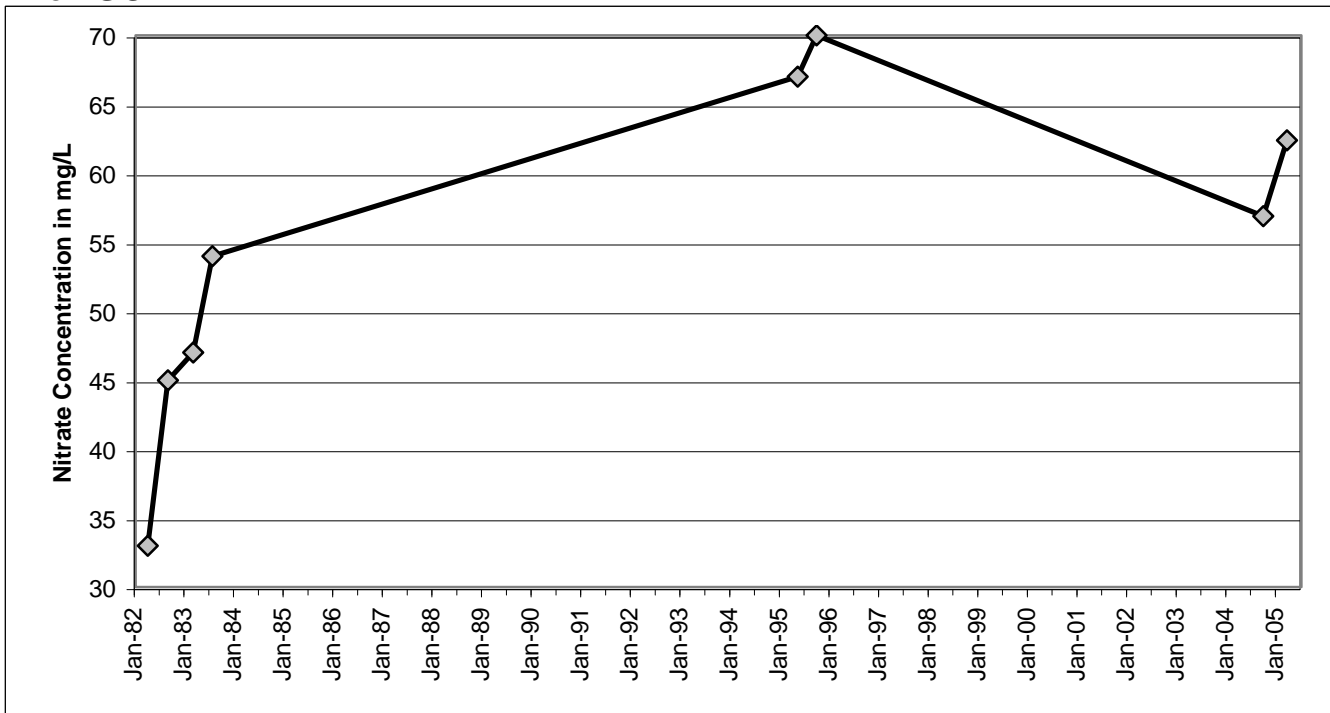
