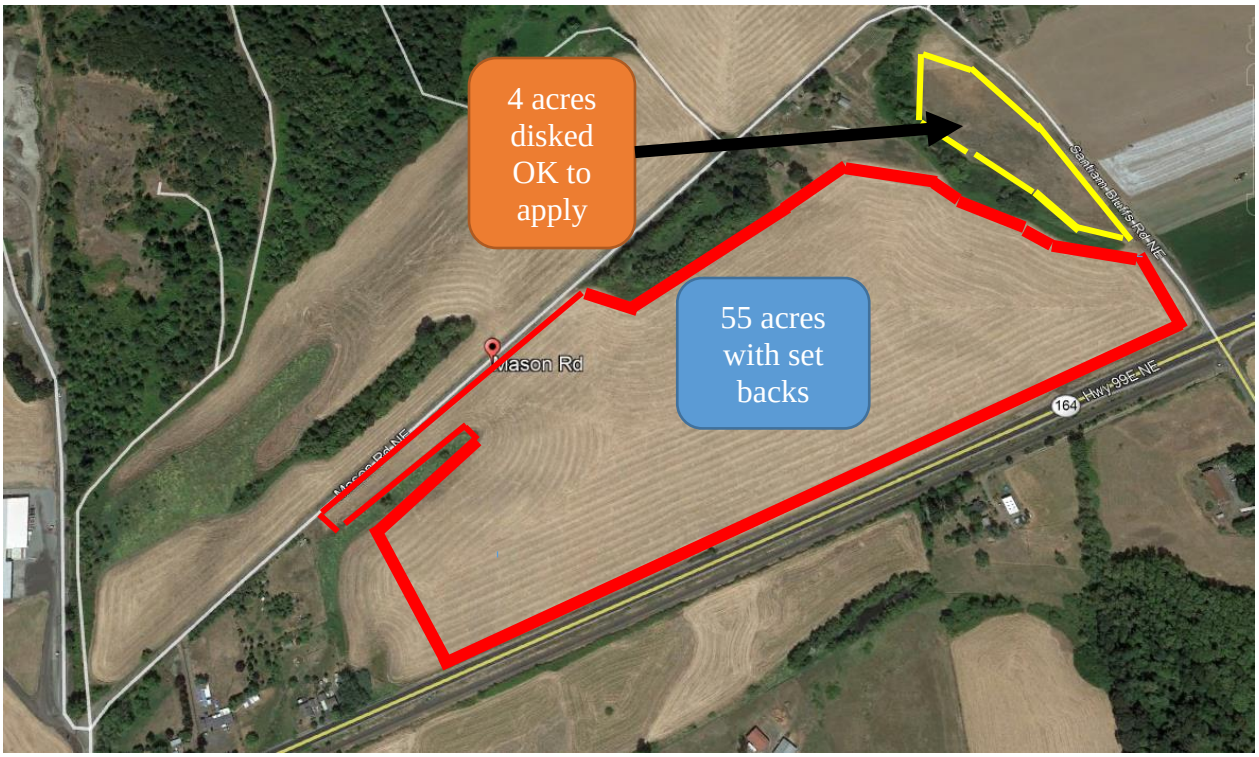
Soil Sample Collected: May 21

Domestic Well Sample Collected: N/A

Farm & Field Number: J. Gross Mason Field
Biosolids Product: Centrifuge Cake
DEQ Maximum Nitrogen Application Rate: 100 Pounds per Acre.
Application Rate =10.06 WT/Acre
Total tonnage on field =594 wet tons
Acreage: 59 Acres with setbacks
Distance to Field: 26 miles

East on Lockhaven, South on I-5 (20.0 miles) to Exit 239 (Toward Dever-Conner.). Turn left on Dever-Conner Rd NE. Continue onto Santiam Bluffs Rd. NE Turn Right onto Mason Rd. In 0.4-mile, field entrance will be on the left.

Field Input and Recommendations:
50-foot buffer at roadside ditches.
200 feet from wells and residences



J. Gross Mason Field Completion Map

SITE:	Mason	TOTAL ACRES:		59.00
START DATE	7/29/21			
ENDING DATE:	8/2/21			
TOTAL TONS	592			
% SOLIDS:	25.00%	BULK DENSITY (LB/YD3):		1215.00
	UNIT #1	DAILY	TOTAL	DAILY DT
DATE	SPDR LDS	SPDR LDS	SPDR LDS	SPREAD
7/29/2021	18	18.00	18.00	54.00
7/30/2021	10	10.00	28.00	30.00
8/2/2021	21	21.00	49.00	63.00

Jimmy Gross - J. Gross Talbot Field (CENT)

FIELD IDENTIFICATION: J. GROSS Talbot Field	
OWNER: JIMMY GROSS	
LOCATION: TOWNSHIP: T9S RANGE: R2W SECTION: 32	
START DATE: 07-13-2021	
STOP DATE: 07-22-2021	
CROP: Perrenial Ryegrass	
TOTAL ACREAGE:	18

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	10.06

TARGET APPLICATION RATE (PAN POUNDS PER ACRE)	100
DRY TONS BIOSOLIDS PER ACRE	2.53
WET TONS BIOSOLIDS PER ACRE	10.06
TOTAL WET TONS TO COMPLETE FIELD	181.04
DATE: Field Finished:7/22/2021	**180.30**
TOTAL WET TONS REMAINING	0.74

FINAL APPLICATION RATE INFORMATION	
FINAL APPLICATION RATE (PAN POUNDS PER ACRE)	99.59
PAN (TOTAL POUNDS APPLIED)	1,792.60
PHOSPHORUS (TOTAL POUNDS APPLIED)	1,346.63
POTASSIUM (TOTAL POUNDS APPLIED)	145.97
TOTAL WET TONS APPLIED	**180.30**
TOTAL DRY TONS APPLIED	45.42
DRY TONS BIOSOLIDS PER ACRE	2.52
WET TONS BIOSOLIDS PER ACRE	10.02

BIOSOLIDS ANALYSIS INFORMATION	
2020 AVERAGED DATA (Cent)(Sept-Nov)	
TOTAL SOLIDS (MG/KG)*	25.19
ORGANIC NITROGEN (MG/KG)	52022
INORGANIC NITROGEN (NH4+NO3) (MG/KG)	8256
TKN (MG/KG)	60278
PHOSPHORUS (MG/KG)	14825
POTASSIUM (MG/KG)	1607
pH	8.27
ARSENIC (MG/KG)	6.8
CADMIUM (MG/KG)	1.35
CHROMIUM (MG/KG)	44
COPPER (MG/KG)	353
LEAD (MG/KG)	18.1
MERCURY (MG/KG)	0.61
MOLYBDENUM (MG/KG)	6.93
NICKEL (MG/KG)	18.2
SELENIUM (MG/KG)	4.01
SILVER (MG/KG)	4.0
ZINC (MG/KG)	1016
1ST YEAR MINERALIZATION RATE	0.30
LIQUID INORGANIC NITROGEN AVAILABILITY FACTOR	0.50
POUNDS OF ORG N AVAILABLE/DRY TON APPLIED	31.21
POUNDS OF INORG N AVAILABLE/DRY TON APPLIED	8.26

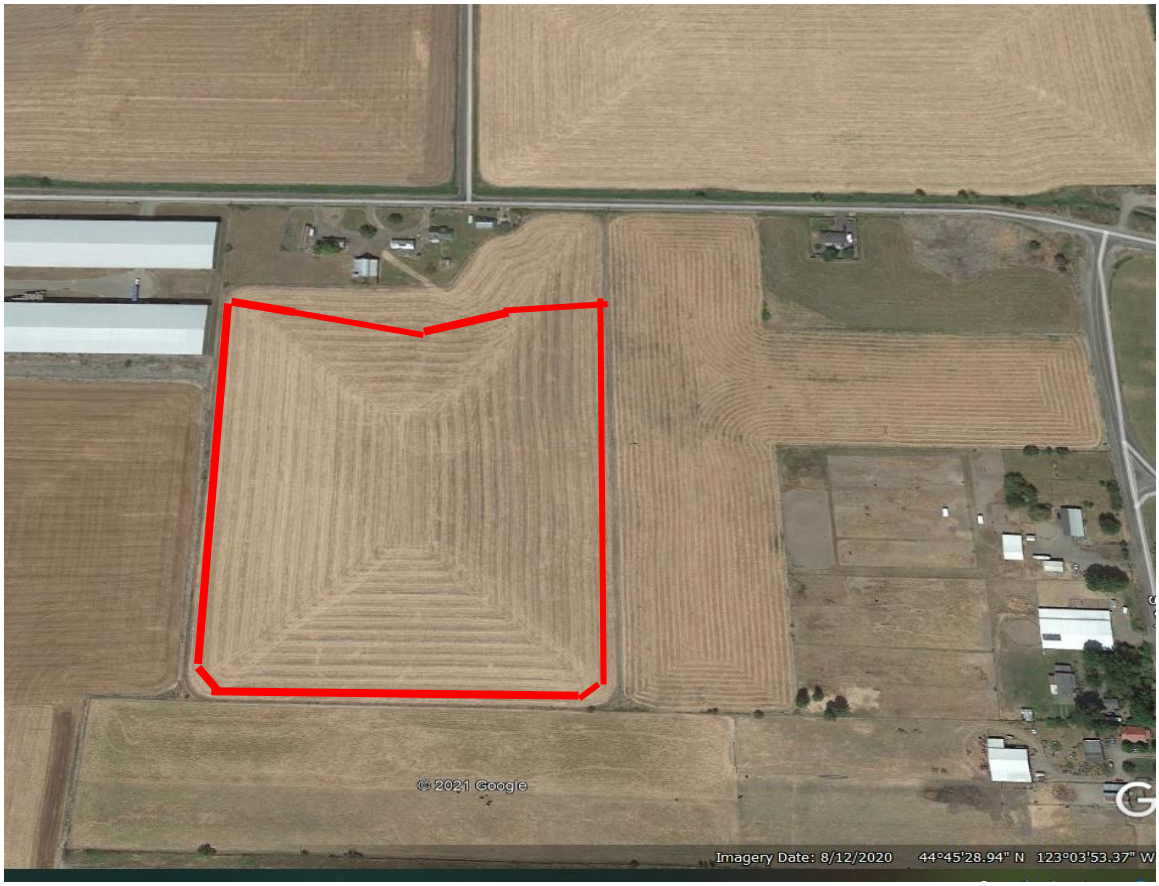
APPLICATION SITE WORKSHEET: 2021

Application Dates: Field

Soil Sample Collected: May'21

Domestic Well Sample Collected: NA

Site and Application Identification: J. Gross Talbot Field Biosolids Product: Centrifuge Cake DEQ Nitrogen Application Authorization: 100 lbs PAN per Acre. Application Rate 10.6 WT/Acre Acreage: About 18 Acres with buffers
Distance: 21 miles 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. Drive about 0.5-mile, entrance to field is between the two farmhouses on the left.** **This field is for Dump Truck access only.**
Field Input and Recommendations: 50 ft buffer from water ways and roads. 200 foot buffer at domestic wells.



J. Gross Talbot Field Completion Report

SITE:	J. Gross Talbot	TOTAL ACRES:	18.00
START DATE	7/27/2021		
ENDING DATE:	7/28/2021		
TOTAL TONS:	180.3		
% SOLIDS:	25.00%	BULK DENSITY (LB/YD3):	1215.00

	UNIT #1	DAILY	TOTAL
DATE	SPDR LDS	SPDR LDS	SPDR LDS
7/27/2021	22	22.00	22.00
7/28/2021	1	1.00	23.00

Soil Monitoring Report - 2021

Site: J. Gross
Field: J. Gross 4

Sample Date: 4/13/2021

Parameter	Result	Units
Nitrate-Nitrogen (NO3-N)	34	mg/kg
Available Phosphorus (P)	17	mg/kg
Total Potassium (K)	109	mg/kg
Sulfate-Sulfur (SO4-S)	23	3.7
Organic Matter	5.5	%
pH	5.1	-

Soil Monitoring Report - 2021

Site: J. Gross
Field: Mason Rd

Sample Date: 4/13/2021

Parameter	Result	Units
Nitrate-Nitrogen (NO3-N)	36	mg/kg
Available Phosphorus (P)	52	mg/kg
Total Potassium (K)	220	mg/kg
Sulfate-Sulfur (SO4-S)	13	3.7
Organic Matter	4.3	%
pH	5.6	-

Soil Monitoring Report - 2021

Site: J. Gross
Field: Talbot Rd

Sample Date: 4/13/2021

Parameter	Result	Units
Nitrate-Nitrogen (NO3-N)	22	mg/kg
Available Phosphorus (P)	3	mg/kg
Total Potassium (K)	59	mg/kg
Sulfate-Sulfur (SO4-S)	23	3.7
Organic Matter	5.5	%
pH	5	-

P. Manning Rock Hill Field B (Cent)

FIELD IDENTIFICATION: P.Manning Rock Hill B Field	
OWNER:Pat Manning	
LOCATION; TOWNSHIP: T4S RANGE: R13E SECTION:2	
START DATE: 09-21-2021	
STOP DATE: 10/07/2021	
CROP: Perennial Ryegrass	
TOTAL ACREAGE:	140

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	10.06

TARGET APPLICATION RATE (PAN POUNDS PER ACRE)	100
DRY TONS BIOSOLIDS PER ACRE	2.53
WET TONS BIOSOLIDS PER ACRE	10.06
TOTAL WET TONS TO COMPLETE FIELD	1,408.13
DATE: Field Finished: 10/07/2021	**1,411.00**
TOTAL WET TONS REMAINING	(2.87)

