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**GROUNDWATER MONITORING
VALIDATED ANALYTICAL RESULTS FOR THE SECOND QUARTER 1994
OB GROUNDS, SENECA ARMY DEPOT**

PREPARED FOR:
U.S. Army Corps of Engineers
Huntsville, Alabama

PREPARED BY:
Engineering-Science, Inc.
Boston, Massachusetts

September 1994
D#12

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Section 1.0
Indicator Parameters

1.1

Indicator Parameters Results

**OB GROUNDS SECOND QUARTER 1994 MONITORING
INDICATOR ANALYSIS RESULTS**

PARAMETER	MATRIX SITE DATE SAMPLED DATE ANALYZED	WATER		WATER		WATER		WATER		WATER		
		OB	6/29/94	7/21/94	OB	6/29/94	7/21/94	OB	6/29/94	7/21/94	OB	6/29/94
Conductivity	ES ID	MW-453B	MW-453C	MW-453D	MW-454A	MW-454B	MW-454C					
	LAB ID	225879	225880	225881	225883	225884	225885					
	UNITS											
Total Organic Carbon	units	7.32	7.31	7.35	7.19	7.17	7.20					
	umhos/cm	1830	1780	1760	752	791	713					
	mg/L	0.8	0.7	0.7	0.6	0.6	0.6					
Total Organic Halides	mg/L	0.03	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U					

**OB GROUNDS SECOND QUARTER 1994 MONITORING
INDICATOR ANALYSIS RESULTS**

K3	PARAMETER	MATRIX	WATER	WATER
		SITE	OB	OB
	DATE SAMPLED		6/29/94	6/29/94
	DATE ANALYZED		7/21/94	7/21/94
	ES ID	MW-27R	MW-27R	MW-453R
	LAB ID	225873	225873	225882
	UNITS	(MW-27 Rinsate)	(MW-27 Rinsate)	(MW-453 Rinsate)
	conductivity	6.96	6.77	6.77
	total Organic Carbon	7	16	16
	total Organic Halides	0.5 U	0.5 U	0.5 U
		0.02 U	0.02 U	0.02 U

1.2
Statistical Analysis

Students t - Test for wells in the OD area
 TOC - Year 1994, 2nd quarter

Well MW -4	TOC	pH	Spec Cond.	TOX
=	28.3125	7.525	1007.8	0.021
-8 =	379.3	0.114	98396.8	0.00056473
=	16	16	12	12

ANIONIC CARBON (TOC) Well MW -452	Compliance Well MW -453	Compliance Well MW -454
-5.64	t* = -5.66	t* = -5.69
2.60	tc = 2.60	tc = 2.60
No Change	No Change	No Change
Well MW -452	Compliance Well MW -453	Compliance Well MW -454
-5.62	t* = -2.38	t* = -3.86
2.98	tc = 2.96	tc = 2.99
No Change	No Change	No Change
CONDUCTANCE Well MW -452	Compliance Well MW -453	Compliance Well MW -454
5.27	t* = 8.50	t* = -2.51
2.62	tc = 2.65	tc = 2.74
Increase	Increase	No Change
ANIONIC HALIDES (TOX) Well MW -452	Compliance Well MW -453	Compliance Well MW -454
-2.33	t* = -1.05	t* = -2.33
3.75	tc = 4.11	tc = 3.75
No Change	No Change	No Change

Most likely an increase in the indicator parameter
 Most likely no change in the indicator parameter

Students t - Test for wells in the OB area
 TOC - Year 1994, 2nd quarter

Well MW -14	TOC	pH	Specific Cond.	TOX
	30.0	7.575	689.7	0.0528
	302.3	0.034	2669.5	0.0009307
	16	16	16	5

ANIC CARBON (TOC)

Well MW -12	Compliance Well MW -13	Compliance Well MW -14	Background
-6.65	t* = -6.63	t* = -6.68	t* =
2.60	to = 2.60	to = 2.60	to =
No Change	No Change	No Change	

