APPENDIX C

DATA VALIDATION MEMOS

CONESTOGA-ROVERS & ASSOCIATES

1801 Old Highway 8 NW, Suite #114
St. Paul, Minnesota 55112
Telephone: (651) 639-0913 Fax: (651) 639-0923
www.CRAworld.com

MEMORANDUM

TO:	Lisa Poole	REF. NO.:	2012
FROM:	Ruth L. Mickle	DATE:	January 24, 2005
C.C.:	Sarah Illi Analytical Data File		
RE:	**Data Quality Assessment** **October 19-20, 2004 Sampling Events** **Highway 96 Site - White Bear Lake, Minnesota (COC 4409, 4497)**		

The following details a data quality assessment and validation for residential well samples collected October 19-20, 2004, at the Highway 96 Site in White Bear Lake, Minnesota. The samples identified in Table 1 were analyzed for volatile organic compounds (VOCs) and chloride.[1] The analyses were performed by Interpoll Laboratories (Interpoll) in Circle Pines, Minnesota. The quality assurance criteria were defined by the quality assurance project plan (QAPP).[2]

HOLDING TIME PERIODS

The holding time periods for the analyses are as follows:

VOC - 14 days from sample collection to completion of analyses; and
Chloride - 28 days from sample collection to completion of analyses.

On the basis of the sample collection date on the chain-of-custody forms and the analytical report provided by Interpoll, the analyses were completed within the specified holding time period.

---

1 VOC and chloride methods were derived from "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, 3rd edition, November 1986 and updates and "Methods for Chemical Analysis of Water and Wastes", EPA 600/4-79-20, March 1983 and updates:

VOC—SW 8260B

Chloride—MCAWW 300.0

2 Application of quality assurance criteria was consistent with "National Functional Guidelines for Organic Data Review", October 1999 and "National Functional Guidelines for Inorganic Data Review", July 2002.

SURROGATE COMPOUND PERCENT RECOVERIES (SURROGATE RECOVERIES)

Individual sample performance for VOC analyses was monitored using surrogate recoveries. The surrogate recoveries were within acceptance criteria.

METHOD BLANK SAMPLES

Contamination of samples contributed by laboratory conditions or procedures was monitored by the concurrent preparation and analyses of method blank samples. The method blank sample results were free of target analytes.

MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD) RESULTS

To assess the long-term accuracy of the analytical method on various matrices, MS/MSD percent recoveries and relative percent difference (RPD) of the recoveries were determined for the analyses. The MS/MSD data for project samples were within control limits criteria.

FIELD QUALITY ASSURANCE/ QUALITY CONTROL (QA/QC) SAMPLES

The field QA/QC associated with the sampling events consisted of one trip blank sample, two field blank samples, and two field duplicate sets.

To evaluate the possibility of contamination arising from sample transport, the environment, and/or shipping, a trip blank sample was submitted to the laboratory for VOC analysis. The trip blank sample yielded chloroform, methylene chloride, toluene, and trichlorofluoromethane detections. There were no associated toluene and methylene chloride data. The associated chloroform and trichlorofluoromethane sample data should be qualified as nondetect, as noted in Table 2.

As a check for cleanliness of sampling conditions, two field blanks (W-041019-SI-100 and W-041019-SI-113) were collected as authentic samples for labeling and submission to the lab. The blank samples were either reported to be free from detectable concentrations of target analytes, yielded detections within acceptance criteria or were previously qualified based on trip blank data. As a result, no qualification was required based on field blank results.

Overall precision for the sampling event was monitored using field duplicate samples: W-041019-SI-102/W-041019-SI-104 and W-041019-SI-115/W-041019-SI-116. The RPD data for positive parameter results was found to be acceptable (RPD values equal to or less than 25), indicating an adequate level of precision was achieved.

OVERALL ASSESSMENT

The data were found to exhibit acceptable levels of accuracy and precision and may be used with the qualifications noted.

RLM/jla/11
Enc.