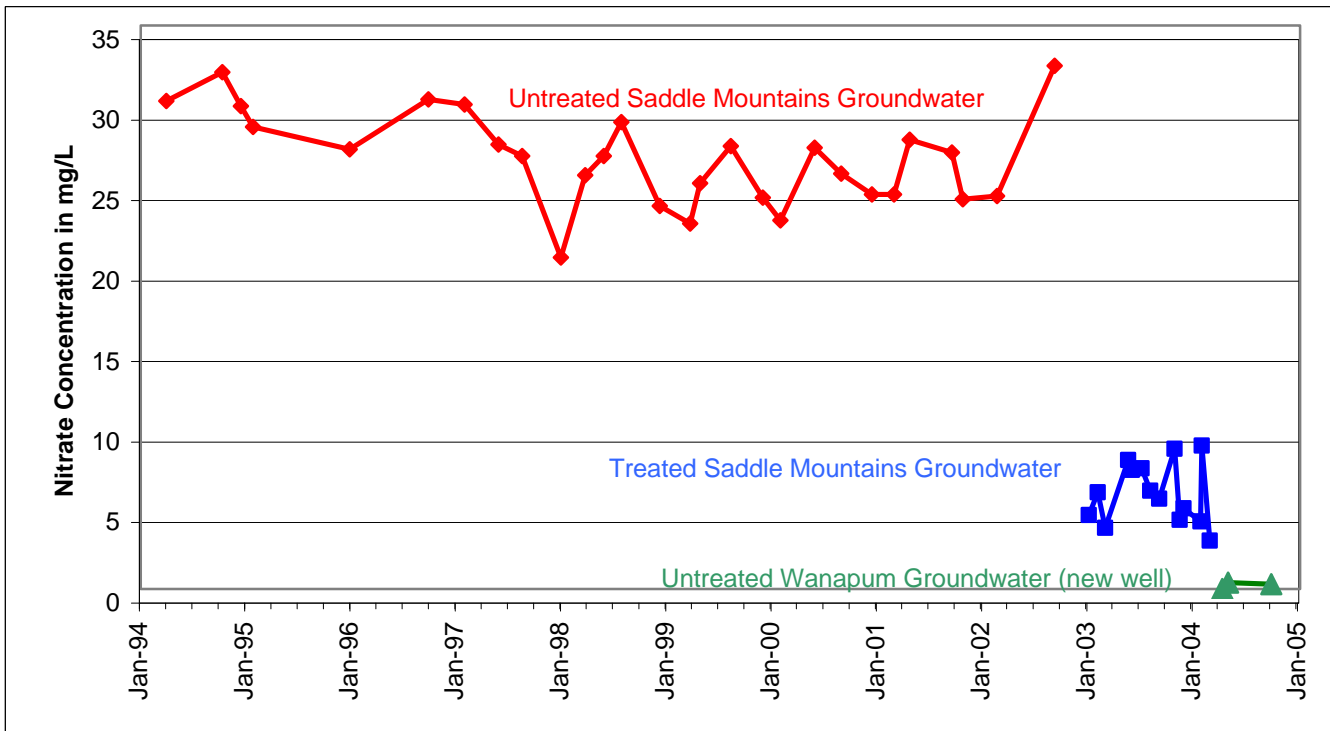
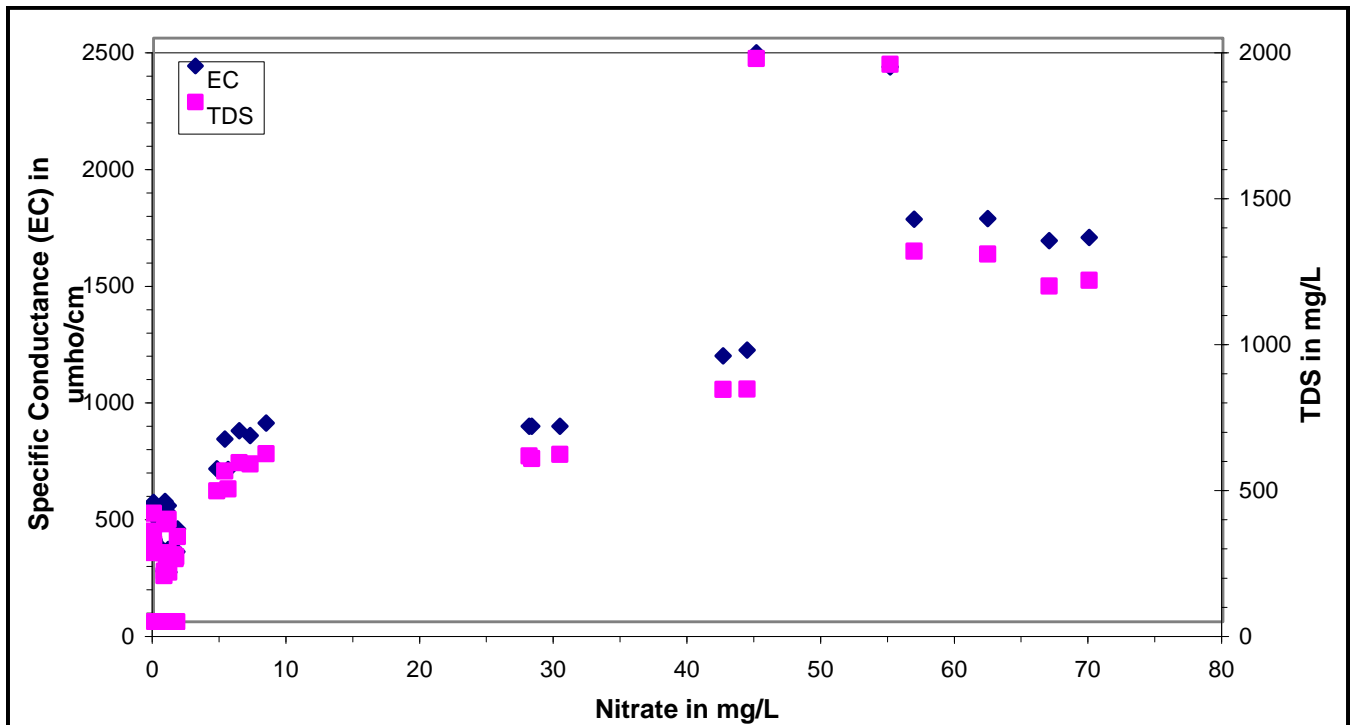
