

State of Washington Department of Ecology  
Northwest Regional Office  
**WATER COMPLIANCE INSPECTION REPORT**

substitute for OMB No. 2040-0057 and EPA form 3560-3 (Rev. 9-94)  
(last file update 12-95.)

Section A: National Data System Coding (i.e., PCS)

Transaction Code 1 <b>N</b> 2 <b>5</b>	NPDES # <b>WA0501489</b>	yr/mo/day 12 <b>14/06/12</b>	Inspection Type 18 <b>S</b>	Inspector 19 <b>S</b>	Fac Type 20 <b>1</b>
Remarks Pending Application					
Inspection work days 67 <b>1.0</b> 69	Facility Self-Monitoring Evaluation Rating 70 <b>4</b>	BI 71 <b>N</b>	QA 72 <b>N</b>	-----Reserved----- 73 _____ 74 _____ 75 _____ 80	

Section B: Facility Data

Name and Location of Facility Inspected (For industrial users discharging to POTW, also include POTW name and NPDES permit number) Hughes Farms 1325 Farm to Market Road Mount Vernon, WA 98273	Entry Time/Date 11:30 am 06/12/14	Permit Effective Date
	Exit Time / Date 1:00 pm 06/12/14	Permit Expiration Date
Name(s) of On-Site Representative(s)/Title(s)/Phone and Fax Number(s) Jose Velazquez Plant Manager 360-424-3772	Other Facility Data	
Name, Address of Responsible Official/Title/Phone and Fax Number. David Hughes Owner		
Phone Number: (360) 424-3772 Fax: Contacted? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		

Section C: Areas Evaluated During Inspection (Check only those areas evaluated)

<input type="checkbox"/> Permit	<input type="checkbox"/> Flow Measurement	<input type="checkbox"/> Operations & Maint.	<input type="checkbox"/> CSO/SSO (Sewer Overflow)
<input type="checkbox"/> Records/Reports	<input type="checkbox"/> Self-Monitoring Program	<input type="checkbox"/> Sludge Handling/Disposal	<input type="checkbox"/> Pollution Prevention
<input type="checkbox"/> Facility Site Review	<input type="checkbox"/> Compliance Schedules	<input type="checkbox"/> Pretreatment	<input type="checkbox"/> Multimedia
<input checked="" type="checkbox"/> Effluent/Receiving water	<input type="checkbox"/> Laboratory	<input type="checkbox"/> Storm Water	<input type="checkbox"/> other

Section D: Summary of Findings/Comments

INTRODUCTION

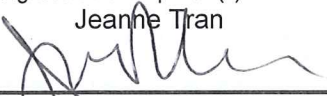
This was a class II inspection involving collecting water samples to investigate the cause of the discoloration and odor of the water in the field ditch and the settling pond. The sample was collected in the water column at a depth of approximately 1 foot. Samples were analyzed for turbidity, BOD<sub>5</sub>, sulfide, sulfite, sulfate, sulfur, ammonia, nitrate/nitrite, TPN, fecal coliforms, manganese (total and dissolved metal). Attached are the analytical results.

Background information: The settling pond is shared by Hughes Farms, Chemtrade Sulex, and other nearby facilities. The majority of the flow comes from Hughes Farms' potato washing operation. Occasionally, other facilities discharge stormwater runoff into this pond. Hughes Farms has been pumping water from the settling pond to the farm field for irrigation.

In summary, the analytical results indicate that the BOD<sub>5</sub> concentrations in the field ditch and in the settling pond were high compared to the municipal technology-based standards for surface water discharge (30 mg/L average monthly, and 45 mg/L average weekly). The measured DO concentration in the settling pond was very low (less than 2 mg/L) compared to the surface water standard (8 mg/L). The reason for the discoloration of the water is unknown. Nevertheless, a common cause of black discoloration of water is due to the formation of sulfides of multivalent metals (e.g. manganese sulfide, iron sulfide, magnesium sulfide, etc). However, the sulfide concentration in the sample was less than the sulfite and sulfate concentrations. Furthermore, Chemtrade Sulex has not been discharging to the settling pond since 2012 and the pond is dredged every year at the end of August or early September by Hughes Farms. In addition, I did not detect a rotten egg odor when I was present on-site on June 9, 2014. My hypothesis is the combination of the nutrients from the decomposition of potato pieces, and the starch and sugars from potatoes coupled with the uncharacteristically warm temperature lead to a predominantly anaerobic condition in the lower portion of the water column, and in the benthos of the pond, resulting in the formation of metallic sulfides which could be the cause of the black discoloration of the water.

10/8/2014

Inspection Report

Name(s) and Signatures of Inspector(s) Jeanne Tran 	Agency/Office/Telephone WA State Dept. of Ecology/NWRO/(425)649-7078 3190 160th SE Ave, Bellevue, WA 98008-5452	Date 09/26/14
Signature of Management Q A Reviewer 	Agency/Office/Phone and Fax Numbers WA Dept. of Ecology/NWRO/(425)649-7000 fax (425)649-7098	Date 10/13/2014

UNANNOUNCED Inspection



## INSTRUCTIONS

## Section A: National Data System Coding (i.e., PCS)

**Column 1: Transaction Code.** Use N, C, or D for New Change or Delete. All inspections will be new unless there is an error in the data entered.

**Columns 3-11: NPDES Permit No.** Enter the facility's NPDES permit number. (Use the Remarks columns to record State permit number, if necessary.)

**Columns 12-17: Inspection Date.** Insert the date entry was made into the facility. Use the year/month/day format (e.g., 94/06/30 = June 30, 1994).

**Column 18: Inspection Type.** Use one of the codes listed below to describe the type of inspection:

A Performance Audit	L Enforcement Case Support	2 IU Sampling Inspection
B Compliance Biomonitoring	M Multimedia	3 IU Non-Sampling Inspection
C Compliance Evaluation (non-sampling)	P Pretreatment Compliance Inspection	4 IU Toxics Inspection
D Diagnostic	R Reconnaissance	5 IU Sampling Inspection with Pretreatment
E Corps of Engineers Inspection	S Compliance Sampling	6 IU Non-Sampling Inspection with pretreatment
F Pretreatment Follow-up	U IU Inspection with Pretreatment Audit	7 IU Toxics with Pretreatment
G Pretreatment Audit	X Toxics Inspection	
I Industrial User (IU) Inspection	Z Sludge	

**Column 19: Inspector Code.** Use one of the codes listed below to describe the *lead agency* in the inspection.

C - Contractor or Other Inspectors ( <i>Specify in Remarks Columns</i> )	N - NEIC Inspectors
E - Corps of Engineers	R - EPA Regional Inspector
J - Joint EPA/State Inspectors - EPA Lead	S - State Inspector
	T - Joint State/EPA Inspectors - State Lead

**Column 20: Facility Type.** Use one of the codes below to describe the facility.

- 1 - Municipal. Publicly Owned Treatment Works (POTWs) with 1987 Standard Industrial Code (SIC) 4952.
- 2 - Industrial. Other than municipal, agricultural, and Federal facilities.
- 3 - Agricultural. Facilities classified with 1987 SIC 0111 to 0971.
- 4 - Federal. Facilities identified as Federal by the EPA Regional Office

**Columns 21-66: Remarks.** These columns are reserved for remarks at the discretion of the Region.

**Columns 67-69: Inspection Work Days.** Estimate the total work effort (to the nearest 0.1 work day), up to 99.9 days, that were used to complete the inspection and submit a QA reviewed report of findings. This estimate includes the accumulative effort of all participating inspectors; any effort for laboratory analyses, testing, and remote sensing; and the billed payroll time for travel and pre and post inspection preparation. This estimate does not require detailed documentation.

**Column 70: Facility Evaluation Rating.** Use information gathered during the inspection (regardless of inspection type) to evaluate the quality of the facility self-monitoring program. Grade the program using a scale of 1 to 5 with a score of 5 being used for very reliable self-monitoring programs, 3 being satisfactory, and 1 being used for very unreliable programs.

**Column 71: Biomonitoring Information.** Enter D for static testing. Enter F for flow through testing. Enter N for no biomonitoring.

**Column 72: Quality Assurance Data Inspection.** Enter Q if the inspection was conducted as follow-up on quality assurance sample results. Enter N otherwise.

**Columns 73-80:** These columns are reserved for regionally defined information.

## Section B: Facility Data

This section is self-explanatory except for "Other Facility Data," which may include new information not in the permit or PCS (e.g., new outfalls, names of receiving waters, new ownership, and other updates to the record).

## Section C: Areas Evaluated During Inspection

Check only those areas evaluated by marking the appropriate box. Use Section D and additional sheets as necessary. Support the findings, as necessary, in a brief narrative report. Use the headings given on the report form (e.g., Permit, Records/Reports) when discussing the areas evaluated during the inspection. The heading marked "Multimedia" may indicate medias such as CAA, RCRA, and TSCA. The heading marked "Other" may indicate activities such as SPCC, BMPs, and concerns that are not covered elsewhere.

## Section D: Summary of Findings/Comments

Briefly summarize the inspection findings. This summary should abstract the pertinent inspection findings, not replace the narrative report. Reference a list of attachments, such as completed checklists taken from the NPDES Compliance Inspection Manuals and pretreatment guidance documents, including effluent data when sampling has been done. Use extra sheets as necessary.



**Analytical Resources, Incorporated**  
Analytical Chemists and Consultants

June 20, 2014

Karin Feddersen  
Washington State Department of Ecology  
7411 Beach Drive East  
Port Orchard, WA 98366-8204

**RE: Project: Black Water**  
**ARI Job No.: YN65**

Dear Karin:

Please find enclosed the original Chain-of-Custody record (COC), sample receipt documentation, and the final data package for samples from the project referenced above. For information regarding sample receipt, refer to the Cooler Receipt Form.

Analytical details are discussed in the Case Narrative.

