Annual Biosolids Report 2009

SECTION A: FACILITY INFORMATION

Name of facility Yakima Regional Wastewater Treatment Plant **Owner** City of Yakima

Physical address 2220 East Viola Yakima WA 19801

Mailing address 2220 East Viola Yakima WA 98901

Primary contact name Tim Cooper **Primary contact title** Biosolids/Chief Operater

Primary contact phone 509-249-6871 **Primary contact email** tcooper@ci.yakima.wa.us

Responsible official name Scott Shafer **Responsible official title** Manager

Responsible official phone 509-575-6077 **Responsible official email** sshafer@ci.yakima.wa.us

Facility type (*check all that apply*)

- ☒ Major sewage treatment facility (design *flow of ≥1 mgd or serving a population of ≥10,000*)
- ☐ Minor sewage treatment facility (design *flow of <1 mgd and serving a population of <10,000*)
- ☐ Class I sewage treatment facility (*have a pretreatment program or designated as Class I*)
- ☐ Composting facility (*receive biosolids or sewage sludge from others for composting*)
- ☐ Septage management facility (*land apply or prepare septage for land application*)
- ☐ Beneficial use facility (*receive biosolids from others for direct land application*)
- ☐ Other—describe _____

SECTION B: BIOSOLIDS/SEPTAGE/SEWAGE SLUDGE MANAGEMENT

Sent to a facility for further treatment N/A *dry tons* Facility names and subtotals N/A

Received from a facility for further treatment N/A *dry tons* Facility names and subtotals N/A

Sent to a biosolids beneficial use facility (BUF) 3,503.38 *dry tons* BUF names and subtotals Natural Slection Farms, INC.

Received by a biosolids beneficial use facility (BUF) N/A *dry tons* Facility names and subtotals N/A

Sent to a landfill for disposal N/A *dry tons* Landfill names and subtotals N/A

Sent to an incinerator (*include your incinerator*) N/A *dry tons* Incinerator names and subtotals N/A

Stored for less than 2 years N/A *dry tons*—describe N/A

Stored or accumulated for more than 2 years (*this includes lagoon facilities*) N/A *dry tons*

When was the last time you surveyed solids accumulation? N/A

When was the last time you tested your solids for the pollutants in WAC 173-308-160? 12-31-2009

How much capacity remains for solids accumulation (*remaining feet of space*)? N/A *feet*

When do you plan to remove solids? N/A

Land applied or sold/given away (*do not complete for biosolids sent to a BUF*) **1.5** *dry tons*

Subtotal applied to an agricultural site **1.5** *dry tons*

Subtotal applied to a forest site _____ *dry tons*

Subtotal applied to a reclamation site _____ *dry tons*

Subtotal applied to a public contact site _____ *dry tons*

Subtotal applied to a lawn or home garden _____ *dry tons*

Subtotal sold/given away in bulk, bag/other container, compost, or blended product _____ *dry tons*

Land application site information (*do not complete for biosolids sent to a BUF; expand this section or include additional sheets if needed*)

Location (unit, field name, address, or latitude/longitude) **Roy Farms Field D-56** Amount applied **1.5** *dry tons* Acres applied to **.25** *acres* Vegetation grown **Hops**

Solid waste feedstocks used for composting (*check all that apply*)

☐ Yard Debris _____ *dry tons*	☐ Land-clearing Debris _____ *dry tons*
☐ Crop Residues (*specify*) _____ *dry tons*	☐ Sawdust/Shavings _____ *dry tons*
☐ Other Wood Waste _____ *dry tons*	☐ Manure _____ *dry tons*
☐ Food Waste (*pre-consumer vegetative*) _____ *dry tons*	☐ Food Waste (*all other*) _____ *dry tons*
☐ Food Processing Waste _____ *dry tons*	☐ Carcasses _____ *dry tons*
☐ Industrial Waste (*specify*) _____ *dry tons*	☐ Other (*specify*) _____ *dry tons*

SECTION C: BIOSOLIDS/SEPTAGE QUALITY

Pollutants (*see WAC 173-308-160; not applicable to septage unless required by permit*)

Number of pollutant monitoring events in the past year **6**

List pollutants exceeding the Table 3 values and explain **N/A**

List pollutants exceeding the Table 1 values and explain **N/A**

Pathogen reduction (*check all that apply; see WAC 173-308-170 or WAC 173-308-270[3]*)

☐ Class A—Alternative 1 (*time/temperature*)	☐ Class A—Alternative 2 (*pH/time/temperature/% solids*)

☐ Class A—Alternative 3 (*process to further reduce pathogens [PFRP]*) ☐ Composting ☐ Heat drying ☐ Heat treatment ☐ Thermophilic aerobic digestion ☐ Beta ray irradiation ☐ Gamma ray irradiation ☐ Pasteurization	
☐ Class A—Alternative 4 (*PFRP equivalent*)	☐ Class B—Alternative 1 (7 *samples*)
☒ Class B—Alternative 2 (*process to significantly reduce pathogens [PSRP]*) ☐ Aerobic digestion ☐ Air drying ☒ Anaerobic digestion ☐ Composting ☐ Liming	
☐ Class B—Alternative 3 (*PSRP equivalent*)	☐ Septage injection
☐ Septage incorporation	☐ Septage pH stabilization
☐ Did not meet requirements—explain **N/A**	