FINAL APPLICATION RATE INFORMATION	
FINAL APPLICATION RATE (PAN POUNDS PER ACRE)	100.20
PAN (TOTAL POUNDS APPLIED)	14,028.57
PHOSPHORUS (TOTAL POUNDS APPLIED)	10,538.53
POTASSIUM (TOTAL POUNDS APPLIED)	1,142.35
TOTAL WET TONS APPLIED	**1,411.00**
TOTAL DRY TONS APPLIED	355.43
DRY TONS BIOSOLIDS PER ACRE	2.54
WET TONS BIOSOLIDS PER ACRE	10.08

BIOSOLIDS ANALYSIS INFORMATION 2020 AVERAGED DATA (Cent)(Sept-Nov)	
TOTAL SOLIDS (MG/KG)*	25.19
ORGANIC NITROGEN (MG/KG)	52022
INORGANIC NITROGEN (NH4+NO3) (MG/KG)	8256
TKN (MG/KG)	60278
PHOSPHORUS (MG/KG)	14825
POTASSIUM (MG/KG)	1607
pH	8.27
ARSENIC (MG/KG)	6.8
CADMIUM (MG/KG)	1.35
CHROMIUM (MG/KG)	44
COPPER (MG/KG)	353
LEAD (MG/KG)	18.1
MERCURY (MG/KG)	0.61
MOLYBDENUM (MG/KG)	6.93
NICKEL (MG/KG)	18.2
SELENIUM (MG/KG)	4.01
SILVER (MG/KG)	4.0
ZINC (MG/KG)	1016
1ST YEAR MINERALIZATION RATE	0.30
LIQUID INORGANIC NITROGEN AVAILABILITY FACTOR	0.50
POUNDS OF ORG N AVAILABLE/DRY TON APPLIED	31.21
POUNDS OF INORG N AVAILABLE/DRY TON APPLIED	8.26
POUNDS OF (P.A.N.)/.DRY TON	39.47

APPLICATION SITE WORKSHEET: 2021

Application Dates: September 2021

Soil Sample Collected: Yes Domestic Well Sample Colle No

Site and Application Identification: Manning Rock Hill Field B
Biosolids Product: Centrifuge Cake.
DEQ Nitrogen Application Authorization: 100 lbs PAN per Acre. 10.06 Wet Tons/ Acre
170 Acres with setbacks
Wet Tons needed – 1,700 Wet Tons
Distance: 44 miles

Directions To Field:

Turn onto Lockhaven Dr. N.
East on Lockhaven,
South on I-5 for 29 miles to Exit 228 Hwy 34(Lebanon/Corvallis exit.
Turn left onto hwy 34(heading east)
Turn Right at 7-mile rd and continue south for 5 miles.
7-mile rd makes a left-hand turn and then continue straight for 0.5 miles. and then continue straight onto Plain view Rd. For 2.5 miles.
Turn right onto Sandridge Rd.
Turn left on Rock Hill Dr. The field entrance will be the second field entrance for the B field. The entrance will be on the left-hand side of the road

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

SITE:	Manning B	TOTAL ACRES:	170.00
START DATE	10/6/2021		
ENDING DATE:	10/14/2021		
TOTAL TONS:	1411.5		
% SOLIDS:	25.00%	BULK DENSITY (LB/YD3):	1215.00

DATE	UNIT #1 SPDR LDS	DAILY SPDR LDS	TOTAL SPDR LDS	DAILY DT SPREAD
10/6/2021	16	16.00	16.00	48.60
10/7/2021	17	17.00	33.00	51.64
10/8/2021	16	16.00	49.00	48.60
10/9/2021	12	12.00	61.00	36.45
10/11/2021	5	5.00	66.00	15.19
10/12/2021	20	20.00	86.00	60.75
10/13/2021	21	21.00	107.00	63.79
10/14/2021	14	14.00	121.00	42.53

Soil Monitoring Report - 2021

Site: P. Manning
Field: Rock Hill B Field

Sample Date: 10/7/2021

Parameter	Result	Units
Nitrate-Nitrogen (NO3-N)	12	mg/kg
Available Phosphorus (P)	18	mg/kg
Total Potassium (K)	88	mg/kg
Sulfate-Sulfur (SO4-S)	16	mg/kg
Organic Matter	2.3	%
pH	5.6	-

R. McCormick

FIELD IDENTIFICATION: R. McCormick Creek Bend	
OWNER: Richard McCormick	
LOCATION; TOWNSHIP: T13S RANGE: R4W SECTION: 27	
START DATE:-08/25/2021	
STOP DATE: -9/01/2021	
CROP: PERENIAL Ryegrass	
TOTAL ACREAGE:	96

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	10.13

TARGET APPLICATION RATE (PAN POUNDS PER ACRE)	100
DRY TONS BIOSOLIDS PER ACRE	2.53
WET TONS BIOSOLIDS PER ACRE	10.13
TOTAL WET TONS TO COMPLETE FIELD	972.91
DATE: Field Finished: 9/1/2021	**916.70**
TOTAL WET TONS REMAINING	-

FINAL APPLICATION RATE INFORMATION	
FINAL APPLICATION RATE (PAN POUNDS PER ACRE)	94.22
PAN (TOTAL POUNDS APPLIED)	9,045.35
PHOSPHORUS (TOTAL POUNDS APPLIED)	6,795.04
POTASSIUM (TOTAL POUNDS APPLIED)	736.57
TOTAL WET TONS APPLIED	**916.70**
TOTAL DRY TONS APPLIED	229.18
DRY TONS BIOSOLIDS PER ACRE	2.39
WET TONS BIOSOLIDS PER ACRE	9.55

BIOSOLIDS ANALYSIS INFORMATION	
2020 AVERAGED DATA (Cent)(Sept-Nov)	
TOTAL SOLIDS (MG/KG)*	25.00
ORGANIC NITROGEN (MG/KG)	52022
INORGANIC NITROGEN (NH4+NO3) (MG/KG)	8256
TKN (MG/KG)	60278
PHOSPHORUS (MG/KG)	14825
POTASSIUM (MG/KG)	1607
pH	8.27
ARSENIC (MG/KG)	6.8
CADMIUM (MG/KG)	1.35
CHROMIUM (MG/KG)	44
COPPER (MG/KG)	353
LEAD (MG/KG)	18.1
MERCURY (MG/KG)	0.61
MOLYBDENUM (MG/KG)	6.93
NICKEL (MG/KG)	18.2
SELENIUM (MG/KG)	4.01
SILVER (MG/KG)	4.0
ZINC (MG/KG)	1016
1ST YEAR MINERALIZATION RATE	0.30
LIQUID INORGANIC NITROGEN AVAILABILITY FACTOR	0.50
POUNDS OF ORG N AVAILABLE/DRY TON APPLIED	31.21
POUNDS OF INORG N AVAILABLE/DRY TON APPLIED	8.26
POUNDS OF (P.A.N.)/.DRY TON	39.47

APPLICATION SITE WORKSHEET: 2021

Application Dates: August 2021

Soil Sample Collected:	8-15-2021	Domestic Well Sample	No

Site and Application Identification: McCormick Dimond Hill Field
Biosolids Product: Centrifuge Cake .
DEQ Nitrogen Application Authorization: 100 lbs PAN per Acre. 10.06 Wet Tons/ Acre
433 Wet Tons needed
Acreage: 43 Acres usable
Distance: 58 miles

Directions to Field:

Go East on Lockhaven, South on I-5 for (50.3 miles) to exit # 209(Dimond Hill Rd in Linn County). Take Exit 209 from I-5 S. Turn right on Dimond Hill Dr. Continue on Dimond Hill Dr. for 4. miles. After passing Powerline line rd. intersection,(Church on the right) continue for .0.68 miles and the field entrance will be on the left side of the road (just before the Forrest River RV Manufacturer.

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

McCormick Diamond Hill Field Completion Report

SITE:	McCormick Diamond Hill	TOTAL ACRES:	43.00
START DATE	8/28/2021		
ENDING DATE:	8/31/2021		
TOTAL TONS:	433		
% SOLIDS:	25.00%	BULK DENSITY (LB/YD3):	1215.00

DATE	UNIT #1 SPDR LDS	DAILY SPDR LDS	TOTAL SPDR LDS
8/28/2021	19	19.00	19.00
8/30/2021	20	20.00	39.00
8/31/2021	12	12.00	51.00

R. McCormick

FIELD IDENTIFICATION: R. McCormick Substation	
OWNER: Richard McCormick	
LOCATION; TOWNSHIP: TI 4S RANGE: R4W SECTION: 35	
START DATE:-08/06/2021	
STOP DATE: -8/21/2021	
CROP: PERENIAL Ryegrass	
TOTAL ACREAGE:	**158**

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	10.13

TARGET APPLICATION RATE (PAN POUNDS PER ACRE)	100
DRY TONS BIOSOLIDS PER ACRE	2.53
WET TONS BIOSOLIDS PER ACRE	10.13
TOTAL WET TONS TO COMPLETE FIELD	1,601.25
DATE: Field Finished: 8/21/2021	**1,578.24**
TOTAL WET TONS REMAINING	23.01

FINAL APPLICATION RATE INFORMATION	
FINAL APPLICATION RATE (PAN POUNDS PER ACRE)	98.56
PAN (TOTAL POUNDS APPLIED)	15,572.97
PHOSPHORUS (TOTAL POUNDS APPLIED)	11,698.70
POTASSIUM (TOTAL POUNDS APPLIED)	1,268.12
TOTAL WET TONS APPLIED	**1,578.24**
TOTAL DRY TONS APPLIED	394.56
DRY TONS BIOSOLIDS PER ACRE	2.50
WET TONS BIOSOLIDS PER ACRE	9.99

BIOSOLIDS ANALYSIS INFORMATION	
2020 AVERAGED DATA (Cent)(Sept-Nov)	
TOTAL SOLIDS (MG/KG)*	25.00
ORGANIC NITROGEN (MG/KG)	52022
INORGANIC NITROGEN (NH4+N03) (MG/KG)	8256
TK.N (MG/KG)	60278
PHOSPHORUS (MG/KG)	14825
POTASSIUM (MG/KG)	1607
PH	8.27
ARSENIC (MG/KG)	6.8
CADMIUM (MG/KG)	1.35
CHROMIUM (MG/KG)	44
COPPER (MG/KG)	353
LEAD (MG/KG)	18.1
MERCURY (MG/KG)	0.61
MOLYBDENUM (MG/KG)	6.93
NICKEL (MG/KG)	18.2
SELENIUM (MG/KG)	4.01
SILVER (MG/KG)	4.0
ZINC (MG/KG)	1016
1ST YEAR MINERALIZATION RATE	0.30
LIQUID INORGANIC NITROGEN AVAILABILITY FACTOR	0.50
POUNDS OF ORG N AVAILABLE/DRY TON APPLIED	31.21
POUNDS OF INORG N AVAILABLE/DRY TON APPLIED	8.26
POUNDS OF (P.A.N.)ADRY TON	39.47

APPLICATION SITE WORKSHEET: 2021

Application Dates: August 2021

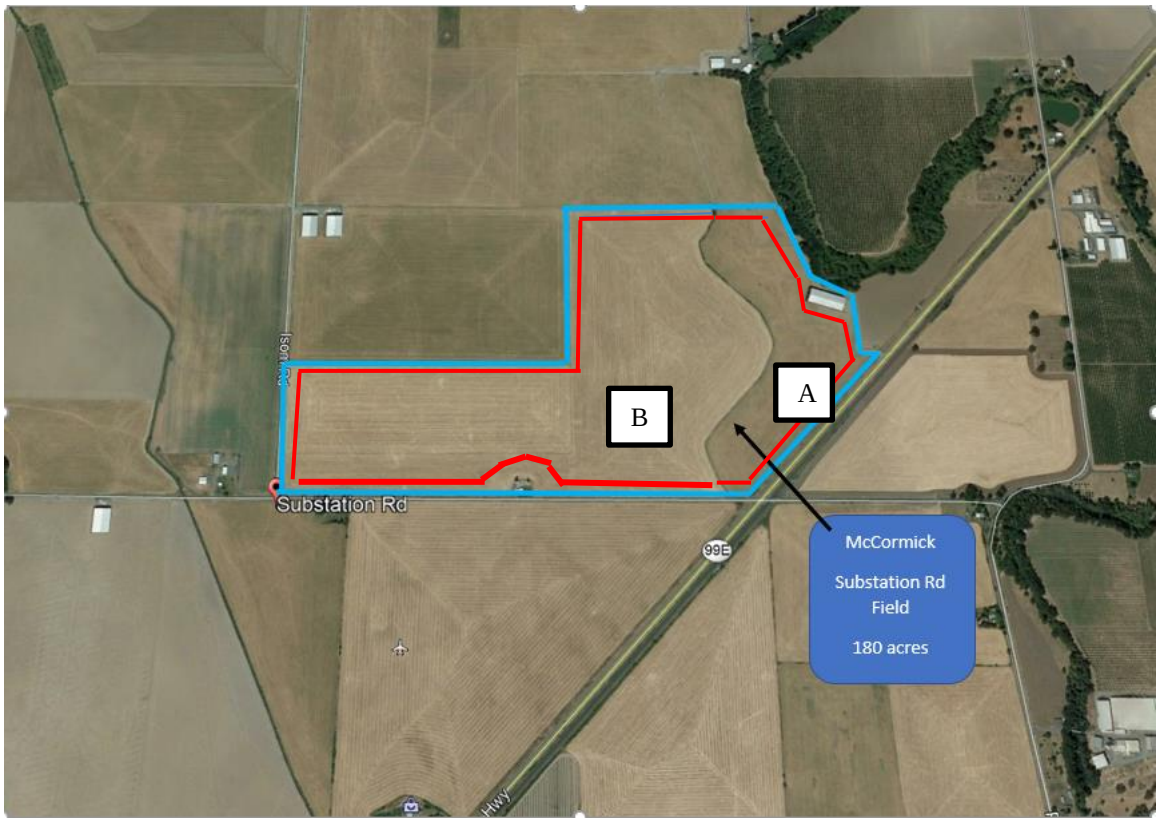
Soil Sample Collected: 8-6-2021 Domestic Well Sample Collected: No