An electronic copy of this package will remain on file with ARI. Should you have any questions or problems, please feel free to contact me at your convenience.

Sincerely,

ANALYTICAL RESOURCES, INC.

Cheronne Oreiro  
Project Manager  
(206) 695-6214  
[cheronneo@arilabs.com](mailto:cheronneo@arilabs.com)  
[www.arilabs.com](http://www.arilabs.com)

cc: eFile YN65

Enclosures



**Analytical Resources, Incorporated**  
Analytical Chemists and Consultants  
4611 South 134th Place, Suite 100  
Tukwila, WA 98168  
206-695-6200 206-695-6201 (fax)  
[www.arilabs.com](http://www.arilabs.com)

ARI Assigned Number:	YN105	Turn-around Requested:	1 Week
ARI Client Company:	Ecology	Phone:	(425) 649-7078
Client Contact:	JEANNE TRAN		
Client Project Name:	Black Water		
Client Project #:	1406053	Samplers:	JEANNE TRAN

YNS : 99992

**Sample Retention Policy:** All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.



# Cooler Receipt Form

ARI Client WSDOE

Project Name Black Water

COC No(s) \_\_\_\_\_ (NA)

Delivered by: Fed-Ex UPS Courier (Hand Delivered) Other \_\_\_\_\_

Assigned ARI Job No: \_\_\_\_\_

Tracking No: \_\_\_\_\_ (NA)

## Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to cooler? YES (NO)

Were custody papers included with the cooler? YES NO

Were custody papers properly filled out (ink, signed, etc) YES NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry)

Time: 1700

238

If cooler temperature is out of compliance fill out form 00070F

Temp Gun ID#: 90877952

Cooler Accepted by AV Date: 6/12/14 Time: 1700

Complete custody forms and attach all shipping documents

## Log-In Phase:

Was a temperature blank included in the cooler? YES (NO)

What kind of packing material was used? Bubble Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other: \_\_\_\_\_

Was sufficient ice used (if appropriate)? NA YES (NO)

Were all bottles sealed in individual plastic bags? YES (NO)

Did all bottles arrive in good condition (unbroken)? YES NO

Were all bottle labels complete and legible? YES NO

Did the number of containers listed on COC match with the number of containers received? YES NO

Did all bottle labels and tags agree with custody papers? YES NO

Were all bottles used correct for the requested analyses? YES NO

Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)... NA YES NO

Were all VOC vials free of air bubbles? NA YES NO

Was sufficient amount of sample sent in each bottle? YES NO

Date VOC Trip Blank was made at ARI: (NA)

Was Sample Split by ARI: (NA) YES Date/Time: \_\_\_\_\_ Equipment: \_\_\_\_\_ Split by: \_\_\_\_\_

Samples Logged by: AV Date: 6/12/14 Time: 1700

\*\* Notify Project Manager of discrepancies or concerns \*\*

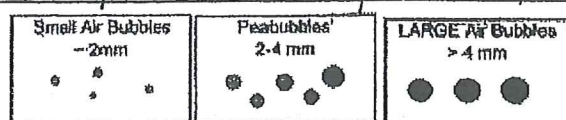
Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

## Additional Notes, Discrepancies, & Resolutions:

Field Ditch time on bottles (sulfite) = 1155, No time on (sulfide)

Settling Pond time on bottle (sulfite) = 1257, (sulfide) = 1255

By: AV/CO Date: 6/12/13 Per the client, Field Ditch was logged as 1406053-01 + Settling Pond was logged as 1406053-02. Only 2 samples rec'd 6/12/14.



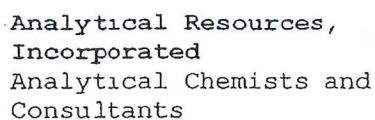
Small → "sm" (< 2 mm)

Peabubbles → "pb" (2 to < 4 mm)

Large → "lg" (4 to < 6 mm)

Headspace → "hs" (> 6 mm)





## Cooler Temperature Compliance Form

Completed by: SA Date: 6/12/14 Time: 1700





# REQUEST FOR LABORATORY SERVICES

LIMS ID: \_\_\_\_\_

PAGE 1 OF 1

SIC NO. \_\_\_\_\_

PPR Request ID \_\_\_\_\_

Quote: **Contract# 02413**

Contact <b>Cheronne Oreiro</b>	Project Name <b>Black Water</b>	Date <b>06/12/14</b>
Laboratory <b>Analytical Resources, Inc</b>	Client and Address: <b>WA STATE DEPT. OF ECOLOGY MANCHESTER LABORATORY 7411 BEACH DRIVE EAST PORT ORCHARD WA 98366-8204</b>	<input type="checkbox"/> Enforcement <input type="checkbox"/> Return to Client <input type="checkbox"/> Dispose Return Cooler
Address <b>4611 S. 134<sup>th</sup> Place, Suite 100 Tukwila, WA 98168-3240</b>		
Phone: (206)695-6214	FAX: ( ) -	

ITEM NO.	LAB SAMPLE NO	PROJECT NAME AND/OR DESCRIPTION	QUANTITY	UNIT PRICE	TOTAL COST
	1406053 - 01,02,03	Analyze 3 water samples collected 06/12/14 for Sulfite by Method SM 4500-S2.	3	26.00	78.00
	1406053 - 01,02,03	Analyze 3 water samples collected 06/12/14 for Sulfide by Method SM4500-SO3.	3	30.00	90.00
		Deliverables to include a case narrative documenting any sample or analysis anomalies, copies of all raw data and QA/QC summaries.	15%	\$3.78	\$3.78
		Report is due within fifteen (15) business days of the sample receipt.			
		Please send invoice with report.			
			TOTAL		\$171.78

Requested By (Your contact if any question arise): <b>Nancy Rosenbower</b>	Phone No. (360) 871-8827
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**CHAIN OF CUSTODY\***

Relinquished By:	Received By.	Yr	Mo	Day	Hr	Min

\*Signatures on this part of the form pertain to the custody of these samples and not to the cost of the analysis.

Invoice will be paid after sample analyses have passed a QA/QC review.

YNES : 00005



ARI Job No: YN65

PC: Cheronne  
VTSR: 06/12/14

Inquiry Number: NONE  
Analysis Requested: 06/13/14  
Contact: Feddersen, Karin  
Client: Washington Department of Ecology  
Logged by: AV  
Sample Set Used: Yes-481  
Validatable Package: No  
Deliverables:

Project #: 1406053  
Project: Black Water  
Sample Site:  
SDG No:  
Analytical Protocol: In-house

LOGNUM	ARI ID	CLIENT ID	CN	WAD	NH3	COD	FOG	MET	PHEN	PHOS	TKN	NO23	TOC	S2	TPHD	Fe2+	DMET DOC	ADJUSTED TO	LOT NUMBER	AMOUNT ADDED	DATE/BY
14-11372	YN65A	FIELD DITCH	>12	>12	<2	<2	<2	<2	<2	<2	<2	<2	<2	*				<12	10249C	2mL	6/12/14
14-11373	YN65B	SETTLING POND												*				I	6/12/14	I	I

\* Sulfide preserved w/ ZnAc, lab to adjust Ph.

YN65: 000006

Added 6/12/14

Checked By AV Date 6/12/14



### **Case Narrative**

**Client: Washington State Department of Ecology**

**Project: Black Water**

**ARI Job No.: YN65**

### **Sample receipt**

Two water samples were received on June 12, 2014 under ARI job YN65. The cooler temperature measured by IR thermometer following ARI SOP was 23.8°C. For further details regarding sample receipt, please refer to the enclosed Cooler Receipt Form.

### **General Chemistry Parameters: Sulfide and Sulfite**

The samples and associated laboratory QC were analyzed within the recommended holding time.

The method blanks were clean at the reporting limits. The LCS percent recoveries were within limits.

The matrix spike percent recovery and replicate RPDs were within control limits.



# Sample ID Cross Reference Report



ARI Job No: YN65  
Client: Washington Department of Ecology  
Project Event: 1406053  
Project Name: Black Water

Sample ID	ARI	ARI	Matrix	Sample Date/Time	VTSR
	Lab ID	LIMS ID			
1. FIELD DITCH	YN65A	14-11372	Water	06/12/14 11:33	06/12/14 17:00
2. SETTLING POND	YN65B	14-11373	Water	06/12/14 12:57	06/12/14 17:00



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## Data Reporting Qualifiers

Effective 2/14/2011

### Inorganic Data

- U Indicates that the target analyte was not detected at the reported concentration
- \* Duplicate RPD is not within established control limits
- B Reported value is less than the CRDL but  $\geq$  the Reporting Limit
- N Matrix Spike recovery not within established control limits
- NA Not Applicable, analyte not spiked
- H The natural concentration of the spiked element is so much greater than the concentration spiked that an accurate determination of spike recovery is not possible
- L Analyte concentration is  $\leq 5$  times the Reporting Limit and the replicate control limit defaults to  $\pm 1$  RL instead of the normal 20% RPD

### Organic Data

- U Indicates that the target analyte was not detected at the reported concentration
- \* Flagged value is not within established control limits
- B Analyte detected in an associated Method Blank at a concentration greater than one-half of ARI's Reporting Limit or 5% of the regulatory limit or 5% of the analyte concentration in the sample.
- J Estimated concentration when the value is less than ARI's established reporting limits
- D The spiked compound was not detected due to sample extract dilution
- E Estimated concentration calculated for an analyte response above the valid instrument calibration range. A dilution is required to obtain an accurate quantification of the analyte.
- Q Indicates a detected analyte with an initial or continuing calibration that does not meet established acceptance criteria ( $< 20\%$  RSD,  $< 20\%$  Drift or minimum RRF).