Vector attraction reduction (*check all that apply; see WAC 173-308-180 or WAC 173-308-270[3]*)

☒ Alternative 1 (*38% volatile solids reduction*) ☐ Alternative 1a (*bench test-anaerobic*) ☐ Alternative 1b (*bench test-aerobic*)	
☐ Alternative 2 (*specific oxygen uptake rate*)	☐ Alternative 3 (*aerobic process*)
☐ Alternative 4 (*pH stabilization*)	☐ Alternative 5 (*≥75% solids*)
☐ Alternative 6 (*≥90% solids*)	☐ Alternative 7 (*injection*)
☐ Alternative 8 (*incorporation*)	☐ Septage injection
☐ Septage incorporation	☐ Septage pH stabilization
☐ Did not meet requirements—explain N/A	

SECTION D: GENERAL COMMENTS RELATED TO FACILITY OPERATION

Please add any comments or descriptions of activities that you think are important _____

SECTION E: ATTACHMENTS, CERTIFICATION STATEMENT, MAILING ADDRESSES

Attachments (*check all that apply; include actual lab reports for analytical data*)

- ☒ Analytical data for pollutants if testing was required
- ☒ Analytical data for pathogen reduction if testing was required
- ☒ Analytical data for vector attraction reduction if testing was required
- ☐ Other—describe (*examples include soil and water sampling results, time and temperature monitoring data, pH monitoring data, and additional land application site information*) **N/A**

Certification statement (*must be signed by the Responsible Official listed in Section A or a duly authorized representative; see WAC 173-308-310(10)(b)*)

"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 who manage the system, or those persons directly responsible for gathering the information, the information submitted 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, including the possibility of fine and imprisonment for knowing violations."

Responsible Official Signature _____ Date 2/9/10

Responsible Official Title Wastewater Plant Manager

Mailing addresses

Biosolids Production for calendar year 2009

MONTH	FEED FLOW (MG)	FEED CONC.	GROSS DRY TONS	CENTRATE CONC.	CENTRATE DRY TONS	TOTAL DRY TONS	Weighed DRY TONS	Lagoon DRY TONS
January	1.974	16,058	132.18	445	3.66	128.52	133.00	
February	2.001	15,438	128.82	193	1.61	127.21	127.00	
March	1.906	15,745	125.14	175	1.39	123.75	136.55	
April	2.565	16,622	177.79	373	3.99	173.80	165.26	
May	2.041	17,065	145.24	220	1.87	143.37	159.93	
June	2.279	15,913	151.23	210	2.00	149.23	137.35	
July	2.565	15,702	167.95	346	3.70	164.25	148.00	90.34
August	1.882	16,188	127.04	110	0.86	126.18	121.00	517.74
September	3.200	16,806	224.26	163	2.18	222.08	189.00	732.39
October	2.810	17,193	201.46	320	3.75	197.71	214.00	303.03
November	2.130	16,520	146.73	330	2.93	143.80	153.00	10.77
December	2.645	13,540	149.34	103	1.14	148.21	119.00	
					DRY TONS/YEAR	1848.11	1803.09	1654.27
					METRIC DRY TONS / YEAR	1676.23	1635.40	
					AVERAGE DRY TONS/MONTH	154.01	150.26	
					METRIC DRY TONS/MONTH	139.69	136.28	
					ADJUSTED DRY TONS PER YEAR	1803.09		
					ADJUSTED METRIC DRY TONS PER YEAR	1635.40		

Adjusted dry tons = calculated dry tons minus 2.44 percent

Calculated amounts= (Flow (MG) X Feed Conc X 8.34) / 2000 - (Flow (MG) X Centrate Conc X 8.34) / 2000

Calculated amounts, using feed flow calculated from pump run time X metered flow rate.

Weighed amounts from hauling records = 2.44 percent less than calculated amounts.

Total dry tonnage is gross dry tons minus centrate dry tons

Average amount is arithmetic average for the year.

concentrations are mg/l as received from lab report.

METALS 2009

	Biosolids #1	Biosolids #2	Biosolids #3	Biosolids #4	Biosolids #5	Biosolids #6	Averages	CFR part 40
DATES - 2009	Feb. 11	Apr. 8	Jun. 10	Aug. 12	Oct. 7	Dec. 9		503 Table 3
Arsenic	ND < 2 mg/kg	ND < 2 mg/kg	ND < 2 mg/kg	ND < 2 mg/kg	ND < 2 mg/kg	ND < 2 mg/kg	ND < 2 mg/kg	41
Cadmium	2.9	1.58	1.14	1.7	1.18	1.57	1.59	39
Copper	303	346	320	357	346	290	326.1	1,500
Lead	51.3	90.2	115	116	71.5	66	81.42	300
Mercury	ND < 0.5 mg/kg	0.989	1.25	0.697	0.723	1.13	0.93	17
Molybdenum	15	13.4	9.6	10.3	9.41	14.2	11.76	75
Nickel	13.6	12.0	13.1	12.2	15.9	8.2	12.26	420
Selenium	ND < 5 mg/kg	ND < 5 mg/kg	ND < 5 mg/kg	ND < 5 mg/kg	ND < 5 mg/kg	ND < 5 mg/kg	ND < 5 mg/kg	36
Zinc	774	821	735	811	847	841	803.9	2,800
CONVENTIONALS								
	Feb. 11	Apr. 8	Jun. 10	Aug. 12	Oct. 7	Dec. 9		
Organic Nitrogen	68,200	65,200	64,000	55,000	60,300	64,100	62,655	
Ammonia Nitrogen	5,660	8,100	4,820	7,980	6,730	8,210	6,783	
Nitrite + Nitrate N	22.70	14.3	17.6	110	35.70	9.23	24.32	
Total Phosphorus	16,900	18,100	16,700	16,200	15,000	15,900	16,439	
Percent Solids	19.8%	21.0%	22.2%	21.8%	19.9%	19.5%	20.7%	