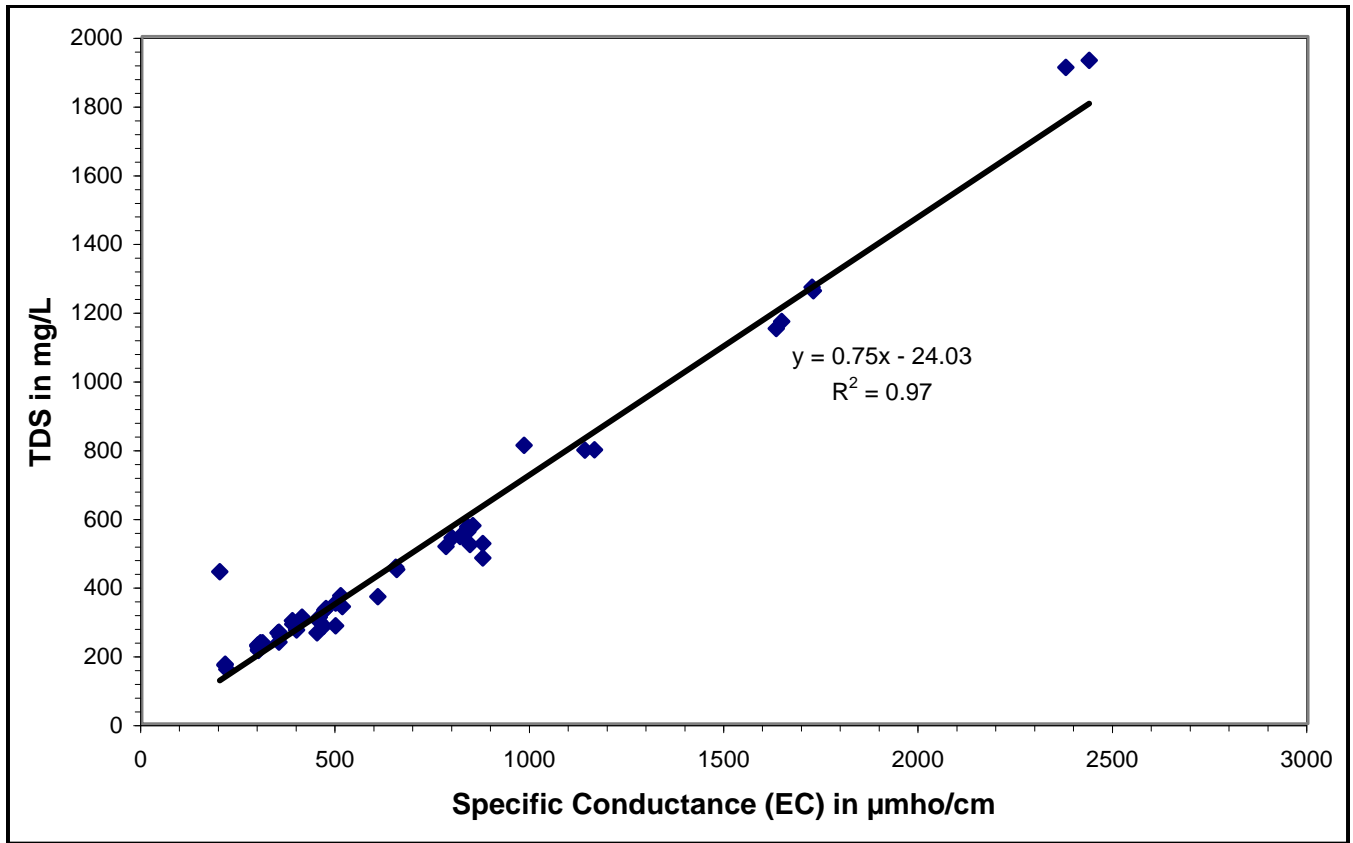


