

Site Investigation Findings Report

Tannery Sludge Farm Fields Site

Andrew, Buchanan, Clinton and DeKalb Counties, MO

Order Numbers 091218004 & 091218005

Site Information:ESP LDPR Code: FEPA8ESP Staff: Ken Hannon, Sean CounihanJob Code: NJ10TSFFInvestigation Date: 12/16 & 12/17

Introduction:

The Missouri Department of Natural Resources (MDNR) Hazardous Waste Program (HWP) requested Environmental Services Program (ESP) personnel to conduct sampling related to an ongoing investigation involving the Prime Tanning Corporation located at 205 Florence Road in St. Joseph, Missouri. ESP Environmental Specialists Ken Hannon and Sean Counihan traveled to the site on December 16 and 17, 2009, to collect grab samples of private well water from selected residences near farm fields where tannery sludge was historically applied as a fertilizer.

Additional MDNR personnel on site included Valerie Wilder and Shelly Jackson with the HWP, site assessment unit. Sampling was conducted in accordance with established standard operating procedures (SOPs) within the MDNR, ESP and outlined in the Tannery Sludge Farm Field Sampling and Analysis Plan (SAP).

Observations:

Personnel arrived on-site and began sampling. Custody of all samples collected was maintained by ESP personnel. Weather conditions were sunny to partly cloudy with temperatures around 30 degrees Fahrenheit. Winds were moderate and from the south. Two wells (Location ID wells 108 and 107) were sampled by using a peristaltic pump and 0.25 inch diameter food grade poly tubing because the wells did not contain a dedicated pump for sampling. Weighted tubing was lowered approximately 25 feet down both wells and samples were collected in accordance to SOP and the SAP. No deviations were noted at any wells sampled. Specific information regarding the owner's names and addresses are not documented in this report due to confidentiality concerns. Names and addresses of residents and property owners are kept on file with the HWP project manager.

Field Methods:

All wells (with exceptions noted above) were sampled from the tap nearest the wellhead after five minutes of flow and the stabilization of field parameters (pH, temperature, specific conductivity, and oxidation/reduction potential) had occurred. The samples were analyzed for total and dissolved chromium and hexavalent chromium. Samples collected for total chromium were preserved with nitric acid while samples collected for dissolved and hexavalent chromium were first filtered then placed into sample containers. Dissolved metals were further preserved with nitric acid while hexavalent chromium samples were preserved in a buffer solution containing ammonium sulfate.

Table 1: Sample Collection Data

Sample Number	Date Collected	Time Collected	Location Collected & Description
H0900201	12/16/09	1258	Water grab sample GW-03 collected from residence 103. Clear odorless sample with a slight brown tinge.
H0900202	12/16/09	1340	Water grab sample GW-04 collected from residence 104. Clear colorless and odorless.
H0900203	12/16/09	1456	Water grab sample GW-08 collected from residence 108. Clear colorless and odorless.
H0900204	12/17/09	1525	Water grab sample GW-05 collected from residence 105. Clear colorless and odorless.
H0900205	12/17/09	1525	Blind triplicate of H0900204.
H0900206	12/17/09	1525	Blind triplicate of H0900204.
H0900207	12/17/09	1237	Water grab sample GW-06 collected from residence 106. Clear colorless and odorless.
H0900208	12/17/09	1300	Water grab sample GW-07 collected from residence 107. Clear colorless and odorless.
H0900210	12/16/09	1250	Water grab sample GW-01 collected from residence 101. Clear colorless and odorless.
H0900211	12/16/09	1352	Water grab sample GW-02 collected from residence 102. Clear colorless and odorless.
H0900212	12/16/09	1624	Water grab sample GW-11 collected from residence 111. Clear colorless and odorless. Background A.
H0900213	12/17/09	1218	Water grab sample GW-12 collected from residence 112. Clear colorless and odorless.
H0900214	12/17/09	1326	Water grab sample GW-09 collected from residence 109. Clear colorless and odorless.
H0900215	12/17/09	1345	Water grab sample GW-10 collected from residence 110. Clear colorless and odorless.

Submitted by:

Kenneth Hannon

Kenneth Hannon
Environmental Specialist
Field Services Unit
Environmental Services Program

Approved by:

Eric Sappington

Digitally signed by Eric Sappington
DN: cn=Eric Sappington, c=US,
o=Environmental Services
Program, ou=Department of
Natural Resources, email=eric.
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Date: 2010.01.25 11:40:36 -06'00'

Eric Sappington
Unit Chief
Field Services Unit
Environmental Services Program

ES:khd

c: Michael Stroh, Environmental Specialist, HWP

APPENDIX A

Chain of Custody/Analytical Results

Tannery Sludge Farm Fields Site
Andrew, Buchanan, Clinton and DeKalb Counties, MO



MISSOURI DEPARTMENT OF NATURAL RESOURCES
FIELD SHEET AND CHAIN-OF-CUSTODY RECORD

316

LABORATORY ORDER ID: 091218004

Collector's Name: Kenneth Hannon <small>(Please Print)</small>								Description of Shipment				
Affiliation: <u>ESP</u> KCRO NERO SERO SLRO SWRO WPP <small>(circle one)</small> DGLS HWP Other:								Shipped-Carrier: _____ Tape sealed and initialed _____ X Hand Delivered _____				
								No. Of Containers: <u>CB</u>				
Sample Number	Sample Collected	Analyses						Sample Type	For Lab Use Only			
		Date:	Total and Dissolved Cr.						X Grab Composite Modified Other:	Matrix	Container	Preserved
H0900201 (Sample A)		12/16/09	Hex Cr EJ 12/22/09							Other:	<u>2</u> Water	1L amber 120 mL
For Lab Use Only		Time: 1258	D.O.	Flow	pH 7.45	Spec. Cond. 300 μs	Temp. 10.8 °C	Other: GRP 120 mV	Soil		Cubitainer	<u>2</u> HNO ₃
									Organic	2 oz glass Nalgene	NAOH	
									Sludge	8 oz glass 1L	HCL	
									Other:	VOA vial <u>2</u> 500mL	4° C(None)	
										Encore 250mL	Disinfected	
										Other:	Other	
H0900202 (Sample B)		12/16/09	Hex Cr EJ 12/22/09						Other:	<u>2</u> Water	1L amber 120 mL	H ₂ SO ₄
For Lab Use Only		Time: 1340	D.O.	Flow	pH 7.73	Spec. Cond. 828 μs	Temp. 6.8 °C	Other: GRP 122		Soil	Cubitainer	<u>2</u> HNO ₃
									Organic	2 oz glass Nalgene	NAOH	
									Sludge	8 oz glass 1L	HCL	
									Other:	VOA vial <u>2</u> 500mL	4° C(None)	
										Encore 250mL	Disinfected	
										Other:	Other	
H0900203 (Sample C)		12/16/09	Hex Cr EJ 12/22/09						Other:	<u>2</u> Water	1L amber 120 mL	H ₂ SO ₄
For Lab Use Only		Time: 1456	D.O.	Flow	pH 7.47	Spec. Cond. 652 μs	Temp. 12.2 °C	Other: GRP -80 mV		Soil	Cubitainer	<u>2</u> HNO ₃
									Organic	2 oz glass Nalgene	NAOH	
									Sludge	8 oz glass 1L	HCL	
									Other:	VOA vial <u>2</u> 500mL	4° C(None)	
										Encore 250mL	Disinfected	
										Other:	Other	
H0900204 (Sample D)		12/17/09	Hex Cr EJ 12/23/09						Other:	<u>2</u> Water	1L amber 120 mL	H ₂ SO ₄
For Lab Use Only		Time: 1525	D.O.	Flow	pH 6.85	Spec. Cond. 833 μs	Temp. 9.1 °C	Other: GRP 160 mV		Soil	Cubitainer	<u>2</u> HNO ₃
									Organic	2 oz glass Nalgene	NAOH	
									Sludge	8 oz glass 1L	HCL	
									Other:	VOA vial <u>2</u> 500mL	4° C(None)	
										Encore 250mL	Disinfected	
										Other:	Other	
Relinquished By: Kenneth Hannon				Received By: Doug K. Rutz				Date: 12-15-09	Time: 0845			
Relinquished By:				Received By:				Date:	Time:			
Relinquished By:				Received By:				Date:	Time:			

Sample I.D. Letter	Site Description					
Sample A	Facility ID:	Site/Study Name: Prime Tanning	County: DeKalb	LDPR Code: 57 58	Job Code: NJ10TSF	
	Sample Comment (briefly describe where and how the sample was collected, station number, sample type, etc.): Groundwater sample GW-03 colleted from residence 103. Bottle reference number B02193.				F	
	GPS Coordinates (Record Coordinates in UTM Zone 15 NAD 83 Only):			Accuracy (check one)	Sample Reference ID:	
	<input checked="" type="checkbox"/> Easting	<input type="checkbox"/> Northing		<input type="checkbox"/> EPE (meters)	103	
			<input type="checkbox"/> PDOP			
Sample B	Facility ID:	Site/Study Name: Prime Tanning	County: DeKalb	LDPR Code: 57 58	Job Code: NJ10TSF	
	Sample Comment (briefly describe where and how the sample was collected, station number, sample type, etc.): Groundwater sample GW-04 colleted from residence 104. Bottle reference number B02347.				F	
	GPS Coordinates (Record Coordinates in UTM Zone 15 NAD 83 Only):			Accuracy (check one)	Sample Reference ID:	
	<input checked="" type="checkbox"/> Easting	<input type="checkbox"/> Northing		<input type="checkbox"/> EPE (meters)	104	
			<input type="checkbox"/> PDOP			
Sample C	Facility ID:	Site/Study Name: Prime Tanning	County: Clinton	LDPR Code: 57 58	Job Code: NJ10TSF	
	Sample Comment (briefly describe where and how the sample was collected, station number, sample type, etc.): Groundwater sample GW-08 colleted from residence 108. Bottle reference number B02347. ^(KH) ₁₀₄				F	
	GPS Coordinates (Record Coordinates in UTM Zone 15 NAD 83 Only):			Accuracy (check one)	Sample Reference ID:	
	<input checked="" type="checkbox"/> Easting	<input type="checkbox"/> Northing		<input type="checkbox"/> EPE (meters)	108	
			<input type="checkbox"/> PDOP			
Sample D	Facility ID:	Site/Study Name: Prime Tanning	County: Clinton	LDPR Code: 57 58	Job Code: NJ10TSF	
	Sample Comment (briefly describe where and how the sample was collected, station number, sample type, etc.): Groundwater sample GW-05 colleted from residence 105. Bottle reference number B02300.				F	
	GPS Coordinates (Record Coordinates in UTM Zone 15 NAD 83 Only):			Accuracy (check one)	Sample Reference ID:	
	<input checked="" type="checkbox"/> Easting	<input type="checkbox"/> Northing		<input type="checkbox"/> EPE (meters)	105	
			<input type="checkbox"/> PDOP			

REMARKS:

Print each sample results separately.