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- S Indicates an analyte response that has saturated the detector. The calculated concentration is not valid; a dilution is required to obtain valid quantification of the analyte
- NA The flagged analyte was not analyzed for
- NR Spiked compound recovery is not reported due to chromatographic interference
- NS The flagged analyte was not spiked into the sample
- M Estimated value for an analyte detected and confirmed by an analyst but with low spectral match parameters. This flag is used only for GC-MS analyses
- M2 The sample contains PCB congeners that do not match any standard Aroclor pattern. The PCBs are identified and quantified as the Aroclor whose pattern most closely matches that of the sample. The reported value is an estimate.
- N The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification"
- Y The analyte is not detected at or above the reported concentration. The reporting limit is raised due to chromatographic interference. The Y flag is equivalent to the U flag with a raised reporting limit.
- EMPC Estimated Maximum Possible Concentration (EMPC) defined in EPA Statement of Work DLM02.2 as a value "calculated for 2,3,7,8-substituted isomers for which the quantitation and /or confirmation ion(s) has signal to noise in excess of 2.5, but does not meet identification criteria" **(Dioxin/Furan analysis only)**
- C The analyte was positively identified on only one of two chromatographic columns. Chromatographic interference prevented a positive identification on the second column
- P The analyte was detected on both chromatographic columns but the quantified values differ by  $\geq 40\%$  RPD with no obvious chromatographic interference
- X Analyte signal includes interference from polychlorinated diphenyl ethers. **(Dioxin/Furan analysis only)**
- Z Analyte signal includes interference from the sample matrix or perfluorokerosene ions. **(Dioxin/Furan analysis only)**





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### **Geotechnical Data**

- A      The total of all fines fractions. This flag is used to report total fines when only sieve analysis is requested and balances total grain size with sample weight.
- F      Samples were frozen prior to particle size determination
- SM     Sample matrix was not appropriate for the requested analysis. This normally refers to samples contaminated with an organic product that interferes with the sieving process and/or moisture content, porosity and saturation calculations
- SS     Sample did not contain the proportion of "fines" required to perform the pipette portion of the grain size analysis
- W      Weight of sample in some pipette aliquots was below the level required for accurate weighting

SAMPLE RESULTS-CONVENTIONALS  
YN65-Washington Department of Ecology



Matrix: Water  
Data Release Authorized: *[Signature]*  
Reported: 06/19/14

Project: Black Water  
Event: NA  
Date Sampled: 06/12/14  
Date Received: 06/12/14


Client ID: 1406053-01  
ARI ID: 14-11372 YN65A

Analyte	Date Batch	Method	Units	RL	Sample
Sulfide	06/13/14 061314#1	SM4500-S2D	mg/L	0.500	2.21
Sulfite	06/12/14 061214#1	SM4500-SO3B	mg/L	1.5	4.3

RL Analytical reporting limit  
U Undetected at reported detection limit

SAMPLE RESULTS-CONVENTIONALS  
YN65-Washington Department of Ecology



Matrix: Water  
Data Release Authorized:   
Reported: 06/19/14

Project: Black Water  
Event: NA  
Date Sampled: 06/12/14  
Date Received: 06/12/14

Client ID: 1406053-02  
ARI ID: 14-11373 YN65B

Analyte	Date Batch	Method	Units	RL	Sample
Sulfide	06/13/14 061314#1	SM4500-S2D	mg/L	0.500	1.73
Sulfite	06/12/14 061214#1	SM4500-SO3B	mg/L	1.5	6.3

RL Analytical reporting limit  
U Undetected at reported detection limit

Water Sample Report-YN65

YN65 00013



MS/MSD RESULTS-CONVENTIONALS  
YN65-Washington Department of Ecology



Matrix: Water

Data Release Authorized: *W*

Reported: 06/19/14

Project: Black Water

Event: NA


Date Sampled: 06/12/14

Date Received: 06/12/14

Analyte	Method	Date	Units	Sample	Spike	Spike Added	Recovery
ARI ID: YN65A Client ID: 1406053-01							
Sulfide	SM4500-S2D	06/13/14	mg/L	2.21	19.1	16.0	105.6%

REPLICATE RESULTS-CONVENTIONALS  
YN65-Washington Department of Ecology



Matrix: Water  
Data Release Authorized:   
Reported: 06/19/14

Project: Black Water  
Event: NA  
Date Sampled: 06/12/14  
Date Received: 06/12/14

Analyte	Method	Date	Units	Sample	Replicate(s)	RPD/RSD
ARI ID: YN65A Client ID: 1406053-01						
Sulfide	SM4500-S2D	06/13/14	mg/L	2.21	2.48	11.5%
Sulfite	SM4500-SO3B	06/12/14	mg/L	4.3	4.4	2.3%

Water Replicate Report-YN65

YN65: 00015

LAB CONTROL RESULTS-CONVENTIONALS  
YN65-Washington Department of Ecology



Matrix: Water  
Data Release Authorized: *AD*  
Reported: 06/19/14

Project: Black Water  
Event: NA  
Date Sampled: NA  
Date Received: NA

Analyte/Method	QC ID	Date	Units	LCS	Spike Added	Recovery
Sulfide SM4500-S2D	ICVL	06/13/14	mg/L	0.508	0.500	101.6%
Sulfite SM4500-SO3B	ICVL	06/12/14	mg/L	4.6	5.0	92.0%

METHOD BLANK RESULTS-CONVENTIONALS  
YN65-Washington Department of Ecology



Matrix: Water  
Data Release Authorized: *AD*  
Reported: 06/19/14

Project: Black Water  
Event: NA  
Date Sampled: NA  
Date Received: NA

Analyte	Method	Date	Units	Blank	ID
Sulfide	SM4500-S2D	06/13/14	mg/L	< 0.050 U	
Sulfite	SM4500-SO3B	06/12/14	mg/L	< 1.5 U	

Water Method Blank Report-YN65

YN65:00017



SULFITE BENCHSHEET (IODOMETRIC TITRATION)				
SM 4500-SO3 B		Date/Time: 6/12/2014		
		ANALYST: RR		
<b>Potassium iodate-iodide Titrant</b>				
Enter grams KIO3 added to make up Standard Titrant. If using a previously prepared solution, enter the weight data from the Standard Prep Log.				
ARI # C002311		Date prepared 6/12/2014		
grams KIO3 = 0.4462		volume (L) = 1.0		
		Normality (eq/L) = 0.0125		
<b>Laboratory Control Sample</b>				
grams Na2SO3 = 0.3936		volume (mL) = 500		mg/L <b>500</b>
LCS = 0.5		mL Stk to 50		<b>5.0</b>
<b>Calculation:</b>				
mg SO3/L = [(mL KIO3 sample - mL KIO3 blank) X N KIO3 X 40,000] / mL sample				
Valid sample titration must be > mean blank + 3 stdev				
<b>SAMPLE DATA</b>		Buret ID:		
<b>TITRATION DATA</b>				
SAMPLE ID	VOLUME SAMPLE (mL)	VOLUME KI-KIO3 (mL)	Titration Result (mg/L SO3)	Sulfite reported as (mg/L SO3)
BLANK	50	0.08		
BLANK	50	0.07	stdev =	0.010
BLANK	50	0.06	RSD =	14.3%
				OK!
MEAN BLANK	50	0.07	0.7	
<i>blimit = mean+ (3 stdev) = 0.10</i>			<i>DL = 1.0</i>	
LCS	50	0.53	4.60	92.1 % Rec
YN65 A2	50	0.50	4.30	4.3
YN65 A2 dup	50	0.51	4.40	4.4
			RPD = 2.3 %	
YN65 B2	50	0.70	6.31	6.3

SULFITE BENCHSHEET (IODOMETRIC TITRATION)				
SM 4500-SO3 B		Date/Time: <u>6/12/14 18:45</u>		
		ANALYST: <u>PR</u>		
<b>Potassium iodate-iodide Titrant</b>				
Enter grams KIO3 added to make up Standard Titrant. If using a previously prepared solution, enter the weight data from the Standard Prep Log.				
ARI # <u>C002911</u>		Date prepared <u>6/12/14</u>		
grams KIO3 = <u>0.4462</u>		volume (L) = <u>1.0</u>		Normality (eq/L) = <u>0.0000</u>
<b>Laboratory Control Sample</b>				
grams Na2SO3 = <u>0.3936</u>		volume (mL) = <u>500 1000</u>		mg/L <u>0</u>
LCS = <u>0.5</u>		mL Stk to <u>50</u>		<u>0.0</u>
<b>Calculation:</b>				
$\text{mg SO}_3/\text{L} = [(\text{mL KIO}_3 \text{ sample} - \text{mL KIO}_3 \text{ blank}) \times N \text{ KIO}_3 \times 40,000] / \text{mL sample}$				
Valid sample titration must be > mean blank + 3 stdev				
<b>SAMPLE DATA</b>		Buret ID: <u>01930627</u>		
TITRATION DATA				
SAMPLE ID	VOLUME SAMPLE (mL)	VOLUME KI-KIO3 (mL)	Titration Result (mg/L SO3)	Sulfite reported as (mg/L SO3)
BLANK	50	0.08		
BLANK	50	0.07	stdev =	#DIV/0!
BLANK	50	0.06	RSD =	#DIV/0!
				#DIV/0!
MEAN BLANK	50	#DIV/0!		#DIV/0!
$\text{blimit} = \text{mean} + (3 \text{ stdev}) =$			$\text{DL} =$	
LCS	50	0.53		
YN65 A2	50	0.50		
↓ B21	50	0.51		
↓ B21	50	0.70		
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			

