Petroleum Source Removal Areas of Concern
Former Griffiss Air Force Base
Rome, New York

IRP Sites

LONG-TERM MONITORING REPORT

Contract No. DACW41-02-D-0020
Delivery Order No. 0001

Revision 0.0
February 2005

FPM group

430 1

File: 21-B-2
M.M.

New York State Department of Environmental Conservation
50 Wolf Road, Albany, New York 12233 -7010

430

Thomas C. Jorling
Commissioner

MAR 1 4 1990

Mr. Bruce Mero
Department of the Air Force
Headquarters 416th Combat Support Group (SAC)
Griffiss AFB, NY 13441-5000

Dear Mr. Mero:

Re: Petroleum Cleanups at Griffiss Air Force Base (ID #633006)

With the interagency agreement (IAG) in its finalization process, I would like to take the opportunity to address a point that may be a source of future confusion. That point is whether the IAG will cover petroleum cleanups or not.

Our position on this matter is that the IAG will address petroleum spills which are mixed with hazardous waste or hazardous constituents not found in petroleum or its fractions, or where hazardous constituents are found in concentrations significantly higher than those found in the petroleum itself. However, since the IAG makes no reference to State or federal law providing jurisdiction over pure petroleum contamination, it will not be the vehicle for remediation in such areas. The proper authority, in such cases, will continue to be the New York State Department of Environmental Conservation (NYSDEC), Division of Water, Bureau of Spill Prevention and Response. All petroleum spill reporting and remedial activities should be handled through them.

Should Griffiss Air Force Base, through the IAG, submit for review documents which contain Areas of Concern that are of a pure petroleum nature, it must be understood (1) where comments made by the NYSDEC, Bureau of Eastern Remedial Action, Federal Projects Section conflict with comments or directives of the Bureau of Spill Prevention, the comments or directives of the Bureau of Spill Prevention shall take precedence; (2) neither comments nor the lack of comments under the IAG shall constitute a waiver of the State's rights with regard to pure petroleum spills.

I hope this letter helps to avoid any future misunderstandings with regard to this matter. If you have any questions, please contact me at (518) 457-3976.

Sincerely,

Jonathan Greco

Jonathan Greco
Federal Projects Section
Bureau of Eastern Remedial Action
Division of Hazardous Waste Remediation

cc: Major Michael Whittington, Air Force Regional Env. Counsel
James Doyle, USEPA, Region II
Robert Wing, USEPA, Region II
Tom Quinn, DOW, Central Office
Joseph Slack, NYSDEC, Central Office
Darrell Sweredoski, RHWRE, Region 6
Jack Marsch, DOW, Region 6, Utica Office
I. Gruber, NYSDEC, Central Office
J. Eckl, NYSDEC, Central Office

HISTORICAL AND CURRENT PETROLEUM SPILLS AT GRIFFISS AFB

NYS Spill #	Date	Location	Material Spilled	Spill Status	Investigation Project Number	IRP Site ID Number	Site Status Work Remaining	Future Project
8504038	18-Feb-86	B/337	Gasoline	Closed - 9/12/97	##########	-	##########	#######
8601227	21-May-86	B/1231-VTA	Fuel oil	Closed - 10/5/95	##########	-	##########	#######
8601247	22-May-86	B/1225,1253	Fuel oil	Closed - 10/5/95	##########	-	##########	#######
8603469	26-Aug-86	B/316	Fuel oil	Closed - 3/21/97	##########	-	##########	#######
8603739	8-Sep-86	B/329	Fuel oil	Closed - 3/21/97	##########	-	##########	#######
8603740	8-Sep-86	B/337	Gasoline	Closed - 9/12/97	##########	-	##########	#######
8603742	8-Sep-86	B/440	Fuel oil	Closed - 3/21/97	##########	-	##########	#######
8603762	9-Sep-86	B/438	Fuel oil	Closed - 9/12/97	##########	-	##########	#######
8603763	9-Sep-86	6304,6305 TF #2	Av Gas	Closed - 9/24/04	##########	-	##########	#######
8603771	9-Sep-86	B/444	Fuel oil	Closed - 9/12/97	##########	-	##########	#######
8603788	10-Sep-86	B/817	Fuel oil	Closed - 12/5/97	##########	-	##########	#######
8603789	10-Sep-86	B/45	Fuel oil	Closed - 3/21/97	##########	-	##########	#######
8603879	15-Sep-86	B/428	Fuel oil	Closed - 9/12/97	##########	-	##########	#######
8603949	18-Sep-94	UST 442-1	Fuel oil	Closed - 3/17/97	##########	-	##########	#######
8603951	18-Sep-86	B/452	Fuel oil	Closed - 9/12/97	##########	-	##########	#######
8604051	23-Sep-86	B/791	Fuel oil	Closed - 3/21/97	##########	-	##########	#######
8604235	1-Oct-86	UST 823-1	Fuel oil	Closed - 9/16/03	##########	-	##########	#######
8604280	3-Oct-86	B/822	Fuel oil	Closed - 10/4/04	##########	-	##########	#######
8604568	17-Oct-86	B/879	Fuel oil	Closed - 3/21/97	##########	-	##########	#######
8604780	18-Oct-86	B/510	Fuel oil	Closed - 7/2/02	##########	-	##########	#######
8604816	28-Oct-86	B/43, Tank 5	Gasoline	Closed - 7/19/99	##########	-	##########	#######
8808975	17-Feb-89	B/859	Fuel oil	Closed - 7/27/01	##########	-	##########	#######
8900166	6-Apr-89	B/1259 VTA	Fuel oil	Closed - 10/5/95	##########	-	##########	#######
8903144	26-Jun-89	B/771, PH 5	Jet fuel	OPEN	02-6009 (CAPE)	ST-37	Site Closed - Spill Open - Landfarm Soil	#######
8907302	24-Oct-89	Newport TA	Fuel oil	Closed - 10/5/95	##########	-	##########	#######
8907867	8-Nov-89	B/100 South	Waste oil	Closed - 6/23/05	##########	-	##########	#######
8910167	24-Jan-90	B/786 - Surface	Waste oil	Closed - 10/18/02	##########	-	##########	#######
8910168	24-Jan-90	B/786 - Sub-surface	Jet fuel	OPEN	05-6040 (FPM)	-	Biovent system & FPR for petroleum	FPM/LTM/PBC
9007614	10-Oct-90	B/1245 VTA	Fuel oil	Closed - 10/5/95	##########	-	##########	#######
9007821	17-Oct-90	B/1277 VTA	Fuel oil	Closed - 10/5/95	##########	-	##########	#######
9008637	7-Nov-90	B/800	Fuel oil	Closed - 5/31/95	##########	-	##########	#######
9009289	26-Nov-90	B/150 Joker	Fuel oil	Closed - 5/31/95	##########	-	##########	#######
9009361	27-Nov-90	Starr Hill Site	Fuel oil	Closed - 8/4/95	##########	-	##########	#######
9101749	14-May-91	B/210, B/480	Fuel oil	Closed - 7/27/01	##########	-	##########	#######
9101849	16-May-91	B/855	Fuel oil	Closed - 3/21/97	##########	-	##########	#######
9104691	31-Jul-91	B/150	Fuel oil	Closed - 5/31/95	##########	-	##########	#######
9104707	31-Jul-91	B/654	Jet fuel	Closed - 12/26/00	##########	-	##########	#######
9107369	10-Oct-91	B/337	Gasoline	Closed - 4/27/01	##########	-	##########	#######
	9-Oct-96	USTs 337	Gasoline	##########	##########	-	##########	#######
9109658	10-Dec-91	B/782 (OWS/AOC)	Waste oil	Closed - 6/21/05	##########	-	##########	#######

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NYS Spill #	Date	Location	Material Spilled	Spill Status	Investigation Project Number	IRP Site ID Number	Site Status Work Remaining	Future Project
9111732	14-Feb-92	B/26	Jet fuel	Closed - 12/7/00	#########	-	#########	######
9111733	14-Feb-92	TF's 1 and 3	Av Gas	OPEN	02-7040 (FPM)	SS-20	Soil in landfarm, site to AOC LTM	FPM/LTM/PBC
9201163	29-Apr-92	Gam Lane	Diesel	Closed - 12/1/98	#########	-	#########	######
9201395	5-May-92	B/133 - OWS	Waste oil	Closed - 3/11/99	#########	-	#########	######
9201792	13-May-92	Donaldson Road	Hydr. Fluid	Closed - 9/12/97	#########	-	#########	######
9202658	4-Jun-92	B/781, PH 1	Jet fuel	OPEN	05-6040 (FPM)	SS-54	Biovent/ FPM LTM	FPM/LTM/PBC
9202808	8-Jun-92	B/896	Diesel	Closed - 7/27/01	#########	-	#########	######
9203492	23-Jun-92	B/846, WSA	Fuel oil	Closed - 7/9/99	#########	-	#########	######
9204543	20-Jul-92	B/43, OWS	Gasoline	OPEN	02-7040 (FPM)	-	Add. soil disposed of. Awaiting closure	FPM/LTM/PBC
9205918	21-Aug-92	B/745	Fuel oil	Closed - 3/21/97	#########	-	#########	######
9205919	21-Aug-92	B/769	Diesel	Closed - 9/16/03	#########	-	#########	######
9208334	22-May-92	Trnsf Pipeline - T/10	Jet fuel	Closed - 6/22/05	#########	-	#########	######
9211169	28-Dec-92	Brooks Rd.	Gasoline	Closed - 2/28/95	#########	-	#########	######
9304639	Unknown	Apron 1, E-8	Jet fuel	Closed - 10/5/95	#########	-	#########	######
9312887	31-Jan-94	B/820 WSA	Fuel oil	Closed - 2/6/97	#########	-	#########	######
9312888	29-Jan-94	B/43 - Island	Gasoline	Closed - 7/19/99	#########	-	#########	######
9313076	3-Feb-94	B/43 - Pipe	Gasoline	OPEN	02-7040 (FPM)	ST-26	Add. soil disposed of. Awaiting closure	FPM/LTM/PBC
9313077	3-Feb-94	Ava Test Site	Fuel oil	Closed - 8/7/97	#########	-	#########	######
9315099	23-Mar-94	B/101	Hydr. Fluid	Closed - 2/6/97	#########	-	#########	######
9400319	7-Apr-94	BCF load	Jet fuel	Closed - 2/6/97	#########	-	#########	######
9404435	30-Jun-94	B/771 PH5 (pipe)	Jet fuel	Closed - 10/23/98	#########	-	#########	######
9410029	26-Oct-94	B/510, Hosp.	Fuel oil	Closed - 2/6/97	#########	-	#########	######
9413303	6-Jan-95	OWS 100-2	Waste oil	Closed - 12/30/02	#########	-	#########	######
9413416	9-Jan-95	OWS 5730 (B/782)	Waste oil	OPEN	05-6040 (FPM)	SD-41	Biovent system for petroleum (xx-6012)	FPM/LTM/PBC
9503481	21-Jun-95	B/779, PH 2	Jet fuel	Closed - 6/22/05	#########	-	#########	######
9505336	31-Jul-95	B/775, PH 3	Jet fuel	Closed - 02/20/03	#########	-	#########	######
9507364	13-Sep-95	Barge Canal Fac. - MW3	Jet fuel	OPEN	05-6040 (FPM)	-	Pilot study - FPM LTM (xx-6013)	FPM/LTM/PBC
9510184	1-Nov-95	FPTA - ANG SITE	Jet fuel	OPEN	02-7040 (FPM)	SFT-30	Groundwater investigation	FPM/LTM/PBC
9510187	1-Nov-95	FPTA - ANG OWS	Jet fuel	OPEN	02-6009 (CAPE)	-	Site Closed - Spill Open - Landfarm Soil	######
9605891	7-Aug-96	APRON 1	Jet Fuel	Closed - 10/6/97	#########	-	#########	######
9605894	7-May-96	UST 724-3	Fuel oil	Closed - 9/12/97	#########	-	#########	######
9605897	28-May-96	UST 936A	Fuel oil	Closed - 12/5/97	#########	-	#########	######
9605899	28-May-96	UST 936B - Pipes	Fuel oil	Closed - 7/16/97	#########	-	#########	######
9605900	9-May-96	UST 326	Fuel oil	Closed - 9/12/97	#########	-	#########	######
9605901	11-Jun-96	AST 632	Fuel oil	Closed - 12/5/97	#########	-	#########	######
9605902	31-May-96	UST 110 (6324)	Gasoline	Closed - 9/12/97	#########	-	#########	######
9605903	28-May-96	UST 838-2	Fuel oil	Closed - 12/5/97	#########	-	#########	######
9605904	2-Jul-96	UST 412	Fuel oil	Closed - 9/12/97	#########	-	#########	######
9605905	28-May-96	UST 846-2	Fuel oil	Closed - 12/5/97	#########	-	#########	######
9605906	26-Jun-96	UST 417	Fuel oil	Closed - 7/3/97	#########	-	#########	######
9605907	2-Jul-96	UST 415B	Fuel oil	Closed - 7/3/97	#########	-	#########	######
9605908	28-May-96	UST 014-2	Fuel oil	Closed - 6/22/05	#########	-	#########	######