Site and Application Identification: McCormick Substation Field
Biosolids Product: Centrifuge Cake .
DEQ Nitrogen Application Authorization: 100 lbs PAN per Acre. 10.06 Wet Tons/ Acre
Wet Tons needed – 1,589 WT
Field A = 32 acres, 320 Wet Tons
Field B =125 acres, 1,258 wet tons
Total of both fields - Acreage: 158 Acres with Buffers
Distance: 56 miles

Directions To Field:

East on Lockhaven, South on I-5 for (43 miles) to Or-228 in Linn County. Take Exit 216 from I-5 S. Turn right on 228, turn right on Falk Rd Turn right on Lake Creek Rd. Turn left on Or-99E S. Continue on 99E S for 4.5 miles, then turn right on Substation Rd, and the entrance to the field will be approximately 250 ft on the right side of the road

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



McCormick Substation Fields A&B Completion Report

SITE:	McCormick Substation A & B	TOTAL ACRES:	158.00
START DATE	8/11/21		
ENDING DATE:	8/25/21		
TOTAL TONS FIELD A:	319.81		
TOTAL TONS FIELD B:	1258.43		
% SOLIDS:	25.00%	BULK DENSITY (LB/YD3):	1215.00

DATE	UNIT #1 SPDR LDS	DAILY SPDR LDS	TOTAL SPDR LDS
8/11/2021	11	11.00	11.00
8/12/2021	22	22.00	33.00
8/13/2021	16	16.00	49.00
8/16/2021	20	20.00	69.00
8/17/2021	25	25.00	94.00
8/18/2021	14	14.00	108.00
8/19/2021	18	18.00	126.00
8/24/2021	4	4.00	130.00
8/25/2021	6	6.00	136.00

R. McCormick

FIELD IDENTIFICATION: R. McCormick Creek Bend	
OWNER: Richard McCormick	
LOCATION; TOWNSHIP: T13S RANGE: R4W SECTION: 27	
START DATE:-08/25/2021	
STOP DATE: -9/01/2021	
CROP: PERENIAL Ryegrass	
TOTAL ACREAGE:	96

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	10.13

TARGET APPLICATION RATE (PAN POUNDS PER ACRE)	100
DRY TONS BIOSOLIDS PER ACRE	2.53
WET TONS BIOSOLIDS PER ACRE	10.13
TOTAL WET TONS TO COMPLETE FIELD	972.91
DATE: Field Finished: 9/1/2021	**916.70**
TOTAL WET TONS REMAINING	-

FINAL APPLICATION RATE INFORMATION	
FINAL APPLICATION RATE (PAN POUNDS PER ACRE)	94.22
PAN (TOTAL POUNDS APPLIED)	9,045.35
PHOSPHORUS (TOTAL POUNDS APPLIED)	6,795.04
POTASSIUM (TOTAL POUNDS APPLIED)	736.57
TOTAL WET TONS APPLIED	**916.70**
TOTAL DRY TONS APPLIED	229.18
DRY TONS BIOSOLIDS PER ACRE	2.39
WET TONS BIOSOLIDS PER ACRE	9.55

BIOSOLIDS ANALYSIS INFORMATION	
2020 AVERAGED DATA (Cent)(Sept-Nov)	
TOTAL SOLIDS (MG/KG)*	25.00
ORGANIC NITROGEN (MG/KG)	52022
INORGANIC NITROGEN (NH4+NO3) (MG/KG)	8256
TKN (MG/KG)	60278
PHOSPHORUS (MG/KG)	14825
POTASSIUM (MG/KG)	1607
pH	8.27
ARSENIC (MG/KG)	6.8
CADMIUM (MG/KG)	1.35
CHROMIUM (MG/KG)	44
COPPER (MG/KG)	353
LEAD (MG/KG)	18.1
MERCURY (MG/KG)	0.61
MOLYBDENUM (MG/KG)	6.93
NICKEL (MG/KG)	18.2
SELENIUM (MG/KG)	4.01
SILVER (MG/KG)	4.0
ZINC (MG/KG)	1016
1ST YEAR MINERALIZATION RATE	0.30
LIQUID INORGANIC NITROGEN AVAILABILITY FACTOR	0.50
POUNDS OF ORG N AVAILABLE/DRY TON APPLIED	31.21
POUNDS OF INORG N AVAILABLE/DRY TON APPLIED	8.26
POUNDS OF (P.A.N.)/.DRY TON	39.47

APPLICATION SITE WORKSHEET: 2021

Application Dates: August 2021

Soil Sample Collected: No

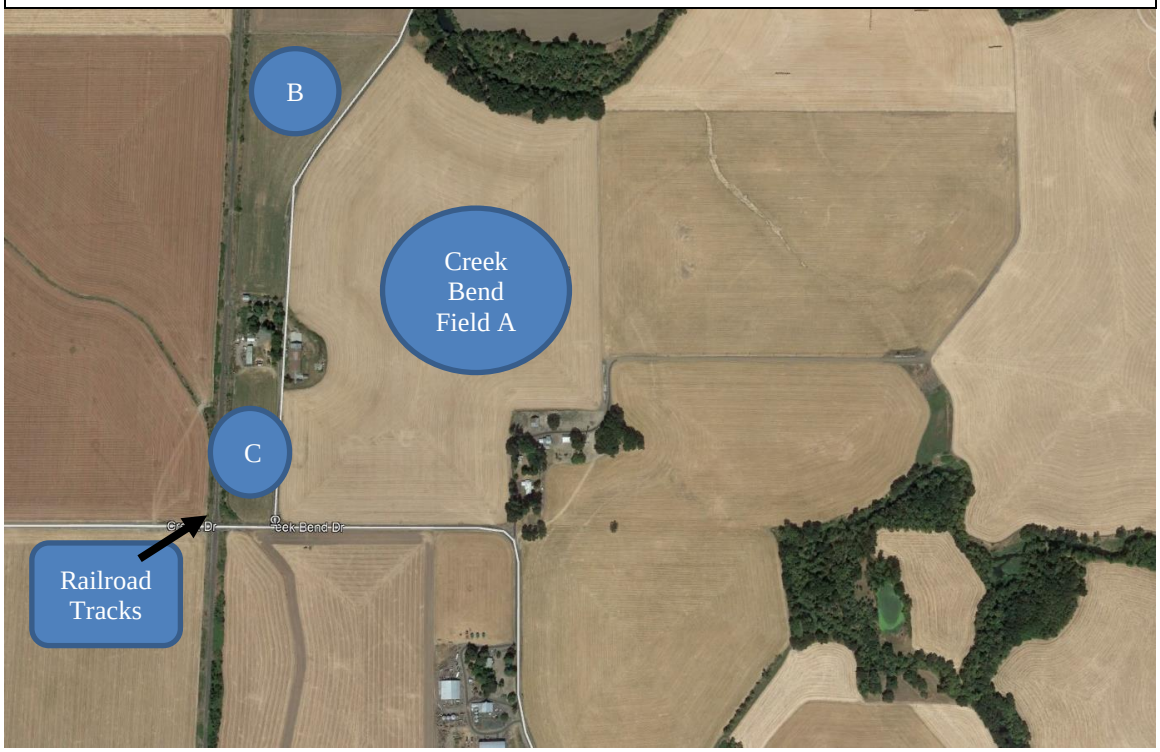
Domestic Well Sample Collected: No

Site and Application Identification: McCormick Creek Bend Field
Biosolids Product: Centrifuge Cake .
DEQ Nitrogen Application Authorization: 100 lbs PAN per Acre. 10.06 Wet Tons/ Acre
Wet Tons needed – 967 Wet Tons
Field A = 78 acres,785 Wet Tons
Field B =14 acres, 141 Wet Tons
Field C= 4 acres, 41.24 Wet Tons
Total of all three fields = 96 Acreage with buffers
Distance: 56 miles

Directions To Field:

East on Lockhaven, South on I-5 for (43 miles) to Or-228 in Linn County. Take Exit 216 from I-5 S. Turn right onto OR-228 and continue straight on American Dr. Just before the entrance to the Paper Mill, turn right on Creek Bend Dr. Before the railroad tracks, stay right to stay on Creek Bend Dr The field is on both sides of the road. The entrance to A field and B field are on the North ends of the field. Entrance to C field is close to McCormick's farmyard on the West side of the Road.

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



SITE:	McCormick	TOTAL ACRES:	96.00
START DATE	8/31/2021		
ENDING DATE:	9/8/2021		
TOTAL TONS FIELD A:	745.53		
TOTAL TONS FIELD B:	127.89		
TOTAL TONS FIELD C:	43.28		
% SOLIDS:	25.00%	BULK DENSITY (LB/YD3):	1215.00

DATE	UNIT #1 SPDR LDS	DAILY SPDR LDS	TOTAL SPDR LDS
8/31/2021	12	12.00	12.00
9/1/2021	10	10.00	22.00
9/2/2021	17	17.00	39.00
9/3/2021	16	16.00	55.00
9/4/2021	8	8.00	63.00
9/8/2021	17	17.00	80.00

Soil Monitoring Report - 2021

Site: McCormick
Field: Dimond Hill

Sample Date: 7/28/2021

Parameter	Result	Units
Nitrate-Nitrogen (NO3-N)	5	mg/kg
Available Phosphorus (P)	24	mg/kg
Total Potassium (K)	62	mg/kg
Sulfate-Sulfur (SO4-S)	30	3.7
Organic Matter	3.2	%
pH	5.1	-

Soil Monitoring Report - 2021

Site: McCormick
Field: Creek Bend

Sample Date: 8/2/2021

Parameter	Result	Units
Nitrate-Nitrogen (NO3-N)	5	mg/kg
Available Phosphorus (P)	15	mg/kg
Total Potassium (K)	52	mg/kg
Sulfate-Sulfur (SO4-S)	6	3.7
Organic Matter	3.2	%
pH	5	-

Soil Monitoring Report - 2021

Site: McCormick
Field: Substation

Sample Date: 8/8/2021

Parameter	Result	Units
Nitrate-Nitrogen (NO3-N)	8	mg/kg
Available Phosphorus (P)	52	mg/kg
Total Potassium (K)	52	mg/kg
Sulfate-Sulfur (SO4-S)	14	3.7
Organic Matter	4.1	%
pH	4.8	-

Riddle Farms Cooper Hollow

FIELD IDENTIFICATION: Cooper Hollow	
OWNER: Dylan Branch	
LOCATION; TOWNSHIP: T8S RANGE: R5W SECTION: 31 & 32	
START DATE: 9-4--2021	
STOP DATE: -9-20-2021	
CROP: Annual Ryegrass	
TOTAL ACREAGE:	184

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	10.06

TARGET APPLICATION RATE (PAN POUNDS PER ACRE)	100
DRY TONS BIOSOLIDS PER ACRE	2.53
WET TONS BIOSOLIDS PER ACRE	10.06
TOTAL WET TONS TO COMPLETE FIELD	1,850.68
DATE: Field Finished:	**1,851.88**
TOTAL WET TONS REMAINING	(1.20)

FINAL APPLICATION RATE INFORMATION	
FINAL APPLICATION RATE (PAN POUNDS PER ACRE)	100.06
PAN (TOTAL POUNDS APPLIED)	18,411.93
PHOSPHORUS (TOTAL POUNDS APPLIED)	13,831.39
POTASSIUM (TOTAL POUNDS APPLIED)	1,499.29
TOTAL WET TONS APPLIED	**1,851.88**
TOTAL DRY TONS APPLIED	466.49
DRY TONS BIOSOLIDS PER ACRE	2.54
WET TONS BIOSOLIDS PER ACRE	10.06

BIOSOLIDS ANALYSIS INFORMATION	
2020 AVERAGED DATA (Cent)(Sept-Nov)	
TOTAL SOLIDS (MG/KG)*	25.19
ORGANIC NITROGEN (MG/KG)	52022
INORGANIC NITROGEN (NH4+NO3) (MG/KG)	8256
TKN (MG/KG)	60278
PHOSPHORUS (MG/KG)	14825
POTASSIUM (MG/KG)	1607
pH	8.27
ARSENIC (MG/KG)	6.8
CADMIUM (MG/KG)	1.35
CHROMIUM (MG/KG)	44
COPPER (MG/KG)	353
LEAD (MG/KG)	18.1
MERCURY (MG/KG)	0.61
MOLYBDENUM (MG/KG)	6.93
NICKEL (MG/KG)	18.2
SELENIUM (MG/KG)	4.01
SILVER (MG/KG)	4.0
ZINC (MG/KG)	1016
1ST YEAR MINERALIZATION RATE	0.30
LIQUID INORGANIC NITROGEN AVAILABILITY FACTOR	0.50
POUNDS OF ORG N AVAILABLE/DRY TON APPLIED	31.21
POUNDS OF INORG N AVAILABLE/DRY TON APPLIED	8.26
POUNDS OF (P.A.N.)/.DRY TON	39.47