Note: (TKN - Ammonia) - (Nitrite+Nitrate) = Organic Nitrogen
Geometric averages were used on all averages.
ND - not detected, Mercury detection limit is 0.05 mg/kg.
ND's are included in Arsenic and Selenium averages, detection limits of 0.50 mg/kg used
units are mg/kg

2009

Volatile Solids Reduction in % For Vector Attraction Reduction

MONTH	RAW	WAS	AVERAGE IN	PRIMARY 1	PRIMARY 2	PRIMARY 3	AVERAGE OUT	PERCENT REDUCTION	TEMP. F°
January	83.3%	87.1%	85.2%	69.8%	71.2%	70.1%	70.4%	58.75%	99.1
February	83.3%	86.3%	84.8%	67.0%	68.9%	69.1%	68.3%	61.32%	98.7
March	80.4%	86.0%	83.2%	67.7%	67.9%	68.0%	67.9%	57.35%	98.8
April	80.8%	85.1%	83.0%	68.2%	68.5%	67.9%	68.2%	55.92%	98.6
May	82.7%	85.4%	84.1%	67.0%	67.7%	66.8%	67.2%	61.18%	99.0
June	82.6%	86.2%	84.4%	66.8%	67.8%	68.6%	67.7%	61.20%	98.8
July	82.7%	86.9%	84.8%	66.3%	68.6%	67.7%	67.5%	62.72%	98.8
August	79.2%	86.5%	82.9%	65.2%	65.3%	66.5%	65.7%	60.41%	99.3
September	82.2%	87.8%	85.0%	65.7%	67.5%	66.6%	66.6%	64.81%	99.1
October	83.3%	88.0%	85.7%	72.3%	71.9%	72.2%	72.1%	56.63%	98.6
November	85.5%	88.6%	87.1%	70.3%	72.0%	70.5%	70.9%	63.70%	98.6
December	87.1%	88.3%	87.7%	68.7%	70.2%	40.1%	59.7%	79.25%	98.6
							High for year	79.25%	99.3
							Low for year	55.92%	98.6
							Average	61.94%	98.8

Notes: Arithmetic averages used to determine averages for volatile solids.
Percents are entered in as decimals.
Formula to determine percent reduction is from page 4-23 of EPA's Operational Manual 430/9-76-001, "Anaerobic Sludge Digestion".

$$\text{Percent reduction} = \frac{(IN - OUT) \times 100\%}{IN - (IN \times OUT)}$$

YAKIMA REGIONAL WASTEWATER TREATMENT PLANT
ANALYTICAL RESULTS

Sample Origin: BIOSOLIDS #6
Sample Description: CENTRIFUGE CONVEYOR COMPOSITE
Matrix: BIOSOLIDS
Date Received by Lab: 12/31/2009
Lab Sample No: 2009 BS #6

	Analytical Method	Results (As Recvd.)	Results (Dry wt.)	Units	Detection Limit	Date Analyzed	Limits Tables 1,3	Comments
A) Pollutants								
Arsenic	SM3030D/SM3113B	ND	ND	mg/kg	2	01/26/10	75, 41	
Cadmium	SM3030D/SM3113B	1.57	1.57	mg/kg	0.2	01/26/10	85, 39	
Chromium	SM3030D/SM3113B	31.3	31.3	mg/kg	0.4	01/26/10		
Copper	SM3030D/SM3113B	290	290	mg/kg	1	01/12/10	4300, 1500	
Lead	SM3030D/SM3113B	66.0	66.0	mg/kg	0.5	01/26/10	840, 300	
Mercury	SM3112B	1.13	1.13	mg/kg	0.5	01/27/10	57, 17	
Molybdenum	SM3030D/SM3113B	14.2	14.2	mg/kg	5	01/25/10	75, -	
Nickel	SM3030D/SM3113B	8.17	8.17	mg/kg	5	01/25/10	420, 420	
Selenium	SM3030D/SM3113B	ND	ND	mg/kg	5	01/31/10	100, 100	
Sodium	SM3030D/SM3113B	1,410	1,410	mg/kg	400	01/12/10		
Zinc	SM3030D/SM3113B	841	841	mg/kg	5	01/12/10	7500, 2800	
B) Nutrients								
Ammonia nitrogen (total)	SM4500-NH3N	8,210	8,210	mg/kg		01/05/10		
Ammonium nitrogen (total)				mg/kg				Not Performed
Nitrate Nitrogen	SM4500NO3-E	9.23	9.23	mg/kg		01/05/10		
Total Kjeldahl nitrogen	SM4500NorgC	64,100	64,100	mg/kg		01/06/10		
Organic Nitrogen				mg/kg				Not Performed
Phosporous (total)	EPA 200.7	15,900	15,900	mg/kg	12.8	01/07/10		
C) Conventionals								
Total solids	SM2540B	19.5	19.5	%	0.01%	01/06/10		
Total volatile solids (% of TS)				%				Not Performed