MISSOURI DEPARTMENT OF NATURAL RESOURCES
FIELD SHEET AND CHAIN-OF-CUSTODY RECORD

B16

LABORATORY ORDER ID: 091218004

Collector's Name: Kenneth Hannon <small>(Please Print)</small>							Description of Shipment					
Affiliation: <input checked="" type="radio"/> ESP <input type="radio"/> KCRO <input type="radio"/> NERO <input type="radio"/> SERO <input type="radio"/> SLRO <input type="radio"/> SWRO <input type="radio"/> WPP <small>(circle one)</small> <input type="radio"/> DGLS <input type="radio"/> HWP Other:							Shipped-Carrier: _____ Tape sealed and initialed _____ <input checked="" type="checkbox"/> Hand Delivered _____					
							No. Of Containers: <input checked="" type="checkbox"/> 8					
Sample Number	Sample Collected	Analyses					Sample Type	For Lab Use Only				
								Matrix	Container		Preserved	
H0900205 (Sample A)	Date: 12/17/09	Total and Dissolved Cr. <i>Hex Cr Et 12/23/09</i>					<input checked="" type="checkbox"/> Grab <input type="checkbox"/> Composite <input type="checkbox"/> Modified	<input checked="" type="checkbox"/> Water	<input type="checkbox"/> 1L amber	<input type="checkbox"/> 120 mL	<input type="checkbox"/> H ₂ SO ₄	
	<i>AB11006</i>	Time: 0	D.O.	Flow	pH	Spec. Cond.		Temp.	Other:	<input type="checkbox"/> Soil	<input type="checkbox"/> Cubitainer	<input checked="" type="checkbox"/> HNO ₃
								<input type="checkbox"/> Organic	<input type="checkbox"/> 2 oz glass	<input type="checkbox"/> Nalgene	<input type="checkbox"/> NaOH	
								<input type="checkbox"/> Sludge	<input type="checkbox"/> 8 oz glass	<input type="checkbox"/> 1L	<input type="checkbox"/> HCL	
								Other:	<input type="checkbox"/> VOA vial	<input checked="" type="checkbox"/> 500mL	<input type="checkbox"/> 4° C(None)	
									<input type="checkbox"/> Encore	<input type="checkbox"/> 250mL	<input type="checkbox"/> Disinfected	
									Other:		<input type="checkbox"/> Other	
H0900206 (Sample B)	Date: 12/17/09	Total and Dissolved Cr. <i>Hex Cr Et 12/23/09</i>					<input checked="" type="checkbox"/> Grab <input type="checkbox"/> Composite <input type="checkbox"/> Modified	<input checked="" type="checkbox"/> Water	<input type="checkbox"/> 1L amber	<input type="checkbox"/> 120 mL	<input type="checkbox"/> H ₂ SO ₄	
	<i>AB11007</i>	Time: 0	D.O.	Flow	pH	Spec. Cond.		Temp.	Other:	<input type="checkbox"/> Soil	<input type="checkbox"/> Cubitainer	<input checked="" type="checkbox"/> HNO ₃
								<input type="checkbox"/> Organic	<input type="checkbox"/> 2 oz glass	<input type="checkbox"/> Nalgene	<input type="checkbox"/> NaOH	
								<input type="checkbox"/> Sludge	<input type="checkbox"/> 8 oz glass	<input type="checkbox"/> 1L	<input type="checkbox"/> HCL	
								Other:	<input type="checkbox"/> VOA vial	<input checked="" type="checkbox"/> 500mL	<input type="checkbox"/> 4° C(None)	
									<input type="checkbox"/> Encore	<input type="checkbox"/> 250mL	<input type="checkbox"/> Disinfected	
									Other:		<input type="checkbox"/> Other	
H0900207 (Sample C)	Date: 12/17/09	Total and Dissolved Cr. <i>Hex Cr Et 12/23/09</i>					<input checked="" type="checkbox"/> Grab <input type="checkbox"/> Composite <input type="checkbox"/> Modified	<input checked="" type="checkbox"/> Water	<input type="checkbox"/> 1L amber	<input type="checkbox"/> 120 mL	<input type="checkbox"/> H ₂ SO ₄	
	<i>AB11008</i>	Time: 1237	D.O.	Flow	pH	Spec. Cond.		Temp.	Other: ORP	<input type="checkbox"/> Soil	<input type="checkbox"/> Cubitainer	<input checked="" type="checkbox"/> HNO ₃
								<input type="checkbox"/> Organic	<input type="checkbox"/> 2 oz glass	<input type="checkbox"/> Nalgene	<input type="checkbox"/> NaOH	
								<input type="checkbox"/> Sludge	<input type="checkbox"/> 8 oz glass	<input type="checkbox"/> 1L	<input type="checkbox"/> HCL	
								Other:	<input type="checkbox"/> VOA vial	<input checked="" type="checkbox"/> 500mL	<input type="checkbox"/> 4° C(None)	
									<input type="checkbox"/> Encore	<input type="checkbox"/> 250mL	<input type="checkbox"/> Disinfected	
									Other:		<input type="checkbox"/> Other	
H0900208 (Sample D)	Date: 12/17/09	Total and Dissolved Cr. <i>Hex Cr Et 12/23/09</i>					<input checked="" type="checkbox"/> Grab <input type="checkbox"/> Composite <input type="checkbox"/> Modified	<input checked="" type="checkbox"/> Water	<input type="checkbox"/> 1L amber	<input type="checkbox"/> 120 mL	<input type="checkbox"/> H ₂ SO ₄	
	<i>AB11009</i>	Time: 1300	D.O.	Flow	pH	Spec. Cond.		Temp.	Other: ORP	<input type="checkbox"/> Soil	<input type="checkbox"/> Cubitainer	<input checked="" type="checkbox"/> HNO ₃
								<input type="checkbox"/> Organic	<input type="checkbox"/> 2 oz glass	<input type="checkbox"/> Nalgene	<input type="checkbox"/> NaOH	
								<input type="checkbox"/> Sludge	<input type="checkbox"/> 8 oz glass	<input type="checkbox"/> 1L	<input type="checkbox"/> HCL	
								Other:	<input type="checkbox"/> VOA vial	<input checked="" type="checkbox"/> 500mL	<input type="checkbox"/> 4° C(None)	
									<input type="checkbox"/> Encore	<input type="checkbox"/> 250mL	<input type="checkbox"/> Disinfected	
									Other:		<input type="checkbox"/> Other	
Relinquished By: Kenneth Hannon			Received By: <i>Dm...</i>			Date: 12-18-09		Time: 0844				
Relinquished By:			Received By:			Date:		Time:				
Relinquished By:			Received By:			Date:		Time:				



MISSOURI DEPARTMENT OF NATURAL RESOURCES
FIELD SHEET AND CHAIN-OF-CUSTODY RECORD

B27

LABORATORY ORDER ID: 091218005

Collector's Name: Sean Counihan <small>(Please Print)</small>								Description of Shipment					
Affiliation: ESP KCRO NERO SERO SLRO SWRO WPP <small>(circle one)</small> DGLS HWP Other:								Shipped-Carrier: _____ Tape sealed and initialed _____ <input checked="" type="checkbox"/> Hand Delivered					
Sample Number	Sample Collected	Analyses						Sample Type	For Lab Use Only				
		Matrix	Container		Preserved								
H0900210 (Sample A)	Date: 12/16/09	Total Cr, Dissolved Cr <i>Hex Cr EA 12/22/09</i>						<input checked="" type="checkbox"/> Grab	<input checked="" type="checkbox"/> Water	1L amber	120 mL	<input checked="" type="checkbox"/> H ₂ SO ₄	
For Lab Use Only	Time: 1250	D.O.	Flow	pH 7.3	Spec. Cond. 504 _{us}	Temp. 8.0°C	Other: DRP 39mv	<input type="checkbox"/> Composite	Soil	Cubitainer	<input checked="" type="checkbox"/> HNO ₃		
AB11010								<input type="checkbox"/> Modified	Organic	2 oz glass Nalgene	NAOH		
								Other:	Sludge	8 oz glass 1L	HCL		
									Other:	VOA vial 2 500mL	4° C(None)		
										Encore 250mL	Disinfected		
										Other:	Other		
H0900211 (Sample B)	Date: 12/16/09	Total Cr, Dissolved Cr <i>Hex Cr EA 12/22/09</i>						<input checked="" type="checkbox"/> Grab	<input checked="" type="checkbox"/> Water	1L amber	120 mL	<input checked="" type="checkbox"/> H ₂ SO ₄	
For Lab Use Only	Time: 1352	D.O.	Flow	pH 7.42	Spec. Cond. 472 _{us}	Temp. 13.9°C	Other: DRP -17mv	<input type="checkbox"/> Composite	Soil	Cubitainer	<input checked="" type="checkbox"/> HNO ₃		
AB11011								<input type="checkbox"/> Modified	Organic	2 oz glass Nalgene	NAOH		
								Other:	Sludge	8 oz glass 1L	HCL		
									Other:	VOA vial 2 500mL	4° C(None)		
										Encore 250mL	Disinfected		
										Other:	Other		
H0900212 (Sample C)	Date: 12/16/09	Total Cr, Dissolved Cr <i>Hex Cr EA 12/22/09</i>						<input checked="" type="checkbox"/> Grab	<input checked="" type="checkbox"/> Water	1L amber	120 mL	<input checked="" type="checkbox"/> H ₂ SO ₄	
For Lab Use Only	Time: 1624	D.O.	Flow	pH 6.92	Spec. Cond. 344 _{us}	Temp. 8.6°C	Other: DRP 33mv	<input type="checkbox"/> Composite	Soil	Cubitainer	<input checked="" type="checkbox"/> HNO ₃		
AB11012								<input type="checkbox"/> Modified	Organic	2 oz glass Nalgene	NAOH		
								Other:	Sludge	8 oz glass 1L	HCL		
									Other:	VOA vial 2 500mL	4° C(None)		
										Encore 250mL	Disinfected		
										Other:	Other		
H0900213 (Sample D)	Date: 12/17/09	Total Cr, Dissolved Cr <i>Hex Cr EA 12/23/09</i>						<input checked="" type="checkbox"/> Grab	<input checked="" type="checkbox"/> Water	1L amber	120 mL	<input checked="" type="checkbox"/> H ₂ SO ₄	
For Lab Use Only	Time: 1218	D.O.	Flow	pH 7.68	Spec. Cond. 760 _{us}	Temp. 12.4°C	Other: DRP -23mv	<input type="checkbox"/> Composite	Soil	Cubitainer	<input checked="" type="checkbox"/> HNO ₃		
AB11013								<input type="checkbox"/> Modified	Organic	2 oz glass Nalgene	NAOH		
								Other:	Sludge	8 oz glass 1L	HCL		
									Other:	VOA vial 2 500mL	4° C(None)		
										Encore 250mL	Disinfected		
										Other:	Other		
Relinquished By: <i>[Signature]</i>				Received By: <i>[Signature]</i>				Date: 12-18-09		Time: 0846			
Relinquished By:				Received By:				Date:		Time:			
Relinquished By:				Received By:				Date:		Time:			

Sample I.D. Letter	Site Description					
Sample A H0900210	Facility ID:	Site/Study Name: Tannery Sludge Farm Fields	County: Clinton County	LDPR Code: FEP A8	Job Code: NJ10TSF	
	Sample Comment (briefly describe where and how the sample was collected, station number, sample type, etc.): Loc. ID 101, GW01 Sample taken at hydrant by house				F	
	GPS Coordinates (Record Coordinates in UTM Zone 15 NAD 83 Only):		Accuracy	(check one)	Sample Reference ID:	
				<input type="checkbox"/> EPE (meters)		
			<input type="checkbox"/> PDOP			
Sample B H0900211	Facility ID:	Site/Study Name: Tannery Sludge Farm Fields	County: Buchanan County	LDPR Code: FEP A8	Job Code: NJ10TSF	
	Sample Comment (briefly describe where and how the sample was collected, station number, sample type, etc.): Loc. ID 102, GW02 Taken from hydrant on side of garage, across from barn				F	
	GPS Coordinates (Record Coordinates in UTM Zone 15 NAD 83 Only):		Accuracy	(check one)	Sample Reference ID:	
				<input type="checkbox"/> EPE (meters)		
			<input type="checkbox"/> PDOP			
Sample C H0900212	Facility ID:	Site/Study Name: Tannery Sludge Farm Fields	County: Andrew County	LDPR Code: FEP A8	Job Code: NJ10TSF	
	Sample Comment (briefly describe where and how the sample was collected, station number, sample type, etc.): Loc. ID 111, GW11, Background A				F	
	GPS Coordinates (Record Coordinates in UTM Zone 15 NAD 83 Only):		Accuracy	(check one)	Sample Reference ID:	
				<input type="checkbox"/> EPE (meters)		
			<input type="checkbox"/> PDOP			
Sample D H0900213	Facility ID:	Site/Study Name: Tannery Sludge Farm Fields	County: Andrew County	LDPR Code: FEP A8	Job Code: NJ10TSF	
	Sample Comment (briefly describe where and how the sample was collected, station number, sample type, etc.): Loc. ID 112, GW12, Bottle number BO2309, Taken from hydrant by old windmill				F	
	GPS Coordinates (Record Coordinates in UTM Zone 15 NAD 83 Only):		Accuracy	(check one)	Sample Reference ID:	
				<input type="checkbox"/> EPE (meters)		
			<input type="checkbox"/> PDOP			

REMARKS:
Print each sample results separately



MISSOURI DEPARTMENT OF NATURAL RESOURCES
FIELD SHEET AND CHAIN-OF-CUSTODY RECORD

B27

LABORATORY ORDER ID: 091218005

Collector's Name: Sean Counihan <small>(Please Print)</small>							Description of Shipment						
Affiliation: <input type="checkbox"/> ESP <input type="checkbox"/> KCRO <input type="checkbox"/> NERO <input type="checkbox"/> SERO <input type="checkbox"/> SLRO <input type="checkbox"/> SWRO <input type="checkbox"/> WPP <small>(circle one)</small> <input type="checkbox"/> DGLS <input type="checkbox"/> HWP Other:							Shipped-Carrier: Tape sealed and initialed <input checked="" type="checkbox"/> Hand Delivered						
							No. Of Containers: 4						
Sample Number	Sample Collected	Analyses						Sample Type	For Lab Use Only				
	Date:	Total Cr, Dissolved Cr						<input checked="" type="checkbox"/> Grab <input type="checkbox"/> Composite <input type="checkbox"/> Modified Other:	Matrix	Container	Preserved		
H0900214 (Sample A)	12/17/09	Hex Cr EA 12/23/09							<input checked="" type="checkbox"/> Water <input type="checkbox"/> Soil <input type="checkbox"/> Organic <input type="checkbox"/> Sludge Other:	1L amber Cubitainer 2 oz glass 8 oz glass VOA vial Encore Other:	120 mL Nalgene 1L 500mL 250mL	<input type="checkbox"/> H ₂ SO ₄ <input checked="" type="checkbox"/> HNO ₃ <input type="checkbox"/> NaOH <input type="checkbox"/> HCL <input type="checkbox"/> 4° C(None) <input type="checkbox"/> Disinfected Other	
For Lab Use Only A011014	Time: 1326	D.O.	Flow	pH 7.66	Spec. Cond. 848 _{uS}	Temp. 13.6°C	Other: ORP 158mv						
H0900215 (Sample B)	12/17/09	Hex Cr EA 12/23/09						<input checked="" type="checkbox"/> Grab <input type="checkbox"/> Composite <input type="checkbox"/> Modified Other:	<input checked="" type="checkbox"/> Water <input type="checkbox"/> Soil <input type="checkbox"/> Organic <input type="checkbox"/> Sludge Other:	1L amber Cubitainer 2 oz glass 8 oz glass VOA vial Encore Other:	120 mL Nalgene 1L 500mL 250mL	<input type="checkbox"/> H ₂ SO ₄ <input checked="" type="checkbox"/> HNO ₃ <input type="checkbox"/> NaOH <input type="checkbox"/> HCL <input type="checkbox"/> 4° C(None) <input type="checkbox"/> Disinfected Other	
For Lab Use Only A011015	Time: 1345	D.O.	Flow	pH 7.75	Spec. Cond. 584 _{uS}	Temp. 12°C	Other: ORP -74mv						
(Sample C)	Date:							<input type="checkbox"/> Grab <input type="checkbox"/> Composite <input type="checkbox"/> Modified Other:	<input type="checkbox"/> Water <input type="checkbox"/> Soil <input type="checkbox"/> Organic <input type="checkbox"/> Sludge Other:	1L amber Cubitainer 2 oz glass 8 oz glass VOA vial Encore Other:	120 mL Nalgene 1L 500mL 250mL	<input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> HNO ₃ <input type="checkbox"/> NaOH <input type="checkbox"/> HCL <input type="checkbox"/> 4° C(None) <input type="checkbox"/> Disinfected Other	
For Lab Use Only	Time:	D.O.	Flow	pH	Spec. Cond.	Temp.	Other:						
(Sample D)	Date:							<input type="checkbox"/> Grab <input type="checkbox"/> Composite <input type="checkbox"/> Modified Other:	<input type="checkbox"/> Water <input type="checkbox"/> Soil <input type="checkbox"/> Organic <input type="checkbox"/> Sludge Other:	1L amber Cubitainer 2 oz glass 8 oz glass VOA vial Encore Other:	120 mL Nalgene 1L 500mL 250mL	<input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> HNO ₃ <input type="checkbox"/> NaOH <input type="checkbox"/> HCL <input type="checkbox"/> 4° C(None) <input type="checkbox"/> Disinfected Other	
For Lab Use Only	Time:	D.O.	Flow	pH	Spec. Cond.	Temp.	Other:						
Relinquished By: <i>[Signature]</i>				Received By: <i>Dunk Ludwig</i>				Date: 12-18-09	Time: 0847				
Relinquished By:				Received By:				Date:	Time:				
Relinquished By:				Received By:				Date:	Time:				