APPLICATION SITE WORKSHEET: 2021

Application Dates: August 2021

Soil Sample Collected: Yes

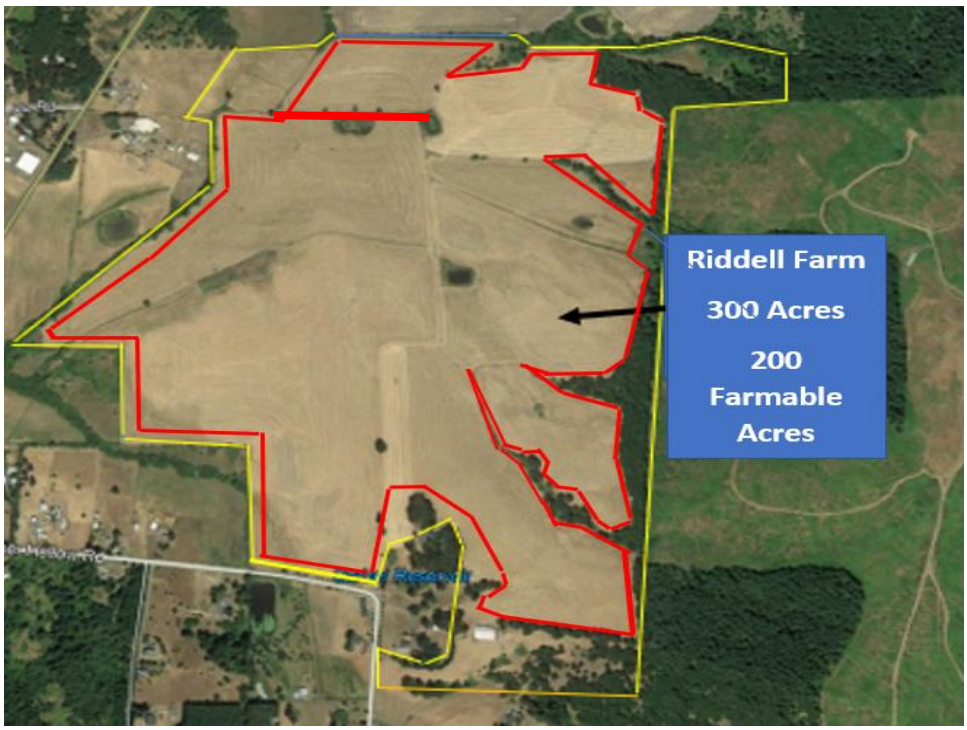
Domestic Well Sample Collected: N/A

Farm & Field Number: Riddle Farm Field
Biosolids Product: Centrifuge Cake
DEQ Maximum Nitrogen Application Rate: 100 Pounds per Acre.
Application Rate =10.06 WT/Acre
2,000 wet tons needed
Acreage: 1851 Acres with buffers
Distance to Field: 32 miles

Directions 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 Marion Street Bridge, Use the left lane to stay on OR-22 W.
Slight left on OR-223 S.
When in Dallas, continue straight thru the S. Main St. intersection
Turn left on levens St.
Turn right on Washington St./Kings Valley Highway
Make a left onto OR-223/SW Fairview Ave./S Kings Valley Hwy. (Signs for Falls City)
6.2 miles, turn left on Monmouth Hwy.
2.7 miles, turn left on Cooper Hallow Rd.
2.3 miles to sharp left turn, keep straight and into the entrance of the field.

Field Input and Recommendations:
50-foot buffer at roadside, ditches. And water ways
200 feet from wells and residences



SITE:	Riddle Farm	TOTAL ACRES:	185.00
START DATE	9/10/2021		
ENDING DATE:	9/22/201		
TOTAL TONS:	1851.88		
% SOLIDS:	25.00%	BULK DENSITY (LB/YD3):	1215.00

UNIT #1 DATE	DAILY SPDR LDS	SPDR LDS	TOTAL SPDR LDS
9/10/2021	8	8.00	8.00
9/11/2021	1	1.00	9.00
9/13/2021	15	15.00	24.00
9/14/2021	11	11.00	35.00
9/15/2021	28	28.00	63.00
9/16/2021	28	28.00	91.00
9/17/2021	16	16.00	107.00
9/20/2021	24	24.00	131.00
9/21/2021	27	27.00	158.00
9/22/2021	25	25.00	183.00

Soil Monitoring Report - 2021

Site: Roiddell
Field: Cooper Hallow

Sample Date: 9/2/2021

Parameter	Result	Units
Nitrate-Nitrogen (NO3-N)	19	mg/kg
Available Phosphorus (P)	23	mg/kg
Total Potassium (K)	188	mg/kg
Sulfate-Sulfur (SO4-S)	14	mg/kg
Organic Matter	4.3	%
pH	5	-

G. ROUSE 1

FIELD IDENTIFICATION: G. ROUSE 1(1_I)	
OWNER: G. ROUSE	
LOCATION: TOWNSHIP: T9S RANGE: R2W SECTION: 7	
START DATE: 5/17/2021	
STOP DATE: 5-19-2021	
CROP: Western Oregon Hay/Pasture	
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	10.06

TARGET APPLICATION RATE (PAN POUNDS PER ACRE)	100
DRY TONS BIOSOLIDS PER ACRE	2.53
WET TONS BIOSOLIDS PER ACRE	10.06
TOTAL WET TONS TO COMPLETE FIELD	251.45
DATE: Field Finished:5-19-2021	**248.94**
TOTAL WET TONS REMAINING	2.51

FINAL APPLICATION RATE INFORMATION	
FINAL APPLICATION RATE (PAN POUNDS PER ACRE)	99.00
PAN (TOTAL POUNDS APPLIED)	2,475.03
PHOSPHORUS (TOTAL POUNDS APPLIED)	1,859.29
POTASSIUM (TOTAL POUNDS APPLIED)	201.54
TOTAL WET TONS APPLIED	**248.94**
TOTAL DRY TONS APPLIED	62.71
DRY TONS BIOSOLIDS PER ACRE	2.51
WET TONS BIOSOLIDS PER ACRE	9.96

BIOSOLIDS ANALYSIS INFORMATION	
(Sept-Nov)2020 AVERAGED DATA (Cent)	
TOTAL SOLIDS (MG/KG)	25.19
ORGANIC NITROGEN (MG/KG)	52022
INORGANIC NITROGEN (NH4) (MG/KG)	8256
TKN (MG/KG)	60278
PHOSPHORUS (MG/KG)	14825
POTASSIUM (MG/KG)	1607
pH	8.27
ARSENIC (MG/KG)	6.8
CADMIUM (MG/KG)	1.35
CHROMIUM (MG/KG)	44
COPPER (MG/KG)	353
LEAD (MG/KG)	18.1
MERCURY (MG/KG)	0.61
MOLYBDENUM (MG/KG)	6.93
NICKEL (MG/KG)	18.2
SELENIUM (MG/KG)	4.01
SILVER (MG/KG)	4.0
ZINC (MG/KG)	1016
1ST YEAR MINERALIZATION RATE	0.30
LIQUID INORGANIC NITROGEN AVAILABILITY FACTOR	0.50
POUNDS OF ORG N AVAILABLE/DRY TON APPLIED	31.21
POUNDS OF INORG N AVAILABLE/DRY TON APPLIED	8.26
POUNDS OF (P.A.N.)/.DRY TON	39.47

APPLICATION SITE WORKSHEET: 2021

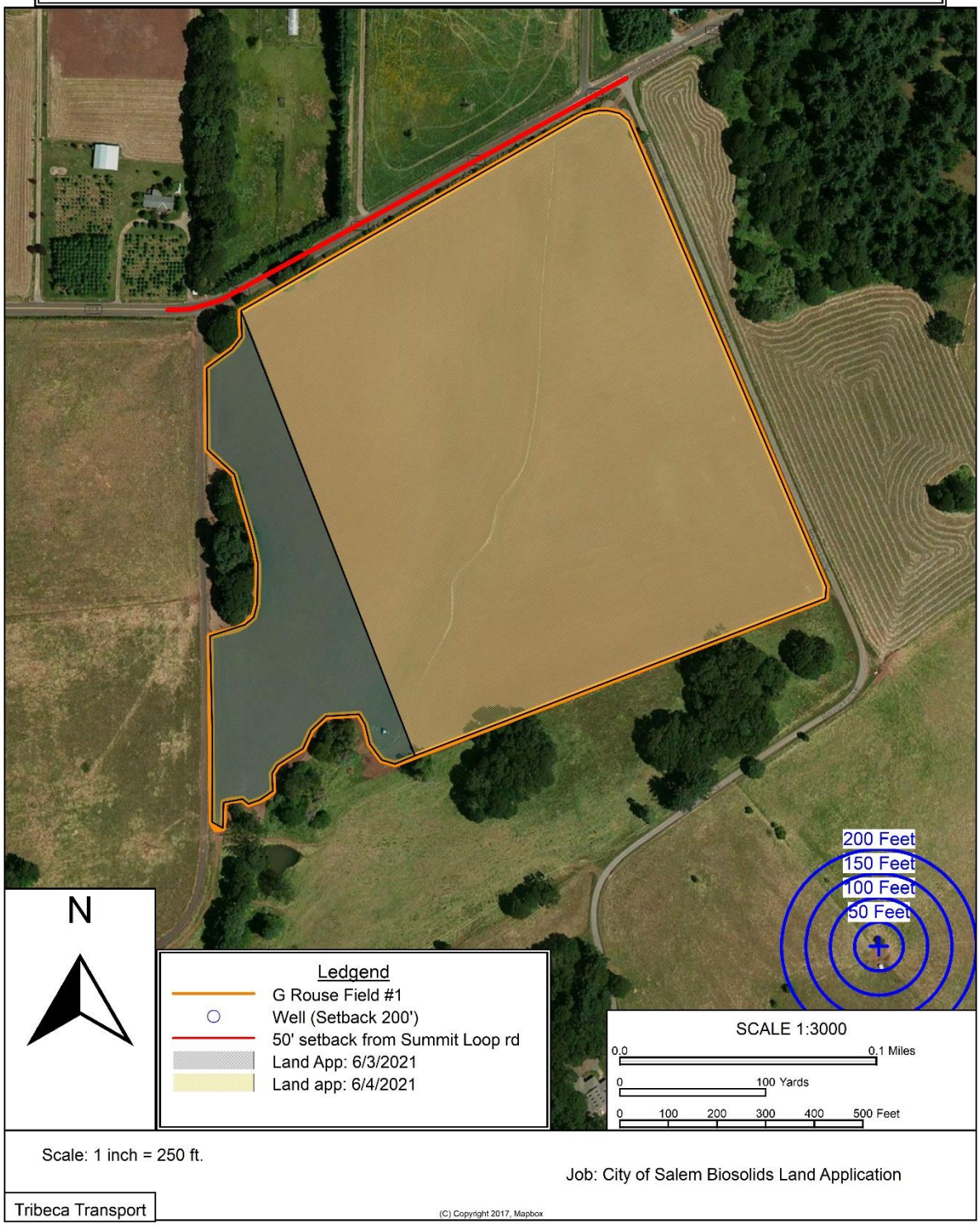
Application Dates: June 2021

Soil Sample Collected: April 21 Domestic Well Sample Collected: No

Site and Application Identification: G. Rouse 1 (1_P) Biosolids Product: Centrifuge Cake DEQ Nitrogen Application Authorization: 100 lbs PAN per Acre. Application Rate at 10.02 Wet Tons/ Acre Acreage: 25 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: 50 ft buffer from ditch along Summit Loop. 200 foot buffer at domestic wells.

Rouse Field#1 Completion Map

Rouse Field#1



Scale: 1 inch = 250 ft.

Job: City of Salem Biosolids Land Application

Tribeca Transport

City of Salem Spreader Track Sheet - Field G Rouse #1

Total Tons Delivered: 248.9 WT

Estimated Loads based on 15 tons per spreader load:

Date	Operator	Loads Spread	EST tons spread
6/3/2021	MK	4	62
6/4/2021	MK	12	186.9
		Total Tons Spread	248.90

G. ROUSE 2

FIELD IDENTIFICATION: G. ROUSE 2 (2_M)	
OWNER: G. ROUSE	
LOCATION: TOWNSHIP: T9S RANGE: R2W SECTION: 7	
START DATE: 6-21-2021	
Stop Date:0 6-21-2021 -	
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	12.07

TARGET APPLICATION RATE (PAN POUNDS PER ACRE)	120
DRY TONS BIOSOLIDS PER ACRE	3.04
WET TONS BIOSOLIDS PER ACRE	12.07
TOTAL WET TONS TO COMPLETE FIELD	84.49
DATE: Field Finished 6-21-2021	**85.30**
TOTAL WET TONS REMAINING	(0.81)

FINAL APPLICATION RATE INFORMATION	
FINAL APPLICATION RATE (PAN POUNDS PER ACRE)	121.15
PAN (TOTAL POUNDS APPLIED)	848.08
PHOSPHORUS (TOTAL POUNDS APPLIED)	637.09
POTASSIUM (TOTAL POUNDS APPLIED)	69.06
TOTAL WET TONS APPLIED	**85.30**
TOTAL DRY TONS APPLIED	21.49
DRY TONS BIOSOLIDS PER ACRE	3.07
WET TONS BIOSOLIDS PER ACRE	12.19

BIOSOLIDS ANALYSIS INFORMATION	
2020 AVERAGED DATA (Cent)(Jan-April)	
TOTAL SOLIDS (MG/KG)	25.19
ORGANIC NITROGEN (MG/KG)	52022
INORGANIC NITROGEN (NH4) (MG/KG)	8256
TKN (MG/KG)	60278
PHOSPHORUS (MG/KG)	14825
POTASSIUM (MG/KG)	1607
pH	8.27
ARSENIC (MG/KG)	6.8
CADMIUM (MG/KG)	1.35
CHROMIUM (MG/KG)	44
COPPER (MG/KG)	353
LEAD (MG/KG)	18.1
MERCURY (MG/KG)	0.61
MOLYBDENUM (MG/KG)	6.93
NICKEL (MG/KG)	18.2
SELENIUM (MG/KG)	4.01
SILVER (MG/KG)	4.0
ZINC (MG/KG)	1016
1ST YEAR MINERALIZATION RATE	0.30
LIQUID INORGANIC NITROGEN AVAILABILITY FACTOR	0.50
POUNDS OF ORG N AVAILABLE/DRY TON APPLIED	31.21
POUNDS OF INORG N AVAILABLE/DRY TON APPLIED	8.26
POUNDS OF (P.A.N.)/.DRY TON	39.47