Well MW -12

Well MW -12	Compliance Well MW -13	Compliance Well MW -14	Background
-5.97	t* = -13.05	t* = -10.91	t* =
2.92	to = 2.93	to = 2.97	to =
No Change	No Change	No Change	

ONDUCTANCE

Well MW -12	Compliance Well MW -13	Compliance Well MW -14	Background
13.96	t* = 18.61	t* = 31.77	t* =
3.16	to = 2.80	to = 2.72	to =
Increase	Increase	Increase	

ANIC HALIDES (TOX)

Well MW -12	Compliance Well MW -13	Compliance Well MW -14	Background
-3.50	t* = -3.50	t* = -3.50	t* =
2.72	to = 2.72	to = 2.72	to =
No Change	No Change	No Change	

Most likely an increase in the indicator parameter
 Most likely no change in the indicator parameter

**Well in the OD area
Background Upgradient Concentrations**

Backgroundwell MW-4				
pH	jan-82	apr-82	jun-82	sep-82
	7.2	7.2	7.8	7.9
	7.2	7.2	7.8	7.9
	7.2	7.2	7.8	7.9
	7.2	7.2	7.8	7.9
Average	7.53	Variance	0.114	
Spec Cond	jan-82	apr-82	jun-82	sep-82
	1130	1300	590	--
	1120	1302	590	--
	1130	1301	600	--
	1130	1300	600	--
Average	1007.75	Variance	98398.57	
TOC	jan-82	apr-82	jun-82	sep-82
	1	54	30	28
	1	54	30	29
	1	54	30	27
	1	55	30	28
Average	28.31	Variance	379.30	
TOX	jan-82	apr-82	jun-82	sep-82
	0.06	0.005	0.005	--
	0.05	0.005	0.005	--
	0.05	0.005	0.005	--
	0.052	0.005	0.005	--
Average	0.021	Variance	0.000565	

**Well in the OB area
Background Upgradient Concentrations**

Backgroundwell MW-5				
pH	jan-82	apr-82	jun-82	sep-82
	7.3	7.6	7.8	7.6
	7.3	7.6	7.8	7.6
	7.3	7.6	7.8	7.6
	7.3	7.6	7.8	7.6
Average	7.58	Variance	0.034	
Spec Cond	jan-82	apr-82	jun-82	sep-82
	730	719	620	795
	730	718	620	790
	730	719	620	795
	730	720	620	795
Average	689.67	Variance	2669.52	
TOC	jan-82	apr-82	jun-82	sep-82
	1	39	43	37
	1	39	42	38
	1	40	42	37
	1	39	42	38
Average	30.00	Variance	302.27	
TOX	jan-82	apr-82	jun-82	sep-82
	-	-	-	0.041
	-	-	0.064	-
	-	-	0.098	-
	0.016	-	0.045	-
Average	0.0528	Variance	0.0009307	

Section 2.0
QA/QC Data

**2.1 Laboratory Control Samples and
Duplicates for Indicator Parameters**

2.2 Indicator Parameter Data

**2.1 Laboratory Control Samples and
Duplicates for Indicator Parameters**



Inchcape Testing Services

Aquatec Laboratories

Laboratory Locations
55 South Park Drive
Colchester, VT 05446

75 Green Mountain Drive
South Burlington, VT 05403

150 Herman Melville Boulevard
New Bedford, MA 02740

Analytical Report

Engineering Science
Prudential Center
Boston, MA 02199

Date : 07/21/94
ETR Number : 45169
Project No.: 94000
No. Samples: 31
Arrived : 07/01/94

Attention : Mike Duchesneau

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Case:OB/OD SDG:45169

Standard analyses were performed in accordance with Methods for Analysis of Water and Wastes, EPA-600/4/79-020, Test Methods for Evaluating Solid Waste, SW-846, or Standard Methods for the Examination of Water and Wastewater. All results are in mg/l unless otherwise noted.

Lab No./ Method No.	Sample Description/ Parameter	Result
225901	LCS: (Water)	
9040	pH (std. units)	5.98
9050	Conductivity (umhos/cm)	1413
9060	Total Organic Carbon	86.3
9020	Total Organic Halides	6.59

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Submitted By :

Aquatec Inc.