NYS Spill #	Date	Location	Material Spilled	Spill Status	Investigation Project Number	IRP Site ID Number	Site Status Work Remaining	Future Project
9605909	17-Jul-96	B/773, PH 4	Jet Fuel	OPEN	99-6040 (FPM)	-	Report under DEC review, anticip. closure	#######
9607373	15-Aug-96	UST 917-1,2,3	Jet fuel	Closed - 7/9/99	##########	-	##########	#######
9608239	15-Sep-96	Apron 2	Jet fuel	Closed - 10/2/96	##########	-	##########	#######
9608374	15-Aug-96	UST 938-2	Fuel oil	Closed - 7/3/97	##########	-	##########	#######
9609336	9-Oct-96	UST 319A	Fuel oil	Closed - 02/6/03	##########	-	##########	#######
9609337	12-Sep-96	UST 322	Fuel oil	Closed - 7/3/97	##########	-	##########	#######
9609338	3-Sep-96	UST 332-drums	Fuel oil	Closed - 6/29/99	##########	-	##########	#######
9609339	18-Sep-96	UST 481	Fuel oil	Closed - 7/3/97	##########	-	##########	#######
9609340	3-Oct-96	UST 500A	Fuel oil	Closed - 9/12/97	##########	-	##########	#######
9609341	8-Oct-96	UST 504	Fuel oil	Closed - 1/25/01	##########	-	##########	#######
9609342	24-Sep-96	UST 506	Fuel oil	Closed - 7/3/97	##########	-	##########	#######
9609343	16-Sep-96	UST 921	Fuel oil	Closed - 12/5/97	##########	-	##########	#######
9609344	24-Sep-96	UST 817-2	Fuel oil	Closed - 12/5/97	##########	-	##########	#######
9609345	21-Oct-96	UST 426	Gasoline	OPEN	02-6009 (CAPE)	-	Site Closed - Spill Open - Landfarm Soil	#######
9609346	10-Oct-96	Barge Canal	Jet fuel	Closed - 12/22/97	##########	-	##########	#######
9610374	4-Nov-96	UST 226	Fuel oil	Closed - 9/12/97	##########	-	##########	#######
9610375	5-Nov-96	UST 318	Fuel oil	Closed - 9/12/97	##########	-	##########	#######
9610377	5-Nov-96	UST 406	Fuel oil	Closed - 9/12/97	##########	-	##########	#######
9610378	4-Nov-96	UST 485	Fuel oil	Closed - 9/12/97	##########	-	##########	#######
9610379	4-Nov-96	UST 701	Fuel oil	Closed - 9/12/97	##########	-	##########	#######
9610380	4-Nov-96	UST 820-2	Fuel oil	Closed - 7/27/01	##########	-	##########	#######
9610381	4-Nov-96	UST 842-2	Diesel	Closed - 7/9/99	##########	-	##########	#######
9610382	11-Nov-96	UST 498	Fuel oil	Closed - 9/12/97	##########	-	##########	#######
9610383	11-Nov-96	UST 912	Fuel oil	Closed - 12/5/97	##########	-	##########	#######
9614094	4-Mar-97	Central Heat Plant	Reactor oil	Closed - 8/3/99	##########	-	##########	#######
9702165	7-May-97	OWS/UST 215	Waste oil	Closed - 7/18/01	##########	-	##########	#######
9702167	7-May-97	AST 316	Fuel oil	Closed - 12/19/01	##########	-	##########	#######
9702168	7-May-97	AST 468-2	Fuel oil	Closed - 12/19/01	##########	-	##########	#######
9702169	7-May-97	UST 930-2	Diesel	Closed - 11/10/00	##########	-	##########	#######
9702171	12-May-97	UST 133	Waste oil	OPEN	99-6040 (FPM)	ST-53	Report under DEC review, anticip. closure	#######
9702173	7-May-97	AST 009-2	Kerosene	Closed - 09/24/04	##########	-	##########	#######
9702174	7-May-97	UST 805-2	Fuel oil	OPEN	02-6009 (CAPE)	-	Site Closed - Spill Open - Landfarm Soil	#######
9704483	4-Jun-97	UST 704-2	Fuel oil	Closed - 9/27/01	##########	-	##########	#######
9704484	4-Jun-97	UST 790-2	Fuel oil	Closed - 4/20/01	##########	-	##########	#######
9704485	4-Jun-97	UST 823-2	Fuel oil	Closed - 3/11/99	##########	-	##########	#######
9704486	10-Jun-97	OWS/UST - 5773	Jet fuel	OPEN	99-6040 (FPM)	-	Report under DEC review, anticip. closure	#######
9704488	10-Jun-97	OWS/UST - 5774	Jet fuel	Closed - 2/29/00	##########	-	##########	#######
9704489	1-Jul-97	UST 119-2	Gasoline	Closed - 11/10/00	##########	-	##########	#######
9704490	1-Jul-97	UST 131	Diesel	Closed - 09/27/04	##########	-	##########	#######
9706037	18-Aug-97	B/47 X-former	Oil	Closed - 9/5/97	##########	-	##########	#######
9706955	27-Aug-97	UST 220-6	Waste oil	Closed - 11/5/02	##########	-	##########	#######
9706957	4-Sep-97	UST 7001-3&5	Jet fuel	OPEN	05-6040 (FPM)	-	Biovent system for petroleum (xx-6012)	FPM/LTM/PBC

NYS Spill #	Date	Location	Material Spilled	Spill Status	Investigation Project Number	IRP Site ID Number	Site Status Work Remaining	Future Project
9707954	15-Sep-97	Apron 1	Jet fuel	OPEN	05-6040 (FPM)	-	Biovent system for petroleum (xx-6012)	FPM/LTM/PBC
9709364	***27-Oct-97***	***UST 745-2***	***Fuel oil***	***Closed - 02/18/05***	##########	-	Spill Closed - Landfarm Soil Remains	#######
9709365	***3-Nov-97***	***UST 440-2***	***Fuel oil***	***Closed - 4/20/01***	##########	-	##########	#######
9709366	10-Nov-97	OWS 015-3	Waste oil	OPEN	05-6040 (FPM)	-	Groundwater investigation	FPM/LTM/PBC
9713631	9-Mar-98	Apron 2	Jet fuel	OPEN	05-6040 (FPM)	-	Biovent system for petroleum (xx-6012)	FPM/LTM/PBC
9713632	9-Mar-98	UST 5771	Waste oil	OPEN	02-6009 (CAPE)	-	Site Closed - Spill Open - Landfarm Soil	#######
9714424	***30-Mar-98***	***B/43 ANG***	***Gasoline***	***Closed - 7/19/99***	##########	-	##########	#######
9801754	***11-May-98***	***OWS/UST-011***	***Waste oil***	***Closed - 11/12/02***	##########	-	##########	#######
9808464	***9-Oct-98***	***OWS 101-3***	***Waste oil***	***Closed - 11/4/02***	##########	-	##########	#######
9808466	***9-Oct-98***	***OWS 220/221***	***Waste oil***	***Closed - 11/6/02***	##########	-	##########	#######
9810713	24-Nov-98	Bldg 789 GAM Lane	Jet fuel	OPEN	05-6040 (FPM)	-	Free product removal (xx-6012)	FPM/LTM/PBC
9810949	1-Dec-98	UST 654-1 (2000g UST)	Jet fuel	OPEN	05-6040 (FPM)	-	Pilot study - FPM LTM (xx-6013)	FPM/LTM/PBC
9902802	***10-Jun-99***	***PAD 5750***	***Jet fuel***	***Closed - 6/23/05***	##########	-	##########	#######
9950016	***9-Aug-99***	***UST 324-2***	***Fuel oil***	***Closed - 1/31/01***	##########	-	##########	#######
9950017	***9-Aug-99***	***USTs 5920-1,2,3***	***Gasoline***	***Closed - 9/26/03***	##########	-	##########	#######
9950018	***9-Aug-99***	***UST 748-2***	***Fuel oil***	***Closed - 9/16/03***	##########	-	##########	#######
2004986	26-Jul-00	UST 821	Fuel oil	OPEN	02-6009 (CAPE)	-	Site Closed - Spill Open - Landfarm Soil	#######
2009824	29-Nov-00	Barge Canal ASTs	Jet fuel	OPEN	05-6040 (FPM)	-	Pilot study - FPM LTM (xx-6013)	FPM/LTM/PBC
2011043	***9-Jan-01***	***AST-790***	***Waste oil***	***Closed - 4/20/01***	##########	-	##########	#######
2013345	21-Mar-01	UST-305-2	Waste oil	OPEN	02-6009 (CAPE)	-	Site Closed - Spill Open - Landfarm Soil	#######
2150007	***6-Sep-01***	***Otis Street Pipeline***	***Jet fuel***	***Closed - 10/16/03***	##########	-	##########	#######
2109015	10-Dec-01	UST-702	Fuel oil	OPEN	02-6009 (CAPE)	-	Site Closed - Spill Open - Landfarm Soil	#######
2109826	11-Jan-02	UST-325	Fuel oil	OPEN	02-6009 (CAPE)	-	Site Closed - Spill Open - Landfarm Soil	#######
2200960	25-Apr-02	UST-404	Fuel oil	OPEN	02-6009 (CAPE)	-	Site Closed - Spill Open - Landfarm Soil	#######
2202337	4-Jun-02	UST-705	Fuel oil	OPEN	02-6009 (CAPE)	-	Site Closed - Spill Open - Landfarm Soil	#######
2300057	***10-Oct-00***	***UST-793-3***	***Fuel oil***	***Closed - 02/18/05***	##########	-	Spill Closed - Landfarm Soil Remains	#######
2300066	8-Jun-98	AST-015-4	Hydr. Fluid	OPEN	02-6009 (CAPE)	-	Site Closed - Spill Open - Landfarm Soil	#######
2500931	22-Apr-05	Alert Apron	Jet fuel	OPEN	Family Dollar	-	Family Dollar Contractor to excavate	#######

TOTAL HISTORICAL SPILLS = 151
TOTAL CLOSED SPILLS = 120
TOTAL OPEN SPILLS = 31

Open Spills Assigned to FPM LTM PBC = 11
Open Spills with anticipated closure = 3
Open Spills Assigned to CAPE (Landfarm) = 12
Open Spills Assigned to FPM AOC LTM PBC = 4
Other Spills (Family Dollar) = 1
TOTAL OPEN SPILLS = 31

** NOTE: in the first column, a 2 that precedes a spill is actually a 0 for the spill number. Excel will not count a cell that begins with 0.

Spills that are IRP Sites = 7

Table D-1

Inventory of Installation Restoration Program Sites

18 Sep 2003

IRP Site No.	Old Site No.	Mgmt Unit	Study Area	Site Name	Site Status	Stage	Project No. 1	Project No. 2	Project No. 3	Project No. 4	Transfer Status	Category	EBS ID No
AOI/AOC 9	-	N / Q	2/7	WSA Landfill	AOI	RI/FS	957090	977001	97701			6	AOI-9
DP-11	OT-11	H	21	B3 - Drywell	AOC	PROD-IC	937082	947082			RL	3	DRY-003-01
DP-12	OT-12	G	20	B301 - Former Entomology Shop Drywell	AOC	ROD-IC	937082				T	3	DRY-301
DP-13	OT-13	G	10	B255 - Two Drywells	AOC	ROD-IC	937082	967006	977006		RFT	4	DRY-255-01
DP-15	OT-15	G	10	B219 - Drywell	AOC	ROD-IC	937082	947082			RFT	3	DRY-219
DP-22	-	G	10	B222 - Battery Acid Disposal Pit	AOC	ROD-IC	937082	967006	977006		RFT	4	DRY-222-02
DP-27	DP-27	M	11	B101 - Battery Acid Disposal Pit	see ST-06							4	
DP-59	-	P	4	Explosive Disposal Site	AOI	CLOSED	947011	977010	977001		PRFT	1	ORD-6025-02
FT-30	-	L	6	Fire Protection Training Area	AOC	SPI	937082	947082	977007			5	
FT-48	-	Q	7	Suspected Fire Training Area	AOC	ROD-NFA	937082	947082	977007		RFT	1	
LF-01	-	P	4	Landfill 1	AOC	RA	937082	947082	977007	987002		5	
LF-02	-	R	13	Landfill 2 and 3	AOC	RA	937082	947082	977007	987002		5	
LF-03	-	O	12	Landfill 7	AOC	RA	937082	947082	977007	987002		4	
LF-07	-	E	26	Landfill 5	AOC	RA	937082	947082	977007	987002		4	
LF-09	-	E	35	LF-09-01, Landfill 6	AOC	RA	937082	947082	977007	987002		6	
LF-28	-	E	35	Landfill 4	AOC	ROD-LTM	937082	947082	977006		RFT	4	
LF-29	LF-29	R	13	Landfill 3	see LF-02							5	
LF-49A	-	P	4	Hardfill Area - AOI 26	AOI	PNFA	966005	976005	007005		PRFT	4	
LF-49B	-	N	4	Hardfill Area - (HF-49B) - AOI 27	AOI	PNFA	966005	976005			PRFT	4	
LF-49C	-	E	35	Hardfill Area - AOI 28	AOI	PNFA	966005	976005			PRFT	4	
LF-49D	-	E	26	Hardfill Area - AOI 29	AOI	PNFA	966005	976005			PRFT	4	
LF-56	-	P	3	Bivouac Dump Site	AOI	PNFA	957090	977001				3	AOI-431

Table D-1

Inventory of Installation Restoration Program SIte

18 Sep 2003

IRP Site No.	Old Site No.	Mgmt Unit	Study Area	Site Name	Site Status	Stage	Project No. 1	Project No. 2	Project No. 3	Project No. 4	Transfer Status	Category	EBS ID No
OT-61	-	P	4	Small Arms Range	AOI	PNFA			007005		PRFT	4	
SD-31	-	D / E	25/26/35/37	Threemile Creek	AOC	RD	937082	947082	977007			6	
SD-32	-	J / N / Q	2/4/7/12/30	Sixmile Creek and Weapons Storage Area Lagoon	AOC	PP-LTM	937082	947082	977007			3	
SD-41	-	J	29	B782 - Nose Dock 1 and 2	AOC	RD/RA	937082	960020	007007			5	OWS-5730
SD-43	-	ALL	ALL	Off-base Groundwater Now Part of SD-52	see SD-52								
SD-47	-	G	10	B215, B216 - Oil/Water Separator	PET	NFA	960020				RFT	2	
SD-50	-	G	10	SD-50-01, B214 - Former Vehicle Shop Oil/Water Separator	AOC	ROD-IC	937082	947082			RFT	3	
SD-50	-	G	10	SD-50-02, B214 - 275 Gallon Waste Oil UST Area	AOC	ROD-IC	937082	947082			RFT	3	
SD-52	-	J / O	12 / 29 / 30	SD-52-01, Apron 2 Chlorinated Plume	AOC	FS	947082	977003	017008			6	
SD-52	-	H / M	11 / 16	SD-52-03, B101 GW Plume	AOC	FS	947082	977003				6	
SD-52	-	N / Q	2 / 7	SD-52-05, WSA Chlorinated Plume	AOC	FS	947082	977003	017007			6	
SD-52	-	E	35	SD-52-04, Landfill 6 Chlorinated Plume	AOC	FS	947082	977003	017007			6	
SD-52	SS-38	F	28	SD-52-02, B775 Chlorinated Plume	AOC	FS	947082	977003	017007			6	
SS-05	-	G	20	Lindane Spill - Former Entomology Shed	AOI	CLOSED	957090	977001	977001		T	3	AOI-102
SS-08	-	H	16	SS-08-01, B112 - PCB Spills, USTs, and Lab Drywell	AOC	PROD-IC	937082	967006	977006		RFT	4	DRY-112-01
SS-08	-	H	16	SS-08-02, B112 - Transformer enclosure Area	AOC	PROD-IC	937082	967006	977006		RFT	4	SS-08
SS-08	-	H	16	SS-08-03, B112 - Lab Drywell	AOC	PROD-IC	937082	967006	977006		RFT	4	SS-08
SS-14	-	ALL	ALL	General Chlordane Application	NFA	CLOSED					RFT	3	
SS-16	-	F	40	Floyd Annex	IRP	CLOSED					T	N/A	
SS-17	-	I	27	Lot 69 - Former Hazardous Waste Storage Yard	AOC	PROD-IC	937082	947082			T	3	
SS-18	-	M	11	B101 - Waste Oil Storage Area	NFA	CLOSED					RFT	3	