YAKIMA REGIONAL WASTEWATER TREATMENT PLANT
ANALYTICAL RESULTS

	Analytical Method	Results (As Recvd.)	Results (Dry wt.)	Units	Detection Limit	Date Analyzed	Limits Tables 1,3	Comments
D) Bacteriological								
Fecal coliform				MPN/gm				Not Performed
E) Recommended Nutrients				mg/kg				
Boron (total/extractable)				mg/kg				Not Performed
Calcium (total/extractable)	SW846 6010	30,792	30,792	mg/kg	625	01/13/10		
Chloride (total/extractable)				mg/kg				Not Performed
Iron (total/extractable)	SW846 6010	8,714	8,714	mg/kg	125	01/12/10		
Magnesium (total/extractable)	SW846 6010	4,730	4,730	mg/kg	250	01/13/10		
Manganese (total/extractable)	SW846 6010	165	165	mg/kg	75	01/12/10		
Potassium (total/extractable)	SW846 6010	2,232	2,232	mg/kg	50	01/12/10		
Sulfur (total/extractable)				mg/kg				Not Performed
F) Alternative Pathogens								
Salmonella				MPN/4 gms				Not Performed
Viruses				PFU/4 gms				Not Performed
Helminths				viable ova/4 gms				Not Performed
G) Additional Analyses								
pH				std units				Not Performed
Conductivity				dS/m				Not Performed
Total carbon				mg/kg				Not Performed
Silver	SM3030D/SM3113B	7.63	7.63	mg/kg	1	01/12/10		

NOTES:

Analytical Methods are prescribed per federal requirements in WAC 173-308-140. See also 40 CFR 503.8

A) Pollutant limits from WAC 173-308-160. Table 1 - Ceiling Concentration Limits, Table 3 - Pollutant Concentation Limits. See also 40CFR 503.13

For B) Nutrient analyses, see "Managing Nitrogen From Biosolids", Ecology publication #99-508, Ch. 9

Analysis for A) Pollutants, B) Nutrients, C) Conventionals, and D) Bacteriological are all required for land application.

Analysis for E) Recommended Nutrients, F) Alternative Pathogens, and G) Additional Analyses are optional.

Analysis for E) Recommended Nutrients can be either total (for environmental purposes) or extractable (for agronomic purposes). Please specify.

Results for F) Alternative Pathogens are reported per 4 grams of total solids.

YAKIMA REGIONAL WASTEWATER TREATMENT PLANT
ANALYTICAL RESULTS

Sample Origin: BIOSOLIDS #5
Sample Description: CENTRIFUGE CONVEYOR COMPOSITE
Matrix: BIOSOLIDS
Date Received by Lab: 10/28/2009
Lab Sample No: 2009 BS #5

	Analytical Method	Results (As Recvd.)	Results (Dry wt.)	Units	Detection Limit	Date Analyzed	Limits Tables 1,3	Comments
A) Pollutants								
Arsenic	SM3030D/SM3113B	ND	ND	mg/kg	2	12/01/09	75, 41	
Cadmium	SM3030D/SM3113B	1.18	1.18	mg/kg	0.2	12/02/09	85, 39	
Chromium	SM3030D/SM3113B	28.2	28.2	mg/kg	0.4	12/02/09		
Copper	SM3030D/SM3113B	346	346	mg/kg	1	11/08/09	4300, 1500	
Lead	SM3030D/SM3113B	71.5	71.5	mg/kg	0.5	11/09/09	840, 300	
Mercury	SM3112B	0.723	0.723	mg/kg	0.5	11/16/09	57, 17	
Molybdenum	SM3030D/SM3113B	9.41	9.41	mg/kg	5	11/08/09	75, -	
Nickel	SM3030D/SM3113B	15.9	15.9	mg/kg	5	12/03/09	420, 420	
Selenium	SM3030D/SM3113B	ND	ND	mg/kg	5	11/08/08	100, 100	
Sodium	SM3030D/SM3113B	987	987	mg/kg	400	11/23/09		
Zinc	SM3030D/SM3113B	847	847	mg/kg	5	11/08/09	7500, 2800	
B) Nutrients								
Ammonia nitrogen (total)	SM4500-NH3N	6,730	6,730	mg/kg		10/30/09		
Ammonium nitrogen (total)				mg/kg				Not Performed
Nitrate Nitrogen	SM4500NO3-E	35.7	35.7	mg/kg		10/30/09		
Total Kjeldahl nitrogen	SM4500NorgC	60,300	60,300	mg/kg		11/03/09		
Organic Nitrogen				mg/kg				Not Performed
Phosporous (total)	EPA 200.7	15,000	15,000	mg/kg	12.6	11/03/09		
C) Conventionals								
Total solids	SM2540B	19.9	19.9	%	0.01%	10/30/09		
Total volatile solids (% of TS)				%				Not Performed