W  
6.17.14

SULFIDE BENCHSHEET (Spectrophotometric, EPA 376.2)				Date / Time		Analyst	
Aqueous Samples				Distillation		NA	
				Finish		6/13/14 17:02	
If distilled, specify procedure: NA				zinc acetate: C001955			
1. Standardization of sodium thiosulfate titrant				Buret used for titrations: S2			
Thiosulfate ID: C001106							
Bi-iodate ID: C000374				Titration of bi-iodate with thiosulfate			
Stock bi-iodate = 0.8116 grams to 1000 mL				ml bi-iodate = 3.00 3.00 3.00			
Normality = 0.025				ml thiosulfate = 3.11 3.10 3.07 nthio			
Normality thiosulfate = (mL bi-iodate*normality) / mL thiosulfate =				0.024 0.024 0.024 0.024			
2. Normality of Iodine				Titration of Iodine with thiosulfate			
Iodine ID: C000565				mL Iodine = 5.00 5.00 5.00			
				mL thiosulfate = 5.05 5.05 5.00 ni			
Normality iodine = (mL thiosulfate*normality) / mL iodine =				0.024 0.024 0.024 0.024			
3. Standardization of sodium sulfide stock				Titration of standard with Thiosulfate			
Stock ID = C002319				mL Standard = 1.00 1.00 1.00			
Approx conc in 100ml				mL iodine = 3.00 3.00 3.00			
g Na2S 0.5153 mg/mL = 0.688				mL thiosulfate = 0.96 0.97 0.93 stlconc (mg/mL)			
Sulfide (mg/mL) = {[(mL iodine*ni)-(mL thio *nthio)]*16} / mL standard =				0.80 0.79 0.81 0.801			
Intermediate Standard				mL required for for 0.025 mg/mL 7.8			
Add 7.8 ml stl to 250 ml 0.2 N ZnOAc =				0.025 mg/mL			
5.0 Calibration Standard Curve				spectrophotometer used:			
Volume Intermediate (ml)	FINAL VOLUME (ml)	CONC (mg S/L)	ABSORBANCE @ 650 nm			REGRESSION DATA	
			1	2	Avg		
0.00	50	0.000	0.000		0.000	intercept	0.006
0.10	50	0.050	0.039		0.039	slope	0.705
0.25	50	0.125	0.093		0.093	r=	0.9997
0.50	50	0.250	0.188		0.188	Comment: Calibration OK!	
1.00	50	0.500	0.367		0.367		
2.00	50	1.000	0.705		0.705	maxabs =	0.705
Calib Verif Std = 1.0 ml int to 50 ml ZnOAc = 0.500 mg/L							
Distillation Prep Std = 3.0 ml Stk to 300 = 8.010 mg/L							
SAMPLE DATA				enter dilution factor as ml final/mL sample			
	DISTILL DATA		SPECTROPHOTOMETRIC DATA			SAMPLE DATA	
SAMPLE ID	Sample Volume	Distill Volume (mL)	Dilution factor	ABS @ 650 nm	BKG ABS	Regressed Conc (mg S/L)	Final Conc mg S/L
Cal Blk		n/a	1.00	0.000		-0.008	< 0.05 OK!
ICV		n/a	1.00	0.364		0.508	0.51 101.63%
YN65 A1			10.00	0.162		0.221	2.21
YN65 A1 dup			10.00	0.181		0.248	2.48 RPD=11.5%
YN65 A1 ms			50.00	0.275		0.382	19.09 105.3%
Spike at 0.10 ml STK to 5.00 ml sample =				16.02 mg/l			
YN65 B1			10.00	0.128		0.173	1.73
Prep Blk			1.00	-0.015		-0.030	< 0.05 OK!
Prep Std			10.00	0.547		0.768	7.68 95.82%
YN82 A1			1.00	-0.020		-0.037	< 0.05
YN82 A1 dup			1.00	-0.004		-0.014	< 0.05 NA
YN82 A1 ms			1.00	0.337		0.470	0.47 94.0%
Spike at 0.10 ml INT to 5.00 ml sample =				0.50 mg/l			
Cal Blk		n/a	1.00	0.000		-0.008	< 0.05 OK!
CCV		n/a	1.00	0.363		0.507	0.51 101.34%

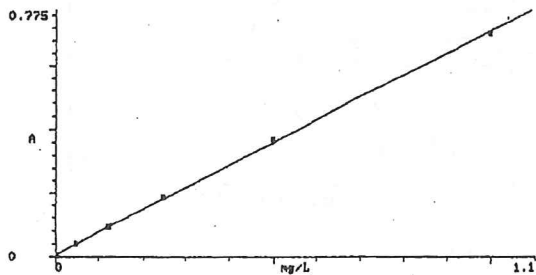


<b>SULFIDE BENCHSHEET (Spectrophotometric, EPA 376.2)</b>				Date / Time		Analyst							
Aqueous Samples				Distillation		NA							
				Finish		6/13/14 17:02							
If distilled, specify procedure: NA				zinc acetate: C001955		A-PD							
1. Standardization of sodium thiosulfate titrant				Buret used for titrations: S2									
Thiosulfate ID: C001106													
Bi-iodate ID: C000374													
Stock bi-iodate = 0.8116 grams to 1000 mL				Titration of bi-iodate with thiosulfate									
Normality = 0.025				<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td>3.00</td> <td>3.00</td> <td>3.00</td> </tr> <tr> <td>3.11</td> <td>3.10</td> <td>3.07</td> </tr> </table>				3.00	3.00	3.00	3.11	3.10	3.07
3.00	3.00	3.00											
3.11	3.10	3.07											
Normality thiosulfate = (mL bi-iodate*normality) / mL thiosulfate =				nthio									
2. Normality of Iodine				Titration of Iodine with thiosulfate									
Iodine ID: C000565				<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td>5.00</td> <td>5.00</td> <td>5.00</td> </tr> <tr> <td>5.05</td> <td>5.05</td> <td>5.00</td> </tr> </table>				5.00	5.00	5.00	5.05	5.05	5.00
5.00	5.00	5.00											
5.05	5.05	5.00											
Normality iodine = (mL thiosulfate*normality) / mL iodine =				ni									
3. Standardization of sodium sulfide stock				Titration of standard with Thiosulfate									
Stock ID = C002319				<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td>1.00</td> <td>1.00</td> <td>1.00</td> </tr> <tr> <td>3.00</td> <td>3.00</td> <td>3.00</td> </tr> </table>				1.00	1.00	1.00	3.00	3.00	3.00
1.00	1.00	1.00											
3.00	3.00	3.00											
Approx conc in 100ml				mL Standard =									
g Na2S 0.5153 mg/mL = 0.688				mL iodine =									
Sulfide (mg/mL) = {(mL iodine*ni)-(mL thio *nthio)}*16 / mL standard =				mL thiosulfate =									
				stkconc (mg/mL)									
Intermediate Standard				mL required for for 0.025 mg/mL									
Add 7.9 ml stk to 250 ml 0.2 N ZnOAc =				mg/mL									
5.0 Calibration Standard Curve				spectrophotometer used:									
Volume Intermediate (ml)		FINAL VOLUME (ml)	CONC (mg S/L)	ABSORBANCE @ 650 nm			REGRESSION DATA  intercept slope r=  Comment:  maxabs =						
				1	2	Avg							
0.00		50	#VALUE!	0.000									
0.10		50	#VALUE!	0.039									
0.25		50	#VALUE!	0.093									
0.50		50	#VALUE!	0.188									
1.00		50	#VALUE!	0.367									
2.00		50	#VALUE!	0.705									
Calib Verif Std = 1.0 ml int to 50 ml ZnOAc = #VALUE! mg/L													
Distillation Prep Std = 3.0 ml Stk to 300 = #VALUE! mg/L													
SAMPLE DATA enter dilution factor as ml final/mL sample													
SAMPLE ID	DISTILL DATA		SPECTROPHOTOMETRIC DATA				SAMPLE DATA						
	Sample Volume	Distill Volume (mL)	Dilution factor	ABS @ 650 nm	BKG ABS	Regressed Conc (mg S/L)		Final Conc mg S/L					
Cal Blk		n/a	1.00	0.000									
ICV		n/a	1.00	0.364									
YN65 A1			10 1.00	0.112									
YN65 A1 dup			10 1.00	0.181									
YN65 A1 ms			50 1.00	0.275									
Spike at 0.10 ml INT to 5.00 ml sample = #VALUE! mg/l													
YN65 B1			10 1.00	0.128									
Prep Blk			1.00	-0.05									
Prep Std			10.00	0.547									
YN82 A1			1.00	0.00									
YN82 A1 dup			1.00	0.004									
YN82 A1 ms			1.00	0.337									
Spike at 0.10 ml INT to 5.00 ml sample = #VALUE! mg/l													
Cal Blk		n/a	1.00	0.000									
CCV		n/a	1.00	0.313									
			1.00										
			1.00										
			1.00										
			1.00										
			1.00										
			1.00										
			1.00										
			1.00										
Cal Blk		n/a	1.00		0.000								
CCV		n/a	1.00										



TEST SETUP  
GENESYS 10 v2.021 2G2G048006

Standard Curve 17:02 13Jun14  
Test Name SULFIDE  
Date Standards Measured 13Jun14  
Wavelength 650nm  
Ref. Wavelength Correction Off  
Curve Fit Linear  
Number of Standards 6  
Units mg/L  
ID# (0=OFF) Off  
Low/High Limits 0.050/1.000  
Statistics Off  
Auto Print On



Curve Fit Linear  
Slope 0.705  
Intercept 0.0059  
Std Dev 0.007  
Corr Coeff 1.000

Conc. mg/L	Abs 650nm
0.000	0.000
0.050	0.039
0.125	0.093
0.250	0.188
0.500	0.367
1.000	0.705

6/13/14  
APD

2 0.364

3 0.162

4 0.181

5 0.275

6 0.128

7 -0.015

8 0.547

9 -0.020

10 -0.004

11 0.337

12 0.000

13 0.363

TEST SETUP  
GENESYS 10 v2.021 2G2G048006

Advanced A-%T-C 17:03 13Jun14  
Test Name SULFIDE[Saved]  
Measurement Mode Absorbance  
Wavelength 650nm  
Ref. Wavelength Correction Off  
Delay Time (min:sec) 0:00  
ID# (0=OFF) 1  
Low/High Limits 0.000/0.800  
Statistics Off  
Auto Print On

ID#	Abs 650nm
1	0.000



Analytical Resources, Incorporated  
Analytical Chemists and Consultants

## Conventional Laboratory Analyst Notes

ARI Job No.: YN65

Client ID: WDOE

Parameter:  $\text{SO}_3^{2-}$

Client Project: WDOE 1406053

List problems, concerns, corrective actions and any other pertinent information

Both samples were positive for  $\text{S}^{2-}$  and were  
subsequently treated with  $\text{ZnOAc}$

Analyst Initials: RR

Date: 6/12/14

**Washington State Department of Ecology (ECY)**  
**Manchester Environmental Laboratory**  
7411 Beach Dr E, Port Orchard, Washington 98366

July 9, 2014

Project: Black Water – Skagit County

ECY LIMS Work Order #: 1406053

Contract Laboratory: Analytical Resources, Inc.