Table D-1

Inventory of Installation Restoration Program Sites

18 Sep 2003

IRP Site No.	Old Site No.	Mgmt Unit	Study Area	Site Name	Site Status	Stage	Project No. 1	Project No. 2	Project No. 3	Project No. 4	Transfer Status	Category	EBS ID No
SS-19	SS-19	H	16	B112 - PCB Transformer Leak	see SS-08							4	
SS-20	-	H	16	Tank Farm 1, 3	SRS	See UST Pr	957050	976042B	0077007		T	2	
SS-23	OT-23	I	27	B20 - Locomotive Storage Facility	AOC	ROD-IC	937082	967006	977006		T	3	
SS-24	-	M	11	Fire Demonstration Area	AOC	ROD-IC	937082	947082	977007		RFT	3	
SS-25	-	I	18	T-9 Storage Area	AOC	ROD-IC	937082	947082	960042A		T	2	AST-009-02, AST-009-03
SS-33	-	I / J	27	SS-33-01, Proposed Coal Storage Yard	AOC	PIC	937082	967008			T	4	
SS-33	UXO-56	I	27	SS-33-02, Coal Storage Yard	AOC	PIC	937082	967008			T	4	
SS-34	-	J	29	B786 Nose Dock 5-Soil Contam-Delisted No ROD Req'd	AOC	CLOSED	937082	947082	017008		RFT	2	
SS-38	-	F	28	B775 - Pumphouse 3, TCE Contamination	AOC	FS	937082	947082	017007			6	
SS-40	OT-40	N / Q	2/7	Weapons Storage Area - JP4 Fuel Spill	NFA	CLOSED	957090	977001	977001			2	
SS-44	-	E	26	Electrical Power Substation	AOC	PROD-IC	937082	947082	977006		PRFT	4	
SS-45	OT-45	P	4	Industrial Soils Collection Pad	AOI	CLOSED	957090	977001	970636			4	AOI-90
SS-46	OT-46	I	18	SS-46-05, B43 Glycol Storage/Use Area- Delisted No ROD Req'd	AOC	CLOSED	937082	947082			RFT	3	SS-46
SS-46	OT-46	J	29	SS-46-04, B785 Glycol Storage/Use Area- Delisted No ROD Req'd	AOC	CLOSED	937082	947082			RFT	3	SS-46
SS-46	OT-46	G	10	SS-46-02, B220 Area of Reported Glycol Release From Base Vehicles - Delisted No ROD Req'd	AOC	CLOSED	937082	947082			RFT	3	SS-46
SS-46	OT-46	G	10	SS-46-03, B220 Area of Glycol Drum Storage (2-3 Drums) - Delisted No ROD Req'd	AOC	CLOSED	937082	947082			RFT	3	SS-46
SS-46	OT-46	J	30	SS-46-01, Apron 2 Glycol Use / Deicing Area	AOC	CLOSED	937082	947082				3	SS-46
SS-54	-	F	28	SS-54-01, B781 - Pumphouse 1 USTs	AOI	RD/RA	930054	007007				2	
SS-54	-	F / J	28	SS-54-02, B781 - Pumphouse 1 Jet Fuel Plume	AOI	RD/RA	930054	007007				2	
SS-55	-	L	6	TW18 Spill Site	AOI	NFS	957090				RFT	1	AOI-260

Table D-1

Inventory of Installation Restoration Program SIte

18 Sep 2003

IRP Site No.	Old Site No.	Mgmt Unit	Study Area	Site Name	Site Status	Stage	Project No. 1	Project No. 2	Project No. 3	Project No. 4	Transfer Status	Category	EBS ID No
SS-58	-	M	11	Aqua System Pipeline		RA	947009	967005	007007		RFT	2	
SS-60	-	I	27	B35 / B36 HWSA	NFA	CLOSED	950036				RFT	4	
ST-04	-	A	38	Bulk Fuel Storage Area - Barge Canal		ROD-NFA	957050	976042B			T	2	UST-654-02
ST-06	-	M	11	B101 - Yellow Submarine, BADP and Disposal Pit	AOC	PROD-IC	937082	947082	95-0036		PRFT	1	
ST-10	-	H	16	B117 Drywell	NFA	CLOSED					RFT	2	
ST-21	-	G	15	ST-21-02, B210 - Former UST 210-01	SRS	PROD-NFA	957050	976072B				2	
ST-21	-	G	15	ST-21-01, B210 - Former Unnamed UST and UST 210-02	SRS	PROD-NFA	957050	976072B				2	
ST-26	ST-26	I	18	B43 - Refueling Station	SRS	See UST Pr	960042					2	
ST-35	-	H	21	B26 - Former Pumping Station	SRS	ROD-NFA	957050					2	
ST-36	-	M	11	B110 - Aqua Refueling Station	SRS	GW	890062	976042B				2	
ST-37	OT-37	J	29	B771 - Pumphouse 5	SRS	PNFA	957050	960021				2	
ST-39	-	H	16	B117 - Former Steam Plant	SRS	ROD-NFA	957050				T	2	
ST-42	-	ALL	ALL	Basewide UST Removal	see UST Program							2	
ST-51	-	M	11	B100 - Fuel Hydrant System	SRS	GW	957050	976042B				2	POL-0100
ST-53	-	I	17	B133 - Underground Vault	AOC	RO/RA	937082	960020				5	
ST-57	-	N	1	Northern Clear Zone USTs	AOI	NFS	957090				RFT	1	

Certification of Compliance

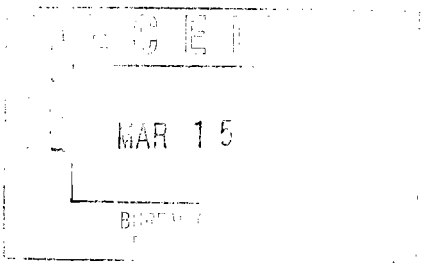
On behalf of FPM Group, Ltd. (FPM), the undersigned certify that the document(s) listed below were developed in conformance with FPM's Quality Control Plan, and further, that the work was performed in accordance with acceptable standards of engineering and scientific practice. Comments made by reviewers will be maintained in the project files in accordance with company policy.

Long-Term Monitoring Report
For Petroleum Source Removal Areas of Concerm
Former Griffiss Air Force Base
Rome, New York
February 2005
Revision 0.0

Contract Number: DACW41-02-D-0020-0002
Task Order No.: 0002

Prepared for:

U.S. Army Corps of Engineers
Kansas City District
601 East 12th Street
Kansas City, Missouri 64106



Niels D. L. van Hoesel
Technical Peer Reviewer — 3/11/05 Date

Niels D. L. van Hoesel
Editorial Reviewer — 3/11/05 Date

Gaby A. Atik, P.E.
Project Manager — 3/11/05 Date

LONG TERM MONITORING REPORT for PETROLEUM SOURCE REMOVAL AREAS of CONCERN

Prepared for:

Air Force Real Property Agency
Former Griffiss Air Force Base
Rome, New York

through

United States Army Corp of Engineers
Kansas City District
Kansas City, Missouri

Prepared by:

FPM Group, Ltd.
153 Brooks Road
Rome, NY 13441

Contract No. DACW41-02-D-0020
Delivery Order No. 0002

Revision 0.0
February 2005

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APPENDICES

(All appendices are located on a CD in the back of this binder.)

LIST OF ACRONYMS AND ABBREVIATIONS

AFB	Air Force Base
AFCEE	Air Force Center for Environmental Excellence
AOC	Area of Concern
AOI	Area of Interest
ARAR	Applicable or Relevant and Appropriate Requirements
AST	aboveground storage tank
AVGAS	aviation gasoline
bgs	below ground surface
BTEX	benzene, toluene, ethylbenzene, xylene
BTOIC	below top of inner casing
COC	contaminant of concern
CSM	Conceptual Site Model
c.y.	cubic yard
DO	dissolved oxygen
EBS	Environmental Baseline Survey
E&E	Ecology and Environmental, Inc.
ESI	Expanded Site Investigation
FFA	Federal Facilities Agreement
FID	flame ionization detector
FPM	FPM Group, Ltd.
FSP	field sampling plan
JP-4	jet propulsion fuel grade 4
LAW	Law Engineering and Environmental Services, Inc.
LTM	long-term monitoring
MDL	method detection limit
MOGAS	automotive gasoline
MSL	mean sea level
NYS	New York State
NYSBC	New York State Barge Canal
NYSDEC	New York State Department of Environmental Conservation
ORC®	Oxygen Release Compound®
OWS	oil water separator
PAH	poly-nuclear aromatic hydrocarbon
PCB	polychlorinated biphenyls

PEER	Peer Consultants P.C.
PID	photoionization detector
ppm	parts per million
QAPP	Quality Assurance Project Plan
RI	Remedial Investigation
RL	reporting limit
SAP	sampling and analysis plan
SI	site investigation
SRA	source removal area of concern
STARS	Spill Technology and Remediation Series
SVOC	semi-volatile organic compound
TAGM	Technical and Administrative Guidance Memorandum
TAL	Target Analyte List
TOGS	Technical and Operational Guidance Series
TPH	Total Petroleum Hydrocarbon
TRC	Tracer Research Corporation
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
UST	underground storage tank
VOC	volatile organic compound
µg/L	micrograms per liter

1 INTRODUCTION

FPM Group Ltd. (FPM) has been contracted by the U.S. Army Corps of Engineers (USACE), Kansas City District, to conduct a long-term monitoring (LTM) program for groundwater at several Petroleum Source Removal Areas of Concern (SRAs) at the former Griffiss Air Force Base (AFB), New York. The LTM program was conducted in accordance with provisions of the Basic Contract # DACW41-02-D-0020 and Delivery Order (DO) #0001 and #0002.

The purpose of the LTM program is to monitor the presence of contaminants of concern (COCs), assess the potential for migration of the COCs, statistically identify groundwater trends for the COCs, and establish an early warning system for assuring compliance with potential COC receptors.

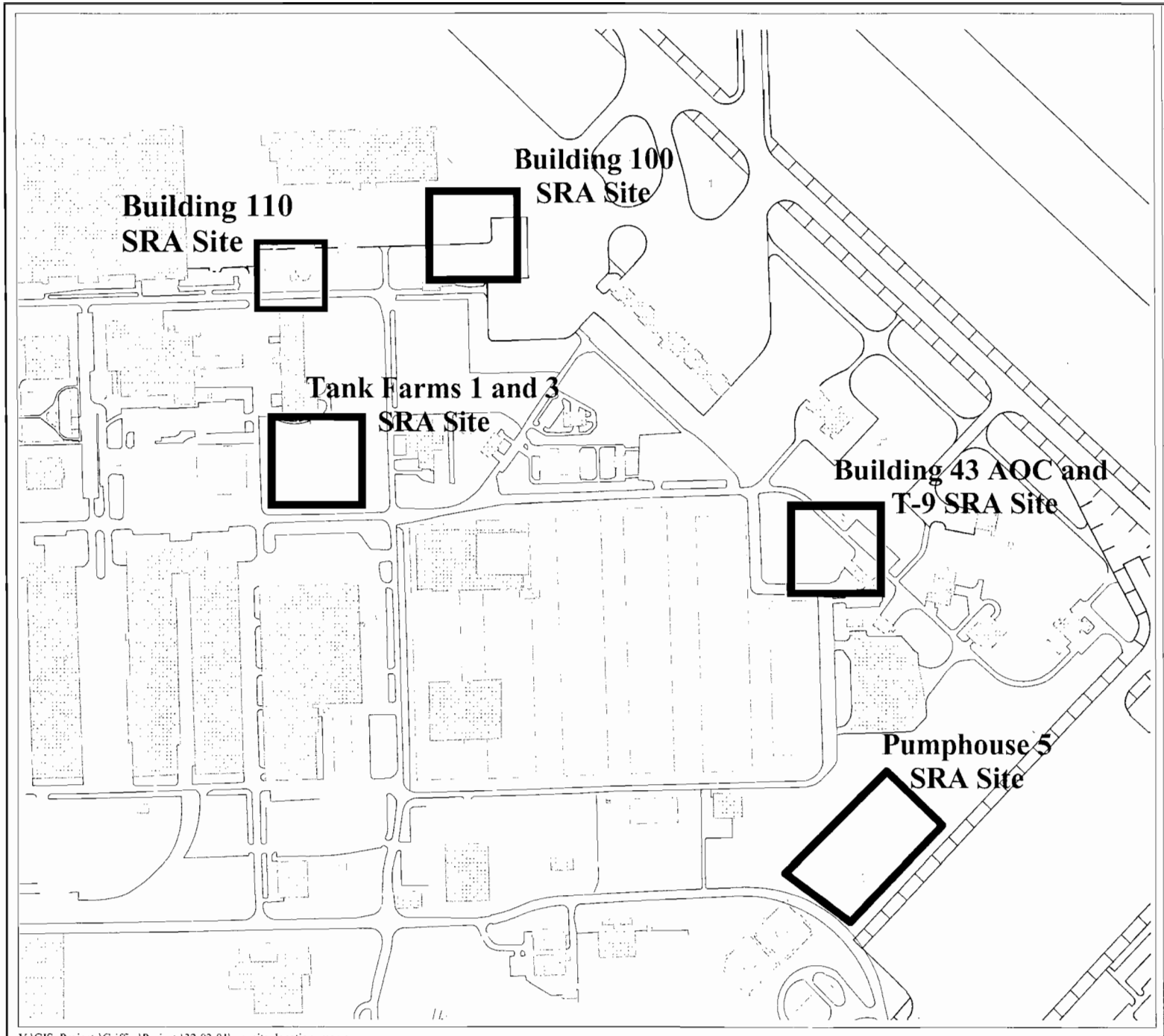
Data evaluation and report preparation for the LTM program includes semi-annual summary updates and a more detailed annual report. The LTM program will also be reviewed periodically to revise sampling locations and/or sampling frequencies for optimal functioning. This semi-annual LTM report includes collection, analysis, and reporting of COCs for the following six SRAs from June 2002 through September 2004:

- Tank Farm 1 and 3 SRA SS-20 (New York State Department of Environmental Conservation [NYSDEC] Spill #9111733)
- Building T-9 SRA SS-25 (NYSDEC Spill #9702173). Spill closed September 24, 2004
- Building 43 SRA ST-26 (NYSDEC Spill #9204543 and #9313076)
- Building 110 SRA ST-36 (NYSDEC Spill #8603763). Spill closure proposed July 2004
- Building 771/Pumphouse 5 SRA ST-37 (NYSDEC Spill #8903144). Site closed October 20, 2004
- Building 100 SRA ST-51 (NYSDEC Spill #9704490). Spill closed September 29, 2004

The locations of the Petroleum SRAs can be reviewed in Figure 1-1. LTM was recommended by FPM and approved by NYSDEC by their approval of site-specific workplans and groundwater monitoring reports for Tank Farms 1 and 3 (FPM, November 2001), T-9 (FPM, January 2003), Building 43 (FPM, May 2003), Building 100 (FPM, April 2003), Building 110 (FPM, July 2001) and Pumphouse 5 (FPM, October 2003).