TABLE 1

SUMMARY OF SAMPLE IDENTIFICATION NUMBERS
HIGHWAY 96 SITE--RESIDENTIAL WELL SAMPLING
OCTOBER 2004 SAMPLING EVENT

W-041019-SI-100	W-041019-SI-112
W-041019-SI-101	W-041019-SI-113
W-041019-SI-102	W-041019-SI-114
W-041019-SI-103	W-041019-SI-115
W-041019-SI-104	W-041019-SI-116
W-041019-SI-105	W-041019-SI-117
W-041019-SI-106	W-041019-SI-118
W-041019-SI-107	W-041019-SI-119
W-041019-SI-108	W-041019-SI-120
W-041019-SI-109	W-041019-SI-121
W-041019-SI-110	W-041019-SI-122
W-041019-SI-111	W-041019-SI-123

TABLE 2

RESULTS QUALIFIED BASED ON TRIP BLANK DETECTIONS
HIGHWAY 96 SITE--RESIDENTIAL WELL SAMPLING
OCTOBER 2004 SAMPLING EVENT

Blank ID	*Analyte*	*Blank Concentration (µg/L)*	*Associated Samples*	*Qualifier*[1]
Trip Blk	Chloroform	0.072	W-041019-SI-101	0.091U
			W-041019-SI-102	0.055U
			W-041019-SI-103	0.060U
			W-041019-SI-115	0.065U
			W-041019-SI-116	0.086U
Trip Blk	Trichlorofluoromethane	0.088	W-041019-SI-105	0.070U

Note:

[1] Sample results should be qualified as:

U - The analyte result is non-detect with the associated value being the quantitation limit.

CONESTOGA-ROVERS & ASSOCIATES

1801 Old Highway 8 NW, Suite #114
St. Paul, Minnesota 55112
Telephone: (651) 639-0913 Fax: (651) 639-0923
www.CRAworld.com

MEMORANDUM

TO:	Lisa Poole	REF. NO.:	2012
FROM:	Grant Anderson	DATE:	February 2, 2005
C.C.:	Sarah Illi Analytical Data File		
RE:	**Data Quality Assessment** **January 12 and 14, 2005 Sampling Events** **Highway 96 Site - White Bear Lake, Minnesota (COC 4489)**		

The following details a data quality assessment for residential well samples collected January 12 and 14, 2005, at the Highway 96 Site in White Bear Lake, Minnesota. The samples identified as W-050112-SI-100 and W-050114-SI-101 were analyzed for volatile organic compounds (VOCs) and chloride.[1] The analyses were performed by Interpoll Laboratories (Interpoll) in Circle Pines, Minnesota. The quality assurance criteria were defined by the quality assurance project plan (QAPP).[2]

HOLDING TIME PERIODS

The holding time periods for the analyses are as follows:

VOC - 14 days from sample collection to completion of analyses; and
Chloride - 28 days from sample collection to completion of analyses.

On the basis of the sample collection dates on the chain-of-custody form and the analytical report provided by Interpoll, the analyses were completed within the specified holding time periods.

---

1 VOC and chloride methods were derived from "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, Third Edition, November 1986 and updates and "Methods for Chemical Analysis of Water and Wastes", EPA 600/4-79-20, March 1983 and updates:

VOC—SW 8260B

Chloride—MCAWW 300.0

2 Application of quality assurance criteria was consistent with "National Functional Guidelines for Organic Data Review", October 1999 and "National Functional Guidelines for Inorganic Data Review", July 2002.

SURROGATE COMPOUND PERCENT RECOVERIES (SURROGATE RECOVERIES)

Individual sample performance for VOC analyses was monitored using surrogate recoveries. The surrogate recoveries were within acceptance criteria.

METHOD BLANK SAMPLES

Contamination of samples contributed by laboratory conditions or procedures was monitored by the concurrent preparation and analysis of method blank samples. The method blank sample results were reported to be free from detectable concentrations of target analytes, indicating that laboratory contamination was unlikely.

MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD) RESULTS

To assess the long-term accuracy of the analytical method on various matrices, MS/MSD percent recoveries and relative percent difference (RPD) of the recoveries were determined for the analyses. The MS/MSD data for project-related samples were within control limits criteria.