Contract Lab Sample ID: YN65

Project Officer: Jeanne Tran

***Sulfide by Standard Methods 4500-S<sup>2-</sup> D***

***Sulfite by Standard Methods 4500-SO<sub>3</sub> B***

Enclosed are the results for samples collected on 6/12/2014. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Karin Feddersen



**Washington State Department of Ecology**  
**Manchester Environmental Laboratory**  
**Data Review Checklist**

**Project:** Black Water

**Analysis:** Sulfide and Sulfite

**Work Order:** 1406053

**Project Officer:** Jeanne Tran

Question	Y	N	NA	Exceptions and action taken
Were all the samples analyzed for the requested parameters?	X			
Did sample arrive in a state of proper preservation at contract lab?		X		<ol style="list-style-type: none"> <li>1. Samples were not packed with frozen ice for transport to the lab. They arrived at a temperature of 23.8°C. All sample results have therefore been qualified as estimates; "J".</li> <li>2. TestAmerica neglected to add EDTA to the sample container for sulfite analysis. If any metals were present, they would interfere with the determination of sulfite in the absence of EDTA. The results for sulfite should be considered estimated, as it is potentially biased either high or low, depending on what metals are present. All sample results for sulfite have therefore been qualified "J".</li> <li>3. The analyst recorded the wrong preservation information on the sample receipt paperwork. She confirmed it was a written error. TestAmerica will hand correct the error from "&lt;12" to "&gt;9", and initial and date, to show the samples to be tested for sulfide were at the correct pH.</li> <li>4. The samples for sulfite were tested for and were confirmed to contain sulfide. Prior to analysis, sulfide was removed from these samples by precipitation with zinc acetate as required by the method.</li> </ol>
Are the holding times within acceptable limits for preparation and analysis?		X		<p>Samples for sulfide are to be analyzed within 7 days of collection for regulatory purposes under 40CFR. Sulfite is supposed to be fixed with EDTA and analyzed immediately.</p> <p>Both analyses were conducted within one day of sample collection.</p> <p>Sulfite samples are to be considered estimated and have been qualified "J".</p>
Are all of the calibration and sample raw data present, including documentation (e.g. standards, run log, and instrument logs) complete?	X			
Are all of the analytes within acceptable limits for the Initial Calibration (ICAL)?	X			
Are all of the analytes within acceptable limits for the Initial Calibration Verifications (ICV)?	X			
Was a Continuing Calibration Verification (CCV)	X			

analyzed every 10 samples?				
Are all of the analytes for the Continuing Calibration Verification (CCV) within acceptable limits?	X			
Was the Laboratory Control Sample (LCS) spiked with all target analytes and are percent recoveries within quality control (QC) limits?	X			
Is one method blank analyzed per batch of 20 samples or less, and is it free of any positive results?		X		
Were the matrix spike percent recoveries within QC limits?	X			
If a Sample Duplicate was analyzed, is the RPD within QC limits?	X			<20%
Are the results correctly calculated, with proper units and within the linear range of the calibrations?	X			

NA – Not available/Not applicable.

### Qualifier      Description

- J              The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
- U              The analyte was not detected at or above the reported sample quantitation limit.

SAMPLE RESULTS-CONVENTIONALS  
YN65-Washington Department of Ecology

ANALYTICAL  
RESOURCES  
INCORPORATED

Matrix: Water  
Data Release Authorized: *W*  
Reported: 06/19/14

Project: Black Water  
Event: NA  
Date Sampled: 06/12/14  
Date Received: 06/12/14

Client ID: 1406053-01  
ARI ID: 14-11372 YN65A

Analyte	Date Batch	Method	Units	RL	Sample
Sulfide	06/13/14 061314#1	SM4500-S2D	mg/L	0.500	2.21 <i>J</i> <i>KF</i>
Sulfite	06/12/14 061214#1	SM4500-SO3B	mg/L	1.5	4.3 <i>J</i> <i>KF</i>

RL Analytical reporting limit  
U Undetected at reported detection limit

Water Sample Report-YN65

YN65: 00012

SAMPLE RESULTS-CONVENTIONALS  
YN65-Washington Department of Ecology

ANALYTICAL  
RESOURCES  
INCORPORATED

Matrix: Water  
Data Release Authorized: *Q*  
Reported: 06/19/14

Project: Black Water  
Event: NA  
Date Sampled: 06/12/14  
Date Received: 06/12/14

Client ID: 1406053-02  
ARI ID: 14-11373 YN65B

Analyte	Date Batch	Method	Units	RL	Sample
Sulfide	06/13/14 061314#1	SM4500-S2D	mg/L	0.500	1.73 <i>J</i>
Sulfite	06/12/14 061214#1	SM4500-SO3B	mg/L	1.5	6.3 <i>J</i>

KF

KF

RL Analytical reporting limit  
U Undetected at reported detection limit

Water Sample Report-YN65

YN65 00013



REPLICATE RESULTS-CONVENTIONALS  
YN65-Washington Department of Ecology



Matrix: Water  
Data Release Authorized: *W*  
Reported: 06/19/14

Project: Black Water  
Event: NA  
Date Sampled: 06/12/14  
Date Received: 06/12/14


Analyte	Method	Date	Units	Sample	Replicate(s)	RPD/RSD
ARI ID: YN65A Client ID: 1406053-01						
Sulfide	SM4500-S2D	06/13/14	mg/L	2.21 <i>J</i>	<i>KF</i> 2.48 <i>J</i>	11.5%
Sulfite	SM4500-SO3B	06/12/14	mg/L	4.3 <i>J</i>	<i>KF</i> 4.4 <i>J</i>	2.3%

Water Replicate Report-YN65.

YN65:00015

MS/MSD RESULTS-CONVENTIONALS  
YN65-Washington Department of Ecology



Matrix: Water  
Data Release Authorized:   
Reported: 06/19/14

Project: Black Water  
Event: NA  
Date Sampled: 06/12/14  
Date Received: 06/12/14

Analyte	Method	Date	Units	Sample	Spike	Spike Added	Recovery
ARI ID: YN65A Client ID: 1406053-01							
Sulfide	SM4500-S2D	06/13/14	mg/L	2.21 <sup>KE</sup>	19.1 <sup>KF</sup>	16.0	105.6%

# PRESERVATION VERIFICATION 06/12/14

Page 1 of 1



ARI Job No: YN65

Inquiry Number: NONE

Analysis Requested: 06/13/14

Contact: Feddersen, Karin

Client: Washington Department of Ecology

Logged by: AV

Sample Set Used: Yes-481

Validatable Package: No

Deliverables:

PC: Cheronne

VTSR: 06/12/14

Project #: 1406053

Project: Black Water

Sample Site:

SDG No:

Analytical Protocol: In-house

LOGNUM	CLIENT ID	CN	WAD	NH3	COD	FOG	MET	PHEN	PHOS	TKN	NO23	TPHD	Fe2+	DMET	DOC	PARAMETER	ADJUSTED TO	LOT NUMBER	AMOUNT ADDED	DATE/BY
14-11372	FIELD DITCH	>12	>12	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	SZ PH	<2	0242	2014	6/12/14
YN65A																I	I	6/12/14	I	ADD
14-11373	SETTLING POND															I	I	6/12/14	I	I
YN65B																				

\* Sulfide preserved w/ ZINCAC, lab to adjust Ph.