Quality Control Summary
Project No 94000 ETR No 45169

Method Preparation Blank
Units: mg/L

<u>Parameter</u>	<u>Found Result</u>
Total Organic Carbon	<0.5
Total Organic Halides	<0.02

Laboratory Control Sample
Units: mg/L

<u>Parameter</u>	<u>Found Value</u>	<u>True Value</u>	<u>% Recovery</u>
Conductivity (uhos/cm)	1398.00	1413.0	98.9
Total Organic Carbon	86.29	86.8	99.4
Total Organic Halides	0.066	0.075	88.0
Total Organic Halides	0.069	0.075	92.0

2.2 Indicator Parameter Data



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Lab No./ Method No.	Sample Description/ Parameter	Result
225857	MW12A:06/29/94 @1915(Water)	
9040	pH (std. units)	7.30
9050	Conductivity (umhos/cm)	894
9060	Total Organic Carbon	1.1
9020	Total Organic Halides	<0.02
225858	MW12B:06/29/94 @1915(Water)	
9040	pH (std. units)	7.30
9050	Conductivity (umhos/cm)	878
9060	Total Organic Carbon	1.1
9020	Total Organic Halides	<0.02
225859	MW12C:06/29/94 @1915(Water)	
9040	pH (std. units)	7.30
9050	Conductivity (umhos/cm)	904
9060	Total Organic Carbon	1.1
9020	Total Organic Halides	<0.02
225860	MW12D:06/29/94 @1915(Water)	
9040	pH (std. units)	7.30
9050	Conductivity (umhos/cm)	912
9060	Total Organic Carbon	1.1
9020	Total Organic Halides	<0.02
225861	MW13A:06/29/94 @1820(Water)	
9040	pH (std. units)	6.98
9050	Conductivity (umhos/cm)	939
9060	Total Organic Carbon	1.2
9020	Total Organic Halides	<0.02

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Lab No./ Method No.	Sample Description/ Parameter	Result
225862	MW13B:06/29/94 @1820(Water)	
9040	pH (std. units)	6.97
9050	Conductivity (umhos/cm)	941
9060	Total Organic Carbon	1.2
9020	Total Organic Halides	<0.02
225863	MW13C:06/29/94 @1820(Water)	
9040	pH (std. units)	6.97
9050	Conductivity (umhos/cm)	929
9060	Total Organic Carbon	1.2
9020	Total Organic Halides	<0.02
225864	MW13D:06/29/94 @1820(Water)	
9040	pH (std. units)	6.97
9050	Conductivity (umhos/cm)	933
9060	Total Organic Carbon	1.2
9020	Total Organic Halides	<0.02
225865	MW14A:06/29/94 @1830(Water)	
9040	pH (std. units)	7.07
9050	Conductivity (umhos/cm)	1100
9060	Total Organic Carbon	1.0
9020	Total Organic Halides	<0.02
225866	MW14B:06/29/94 @1830(Water)	
9040	pH (std. units)	7.05
9050	Conductivity (umhos/cm)	1100
9060	Total Organic Carbon	0.9
9020	Total Organic Halides	<0.02

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Lab No./ Method No.	Sample Description/ Parameter	Result
225867	MW14C:06/29/94 @1830(Water)	
9040	pH (std. units)	7.08
9050	Conductivity (umhos/cm)	1110
9060	Total Organic Carbon	1.0
9020	Total Organic Halides	<0.02
225868	MW14D:06/29/94 @1830(Water)	
9040	pH (std. units)	7.07
9050	Conductivity (umhos/cm)	1100
9060	Total Organic Carbon	0.9
9020	Total Organic Halides	<0.02
225869	MW27A:06/29/94 @1900(Water)	
9040	pH (std. units)	7.28
9050	Conductivity (umhos/cm)	896
9060	Total Organic Carbon	0.6
9020	Total Organic Halides	<0.02
225870	MW27B:06/29/94 @1900(Water)	
9040	pH (std. units)	7.27
9050	Conductivity (umhos/cm)	875
9060	Total Organic Carbon	0.6
9020	Total Organic Halides	<0.02
225871	MW27C:06/29/94 @1900(Water)	
9040	pH (std. units)	7.28
9050	Conductivity (umhos/cm)	883
9060	Total Organic Carbon	0.6
9020	Total Organic Halides	<0.02