Groundwater samples were collected from each of the sites listed and analyzed for the respective COCs as identified during previous investigations (e.g., volatile organic compounds [VOCs] and semivolatile organic compounds [SVOCs]). Both existing data and the information from new sampling are utilized for overall performance evaluation.

Groundwater samples were collected and analyzed at as many existing monitoring wells as possible insofar as they were adequately located to track the migration of the COC plume(s).



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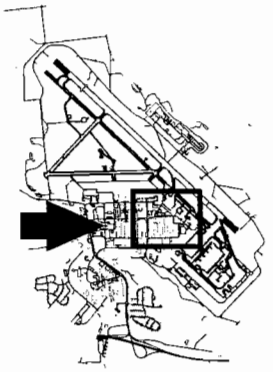

Legend

Road/Airfield

Demolished Building

Existing Building

200 0 200 Feet

UNITED STATES AIR FORCE
GRIFFISS AIR FORCE BASE
ROME, NEW YORK

Figure 1-1
Petroleum Source Removal Areas Location Map

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New monitoring wells were installed at the Building 43, Building 100, and Tank Farms 1 and 3 SRAs to help establish an LTM network to track the migration and/or attenuation of COCs.

New wells were installed according to the protocol as described in the Field Sampling Plan (FSP) (FPM, August 2003). Reference is also made to the AFCEE Quality Assurance Project Plan (QAPP) Version 3.1 (AFCEE, 2001), with project-specific variances. The QAPP together with the FSP form the Sampling and Analysis Plan (SAP).

1.1 LONG-TERM MONITORING APPROACH

1.1.1 Long-Term Monitoring Background

To illustrate how this LTM Program will operate, the following highlights the overall objectives, components, and constraints of the groundwater LTM Program.

The objectives of LTM are:

- To continue refining the conceptual site model (CSM) for groundwater flow so that the predictions regarding the fate and transport of COCs are accurate;
- To establish an early warning monitoring system for the protection of potential receptors prior to completion of exposure pathways;
- To evaluate COC degradation due to remedial action or natural attenuation processes; and
- To collect data that support attainment of spill closure.

Typical components of a groundwater LTM system include:

- One or more upgradient well(s) representative of background conditions; and
- LTM wells that track the COC migration or degradation trend.

Constraints associated with a groundwater LTM system include:

- All monitoring wells must be screened in the same hydrogeologic unit as the COC plume or known/probable groundwater pathway from a potential source; and
- Downgradient LTM wells must be located to detect unexpected variations in groundwater quality as efficiently as possible (i.e., with respect to groundwater migration rates and downgradient flow direction).

Given the above objectives and constraints the design of an LTM system considers the following tasks:

1. Selecting water-level observation wells and water quality monitoring wells from existing monitoring wells and piezometers, or selecting locations for new wells, depending on the

evaluation of existing data (i.e., well logs, water-level measurements, proximity to natural flow boundaries, trends and uncertainties in the existing data) and the specific intended and distinct role of that monitoring point;

2. Providing a statistical evaluation of water-level elevation data for groundwater flow direction, existing COC concentrations, and groundwater chemistry to predict long-term trends;
3. Identifying performance evaluation criteria (e.g., statistical tests), including appropriate analysis methods for evaluating data variations or closure attainment;
4. Identifying water quality sampling frequency at each monitoring point both for
    a) understanding the trends of COCs and/or their indicator analytes, and
    b) minimizing the costs and maximizing the benefits of the program;
5. Identifying physical and chemical parameters (e.g., transport and attenuation properties) for the COCs; and
6. Periodically assessing the LTM monitoring well network for addition of new monitoring wells or possible decommissioning of monitoring wells from the LTM program.

1.1.2 Purpose of LTM Program

Each site-specific LTM Work Plan has identified monitoring points that will best detect groundwater COCs that are known to exist at the Petroleum Source Removal Areas, and track their transport over time to support a decision for either continued monitoring, remedial measures (i.e., free product recovery in those cases where free product is encountered), or spill closure. The LTM Program will use historic data and new information from annual and quarterly sampling rounds at specified existing and new monitoring wells.

2 ENVIRONMENTAL SETTING

2.1 PHYSIOGRAPHY AND TOPOGRAPHY

The former Griffiss AFB is located in the city of Rome in Oneida County, New York (refer to Figure 2-1). The former Base lies within the Mohawk Valley between the Appalachian plateau and the Adirondack Mountains. A rolling plateau northeast of the former Base reaches an elevation of 1300 feet above mean sea level (MSL). The New York State Barge Canal (NYSBC) and the Mohawk River valley south of the former Base lie below 430 feet above MSL. The topography across the former Base is relatively flat with elevations ranging from 435 feet above MSL in the southwest portion to 595 feet above MSL in the northwest portion of the former Base.

2.2 GEOLOGY

Unconsolidated sediments at the former Griffiss AFB consist primarily of glacial till with minor quantities of clay and sand and significant quantities of silt and gravel. The thickness of these sediments range from 12 feet in the northeast portion to more than 130 feet in the southern portion of the former Base. The average thickness of the unconsolidated sediments is 25 to 50 feet in the central portion and 100 to 130 feet in the south and southwest portions of the former Base. The bedrock beneath the former AFB generally dips from the northeast to the southwest and consists of Utica Shale, a gray and black carbonaceous unit with a high/medium organic content (Remedial Investigation (RI), Law Engineering and Environmental Services, Inc. (LAW), 1996).

2.3 HYDROGEOLOGY

The shallow water table aquifer lies within the unconsolidated sediments, where depth to groundwater, during the December 1998 synoptic Base-wide water-level measurement of wells, ranged from just below the ground surface to approximately 57 feet below ground surface (bgs) in the southwest portion of the base and to 63 feet bgs in the northeast portion of the former Base (FPM, September 2000). Several surface water creeks act as discharge areas for shallow groundwater, and drainage culverts and sewers intercept surface water runoff.

A comprehensive description of regional and local geology, hydrogeology, lithology, and hydrology for the former Griffiss AFB was given in the RI (LAW, December 1996), and in the Supplemental Investigation (SI) prepared by Ecology and Environment, Inc. (E&E, July 1998). Detailed site descriptions and the hydrology for each Petroleum Source Removal Area are presented with each site-specific section.

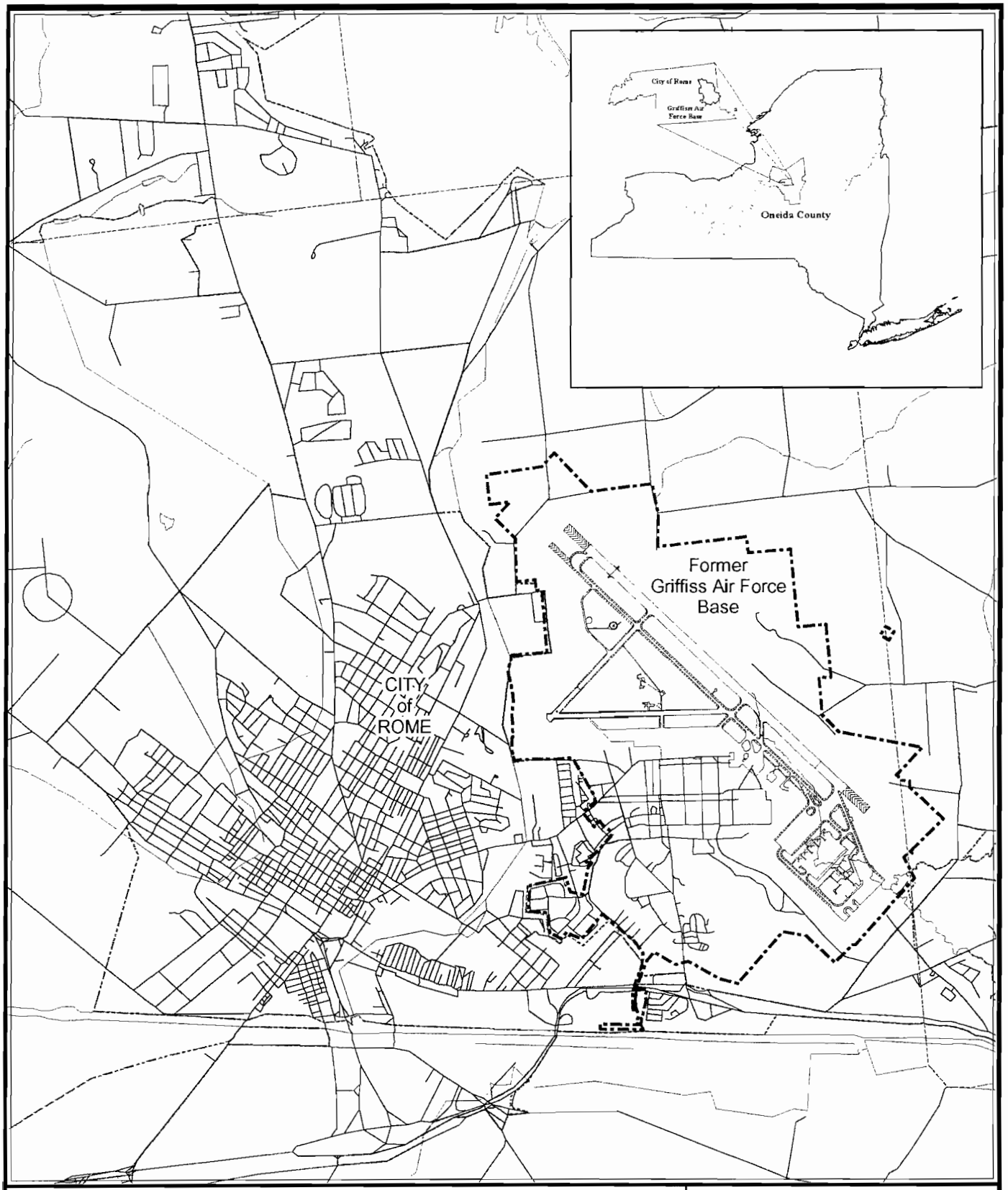

FIGURE 2-1
Base Location Map

UNITED STATES AIR FORCE
GRIFFISS AIR FORCE BASE
ROME,NEW YORK

FPM group

Y:\GIS_Projects\GriffissProjects\32-03-01\AP2_VC_Plume\Base_Location_Map.mxd

2.4 CLIMATE

The former Griffiss AFB experiences a continental climate characterized by warm, humid, moderately wet summers and cold winters with moderately heavy snowfalls. The mean annual precipitation is 45.6 inches, which includes the mean annual snowfall of 107 inches. The annual evapotranspiration rate is 23 inches. The average temperature during the winter season is 20 degrees Fahrenheit; temperatures during the spring, summer, and fall vary from 31 to 81 degrees Fahrenheit. The prevailing winds are from the southwest, with an average wind speed of 5 knots.

The former Griffiss AFB is located in a region prone to acid precipitation; the annual average pH of precipitation recorded for 1992 at the three closest stations ranged from 4.25 to 4.28. Fluctuations in pH have an inverse correlation to precipitation, such that lower pH levels correlate with higher amounts of precipitation (LAW, December 1996).

2.5 BIOLOGY

The former Griffiss AFB, covering 3,552 acres of property within the Erie-Ontario ecozone of the Great Lakes Physiographic Province, has been heavily disturbed from an ecological perspective. Although there are a few undisturbed communities within the former Base's boundary, the 1993 Inventory of Rare Plant Species and Significant Natural Communities identified six significant habitats of special concern occurring on the former Base (New York Natural Heritage Program, 1994). None of these habitats occur adjacent to the Petroleum Source Removal Areas described in this report.

2.6 APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS IDENTIFICATION

At each of the Petroleum Source Removal Areas to be monitored under the LTM Program, the Applicable or Relevant and Appropriate Requirements (ARARs) and other criteria and guidelines to be considered include the NYSDEC Spill Technology and Remediation Series (STARS), Technical and Administrative Guidance Memorandum (TAGM): Determination of Soil Cleanup Objectives and Cleanup Levels, January 1994, NYSDEC Interim Procedures for Inactivation of Petroleum-Impacted Sites, January 1997, and NYSDEC Ambient Water Quality Standards and Guidance Values, June 1998.