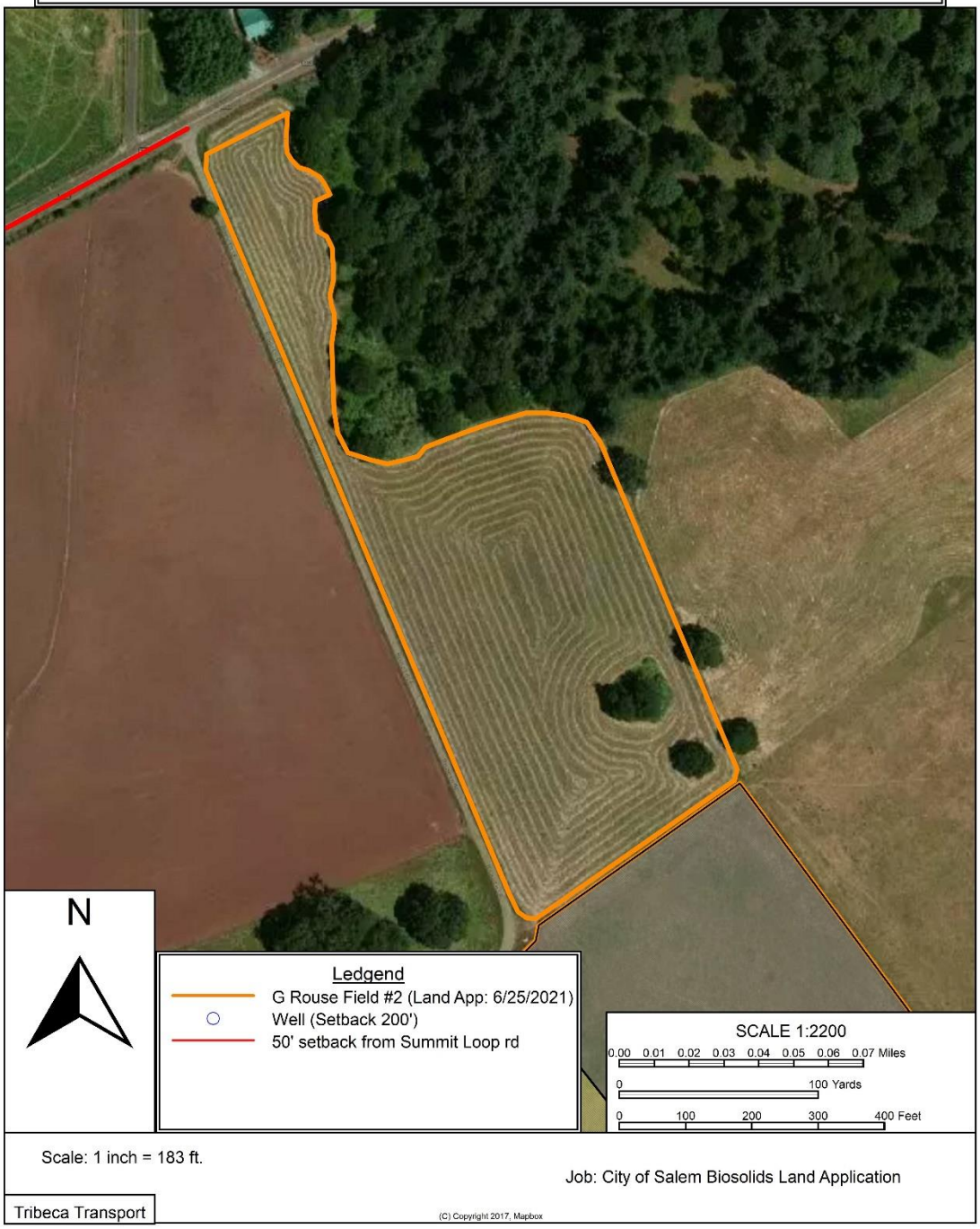
APPLICATION SITE WORKSHEET: 2021

Application Dates June '21

Soil Sample Collected: May'2021 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)12.07 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.

Rouse Field #2



Scale: 1 inch = 183 ft.

Job: City of Salem Biosolids Land Application

Tribeca Transport

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

Total Tons Delivered: 85.3

Estimated Loads based on 15 tons per spreader load:

Date	Operator	Loads Spread	EST tons spread
6/25/2021	MK	6	85.3
		Total Tons Spread	85.30

G. ROUSE 3

FIELD IDENTIFICATION: G. ROUSE 3 (3_I)	
OWNER: G. ROUSE	
LOCATION: TOWNSHIP: T9S RANGE: R2W SECTION: 7	
START DATE: 6-23-2021	
STOP DATE:6-25-2021	
CROP: Western Oregon Hay/Pasture	
TOTAL ACREAGE:	17

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	12.07

TARGET APPLICATION RATE (PAN POUNDS PER ACRE)	120
DRY TONS BIOSOLIDS PER ACRE	3.04
WET TONS BIOSOLIDS PER ACRE	12.07
TOTAL WET TONS TO COMPLETE FIELD	205.18
DATE: Field Finished 6-26-2021	**206.85**
TOTAL WET TONS REMAINING	(1.67)

FINAL APPLICATION RATE INFORMATION	
FINAL APPLICATION RATE (PAN POUNDS PER ACRE)	120.97
PAN (TOTAL POUNDS APPLIED)	2,056.56
PHOSPHORUS (TOTAL POUNDS APPLIED)	1,544.93
POTASSIUM (TOTAL POUNDS APPLIED)	167.47
TOTAL WET TONS APPLIED	**206.85**
TOTAL DRY TONS APPLIED	52.11
DRY TONS BIOSOLIDS PER ACRE	3.07
WET TONS BIOSOLIDS PER ACRE	12.17

BIOSOLIDS ANALYSIS INFORMATION	
2020 AVERAGED DATA (Cent)(Sept-Novl)	
TOTAL SOLIDS (MG/KG)	25.19
ORGANIC NITROGEN (MG/KG)	52022
INORGANIC NITROGEN (NH4) (MG/KG)	8256
TKN (MG/KG)	60278
PHOSPHORUS (MG/KG)	14825
POTASSIUM (MG/KG)	1607
pH	8.27
ARSENIC (MG/KG)	6.8
CADMIUM (MG/KG)	1.35
CHROMIUM (MG/KG)	44
COPPER (MG/KG)	353
LEAD (MG/KG)	18.1
MERCURY (MG/KG)	0.61
MOLYBDENUM (MG/KG)	6.93
NICKEL (MG/KG)	18.2
SELENIUM (MG/KG)	4.01
SILVER (MG/KG)	4.0
ZINC (MG/KG)	1016
1ST YEAR MINERALIZATION RATE	0.30
LIQUID INORGANIC NITROGEN AVAILABILITY FACTOR	0.50
POUNDS OF ORG N AVAILABLE/DRY TON APPLIED	31.21
POUNDS OF INORG N AVAILABLE/DRY TON APPLIED	8.26
POUNDS OF (P.A.N.)/.DRY TON	39.47

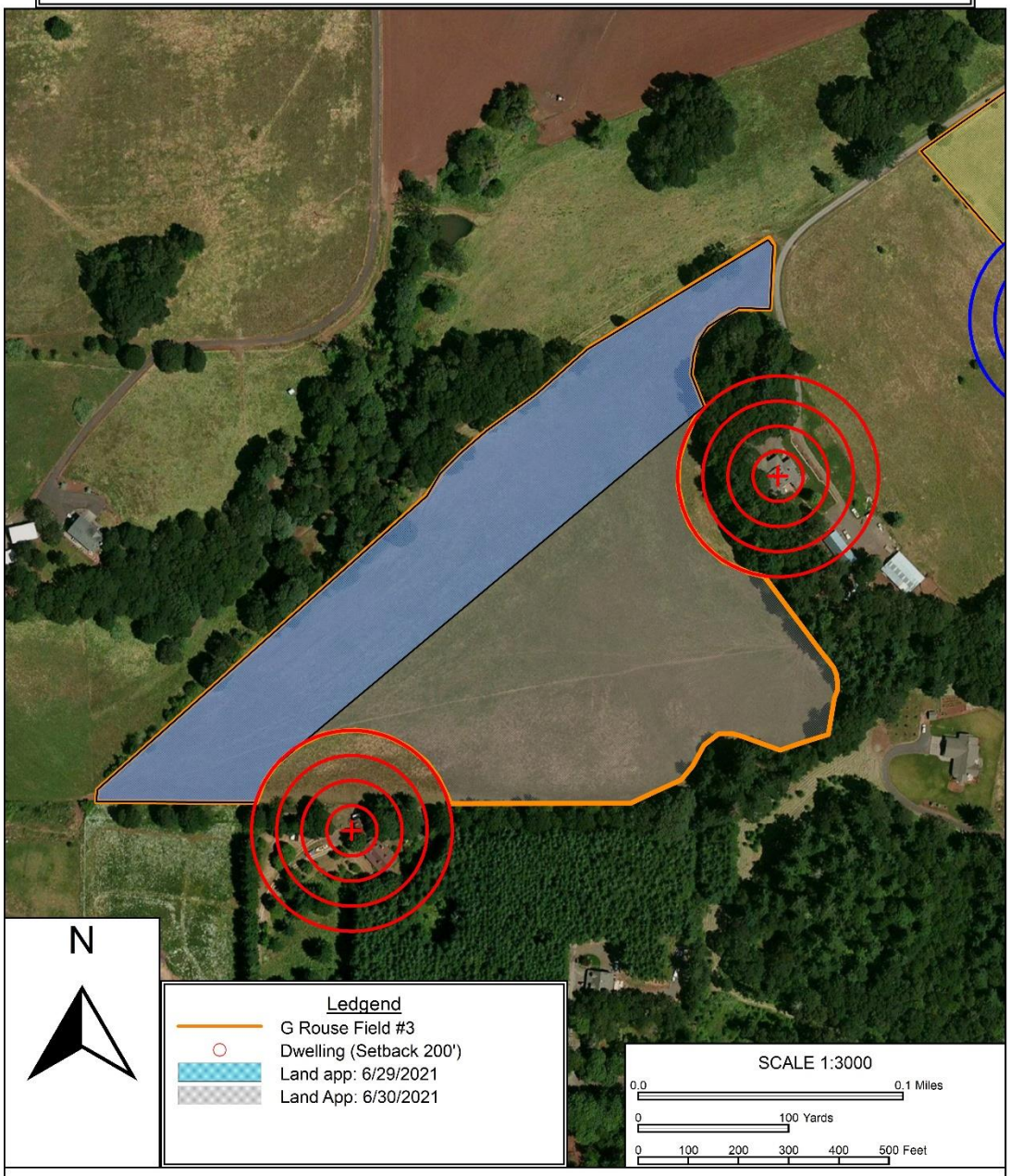
APPLICATION SITE WORKSHEET: 2020

Application Dates: June ‘ 21

Soil Sample Collected: June ‘21 Domestic Well Sample Collected: No

Site and Application Identification: G. Rouse 3 (3_K) Biosolids Product: Centrifuge Cake DEQ Nitrogen Application Authorization: 120 lbs PAN per Acre (Western Oregon Hay/Pasture) Application Rate at 12.07 WT/Acre 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.

Rouse Field #3



Scale: 1 inch = 250 ft.

Job: City of Salem Biosolids Land Application

Tribeca Transport

City of Salem Spreader Track Sheet - Field: **G Rouse Field 3**

Total Tons Delivered: 206.9 WT

Estimated Loads based on 15 tons per spreader load:

Date	Operator	Loads Spread	EST tons spread
6/29/2021	KM/GB	6	93
6/30/2021	KM	8	113.9
		Total Tons Spread	206.90

G. ROUSE 4

FIELD IDENTIFICATION: G. ROUSE 4 (4_J)	
OWNER: G. ROUSE	
LOCATION: TOWNSHIP: T9S RANGE: R2W SECTION: 7	
START DATE: 6-21-2021	
STOP DATE: 6-21-2021	
CROP: Western Oregon Hay/Pasture	
TOTAL ACREAGE:	12

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	12.07

TARGET APPLICATION RATE (PAN POUNDS PER ACRE)	120
DRY TONS BIOSOLIDS PER ACRE	3.04
WET TONS BIOSOLIDS PER ACRE	12.07
TOTAL WET TONS TO COMPLETE FIELD	144.84
DATE: Field Finished 6-22/2021	**146.30**
TOTAL WET TONS REMAINING	(1.46)

FINAL APPLICATION RATE INFORMATION	
FINAL APPLICATION RATE (PAN POUNDS PER ACRE)	121.21
PAN (TOTAL POUNDS APPLIED)	1,454.56
PHOSPHORUS (TOTAL POUNDS APPLIED)	1,092.69
POTASSIUM (TOTAL POUNDS APPLIED)	118.45
TOTAL WET TONS APPLIED	**146.30**
TOTAL DRY TONS APPLIED	36.85
DRY TONS BIOSOLIDS PER ACRE	3.07
WET TONS BIOSOLIDS PER ACRE	12.19