90 7/10/14

>9

I

ADD 6/12/14

90 7/10/14

YN65 : 00006 REV

Checked By AV Date 6/12/14

W  
6.17-14

Methylene Blue, SM4500-SO-D

SULFIDE BENCHSHEET (Spectrophotometric, EPA 376.2)				Date / Time		Analyst																	
Aqueous Samples				Distillation		NA																	
				Finish		6/13/14 17:02																	
If distilled, specify procedure: NA				zinc acetate: C001955																			
1. Standardization of sodium thiosulfate titrant				Buret used for titrations: S2																			
Thiosulfate ID: C001106																							
BI-Iodate ID: C000374																							
Stock bi-Iodate = 0.8116 grams to 1000 mL				Titration of bi-Iodate with thiosulfate																			
Normality = 0.025				<table border="1"> <tr> <td>ml bi-Iodate =</td> <td>3.00</td> <td>3.00</td> <td>3.00</td> </tr> <tr> <td>ml thiosulfate =</td> <td>3.11</td> <td>3.10</td> <td>3.07</td> </tr> <tr> <td>Normality thiosulfate = (mL bi-Iodate*normality) / mL thiosulfate =</td> <td>0.024</td> <td>0.024</td> <td>0.024</td> </tr> </table>				ml bi-Iodate =	3.00	3.00	3.00	ml thiosulfate =	3.11	3.10	3.07	Normality thiosulfate = (mL bi-Iodate*normality) / mL thiosulfate =	0.024	0.024	0.024				
ml bi-Iodate =	3.00	3.00	3.00																				
ml thiosulfate =	3.11	3.10	3.07																				
Normality thiosulfate = (mL bi-Iodate*normality) / mL thiosulfate =	0.024	0.024	0.024																				
2. Normality of Iodine				Titration of Iodine with thiosulfate																			
Iodine ID: C000585				<table border="1"> <tr> <td>mL Iodine =</td> <td>5.00</td> <td>5.00</td> <td>5.00</td> </tr> <tr> <td>mL thiosulfate =</td> <td>5.05</td> <td>5.05</td> <td>5.00</td> </tr> <tr> <td>Normality Iodine = (mL thiosulfate*normality) / mL Iodine =</td> <td>0.024</td> <td>0.024</td> <td>0.024</td> </tr> </table>				mL Iodine =	5.00	5.00	5.00	mL thiosulfate =	5.05	5.05	5.00	Normality Iodine = (mL thiosulfate*normality) / mL Iodine =	0.024	0.024	0.024				
mL Iodine =	5.00	5.00	5.00																				
mL thiosulfate =	5.05	5.05	5.00																				
Normality Iodine = (mL thiosulfate*normality) / mL Iodine =	0.024	0.024	0.024																				
3. Standardization of sodium sulfide stock				Titration of standard with Thiosulfate																			
Stock ID = C002319				<table border="1"> <tr> <td>mL Standard =</td> <td>1.00</td> <td>1.00</td> <td>1.00</td> </tr> <tr> <td>mL Iodine =</td> <td>3.00</td> <td>3.00</td> <td>3.00</td> </tr> <tr> <td>mL thiosulfate =</td> <td>0.98</td> <td>0.97</td> <td>0.93</td> </tr> <tr> <td>Sulfide (mg/mL) = [(mL Iodine*ni)-(mL thio*nthio)]*16 / mL standard =</td> <td>0.80</td> <td>0.79</td> <td>0.81</td> </tr> </table>				mL Standard =	1.00	1.00	1.00	mL Iodine =	3.00	3.00	3.00	mL thiosulfate =	0.98	0.97	0.93	Sulfide (mg/mL) = [(mL Iodine*ni)-(mL thio*nthio)]*16 / mL standard =	0.80	0.79	0.81
mL Standard =	1.00	1.00	1.00																				
mL Iodine =	3.00	3.00	3.00																				
mL thiosulfate =	0.98	0.97	0.93																				
Sulfide (mg/mL) = [(mL Iodine*ni)-(mL thio*nthio)]*16 / mL standard =	0.80	0.79	0.81																				
Approx conc in 100ml				mL required for 0.025 mg/mL 7.8																			
g Na2S 0.5153 mg/mL = 0.888				mg/mL																			
Intermediate Standard				mL required for 0.025 mg/mL 7.8																			
Add 7.8 ml stk to 250 ml 0.2 N ZnOAc = 0.025 mg/mL																							
5.0 Calibration Standard Curve				spectrophotometer used:																			
Volume Intermediate (ml)	FINAL VOLUME (ml)	CONC (mg S/L)	ABSORBANCE @ 650 nm			REGRESSION DATA																	
			1	2	Avg																		
0.00	50	0.000	0.000		0.000	Intercept	0.006																
0.10	50	0.050	0.039		0.039	slope	0.705																
0.25	50	0.125	0.093		0.093	r=	0.9997																
0.50	50	0.250	0.188		0.188	Comment: Calibration OK!																	
1.00	50	0.500	0.367		0.367																		
2.00	50	1.000	0.705		0.705	maxabs =	0.705																
Calib Verif Std = 1.0 ml int to 50 ml ZnOAc = 0.500 mg/L																							
Distillation Prep Std = 3.0 ml Stk to 300 = 8.010 mg/L																							
SAMPLE DATA				enter dilution factor as ml final/mL sample																			
SAMPLE ID	DISTILL DATA		SPECTROPHOTOMETRIC DATA			SAMPLE DATA																	
	Sample Volume	Distill Volume (mL)	Dilution factor	ABS @ 650 nm	BKG ABS	Regressed Conc (mg S/L)	Final Conc mg S/L																
Cal Blk		n/a	1.00	0.000		-0.008	< 0.05 OK!																
ICV		n/a	1.00	0.364		0.508	0.51 101.63%																
YN65 A1			10.00	0.162		0.221	2.21																
YN65 A1 dup			10.00	0.181		0.248	2.48 RPD=11.5%																
YN65 A1 ms			50.00	0.275		0.382	19.09 105.3%																
Spike at 0.10 ml STK to 5.00 ml sample =				16.02 mg/l																			
YN65 B1			10.00	0.128		0.173	1.73																
Prep Blk			1.00	-0.015		-0.030	< 0.05 OK!																
Prep Std			10.00	0.547		0.768	7.68 95.82%																
YN82 A1			1.00	-0.020		-0.037	< 0.05																
YN82 A1 dup			1.00	-0.004		-0.014	< 0.05 NA																
YN82 A1 ms			1.00	0.337		0.470	0.47 94.0%																
Spike at 0.10 ml INT to 5.00 ml sample =				0.50 mg/l																			
Cal Blk		n/a	1.00	0.000		-0.008	< 0.05 OK!																
CCV		n/a	1.00	0.363		0.507	0.51 101.34%																

W 7/3/14

YN65: 000000REV



Methylene Blue, SM4500-S2-D

SULFIDE BENCHSHEET - (Spectrophotometric, EPA 376.2)				Date / Time		Analyst							
Aqueous Samples				NA		NA							
Distillation Finish				6/13/14 17:02		APD							
If distilled, specify procedure: NA				zinc acetate: C001955									
1. Standardization of sodium thiosulfate titrant				Buret used for titrations: S2									
Thiosulfate ID: C001106													
Bi-iodate ID: C000374													
Stock bi-iodate = 0.8116 grams to 1000 mL				Titration of bi-iodate with thiosulfate									
Normality = 0.025				<table border="1"> <tr> <td>ml bi-iodate = 3.00</td> <td>3.00</td> <td>3.00</td> </tr> <tr> <td>ml thiosulfate = 3.11</td> <td>3.10</td> <td>3.07</td> </tr> </table>				ml bi-iodate = 3.00	3.00	3.00	ml thiosulfate = 3.11	3.10	3.07
ml bi-iodate = 3.00	3.00	3.00											
ml thiosulfate = 3.11	3.10	3.07											
Normality thiosulfate = (mL bi-iodate*normality) / mL thiosulfate =													
2. Normality of Iodine				Titration of Iodine with thiosulfate									
Iodine ID: C000565				<table border="1"> <tr> <td>mL Iodine = 5.300</td> <td>5.300</td> <td>5.300</td> </tr> <tr> <td>mL thiosulfate = 5.05</td> <td>5.05</td> <td>5.07</td> </tr> </table>				mL Iodine = 5.300	5.300	5.300	mL thiosulfate = 5.05	5.05	5.07
mL Iodine = 5.300	5.300	5.300											
mL thiosulfate = 5.05	5.05	5.07											
Normality iodine = (mL thiosulfate*normality) / mL Iodine =													
3. Standardization of sodium sulfide stock				Titration of standard with Thiosulfate									
Stock ID = C002319				<table border="1"> <tr> <td>mL Standard = 1.00</td> <td>1.00</td> <td>1.00</td> </tr> <tr> <td>mL Iodine = 3.00</td> <td>3.00</td> <td>3.00</td> </tr> </table>				mL Standard = 1.00	1.00	1.00	mL Iodine = 3.00	3.00	3.00
mL Standard = 1.00	1.00	1.00											
mL Iodine = 3.00	3.00	3.00											
Approx conc in 100ml													
g Na2S 0.5153 mg/mL = 0.888				<table border="1"> <tr> <td>mL thiosulfate = 0.96</td> <td>0.97</td> <td>0.93</td> </tr> </table>				mL thiosulfate = 0.96	0.97	0.93			
mL thiosulfate = 0.96	0.97	0.93											
Sulfide (mg/mL) = ((mL Iodine*ni)-(mL thio*nthio))*16 / mL standard =				stkconc (mg/mL)									
Intermediate Standard				mL required for 0.025 mg/mL									
Add 7.9 ml stk to 250 ml 0.2 N ZnOAc =				mg/mL									
5.0 Calibration Standard Curve				spectrophotometer used:									
Volume Intermediate (ml)	FINAL VOLUME (ml)	CONC (mg S/L)	ABSORBANCE @ 650 nm			REGRESSION DATA							
			1	2	Avg								
0.00	50		0.000			Intercept							
0.10	50	#VALUE!	0.039			slope							
0.25	50	#VALUE!	0.093			r=							
0.50	50	#VALUE!	0.188			Comment:							
1.00	50	#VALUE!	0.364										
2.00	50	#VALUE!	0.705			maxabs =							
Calib Verif Std = 1.0 ml int to 50 ml ZnOAc = #VALUE! mg/L													
Distillation Prep Std = 3.0 ml Stk to 300 = #VALUE! mg/L													
SAMPLE DATA enter dilution factor as ml final/mL sample													
SAMPLE ID	DISTILL DATA		SPECTROPHOTOMETRIC DATA			SAMPLE DATA							
	Sample Volume	Distill Volume (mL)	Dilution factor	ABS @ 650 nm	BKG ABS	Regressed Conc (mg S/L)	Final Conc mg S/L						
Cal Blk		n/a	1.00	0.000									
ICV		n/a	1.00	0.364									
YN65 A1			10 1.00	0.162									
YN65 A1 dup			10 1.00	0.161									
YN65 A1 ms			50 1.00	0.275									
Spike at	0.10 ml INT to		5.00 ml sample =	#VALUE! mg/l									
YN65 B1			10 1.00	0.126									
Prep Blk			1.00	0.005									
Prep Std			10.00	0.547									
YN82 A1			1.00	0.006									
YN82 A1 dup			1.00	0.004									
YN82 A1 ms			1.00	0.337									
Spike at	0.10 ml INT to		5.00 ml sample =	#VALUE! mg/l									
Cal Blk		n/a	1.00	0.000									
CCV		n/a	1.00	0.363									
			1.00										
			1.00										
			1.00										
			1.00										
			1.00										
			1.00										
			1.00										
			1.00										
Cal Blk		n/a	1.00	0.000									
CCV		n/a	1.00										



**Manchester Environmental Laboratory**  
7411 Beach Drive E, Port Orchard, Washington 98366

**Case Narrative**

June 20, 2014

Project: Microbiology Black Water

Work Order: 1406053

Project  
Manager: Tran, Jeanne

By: Edlin Limmer, Microbiologist 2 

**Summary**

The samples were analyzed for fecal coliforms following Standard Methods 9222D.