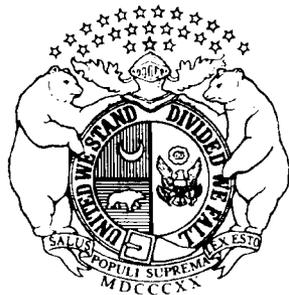
Sample I.D. Letter	Site Description				
Sample A H0900214	Facility ID:	Site/Study Name: Tannery Sludge Farm Fields	County: Andrew County	LDPR Code: FEPAS	Job Code: NJ10TSF
	Sample Comment (briefly describe where and how the sample was collected, station number, sample type, etc.): Loc. ID 109, GW09, Taken from hydrant behind house, Bottle number BO2307				
	GPS Coordinates (Record Coordinates in UTM Zone 15 NAD 83 Only):		Accuracy (check one)		Sample Reference ID:
	<input type="checkbox"/> Easting		<input type="checkbox"/> EPE (meters)		
<input type="checkbox"/> Northing		<input type="checkbox"/> PDOP			
Sample B H0900215	Facility ID:	Site/Study Name: Tannery Sludge Farm Fields	County: Andrew County	LDPR Code: FEPAS	Job Code: NJ10TSF
	Sample Comment (briefly describe where and how the sample was collected, station number, sample type, etc.): Loc. ID 110, GW10, Taken from windmill operated pump				
	GPS Coordinates (Record Coordinates in UTM Zone 15 NAD 83 Only):		Accuracy (check one)		Sample Reference ID:
	<input type="checkbox"/> Easting		<input type="checkbox"/> EPE (meters)		
<input type="checkbox"/> Northing		<input type="checkbox"/> PDOP			
Sample C	Facility ID:	Site/Study Name: Tannery Sludge Farm Fields	County:	LDPR Code:	Job Code:
	Sample Comment (briefly describe where and how the sample was collected, station number, sample type, etc.):				
	GPS Coordinates (Record Coordinates in UTM Zone 15 NAD 83 Only):		Accuracy (check one)		Sample Reference ID:
	<input type="checkbox"/> Easting		<input type="checkbox"/> EPE (meters)		
<input type="checkbox"/> Northing		<input type="checkbox"/> PDOP			
Sample D	Facility ID:	Site/Study Name: Tannery Sludge Farm Fields	County:	LDPR Code:	Job Code:
	Sample Comment (briefly describe where and how the sample was collected, station number, sample type, etc.):				
	GPS Coordinates (Record Coordinates in UTM Zone 15 NAD 83 Only):		Accuracy (check one)		Sample Reference ID:
	<input type="checkbox"/> Easting		<input type="checkbox"/> EPE (meters)		
<input type="checkbox"/> Northing		<input type="checkbox"/> PDOP			

REMARKS:
 Print each sample results separately

Sample I.D. Letter	Site Description					
Sample A	Facility ID:	Site/Study Name: Prime Tanning	County: Clinton		LDPR Code: FEPASB ^{EW}	Job Code: NJ10TSF
	Sample Comment (briefly describe where and how the sample was collected, station number, sample type, etc.): Blind Triplicate.					
	GPS Coordinates (Record Coordinates in UTM Zone 15 NAD 83 Only):			Accuracy (check one)		Sample Reference ID:
	X Easting		Y Northing		EPE (meters)	
Sample B	Facility ID:	Site/Study Name: Prime Tanning	County: Clinton		LDPR Code: FEPASB ^{EW}	Job Code: NJ10TSF
	Sample Comment (briefly describe where and how the sample was collected, station number, sample type, etc.): Blind Triplicate.					
	GPS Coordinates (Record Coordinates in UTM Zone 15 NAD 83 Only):			Accuracy (check one)		Sample Reference ID:
	X Easting		Y Northing		EPE (meters)	
Sample C	Facility ID:	Site/Study Name: Prime Tanning	County: Clinton		LDPR Code: FEPASB ^{EW}	Job Code: NJ10TSF
	Sample Comment (briefly describe where and how the sample was collected, station number, sample type, etc.): Groundwater sample GW-06 colleted from residence 106. Bottle reference number B02328.					
	GPS Coordinates (Record Coordinates in UTM Zone 15 NAD 83 Only):			Accuracy (check one)		Sample Reference ID: 106
	X Easting		Y Northing		EPE (meters)	
Sample D	Facility ID:	Site/Study Name: Prime Tanning	County: Clinton		LDPR Code: FEPASB ^{EW}	Job Code: NJ10TSF
	Sample Comment (briefly describe where and how the sample was collected, station number, sample type, etc.): Groundwater sample GW-07 colleted from residence 107. Bottle reference number B02197.					
	GPS Coordinates (Record Coordinates in UTM Zone 15 NAD 83 Only):			Accuracy (check one)		Sample Reference ID: 107
	X Easting		Y Northing		EPE (meters)	

REMARKS:

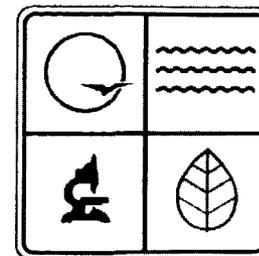
Print each sample results separately.



Addendum

Missouri Department of Natural Resources
Environmental Services Program

Addendum



Reason: LDPR CHANGED PER PROJECT MANAGER

Order ID 091218004 Program, Contact: HWP Julieann Warren

Report Date: 01/05/2010 LDPR/JobCode: FEPA8 / NJ10TSFF



Sample: AB11002



Customer #: H0900201

Facility ID:

County: Dekalb

Collector: KENNETH HANNON

Site: Prime Tanning

Sample Reference ID:

Affiliation: ESP

Collect Date: 12/16/2009 12:58:00PM

Sample Comment:

Groundwater sample GW-3 collected from residence 103. Bottle reference number B02193. Samples were sent directly from the field to contract lab for Hexavalent Chromium analyses.

Table with 7 columns: Test, Parameter, Result, Qualifier, Units, QC Batch ID, Method. Rows include 6020 Metals-Dissolved, 6020 Metals-Total Recoverable, Field pH, Field Specific Conductivity, Field Temperature, Hexavalent Chromium, and Oxidation Reduction Potential-Dissolved.

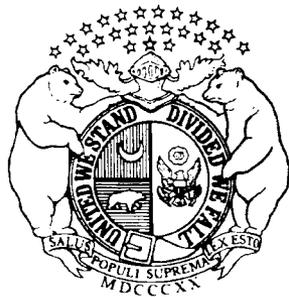
The analysis of this sample was performed in accordance with procedures approved or recognized by the U.S Environmental Protection Agency.

Qualifier Descriptions

- 01 Improper collection method
02 Improper preservation
03 Exceeded holding time
04 Analyzed by Contract Laboratory
05 Estimated value, detected below PQL
06 Estimated value, QC data outside limits
07 Estimated value, analyte outside calibration range
08 Analyte present in blank at > 1/2 reported value
09 Sample was diluted during analysis
10 Laboratory error
11 Estimated value, matrix interference
12 Insufficient quantity
13 Estimated value, true result is > reported value
14 Estimated value, non-homogeneous sample
15 No Result - Failed Quality Controls Requirements
16 Not analyzed - related analyte not detected
17 Results in dry weight
18 Sample pH is outside the acceptable range
19 Estimated value
20 Not analyzed - Instrument failure
21 No result - spectral interference
22 pH was performed at the Laboratory
23 Contract Lab specific qualifier - see sample comments
24 ND Not detected at reported value

Chris Boldt (handwritten signature)

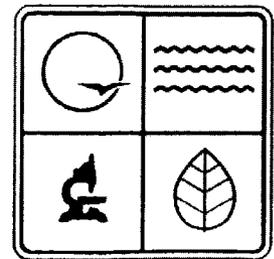
Chris Boldt, Laboratory Manager
Environmental Services Program
Field Services Division



Addendum

Missouri Department of Natural Resources Environmental Services Program

Addendum



Reason: LDPR CHANGED PER PROJECT MANAGER

Order ID 091218004 Program, Contact: HWP Julieann Warren

Report Date: 01/05/2010 LDPR/JobCode: FEPA8 / NJ10TSFF



Sample: AB11003



Customer #: H0900202

Facility ID:

County: Dekalb

Collector: KENNETH HANNON

Sample Comment:

Site: Prime Tanning

Sample Reference ID:

Affiliation: ESP

Collect Date: 12/16/2009 1:40:00PM

Groundwater sample GW-4 collected from residence 104. Bottle reference number B02347. Samples were sent directly from the field to contract lab for Hexavalent Chromium analyses.

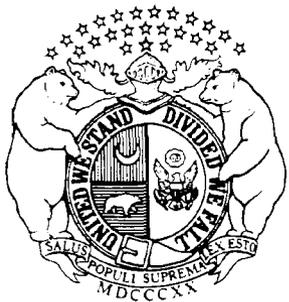
Test	Parameter	Result	Qualifier	Units	QC Batch ID	Method
6020 Metals-Dissolved	Chromium	2.85		µg/L	2,728	SW 846 6020
6020 Metals-Total Recoverable	Chromium	0.32	05	µg/L	2,740	SW 846 6020
Field pH	Field pH	7.73		pH Units		EPA 150.1
Field Specific Conductivity	Field Specific Conductivity	828 uS/cm				SM 2510
Field Temperature	Field Temperature	6.8 C				EPA 170.1
Hexavalent Chromium	Hexavalent Chromium	<0.017	04, ND	mg/L	2,719	SW 846 7196A
Oxidation Reduction Potential-Dissolved	Oxidation Reduction Potential-Dissolved	122		mV		Not Applicable

The analysis of this sample was performed in accordance with procedures approved or recognized by the U.S Environmental Protection Agency.

Qualifier Descriptions

- 01 Improper collection method
- 02 Improper preservation
- 03 Exceeded holding time
- 04 Analyzed by Contract Laboratory
- 05 Estimated value, detected below PQL
- 06 Estimated value, QC data outside limits
- 07 Estimated value, analyte outside calibration range
- 08 Analyte present in blank at > 1/2 reported value
- 09 Sample was diluted during analysis
- 10 Laboratory error
- 11 Estimated value, matrix interference
- 12 Insufficient quantity
- 13 Estimated value, true result is > reported value
- 14 Estimated value, non-homogeneous sample
- 15 No Result - Failed Quality Controls Requirements
- 16 Not analyzed - related analyte not detected
- 17 Results in dry weight
- 18 Sample pH is outside the acceptable range
- 19 Estimated value
- 20 Not analyzed - Instrument failure
- 21 No result - spectral interference
- 22 pH was performed at the Laboratory
- 23 Contract Lab specific qualifier - see sample comments
- ND Not detected at reported value

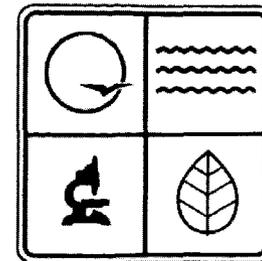
Chris Boldt, Laboratory Manager
Environmental Services Program
Field Services Division



Addendum

Missouri Department of Natural Resources Environmental Services Program

Addendum



Reason: LDPR CHANGED PER PROJECT MANAGER

Order ID: 091218004 Program, Contact: HWP Julieann Warren
Report Date: 01/05/2010 LDPR/JobCode: FEPA8 / NJ10TSFF



Sample: AB11004

Facility ID:

Site: Prime Tanning

County: Dekalb

Sample Reference ID:

Collector: KENNETH HANNON

Affiliation: ESP

Collect Date: 12/16/2009 2:56:00PM

Sample Comment:

Groundwater sample GW-8 collected from residence 108. Bottle reference number B02104. Samples were sent directly from the field to contract lab for Hexavalent Chromium analyses.

Customer #: H0900203

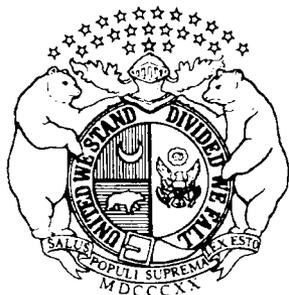
Test	Parameter	Result	Qualifier	Units	QC Batch ID	Method
6020 Metals-Dissolved	Chromium	3.36		µg/L	2,728	SW 846 6020
6020 Metals-Total Recoverable	Chromium	0.38	05	µg/L	2,740	SW 846 6020
Field pH	Field pH	7.47		pH Units		EPA 150.1
Field Specific Conductivity	Field Specific Conductivity	652 uS/cm				SM 2510
Field Temperature	Field Temperature	12.2 C				EPA 170.1
Hexavalent Chromium	Hexavalent Chromium	0.022	04.05	mg/L	2,719	SW 846 7196A
Oxidation Reduction Potential-Dissolved	Oxidation Reduction Potential-Dissolved	-80		mV		Not Applicable

The analysis of this sample was performed in accordance with procedures approved or recognized by the U.S Environmental Protection Agency.