YAKIMA REGIONAL WASTEWATER TREATMENT PLANT
ANALYTICAL RESULTS

	Analytical Method	Results (As Recvd.)	Results (Dry wt.)	Units	Detection Limit	Date Analyzed	Limits Tables 1,3	Comments
D) Bacteriological								
Fecal coliform				MPN/gm				Not Performed
E) Recommended Nutrients				mg/kg				
Boron (total/extractable)				mg/kg				Not Performed
Calcium (total/extractable)	SW846 6010	29,734	29,734	mg/kg	625	11/27/09		
Chloride (total/extractable)				mg/kg				Not Performed
Iron (total/extractable)	SW846 6010	9,824	9,824	mg/kg	125	11/23/09		
Magnesium (total/extractable)	SW846 6010	4,533	4,533	mg/kg	250	11/23/09		
Manganese (total/extractable)	SW846 6010	217	217	mg/kg	75	11/23/09		
Potassium (total/extractable)	SW846 6010	2,316	2,316	mg/kg	50	11/27/09		
Sulfur (total/extractable)				mg/kg				Not Performed
F) Alternative Pathogens								
Salmonella				MPN/4 gms				Not Performed
Viruses				PFU/4 gms				Not Performed
Helminths				viable ova/4 gms				Not Performed
G) Additional Analyses								
pH				std units				Not Performed
Conductivity				dS/m				Not Performed
Total carbon				mg/kg				Not Performed
Silver	SM3030D/SM3113B	8.38	8.38	mg/kg	1	11/28/09		

NOTES:

Analytical Methods are prescribed per federal requirements in WAC 173-308-140. See also 40 CFR 503.8

A) Pollutant limits from WAC 173-308-160. Table 1 - Ceiling Concentration Limits, Table 3 - Pollutant Concentation Limits. See also 40CFR 503.13

For B) Nutrient analyses, see "Managing Nitrogen From Biosolids", Ecology publication #99-508, Ch. 9

Analysis for A) Pollutants, B) Nutrients, C) Conventionals, and D) Bacteriological are all required for land application.

Analysis for E) Recommended Nutrients, F) Alternative Pathogens, and G) Additional Analyses are optional.

Analysis for E) Recommended Nutrients can be either total (for environmental purposes) or extractable (for agronomic purposes). Please specify.

Results for F) Alternative Pathogens are reported per 4 grams of total solids.

YAKIMA REGIONAL WASTEWATER TREATMENT PLANT
ANALYTICAL RESULTS

Sample Origin: BIOSOLIDS #4
Sample Description: CENTRIFUGE CONVEYOR COMPOSITE
Matrix: BIOSOLIDS
Date Received by Lab: 9/15/2009
Lab Sample No: 2009 BS #4

	Analytical Method	Results (As Recvd.)	Results (Dry wt.)	Units	Detection Limit	Date Analyzed	Limits Tables 1,3	Comments
A) Pollutants								
Arsenic	SM3030D/SM3113B	ND	ND	mg/kg	2	10/08/09	75, 41	
Cadmium	SM3030D/SM3113B	1.70	1.70	mg/kg	0.2	10/13/09	85, 39	
Chromium	SM3030D/SM3113B	46.1	46.1	mg/kg	0.4	10/01/09		
Copper	SM3030D/SM3113B	357	357	mg/kg	1	10/07/09	4300, 1500	
Lead	SM3030D/SM3113B	116	116	mg/kg	0.5	09/18/09	840, 300	
Mercury	SM3112B	0.697	0.697	mg/kg	0.5	10/28/09	57, 17	
Molybdenum	SM3030D/SM3113B	10.3	10.3	mg/kg	5	10/15/09	75, -	
Nickel	SM3030D/SM3113B	12.2	12.2	mg/kg	5	10/07/09	420, 420	
Selenium	SM3030D/SM3113B	ND	ND	mg/kg	5	10/01/09	100, 100	
Sodium	SM3030D/SM3113B	1,429	1,429	mg/kg	400	10/06/09		
Zinc	SM3030D/SM3113B	811	811	mg/kg	5	10/07/09	7500, 2800	
B) Nutrients								
Ammonia nitrogen (total)	SM4500-NH3N	7,980	7,980	mg/kg		09/21/09		
Ammonium nitrogen (total)				mg/kg				Not Performed
Nitrate Nitrogen	SM4500NO3-E	110	110	mg/kg		09/18/09		
Total Kjeldahl nitrogen	SM4500NorgC	55,000	55,000	mg/kg		09/18/09		
Organic Nitrogen				mg/kg				Not Performed
Phosporous (total)	EPA 200.7	16,200	16,200	mg/kg	11.5	09/21/09		
C) Conventionals								
Total solids	SM2540B	21.8	21.8	%	0.01%	09/18/09		
Total volatile solids (% of TS)				%				Not Performed

YAKIMA REGIONAL WASTEWATER TREATMENT PLANT
ANALYTICAL RESULTS

	Analytical Method	Results (As Recvd.)	Results (Dry wt.)	Units	Detection Limit	Date Analyzed	Limits Tables 1,3	Comments
D) Bacteriological								
Fecal coliform				MPN/gm				Not Performed
E) Recommended Nutrients				mg/kg				
Boron (total/extractable)				mg/kg				Not Performed
Calcium (total/extractable)	SW846 6010	25,767	25,767	mg/kg	625	10/05/09		
Chloride (total/extractable)				mg/kg				Not Performed
Iron (total/extractable)	SW846 6010	12,508	12,508	mg/kg	125	10/06/09		
Magnesium (total/extractable)	SW846 6010	4,553	4,553	mg/kg	250	10/06/09		
Manganese (total/extractable)	SW846 6010	213	213	mg/kg	75	10/06/09		
Potassium (total/extractable)	SW846 6010	2,143	2,143	mg/kg	50	10/05/09		
Sulfur (total/extractable)				mg/kg				Not Performed
F) Alternative Pathogens								
Salmonella				MPN/4 gms				Not Performed
Viruses				PFU/4 gms				Not Performed
Helminths				viable ova/4 gms				Not Performed
G) Additional Analyses								
pH				std units				Not Performed
Conductivity				dS/m				Not Performed
Total carbon				mg/kg				Not Performed
Silver	SM3030D/SM3113B	11.2	11.2	mg/kg	1	10/19/09		