The analysis requested was evaluated by established regulatory quality assurance guidelines.

**Sample Information**

The samples were received at the Manchester Laboratory on 6/13/2014. The cooler was received at 11°C, above the proper temperature range of 0°C - <10°C. The samples were qualified as estimates. Two samples were received and assigned laboratory identification numbers 01 and 02.

**Holding Times**

Holding times used at the Manchester Laboratory follow Standard Methods 20th Edition, 9060B. The samples were analyzed within their hold times.

**Replicates**

The duplicate relative percent difference with plate counts > 20 counts was within the acceptance limits.

**Controls**

Pre and post filtering blanks were analyzed with each set of samples. The blanks were negative for growth.

### **Other Quality Assurance Measures and Issues**

J - The organism was positively identified. The associated numerical result is an estimate.

U - The organism was not detected at or above the reported result.

G -Greater than

NC -Not calculated.

**Bold** - The analyte was present in the sample. (Visual Aid to locate detected organisms on report sheet.)

Please call Edlin Limmer at (360) 871-8810 to further discuss this project.  
cc: Project File.

**Washington State Department of Ecology  
Manchester Environmental Laboratory  
Final Analysis Report for  
Fecal Coliforms: Membrane Filter method**

Project Name: Black Water  
Work Order: 1406053  
Project Officer: Tran, Jeanne

Method: SM9222D  
Batch ID: B14F111  
Analyte: Fecal Coliform

Hold Time: 24:00  
Matrix: Water  
Units: #/100mL

Sample #	Sample ID	Result	Qualifier	RL	Time Elapsed	Collected	Analysis Date
1406053-01	Field Ditch	31	J	8	23:17	06/12/2014	6/13/2014
1406053-02	Settling Pond	77	J	8	21:51	06/12/2014	6/13/2014

**QC Results for Batch ID: B14F111**

Method Blank	Sample ID	Result	Qualifier	RL	Analyzed
B14F111-BLK1	Blank	1	U	1	06/13/2014
B14F111-BLK2	Blank	1	U	1	06/13/2014

Sample #	QC Sample Type	Result	Qual	Source Sample	Source Result	Source Qual	RPD	RPD Limit
B14F111-DUP1	Duplicate	38		1406053-01	31	J	20	40

Authorized by: \_\_\_\_\_

*RH*

Release Date: \_\_\_\_\_

6/24/14

Page 1 of 1

**Manchester Environmental Laboratory**  
7411 Beach Drive E, Port Orchard, Washington 98366

**Case Narrative**

June 23, 2014

Project: Metals Black Water

Work Order: 1406053

Project  
Manager: Tran, Jeanne

By: Dean Momohara

**Summary**

The laboratory followed EPA 200.7 for the preparation and analysis of trace metals. The samples were also analyzed for sulfur. The sulfur (S) result for samples 01 and 02 were 10.5 ppm and 18.6 ppm, respectively. Since the laboratory is not accredited for S analysis, the results are for informational purposes and should be viewed as estimates.

The samples also contained high levels of silicon (Si), 38.7 ppm and 27.2 ppm in samples 01 and 02, respectively. The levels detected may not be a true indicator of the Si in the samples. Since the preparation used to digest the samples is not suitable for Si, the results should be used for informational purposes and be viewed as estimates.

The analysis requested was evaluated by established regulatory quality assurance guidelines.

**Sample Information**

The samples were received at the Manchester Laboratory on 6/13/2014. The samples were received in good condition and were properly preserved. Two samples were received and assigned laboratory identification numbers 01 and 02.

**Holding Times**

The laboratory performed the analysis within its hold time.

### **Calibration**

The instrument was calibrated following the appropriate method. All initial and continuing calibration verification checks were within the acceptance limits. All initial and continuing calibration verification and blank checks were within the acceptance limits. The instrument was calibrated with a NIST traceable standard and verified to be in calibration with a second source NIST traceable standard.

### **Method Blanks**

No analytically significant level of analyte was detected in the method blank associated with these samples.

### **Laboratory Control Samples**

The laboratory control sample recovery was within the acceptance limits.

### **Replicates**

The associated duplicate relative percent difference of samples with concentrations greater than 5 times the reporting limit was within the acceptance limits.

### **Matrix Spikes**

All matrix spike recoveries were within the acceptance limits.

### **Internal Standards**

NA

### **Other Quality Assurance Measures and Issues**

U - The analyte was not detected at or above the reported result.

**bold** - The analyte was present in the sample. (Visual Aid to locate detected compounds on report sheet.)



Please call Dean Momohara at (360) 871-8808 to further discuss this project.

cc: Project File

**Washington State Department of Ecology  
Manchester Environmental Laboratory  
Final Analysis Report for  
Manganese**

**Project Name: Black Water**

**Project Officer:** Tran, Jeanne  
**Work Order:** 1406053  
**Analyte:** Manganese

**Prep Method:** EPA200.2  
**Prepared:** 06/17/14  
**Batch ID:** B14F131

**Analysis Method:** EPA200.7  
**Matrix:** Water  
**Units:** mg/L

Sample #	Sample ID	Result	Qualifier	RL	MDL	Collected	Analyzed
1406053-01	Field Ditch	0.868		0.005	0.0003	06/12/14	06/20/14
1406053-02	Settling Pond	1.12		0.005	0.0003	06/12/14	06/20/14

**QC Results for Batch ID: B14F131**

Method Blank	Sample ID	Result	Qualifier	RL	MDL
B14F131-BLK1	Blank	0.005	U	0.005	0.0003

Sample #	QC Sample	Result	Spike Level	Source Sample	Source Result	%Rec	%Rec Limits	RPD	RPD Limit
B14F131-BS1	LCS	107	2.00		2.13	107	85-115		
B14F131-MS1	Matrix Spike	99	2.00	1406053-01	2.85	99	75-125		
B14F131-MSD1	Matrix Spike Dup	101	2.00	1406053-01	2.88	101	75-125	1	20

**Authorized by:** DM

**Release Date:** 6/23/14

**Page 1 of 1**

**Manchester Environmental Laboratory**  
7411 Beach Drive E, Port Orchard, Washington 98366

**Case Narrative**

June 24, 2014

Project: General Chemistry Black Water

Work Order: 1406053

Project  
Manager: Tran, Jeanne

By: Dean Momohara  
Dr

**Summary**

The laboratory analyzed the samples following Standard Methods (SM) 4500NH3H for ammonia, SM2130 for turbidity, SM4500NO3I for nitrate-nitrite, EPA 300.0 for sulfate, SM4500NB for total persulfate nitrogen and SM5210B for biochemical oxygen demand.

All analyses requested were evaluated by established regulatory quality assurance guidelines.

**Sample Information**

The samples were received at the Manchester Laboratory on 6/13/2014. The cooler was received at 11°C, above the proper temperature range of 0°C - 6°C. All results were qualified as estimates. The samples were received in good condition and where applicable, were properly preserved. Two samples were received and assigned laboratory identification numbers 01 and 02.

**Holding Times**

The laboratory performed all analyses within their hold times.

**Calibration**

The instruments were calibrated following the appropriate methods. All initial and continuing calibration verification checks were within the acceptance limits. All initial and continuing blank checks were within the acceptance limits. The r-value was within the acceptance limits. All standard residuals were within acceptance limits.

The instruments were calibrated with NIST traceable standards and verified to be in calibration with a second source NIST traceable standard. Incubator drying temperatures were monitored before and after drying.

#### **Method Blanks**

No analytically significant levels of analyte were detected in the method blanks associated with these samples.

#### **Laboratory Control Samples**

All laboratory control sample recoveries were within the acceptance limits.

#### **Replicates**

The associated duplicate relative percent differences of samples with concentrations greater than 5 times the reporting limit were within the acceptance limits.

#### **Matrix Spikes**

All matrix spike recoveries were within the acceptance limits.

#### **Other Quality Assurance Measures and Issues**

U - The analyte was not detected at or above the reported result.

J - The analyte was positively identified. The associated numerical result is an estimate.