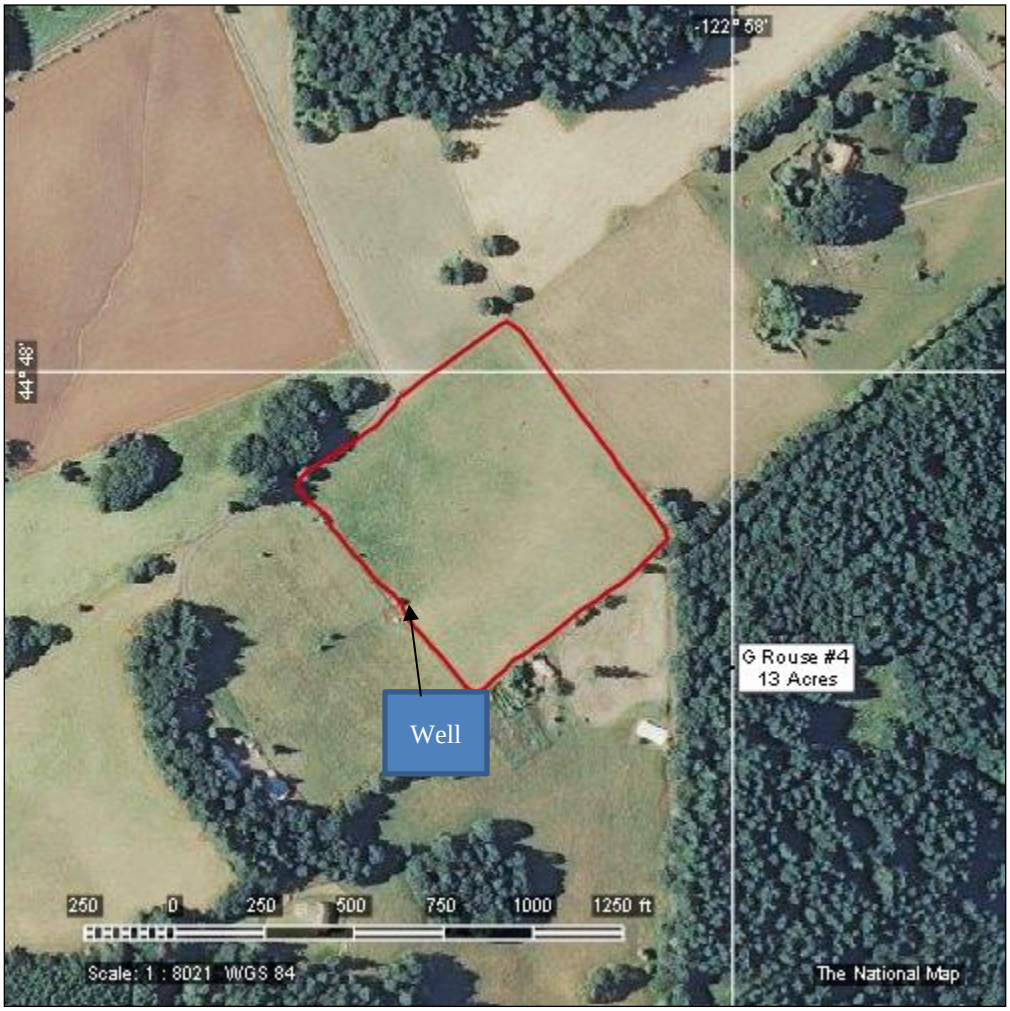
BIOSOLIDS ANALYSIS INFORMATION	
2020 AVERAGED DATA (Cent)(Jan-April)	
TOTAL SOLIDS (MG/KG)	25.19
ORGANIC NITROGEN (MG/KG)	52022
INORGANIC NITROGEN (NH4) (MG/KG)	8256
TKN (MG/KG)	60278
PHOSPHORUS (MG/KG)	14825
POTASSIUM (MG/KG)	1607
pH	8.27
ARSENIC (MG/KG)	6.8
CADMIUM (MG/KG)	1.35
CHROMIUM (MG/KG)	44
COPPER (MG/KG)	353
LEAD (MG/KG)	18.1
MERCURY (MG/KG)	0.61
MOLYBDENUM (MG/KG)	6.93
NICKEL (MG/KG)	18.2
SELENIUM (MG/KG)	4.01
SILVER (MG/KG)	4.0
ZINC (MG/KG)	1016
1ST YEAR MINERALIZATION RATE	0.30
LIQUID INORGANIC NITROGEN AVAILABILITY FACTOR	0.50
POUNDS OF ORG N AVAILABLE/DRY TON APPLIED	31.21
POUNDS OF INORG N AVAILABLE/DRY TON APPLIED	8.26
POUNDS OF (P.A.N.)/.DRY TON	39.47

APPLICATION SITE WORKSHEET: 2018

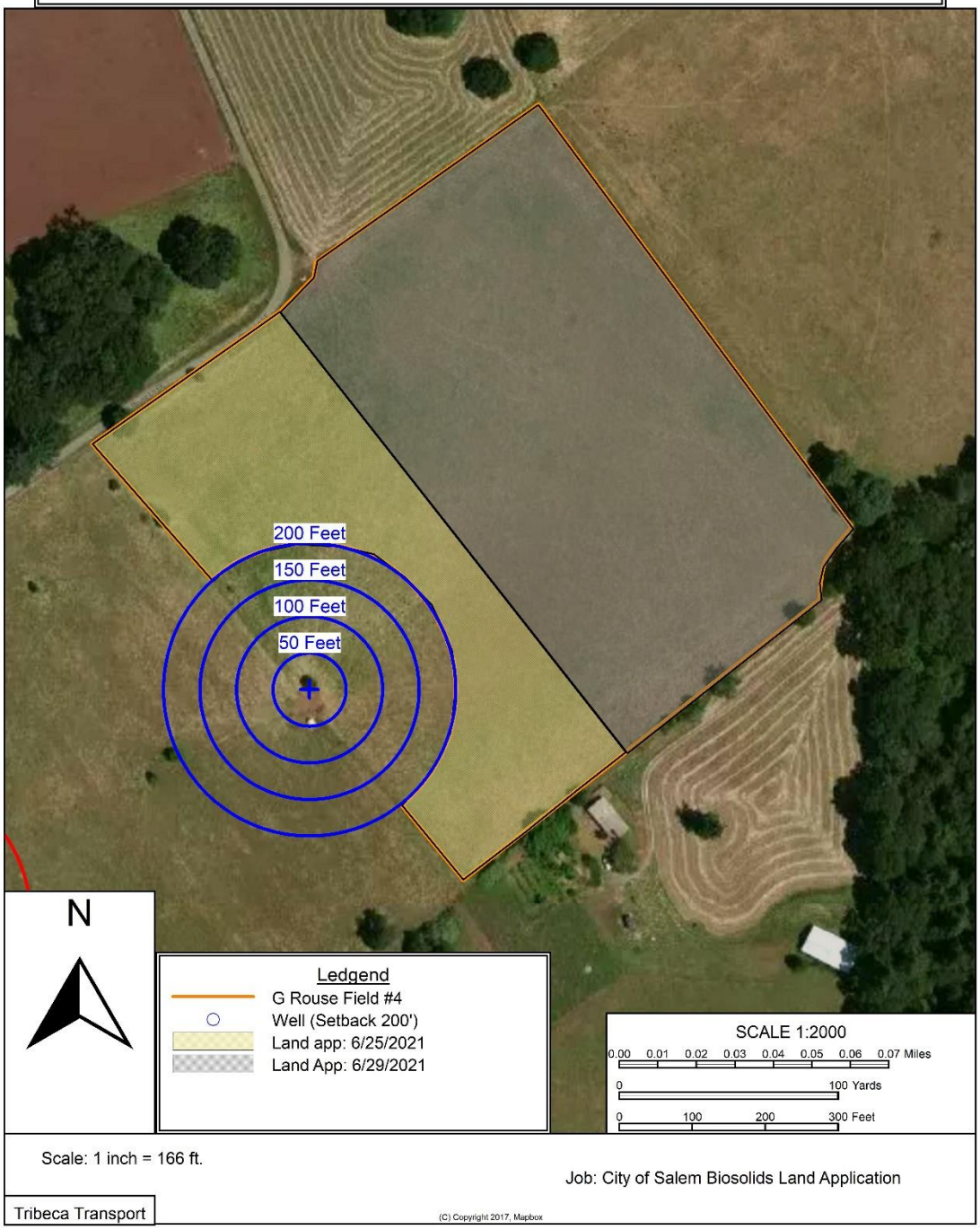
Application Dates: 08/03/2020

Soil Sample Collected: May 21 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) 12.07 Wet Tons/Acre Acreage: 12 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.



Rouse Field #4



Scale: 1 inch = 166 ft.

Job: City of Salem Biosolids Land Application

Tribeca Transport

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

Total Tons Delivered: 146.3

Estimated Loads based on 15 tons per spreader load:

Date	Operator	Loads Spread	EST tons spread
6/25/2021	MK	4	60
6/29/2021	KM/GB	6	86.3
		Total Tons Spread	146.30

G. ROUSE 5

FIELD IDENTIFICATION: G. ROUSE 5 (5_I)	
OWNER: G. ROUSE	
LOCATION: TOWNSHIP: T9S RANGE: R2W SECTION: 7	
START DATE: 6-7-2021	
STOP DATE: 6-9-21	
CROP: Western Oregon Hay/Pasture	
TOTAL ACREAGE:	38

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	12.07

TARGET APPLICATION RATE (PAN POUNDS PER ACRE)	120
DRY TONS BIOSOLIDS PER ACRE	3.04
WET TONS BIOSOLIDS PER ACRE	12.07
TOTAL WET TONS TO COMPLETE FIELD	458.65
DATE: Field Finished 6/9/2021	**455.57**
TOTAL WET TONS REMAINING	3.08

FINAL APPLICATION RATE INFORMATION	
FINAL APPLICATION RATE (PAN POUNDS PER ACRE)	119.19
PAN (TOTAL POUNDS APPLIED)	4,529.41
PHOSPHORUS (TOTAL POUNDS APPLIED)	3,402.58
POTASSIUM (TOTAL POUNDS APPLIED)	368.83
TOTAL WET TONS APPLIED	**455.57**
TOTAL DRY TONS APPLIED	114.76
DRY TONS BIOSOLIDS PER ACRE	3.02
WET TONS BIOSOLIDS PER ACRE	11.99

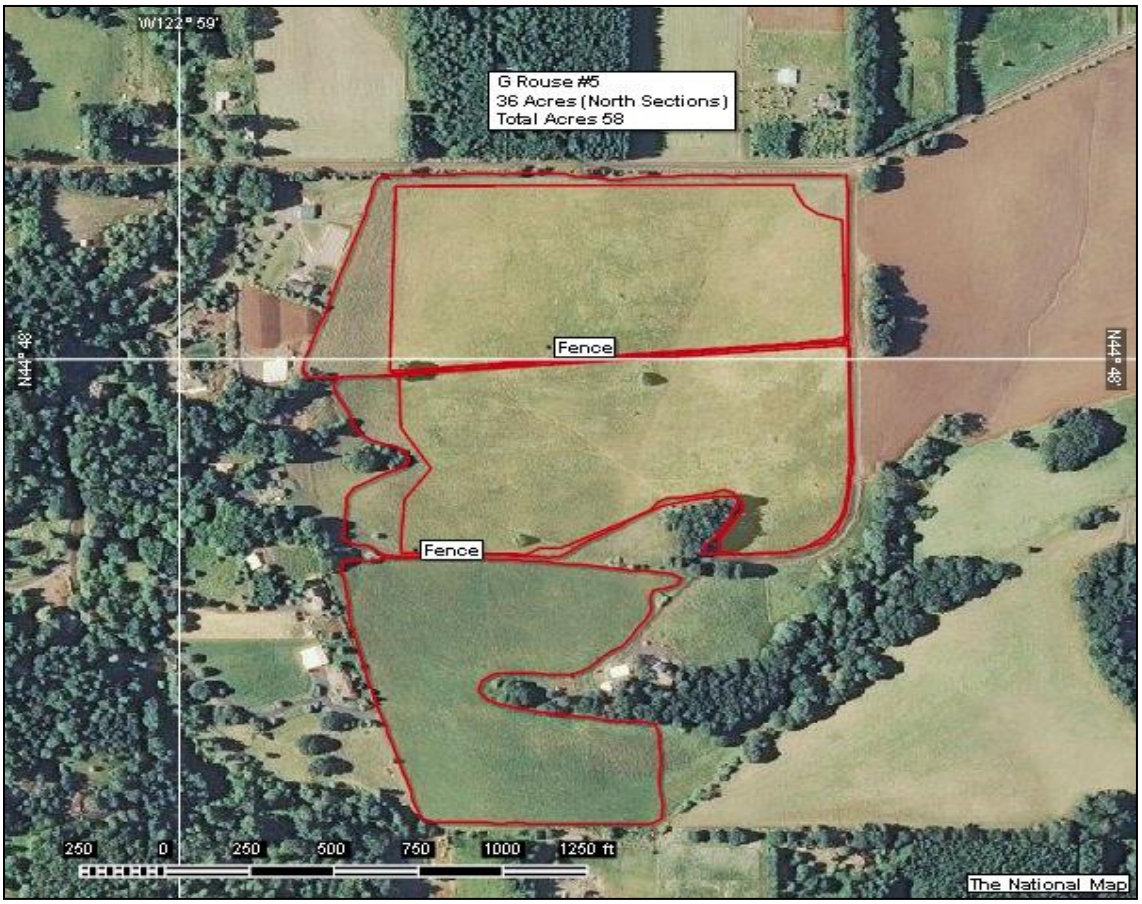
BIOSOLIDS ANALYSIS INFORMATION	
2020 AVERAGED DATA (Cent)(Sept-Novl)	
TOTAL SOLIDS (MG/KG)	25.19
ORGANIC NITROGEN (MG/KG)	52022
INORGANIC NITROGEN (NH4) (MG/KG)	8256
TKN (MG/KG)	60278
PHOSPHORUS (MG/KG)	14825
POTASSIUM (MG/KG)	1607
pH	8.27
ARSENIC (MG/KG)	6.8
CADMIUM (MG/KG)	1.35
CHROMIUM (MG/KG)	44
COPPER (MG/KG)	353
LEAD (MG/KG)	18.1
MERCURY (MG/KG)	0.61
MOLYBDENUM (MG/KG)	6.93
NICKEL (MG/KG)	18.2
SELENIUM (MG/KG)	4.01
SILVER (MG/KG)	4.0
ZINC (MG/KG)	1016
1ST YEAR MINERALIZATION RATE	0.30
LIQUID INORGANIC NITROGEN AVAILABILITY FACTOR	0.50
POUNDS OF ORG N AVAILABLE/DRY TON APPLIED	31.21
POUNDS OF INORG N AVAILABLE/DRY TON APPLIED	8.26
POUNDS OF (P.A.N.)/.DRY TON	39.47