FIELD QUALITY ASSURANCE/ QUALITY CONTROL (QA/QC) SAMPLES

The field QA/QC associated with the sampling events consisted of a trip blank sample.

To evaluate the possibility of contamination arising from sample transport, the environment, and/or shipping, a trip blank sample was submitted to the laboratory for VOC analysis. The trip blank sample yielded a methylene chloride detection (0.47 µg/L). As a result, the methylene chloride result for sample W-050114-SI-101 should be qualified as non-detect (0.23U).

OVERALL ASSESSMENT

The data were found to exhibit acceptable levels of accuracy and precision and may be used with the qualification noted above.

GDA/jla/12

CONESTOGA-ROVERS & ASSOCIATES

1801 Old Highway 8 NW, Suite #114
St. Paul, Minnesota 55112
Telephone: (651) 639-0913 Fax: (651) 639-0923
www.CRAworld.com

MEMORANDUM

TO: Lisa Poole

REF. NO.: 2012

FROM: Grant Anderson

DATE: March 2, 2005

C.C.: Sarah Illi
Analytical Data File

RE: **Data Quality Assessment**
February 16, 2005, Sampling Event
Highway 96 Site - White Bear Lake, Minnesota (COC 4491)

The following details a data quality assessment for two residential water samples collected February 16, 2005, at the Highway 96 Site in White Bear Lake, Minnesota. The samples identified as W-050216-SI-100 and W-050216-SI-101 were analyzed for volatile organic compounds (VOCs) and chloride.[1] The analyses were performed by Severn Trent Laboratories (STL) in Buffalo, New York. The quality assurance criteria were defined by the quality assurance project plan (QAPP).[2]

HOLDING TIME PERIODS

The holding time periods for the analyses are as follows:

VOC - 14 days from sample collection to completion of analyses; and
Chloride - 28 days from sample collection to completion of analyses.

On the basis of the sample collection date on the chain-of-custody form and the analytical report provided by STL, the analyses were completed within the specified holding time period.

---

1 VOC and chloride methods were derived from "Methods for the Determination of Organic Compounds in Drinking Water", EPA-600/4-88-039, December 1988 with revisions/updates and "Methods for Chemical Analysis of Water and Wastes", EPA 600/4-79-20, March 1983 with revisions/ updates:
VOC—EPA 524.2
Chloride—MCAWW 300.0A

2 Application of quality assurance criteria was consistent with "National Functional Guidelines for Organic Data Review", October 1999 and "National Functional Guidelines for Inorganic Data Review", July 2002.

SURROGATE COMPOUND PERCENT RECOVERIES (SURROGATE RECOVERIES)

Individual sample performance for VOC analyses was monitored using surrogate recoveries. The surrogate recoveries were within acceptance criteria.

METHOD BLANK SAMPLES

Contamination of samples contributed by laboratory conditions or procedures was monitored by the concurrent preparation and analyses of method blank samples. The method blank samples were reported to be free from detectable concentrations of target analytes, indicating that laboratory contamination was unlikely.

BLANK SPIKE SAMPLES

Overall performance of the analyses was monitored by means of blank spike samples. The blank spike recoveries were within control limits criteria, indicating that overall performance was adequate.

MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD) RESULTS

To assess the long-term accuracy and precision of the analytical method on various matrices, matrix spike percent recoveries and relative percent difference (RPD) of the spike recoveries were determined for the analyses. Since the MS/MSD spike samples were performed on non-project samples, no evaluation of project samples was made based on matrix spike results.

FIELD QUALITY ASSURANCE/ QUALITY CONTROL (QA/QC) SAMPLES

The field QA/QC associated with the sampling event consisted of a trip blank sample.

To evaluate the possibility of contamination arising from sample transport, the environment, and/or shipping, a trip blank sample was submitted to the laboratory for VOC analysis. The trip blank was reported to be free from detectable concentrations of target analytes, indicating that cross-contamination was unlikely.

OVERALL ASSESSMENT

The data were found to exhibit acceptable levels of accuracy and precision and may be used without qualification.