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3 TANK FARMS 1 AND 3 SRA (IRP SITE SS-20, NYSDEC SPILL # 9111733)

3.1 SITE LOCATION AND HISTORY

The Tank Farms 1 and 3 SRA is located in the central portion of the former Griffiss AFB, as shown in Figure 1-1. The site is a grass-covered area that is located southeast of Building 112 and is bounded by Brooks Road to the south, Otis Street to the east, and Moody Street to the west. The SRA encompasses the former fuel storage facilities for the following products: aviation gasoline (AVGAS), jet propulsion fuel grade 4 (JP-4), automotive gasoline (MOGAS), diesel fuel, fuel oil, and deicing fluid. The Tank Farms 1 and 3 site layout is shown in Figure 3-1.

Tank Farm 1 is the former location of eight 25,000-gallon underground storage tanks (USTs). The USTs are numerically identified as UST 114-1 through UST 114-8. The tanks originally contained AVGAS, then were used for diesel fuel, MOGAS, and finally fuel oil. Other former facilities associated with Tank Farm 1 include one 50,000-gallon aboveground storage tank (AST) for deicing fluid (AST 6045), one underground 50,000-gallon deicing fluid tank (UST 5885), one pumphouse (Building 114), one pump pit, separator tanks, and one water separator pit. The pumphouse was connected to a railroad car unloading stand with three outlets used to off-load fuel from railroad cars into the tanks (Tetra Tech, September 1994; E&E, December 1997). Open NYSDEC Spill Number 9111733 is associated with former USTs 114-1 through 114-8.

Tank Farm 3 is the former location of four 25,000-gallon USTs (UST 147-1 through -4) that contained JP-4. Other former facilities associated with Tank Farm 3 include two pumphouses (Buildings 147 and 165), one pump pit, separator tanks, one water separator pit, and three aboveground bulk fuel storage tanks (ASTs 161, 162, and 163). The former bulk fuel ASTs originally contained JP-4 but were later used to store fuel oil. Former AST 161 was 840,000 gallons in capacity and former ASTs 162 and 163 were both 420,000 gallons in capacity. Each bulk fuel AST was surrounded by a soil berm.

3.2 DESCRIPTION OF PREVIOUS SAMPLING AND INVESTIGATIONS

In November 1981, Base Fuels verified that 2 to 3 gallons per day of JP-4 leaked from eight valves at Tank Farm 3 for an indefinite period (LAW, February 1995).

In the fall of 1982, investigative soil borings associated with the construction of a steam line were installed to the south of Brooks Road and former Tank Farm 1, where free product was found floating above the water table in the area.

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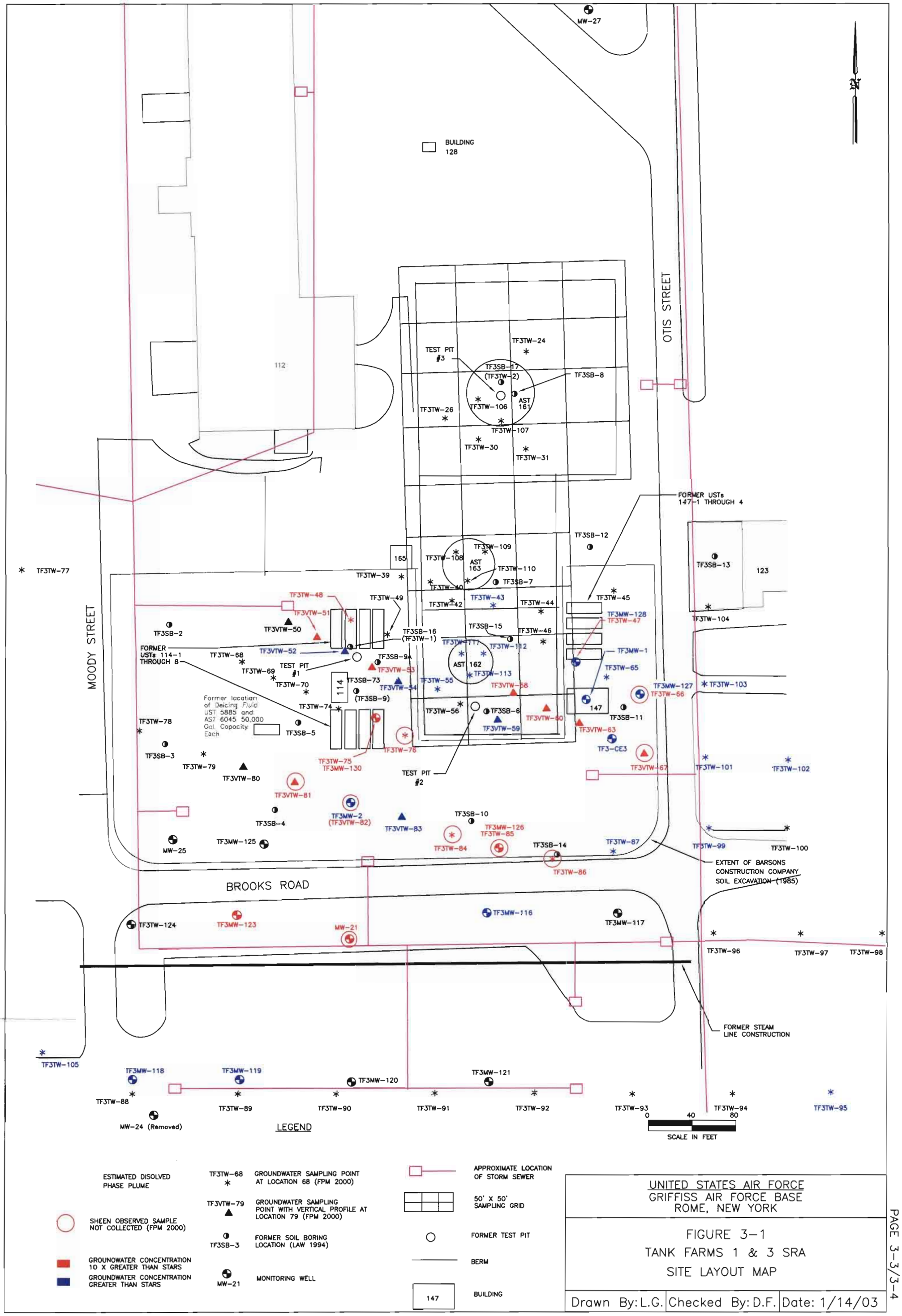

UNITED STATES AIR FORCE
GRIFFISS AIR FORCE BASE
ROME, NEW YORK

FIGURE 3-1
TANK FARMS 1 & 3 SRA
SITE LAYOUT MAP

Drawn By: L.G.	Checked By: D.F.	Date: 1/14/03

In October 1983, the Base Civil Engineering Department installed and sampled well TF3-CE3, shown in Figure 3-1. The well was found to contain free product. When monitoring well TF3-CE3 was sampled again during the summer of 1984, no free product was detected.

In the summer of 1984, Roy F. Weston, Inc. installed 33 temporary wells and eight permanent wells. The Weston report hypothesized that the source of the fuel in the groundwater was potentially contributed by two sources: (1) numerous small spills and leaks from the Tank Farms, and (2) from a former truck maintenance shed that was located north of Building 3, where base personnel informed Weston that waste fuels were discharged to the subsurface via a drywell (Weston, 1985). Review of the 1994 Environmental Baseline Survey (EBS) did not confirm information on drywells or a truck maintenance shed north of Building 3, prior to 1985. The Expanded Site Investigation (ESI) of Area of Interest (AOI) Site 58/101 detected minor SVOCs in surficial soils north of Building 3; however, the groundwater was not impacted (Tetra Tech, 1994).

In November 1985, all ASTs and USTs associated with Tank Farms 1 and 3 were removed, with the exception of the bulk fuel ASTs (AST 161, 162, and 163). While underground piping was being cut and capped at Tank Farm 1, a 4-inch pipe was found to be full of AVGAS. While a similar action was being performed at Tank Farm 3, the contractor discovered 3 inches of fuel on the floor of Building 147 (Tank Farm 3 pumphouse) and fuel in a header pipe. Industrial Tank and Oil Company subsequently removed the fuel (1,200 gallons). There is no indication in the administrative records that endpoint sampling was performed following the removal of the ASTs and USTs.

In December 1985, Barsons Construction Company removed 60,000 cubic yards (c.y.) of contaminated soil and replaced it with clean fill.

In 1988, the bulk fuel ASTs (AST 161, 162, and 163) and associated underground facilities were removed, along with any contaminated soils. The soil berms surrounding the bulk fuel ASTs were used to fill the excavated area previously occupied by the removed contaminated soil and underground facilities. Additional cover soil was placed on top of the former berm material to bring the excavated area to grade.

In 1993 and 1994, monitoring wells TF3MW-21, -25, -27 and TF3-CE3 were sampled as part of the quarterly sampling program. The analytical results indicated no VOC or SVOC exceedances of the NYS Groundwater Standards. No VOC, SVOC, or metal data were found to exist for wells TF3MW-22, -23, -24, -26, and -28. Based on the October 1998 well/piezometer inventory (E&E, 1999), and visual inspection, these additional wells do not exist at the present time.

Groundwater observation wells TF3TW-1 and -2 were placed as close as practical to boring locations TF3SB-16 and -17, respectively, to identify the presence of free product. No free product was observed in either temporary well. However, the boring logs and field notes from

TF3TW-1 indicated flame ionization detector (FID) readings as high as 1,000 ppm near the surface of the water table (14 ft bgs) and sheen on all split-spoon samples. The field notes for TF3TW-2 indicated a maximum FID reading of 100 ppm at an interval from 4 to 6 ft bgs (vadose zone) and a slight sheen on all split-spoon samples, except the interval from 0 to 2 ft bgs.

In 1999 and 2000, FPM completed a Supplemental Study to fill data gaps and fully delineate groundwater contamination at the site (FPM, 2000). A total of 96 soil borings were installed with 72 groundwater samples collected and analyzed using United States Environmental Protection Agency (USEPA) methods 8021 for VOCs and 8270 for SVOCs. In addition, groundwater samples were collected from existing monitoring wells TF3MW-1, TF3-CE3, and TF3MW-21 and newly installed TF3MW-2. These locations are shown in Figure 3-1.

In general, groundwater sample analysis showed numerous exceedances downgradient of USTs 114-1 through -8 (NYSDEC open Spill Number 9111733) and USTs 147-1 through -4. Except for minor exceedances at TF3TW-43 and -55, groundwater samples immediately downgradient from former Building 165, bulk fuel storage ASTs 161, 163, and 6045, and UST 5885 showed no groundwater exceedances.

In November 2001, monitoring wells TF3MW-116, -117, -118, -119, -120, -121, -123, -124, -125, -126, -127, -128, -129, and -130 were installed and developed prior to sampling. A source removal action in Fall 2002, at the Tank Farms 1 and 3 site, removed residual soil contamination that was identified during the previous soil boring activities and not removed during the Barson's excavation in 1985. Approximately 12,800 c.y. of soil was excavated from locations within the former bermed area and vicinity including the former building 147 footprint at Tank Farms site. Removal of the residual soil contamination continued into the saturated zone where contamination was located and stopped any additional leaching of contamination to groundwater from the vadose zone (Parsons, 2003).

In summary, separate petroleum plumes may have originated from three locations including, USTs 114-1 through -8 and USTs 147-1 through -4, as well as the former truck maintenance shed north of Building 3, possibly in the vicinity of TF3MW-123 or -125. The dissolved groundwater plume appears to be well defined and to be naturally attenuating. Based on observations at the site and based on the size and stability of the dissolved plume, residual free product has not been identified. (FPM, February 2004)

3.3 LTM PLAN

Table 3-1 summarizes the original LTM sampling and analysis plan. The objectives of the Tank Farm 1 and 3 LTM program include the following:

- Monitor the groundwater to track plume migration.

- Monitor natural attenuation parameters including pH, temperature, alkalinity, redox potential, nitrate, ferrous iron, sulfate, sulfide and dissolved oxygen to assess the potential for natural attenuation of the petroleum plume.

Table 3-1
Tank Farms 1 and 3 Quarterly Sampling Analysis Summary

Site/ Sampling Locations	Screen Interval (ft. MSL)	Sampling Rationale	Target Analytes/ USEPA Method Numbers	Sampling Frequency
TF3-CE3	442-457	Downgradient, within plume	VOCs 8260 Full List	Quarterly
TF3MW-2	450-460	Downgradient, within plume		
TF3MW-21	445-465	Downgradient within plume	SVOCs 8270 Full List	
TF3MW-25	444-464	Crossgradient		
TF3MW-116	449-459	Downgradient within plume	* Natural attenuation	
TF3MW-117	448-458	Crossgradient from plume	parameters pH, temperature,	
TF3MW-123	449-459	Downgradient within plume	redox potential, ferrous	
TF3MW-124	449-459	Crossgradient from plume	iron, and dissolved oxygen	
TF3MW-125	449-459	Downgradient	will be measured in the	
TF3MW-126	449-459	Downgradient within plume	field.	
TF3MW-127	450-460	Upgradient within plume		
TF3MW-128	451-461	Upgradient within plume	Alkalinity, nitrate, sulfate,	
TF3MW-129	451-461	Upgradient from plume	sulfide	
TF3MW-130	451-461	Upgradient within plume		

3.4 RESULTS

Twelve sampling rounds were conducted at the Tank Farm 1 and 3 SRA site in: December 2001; February, June, September and December 2002; March, June, September and December 2003, and March, June, and September 2004. Sampling locations are identified on Figure 3-2. The detected groundwater analytical results are shown in Table 3-3, and total VOC detections are illustrated in Figures 3-3 and 3-4. Groundwater flow is to the south-southeast. A VOC- and SVOC-contaminated groundwater plume is shown on Figure 3-2. Two plumes from two source areas have comingled to create a single plume. The plume located near monitoring wells TF3MW-127 and -128 is associated with former UST 147-1 through 4, while the second plume is located in the vicinity of TF3MW-123 and -125, where the source was most likely former USTs 114-1 through -8 and the former truck maintenance shed that was located north of Building 3 (possibly near TF3MW-123 and -125).