APPLICATION SITE WORKSHEET:2021

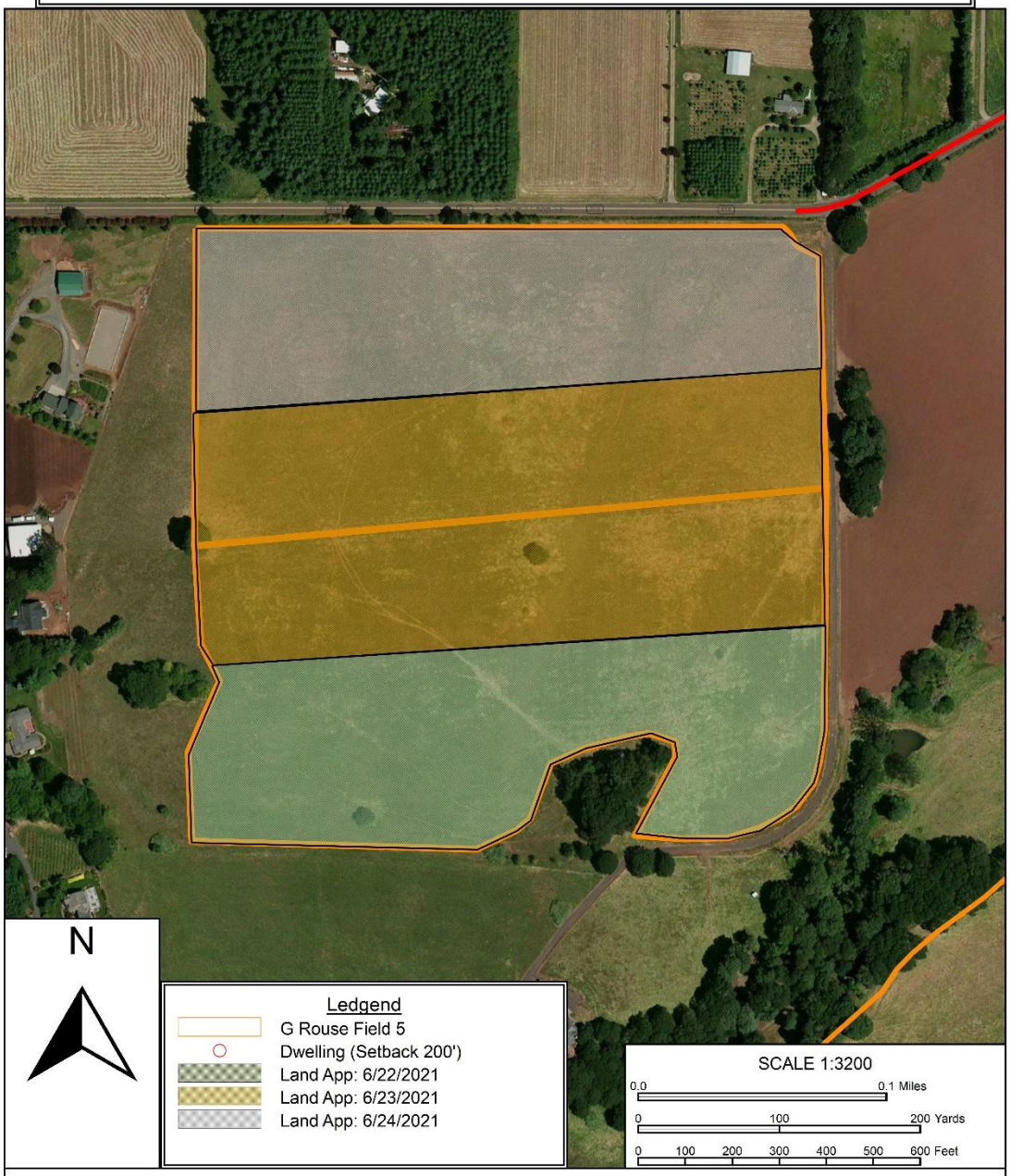
Application Dates:

Soil Sample Collected: 05-21-21 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) Application Rate is 12.02 WT/Acre 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.



G Rouse Field 5



Scale: 1 inch = 266 ft.

Job: City of Salem Biosolids Land Application

Tribeca Transport

City of Salem Spreader Track Sheet - Field: **G Rouse Field #5**

Total Tons Delivered: 455.6 WT

Estimated Loads based on 15 tons per spreader load:

Date	Operator	Loads Spread	EST tons spread
6/22/2021	MK	6	93
6/23/2021	MK	14	217
6/24/2021	MK	10	145.6
		Total Tons Spread	455.60

Soil Monitoring Report (0 - 12inch) - 2018

Site: Ward Rouse
Field: G. Rouse 1

Sample Date: 4/29/2021

Parameter	Result	Units
Nitrate-Nitrogen (NO3-N)	14	mg/kg
Available Phosphorus (P)	11	mg/kg
Total Potassium (K)	189	mg/kg
Sulfate-Sulfur (SO4-S)	34	mg/kg
Organic Matter	6.6	%
pH	5	-

Soil Monitoring Report (0-12inch) - 2021

Site: Ward Rouse
Field: G. Rouse 4

Sample Date: 4/29/2021

Parameter	Result	Units
Nitrate-Nitrogen (NO3-N)	30	mg/kg
Available Phosphorus (P)	22	mg/kg
Total Potassium (K)	63	mg/kg
Sulfate-Sulfur (SO4-S)	78	mg/kg
Organic Matter	6	%
pH	4.6	-

Soil Monitoring Report (0 - 12inch) - 2021

Site: Ward Rouse
Field: G. Rouse 2

Sample Date: 4/29/2021

Parameter	Result	Units
Nitrate-Nitrogen (NO3-N)	6	mg/kg
Available Phosphorus (P)	33	mg/kg
Total Potassium (K)	42	mg/kg
Sulfate-Sulfur (SO4-S)	58	mg/kg
Organic Matter	5.8	%
pH	4.9	-

Soil Monitoring Report (0-12 inch) - 2021

Site: Ward Rouse
Field: G. Rouse 5

Sample Date: 4/29/2021

Parameter	Result	Units
Nitrate-Nitrogen (NO3-N)	14	mg/kg
Available Phosphorus (P)	19	mg/kg
Total Potassium (K)	84	mg/kg
Sulfate-Sulfur (SO4-S)	51	mg/kg
Organic Matter	6.1	%
pH	4.8	-

Soil Monitoring Report (0 - 12inch) - 2021

Site: Ward Rouse
Field: G. Rouse 3

Sample Date: 4/29/2021

Parameter	Result	Units
Nitrate-Nitrogen (NO3-N)	11	mg/kg
Available Phosphorus (P)	80	mg/kg
Total Potassium (K)	52	mg/kg
Sulfate-Sulfur (SO4-S)	39	mg/kg
Organic Matter	7.5	%
pH	5.5	-

W. ORTON 1

FIELD IDENTIFICATION: W. ORTON 1 (1_R)	
OWNER: WAYNE ORTON	
LOCATION; TOWNSHIP: T8S RANGE: R5W SECTION: 31 & 32	
START DATE:-07-08-2021	
STOP DATE: -8/5/2021	
CROP: Western Oregon Hay	
TOTAL ACREAGE:	60

DEWATERED BIOSOLIDS APPLICATION RATE INFORMATION	
PERMITTED APPLICATION RATE (PAN POUNDS PER ACR	100
DRY TONS BIOSOLIDS PER ACRE	2.53
WET TONS BIOSOLIDS PER ACRE	10.06
TARGET APPLICATION RATE (PAN POUNDS PER ACRE)	100
DRY TONS BIOSOLIDS PER ACRE	2.53
WET TONS BIOSOLIDS PER ACRE	10.06
TOTAL WET TONS TO COMPLETE FIELD	603.48
DATE: Field Finished:8/5/2021	**601.50**
TOTAL WET TONS REMAINING	1.98

FINAL APPLICATION RATE INFORMATION	
FINAL APPLICATION RATE (PAN POUNDS PER ACRE)	99.67
PAN (TOTAL POUNDS APPLIED)	5,980.29
PHOSPHORUS (TOTAL POUNDS APPLIED)	4,492.50
POTASSIUM (TOTAL POUNDS APPLIED)	486.98
TOTAL WET TONS APPLIED	**601.50**
TOTAL DRY TONS APPLIED	151.52
DRY TONS BIOSOLIDS PER ACRE	2.53
WET TONS BIOSOLIDS PER ACRE	10.03

BIOSOLIDS ANALYSIS INFORMATION	
2020 AVERAGED DATA (Cent)(Sept-Nov)	
TOTAL SOLIDS (MG/KG)*	25.19
ORGANIC NITROGEN (MG/KG)	52022
INORGANIC NITROGEN (NH4+NO3) (MG/KG)	8256
TKN (MG/KG)	60278
PHOSPHORUS (MG/KG)	14825
POTASSIUM (MG/KG)	1607
pH	8.27
ARSENIC (MG/KG)	6.8
CADMIUM (MG/KG)	1.35

BIOSOLIDS ANALYSIS INFORMATION	
2020 AVERAGED DATA (Cent)(Sept-Nov)	
CHROMIUM (MG/KG)	44
COPPER (MG/KG)	353
LEAD (MG/KG)	18.1
MERCURY (MG/KG)	0.61
MOLYBDENUM (MG/KG)	6.93
NICKEL (MG/KG)	18.2
SELENIUM (MG/KG)	4.01
SILVER (MG/KG)	4.0
ZINC (MG/KG)	1016
1ST YEAR MINERALIZATION RATE	0.30
LIQUID INORGANIC NITROGEN AVAILABILITY FACTOR	0.50
POUNDS OF ORG N AVAILABLE/DRY TON APPLIED	31.21
POUNDS OF INORG N AVAILABLE/DRY TON APPLIED	8.26
POUNDS OF (P.A.N.)/.DRY TON	39.47

APPLICATION SITE WORKSHEET: 2021

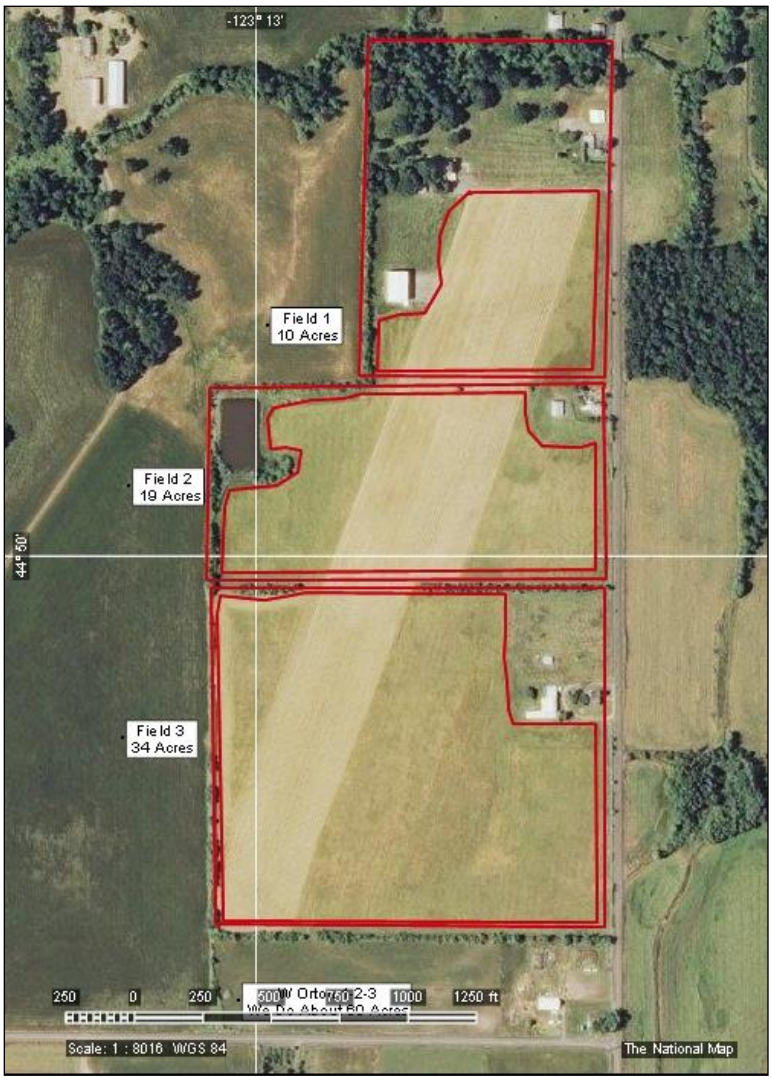
Application Dates:

Soil Sample Collected: No Domestic Well Sample Collected: No

Site and Application Identification: W. Orton 1(1_Q) & (1_R)
Biosolids Product: Centrifuge Cake @ Tract (1_R) 60 Acres
DEQ Nitrogen Application Authorization: 100 lbs PAN per Acre. 10.06 Wet Tons/ Acre
Tonnage needed – 604 Wet Tons
Acreage: 60 Acres

Distance: 20 miles. "Orton Farms"6765 Talmage Rd"
Route To Field: East on Lockhaven, Turn Right(South) on River Road then River Road turns into Commercial, Turn right(wes)t on Hwy 22, over bridge. Continue Hwy 22 until Hwy 99 exit. Turn rightt (south) on Hwy 99W (Rickreall/Monmouth Exit). Go 4.8 miles then Turn left (east) (At Light) 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"6765 Talmage Rd, Independence, Or,97351

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



SITE:	Orton	TOTAL ACRES:	60.00
START DATE	8/4/2021		
ENDING DATE:	8/10/2021		
TOTAL TONS:	601.53		
% SOLIDS:	25.00%	BULK DENSITY (LB/YD3):	1215.00

	UNIT #1	DAILY	TOTAL
DATE	SPDR LDS	SPDR LDS	SPDR LDS
8/4/2021	3	3.00	3.00
8/5/2021	13	13.00	16.00
8/6/2021	20	20.00	36.00
8/7/2021	9	9.00	45.00
8/10/2021	5	5.00	50.00

Section 7: Updated Biosolids Spill Plan

City of Salem
Willow Lake Water Pollution Control Facility
5915 Windsor Island Road North
Salem OR 97302

CITY OF SALEM BIOSOLIDS TRANSPORT SPILL RESPONSE PLAN

BIOGRO™ PROGRAM

Biosolids to Land Application

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
Revised January 2021

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 Supervisor	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 atreas at Wi;llow

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 11104 9973 11584	Beall /Stephens 6,000 gallons each	11517 11518 372

CAKE TRANSPORT EQUIPMENT

Tractors	ID Number	Trailer	ID Number
Freightliner	11104 11430 11584 11502	Ravens Semi-End Dump Trailer Approximately 22 wet tons semi-solid product capacity	9703
Freightliner		Trininty Semi-Belt Trailer Approximately 26 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.