GDA/jla/15

CONESTOGA-ROVERS & ASSOCIATES

1801 Old Highway 8 NW, Suite #114
St. Paul, Minnesota 55112
Telephone: (651) 639-0913 Fax: (651) 639-0923
www.CRAworld.com

MEMORANDUM

TO: Ron Frehner

REF. NO.: 2012

FROM: Grant Anderson

DATE: May 26, 2005

C.C.: Sarah Illi
Analytical Data File

RE: **Revised Data Quality Assessment**
March and April 2005, Sampling Event
Highway 96 Site - White Bear Lake, Minnesota

The following details a data quality assessment for residential water samples collected March 28-31, April 1, and April 14, 2005, at the Highway 96 Site in White Bear Lake, Minnesota. The samples identified in Table 1 were analyzed for volatile organic compounds (VOCs).[1] The analyses were performed by Minnesota Department of Health (MDH) Laboratory in Minneapolis, Minnesota. The quality assurance criteria were defined by the quality assurance project plan (QAPP).[2]

HOLDING TIME PERIODS

The holding time period for VOC analysis is 14 days from sample collection to completion of analysis. On the basis of the sample collection dates on the chain-of-custody forms and the analytical reports provided by MDH, the analyses were completed within the specified holding time period.

SURROGATE COMPOUND PERCENT RECOVERIES (SURROGATE RECOVERIES)

Individual sample performance for VOC analyses was monitored using surrogate recoveries. The surrogate recoveries were within acceptance criteria.

1 VOC method 524.2 was derived from "Methods for the Determination of Organic Compounds in Drinking Water", EPA-600/4-88-039, December 1988 with revisions/updates.

2 Application of quality assurance criteria was consistent with "National Functional Guidelines for Organic Data Review", October 1999.

METHOD BLANK SAMPLES

Contamination of samples contributed by laboratory conditions or procedures was monitored by the concurrent preparation and analyses of method blank samples. The method blank samples were reported to be free from detectable concentrations of target analytes, indicating that laboratory contamination was unlikely.

BLANK SPIKE/BLANK SPIKE DUPLICATE SAMPLES

Overall performance of the analyses was monitored by means of blank spike samples. Table 2 lists outlying blank spike/blank spike duplicate results. Associated sample data should be qualified as noted in the table.

FIELD QUALITY ASSURANCE/ QUALITY CONTROL (QA/QC) SAMPLES

The field QA/QC associated with the sampling event consisted of four trip blank samples and four field duplicate sample sets.

To evaluate the possibility of contamination arising from sample transport, the environment, and/or shipping, four trip blank samples were submitted to the laboratory for VOC analysis. Due to instrument malfunction at the MDH, one of the trip blanks was not analyzed. The other three trip blank samples were reported to be free from detectable concentrations of target analytes, indicating that cross-contamination was unlikely.

Overall precision for the sampling event was monitored using field duplicate sample sets: 7 West Shore Rd/duplicate #1, 8 Poplar Lane/CRA duplicate #1, 1 Thompson Lane/CRA duplicate #2, and 6 Poplar Lane/duplicate #2. The RPD results for positive values from the field duplicate sets were calculated and found to be within acceptance criteria (RPD not greater than 25).

OVERALL ASSESSMENT

The data were found to exhibit acceptable levels of accuracy and precision and may be used with the qualifications noted in Table 2.

GDA/jla/6
Enc.