### Well GC-22



### PWS 66475 Well





## **APPENDIX A**

### **Analytical Data Quality Review**

## Analytical Laboratory

Analysis of surface water and groundwater samples collected specifically for this study was performed by North Creek Analytical (NCA) in Beaverton, Oregon. This laboratory is accredited by Ecology for analysis of all parameters included in this project. They also appear to be the closest commercial lab to the study area that is accredited for the analytes required for this project. Contact information for the laboratory is:

North Creek Analytical  
9405 SW Nimbus Avenue  
Beaverton, OR 97008-7132

(503) 906-9200  
Fax: (503) 906-9210

Nitrate + nitrite as nitrogen (N) was analyzed using EPA Method 353.2. TDS was analyzed using EPA Method 160.1.

## Analytical Data Quality Assurance Review for September, 2004 Sampling

A quality assurance review of the laboratory's analytical data packages was performed to ensure that the data were of suitable quality for their intended use. The samples were delivered to the lab in one sample delivery group including seventeen samples collected between September 28 and 30, 2004. The laboratory certificates of analysis are included at the end of this appendix.

The quality assurance review included evaluation of sample custody, holding times, method blank analysis, laboratory control sample (blank spike) and matrix spike/matrix spike duplicate recoveries and precision. The results of the quality assurance review for the Fall 2004 sample data set are as follows:

1. Sample custody and holding times were acceptable.
2. The reporting limits for each analysis were at or below those specified in the QAPP (Aspect Consulting 2004).
3. No method blank contamination was detected.
4. Laboratory control sample (LCS) recoveries were within control limits.
5. Matrix spike (MS) and matrix spike duplicate (MSD) recoveries were within control limits.

6. The relative percent differences (RPDs) for MS/MSD sample pairs were within control limits.
7. The field duplicate pair RPDs for nitrate and TDS were 3 percent and 0 percent, respectively. Because field duplicates represent both field and laboratory variability, EPA (2002) provides no required review criteria for determining comparability of field duplicate analyses.

Based on the quality assurance review, the analytical data are determined to be of acceptable quality for their intended use. No data were rejected, therefore, the data set is 100 percent complete.

## **Analytical Data Quality Assurance Review for March 21-22, 2005 Sampling**

A quality assurance review of the laboratory's analytical data packages was performed to ensure that the data were of suitable quality for their intended use. The samples were delivered to the lab in one sample delivery group including seventeen samples collected between March 21 and 22, 2005. The laboratory certificates of analysis are included at the end of this appendix.

The quality assurance review included evaluation of sample custody, holding times, method blank analysis, laboratory control sample (blank spike) and matrix spike/matrix spike duplicate recoveries and precision. The results of the quality assurance review for the Spring 2005 sample data set are as follow:

1. Sample custody and holding times were acceptable.
2. The reporting limits for each analysis were at or below those specified in the QAPP (Aspect Consulting, 2004).
3. No method blank contamination was detected.
4. Laboratory control sample (LCS) recoveries were within control limits.
5. Matrix spike (MS) and matrix spike duplicate (MSD) recoveries were within control limits.
6. The relative percent differences (RPDs) for MS/MSD sample pairs were within control limits.
7. The field duplicate pair RPDs for nitrate and TDS were 22 percent and 0.4 percent, respectively. Because field duplicates represent both field and laboratory variability, EPA (2002) provides no required review criteria for determining comparability of field duplicate analyses.

Based on the quality assurance review, the analytical data are determined to be of acceptable quality for their intended use. No data were rejected; therefore the data set is 100 percent complete.



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October 18, 2004

Steve Germiot  
Aspect Consulting LLC  
811 First Ave., Suite 480  
Seattle, WA 98104

RE: WRIA 31 Water Quality

Enclosed are the results of analyses for samples received by the laboratory on 10/02/04 10:00.  
The following list is a summary of the NCA Work Orders contained in this report.  
If you have any questions concerning this report, please feel free to contact me.

<u>Work</u>	<u>Project</u>	<u>ProjectNumber</u>
P4J0088	WRIA 31 Water Quality	030009-003-01

Thank You,

Mary A. Fritzmann Smith, Project Manager

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**Environmental Laboratory Network**



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<b>Aspect Consulting LLC</b> 811 First Ave., Suite 480 Seattle, WA 98104	Project Name:	<b>WRIA 31 Water Quality</b>	<u>Report Created:</u> 10/18/04 15:52
	Project Number:	030009-003-01	
	Project Manager:	Steve Germiot	

### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
GC-16	P4J0088-01	Water	09/28/04 13:00	10/02/04 10:00
GC-19	P4J0088-02	Water	09/28/04 13:30	10/02/04 10:00
GC-01	P4J0088-03	Water	09/28/04 14:00	10/02/04 10:00
GC-62	P4J0088-04	Water	09/28/04 15:00	10/02/04 10:00
GC-27	P4J0088-05	Water	09/28/04 17:00	10/02/04 10:00
GC-96S	P4J0088-06	Water	09/29/04 09:55	10/02/04 10:00
GC-95	P4J0088-07	Water	09/29/04 10:40	10/02/04 10:00
GC-97SW	P4J0088-08	Water	09/29/04 12:10	10/02/04 10:00
GC-98SW	P4J0088-09	Water	09/29/04 14:20	10/02/04 10:00
GC-99SW	P4J0088-10	Water	09/29/04 14:35	10/02/04 10:00
GC-22	P4J0088-11	Water	09/29/04 16:30	10/02/04 10:00
GC-FD	P4J0088-12	Water	09/29/04 12:00	10/02/04 10:00
GC-94	P4J0088-13	Water	09/30/04 09:30	10/02/04 10:00
GC-69	P4J0088-14	Water	09/30/04 10:45	10/02/04 10:00
FC-01	P4J0088-15	Water	09/30/04 12:00	10/02/04 10:00
GC-02	P4J0088-16	Water	09/30/04 13:00	10/02/04 10:00
GC-65	P4J0088-17	Water	09/30/04 17:15	10/02/04 10:00