Chris Boldt, Laboratory Manager
Environmental Services Program
Field Services Division

Qualifier Descriptions

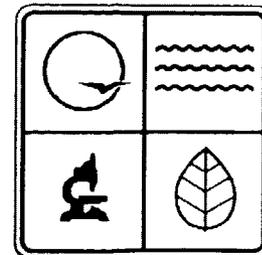
- 01 Improper collection method
- 02 Improper preservation
- 03 Exceeded holding time
- 04 Analyzed by Contract Laboratory
- 05 Estimated value, detected below PQL
- 06 Estimated value, QC data outside limits
- 07 Estimated value, analyte outside calibration range
- 08 Analyte present in blank at > 1/2 reported value
- 09 Sample was diluted during analysis
- 10 Laboratory error
- 11 Estimated value, matrix interference
- 12 Insufficient quantity
- 13 Estimated value, true result is > reported value
- 14 Estimated value, non-homogeneous sample
- 15 No Result - Failed Quality Controls Requirements
- 16 Not analyzed - related analyte not detected
- 17 Results in dry weight
- 18 Sample pH is outside the acceptable range
- 19 Estimated value
- 20 Not analyzed - Instrument failure
- 21 No result - spectral interference
- 22 pH was performed at the Laboratory
- 23 Contract Lab specific qualifier - see sample comments
- ND Not detected at reported value



Addendum

Missouri Department of Natural Resources Environmental Services Program

Addendum



Reason: LDPR CHANGED PER PROJECT MANAGER

Order ID 091218004 Program, Contact: HWP Julieann Warren

Report Date: 01/05/2010 LDPR/JobCode: FEPA8 / NJ10TSFF



Sample: AB11006



Customer #: H0900205

Facility ID:

County: Dekalb

Collector: KENNETH HANNON

Sample Comment: Blind Triplicate.

Site: Prime Tanning

Sample Reference ID:

Affiliation: ESP

Collect Date: 12/17/2009 12:00:00AM

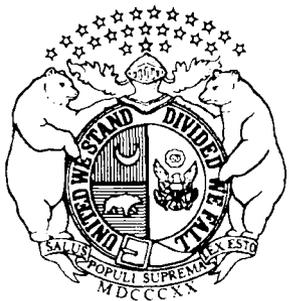
Test	Parameter	Result	Qualifier	Units	QC Batch ID	Method
6020 Metals-Dissolved	Chromium	0.73	05	µg/L	2,728	SW 846 6020
6020 Metals-Total Recoverable	Chromium	0.6	05	µg/L	2,740	SW 846 6020
Hexavalent Chromium	Hexavalent Chromium	0.131	04, 05	mg/L	2,719	SW 846 7196A

The analysis of this sample was performed in accordance with procedures approved or recognized by the U.S Environmental Protection Agency.

Qualifier Descriptions

- 01 Improper collection method
- 02 Improper preservation
- 03 Exceeded holding time
- 04 Analyzed by Contract Laboratory
- 05 Estimated value, detected below PQL
- 06 Estimated value, QC data outside limits
- 07 Estimated value, analyte outside calibration range
- 08 Analyte present in blank at > 1/2 reported value
- 09 Sample was diluted during analysis
- 10 Laboratory error
- 11 Estimated value, matrix interference
- 12 Insufficient quantity
- 13 Estimated value, true result is > reported value
- 14 Estimated value, non-homogeneous sample
- 15 No Result - Failed Quality Controls Requirements
- 16 Not analyzed - related analyte not detected
- 17 Results in dry weight
- 18 Sample pH is outside the acceptable range
- 19 Estimated value
- 20 Not analyzed - Instrument failure
- 21 No result - spectral interference
- 22 pH was performed at the Laboratory
- 23 Contract Lab specific qualifier - see sample comments
- ND Not detected at reported value

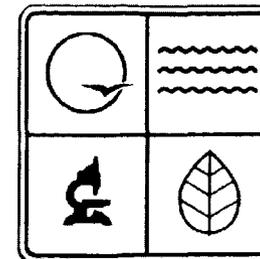
Chris Boldt, Laboratory Manager
Environmental Services Program
Field Services Division



Addendum

Missouri Department of Natural Resources
Environmental Services Program

Addendum



Reason: LDPR CHANGED PER PROJECT MANAGER

Order ID 091218004 Program, Contact: HWP Julieann Warren
Report Date: 01/05/2010 LDPR/JobCode: FEPA8 / NJ10TSFF



Sample: AB11007



Customer #: H0900206

Facility ID: Site: Prime Tanning
County: Dekalb Sample Reference ID:
Collector: KENNETH HANNON Affiliation: ESP Collect Date: 12/17/2009 12:00:00AM
Sample Comment: Blind Triplicate

Table with 7 columns: Test, Parameter, Result, Qualifier, Units, QC Batch ID, Method. Rows include 6020 Metals-Dissolved, 6020 Metals-Total Recoverable, and Hexavalent Chromium.

The analysis of this sample was performed in accordance with procedures approved or recognized by the U.S Environmental Protection Agency.

Qualifier Descriptions

- 01 Improper collection method
02 Improper preservation
03 Exceeded holding time
04 Analyzed by Contract Laboratory
05 Estimated value, detected below PQL
06 Estimated value, QC data outside limits
07 Estimated value, analyte outside calibration range
08 Analyte present in blank at > 1/2 reported value
09 Sample was diluted during analysis
10 Laboratory error
11 Estimated value, matrix interference
12 Insufficient quantity
13 Estimated value, true result is > reported value
14 Estimated value, non-homogeneous sample
15 No Result - Failed Quality Controls Requirements
16 Not analyzed - related analyte not detected
17 Results in dry weight
18 Sample pH is outside the acceptable range
19 Estimated value
20 Not analyzed - Instrument failure
21 No result - spectral interference
22 pH was performed at the Laboratory
23 Contract Lab specific qualifier - see sample comments
ND Not detected at reported value

Chris Boldt (handwritten signature)

Chris Boldt, Laboratory Manager
Environmental Services Program
Field Services Division



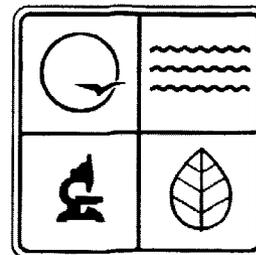
**Missouri Department of Natural Resources
Environmental Services Program**

Addendum **Addendum**

Reason: LDPR CHANGED PER PROJECT MANAGER

Order ID: 091218004 **Program, Contact:** HWP Julieann Warren

Report Date: 01/05/2010 **LDPR/JobCode:** FEPA8 / NJ10TSFF



Sample: AB11009



Customer #: H0900208

Facility ID:

County: Dekalb

Collector: KENNETH HANNON

Sample Comment:

Groundwater sample GW-07 collected from residence 107. Bottle reference number B02197.

Site: Prime Tanning

Sample Reference ID:

Affiliation: ESP

Collect Date: 12/17/2009 1:00:00PM

Test	Parameter	Result	Qualifier	Units	QC Batch ID	Method
6020 Metals-Dissolved	Chromium	1.56		µg/L	2,728	SW 846 6020
6020 Metals-Total Recoverable	Chromium	0.49	05	µg/L	2,740	SW 846 6020
Field pH	Field pH	8.23		pH Units		EPA 150.1
Field Specific Conductivity	Field Specific Conductivity	420 µS/cm				SM 2510
Field Temperature	Field Temperature	12.1 C				EPA 170.1
Hexavalent Chromium	Hexavalent Chromium	0.139	04, 05	mg/L	2,719	SW 846 7196A
Oxidation Reduction Potential-Dissolved	Oxidation Reduction Potential-Dissolved	130		mV		Not Applicable

The analysis of this sample was performed in accordance with procedures approved or recognized by the U.S Environmental Protection Agency.

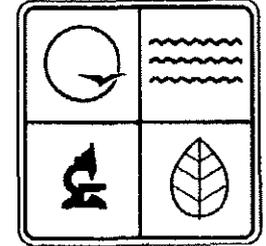
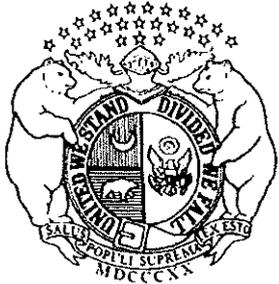
Qualifier Descriptions

- | | |
|---|--|
| 01 Improper collection method | 02 Improper preservation |
| 03 Exceeded holding time | 04 Analyzed by Contract Laboratory |
| 05 Estimated value, detected below PQL | 06 Estimated value, QC data outside limits |
| 07 Estimated value, analyte outside calibration range | 08 Analyte present in blank at > 1/2 reported value |
| 09 Sample was diluted during analysis | 10 Laboratory error |
| 11 Estimated value, matrix interference | 12 Insufficient quantity |
| 13 Estimated value, true result is > reported value | 14 Estimated value, non-homogeneous sample |
| 15 No Result - Failed Quality Controls Requirements | 16 Not analyzed - related analyte not detected |
| 17 Results in dry weight | 18 Sample pH is outside the acceptable range |
| 19 Estimated value | 20 Not analyzed - Instrument failure |
| 21 No result - spectral interference | 22 pH was performed at the Laboratory |
| ND Not detected at reported value | 23 Contract Lab specific qualifier - see sample comments |

Chris Boldt

**Chris Boldt, Laboratory Manager
Environmental Services Program
Field Services Division**

**Missouri Department of Natural Resources
Environmental Services Program**



Order ID 091218005 Program, Contact: HWP Julieann Warren

Report Date: 01/05/2010 LDPR/JobCode: FEPA8

Order Comment:



Sample: AB11012



Customer #: H0900212

Facility ID:

County: Clinton

Collector: SEAN COUNIHAN

Sample Comment:

Site: Tannery Sludge Farm Fields

Sample Reference ID:

Affiliation: ESP

Collect Date: 12/16/2009 4:24:00PM

Loc. ID 111, GW11, Background A
Samples were sent directly from the field to contract lab for Hexavalent Chromium analyses.

Test	Parameter	Result	Qualifier	Units	QC Batch ID	Method
6020 Metals-Dissolved	Chromium	2.14		µg/L	2,729	SW 846 6020
6020 Metals-Total Recoverable	Chromium	0.3	05	µg/L	2,741	SW 846 6020
Field pH	Field pH	6.92		pH Units		EPA 150.1
Field Specific Conductivity	Field Specific Conductivity	344 uS/cm				SM 2510
Field Temperature	Field Temperature	8.6 C				EPA 170.1
Hexavalent Chromium	Hexavalent Chromium	<0.017	04, ND	ug/L	2,719	Contract Lab Dep
Oxidation Reduction Potential-Dissolved	Oxidation Reduction Potential-Dissolved	33		mV		Not Applicable

The analysis of this sample was performed in accordance with procedures approved or recognized by the U.S Environmental Protection Agency.

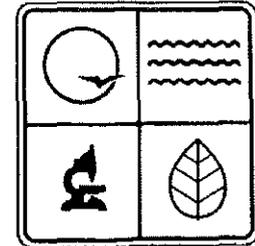
Qualifier Descriptions

- | | |
|---|---|
| 01 Improper collection method | 02 Improper preservation |
| 03 Exceeded holding time | 04 Analyzed by Contract Laboratory |
| 05 Estimated value, detected below PQL | 06 Estimated value, QC data outside limits |
| 07 Estimated value, analyte outside calibration range | 08 Analyte present in blank at > 1/2 reported value |
| 09 Sample was diluted during analysis | 10 Laboratory error |
| 11 Estimated value, matrix interference | 12 Insufficient quantity |
| 13 Estimated value, true result is > reported value | 14 Estimated value, non-homogeneous sample |
| 15 No Result - Failed Quality Controls Requirements | 16 Not analyzed - related analyte not detected |
| 17 Results in dry weight | 18 Sample pH is outside the acceptable range |
| 19 Estimated value | 20 Not analyzed - Instrument failure |
| 21 No result - spectral interference | 22 pH was performed at the Laboratory |
| ND Not detected at reported value | |

Chris Boldt, Laboratory Manager
Environmental Services Program
Field Services Division



Missouri Department of Natural Resources
Environmental Services Program



Order ID 091218005 Program, Contact: HWP Julieann Warren

Report Date: 01/05/2010 LDPR/JobCode: FEPA8

Order Comment:



Sample: AB11013

Facility ID: Site: Tannery Sludge Farm Fields

County: Clinton

Sample Reference ID:

Collector: SEAN COUNIHAN

Affiliation: ESP

Collect Date: 12/17/2009 12:18:00PM

Customer #: H0900213

Sample Comment: Loc. ID 112, GW12, Bottle number BO2309, Taken from hydrant by old windmill

Table with 7 columns: Test, Parameter, Result, Qualifier, Units, QC Batch ID, Method. Rows include 6020 Metals-Dissolved, 6020 Metals-Total Recoverable, Field pH, Field Specific Conductivity, Field Temperature, Hexavalent Chromium, and Oxidation Reduction Potential-Dissolved.

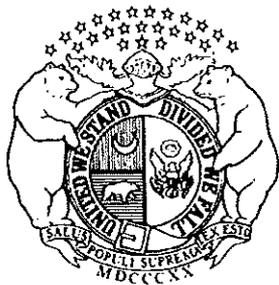
The analysis of this sample was performed in accordance with procedures approved or recognized by the U.S Environmental Protection Agency.