NOTES:

Analytical Methods are prescribed per federal requirements in WAC 173-308-140. See also 40 CFR 503.8

A) Pollutant limits from WAC 173-308-160. Table 1 - Ceiling Concentration Limits, Table 3 - Pollutant Concentation Limits. See also 40CFR 503.13

For B) Nutrient analyses, see "Managing Nitrogen From Biosolids", Ecology publication #99-508, Ch. 9

Analysis for A) Pollutants, B) Nutrients, C) Conventionals, and D) Bacteriological are all required for land application.

Analysis for E) Recommended Nutrients, F) Alternative Pathogens, and G) Additional Analyses are optional.

Analysis for E) Recommended Nutrients can be either total (for environmental purposes) or extractable (for agronomic purposes). Please specify.

Results for F) Alternative Pathogens are reported per 4 grams of total solids.

YAKIMA REGIONAL WASTEWATER TREATMENT PLANT
ANALYTICAL RESULTS

Sample Origin: BIOSOLIDS #3
Sample Description: CENTRIFUGE CONVEYOR COMPOSITE
Matrix: BIOSOLIDS
Date Received by Lab: 7/8/2009
Lab Sample No: 2009 BS #3

	Analytical Method	Results (As Recvd.)	Results (Dry wt.)	Units	Detection Limit	Date Analyzed	Limits Tables 1,3	Comments
A) Pollutants								
Arsenic	SM3030D/SM3113B	ND	ND	mg/kg	2	07/16/09	75, 41	
Cadmium	SM3030D/SM3113B	1.14	1.14	mg/kg	0.2	07/14/09	85, 39	
Chromium	SM3030D/SM3113B	30.0	30.0	mg/kg	0.4	07/21/09		
Copper	SM3030D/SM3113B	302	302	mg/kg	1	07/23/09	4300, 1500	
Lead	SM3030D/SM3113B	115	115	mg/kg	0.5	07/28/09	840, 300	
Mercury	SM3112B	1.25	1.25	mg/kg	0.5	08/24/09	57, 17	
Molybdenum	SM3030D/SM3113B	9.56	9.56	mg/kg	5	07/15/09	75, -	
Nickel	SM3030D/SM3113B	13.1	13.1	mg/kg	5	07/15/09	420, 420	
Selenium	SM3030D/SM3113B	ND	ND	mg/kg	5	07/30/09	100, 100	
Sodium	SM3030D/SM3113B	1,173	1,173	mg/kg	400	08/03/09		
Zinc	SM3030D/SM3113B	735	735	mg/kg	5	08/21/09	7500, 2800	
B) Nutrients								
Ammonia nitrogen (total)	SM4500-NH3N	4,820	4,820	mg/kg		07/10/09		
Ammonium nitrogen (total)				mg/kg				Not Performed
Nitrate Nitrogen	SM4500NO3-E	17.6	17.6	mg/kg		07/10/09		
Total Kjeldahl nitrogen	SM4500NorgC	64,000	64,000	mg/kg		07/23/09		
Organic Nitrogen				mg/kg				Not Performed
Phosporous (total)	EPA 200.7	16,700	16,700	mg/kg	11.3	07/14/09		
C) Conventionals								
Total solids	SM2540B	22.2	22.2	%	0.01%	07/15/09		
Total volatile solids (% of TS)				%				Not Performed

YAKIMA REGIONAL WASTEWATER TREATMENT PLANT
ANALYTICAL RESULTS

	Analytical Method	Results (As Recvd.)	Results (Dry wt.)	Units	Detection Limit	Date Analyzed	Limits Tables 1,3	Comments
D) Bacteriological								
Fecal coliform				MPN/gm				Not Performed
E) Recommended Nutrients				mg/kg				
Boron (total/extractable)				mg/kg				Not Performed
Calcium (total/extractable)	SW846 6010	26,079	26,079	mg/kg	625	08/17/09		
Chloride (total/extractable)				mg/kg				Not Performed
Iron (total/extractable)	SW846 6010	12,376	12,376	mg/kg	125	08/21/09		
Magnesium (total/extractable)	SW846 6010	4,680	4,680	mg/kg	250	07/13/09		
Manganese (total/extractable)	SW846 6010	170	170	mg/kg	75	08/17/09		
Potassium (total/extractable)	SW846 6010	2,061	2,061	mg/kg	50	08/15/09		
Sulfur (total/extractable)				mg/kg				Not Performed
F) Alternative Pathogens								
Salmonella				MPN/4 gms				Not Performed
Viruses				PFU/4 gms				Not Performed
Helminths				viable ova/4 gms				Not Performed
G) Additional Analyses								
pH				std units				Not Performed
Conductivity				dS/m				Not Performed
Total carbon				mg/kg				Not Performed
Silver	SM3030D/SM3113B	9.30	9.30	mg/kg	1	07/22/09		

NOTES:

Analytical Methods are prescribed per federal requirements in WAC 173-308-140. See also 40 CFR 503.8

A) Pollutant limits from WAC 173-308-160. Table 1 - Ceiling Concentration Limits, Table 3 - Pollutant Concentation Limits. See also 40CFR 503.13

For B) Nutrient analyses, see "Managing Nitrogen From Biosolids", Ecology publication #99-508, Ch. 9

Analysis for A) Pollutants, B) Nutrients, C) Conventionals, and D) Bacteriological are all required for land application.