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<b>Aspect Consulting LLC</b> 811 First Ave., Suite 480 Seattle, WA 98104	Project Name:	<b>WRIA 31 Water Quality</b>	<u>Report Created:</u> 10/18/04 15:52
	Project Number:	030009-003-01	
	Project Manager:	Steve Germiot	

### Conventional Chemistry Parameters per APHA/EPA Methods

#### North Creek Analytical - Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
<b>P4J0088-01</b>	<b>Water</b>	<b>GC-16</b>	<b>Sampled: 09/28/04 13:00</b>							
Nitrate/Nitrite-Nitrogen	EPA 353.2	8.43	-----	0.500	mg/l	100x	4100772	10/15/04	10/15/04	15:40
Total Dissolved Solids	EPA 160.1	576	-----	10.0	"	1x	4100182	10/05/04	10/05/04	17:15
<b>P4J0088-02</b>	<b>Water</b>	<b>GC-19</b>	<b>Sampled: 09/28/04 13:30</b>							
Nitrate/Nitrite-Nitrogen	EPA 353.2	ND	-----	0.00500	mg/l	1x	4100772	10/15/04	10/15/04	15:40
Total Dissolved Solids	EPA 160.1	264	-----	10.0	"	"	4100182	10/05/04	10/05/04	17:15
<b>P4J0088-03</b>	<b>Water</b>	<b>GC-01</b>	<b>Sampled: 09/28/04 14:00</b>							
Nitrate/Nitrite-Nitrogen	EPA 353.2	4.75	-----	0.500	mg/l	100x	4100772	10/15/04	10/15/04	15:40
Total Dissolved Solids	EPA 160.1	449	-----	10.0	"	1x	4100182	10/05/04	10/05/04	17:15
<b>P4J0088-04</b>	<b>Water</b>	<b>GC-62</b>	<b>Sampled: 09/28/04 15:00</b>							
Nitrate/Nitrite-Nitrogen	EPA 353.2	ND	-----	0.00500	mg/l	1x	4100772	10/15/04	10/15/04	15:40
Total Dissolved Solids	EPA 160.1	300	-----	10.0	"	"	4100182	10/05/04	10/05/04	17:15
<b>P4J0088-05</b>	<b>Water</b>	<b>GC-27</b>	<b>Sampled: 09/28/04 17:00</b>							
Nitrate/Nitrite-Nitrogen	EPA 353.2	0.710	-----	0.0500	mg/l	10x	4100772	10/15/04	10/15/04	15:40
Total Dissolved Solids	EPA 160.1	236	-----	10.0	"	1x	4100182	10/05/04	10/05/04	17:15
<b>P4J0088-06</b>	<b>Water</b>	<b>GC-96S</b>	<b>Sampled: 09/29/04 09:55</b>							
Nitrate/Nitrite-Nitrogen	EPA 353.2	1.15	-----	0.0500	mg/l	10x	4100772	10/15/04	10/15/04	15:40
Total Dissolved Solids	EPA 160.1	170	-----	10.0	"	1x	4100182	10/05/04	10/05/04	17:15

North Creek Analytical - Portland

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*Mary A. Fritzmann Smith*

Mary A. Fritzmann Smith, Project Manager

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<b>Aspect Consulting LLC</b> 811 First Ave., Suite 480 Seattle, WA 98104	Project Name:	<b>WRIA 31 Water Quality</b>	<u>Report Created:</u> 10/18/04 15:52
	Project Number:	030009-003-01	
	Project Manager:	Steve Germiot	