Qualifier Descriptions

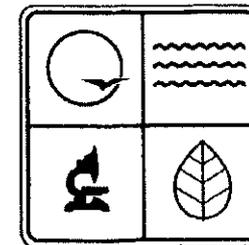
- 01 Improper collection method
02 Improper preservation
03 Exceeded holding time
04 Analyzed by Contract Laboratory
05 Estimated value, detected below PQL
06 Estimated value, QC data outside limits
07 Estimated value, analyte outside calibration range
08 Analyte present in blank at > 1/2 reported value
09 Sample was diluted during analysis
10 Laboratory error
11 Estimated value, matrix interference
12 Insufficient quantity
13 Estimated value, true result is > reported value
14 Estimated value, non-homogeneous sample
15 No Result - Failed Quality Controls Requirements
16 Not analyzed - related analyte not detected
17 Results in dry weight
18 Sample pH is outside the acceptable range
19 Estimated value
20 Not analyzed - Instrument failure
21 No result - spectral interference
22 pH was performed at the Laboratory
ND Not detected at reported value

Chris Boldt (handwritten signature)

Chris Boldt, Laboratory Manager
Environmental Services Program
Field Services Division



**Missouri Department of Natural Resources
Environmental Services Program**



Order ID 091218005 **Program, Contact:** HWP Julieann Warren

Report Date: 01/05/2010 **LDPR/JobCode:** FEPA8

Order Comment:



Sample: AB11014



Customer #: H0900214

Facility ID: **Site:** Tannery Sludge Farm Fields

County: Clinton **Sample Reference ID:**

Collector: SEAN COUNIHAN

Affiliation: ESP

Collect Date: 12/17/2009 1:26:00PM

Sample Comment: Loc. ID 109, GW09, Taken from hydrant behind house, Bottle number BO2307

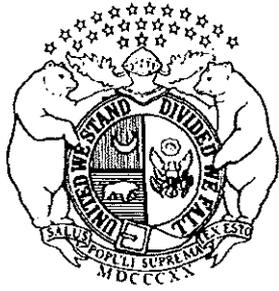
Test	Parameter	Result	Qualifier	Units	QC Batch ID	Method
6020 Metals-Dissolved	Chromium	3.41		µg/L	2,729	SW 846 6020
6020 Metals-Total Recoverable	Chromium	0.39	05	µg/L	2,741	SW 846 6020
Field pH	Field pH	7.66		pH Units		EPA 150.1
Field Specific Conductivity	Field Specific Conductivity	848 uS/cm				SM 2510
Field Temperature	Field Temperature	13.6 C				EPA 170.1
Hexavalent Chromium	Hexavalent Chromium	<0.017	04, ND	ug/L	2,719	Contract Lab Dep
Oxidation Reduction Potential-Dissolved	Oxidation Reduction Potential-Dissolved	158		mV		Not Applicable

The analysis of this sample was performed in accordance with procedures approved or recognized by the U.S Environmental Protection Agency.

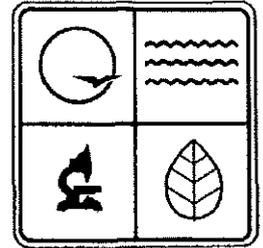
Qualifier Descriptions

- | | |
|---|---|
| 01 Improper collection method | 02 Improper preservation |
| 03 Exceeded holding time | 04 Analyzed by Contract Laboratory |
| 05 Estimated value, detected below PQL | 06 Estimated value, QC data outside limits |
| 07 Estimated value, analyte outside calibration range | 08 Analyte present in blank at > 1/2 reported value |
| 09 Sample was diluted during analysis | 10 Laboratory error |
| 11 Estimated value, matrix interference | 12 Insufficient quantity |
| 13 Estimated value, true result is > reported value | 14 Estimated value, non-homogeneous sample |
| 15 No Result - Failed Quality Controls Requirements | 16 Not analyzed - related analyte not detected |
| 17 Results in dry weight | 18 Sample pH is outside the acceptable range |
| 19 Estimated value | 20 Not analyzed - Instrument failure |
| 21 No result - spectral interference | 22 pH was performed at the Laboratory |
| ND Not detected at reported value | |

**Chris Boldt, Laboratory Manager
Environmental Services Program
Field Services Division**



**Missouri Department of Natural Resources
Environmental Services Program**



Order ID 091218005 **Program, Contact:** HWP Julieann Warren
Report Date: 01/05/2010 **LDPR/JobCode:** FEPA8
Order Comment: 

Sample: AB11015



Customer #: H0900215

Facility ID: **Site:** Tannery Sludge Farm Fields
County: Clinton **Sample Reference ID:**
Collector: SEAN COUNIHAN **Affiliation:** ESP **Collect Date:** 12/17/2009 1:45:00PM
Sample Comment: Loc. ID 110, GW10 Taken from windmill operated pump

Test	Parameter	Result	Qualifier	Units	QC Batch ID	Method
6020 Metals-Dissolved	Chromium	1.70		µg/L	2,729	SW 846 6020
6020 Metals-Total Recoverable	Chromium	3.52		µg/L	2,741	SW 846 6020
Field pH	Field pH	7.75		pH Units		EPA 150.1
Field Specific Conductivity	Field Specific Conductivity	584 µS/cm				SM 2510
Field Temperature	Field Temperature	12 C				EPA 170.1
Hexavalent Chromium	Hexavalent Chromium	<0.017	04, ND	ug/L	2,719	Contract Lab Dep
Oxidation Reduction Potential-Dissolved	Oxidation Reduction Potential-Dissolved	-74		mV		Not Applicable

The analysis of this sample was performed in accordance with procedures approved or recognized by the U.S Environmental Protection Agency.

Qualifier Descriptions

- | | |
|---|---|
| 01 Improper collection method | 02 Improper preservation |
| 03 Exceeded holding time | 04 Analyzed by Contract Laboratory |
| 05 Estimated value, detected below PQL | 06 Estimated value, QC data outside limits |
| 07 Estimated value, analyte outside calibration range | 08 Analyte present in blank at > 1/2 reported value |
| 09 Sample was diluted during analysis | 10 Laboratory error |
| 11 Estimated value, matrix interference | 12 Insufficient quantity |
| 13 Estimated value, true result is > reported value | 14 Estimated value, non-homogeneous sample |
| 15 No Result - Failed Quality Controls Requirements | 16 Not analyzed - related analyte not detected |
| 17 Results in dry weight | 18 Sample pH is outside the acceptable range |
| 19 Estimated value | 20 Not analyzed - instrument failure |
| 21 No result - spectral interference | 22 pH was performed at the Laboratory |
| ND Not detected at reported value | |

Chris Boldt

**Chris Boldt, Laboratory Manager
Environmental Services Program
Field Services Division**

APPENDIX B

Field Notes

Tannery Sludge Farm Fields Site
Andrew, Buchanan, Clinton and DeKalb Counties, MO

Prime Tanning - H₂O Collection
FCPAS / NSD TSEF

Date: 12/16/69

Arrival Time: 11:30

Depart Time: 1700

Participants: Val Wilder
Sean Cummer
Shelly Jackson

Conditions: Sunny $\approx 34^\circ$ Winds moderate south

Calibrations: pH 7.0 = 6.97 (OK)
pH 4.0 = 4.10 (OK)

ORP = 228 (OK)

Loc ID # 103

ID # H0900201

Time: 1258

B02193

pH	7.36	7.45
Temp	16.8	10.8
Cond	330	300
ORP	128	120

-slight Brown tinge

(KA)

12/16/69

Loc #104

B02347
ID # H0900202
Time: 1340

pH	7.72	7.73
Temp	6.3	6.8
Cond	833	828
ORP	143	122

-Clear colorless, odorless

Loc # 105

ID # H0900203
B02104
Time: 1456

pH	7.41	7.47
Temp	11.3	12.2
Cond	680	652
ORP	-65	-80

Rate = 350 L/min.

- Clear colorless water

~~XX Day 2 XX XX XX XX~~

Loc # 105

ID H0900204
H0900205

pH	6.87	6.95	6.85	H0900206
Temp	10.3	9.5	9.1	B02300
Cond	947	828	833	B02304
ORP	182	162	160	B02352

Time: 1525

- (Clear, colorless, odorless)

Loc # 106

ID # H0900207
B02328

pH	6.73	6.72
Temp	11.0	10.3
Cond	723	654
ORP	178	162

Rate: 350
Time: 1237

-Clear, colorless, odorless

Loc # 107

ID # H0900208
B02197

pH	8.15	8.23
Temp	12.0	12.1
Cond	463	420
ORP	150	130

Rate: 350 L/min
Time: 1306

12/16/09 Tannery Sludge Farm Fields

Well Sampling

Sam Conner

Shelly Jackson

1230 hrs Partly Cloudy 37°F

Parcel: BKBC Clinton Co.

Loc. ID 101, GW01

Started water @ 1240

1245

Temp 8.4°C

Cond. 515 μ S

pH 7.5 ~~7.5~~ 7.40

ORP 38mv

1250 sample taken

Temp 8.0

Cond. 504 μ S

pH 7.30

ORP 39mv

Sample taken H0900210

Taken from Hydrant at corner of House

Parcel # 3383 Buchanan Co.

Loc. 10 102, GW02

Water on @ 1344

Temp @ 1349 Measurements taken

ORP -23

Temp 13.3°

Cond. 482

pH 7.50

Taken @ 1352

Temp 13.9°

ORP -17

Cond 472

pH 7.42 Sample # H0900211

Taken from Hydrant on side of Gully across from House of Barr

Parcel: BKGA

Loc. ID 111, GW11

Started water @

Taken measurements @

Temp Noddy Valley Ct.

Cond. Could not do

ORP Pump was frozen.

pH

going to 6450 CR 27 Balcon, MO. 64427

Cheryl Lewis

Well is ^{approx} 34 years old and about 35 ft deep.

Keeping same ID # for Background A

Parcel: BKGA

Andrew Co.

Loc - ID 111, GW11

Started water @ 1616 hrs

Taking measurements @ 1621

Temp 9.0°

Cond. 345 us

ORP 35

pH. 6.95

Measurements taken @ 1624

Temp 8.6°

Cond 344 us

ORP 33

pH 6.92

Sample taken # H0900212

12/17/09

Tannery Sludge Farm fields groundwater

Sampling

Mostly cloudy 41° F

Parcel # 5180

Andrew Co. ~~Clinton~~

Loc. ID 112, GW12

Water started @ 1204 hrs

1st measurement taken @ 1209

Temp 12.3° C

pH 7.69

Cond 753

ORP -17

Second measurement taken @ 1212

Temp 12.5°C

Cond 761

pH 7.65

ORP -26

Third measurement taken @ 1216

Temp 12.4°C

Cond 760

pH 7.68

ORP -23

Sample taken @ 1218 from hydrant by old windmill

Sample # H0900213

Bottle ID # B02309

Parcel # - 9949

Andrew Co.

Loc. ID 109 + ~~110~~^{some} pump by house

GW 09 + ~~GW 10~~^{some}

Started work @ 1317

1st measurement @ 1322

Temp 13.6°C

Cond 833

pH 7.62

ORP 158

2nd measurement @ 1325

Temp 13.9°C

Cond 848

ORP 158

pH 7.60

Sample Taken @ 1326 H0900214

Bottle ID

B02307

Loc. ID 110 GW 10

Some parcel pump off windmill in field

Started work @ 1333

1st measurement @ 1338

Temp 13.8°C

Cond 506

pH 7.64

ORP -55

2nd measurement @ 1341

Temp 11.6°C

Cond 586

pH 7.76

ORP -76

Third measurement @ 1344

Temp 12.0°C

Cond 584

pH 7.75

ORP -74

Sample taken @ 1345

Sample # H0900215 Bottle # B02348

pump from windmill trucked through approx.

3 foot steel/iron pipe to fill cattle trough

Had mouse nest inside with lots of soil + plant matter.

Water samples had a lot of debris in them.

**ANALYTICAL RESULTS FOR PRIVATE WELL WATER SAMPLES
TANNERY SLUDGE FARM FIELDS SITE, NORTHWEST MISSOURI**

- All values listed in parts per billion (ug/l) unless otherwise noted.
- NA denotes not analyzed
- -- denotes not available/applicable

- Sample results in bold are significantly above background concentrations

Location ID	101 Bkgnd	108 Bkgnd	111 Bkgnd	Bkgnd Average	103	104	105	105 replicate	105 replicate	106	107	102	102 resample	102 duplicate	Field Blank	112	109	110	RBSL ²	MCL ³	
Date Collected	12/16/09	12/16/09	12/16/09		12/16/09	12/16/09	12/16/09	12/17/09	12/17/09	12/17/09	12/17/09	12/17/09	12/16/09	1/26/10	1/26/10	1/26/10	12/17/09	12/17/09			12/17/09
Laboratory Number	H0900210	H0900203	H0900212		H0900201	H0900202	H0900204	H0900205	H0900206	H0900207	H0900208	H0900211	1000501	1000503	1000502	H0900213	H0900214	H0900215			
Water Quality Indicators																					
Oxidation Reduction Potential, mV	39.0	-80.0	33	--	120.0	122.0	160.0	NA	NA	162.0	130.0	-17	177	NA	NA	-23	158	-74	--	--	
pH	7.3	7.47	6.92	--	7.45	7.73	6.85	NA	NA	6.72	8.23	7.42	6.82	NA	NA	7.68	7.66	7.75	--	--	
Specific Conductivity, uS/cm	504	652	344	--	300	828	833	NA	NA	654	420	472	483	NA	NA	760	848	584	--	--	
Metals																					
*Chromium, hexavalent, dissolved	0.039 (e)	0.022 (e)	<0.017	0.026	<0.017	<0.017	0.157 (e)	0.131 (e)	0.125 (e)	0.033 (e)	0.139 (e)	0.301**	0.269	0.263	<0.022	0.230 (e)	<0.017	<0.017	0.30	--	
Chromium, total	0.35 (e)	0.38 (e)	0.30(e)	0.34	2.77	0.32 (e)	0.59 (e)	0.60 (e)	0.67 (e)	0.68 (e)	0.49 (e)	0.51(e)	<0.25	<0.25	<0.25	0.60(e)	0.39(e)	3.52	--	100	
Chromium, dissolved	1.92	3.36	2.14	2.47	0.71 (e)	2.85	0.76 (e)	0.73 (e)	0.92 (e)	1.64	1.56	1.95	NA	NA	NA	1.86	3.41	1.70	--	100	

¹ Three times the background average. Non-detect background results are treated as the MDL for calculating average.