December 2001 Downgradient Delineation Results:

During December 2001 sampling round, monitoring wells TF3MW-116, -117, -118, -119, -120,

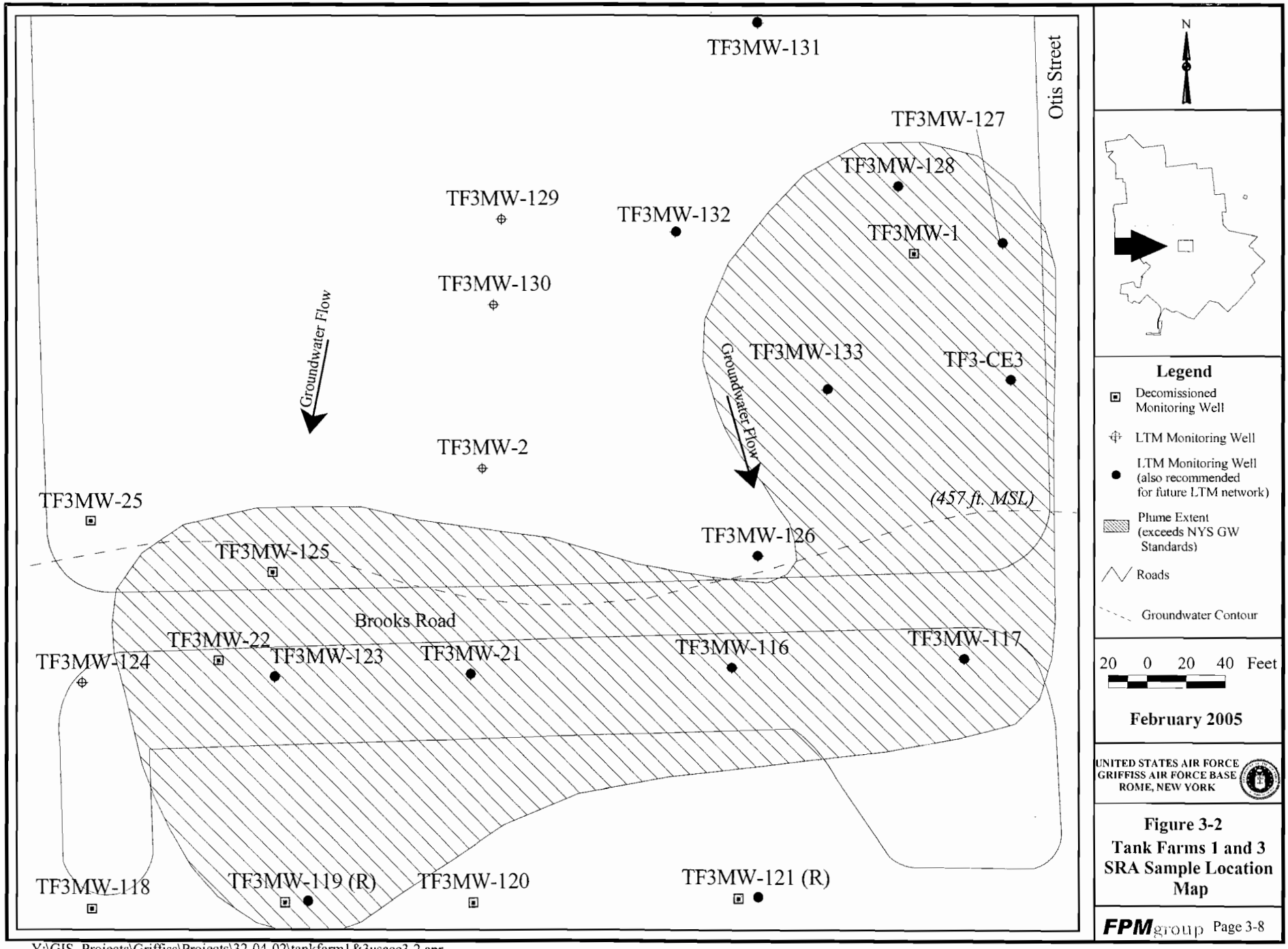

Figure 3-2
Tank Farms 1 and 3 SRA Sample Location Map

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Table 3-2
Tank Farms 1 and 3 Detected Analytical Results

Monitoring Well ID	NYSDEC	TF3-CE3										
Sample ID	GW	TF3CE313AA	TF3CE312BB	TF3CE313CA	TF3CE312DA	TF3CE312EA	TF3CE313FA	TF3CE313GB	TF3CE313HB	TF3CE312IB	TF3CE313JB	TF3CE313KB
Date of Collection	Standards[1]	2/19/02	6/19/02	9/13/02	12/12/02	3/12/03	6/20/03	9/12/03	12/12/2003	3/17/2004	6/17/2004	9/16/2004
Sample Depth (ft)	(µg/L)	13	12	13	12	12	13	13	13	12	13	13
VOCs (ug/L)												
n - butylbenzene	5	1.1	1.1	U	U	U	U	U	U	2.7	0.85 F	8.6
sec-butylbenzene	5	4.4	4.8	8.1	3.4 ♦	1.9	1.6	1.7	6.0	6.0	5.0	5.8
t-butylbenzene	5	0.85	1.1	1.2	0.83 ♦	0.39 F	U	0.34 F	0.79 F	0.71 F	0.69 F	0.78 F
chloroethane	5	U	U	0.21 F	U	U	U	U	U	U	U	U
chloromethane	5	U	U	0.24 F	U	U	U	U	U	U	U	U
ethylbenzene	5	0.21 F	U	0.37 F	U	U	U	U	U	0.28 F	U	0.22 F
isopropylbenzene	5	6.9	7.6	13	5.1 ♦	2.1	3.1	3.6	9.8	11	7.8	8.7
naphthalene	10	U	1.3	5.2	2 J	0.72 F	0.78 F	0.81 F	2.6	3.8	2.0	2.2
n-propylbenzene	5	8.1	5.8	11	4.8 ♦	2	2.3	2.1	10	13	8.4	U
trichloroethylene	5	1.7	0.98	1	2	2	1.4	3	1.6	1.3	1.1	1.2
Total VOCs		22.16	21.58	40.32	18.13	9.11	9.18	11.55	30.79	38.79	25.84	27.5
SVOCs (µg/L)												
2-methylnaphthalene	--	6 F	U	U	U	U	2 F	4 F	3 F	U	N/S	N/S
di-n-butyl phthalate	50	4 F	U	U	U	U	U	U	U	U	N/S	N/S
Wet Chemistry Data (mg/L)												
nitrate	10,000	0.36	0.087	0.32	N/A	0.38	0.71	0.60	0.56	0.63	0.46	0.52
sulfate	250,000	17.3	11.4 B	17.4	6.4	10.7 B	15	20.3	11.6	14.2	N/S	N/S
sulfide		U	U	U	U	U	U	U	U	0.077 F	N/S	N/S
total alkalinity	--	242	217	342	174	189	202	211	412	179 B	243	197
Field Parameters												
dissolved iron (mg/L)		3.5	N/A	5.5	2.8	2.9	2.8	2.5	3.4	2.4	3	3
pH		7.11	7.88	6.68	7.12	7.09	7.29	7.32	6.61	7.32	7.22	7.74
specific conductance (µS/cm)		469	550	658	534	497	342	515	589	66	66	67
temperature (degrees C)		9.8	10.3	12.8	11.8	9.33	9.76	12.35	11.42	8.68	9.7	12
dissolved oxygen (mg/L)		4.23	1.05	1.62	2.78	4.62	3.12	6	2.95	3.3	3.5	4.03
oxidation reduction potential (mV)		-103	-127	-3	-114	-27	-122	-141	-110	-79	-108	-107

Notes:

1 - Groundwater Standards are from Technical and Operational Guidance Series (TOGS) 1.1.1, June 1998. Amended in April 2000

-- Indicates no NYS GA Groundwater Standard

♦ - Indicates higher value detected in the sample duplicate or during the dilution phase.

B - The analyte was also detected in a blank.

F - Ananlyte was positively identified but the associated numerical value is below the reporting limit

N/A - Analyte was not analyzed during sampling

N/S- Analyte was not sampled.

R - The data is unusable due to deficiences in the ability to analyze the sample and meet QC criteria.

U - The analyte was analyzed for, but not detected. The associated numerical value is at or below the method detection limit.

UJ - The analyte was not detected above the RL. However the quantitation is an approximation.

-- Indidcates no NYS GA Groundwater Standard

Table 3-2
Tank Farms 1 and 3 Detected Analytical Results (continued)

Monitoring Well ID	NYSDEC	TF3MW-2									
Sample ID	GW	TF3M0214AA	TF3M0214BB	TF3M0219CA	TF3M0214DA	TF3M0214EA	TF3M0214FA	TF3M0215GB	TF3M0214HB	TF3M0214IB	
Date of Collection	Standards[1]	2/26/02	6/19/02	9/13/02	12/12/02	3/12/03	6/23/03	9/12/03	12/12/2003	3/18/2004	
Sample Depth (ft)	(µg/L)	14	14	19	14	14	14	15	14	14	
VOCs (ug/L)											
1,1,1-trichloroethane	5	U	0.68	0.31 F	0.41 F	0.54	0.35 F	U	U	U	
1,2,4-trimethylbenzene	5	0.71	U	U	0.24 F	U	0.24 F	0.39 F	U	U	
acetone	50	U	U	U	U	U	U	U	4.1 F	U	
chloroform	7	1.8	2	0.77	1.3	2.1	0.92	0.83	1.1 B	1	
ethylbenzene	5	0.54	0.3 F	0.24 F	0.21 F	U	0.3 F	U	U	U	
isopropylbenzene	5	0.66	U	0.58	0.38 F	U	0.29 F	0.29 F	0.43 F	U	
methyl ethyl ketone	5	U	U	U	U	1.6 UJ	U	U	U	U	
n-propylbenzene	5	0.39 F	U	0.31 F	0.23 F	U	0.23 F	U	U	U	
trichloroethylene	5	0.91	1	0.51	0.62	0.95	0.52 F	0.75 F	0.9 F	0.68 F	
m,p-xylene	5	0.45 F	U	U	U	U	U	U	U	U	
Total VOCs		5.46	3.98	2.72	3.39	3.59	2.85	0.83	5.43	1.68	
SVOCs (µg/L)											
Total SVOCs		0	0	0	0	0	0	0	0	0	
Wet Chemistry Data (mg/L)											
nitrate	10,000	1.3	1.1	1.5	N/A	1.3	0.8	0.94	1	1.3	
sulfate	250,000	27.2	17 B	13.1	9.1	17.6 B	16.5	15.7	15.3	18.1	
sulfide		U	U	U	U	U	U	U	U	U	
total alkalinity	--	144	120	148	87.2	132	148	158	222	218	
Field Parameters											
dissolved iron (mg/L)		0.3	N/A	0.8	0.8	0	0	0	0.4	0	
pH		7.35	7.58	7.26	7.17	7.49	7.26	7.42	6.44	7.4	
specific conductance (µS/cm)		326	360	544	469	277	287	426	459	48	
temperature (degrees C)		10.3	10.4	12.7	12.5	9.96	10.49	12.13	12.44	9.41	
dissolved oxygen (mg/L)		5.65	3.92	3.79	6.19	6.8	5.56	6.26	4.97	6.7	
oxidation reduction potential (mV)		-47	-19	-19	-35	226	-11	-73	78	52	

Well was not sampled after 3/2004

Notes:

1 - Groundwater Standards are from Technical and Operational Guidance Series (TOGS) 1.1.1, June 1998. Amended in April 2000

-- Indicates no NYS GA Groundwater Standard

♦ - Indicates higher value detected in the sample duplicate or during the dilution phase.

B - The analyte was also detected in a blank.

F - Ananlyte was positively identified but the associated numerical value is below the reporting limit

N/A - Analyte was not analyzed during sampling

R - The data is unusable due to deficiences in the ability to analyze the sample and meet QC criteria.

U - The analyte was analyzed for, but not detected. The associated numerical value is at or below the method detection limit.

UJ - The analyte was not detected above the RL. However the quantitation is an approximation.

-- Indidcates no NYS GA Groundwater Standard

Table 3-2
Tank Farms 1 and 3 Detected Analytical Results (continued)