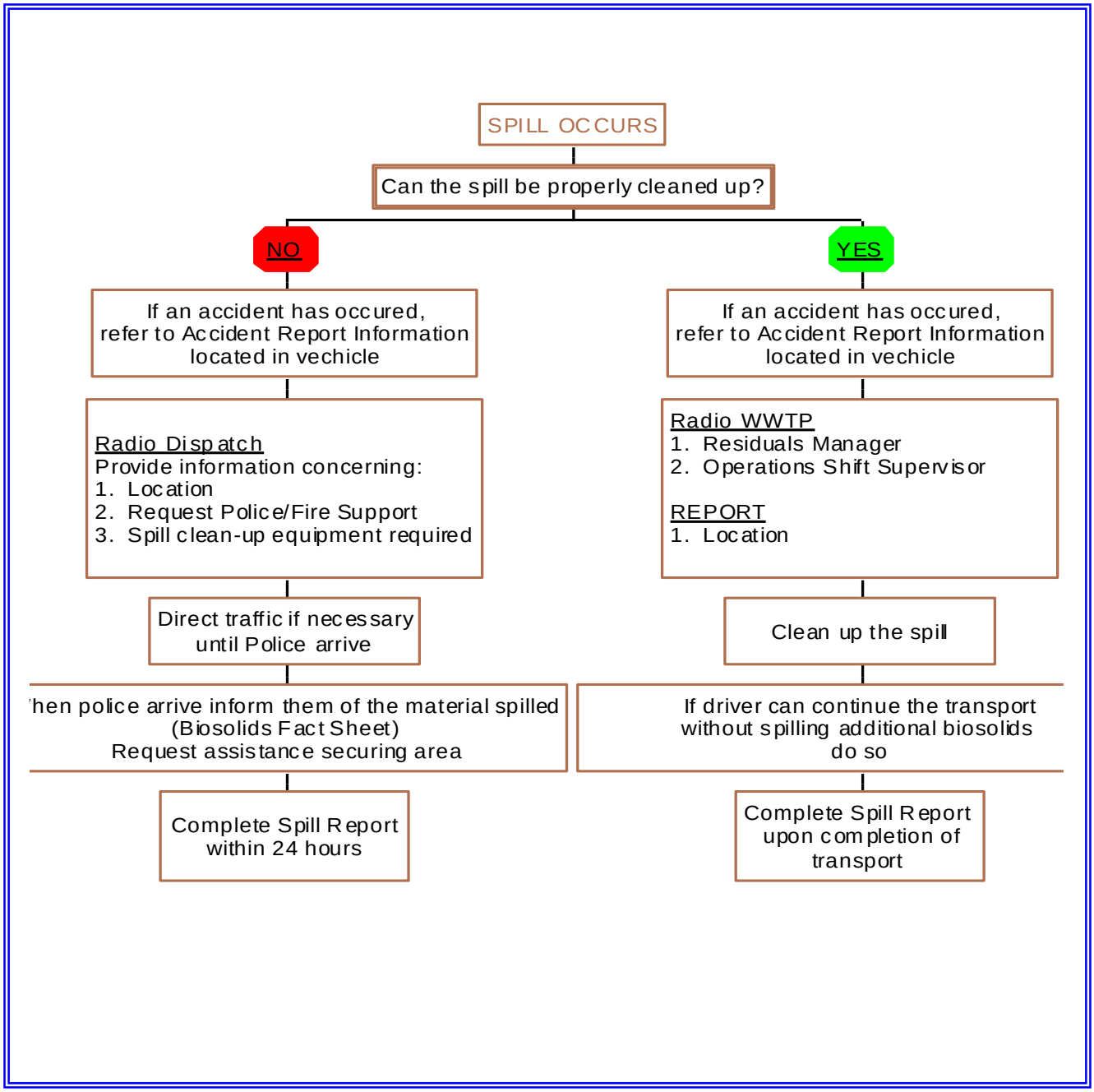
- Inform police or fire personnel of the type of material (Biosolids Fact Sheet) that has been spilled. Request the area to be secured and protected to prevent property damage and personal injury.

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

- Complete Spill Notification Report Form after returning to WLWPCF.

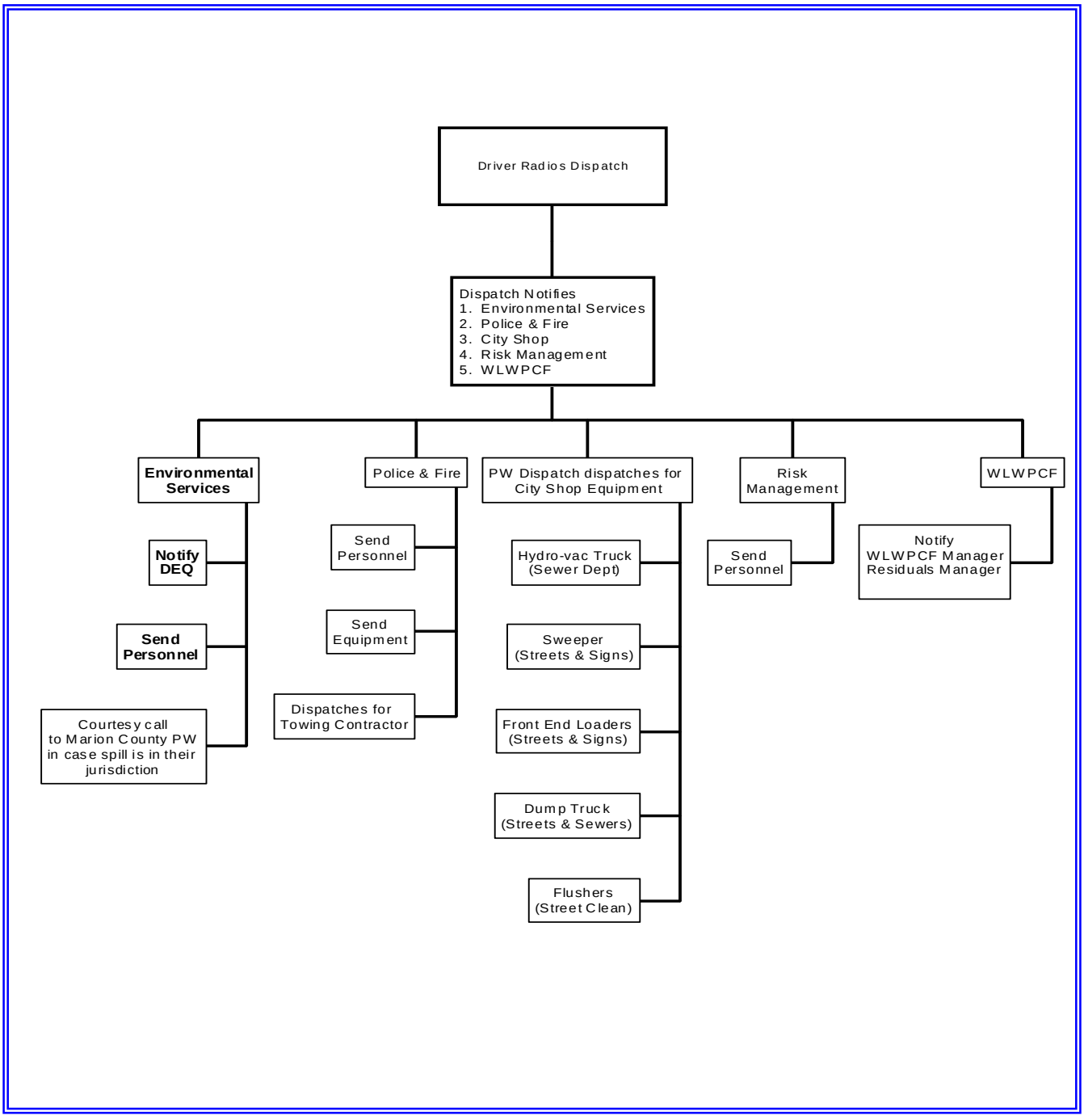
BIOSOLIDS SPILL NOTIFICATION SYSTEM

DRIVER RESPONSE



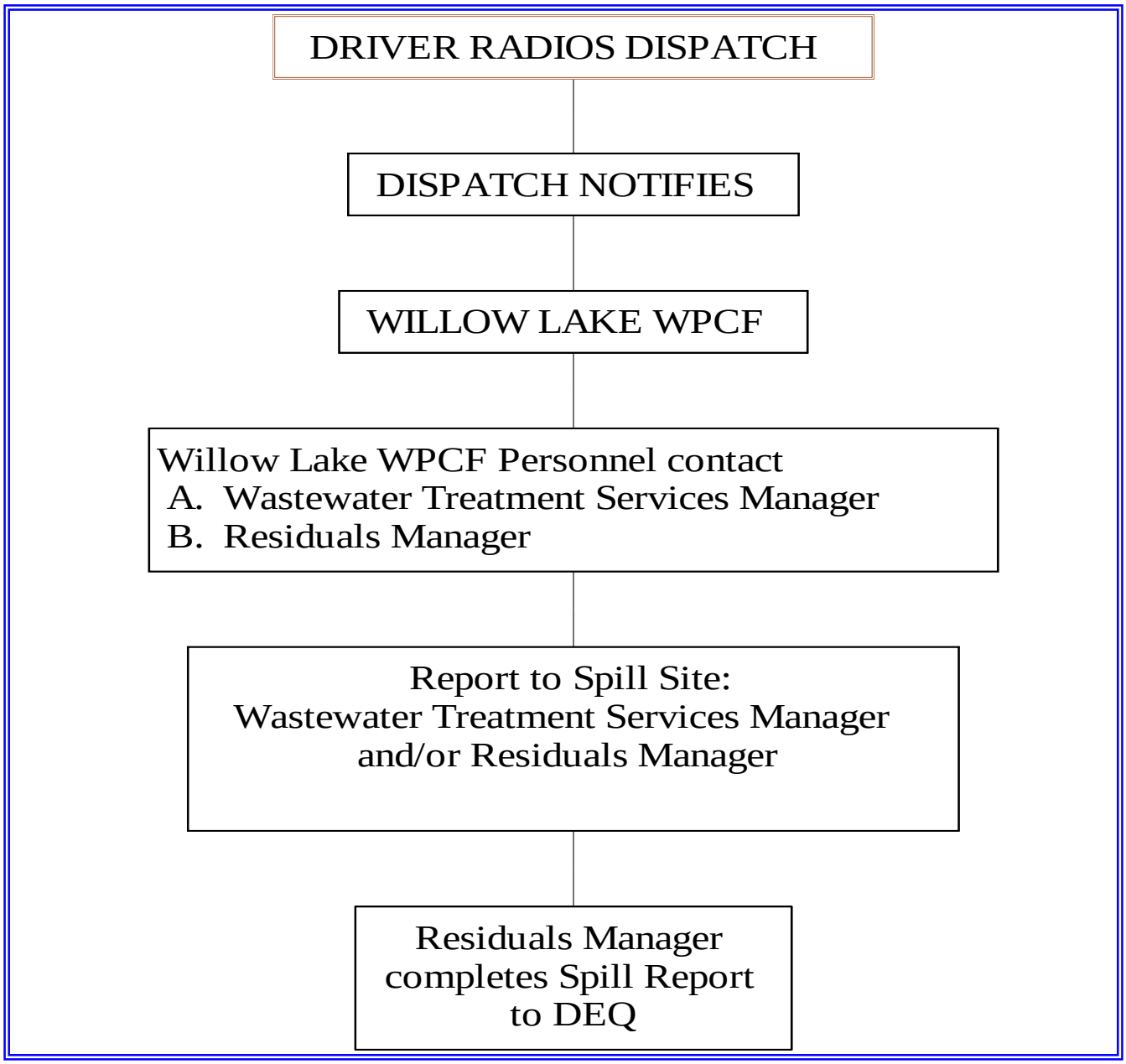
BIOSOLIDS SPILL NOTIFICATION SYSTEM

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
- Horner Enterprises Sweet Home, Oregon