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Lab No./ Method No.	Sample Description/ Parameter	Result
225872	MW27D:06/29/94 @1900(Water)	
9040	pH (std. units)	7.28
9050	Conductivity (umhos/cm)	846
9060	Total Organic Carbon	0.7
9020	Total Organic Halides	<0.02
225873	MW27R:06/29/94 @1855(Water)	
9040	pH (std. units)	6.96
9050	Conductivity (umhos/cm)	7
9060	Total Organic Carbon	<0.5
9020	Total Organic Halides	<0.02
225874	MW452A:06/30/94 @0745(Water)	
9040	pH (std. units)	7.07
9050	Conductivity (umhos/cm)	1510
9060	Total Organic Carbon	0.8
9020	Total Organic Halides	<0.02
225875	MW452B:06/30/94 @0745(Water)	
9040	pH (std. units)	7.05
9050	Conductivity (umhos/cm)	1470
9060	Total Organic Carbon	0.9
9020	Total Organic Halides	<0.02
225876	MW452C:06/30/94 @0745(Water)	
9040	pH (std. units)	7.01
9050	Conductivity (umhos/cm)	1490
9060	Total Organic Carbon	0.9
9020	Total Organic Halides	<0.02

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Lab No. / Method No.	Sample Description/ Parameter	Result
225877	MW452D:06/30/94 @0745(Water)	
9040	pH (std. units)	7.05
9050	Conductivity (umhos/cm)	1480
9060	Total Organic Carbon	0.9
9020	Total Organic Halides	<0.02
225878	MW453A:06/30/94 @0830(Water)	
9040	pH (std. units)	7.31
9050	Conductivity (umhos/cm)	1780
9060	Total Organic Carbon	0.8
9020	Total Organic Halides	<0.02
225879	MW453B:06/30/94 @0830(Water)	
9040	pH (std. units)	7.32
9050	Conductivity (umhos/cm)	1830
9060	Total Organic Carbon	0.8
9020	Total Organic Halides	0.03
225880	MW453C:06/30/94 @0830(Water)	
9040	pH (std. units)	7.31
9050	Conductivity (umhos/cm)	1780
9060	Total Organic Carbon	0.7
9020	Total Organic Halides	<0.02
225881	MW453D:06/30/94 @0830(Water)	
9040	pH (std. units)	7.35
9050	Conductivity (umhos/cm)	1760
9060	Total Organic Carbon	0.7
9020	Total Organic Halides	<0.02

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Lab No./ Method No.	Sample Description/ Parameter	Result
225882	MW453R:06/30/94 @0820(Water)	
9040	pH (std. units)	6.77
9050	Conductivity (umhos/cm)	16
9060	Total Organic Carbon	<0.5
9020	Total Organic Halides	<0.02
225883	MW454A:06/29/94 @1800(Water)	
9040	pH (std. units)	7.19
9050	Conductivity (umhos/cm)	752
9060	Total Organic Carbon	0.6
9020	Total Organic Halides	<0.02
225884	MW454B:06/29/94 @1800(Water)	
9040	pH (std. units)	7.17
9050	Conductivity (umhos/cm)	791
9060	Total Organic Carbon	0.6
9020	Total Organic Halides	<0.02
225885	MW454C:06/29/94 @1800(Water)	
9040	pH (std. units)	7.20
9050	Conductivity (umhos/cm)	713
9060	Total Organic Carbon	0.6
9020	Total Organic Halides	<0.02
225886	MW454D:06/29/94 @1800(Water)	
9040	pH (std. units)	7.18
9050	Conductivity (umhos/cm)	831
9060	Total Organic Carbon	0.7
9020	Total Organic Halides	<0.02

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