TABLE 1

SAMPLE IDENTIFICATION NUMBERS
HIGHWAY 96 SITE
MARCH AND APRIL 2005 SAMPLING EVENT

Sample Location	*Sampled By*
11 West Shore Road	CRA (Illi)
2 Hummingbird Hill	CRA (Illi)
3 Thompson Lane	CRA (Illi)
2 Eagle Ridge Road	CRA (Illi)
4 Eagle Ridge Road	CRA (Illi)
9 West Shore Road	CRA (Illi)
10 West Shore Road	CRA (Illi)
15 West Shore Road	CRA (Illi)
32 East Oaks Road	MPCA (Estuesta)
36 East Oaks Road	MPCA (Estuesta)
North Oaks Golf Course/54 East Oaks Road	MPCA (Estuesta)
1 Poplar Lane	MPCA (Estuesta)
3 Poplar Lane	MPCA (Estuesta)
1 West Shore Road	MPCA (Estuesta)
3 West Shore Road	MPCA (Estuesta)
5 West Shore Road	MPCA (Estuesta)
6 West Shore Road	MPCA (Estuesta)
7 West Shore Road	MPCA (Estuesta)
7 West Shore Road (Dup.)	MPCA (Estuesta)
3 Eagle Ridge Road	CRA (Illi)
13 West Shore Road	MPCA (Estuesta)
1 Eagle Ridge Road	CRA (Illi)
44 East Oaks Road	CRA (Illi)
8 Poplar Lane	CRA (Illi)
8 Poplar Lane (Dup.)	CRA (Illi)
2 Thompson Lane	CRA (Illi)
2 West Shore Road	MPCA (Estuesta)
4 West Shore Road	MPCA (Estuesta)
12 West Shore Road	MPCA (Estuesta)
6 Eagle Ridge Road	CRA (Illi)
1 Thompson Lane	CRA (Illi)
1 Thompson Lane (Dup.)	CRA (Illi)
6 Poplar Lane	MPCA (Estuesta)
6 Poplar Lane (Dup.)	MPCA (Estuesta)
38 East Oaks Road	MPCA (Estuesta)
4 Poplar Lane	MPCA (Estuesta)

TABLE 2

OUTLYING LABORATORY CONTROL SAMPLE/LCS DUPLICATE DATA
HIGHWAY 96 SITE
MARCH AND APRIL 2005 SAMPLING EVENT

Analsis	*Analyte*	*LCS %R*	*LCSD %R*	*%R Limits*	*RPD*	*RPD Limits*	*Qualifier*[1]	*Associated Samples*
VOC	m-/p-Xylene	46	46	70-130	1	20	J/UJ	9 West Shore Rd;
	1,2,3-Trichlorobenzene	70	65	70-130	7	20	J/UJ	15 West Shore Rd;
								4 Eagle Ridge Road;
								2 Eagle Ridge Road;
								10 West Shore Rd;
								1 Poplar Ln;
								1 West Shore Rd;
								5 West Shore Rd;
								6 West Shore Rd;
								11 West Shore Rd;
								2 Hummingbird Hill;
								3 Thompson Lane;
								13 West Shore Rd

TABLE 2

OUTLYING LABORATORY CONTROL SAMPLE/LCS DUPLICATE DATA
HIGHWAY 96 SITE
MARCH AND APRIL 2005 SAMPLING EVENT

Analsis	*Analyte*	*LCS %R*	*LCSD %R*	*%R Limits*	*RPD*	*RPD Limits*	*Qualifier*[1]	*Associated Samples*
VOC	Allyl Chloride	67	116	70-130	54	30	J/UJ	9 West Shore Rd;
	Methyl tert-butyl ether	72	66	70-130	8	30	J/UJ	15 West Shore Rd;
	Tetrachloroethene	66	71	70-130	7	20	J/UJ	4 Eagle Ridge Road;
	1,2-Dibromoethane	70	69	70-130	1	20	J/UJ	2 Eagle Ridge Road;
	Chlorobenzene	72	66	70-130	9	20	J/UJ	7 West Shore Rd;
	Ethylbenzene	73	65	70-130	12	20	J/UJ	3 West Shore Rd;
	m-/p-Xylene	59	62	70-130	5	20	J/UJ	3 Poplar Ln;
	o-Xylene	52	53	70-130	2	20	J/UJ	North Oaks gc;
	Styrene	59	54	70-130	10	20	J/UJ	7 West Shore Rd (dup #1);
	sec-Butylbenzene	63	57	70-130	9	20	J/UJ	3 Eagle Ridge Road;
	1,2-Dichlorobenzene	64	59	70-130	7	20	J/UJ	36 East Oaks Rd;
	1,2,4-Trichlorobenzene	63	53	70-130	16	20	J/UJ	32 East Oaks Rd
	Hexachlorobutadiene	78	68	70-130	14	20	J/UJ	
	Naphthalene	77	67	70-130	15	20	J/UJ	
	Hexachlorobutadiene	78	68	70-130	14	20	J/UJ	
	1,2,3-Trichlorobenzene	65	57	70-130	13	20	J/UJ	