Analysis for E) Recommended Nutrients, F) Alternative Pathogens, and G) Additional Analyses are optional.

Analysis for E) Recommended Nutrients can be either total (for environmental purposes) or extractable (for agronomic purposes). Please specify.

Results for F) Alternative Pathogens are reported per 4 grams of total solids.

YAKIMA REGIONAL WASTEWATER TREATMENT PLANT
ANALYTICAL RESULTS

Sample Origin: BIOSOLIDS #2
Sample Description: CENTRIFUGE CONVEYOR COMPOSITE
Matrix: BIOSOLIDS
Date Received by Lab: 5/11/2009
Lab Sample No: 2009 BS #2

	Analytical Method	Results (As Recvd.)	Results (Dry wt.)	Units	Detection Limit	Date Analyzed	Limits Tables 1,3	Comments
A) Pollutants								
Arsenic	SM3030D/SM3113B	ND	ND	mg/kg	2	05/18/09	75, 41	
Cadmium	SM3030D/SM3113B	1.58	1.58	mg/kg	0.2	05/29/09	85, 39	
Chromium	SM3030D/SM3113B	40.9	40.9	mg/kg	0.4	05/25/09		
Copper	SM3030D/SM3113B	346	346	mg/kg	1	06/04/09	4300, 1500	
Lead	SM3030D/SM3113B	90.2	90.2	mg/kg	0.5	05/24/09	840, 300	
Mercury	SM3112B	0.989	0.989	mg/kg	0.5	06/18/09	57, 17	
Molybdenum	SM3030D/SM3113B	13.4	13.4	mg/kg	5	06/05/09	75, -	
Nickel	SM3030D/SM3113B	12.0	12.0	mg/kg	5	05/16/09	420, 420	
Selenium	SM3030D/SM3113B	ND	ND	mg/kg	5	05/23/09	100, 100	
Sodium	SM3030D/SM3113B	1,514	1,514	mg/kg	400	06/04/09		
Zinc	SM3030D/SM3113B	821	821	mg/kg	5	06/04/09	7500, 2800	
B) Nutrients								
Ammonia nitrogen (total)	SM4500-NH3N	8,100	8,100	mg/kg		05/13/09		Not Performed
Ammonium nitrogen (total)				mg/kg				
Nitrate Nitrogen	SM4500NO3-E	14.3	14.3	mg/kg		05/13/09		
Total Kjeldahl nitrogen	SM4500NorgC	65,200	65,200	mg/kg		05/15/09		Not Performed
Organic Nitrogen				mg/kg				
Phosporous (total)	EPA 200.7	18,100	18,100	mg/kg	11.9	05/20/09		
C) Conventionals								
Total solids	SM2540B	21.0	21.0	%	0.01%	05/14/09		Not Performed
Total volatile solids (% of TS)				%				

YAKIMA REGIONAL WASTEWATER TREATMENT PLANT
ANALYTICAL RESULTS

	Analytical Method	Results (As Recvd.)	Results (Dry wt.)	Units	Detection Limit	Date Analyzed	Limits Tables 1,3	Comments
D) Bacteriological								
Fecal coliform				MPN/gm				Not Performed
E) Recommended Nutrients				mg/kg				
Boron (total/extractable)				mg/kg				Not Performed
Calcium (total/extractable)	SW846 6010	30,522	30,522	mg/kg	625	06/05/09		
Chloride (total/extractable)				mg/kg				Not Performed
Iron (total/extractable)	SW846 6010	13,087	13,087	mg/kg	125	06/02/09		
Magnesium (total/extractable)	SW846 6010	5,013	5,013	mg/kg	250	05/30/09		
Manganese (total/extractable)	SW846 6010	162	162	mg/kg	75	06/02/09		
Potassium (total/extractable)	SW846 6010	2,909	2,909	mg/kg	50	06/04/09		
Sulfur (total/extractable)				mg/kg				Not Performed
F) Alternative Pathogens								
Salmonella				MPN/4 gms				Not Performed
Viruses				PFU/4 gms				Not Performed
Helminths				viable ova/4 gms				Not Performed
G) Additional Analyses								
pH				std units				Not Performed
Conductivity				dS/m				Not Performed
Total carbon				mg/kg				Not Performed
Silver	SM3030D/SM3113B	9.61	9.61	mg/kg	1	06/10/09		

NOTES:

Analytical Methods are prescribed per federal requirements in WAC 173-308-140. See also 40 CFR 503.8

A) Pollutant limits from WAC 173-308-160. Table 1 - Ceiling Concentration Limits, Table 3 - Pollutant Concentation Limits. See also 40CFR 503.13

For B) Nutrient analyses, see "Managing Nitrogen From Biosolids", Ecology publication #99-508, Ch. 9

Analysis for A) Pollutants, B) Nutrients, C) Conventionals, and D) Bacteriological are all required for land application.