² Risk-based Screening Level for hexavalent chromium developed for the site

³ EPA Maximum Contaminant Level for drinking water

e - Estimated value, detected above the method detection limit (MDL), but below the practical quantitation limit (PQL)

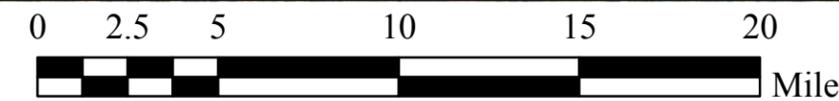
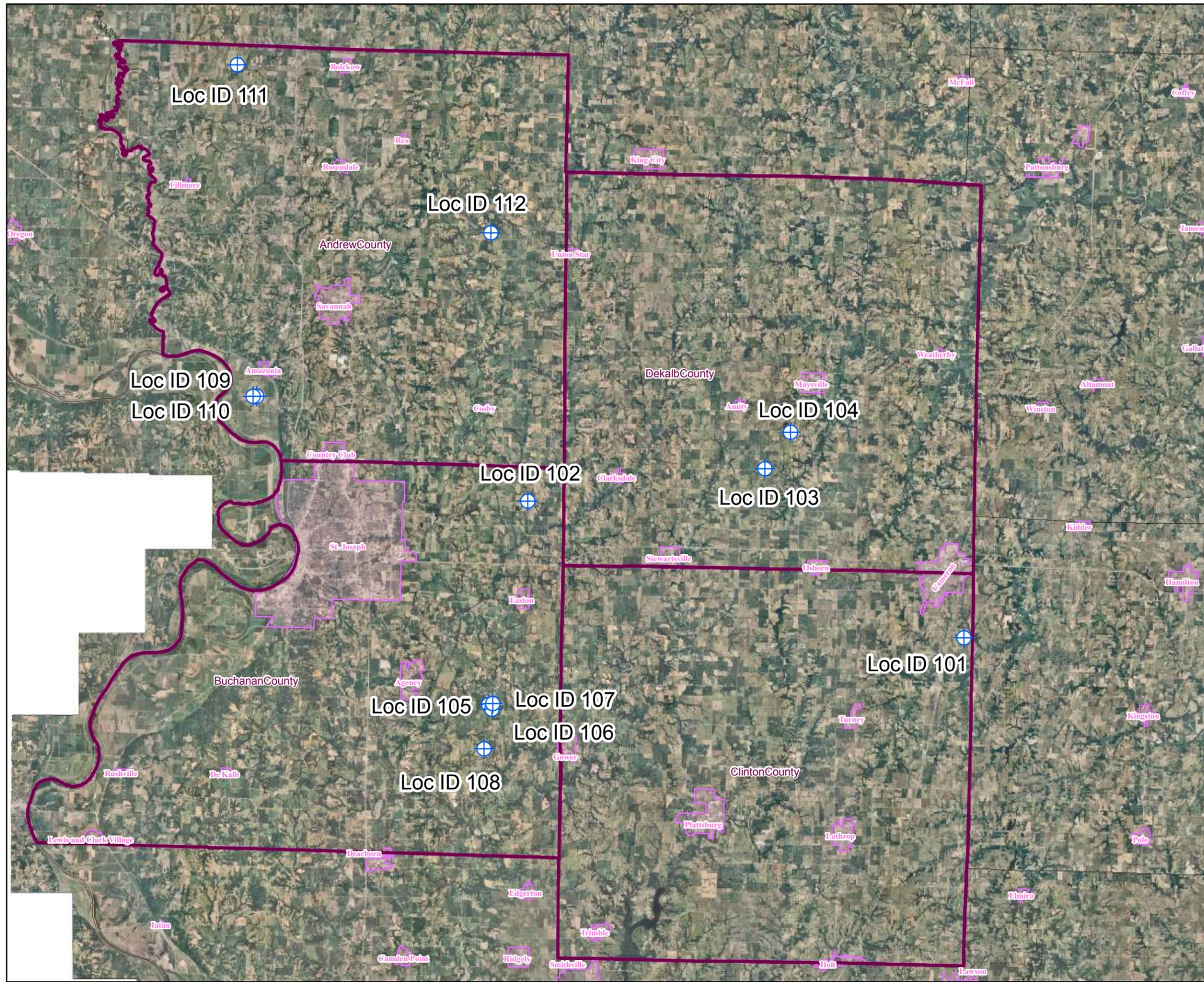
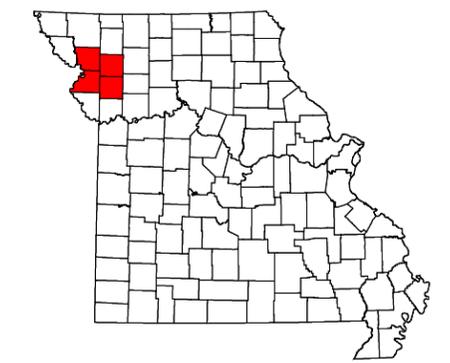
* - Hexavalent Chromium subcontracted to outside laboratory for analysis

** - Department of Health and Senior Services does not consider this value an exceedance of the screening level.

Groudnwater Sampling Locations
Tannery Sludge Farm Field Site
Andrew, Buchanan, Clinton
and Dekalb Counties
Northwest Missouri
December 16 and 17, 2009

Legend

-  Private Well
-  Municipality
-  County Boundary



Map Created in January 2010 by Shelly Jackson

This map can be found at M:\Superfund\Tannery Sludge Farm Fields\
Maps\WaterSamplingLocMap.mxd

Base Map: 2007 Missouri State Leaf-Off Imagery Program. Flight Date: 2008.

Although data sets used to create this map have been compiled by the Missouri Department of Natural Resources, no warranty, expressed or implied, is made by the department as to the accuracy of the data and related materials. The act of distribution shall not constitute any such warranty, and no responsibility is assumed by the department in the use of these data or related materials.



Missouri Department of Natural Resources
Division of Environmental Quality
Hazardous Waste Program



December 22, 2009

Michael Stroh
Missouri Department of Natural Resources
2710 W. Main St.
Jefferson City, MO 65109
(573) 522-4681

Re: Prime Tanning

Dear Mr. Stroh,

Attached is the report associated with the six (6) groundwater samples submitted for hexavalent chromium quantitation on December 16, 2009. The samples were received on December 17, 2009 in a sealed cooler at 2.7°C. Hexavalent chromium quantitation was performed by ion chromatography inductively coupled plasma mass spectrometry (IC-ICP-MS). Any analytical issues associated with the analysis are addressed in the following report.

If you have any questions, please feel free to contact me at your convenience.

Sincerely,

A handwritten signature in black ink that reads "Ben Wozniak".

Ben Wozniak
Project Manager
Applied Speciation and Consulting, LLC

Applied Speciation and Consulting, LLC

Report Prepared for:

Michael Stroh
Missouri Department of Natural Resources
2710 W. Main St.
Jefferson City, MO 65109

Project: Prime Tanning

December 22, 2009

1. Sample Reception

Six (6) groundwater samples were submitted in 125mL HDPE bottles (provided by Applied Speciation and Consulting) for hexavalent chromium quantitation on December 16, 2009. The samples were received in acceptable condition on December 17, 2009 in a sealed cooler at 2.7°C.

All samples were received in a laminar flow clean hood, void of trace metals contamination and ultra-violet radiation, and designated discrete sample identifiers. The pH of each sample was checked to confirm the field-preservation, then all samples were placed in a secure monitored refrigerator (maintained at a temperature of $\leq 4^{\circ}\text{C}$) until the analyses could be performed.

2. Sample Preparation

All sample preparation is performed in laminar flow clean hoods known to be free from trace metals contamination. All applied water for dilutions and sample preservatives are monitored for contamination to account for any biases associated with the sample results.

Hexavalent Chromium Quantitation by IC-ICP-DRC-MS Applied Speciation and Consulting provided a buffered ammonium hydroxide/ammonium sulfate solution in each HDPE bottle to adjust the sample pH between 9 and 9.5. Upon reception the pH of each sample was checked to confirm it was within this range. Since the pH of each sample was acceptable, no further sample preparation was performed prior to analysis.

3. Sample Analysis

All sample analysis is preceded by a minimum of a five-point calibration curve spanning the entire concentration range of interest. Calibration curves are performed at the beginning of each analytical day. All calibration curves, associated with each

species of interest, are standardized by linear regression resulting in a response factor. All sample results are **instrument blank corrected** to account for any operational biases associated with the analytical platform.

Prior to sample analysis, all calibration curves are verified using second source standards which are identified as initial calibration verification standards (ICV).

Ongoing instrument performance is identified by the analysis of continuing calibration verification standards (CCV) and continuing calibration blanks (CCB) at a minimal interval of every ten analytical runs.

Hexavalent Chromium Quantitation by IC-ICP-DRC-MS All samples for hexavalent chromium quantitation were analyzed on December 17, 2009 via a modified version of EPA Method 7199 employing ion chromatography inductively coupled plasma dynamic reaction cell mass spectrometry (IC-ICP-DRC-MS). Aliquots of each sample are injected onto an anion exchange column and mobilized by a basic (pH > 7) gradient. The eluting chromium species are then introduced into a radio frequency (RF) plasma where energy-transfer processes cause desolvation, atomization, and ionization. The ions are extracted from the plasma through a differentially-pumped vacuum interface and travel through a pressurized chamber (DRC) containing a specific reactive gas which preferentially reacts with interfering ions of the same target mass to charge (m/z) ratios. A solid-state detector detects ions transmitted through the mass analyzer, on the basis of their mass-to-charge ratio (m/z), and the resulting current is processed by a data handling system.

The retention time for hexavalent chromium is compared to known standards for species identification.

4. Analytical Issues

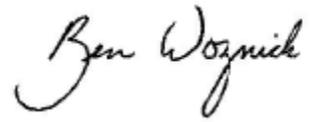
The overall analyses went very well and no significant analytical issues were encountered. All quality control parameters associated with the samples were within acceptance limits with the following exception:

The submitted samples were analyzed as soon as practically possible after sample receipt, although all samples were analyzed outside the 24-hour holding time recommended in EPA Method 7199. However, all samples were field-preserved with an ammonium hydroxide/ammonium sulfate buffer solution designed to stabilize hexavalent chromium in solution.

In accordance with Applied Speciation and Consulting's SOP for hexavalent chromium quantitation via IC-ICP-DRC-MS, the estimated method detection limit (eMDL) has been generated from replicate analyses of the lowest standard in the calibration curve.

If you have any questions or concerns regarding this report, please feel free to contact me.

Sincerely,

A handwritten signature in cursive script that reads "Ben Wozniak". The signature is written in black ink and is positioned below the word "Sincerely,".

Ben Wozniak
Project Manager
Applied Speciation and Consulting, LLC

Hexavalent Chromium Results for the Missouri Department of Natural Resources

Contact: Michael Stroh

Project: Prime Tanning

Date: December 22, 2009

Report Generated by: Ben Wozniak

Applied Speciation and Consulting, LLC

Sample Results

Sample ID	Date & Time Collected*	Date & Time Analyzed*	Cr(VI)
H0900201 / ID#103	12/16/09 12:58	12/17/09 18:05	< 0.017 U
H0900202 / ID#104	12/16/09 13:40	12/17/09 18:10	< 0.017 U
H0900203 / ID#108	12/16/09 14:56	12/17/09 18:15	0.022 J
H0900210 / ID#101	12/16/09 12:50	12/17/09 18:47	0.039 J
H0900211 / ID#102	12/16/09 13:52	12/17/09 18:52	0.301
H0900212 / ID#111	12/16/09 16:24	12/17/09 18:57	< 0.017 U

All results are reported in µg/L

* Times reported in CST

U = Sample concentration is less than the estimated Method Detection Limit (eMDL)

J = Sample concentration is between the eMDL and the Reporting Limit (RL)

Hexavalent Chromium Results for the Missouri Department of Natural Resources

Contact: Michael Stroh

Project: Prime Tanning

Date: December 22, 2009

Report Generated by: Ben Wozniak

Applied Speciation and Consulting, LLC

Quality Control Summary - Preparation Blank Summary

Analyte (µg/L)	PBW1	PBW2	PBW3	PBW4	Mean	StdDev	eMDL at 5x	RL at 5x
Cr(VI)	0.017	-0.006	-0.002	-0.004	0.001	0.011	0.017	0.25

eMDL = Estimated Method Detection Limit; please see narrative regarding eMDL calculations

RL = Reporting Limit

Quality Control Summary - Laboratory Control Samples

Analyte (µg/L)	LCS	True Value	Result	Recovery
Cr(VI)	LCS	10.00	10.32	103.2

Quality Control Summary - Matrix Duplicate

Analyte (µg/L)	Sample ID	Rep 1	Rep 2	Mean	RPD
Cr(VI)	H0900203 / ID#108	0.022 J	< 0.017 U	NC	NC

NC = Value was not calculated due to one or more concentrations below the eMDL

Quality Control Summary - Matrix Spike/ Matrix Spike Duplicate

Analyte (µg/L)	Sample ID	Spike Conc	MS Result	Recovery	Spike Conc	MSD Result	Recovery	RPD
Cr(VI)	H0900203 / ID#108	25.00	23.26	93.0	25.00	22.96	91.8	1.3

Hexavalent Chromium Results for the Missouri Department of Natural Resources
Contact: Michael Stroh

Date: December 22, 2009
Report Generated by: Ben Wozniak
Applied Speciation and Consulting, LLC

Quality Control Summary - Historical Calibration Standards

Cr(VI) True Value	Cr(VI) Measured Result	Percent Recovery
0.050	0.062	123.3
0.050	0.057	113.4
0.050	0.054	108.2
0.050	0.057	113.7
0.500	0.498	99.6
5.000	5.101	102.0
50.00	49.99	100.0
0.050	0.057	113.1
0.050	0.050	99.8
0.050	0.054	108.6
0.050	0.045	90.9
0.500	0.513	102.6
5.000	4.985	99.7
25.00	24.98	99.9
0.050	0.053	106.3
0.050	0.055	110.8
0.050	0.055	109.3
0.050	0.053	106.1
0.500	0.498	99.6
5.000	5.031	100.6
25.00	24.98	99.9

All results are reported in µg/L

Hexavalent Chromium Results for the Missouri Department of Natural Resources
Contact: Michael Stroh

Date: December 22, 2009
Report Generated by: Ben Wozniak
Applied Speciation and Consulting, LLC