**Conventional Chemistry Parameters per APHA/EPA Methods**

**North Creek Analytical - Portland**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
<b>P4J0088-07</b>	<b>Water</b>	<b>GC-95</b>	<b>Sampled: 09/29/04 10:40</b>							
Nitrate/Nitrite-Nitrogen	EPA 353.2	1.10	-----	0.0500	mg/l	10x	4100772	10/15/04	10/15/04	15:40
Total Dissolved Solids	EPA 160.1	351	-----	10.0	"	1x	4100182	10/05/04	10/05/04	17:15
<b>P4J0088-08</b>	<b>Water</b>	<b>GC-97SW</b>	<b>Sampled: 09/29/04 12:10</b>							
Nitrate/Nitrite-Nitrogen	EPA 353.2	39.0	-----	5.00	mg/l	1000x	4100772	10/15/04	10/15/04	15:40
<b>P4J0088-09</b>	<b>Water</b>	<b>GC-98SW</b>	<b>Sampled: 09/29/04 14:20</b>							
Nitrate/Nitrite-Nitrogen	EPA 353.2	37.7	-----	5.00	mg/l	1000x	4100772	10/15/04	10/15/04	15:40
<b>P4J0088-10</b>	<b>Water</b>	<b>GC-99SW</b>	<b>Sampled: 09/29/04 14:35</b>							
Nitrate/Nitrite-Nitrogen	EPA 353.2	42.7	-----	5.00	mg/l	1000x	4100772	10/15/04	10/15/04	15:40
<b>P4J0088-11</b>	<b>Water</b>	<b>GC-22</b>	<b>Sampled: 09/29/04 16:30</b>							
Nitrate/Nitrite-Nitrogen	EPA 353.2	56.9	-----	5.00	mg/l	1000x	4100772	10/15/04	10/15/04	15:40
Total Dissolved Solids	EPA 160.1	1270	-----	10.0	"	1x	4100182	10/05/04	10/05/04	17:15
<b>P4J0088-12</b>	<b>Water</b>	<b>GC-FD</b>	<b>Sampled: 09/29/04 12:00</b>							
Nitrate/Nitrite-Nitrogen	EPA 353.2	58.5	-----	5.00	mg/l	1000x	4100772	10/15/04	10/15/04	15:40
Total Dissolved Solids	EPA 160.1	1270	-----	10.0	"	1x	4100182	10/05/04	10/05/04	17:15

North Creek Analytical - Portland

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*Mary A. Fritzmann Smith*

Mary A. Fritzmann Smith, Project Manager

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	Project Number:	030009-003-01	
	Project Manager:	Steve Germiot	

**Conventional Chemistry Parameters per APHA/EPA Methods**

**North Creek Analytical - Portland**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
<b>P4J0088-13</b>	<b>Water</b>	<b>GC-94</b>	<b>Sampled: 09/30/04 09:30</b>							
Nitrate/Nitrite-Nitrogen	EPA 353.2	1.36	-----	0.0500	mg/l	10x	4100772	10/15/04	10/15/04	15:40
Total Dissolved Solids	EPA 160.1	226	-----	10.0	"	1x	4100182	10/05/04	10/05/04	17:15
<b>P4J0088-14</b>	<b>Water</b>	<b>GC-69</b>	<b>Sampled: 09/30/04 10:45</b>							
Nitrate/Nitrite-Nitrogen	EPA 353.2	42.6	-----	5.00	mg/l	1000x	4100772	10/15/04	10/15/04	15:40
Total Dissolved Solids	EPA 160.1	796	-----	10.0	"	1x	4100182	10/05/04	10/05/04	17:15
<b>P4J0088-15</b>	<b>Water</b>	<b>FC-01</b>	<b>Sampled: 09/30/04 12:00</b>							
Nitrate/Nitrite-Nitrogen	EPA 353.2	5.41	-----	0.500	mg/l	100x	4100772	10/15/04	10/15/04	15:40
<b>P4J0088-16</b>	<b>Water</b>	<b>GC-02</b>	<b>Sampled: 09/30/04 13:00</b>							
Nitrate/Nitrite-Nitrogen	EPA 353.2	55.1	-----	5.00	mg/l	1000x	4100772	10/15/04	10/15/04	15:40
Total Dissolved Solids	EPA 160.1	1910	-----	10.0	"	1x	4100182	10/05/04	10/05/04	17:15
<b>P4J0088-17</b>	<b>Water</b>	<b>GC-65</b>	<b>Sampled: 09/30/04 17:15</b>							
Nitrate/Nitrite-Nitrogen	EPA 353.2	ND	-----	0.500	mg/l	100x	4100772	10/15/04	10/15/04	15:40
Total Dissolved Solids	EPA 160.1	285	-----	10.0	"	1x	4100182	10/05/04	10/05/04	17:15

North Creek Analytical - Portland

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*Mary A. Fritzmann Smith*

Mary A. Fritzmann Smith, Project Manager

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<b>Aspect Consulting LLC</b> 811 First Ave., Suite 480 Seattle, WA 98104	Project Name: <b>WRIA 31 Water Quality</b> Project Number: 030009-003-01 Project Manager: Steve Germiot	Report Created: 10/18/04 15:52
--	---	-----------------------------------