TABLE 2

OUTLYING LABORATORY CONTROL SAMPLE/LCS DUPLICATE DATA
HIGHWAY 96 SITE
MARCH AND APRIL 2005 SAMPLING EVENT

Analsis	*Analyte*	*LCS %R*	*LCSD %R*	*%R Limits*	*RPD*	*RPD Limits*	*Qualifier*[1]	*Associated Samples*
VOC	Dichlorofluoromethane	126	135	70-130	6	20	J/NR	2 West Shore Rd;
	Methyl iso-butyl Ketone	70	67	70-130	4	30	J/UJ	4 West Shore Rd;
	m-/p-Xylene	47	48	70-130	3	20	J/UJ	12 West Shore Rd; 8 Poplar Lane; 1 Eagle Ridge Road; 44 East Oaks Rd; 2 Thompson Ln; 8 Poplar Lane (CRA dup #1); 1 Thompson Ln; 6 Eagle Ridge Road; 1 Thompson Ln (CRA dup #2); 6 Poplar Lane; 6 Poplar Lane (dup #2)
VOC	1,2,4-Trichlorobenzene	90	67	70-130	29	20	J/UJ	38 East Oaks Rd;
	1,2,3-Trichlorobenzene	82	65	70-130	23	20	J/UJ	4 Poplar Lane

Notes:

[1] Sample results should be qualified as:

J - Estimated concentration for detected analytes.

UJ - Estimated reporting limit for non-detect analytes.

NR - No qualification of data is necessary for non-detect analytes.

CONESTOGA-ROVERS
& ASSOCIATES

1801 Old Highway 8 NW, Suite #114
St. Paul, Minnesota 55112
Telephone: (651) 639-0913 Fax: (651) 639-0923
www.CRAworld.com

MEMORANDUM

TO: Ron Frehner

REF. NO.: 2012

FROM: Grant Anderson

DATE: May 26, 2005

C.C.: Sarah Illi
Analytical Data File

RE: **Revised Data Quality Assessment**
April 29, 2005, Sampling Event
Highway 96 Site - White Bear Lake, Minnesota

The following details a data quality assessment for residential water samples collected April 29, 2005, at the Highway 96 Site in White Bear Lake, Minnesota. The samples were collected by the Minnesota Pollution Control Agency (MPCA). The samples identified as 13WSR, 12WSR, 50EOR, and 2HH were analyzed for volatile organic compounds (VOCs).[1] The analyses were performed by Minnesota Department of Health (MDH) Laboratory in Minneapolis, Minnesota. The quality assurance criteria were defined by the quality assurance project plan (QAPP).[2]

HOLDING TIME PERIODS

The holding time period for VOC analysis is 14 days from sample collection to completion of analysis. On the basis of the sample collection dates on the chain-of-custody form and the analytical report provided by MDH, the analyses were completed within the specified holding time period.

SURROGATE COMPOUND PERCENT RECOVERIES (SURROGATE RECOVERIES)

Individual sample performance for VOC analyses was monitored using surrogate recoveries. The surrogate recoveries were within acceptance criteria, indicating that individual sample performance was adequate.

1 VOC method 524.2 was derived from "Methods for the Determination of Organic Compounds in Drinking Water", EPA-600/4-88-039, December 1988 with revisions/updates.

2 Application of quality assurance criteria was consistent with "National Functional Guidelines for Organic Data Review", October 1999.

METHOD BLANK SAMPLES

Contamination of samples contributed by laboratory conditions or procedures was monitored by the concurrent preparation and analysis of a method blank sample. The method blank sample was reported to be free from detectable concentrations of target analytes, indicating that laboratory contamination was unlikely.