Monitoring Well ID	NYSDEC	TF3MW-21											
Sample ID	GW	TF3M2114AA	TF3M2114BB	TF3M2115CA	TF3M2113DA	TF3M2114EA	TF3M2114FA	TF3M2114GB	TF3M2114HB	TF3M2114IB	TF3M2114JB	TF3M2114KB
Date of Collection	Standards[1]	2/27/02	6/19/02	9/13/02	12/12/2002	3/12/2003	6/23/2003	9/11/2003	12/12/2003	3/18/2004	6/17/2004	9/13/2004
Sample Depth (ft)	(ug/L)	14	14	15	13	14	14	14	14	14	14	14
VOCs (ug/L)												
1,1-dichloroethane	5	0.33 F	0.25 F	U	0.23 F	0.24 F	U	U	U	U	U	U
1,1,2,2-tetrachloroethane	5	U	1.9	U	U	0.16 UJ	U	U	U	U	U	U
1,2-dibromo-3-chloropropane	0.04	U	U	2.1 J ♦	U	0.25 UJ	U	U	U	U	U	U
1,2,3-trichloropropane	0.04	U	1.1	U	U	0.16 UJ	U	U	U	U	U	U
1,2,4-trimethylbenzene	5	3.3	2.4 ♦	11	0.41 F	2.2 J ♦	0.9 F	9.6	1.8	U	1.9 F	U
1,3,5-trimethylbenzene	5	1.3	U	0.4 F	U	0.5 J ♦	U	2.6	U	U	U	U
benzene	1	0.75	0.55	0.56 ♦	U	0.15 UJ	U	U	U	U	U	U
n - butylbenzene	5	5.1	4.4	6.9 J ♦	4.3	0.22 UJ	U	8.1	U	3.8 F	3 F	2.5 F
sec-butylbenzene	5	6.4	6.4	9.8	4.8	4.7 J ♦	U	7.2	6.4	2.9 F	5.4	5.3
t-butylbenzene	5	1.8	1.6	2.3	1.2	1.3 J ♦	1.2 J	2	U	U	0.69 F	1.5 F
chloroethane	5	U	U	0.82 J ♦	0.55	0.16 UJ	0.44 F	U	U	U	U	U
chloromethane	5	U	U	0.85 ♦	0.33 F	0.26 J ♦	0.28 F	U	U	U	U	U
ethylbenzene	5	U	0.28 F	U	U	0.18 UJ	0.71 F	3.5	U	U	U	U
Hexachlorobutadiene	0.5	U	U	U	U	U	U	U	U	U	1.4 F	U
isopropylbenzene	5	34	28	50	36	25 J ♦	32 J	71	63	23	30	41
p-isopropyltoluene	5	8.9	7	10 ♦	4	4.4 J ♦	3.5 J	7.6	6.3	2.4 F	4.4 F	4.1 F
methylene chloride	5	U	U	U	U	U	U	U	U	2.6 F	U	U
naphthalene	10	U	U	1.6 J ♦	0.78 J	0.21 UJ	0.7 F	2.2	2	U	1.1 F	1.2 F
n-propylbenzene	5	7.8	6.7	10	6.9	5.2 J ♦	5.2 J	12	11	4.2	6.7	8.8
tetrachloroethylene	5	U	U	U	U	0.18 UJ	U	U	U	U	U	U
trichloroethylene	5	U	U	U	U	0.17 UJ	U	U	U	U	U	U
toluene	5	0.31 F	U	0.48 F	U	0.16 UJ	U	U	U	U	U	2 F
m,p-xylene	5	4.4	4.5	8.2	1.2	1.9 J ♦	2.3 J	18	5.2	2 F	3.7 F	2.4 F
Total VOCs		74.39	65.08	108.11	60.7	40.5	42.03	143.8	95.7	40.9	58.29	68.8
SVOCs (ug/L)												
2-methylnaphthalene	--	5 F	U	6	U	U	3 F	4 F	4 F	U	N/S	N/S
acenapthene		U	U	U	U	U	U	U	2 F	U	N/S	N/S
benzoic acid	--	U	U	U	U	13 UJ	17 R	18 R	U	U	N/S	N/S
phenanthrene		U	U	U	U	U	U	U	2 F	U	N/S	N/S
di-n-butyl phthalate	50	3 F	U	3	U	U	U	U	U	U	N/S	N/S
2,4,5-trichlorophenol	1*	U	3 M	U	U	U	U	U	U	U	N/S	N/S
2,4,6 - trichlorophenol	1*	U	4 M	U	U	U	U	U	U	U	N/S	N/S
2,4-dichlorophenol	1*	U	5 M	U	U	U	U	U	U	U	N/S	N/S
2,4-dinitrophenol	1*	U	13 M	U	U	11 UJ	U	U	U	U	N/S	N/S
4,6-dinitro-2-methylphenol	1*	U	18 M	U	U	U	U	U	U	U	N/S	N/S
4 - nitrophenol	1*	U	4 M	U	U	U	U	U	U	U	N/S	N/S
Total SVOCs		8 F	0	9	0	0	3F	4 F	8 F	0	N/S	N/S
Wet Chemistry Data (mg/L)												
nitrate	10000	U	U	U	U	U	U	U	U	U	U	U
sulfate	250000	4	9	3.7 B	4.5	10.5 B ♦	34.9	8.4	6.9	10.9	N/S	N/S
sulfide		U	U	U	U	U	U	U	U	U	N/S	N/S
total alkalinity	--	233	185	210 ♦	158	178	182	221	456	215	210	187
Field Parameters												
dissolved iron (mg/L)		3.8	N/A	3.2	2	1.9	1.9	1.6	2.4	1.6	2.4	3.2
pH		7.26	8.19	6.92	7.09	9.95	7.36	7.43	8.99	7.41	6.92	6.98
specific conductance (µS/cm)		591	665	940	524	443	749	898	979	62	60	60
temperature (degrees C)		10.5	10.5	12.8	12.3	10.1	10.4	12.05	12.79	10.11	10.6	13.2
dissolved oxygen (mg/L)		3.26	1.08	1.54	6.99	4.24	4.28	4.35	8.13	4.1	2.4	5.2
oxidation reduction potential (mV)		-130	-139	108	-101	-121	-156	-149	-144	-90	-95	-107

Notes:

1 - Groundwater Standards are from Technical and Operational Guidance Series (TOGS) 1.1.1, June 1998 Amended in April 2000

* - Sum of total phenolic compounds may not exceed 1 ppm.

♦ - Indicates higher value detected in the sample duplicate or during the dilution phase.

B - The analyte was also detected in a blank.

F - Ananlyte was positively identified but the associated numerical value is below the reporting limit

M - Matrix effect present

N/A - Analyte was not analyzed during sampling

N/S- Analyte was not sampled.

R - The data is unusable due to deficiences in the ability to analyze the sample and meet QC criteria

U - The analyte was analyzed for, but not detected. The associated numerical value is at or below the method detection limit

-- Indicates no NYS GA Groundwater Standard

Table 3-2
Tank Farms 1 and 3 Detected Analytical Results (continued)

Monitoring Well ID	NYSDEC	TF3MW-25							
Sample ID	GW	TF3M2513AA	TF3M2513BB	TF3M2514CA	TF3M2512DA	TF3M2513EA	TF3M2513FA	TF3M2513GB	
Date of Collection	Standards[1]	2/26/02	6/19/02	9/13/02	12/12/2002	3/12/2003	6/20/2003	9/11/2003	
Sample Depth (ft)	(µg/L)	13	13	14	12	13	13	14	
VOCs (ug/L)									
acetone	50	U	U	U	U	U	U	2.4 F	
t-butylbenzene	5	1.8	U	U	U	U	U	U	
bromomethane	5	U	U	U	U	0.19 UJ	U	U	
chloroform	7	1.2	1.2	1.1	0.97	1.1	0.61	0.63	
ethylbenzene	5	0.23 F	U	U	U	U	U	U	
tetrachloroethylene	5	0.29 F	0.27 F	0.33 F	0.28 F	0.31 F	U	0.29 F	
trichloroethylene	5	0.4 F	0.35 F	0.38 F	0.38 F	0.35 F	U	0.31 F	
toluene	5	U	U	U	U	U	U	U	
m,p-xylene	5	U	U	U	U	U	U	U	
Total VOCs		3	1.2	1.1	0.97	1.1	0.61	3.94	
SVOCs (µg/L)									
benzoic acid	--	U	U	U	U	13 UJ	17 R	18 R	
isophorone	50	U	U	U	U	U	1 R	U	
2,4-dinitrophenol	1*	U	U	U	U	11 UJ	U	U	
Total SVOCs		0	0	0	0	0	0	0	
Wet Chemistry Data (mg/L)									
nitrate	10000	1	0.83	0.85	N/A	1.5	0.92	0.7	
sulfate	250000	27.9	17.9 B	178 B	7.7	16.1 B	17.9	17.4	
sulfide		U	U	U	U	U	U	U	
total alkalinity	--	160	122	148	106	131	140	139	
Field Parameters									
Dissolved Iron (mg/L)		0.5	N/A	0.6	0.8	0.1	1.8	N/S	
pH		7.38	7.94	7.1	7.1	7.06	7.28	N/S	
Specific Conductance (µS/cm)		483	573	876	506	385	503	N/S	
Temperature (degrees C)		10.3	10.4	13.2	12.5	10.14	10.15	N/S	
Dissolved Oxygen (mg/L)		4.35	2.76	3.12	3.89	9.07	4.45	N/S	
Oxidation Reduction Potential (mV)		-77	-101	-22	-88	235	-108	N/S	

Decomissioned and not sampled after September 2003

Notes:

1 - Groundwater Standards are from Technical and Operational Guidance Series (TOGS) 1.1.1, June 1998. Amended in April 2000

* - Sum of total phenolic compounds may not exceed 1 ppm.

♦ - Indicates higher value detected in the sample duplicate or during the dilution phase.

B - The analyte was also detected in a blank.

F - Ananlyte was positively identified but the associated numerical value is below the reporting limit

M - Matrix effect present

N/A - Analyte was not analyzed during sampling

R - The data is unusable due to deficiences in the ability to analyze the sample and meet QC criteria.

U - The analyte was analyzed for, but not detected. The associated numerical value is at or below the method detection limit.

-- Indidcates no NYS GA Groundwater Standard

Table 3-2
Tank Farms 1 and 3 Detected Analytical Results (continued)

Monitoring Well ID	NYSDEC	TF3MW-116											
Sample ID	GW	TF3M11613AA	TF3M11613AA	TF3M11613BE	TF3M11614CA	TF3M11613DA	TF3M11613EA	TF3M11613FA	TF3M11614GB	TF3M11613HB	TF3M11613IB	TF3M11613JB	TF3M11613KB
Date of Collection	Standards[1]	12/13/01	2/27/02	6/18/02	9/13/02	12/19/02	3/12/03	6/23/03	9/12/2003	12/12/2003	3/17/2004	6/17/2004	9/13/2004
Sample Depth (ft)	(µg/L)	13	13	13	14	13	13	13		13	13	13	16
VOCs (ug/L)													
1,2,4-trimethylbenzene	5								U	U	U	0.26 F	UM
sec-butylbenzene	5	10	8.1 ♦	7.3	10	10	4.1	7.9	3.1 ♦	3.5 ♦	4.9 ♦	6.5	13 M
t-butylbenzene	5	2.1	1.5 ♦	2.2	2.1	2.1	1.2	1.7 J	0.86 ♦	1.2 ♦	1.8 ♦	1.9	2.8 M
cis-1,2-dichloroethylene	5	U	0.26 F	U	U	U	U	U	U	0.24 F	U	U	U
ethylbenzene	5								U	U	U	0.24 F	U
isopropylbenzene	5	15	7.9 ♦	12	6.3	14	4.9	9	2.8 ♦	5.8 ♦	9.4 ♦	14	22
n - butylbenzene	5	3.8	3.6	4.4	7.8	3.8	U	3.1 J	2 ♦	1.5 ♦	1.8 ♦	1.5	3.6 M
n-propylbenzene	5	8.3	10 ♦	11	9.5	6.8	4.6	9.4	2.7 ♦	3.7 ♦	6 ♦	6.8	16
Total VOCs		39.2	32.18	36.9	36.57	37.08	15.02	31.1	11.46	15.94	23.9	31.2	57.6
SVOCs (µg/L)													
2-methylnaphthalene	--	8	10	11	4	11	10	3	10	7 F ♦	6 F ♦	N/S	N/S
2,4-dichlorophenol	1*	U	U	5 M	U	U	U	U	U	U	U	N/S	N/S
2,4-dinitrophenol	1*	U	U	13 M	U	U	11 UJ	U	U	U	U	N/S	N/S
2,4,5-trichlorophenol	1*	U	U	3 M	U	U	U	U	U	U	U	N/S	N/S
4,6-dinitro-2-methylphenol	1*	U	U	18 M	U	U	U	U	U	U	U	N/S	N/S
4-nitrophenol	1*	U	U	4 M	U	U	U	U	U	U	U	N/S	N/S
2,4,6-trichlorophenol	1*	U	U	4 M	U	U	U	U	U	U	U	N/S	N/S
napthalene	10	U	U	U	U	U	U	4	U	U	U	N/S	N/S
phenanthrene	50	U	U	U	U	U	U	2	U	U	U	N/S	N/S
pyrene	50	U	U	U	U	U	U	2	U	U	U	N/S	N/S
di-n-octyl phthalate	50	U	U	3 F	U	U	U	U	U	U	U	N/S	N/S
Total SVOCs		8	10	14	4	11	10	11	10	7	6	N/S	N/S
Wet Chemistry Data (mg/L)													
nitrate	10000	N/A	U	U	U	U	0.056	U	U	U	0.1 ♦	0.052	U
sulfate	250000	N/A	U	11.1	2.9 B	7.9	11.4 B	U	13.2	21.6 ♦	10.1	N/S	N/S
sulfide	--	N/A	U	U	U	U	U	U	U	U	0.091 F ♦	N/S	N/S
total alkalinity	--	N/A	232 ♦	215	252	181	260	252	227 ♦	487	161 B ♦	222	191
Field Parameters													
dissolved iron (mg/L)		N/A	6	N/A	6.8	3.5	2.4	5.6	2.8	XXX	4.4	5	5
pH		7.5	7.05	7.96	6.91	6.92	9.9	7.09	6.85	8.78	6.74	6.8	6.65
specific conductance (µS/cm)		1020	437	668	821	674	471	519	582	767	66	83	79
temperature (degrees C)		12.91	10.5	10.7	13.1	12.5	10.3	10.78	12.22	12.9	9.38	10.4	13.1
dissolved oxygen (mg/L)		5.06	3.55	0.62	1.16	5.55	3.71	4.46	5.24	4.36	3.5	3.9	2.65
oxidation reduction potential (mV)		-124	-117	-135	-16	-105	-120	-142	-136	-135	-63	-99	-106

Notes:

♦ - Indicates higher value detected in the sample duplicate or during the dilution phase.

1 - Groundwater Standards are from Technical and Operational Guidance Series (TOGS) 1.1.1, June 1998. Amended in April 2000

-- Indidcates no NYS GA Groundwater Standard

B - The analyte was also detected in a blank.

F - Ananlyte was positively identified but the associated numerical value is below the reporting limit

M - Matrix effect present

N/A - Analyte was not analyzed during sampling

N/S- Analyte was not sampled.

R - The data is unusable due to deficiences in the ability to analyze the sample and meet QC criteria.

U - The analyte was analyzed for, but not detected. The associated numerical value is at or below the method detection limit.

* - Sum of total phenolic compounds may not exceed 1 ppm.