Quality Control Summary - Historical CCV Standards

Cr(VI) True Value	Cr(VI) Measured Result	Percent Recovery
5.000	4.958	99.2
5.000	5.437	108.7
5.000	5.285	105.7
5.000	5.219	104.4
5.000	5.488	109.8
5.000	5.384	107.7
5.000	4.932	98.6
5.000	5.272	105.4
5.000	5.407	108.1
5.000	5.611	112.2
5.000	4.928	98.6
5.000	4.725	94.5
5.000	4.659	93.2
5.000	4.971	99.4
5.000	4.680	93.6
5.000	4.817	96.3
5.000	4.769	95.4
5.000	4.833	96.7
5.000	5.093	101.9
5.000	4.895	97.9

CCV = Continuing Calibration Verification
All results are reported in µg/L

Hexavalent Chromium Results for the Missouri Department of Natural Resources
Contact: Michael Stroh

Date: December 22, 2009
Report Generated by: Ben Wozniak
Applied Speciation and Consulting, LLC

Quality Control Summary - Historical Second Source Standards

Cr(VI) True Value	Cr(VI) Measured Result	Percent Recovery
10.00	9.875	98.7
10.00	9.266	92.7
10.00	10.28	102.8
10.00	10.18	101.8
10.00	10.38	103.8
10.00	11.12	111.2
10.00	9.916	99.2
10.00	9.171	91.7
10.00	9.440	94.4
10.00	10.15	101.5
10.00	9.630	96.3
10.00	10.05	100.5
10.00	10.31	103.1
10.00	10.58	105.8
10.00	10.66	106.6
10.00	9.531	95.3
10.00	10.41	104.1
10.00	9.807	98.1
10.00	10.08	100.8
10.00	10.32	103.2

Second-source standard = Initial Calibration Verification (ICV) Standard
All results are reported in µg/L

Hexavalent Chromium Results for the Missouri Department of Natural Resources
 Contact: Michael Stroh

Date: December 22, 2009
 Report Generated by: Ben Wozniak
 Applied Speciation and Consulting, LLC

Quality Control Summary - Historical Matrix Spikes

Ambient Cr(VI) Conc.	MS Spike Conc.	MS		MSD Spike Conc.	MSD		RPD
		Measured Result	MS Recovery		Measured Result	MSD Recovery	
< 0.032 U	25.00	23.26	93.0	25.00	22.96	91.8	1.3
10.42	50.00	62.63	104.4	50.00	62.69	104.5	0.1
0.126	25.00	23.77	94.6	25.00	23.19	92.3	2.5
< 0.032 U	25.00	23.39	93.6	25.00	24.02	96.1	2.7
< 1.5 U	500.0	484.0	96.8	500.0	499.3	99.9	3.1
< 0.37 U	125.0	131.2	105.0	125.0	130.2	104.1	0.8
0.830	125.0	134.5	106.9	125.0	135.8	108.0	1.0
309.0	250.0	539.1	92.1	250.0	534.5	90.2	0.9
421.4	500.0	862.9	88.3	500.0	892.1	94.2	3.3
368.2	500.0	838.8	94.1	500.0	894.5	105.3	6.4
0.54	25.00	25.59	100.2	25.00	26.27	102.9	2.6
229.4	250.0	491.0	104.7	250.0	475.4	98.4	3.2
< 37 U	5000	4843	96.9	5000	4952	99.0	2.2
9.36	50.00	60.96	103.2	50.00	57.09	95.5	6.5
0.36	50.00	47.06	93.4	50.00	46.30	91.9	1.6
568.9	500.0	1089	104.1	500.0	1072	100.6	1.6
368.2	500.0	838.8	94.1	500.0	894.5	105.3	6.4
< 0.23 U	50.00	44.25	88.5	50.00	41.14	82.3	7.3
274.2	5000	5144	97.4	5000	5237	99.2	1.8
190.2	500.0	643.2	90.6	500.0	642.1	90.4	0.2

All results are reported in µg/L



December 22, 2009

Michael Stroh
Missouri Department of Natural Resources
2710 W. Main St.
Jefferson City, MO 65109
(573) 522-4681

Re: Prime Tanning

Dear Mr. Stroh,

Attached is the report associated with the eight (8) groundwater samples submitted for hexavalent chromium quantitation on December 17, 2009. The samples were received on December 18, 2009 in a sealed cooler at 4.1°C. Hexavalent chromium quantitation was performed by ion chromatography inductively coupled plasma mass spectrometry (IC-ICP-MS). Any analytical issues associated with the analysis are addressed in the following report.

If you have any questions, please feel free to contact me at your convenience.

Sincerely,

A handwritten signature in black ink that reads "Ben Wozniak".

Ben Wozniak
Project Manager
Applied Speciation and Consulting, LLC

Applied Speciation and Consulting, LLC

Report Prepared for:

Michael Stroh
Missouri Department of Natural Resources
2710 W. Main St.
Jefferson City, MO 65109

Project: Prime Tanning

December 22, 2009

1. Sample Reception

Eight (8) groundwater samples were submitted in 125mL HDPE bottles (provided by Applied Speciation and Consulting) for hexavalent chromium quantitation on December 17, 2009. The samples were received in acceptable condition on December 18, 2009 in a sealed cooler at 4.1°C.

All samples were received in a laminar flow clean hood, void of trace metals contamination and ultra-violet radiation, and designated discrete sample identifiers. The pH of each sample was checked to confirm the field-preservation, then all samples were placed in a secure monitored refrigerator (maintained at a temperature of $\leq 4^{\circ}\text{C}$) until the analyses could be performed.

2. Sample Preparation

All sample preparation is performed in laminar flow clean hoods known to be free from trace metals contamination. All applied water for dilutions and sample preservatives are monitored for contamination to account for any biases associated with the sample results.

Hexavalent Chromium Quantitation by IC-ICP-DRC-MS Applied Speciation and Consulting provided a buffered ammonium hydroxide/ammonium sulfate solution in each HDPE bottle to adjust the sample pH between 9 and 9.5. Upon reception the pH of each sample was checked to confirm it was within this range. Since the pH of each sample was acceptable, no further sample preparation was performed prior to analysis.

3. Sample Analysis

All sample analysis is preceded by a minimum of a five-point calibration curve spanning the entire concentration range of interest. Calibration curves are performed at the beginning of each analytical day. All calibration curves, associated with each

species of interest, are standardized by linear regression resulting in a response factor. All sample results are **instrument blank corrected** to account for any operational biases associated with the analytical platform.

Prior to sample analysis, all calibration curves are verified using second source standards which are identified as initial calibration verification standards (ICV).

Ongoing instrument performance is identified by the analysis of continuing calibration verification standards (CCV) and continuing calibration blanks (CCB) at a minimal interval of every ten analytical runs.

Hexavalent Chromium Quantitation by IC-ICP-DRC-MS All samples for hexavalent chromium quantitation were analyzed on December 18, 2009 via a modified version of EPA Method 7199 employing ion chromatography inductively coupled plasma dynamic reaction cell mass spectrometry (IC-ICP-DRC-MS). Aliquots of each sample are injected onto an anion exchange column and mobilized by a basic (pH > 7) gradient. The eluting chromium species are then introduced into a radio frequency (RF) plasma where energy-transfer processes cause desolvation, atomization, and ionization. The ions are extracted from the plasma through a differentially-pumped vacuum interface and travel through a pressurized chamber (DRC) containing a specific reactive gas which preferentially reacts with interfering ions of the same target mass to charge (m/z) ratios. A solid-state detector detects ions transmitted through the mass analyzer, on the basis of their mass-to-charge ratio (m/z), and the resulting current is processed by a data handling system.

The retention time for hexavalent chromium is compared to known standards for species identification.

4. Analytical Issues

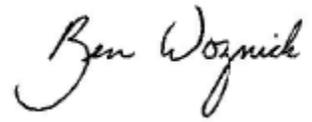
The overall analyses went very well and no significant analytical issues were encountered. All quality control parameters associated with the samples were within acceptance limits with the following exception:

The submitted samples were analyzed as soon as practically possible after sample receipt, although several samples were analyzed outside the 24-hour holding time recommended in EPA Method 7199. However, all samples were field-preserved with an ammonium hydroxide/ammonium sulfate buffer solution designed to stabilize hexavalent chromium in solution.

In accordance with Applied Speciation and Consulting's SOP for hexavalent chromium quantitation via IC-ICP-DRC-MS, the estimated method detection limit (eMDL) has been generated from replicate analyses of the lowest standard in the calibration curve.

If you have any questions or concerns regarding this report, please feel free to contact me.

Sincerely,

A handwritten signature in cursive script that reads "Ben Wozniak". The signature is written in black ink and is positioned below the word "Sincerely,".

Ben Wozniak
Project Manager
Applied Speciation and Consulting, LLC

Hexavalent Chromium Results for the Missouri Department of Natural Resources
Contact: Michael Stroh
Project: Prime Tanning

Date: December 22, 2009
Report Generated by: Ben Wozniak
Applied Speciation and Consulting, LLC

Sample Results

Sample ID	Date & Time Collected*	Date & Time Analyzed*	Cr(VI)
H0900204 / LOC# 105	12/17/09 15:25	12/18/09 14:38	0.157 J
H0900205 / LOC# 105	12/17/09 15:25	12/18/09 14:43	0.131 J
H0900206 / LOC# 105	12/17/09 15:25	12/18/09 14:48	0.125 J
H0900207 / LOC# 106	12/17/09 12:37	12/18/09 14:54	0.033 J
H0900208 / LOC# 107	12/17/09 13:00	12/18/09 14:59	0.139 J
H0900213 / LOC# 112	12/17/09 12:18	12/18/09 15:04	0.230 J
H0900214 / LOC# 109	12/17/09 13:20	12/18/09 15:09	< 0.017 U
H0900215 / LOC# 110	12/17/09 13:45	12/18/09 15:41	< 0.017 U

All results are reported in µg/L

* Times reported in CST

U = Sample concentration is less than the estimated Method Detection Limit (eMDL)

J = Sample concentration is between the eMDL and the Reporting Limit (RL)

Hexavalent Chromium Results for the Missouri Department of Natural Resources

Contact: Michael Stroh

Project: Prime Tanning

Date: December 22, 2009

Report Generated by: Ben Wozniak

Applied Speciation and Consulting, LLC

Quality Control Summary - Preparation Blank Summary

Analyte (µg/L)	PBW1	PBW2	PBW3	PBW4	Mean	StdDev	eMDL at 5x	RL at 5x
Cr(VI)	0.022	-0.001	-0.002	0.035	0.013	0.018	0.017	0.25

eMDL = Estimated Method Detection Limit; please see narrative regarding eMDL calculations

RL = Reporting Limit

Quality Control Summary - Laboratory Control Samples

Analyte (µg/L)	LCS	True Value	Result	Recovery
Cr(VI)	LCS	10.00	10.32	103.2

Quality Control Summary - Matrix Duplicate

Analyte (µg/L)	Sample ID	Rep 1	Rep 2	Mean	RPD
Cr(VI)	H0900214 / LOC# 109	< 0.017 U	< 0.017 U	NC	NC

NC = Value was not calculated due to one or more concentrations below the eMDL

Quality Control Summary - Matrix Spike/ Matrix Spike Duplicate

Analyte (µg/L)	Sample ID	Spike Conc	MS Result	Recovery	Spike Conc	Result	Recovery	RPD
Cr(VI)	H0900214 / LOC# 109	25.00	23.39	93.6	25.00	24.02	96.1	2.7

Hexavalent Chromium Results for the Missouri Department of Natural Resources
Contact: Michael Stroh

Date: December 22, 2009
Report Generated by: Ben Wozniak
Applied Speciation and Consulting, LLC

Quality Control Summary - Historical Calibration Standards

Cr(VI) True Value	Cr(VI) Measured Result	Percent Recovery
0.050	0.062	123.3
0.050	0.057	113.4
0.050	0.054	108.2
0.050	0.057	113.7
0.500	0.498	99.6
5.000	5.101	102.0
50.00	49.99	100.0
0.050	0.057	113.1
0.050	0.050	99.8
0.050	0.054	108.6
0.050	0.045	90.9
0.500	0.513	102.6
5.000	4.985	99.7
25.00	24.98	99.9
0.050	0.053	106.3
0.050	0.055	110.8
0.050	0.055	109.3
0.050	0.053	106.1
0.500	0.498	99.6
5.000	5.031	100.6
25.00	24.98	99.9

All results are reported in µg/L

Hexavalent Chromium Results for the Missouri Department of Natural Resources
Contact: Michael Stroh

Date: December 22, 2009
Report Generated by: Ben Wozniak
Applied Speciation and Consulting, LLC

Quality Control Summary - Historical CCV Standards

Cr(VI) True Value	Cr(VI) Measured Result	Percent Recovery
5.000	4.958	99.2
5.000	5.437	108.7
5.000	5.285	105.7
5.000	5.219	104.4
5.000	5.488	109.8
5.000	5.384	107.7
5.000	4.932	98.6
5.000	5.272	105.4
5.000	5.407	108.1
5.000	5.611	112.2
5.000	4.928	98.6
5.000	4.725	94.5
5.000	4.659	93.2
5.000	4.971	99.4
5.000	4.680	93.6
5.000	4.817	96.3
5.000	4.769	95.4
5.000	4.833	96.7
5.000	5.093	101.9
5.000	4.895	97.9

CCV = Continuing Calibration Verification
All results are reported in µg/L

Hexavalent Chromium Results for the Missouri Department of Natural Resources
Contact: Michael Stroh

Date: December 22, 2009
Report Generated by: Ben Wozniak
Applied Speciation and Consulting, LLC

Quality Control Summary - Historical Second Source Standards

Cr(VI) True Value	Cr(VI) Measured Result	Percent Recovery
10.00	9.875	98.7
10.00	9.266	92.7
10.00	10.28	102.8
10.00	10.18	101.8
10.00	10.38	103.8
10.00	11.12	111.2
10.00	9.916	99.2
10.00	9.171	91.7
10.00	9.440	94.4
10.00	10.15	101.5
10.00	9.630	96.3
10.00	10.05	100.5
10.00	10.31	103.1
10.00	10.58	105.8
10.00	10.66	106.6
10.00	9.531	95.3
10.00	10.41	104.1
10.00	9.807	98.1
10.00	10.08	100.8
10.00	10.32	103.2

Second-source standard = Initial Calibration Verification (ICV) Standard
All results are reported in µg/L