BLANK SPIKE/BLANK SPIKE DUPLICATE SAMPLES

Overall performance of the analyses was monitored by means of blank spike samples. With the exception of styrene, the blank spike/blank spike duplicate results were within acceptance criteria. The styrene percent recoveries were above the control limits. However, the associated sample results were all reported as non-detect; therefore, no qualification of data was necessary based on blank spike data.

FIELD QUALITY ASSURANCE/ QUALITY CONTROL (QA/QC) SAMPLES

The field QA/QC associated with the sampling event consisted of a trip blank sample.

To evaluate the possibility of contamination arising from sample transport, the environment, and/or shipping, a trip blank sample was submitted to the laboratory for VOC analysis. The trip blank sample was reported to be free from detectable concentrations of target analytes, indicating that cross-contamination was unlikely.

OVERALL ASSESSMENT

The data were found to exhibit acceptable levels of accuracy and precision and may be used without qualification.

GDA/jla/7

CONESTOGA-ROVERS & ASSOCIATES

1801 Old Highway 8 NW, Suite #114
St. Paul, Minnesota 55112
Telephone: (651) 639-0913 Fax: (651) 639-0923
www.CRAworld.com

MEMORANDUM

TO: Ron Frehner

REF. NO.: 2012

FROM: Ruth Mickle

DATE: June 8, 2005

C.C.: Sarah Illi
Analytical Data File

RE: **Data Quality Assessment**
May 2005 Sampling Events
Highway 96 Site - White Bear Lake, Minnesota

The following details a data quality assessment for residential water samples collected on May 23 and 24, 2005, at the Highway 96 Site in White Bear Lake, Minnesota. The samples were collected by the Minnesota Pollution Control Agency (MPCA) and Conestoga-Rovers & Associates (CRA) as identified in Table 1. The samples were analyzed for volatile organic compounds (VOCs), iron, and chloride. The VOC analyses were performed by Minnesota Department of Health (MDH) Laboratory in Minneapolis, Minnesota. The iron and chloride analyses were performed by PACE Laboratories in Minneapolis, Minnesota.[1] The quality assurance criteria were defined by the quality assurance project plan (QAPP).[2]

HOLDING TIME PERIODS

The holding time periods for the analyses are as follows:

VOC - 14 days from sample collection to completion of analysis;
Chloride - 28 days from sample collection to completion of analysis; and
Iron – Six months from sample collection to completion of analysis.

On the basis of the sample collection dates on the chain-of-custody forms and the analytical reports provided by the labs, the analyses were completed within the specified holding time periods.

---

1 VOC method 524.2 was derived from "Methods for the Determination of Organic Compounds in Drinking Water", EPA-600/4-88-039, December 1988 with revisions/updates. Chloride method 325 was derived from "Methods for Chemical Analyses of Water and Wastes", EPA 600/4-79-20, March 1983 and updates. Finally, the iron method 6010 was derived from "Test Methods for Evaluating Solid Waste", Sw-846, Third Edition, November 1986 with updates.

2 Application of quality assurance criteria was consistent with "National Functional Guidelines for Organic Data Review", October 1999 and "National Functional Guidelines for Inorganic Data Review", July 2002.

SURROGATE COMPOUND PERCENT RECOVERIES (SURROGATE RECOVERIES)

Individual sample performance for VOC analyses was monitored using surrogate recoveries. The surrogate recoveries were within acceptance criteria.

METHOD BLANK SAMPLES

Contamination of samples contributed by laboratory conditions or procedures was monitored by the concurrent preparation and analyses of method blank samples. The method blank samples were reported to be free from detectable concentrations of target analytes, indicating that laboratory contamination was unlikely.

BLANK SPIKE/BLANK SPIKE DUPLICATE SAMPLES

Overall performance of the analyses was monitored by means of blank spike samples. Table 2 lists outlying blank spike/blank spike duplicate results from VOC analyses. Associated sample data should be qualified as noted in the table.

MATRIX SPIKE/MATRIX SPIKE DUPLICATE SAMPLES

To assess the long-term accuracy and precision of the analytical method on various matrices, matrix spike percent recoveries and relative percent difference (RPD) of the spike recoveries were determined for the analyses. Table 3 lists outlying spike results from chloride analyses. Associated sample data should be qualified as noted in the table.