**Conventional Chemistry Parameters per APHA/EPA Methods - Laboratory Quality Control Results**  
North Creek Analytical - Portland

**QC Batch: 4100182      Water Preparation Method: General Preparation**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC (Limits)	% RPD (Limits)	Analyzed	Notes	
<b>Blank (4100182-BLK1)</b>											Extracted: 10/05/04 09:51		
Total Dissolved Solids	EPA 160.1	ND	---	10.0	mg/l	1x	--	--	--	--	10/05/04 17:15		
<b>LCS (4100182-BS1)</b>											Extracted: 10/05/04 09:51		
Total Dissolved Solids	EPA 160.1	101	---	10.0	mg/l	1x	--	100	101% (80-120)	--	10/05/04 17:15		
<b>Duplicate (4100182-DUP1)</b>											QC Source: P4I1208-01	Extracted: 10/05/04 09:51	
Total Dissolved Solids	EPA 160.1	100	---	10.0	mg/l	1x	100	--	--	0.00% (20)	10/05/04 17:15		

**QC Batch: 4100772      Water Preparation Method: General Preparation**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC (Limits)	% RPD (Limits)	Analyzed	Notes	
<b>Blank (4100772-BLK1)</b>											Extracted: 10/15/04 10:07		
Nitrate/Nitrite-Nitrogen	EPA 353.2	ND	---	0.00500	mg/l	1x	--	--	--	--	10/15/04 15:40		
<b>LCS (4100772-BS1)</b>											Extracted: 10/15/04 10:07		
Nitrate/Nitrite-Nitrogen	EPA 353.2	0.0923	---	0.00500	mg/l	1x	--	0.100	92.3% (85-115)	--	10/15/04 15:40		
<b>Duplicate (4100772-DUP1)</b>											QC Source: P4J0088-01	Extracted: 10/15/04 10:07	
Nitrate/Nitrite-Nitrogen	EPA 353.2	7.41	---	0.500	mg/l	100x	8.43	--	--	12.9% (20)	10/15/04 15:40		
<b>Matrix Spike (4100772-MS1)</b>											QC Source: P4J0088-01	Extracted: 10/15/04 10:07	
Nitrate/Nitrite-Nitrogen	EPA 353.2	13.0	---	0.500	mg/l	100x	8.43	5.00	91.4% (75-125)	--	10/15/04 15:40		
<b>Matrix Spike Dup (4100772-MSD1)</b>											QC Source: P4J0088-01	Extracted: 10/15/04 10:07	
Nitrate/Nitrite-Nitrogen	EPA 353.2	13.4	---	0.500	mg/l	100x	8.43	5.00	99.4% (75-125)	3.03% (20)	10/15/04 15:40		

North Creek Analytical - Portland

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*Mary A. Fritzmann Smith*

Mary A. Fritzmann Smith, Project Manager

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<b>Aspect Consulting LLC</b> 811 First Ave., Suite 480 Seattle, WA 98104	Project Name: <b>WRIA 31 Water Quality</b>	
	Project Number: 030009-003-01	<u>Report Created:</u>
	Project Manager: Steve Germiot	10/18/04 15:52

**Notes and Definitions**

Report Specific Notes:

R-05 - Reporting limits raised due to dilution necessary for analysis. Sample contains high levels of reported analyte, non-target analyte, and/or matrix interference.

Laboratory Reporting Conventions:

DET - Analyte DETECTED at or above the Reporting Limit. Qualitative Analyses only.

ND - Analyte NOT DETECTED at or above the reporting limit (MDL or MRL, as appropriate).

NR / NA - Not Reported / Not Available

dry - Sample results reported on a dry weight basis. Reporting Limits are corrected for %Solids when %Solids are <50%.

wet - Sample results and reporting limits reported on a wet weight basis (as received).

RPD - Relative Percent Difference. (RPDs calculated using Results, not Percent Recoveries).

MRL - METHOD REPORTING LIMIT. Reporting Level at, or above, the lowest level standard of the Calibration Table.

MDL\* - METHOD DETECTION LIMIT. Reporting Level at, or above, the statistically derived limit based on 40CFR, Part 136, Appendix B. \*MDLs are listed on the report only if the data has been evaluated below the MRL. Results between the MDL and MRL are reported as Estimated results.

Dil - Dilutions are calculated based on deviations from the standard dilution performed for an analysis, and may not represent the dilution found on the analytical raw data.

Reporting limits - Reporting limits (MDLs and MRLs) are adjusted based on variations in sample preparation amounts, analytical dilutions and percent solids, where applicable.