Hexavalent Chromium Results for the Missouri Department of Natural Resources
 Contact: Michael Stroh

Date: December 22, 2009
 Report Generated by: Ben Wozniak
 Applied Speciation and Consulting, LLC

Quality Control Summary - Historical Matrix Spikes

Ambient Cr(VI) Conc.	MS Spike Conc.	MS		MSD Spike Conc.	MSD		RPD
		Measured Result	MS Recovery		Measured Result	MSD Recovery	
< 0.032 U	25.00	23.26	93.0	25.00	22.96	91.8	1.3
10.42	50.00	62.63	104.4	50.00	62.69	104.5	0.1
0.126	25.00	23.77	94.6	25.00	23.19	92.3	2.5
< 0.032 U	25.00	23.39	93.6	25.00	24.02	96.1	2.7
< 1.5 U	500.0	484.0	96.8	500.0	499.3	99.9	3.1
< 0.37 U	125.0	131.2	105.0	125.0	130.2	104.1	0.8
0.830	125.0	134.5	106.9	125.0	135.8	108.0	1.0
309.0	250.0	539.1	92.1	250.0	534.5	90.2	0.9
421.4	500.0	862.9	88.3	500.0	892.1	94.2	3.3
368.2	500.0	838.8	94.1	500.0	894.5	105.3	6.4
0.54	25.00	25.59	100.2	25.00	26.27	102.9	2.6
229.4	250.0	491.0	104.7	250.0	475.4	98.4	3.2
< 37 U	5000	4843	96.9	5000	4952	99.0	2.2
9.36	50.00	60.96	103.2	50.00	57.09	95.5	6.5
0.36	50.00	47.06	93.4	50.00	46.30	91.9	1.6
568.9	500.0	1089	104.1	500.0	1072	100.6	1.6
368.2	500.0	838.8	94.1	500.0	894.5	105.3	6.4
< 0.23 U	50.00	44.25	88.5	50.00	41.14	82.3	7.3
274.2	5000	5144	97.4	5000	5237	99.2	1.8
190.2	500.0	643.2	90.6	500.0	642.1	90.4	0.2

All results are reported in µg/L



February 3, 2010

Michael Stroh
Missouri Department of Natural Resources
2710 W. Main St.
Jefferson City, MO 65109
(573) 522-4681

Re: Prime Tanning

Dear Mr. Stroh,

Attached is the report associated with the three (3) aqueous samples submitted for hexavalent chromium quantitation on January 26, 2010. The samples were received on January 27, 2010 in a sealed cooler at 2.9°C. Hexavalent chromium quantitation was performed by ion chromatography inductively coupled plasma mass spectrometry (IC-ICP-MS). Any analytical issues associated with the analysis are addressed in the following report.

If you have any questions, please feel free to contact me at your convenience.

Sincerely,

A handwritten signature in black ink that reads "Ben Wozniak".

Ben Wozniak
Project Manager
Applied Speciation and Consulting, LLC

Applied Speciation and Consulting, LLC

Report Prepared for:

Michael Stroh
Missouri Department of Natural Resources
2710 W. Main St.
Jefferson City, MO 65109

Project: Prime Tanning

February 3, 2010

1. Sample Reception

Three (3) aqueous samples were submitted in 125mL HDPE bottles (provided by Applied Speciation and Consulting) for hexavalent chromium quantitation on January 26, 2010. The samples were received in acceptable condition on January 27, 2010 in a sealed cooler at 2.9°C.

All samples were received in a laminar flow clean hood, void of trace metals contamination and ultra-violet radiation, and designated discrete sample identifiers. The pH of each sample was checked to confirm the field-preservation, then all samples were placed in a secure monitored refrigerator (maintained at a temperature of $\leq 4^{\circ}\text{C}$) until the analyses could be performed.

2. Sample Preparation

All sample preparation is performed in laminar flow clean hoods known to be free from trace metals contamination. All applied water for dilutions and sample preservatives are monitored for contamination to account for any biases associated with the sample results.

Hexavalent Chromium Quantitation by IC-ICP-DRC-MS Applied Speciation and Consulting provided a buffered ammonium hydroxide/ammonium sulfate solution in each HDPE bottle to adjust the sample pH between 9 and 9.5. Upon reception the pH of each sample was checked to confirm it was within this range. Since the pH of each sample was acceptable, no further sample preparation was performed prior to analysis.

3. Sample Analysis

All sample analysis is preceded by a minimum of a five-point calibration curve spanning the entire concentration range of interest. Calibration curves are performed at the beginning of each analytical day. All calibration curves, associated with each

species of interest, are standardized by linear regression resulting in a response factor. All sample results are **instrument blank corrected** to account for any operational biases associated with the analytical platform.

Prior to sample analysis, all calibration curves are verified using second source standards which are identified as initial calibration verification standards (ICV).

Ongoing instrument performance is identified by the analysis of continuing calibration verification standards (CCV) and continuing calibration blanks (CCB) at a minimal interval of every ten analytical runs.

Hexavalent Chromium Quantitation by IC-ICP-DRC-MS All samples for hexavalent chromium quantitation were analyzed on January 27, 2010 via a modified version of EPA Method 7199 employing ion chromatography inductively coupled plasma dynamic reaction cell mass spectrometry (IC-ICP-DRC-MS). Aliquots of each sample are injected onto an anion exchange column and mobilized by a basic (pH > 7) gradient. The eluting chromium species are then introduced into a radio frequency (RF) plasma where energy-transfer processes cause desolvation, atomization, and ionization. The ions are extracted from the plasma through a differentially-pumped vacuum interface and travel through a pressurized chamber (DRC) containing a specific reactive gas which preferentially reacts with interfering ions of the same target mass to charge (m/z) ratios. A solid-state detector detects ions transmitted through the mass analyzer, on the basis of their mass-to-charge ratio (m/z), and the resulting current is processed by a data handling system.

The retention time for hexavalent chromium is compared to known standards for species identification.

4. Analytical Issues

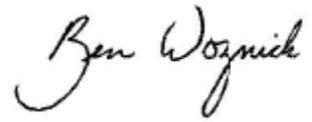
The overall analyses went very well and no significant analytical issues were encountered. All quality control parameters associated with the samples were within acceptance limits with the following exception:

The submitted samples were analyzed as soon as practically possible after sample receipt, although all samples were analyzed outside the 24-hour holding time recommended in EPA Method 7199. However, all samples were field-preserved with an ammonium hydroxide/ammonium sulfate buffer solution designed to stabilize hexavalent chromium in solution.

In accordance with Applied Speciation and Consulting's SOP for hexavalent chromium quantitation via IC-ICP-DRC-MS, the estimated method detection limit (eMDL) has been generated from replicate analyses of the lowest standard in the calibration curve.

If you have any questions or concerns regarding this report, please feel free to contact me.

Sincerely,

A handwritten signature in cursive script that reads "Ben Wozniak". The signature is written in black ink and is positioned below the word "Sincerely,".

Ben Wozniak
Project Manager
Applied Speciation and Consulting, LLC

Hexavalent Chromium Results for the Missouri Department of Natural Resources

Contact: Michael Stroh

Project: Prime Tanning

Date: February 3, 2010

Report Generated by: Ben Wozniak

Applied Speciation and Consulting, LLC

Sample Results

Sample ID	Date & Time Collected*	Date & Time Analyzed*	Cr(VI)
1000501	1/26/10 16:27	1/27/10 21:04	0.269
1000502	1/26/10 16:35	1/27/10 20:58	< 0.022 U
1000503	1/26/2010	1/27/10 21:10	0.263

All results are reported in µg/L

* Times reported in CST

U = Sample concentration is less than the estimated Method Detection Limit (eMDL)

J = Sample concentration is between the eMDL and the Reporting Limit (RL)

Hexavalent Chromium Results for the Missouri Department of Natural Resources

Contact: Michael Stroh

Project: Prime Tanning

Date: February 3, 2010

Report Generated by: Ben Wozniak

Applied Speciation and Consulting, LLC

Quality Control Summary - Preparation Blank Summary

Analyte (µg/L)	PBW1	PBW2	PBW3	PBW4	Mean	StdDev	eMDL at 5x	RL at 5x
Cr(VI)	0.006	-0.017	-0.015	-0.008	-0.009	0.010	0.022	0.25

eMDL = Estimated Method Detection Limit; please see narrative regarding eMDL calculations

RL = Reporting Limit

Quality Control Summary - Laboratory Control Samples

Analyte (µg/L)	LCS	True Value	Result	Recovery
Cr(VI)	LCS	10.00	9.791	97.9

Quality Control Summary - Matrix Duplicate

Analyte (µg/L)	Sample ID	Rep 1	Rep 2	Mean	RPD
Cr(VI)	1000503	0.263	0.259	0.261	1.5

Quality Control Summary - Matrix Spike/ Matrix Spike Duplicate

Analyte (µg/L)	Sample ID	Spike Conc	MS Result	Recovery	Spike Conc	MSD Result	Recovery	RPD
Cr(VI)	1000503	25.00	25.86	102.4	25.00	25.81	102.2	0.2

Hexavalent Chromium Results for the Missouri Department of Natural Resources
Contact: Michael Stroh

Date: February 3, 2010
Report Generated by: Ben Wozniak
Applied Speciation and Consulting, LLC

Quality Control Summary - Historical Calibration Standards

Cr(VI) True Value	Cr(VI) Measured Result	Percent Recovery
0.050	0.053	106.3
0.050	0.055	110.8
0.050	0.055	109.3
0.050	0.053	106.1
0.500	0.498	99.6
5.000	5.031	100.6
25.00	24.98	99.9
0.050	0.049	98.9
0.050	0.052	103.6
0.050	0.053	105.4
0.050	0.050	100.6
0.500	0.491	98.1
5.000	4.944	98.9
25.00	25.00	100.0
0.050	0.060	120.0
0.050	0.060	120.9
0.050	0.056	111.4
0.050	0.060	120.1
0.500	0.442	88.5
5.000	5.062	101.2
50.00	49.98	100.0

All results are reported in µg/L

Hexavalent Chromium Results for the Missouri Department of Natural Resources
Contact: Michael Stroh

Date: February 3, 2010
Report Generated by: Ben Wozniak
Applied Speciation and Consulting, LLC

Quality Control Summary - Historical CCV Standards

Cr(VI) True Value	Cr(VI) Measured Result	Percent Recovery
5.000	5.043	100.9
5.000	5.181	103.6
5.000	5.013	100.3
5.000	5.063	101.3
5.000	5.055	101.1
5.000	5.018	100.4
5.000	5.162	103.2
5.000	5.395	107.9
5.000	5.616	112.3
5.000	5.328	106.6
5.000	5.385	107.7
5.000	5.390	107.8
5.000	4.659	93.2
5.000	4.971	99.4
5.000	4.680	93.6
5.000	4.817	96.3
5.000	4.769	95.4
5.000	4.833	96.7
5.000	5.093	101.9
5.000	4.895	97.9

CCV = Continuing Calibration Verification

All results are reported in µg/L

Hexavalent Chromium Results for the Missouri Department of Natural Resources
Contact: Michael Stroh

Date: February 3, 2010
Report Generated by: Ben Wozniak
Applied Speciation and Consulting, LLC

Quality Control Summary - Historical Second Source Standards

Cr(VI) True Value	Cr(VI) Measured Result	Percent Recovery
10.00	9.791	97.9
10.00	9.800	98.0
10.00	10.32	103.2
10.00	9.875	98.7
10.00	9.266	92.7
10.00	10.28	102.8
10.00	10.18	101.8
10.00	10.38	103.8
10.00	11.12	111.2
10.00	9.916	99.2
10.00	9.171	91.7
10.00	9.440	94.4
10.00	10.15	101.5
10.00	9.630	96.3
10.00	10.05	100.5
10.00	10.31	103.1
10.00	10.58	105.8
10.00	10.66	106.6
10.00	9.531	95.3
10.00	10.41	104.1

Second-source standard = Initial Calibration Verification (ICV) Standard
All results are reported in µg/L

Hexavalent Chromium Results for the Missouri Department of Natural Resources
 Contact: Michael Stroh

Date: February 3, 2010
 Report Generated by: Ben Wozniak
 Applied Speciation and Consulting, LLC

Quality Control Summary - Historical Matrix Spikes

Ambient Cr(VI) Conc.	MS Spike Conc.	MS		MSD Spike Conc.	MSD		RPD
		Measured Result	MS Recovery		Measured Result	MSD Recovery	
0.261	25.00	25.86	102.4	25.00	25.81	102.2	0.2
0.606	25.00	27.22	106.5	25.00	26.89	105.1	1.2
< 0.032 U	25.00	23.26	93.0	25.00	22.96	91.8	1.3
10.42	50.00	62.63	104.4	50.00	62.69	104.5	0.1
0.126	25.00	23.77	94.6	25.00	23.19	92.3	2.5
< 0.032 U	25.00	23.39	93.6	25.00	24.02	96.1	2.7
< 1.5 U	500.0	484.0	96.8	500.0	499.3	99.9	3.1
< 0.37 U	125.0	131.2	105.0	125.0	130.2	104.1	0.8
0.830	125.0	134.5	106.9	125.0	135.8	108.0	1.0
309.0	250.0	539.1	92.1	250.0	534.5	90.2	0.9
421.4	500.0	862.9	88.3	500.0	892.1	94.2	3.3
368.2	500.0	838.8	94.1	500.0	894.5	105.3	6.4
0.54	25.00	25.59	100.2	25.00	26.27	102.9	2.6
229.4	250.0	491.0	104.7	250.0	475.4	98.4	3.2
9.36	50.00	60.96	103.2	50.00	57.09	95.5	6.5
0.36	50.00	47.06	93.4	50.00	46.30	91.9	1.6
568.9	500.0	1089	104.1	500.0	1072	100.6	1.6
368.2	500.0	838.8	94.1	500.0	894.5	105.3	6.4
274.2	5000	5144	97.4	5000	5237	99.2	1.8
190.2	500.0	643.2	90.6	500.0	642.1	90.4	0.2

All results are reported in µg/L