Analysis for E) Recommended Nutrients, F) Alternative Pathogens, and G) Additional Analyses are optional.

Analysis for E) Recommended Nutrients can be either total (for environmental purposes) or extractable (for agronomic purposes). Please specify.

Results for F) Alternative Pathogens are reported per 4 grams of total solids.

YAKIMA REGIONAL WASTEWATER TREATMENT PLANT
ANALYTICAL RESULTS

Sample Origin: BIOSOLIDS #1
Sample Description: CENTRIFUGE CONVEYOR COMPOSITE
Matrix: BIOSOLIDS
Date Received by Lab: 2/12/2009
Lab Sample No: 2009 BS #1

	Analytical Method	Results (As Recvd.)	Results (Dry wt.)	Units	Detection Limit	Date Analyzed	Limits Tables 1,3	Comments
A) Pollutants								
Arsenic	SM3030D/SM3113B	ND	ND	mg/kg	2	02/26/09	75, 41	
Cadmium	SM3030D/SM3113B	2.90	2.90	mg/kg	0.2	03/05/09	85, 39	
Chromium	SM3030D/SM3113B	25.9	25.9	mg/kg	0.4	02/20/09		
Copper	SM3030D/SM3113B	303	303	mg/kg	1	02/24/09	4300, 1500	
Lead	SM3030D/SM3113B	51.3	51.3	mg/kg	0.5	03/10/09	840, 300	
Mercury	SM3112B	ND	ND	mg/kg	0.5	02/25/09	57, 17	
Molybdenum	SM3030D/SM3113B	15.0	15.0	mg/kg	5	03/05/09	75, -	
Nickel	SM3030D/SM3113B	13.6	13.6	mg/kg	5	03/11/09	420, 420	
Selenium	SM3030D/SM3113B	ND	ND	mg/kg	5	02/12/09	100, 100	
Sodium	SM3030D/SM3113B	2,041	2,041	mg/kg	400	03/03/09		
Zinc	SM3030D/SM3113B	774	774	mg/kg	5	03/24/09	7500, 2800	
B) Nutrients								
Ammonia nitrogen (total)	SM4500-NH3N	5,660	5,660	mg/kg		02/17/09		
Ammonium nitrogen (total)				mg/kg				Not Performed
Nitrate Nitrogen	SM4500NO3-E	22.7	22.7	mg/kg		02/17/09		
Total Kjeldahl nitrogen	SM4500NorgC	68,200	68,200	mg/kg		02/24/09		
Organic Nitrogen				mg/kg				Not Performed
Phosporous (total)	EPA 200.7	16,900	16,900	mg/kg	12.6	02/18/09		
C) Conventionals								
Total solids	SM2540B	19.8	19.8	%	0.01%	02/23/09		
Total volatile solids (% of TS)				%				Not Performed

YAKIMA REGIONAL WASTEWATER TREATMENT PLANT
ANALYTICAL RESULTS

	Analytical Method	Results (As Recvd.)	Results (Dry wt.)	Units	Detection Limit	Date Analyzed	Limits Tables 1,3	Comments
D) Bacteriological								
Fecal coliform				MPN/gm				Not Performed
E) Recommended Nutrients								
Boron (total/extractable)				mg/kg				Not Performed
Calcium (total/extractable)	SW846 6010	24,933	24,933	mg/kg		03/24/09		
Chloride (total/extractable)				mg/kg				Not Performed
Iron (total/extractable)	SW846 6010	9,672	9,672	mg/kg		03/24/09		
Magnesium (total/extractable)	SW846 6010	3,934	3,934	mg/kg		02/28/09		
Manganese (total/extractable)	SW846 6010	162	162	mg/kg		03/24/09		
Potassium (total/extractable)	SW846 6010	2,370	2,370	mg/kg		03/03/09		
Sulfur (total/extractable)				mg/kg				Not Performed
F) Alternative Pathogens								
Salmonella				MPN/4 gms				Not Performed
Viruses				PFU/4 gms				Not Performed
Helminths				viable ova/4 gms				Not Performed
G) Additional Analyses								
pH				std units				Not Performed
Conductivity				dS/m				Not Performed
Total carbon				mg/kg				Not Performed
Silver	SM3030D/SM3113B	11.2	11.2	mg/kg	1	3/29/09		

NOTES:

Analytical Methods are prescribed per federal requirements in WAC 173-308-140. See also 40 CFR 503.8

A) Pollutant limits from WAC 173-308-160. Table 1 - Ceiling Concentration Limits, Table 3 - Pollutant Concentation Limits. See also 40CFR 503.13

For B) Nutrient analyses, see "Managing Nitrogen From Biosolids", Ecology publication #99-508, Ch. 9

Analysis for A) Pollutants, B) Nutrients, C) Conventionals, and D) Bacteriological are all required for land application.

Analysis for E) Recommended Nutrients, F) Alternative Pathogens, and G) Additional Analyses are optional.

Analysis for E) Recommended Nutrients can be either total (for environmental purposes) or extractable (for agronomic purposes). Please specify.

Results for F) Alternative Pathogens are reported per 4 grams of total solids.