**bold** - The analyte was present in the sample. (Visual Aid to locate detected compounds on report sheet.)

Please call Dean Momohara at (360) 871-8808 to further discuss this project.

cc: Project File



**Washington State Department of Ecology  
Manchester Environmental Laboratory  
Final Analysis Report for  
Biochemical Oxygen Demand five day test**

**Project Name: Black Water**

**Project Officer: Tran, Jeanne  
Work Order: 1406053  
Analyte: Biochemical Oxygen Demand**

**Method: SM5210B  
Batch ID: B14F110  
Prepared: 06/13/14**

**Matrix: Water  
Units: mg/L**

Sample #	Sample ID	Result	Qualifier	RL	MDL	Collected	Analyzed
1406053-01	Field Ditch	108	J	75		06/12/14	06/13/14
1406053-02	Settling Pond	181	J	112		06/12/14	06/13/14

**QC Results for Batch ID: B14F110**

Method Blank	Sample ID	Result	Qualifier	RL	MDL
B14F110-BLK1	Blank	2	U	2	

Sample #	QC Sample	Result	Spike Level	Source Sample	Source Result	%Rec	%Rec Limits	RPD	RPD Limit
B14F110-BS1	LCS	94	198		187	94	70-130		
B14F110-DUP1	Duplicate	14		1406031-01	14			4	20

Authorized by: DM

Release Date: 6/24/14 Page 1 of 6

**Washington State Department of Ecology  
Manchester Environmental Laboratory  
Final Analysis Report for  
Ammonia**

**Project Name: Black Water**

**Project Officer:** Tran, Jeanne  
**Work Order:** 1406053  
**Analyte:** Ammonia

**Method:** SM4500NH3H  
**Batch ID:** B14F168  
**Prepared:** 06/20/14

**Matrix:** Water  
**Units:** mg/L

Sample #	Sample ID	Result	Qualifier	RL	MDL	Collected	Analyzed
1406053-01	Field Ditch	1.99	J	0.100	0.014	06/12/14	06/20/14
1406053-02	Settling Pond	2.31	J	0.150	0.021	06/12/14	06/20/14

**QC Results for Batch ID: B14F168**

Method Blank	Sample ID	Result	Qualifier	RL	MDL
B14F168-BLK1	Blank	0.010	U	0.010	0.001

Sample #	QC Sample	Result	Spike Level	Source Sample	Source Result	%Rec	%Rec Limits	RPD	RPD Limit
B14F168-BS1	LCS	100	0.050		0.050	100	80-120		
B14F168-DUP1	Duplicate	0.530		1406036-01	0.508			4	20
B14F168-MS1	Matrix Spike	97	0.050	1406014-09	0.054	97	75-125		

**Authorized by:**

DM

**Release Date:**

6/24/14

**Page 2 of 6**

**Washington State Department of Ecology  
Manchester Environmental Laboratory  
Final Analysis Report for  
Nitrite/Nitrate as N**

**Project Name: Black Water**

Project Officer: Tran, Jeanne	Method: SM4500NO3I	Matrix: Water
Work Order: 1406053	Batch ID: B14F122	Units: mg/L
Analyte: Nitrate-Nitrite as N	Prepared: 06/17/14	

Sample #	Sample ID	Result	Qualifier	RL	MDL	Collected	Analyzed
1406053-01	Field Ditch	0.042	J	0.010	0.003	06/12/14	06/17/14
1406053-02	Settling Pond	0.053	J	0.010	0.003	06/12/14	06/17/14

**QC Results for Batch ID: B14F122**

Method Blank	Sample ID	Result	Qualifier	RL	MDL
B14F122-BLK1	Blank	0.010	U	0.010	0.003

Sample #	QC Sample	Result	Spike Level	Source Sample	Source Result	%Rec	%Rec Limits	RPD	RPD Limit
B14F122-BS1	LCS	103	0.198		0.203	103	80-120		
B14F122-DUP1	Duplicate	0.055		1406005-01	0.053			3	20
B14F122-MS1	Matrix Spike	100	0.198	1406004-01	0.269	100	75-125		

Authorized by: \_\_\_\_\_

*DM*

Release Date: \_\_\_\_\_

*6/24/14*

Page 3 of 6

**Washington State Department of Ecology  
Manchester Environmental Laboratory  
Final Analysis Report for  
Sulfate**

**Project Name: Black Water**

**Project Officer: Tran, Jeanne**  
**Work Order: 1406053**  
**Analyte: Sulfate**

**Method: EPA300.0**  
**Batch ID: B14F119**  
**Prepared: 06/16/14**

**Matrix: Water**  
**Units: mg/L**

Sample #	Sample ID	Result	Qualifier	RL	MDL	Collected	Analyzed
1406053-01	Field Ditch	25.6	J	0.30	0.06	06/12/14	06/16/14
1406053-02	Settling Pond	51.2	J	0.30	0.06	06/12/14	06/16/14

**QC Results for Batch ID: B14F119**

Method Blank	Sample ID	Result	Qualifier	RL	MDL
B14F119-BLK1	Blank	0.30	U	0.30	0.06

Sample #	QC Sample	Result	Spike Level	Source Sample	Source Result	%Rec	%Rec Limits	RPD	RPD Limit
B14F119-BS1	LCS	99	5.00		4.94	99	90-110		
B14F119-DUP1	Duplicate	25.5		1406053-01	25.6			0.4	20
B14F119-MS1	Matrix Spike	106	5.00	1406053-01	30.9	106	75-125		

**Authorized by:**

DM

**Release Date:**

6/24/14

**Page 4 of 6**



**Washington State Department of Ecology  
Manchester Environmental Laboratory  
Final Analysis Report for  
Total Persulfate Nitrogen as N**

**Project Name: Black Water**

**Project Officer:** Tran, Jeanne  
**Work Order:** 1406053  
**Analyte:** Total Persulfate Nitrogen

**Method:** SM4500NB  
**Batch ID:** B14F117  
**Prepared:** 06/16/14

**Matrix:** Water  
**Units:** mg/L

Sample #	Sample ID	Result	Qualifier	RL	MDL	Collected	Analyzed
1406053-01	Field Ditch	3.65	J	0.125	0.063	06/12/14	06/16/14
1406053-02	Settling Pond	4.93	J	0.125	0.063	06/12/14	06/16/14

**QC Results for Batch ID: B14F117**

Method Blank	Sample ID	Result	Qualifier	RL	MDL
B14F117-BLK1	Blank	0.025	U	0.025	0.013

Sample #	QC Sample	Result	Spike Level	Source Sample	Source Result	%Rec	%Rec Limits	RPD	RPD Limit
B14F117-BS1	LCS	97	0.397		0.386	97	80-120		
B14F117-DUP1	Duplicate	0.192		1406002-23	0.193			0.7	20
B14F117-MS1	Matrix Spike	93	0.397	1406002-24	0.565	93	75-125		

**Authorized by:** DM

**Release Date:**

6/24/14

**Page 5 of 6**

**Washington State Department of Ecology  
Manchester Environmental Laboratory  
Final Analysis Report for  
Turbidity of water**

**Project Name: Black Water**

**Project Officer: Tran, Jeanne  
Work Order: 1406053  
Analyte: Turbidity**

**Method: SM2130  
Batch ID: B14F118  
Prepared: 06/13/14**

**Matrix: Water  
Units: NTU**

Sample #	Sample ID	Result	Qualifier	RL	MDL	Collected	Analyzed
1406053-01	Field Ditch	190	J	0.5	0.1	06/12/14	06/13/14
1406053-02	Settling Pond	180	J	0.5	0.1	06/12/14	06/13/14

**QC Results for Batch ID: B14F118**

Method Blank	Sample ID	Result	Qualifier	RL	MDL
B14F118-BLK1	Blank	0.5	U	0.5	0.1

Sample #	QC Sample	Result	Spike Level	Source Sample	Source Result	%Rec	%Rec Limits	RPD	RPD Limit
B14F118-BS1	LCS	98	18.3		18.0	98	90-110		
B14F118-DUP1	Duplicate	190	J	1406053-02	180	J		5	20

**Authorized by:** DM

**Release Date:** 6/24/14 **Page 6 of 6**

**Manchester Environmental Laboratory**  
7411 Beach Drive E, Port Orchard, Washington 98366


**Case Narrative**

June 20, 2014

Project: Microbiology Black Water

Work Order: 1406053

Project  
Manager: Tran, Jeanne

By: Edlin Limmer, Microbiologist 2 

**Summary**

The samples were analyzed for fecal coliforms following Standard Methods 9222D.

The analysis requested was evaluated by established regulatory quality assurance guidelines.

**Sample Information**

The samples were received at the Manchester Laboratory on 6/13/2014. The cooler was received at 11°C, above the proper temperature range of 0°C - <10°C. The samples were qualified as estimates. Two samples were received and assigned laboratory identification numbers 01 and 02.

**Holding Times**

Holding times used at the Manchester Laboratory follow Standard Methods 20th Edition, 9060B. The samples were analyzed within their hold times.

**Replicates**

The duplicate relative percent difference with plate counts > 20 counts was within the acceptance limits.

**Controls**

Pre and post filtering blanks were analyzed with each set of samples. The blanks were negative for growth.

### Other Quality Assurance Measures and Issues

- J - The organism was positively identified. The associated numerical result is an estimate.
- U - The organism was not detected at or above the reported result.
- G -Greater than
- NC -Not calculated.
- Bold** - The analyte was present in the sample. (Visual Aid to locate detected organisms on report sheet.)

Please call Edlin Limmer at (360) 871-8810 to further discuss this project.  
cc: Project File.



**Washington State Department of Ecology  
Manchester Environmental Laboratory  
Final Analysis Report for  
Fecal Coliforms: Membrane Filter method**

Project Name: Black Water  
Work Order: 1406053  
Project Officer: Tran, Jeanne

Method: SM9222D  
Batch ID: B14F111  
Analyte: Fecal Coliform

Hold Time: 24:00  
Matrix: Water  
Units: #/100mL

Sample #	Sample ID	Result	Qualifier	RL	Time Elapsed	Collected	Analysis Date
1406053-01	Field Ditch	31	J	8	23:17	06/12/2014	6/13/2014
1406053-02	Settling Pond	77	J	8	21:51	06/12/2014	6/13/2014

**QC Results for Batch ID: B14F111**

Method Blank	Sample ID	Result	Qualifier	RL	Analyzed
B14F111-BLK1	Blank	1	U	1	06/13/2014
B14F111-BLK2	Blank	1	U	1	06/13/2014

Sample #	QC Sample Type	Result	Qual	Source Sample	Source Result	Source Qual	RPD	RPD Limit
B14F111-DUP1	Duplicate	38		1406053-01	31	J	20	40

Authorized by: \_\_\_\_\_

*RN*

Release Date: \_\_\_\_\_

6/24/14

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