FIELD QUALITY ASSURANCE/ QUALITY CONTROL (QA/QC) SAMPLES

The field QA/QC associated with the sampling events consisted of four trip blank samples and two field duplicate sample sets.

To evaluate the possibility of contamination arising from sample transport, the environment, and/or shipping, four trip blank samples were submitted to the laboratory for VOC analysis. The trip blank samples were reported to be free from detectable concentrations of target analytes, indicating that cross-contamination was unlikely.

Overall precision for the sampling event was monitored using the field duplicate sample sets: 12 West Shore Road/Duplicate 1 (12 West Shore Rd) and 10 Poplar Ln/Duplicate 2 (10 Poplar Ln). The RPD results for positive values from the field duplicate sets were calculated and found to be within acceptance criteria (RPD not greater than 25).

OVERALL ASSESSMENT

The data were found to exhibit acceptable levels of accuracy and precision and may be used with the qualifications noted in Tables 2 and 3.

RLM/jla/8
Enc.

TABLE 1

SAMPLE IDENTIFICATION NUMBERS
HIGHWAY 96 SITE
MAY 2005 SAMPLING EVENT

CRA Samples	*MPCA Samples*
1 Buffalo	2 Hummingbird Hill
2 Eagle Ridge Road	12 Ski Lane
1 Poplar Lane	2 Thompson Lane
2 Ski Lane	1 Thompson Lane
4 Ski Lane	1 Hummingbird Hill
Trip blank 200512163	11 West Shore Road
6 Ski Lane	Trip Blank 200512157
8 Ski Lane	10 West Shore Road
14 Ski Lane	15 West Shore Road
16 Ski Lane	50 East Oaks Road
3 Buffalo	12 West Shore Road
10 Poplar Lane	Duplicate 1 (12 West Shore Rd)
Duplicate 2 (10 Poplar Ln)	Trip blank 200512444
Trip blank 200512451	

TABLE 2

OUTLYING LABORATORY CONTROL SAMPLE/LCS DUPLICATE DATA
HIGHWAY 96 SITE
MAY 2005 SAMPLING EVENTS

Analsis	*Analyte*	*LCS %R*	*LCSD %R*	*%R Limits*	*RPD*	*RPD Limits*	*Qualifier*[1]	*Associated Samples*
VOC	Allyl Chloride	63	61	70-130	4	30	UJ	10 Poplar; Trip blank 200512451; Duplicate 2 (10 Poplar Ln)
	2,2-Dichloropropane	74	51	70-130	36	30	UJ	
	1,2,4-Trichlorobenzene	66	67	70-130	1	20	UJ	
	Naphthalene	64	64	70-130	1	20	UJ	
VOC	2,2-Dichloropropane	87	58	70-130	40	30	UJ	2 Hummingbird Hill; 12 Shi Lane; 2 Thompson Lane; 1 Thompson Lane; 1 Hummingbird Hill; 11 West Shore Road; Trip Blank 200512157; 1 Buffalo; 2 Eagle Ridge Road; 1 Poplar; 2 Ski Lane; 4 Ski Lane
	Naphthalene	69	53	70-130	27	20	UJ	

Notes:

[1] Sample results should be qualified as:

UJ - Estimated reporting limit for non-detect analytes.

TABLE 3

OUTLYING MATRIX SPIKE/MS DUPLICATE DATA
HIGHWAY 96 SITE
MAY 2005 SAMPLING EVENTS

Analsis	*Analyte*	*MS %R*	*MSD %R*	*%R Limits*	*RPD*	*RPD Limits*	*Qualifier*[1]	*Associated Samples*
Gen Chem	Chloride	53	52	80-120	1	30	J/UJ	8 Ski Lane; 14 Ski Lane; 16 Ski Lane; 3 Buffalo; 10 Poplar Lane; Duplicate 2 (10 Poplar Ln)

Notes:

[1] Sample results should be qualified as:

J - Estimated concentration for detected analytes.

UJ - Estimated reporting limit for non-detect analytes.