*Mary A. Fritzmann Smith*



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 541-383-9310 FAX 382-7588  
 907-334-9200 FAX 334-9210



## CHAIN OF CUSTODY REPORT

Work Order #: **P150088**

CLIENT: **Aspect Consulting**  
 REPORT TO: **Steve Gorman**  
 ADDRESS: **811 First Avenue Suite 480**  
**Seattle, WA 98101**  
 PHONE: **(206) 328-7443** FAX: **206-858-5053**

INVOICE TO:  
 P.O. NUMBER:

PROJECT NAME: **WRIA 31 Glade Creek WQ**  
 PROJECT NUMBER: **030009-003-01**  
 SAMPLED BY: **Jay Chennault / Jeremy Shaker**

PRESERVATIVE  
 Y N  
 REQUESTED ANALYSES

**TURNAROUND REQUEST**  
 in Business Days \*  
 Organic & Inorganic Analyses  
 7  5  4  3  2  1 <1  
 Petroleum Hydrocarbon Analyses  
 5  4  3  2  1 <1  
 STD.  
 OTHER Specify:  
 \* Turnaround Requests less than standard may incur Rush Charges.

CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE/TIME	N <sup>1</sup> N <sup>2</sup>	TDS															
1 GC-16	9/28/04 13:00	X	X															
2 GC-19	9/28/04 13:30	X	X															
3 GC-01	9/28/04 14:00	X	X															
4 GC-62	9/28/04 15:00	X	X															
5 GC-27	9/28/04 17:00	X	X															
6 GC-965	9/29/04 9:55	X	X															
7 GC-45	9/29/04 10:40	X	X															
8 GC-975W	9/29/04 12:10	X																
9 GC-985W	9/29/04 14:20	X																
10 GC-995W	9/29/04 14:35	X																

MATRIX (W, S, O)	# OF CONT.	LOCATION / COMMENTS	NCA WO ID
W	2	ground water	
W	2	"	
W	2	"	
W	2	"	
W	2	"	
W	2	"	
W	2	"	
W	2	surface water	
W	2	surface water	
W	1	surface water	

RELEASED BY: **Jay Chennault** DATE: **10/1/04**  
 PRINT NAME: **Jay Chennault** FIRM: **Aspect Consulting** TIME: **11:00**

RECEIVED BY: **Vannessa Egan** DATE: **10-2-04**  
 PRINT NAME: **Vannessa Egan** FIRM: **NCA** TIME: **10:00**

ADDITIONAL REMARKS: **Nitrate by Method 353.2**



**NORTH CREEK ANALYTICAL COOLER RECEIPT FORM**

(Army Corp. compliant)

Client: Aspect Consulting

1. Please sign for receipt and opening of 1 cooler or          other         

By (print) Vannessa Bran (sign) Vannessa Bran

2. Date samples received 10/2/04 Date opened: Same  or   /  /  

3. Delivered by:          NCA courier          FedEx  UPS          Courier          Client          Other         

Airbill # if applicable 123T358T494934648 (Put copy of shipping papers in file)

4. There were 0 custody seals present, signed by          date   /  /  .

5. Were the custody seals unbroken and intact at the date and time of arrival?          Yes          No  
taped shut

6. Was ice used?  yes          no Type of ice:          blue ice          gel ice  real ice

Temperature (degrees C) 0.6 Raytek thermometer  Digi-Therm (probe temperature blank)

7. Are custody papers sealed in a plastic bag ~~and taped inside to lid?~~  Yes          No

8. Were custody papers filled out properly (ink, signed, etc.)?  Yes          No

If "no" please specify:         

9. Was project identifiable from custody papers?  Yes          No

Name of project WR1A 31 Blade Creek (if applicable)

10. Initial and date for unpacking: VE (initials) date 10/4/04

11. Packing material: NA bubble wrap/bag          styrofoam          cardboard          other

12. Were samples in bags?          Yes  No

13. Did all containers indicated on the COC arrive?  Yes          No

If "no" please indicate which containers were absent         

14. Were all containers unbroken and labels in good condition?  Yes          No

If "no" please indicate which containers         

15. Were all bottle labels complete (ID, date, time, signature, etc.)?  Yes          No

Do the IDs, times, etc. agree with the COC?  Yes          No

If "no" please indicate which containers         

16. Are containers properly preserved for indicated analysis?  Yes          No

17. Is there adequate volume for the test(s) requested?  Yes          No

18. If voa vials were submitted, are they free of bubbles?  N/A          Yes          No

19. Log-in phase: Date samples were logged in: 10/4/04 Elm Project # P 4J0088

20. Logged in by (print) Vannessa Bran (sign) Vannessa Bran

21. Was the project manager notified of status? (Use back of form as a record)          Yes  No