Table 3-2
Tank Farms 1 and 3 Detected Analytical Results (continued)

Monitoring Well ID	NYSDEC	TF3MW-117											
Sample ID	GW	TF3M11713AA	TF3M11713AA	TF3M11713BE	TF3M11713CA	TF3M11712DA	TF3M11713EA	TF3M11713FA	TF3M11713GB	TF3M11713HB	TF3M11713IB	TF3M11713JB	TF3M11713KB
Date of Collection	Standards[1]	12/13/01	2/27/02	6/18/02	9/13/02	12/12/2002	3/12/03	6/20/03	9/12/2003	12/12/2003	3/18/2004	6/17/2004	9/13/2004
Sample Depth (ft)	(ug/L)	13	13	13	13	12	13	13	13	13	13	13	13
VOCs (ug/L)													
1,1,2 -trichloroethane	1	U	U	0.42 M	U	U	U	U	U	U	U	U	U
1,2-dibromo-3-chloropropane	5	U	U	U	U	U	0.25 UJ	U	U	U	U	U	U
benzene	1	0.29 F	0.35 F	U	0.28 F	0.31 F	U	0.28	0.24 F	U	0.26 F	U	U
bromomethane	5	U	U	U	U	U	0.19 UJ	U	U	U	U	U	U
chloromethane	5	U	U	U	U	0.21 F	U	U	U	U	U	U	U
sec-butylbenzene	5	1.9	1.6	1.4	2.8	1.9	U	6.1	2.4	5.6	2.1	4.8	6.4
t-butylbenzene	5	1	2.5	2.6	2	2.1	2.2	2	2.7	1.9	2.8	2.9	2.8
cis-1,2-dichloroethylene	5	0.4 F	0.29 F	U	U	U	0.36 F	0.22 F	U	0.48 F	0.33 F	U	U
isopropylbenzene	5	2	0.52	1.1	4.7	1.1	0.8	7.7	2.9	6.1	2.9	6.4	12
p-isopropyltoluene	5	1.8	4.5	U	U	U	3.8	U	5.5	U	5.2	6	5.5
n-propylbenzene	5	0.32 F	U	U	0.52	U	U	0.83 F	0.37 F	2.5	0.39 F	2.5	5.2
Total VOCs		7.71	9.76	5.1	10.3	5.62	7.16	17.13	14.11	16.58	13.98	22.6	31.9
SVOCs (µg/L)													
2,4-dichlorophenol	1*	U	U	4 M	U	U	U	U	U	U	U	N/S	N/S
2,4-dinitrophenol	1*	U	U	12 M	U	U	11UJ	U	U	U	U	N/S	N/S
2,4,5-trichlorophenol	1*	U	U	3 M	U	U	U	U	U	U	U	N/S	N/S
4,6-dinitro-2-methylphenol	1*	U	U	16 M	U	U	U	U	U	U	U	N/S	N/S
4-nitrophenol	1*	U	U	3 M	U	U	U	U	U	U	U	N/S	N/S
2,4,6-trichlorophenol	1*	U	U	4 M	U	U	U	U	U	U	U	N/S	N/S
benzoic acid		U	U	U	U	U	13 UJ	17 R	7 R	U	U	N/S	N/S
Wet Chemistry Data (mg/L)													
nitrate	10000	N/A	0.064	U	U	U	U	U	U	0.061	0.11	0.069	2.5
sulfate	250000	N/A	U	7.7	6.2 B	3.2	5.8 B	83.4	U	6.3	1.3	N/S	N/S
sulfide		N/A	U	U	U	U	U	U	U	U	U	N/S	N/S
total alkalinity	--	N/A	298	274	312	206	251	264	307	445	336	316	269
Field Parameters													
dissolved iron (mg/L)		N/A	6	N/A	6.2	5.6	4.6	4.9	4	3.3	4.2	4.4	3.6
pH		7.57	6.87	7.82	6.92	6.84	9.58	6.93	6.98	8.63	6.82	6.64	6.78
specific conductance (µS/cm)		1340	1190	1840	1620	1330	158	209	180	179	13	95	82
temperature (degrees C)		13.71	10	11	14.8	13.4	9.5	10.72	14.03	13.88	8.81	10.7	15
dissolved oxygen (mg/L)		4.31	4.19	6.93	1.39	3.55	5.35	4.13	5.53	6.71	4.9	2.5	4.42
oxidation reduction potential (mV)		-93	-98	-123	88	-102	-102	-119	-141	-112	-68	-53	-97

Notes:

1 - Groundwater Standards are from Technical and Operational Guidance Series (TOGS) 1.1.1, June 1998. Amended in April 2000

B - The analyte was also detected in a blank.

F - Ananlyte was positively identified but the associated numerical value is below the reporting limit

N/A - Analyte was not analyzed during sampling

N/S- Analyte was not sampled.

M - Matrix effect present

R - The data is unusable due to deficiences in the ability to analyze the sample and meet QC criteria.

UJ - The analyte was not detected above the RL. However the quantitation is an approximation.

U - The analyte was analyzed for, but not detected. The associated numerical value is at or below the method detection limit.

-- Indidcates no NYS GA Groundwater Standard

* - Sum of total phenolic compounds may not exceed 1 ppm.

Table 3-2
Tank Farms 1 and 3 Detected Analytical Results (continued)

Decommissioned Monitoring Wells (November 2001) Including Replacement Wells (September 2004)											
Monitoring Well ID	**NYSDEC**	**TF3MW-118**		**TF3MW-119**		**TF3MW-119R**	**TF3MW-120**		**TF3MW-121**		**TF3MW-121R**
Sample ID	**GW**	**TF3M11810AA**	**TF3M11810AA**	**TF3M11913AA**	**TF3M11913AA**	**TF3M119R12KB**	**TF3M12010AA**	**TF3M12010AA**	**TF3M12110AA**	**TF3M12110AA**	**TF3M121R12KB**
Date of Collection	**Standards[1]**	**12/13/01**	**2/27/02**	**12/13/01**	**2/27/02**	**9/13/2004**	**12/13/01**	**2/27/02**	**12/20/01**	**2/27/02**	**9/13/2004**
Sample Depth (ft)	**(µg/L)**	**10**	**10**	**13**	**13**	**12**	**11**	**11**	**11**	**11**	**12**
VOCs (ug/L)											
1,1-dichloroethane	5	U	U	U	U	U	U	U	U	0.23 F	U
1,2,4-trimethylbenzene	5	U	U	U	U	U	4.1	U	U	1.4	U
1,3,5-trimethylbenzene	5	U	U	U	U	U	1.2	U	U	0.54	U
t-butylbenzene	5	0.6 F	0.54	1.2	0.41 F	1.4 F	0.3 F	U	U	0.43 F	U
ethylbenzene	5	U	U	U	U	U	0.56 F	U	U	U	U
isopropylbenzene	5	6.8	0.21 F	2.3	8.5	63	U	U	U	U	U
n-butylbenzene	5	U	U	0.53 F	U	U	U	U	U	U	U
sec-butylbenzene	5	0.36 F	0.28 F	1.4	0.43 F	1.9 F	U	U	U	U	U
n-propylbenzene	5	0.33 F	U	0.24 F	0.57	U	0.24 F	U	U	U	U
acetone	50	U	U	U	U	U	U	U	U	U	5.1 F
chlorobenzene	5	U	U	U	U	1.8 F	U	U	U	U	U
chloroform	5	U	U	U	U	U	U	0.29 F	0.49 F	U	0.29 F
cis-1,2-dichloroethylene	5	U	U	U	U	2.9 F	U	U	U	U	U
toluene	5	U	U	U	U	U	3.8	U	U	U	U
trichloroethylene	5	U	0.44 F	0.31 F	U	U	U	2.8	2.5	U	2.6
o-xylene	5	U	U	U	U	U	2.1	U	U	U	U
m,p,-xylene	5	U	U	U	U	U	3.8	U	U	0.46 F	U
Total VOCs		8.09	1.47	5.98	9.91	14.3	16.1	3.09	2.99	3.06	7.99
SVOCs (µg/L)											
anthracene	50	U	U	7 J	U	N/S	U	U	U	U	N/S
bis(2-ethylhexyl)phthalate	5	U	2	8 J	5	N/S	U	U	U	U	N/S
chrysene	0.002	U	U	8 J	3	N/S	U	U	U	U	N/S
benzo(a)anthracene	0.002	U	U	8 J	3	N/S	U	U	U	U	N/S
benzo(b)fluoranthene	0.002	U	U	7 J	U	N/S	U	U	U	U	N/S
benzo(a)pyrene	0.002	U	U	6 J	2	N/S	U	U	U	U	N/S
flouranthene	50	U	U	8 J	8	N/S	U	U	U	U	N/S
phenanthrene	50	U	U	7 J	U	N/S	U	U	U	U	N/S
pyrene	50	U	U	7 J	8	N/S	U	U	U	U	N/S
Total SVOCs		8	2	0	26	N/S	0	0	0	0	N/S
Wet Chemistry Data (mg/L)											
nitrate	10000	N/S	0.16	N/S	U	U	N/S	0.37	N/S	0.054	1.2
sulfate	250000	N/S	U	N/S	U	U	N/S	U	N/S	U	N/S
sulfide		N/S	U	N/S	U	U	N/S	U	N/S	U	N/S
total alkalinity	--	N/S	90.8	N/S	176	127	N/S	233	N/S	232	156
Field Parameters											
dissolved iron (mg/L)		N/A	0	N/A	2	0	N/A	0	N/A	0	0
pH		6.79	6.61	7.64	7.12	7.14	7.76	7.13	7.71	7.12	6.95
specific conductance (µS/cm)		242	1520	815	794	0.14	1030	601	819	743	0.13
temperature (degrees C)		14.62	7.4	14.88	11.3	16	15.5	12	16.07	12.6	15.7
dissolved oxygen (mg/L)		6.71	4.44	6.09	3.34	5.6	3.6	3.2	5.62	4.02	4.78
oxidation reduction potential (mV)		-79	-40	-87	-94	47	-62	-94	179	83	101

Notes:

1 - Groundwater Standards are from Technical and Operational Guidance Series (TOGS) 1.1.1, June 1998. Amended in April 2000

F - Ananlyte was positively identified but the associated numerical value is below the reporting limit

J - The analyte was positively identified, the quantitation is an approximate value of the analyte in the sample

N/A - Analyte was not analyzed during sampling

N/S- Analyte was not sampled.

U - The analyte was analyzed for, but not detected. The associated numerical value is at or below the method detection limit.

-- Indidcates no NYS GA Groundwater Standard

Table 3-2
Tank Farms 1 and 3 Detected Analytical Results (continued)

Monitoring Well ID	NYSDEC	TF3MW-123												
Sample ID	GW	TF3M12313AA	TF3M12313AA	TF3M12313BB	TF3M12313CA	TF3M12313DA	TF3M12313EA	TF3M12313FA	TF3M12313GB	TF3M12313HB	TF3M12313IB	TF3MW12313JB	TF3M12313KB
Date of Collection	Standards[1]	12/13/01	2/26/02	6/19/02	9/13/02	12/12/02	3/12/03	6/23/03	9/12/2003	12/12/2003	3/18/2004	6/17/2004	9/13/2004
Sample Depth (ft)	(ug/L)	13	13	13	13	13	13	13	13	13	13	13	13
VOCs (ug/L)													
1,2,3-trichlorobenzene	5	U	U	U	0.9 M	U	U	U	U	U	U	U	U
1,2,4-trimethylbenzene	5	350 ♦	88 ♦	46 ♦	78 M♦	28	31 ♦	60	72	37	54	45	66
1,1,2-trichloroethylene	5	U	U	U	2.6	U	U	U	U	U	U	U	U
1,3,5-trimethylbenzene	5	26 ♦	10	6.1 ♦	12	4	4.1	8.9	9.9	4.9	7.1	7	10
1,2-dibromo-3-chloropropane	0.04	5.6	U	1.4 ♦	U	.5 UJ	0.5 UJ	U	U	U	U	U	U
benzene	1	0.38 F	0.32 F	U	U	0.25 F	U	U	U	U	U	U	U
bromomethane	5	U	U	U	U	U	0.38 UJ	U	U	U	U	U	U
chloromethane	5	U	U	U	U	0.29 F	U	U	U	U	U	U	U
t-butylbenzene	5	8.2 ♦	2.5	1.4	3.9 M	1.3	1.2 ♦	U	2.2	U	U	1.5 F	2.1 F
isopropylbenzene	5	480 ♦	140 ♦	73 ♦	130 M♦	53	62 J ♦	120	130	63	110	85	120
n-butylbenzene	5	20 ♦	4.7	2.1 ♦	U	U	U	U	5.2	U	U	1.4 F	1.9 F
ethylbenzene	5	2.4	1.7	0.95 ♦	U	0.33 F	U	U	U	U	U	U	U
methylene chloride	5	U	U	U	U	U	U	6.5 B	U	3 B	U	U	U
n-propylbenzene	5	63 ♦	16 ♦	10 ♦	15	U	6.4 J ♦	11	U	U	U	11	U
p-isopropyltoluene	5	21 ♦	6.4	3 ♦	5 ♦	2.4	1.9 ♦	U	4.6	1.2	U	2.6 F	3.7 F
sec-butylbenzene	5	22 ♦	6.1	2.7 ♦	5 ♦	2.5	2 ♦	2.7	4.8	1.4	U	2.8 F	4.3
n-propylbenzene	5	U	23	U	26	9.1	U	U	16	7	11	11	15
naphthalene	10	U	U	2.2 ♦	3.4	U	U	U	U	U	U	U	U
toluene	5	1.1	0.27 F	U	2	U	U	U	U	U	U	U	1 F
m,p-xylene	5	22 ♦	7	2.5 ♦	4,3	1.8	1.2	U	U	1.3 F	U	1.4 F	1.4 F
Total VOCs		1021.3	305.99	151.35	288.1	102.97	109.8	209.1	244.7	118.8	182.1	168.7	225.4
SVOCs (µg/L)													
2-methylnaphthalene	--	21	U	5 F	U	U	4 F	4	U	4 F	5 F	N/S	N/S
benzo(a)anthracene	0.002	10	3 F	2 J	U	2 F	U	U	U	U	U	N/S	N/S
benzoic acid	--	U	U	U	U	U	U	17 R	U	U	U	N/S	N/S
bis(2-ethylhexyl)phthalate	5	16	4 F	U	U	U	U	U	U	U	U	N/S	N/S
benzyl butyl phthalate	50	U	U	U	U	U	14	U	U	U	U	N/S	N/S
di-n-octyl phthalate		U	U	U	U	U	3	U	U	U	U	N/S	N/S
chrysene	0.002	8 F	U	U	U	U	U	U	U	U	U	N/S	N/S
flouranthene	50	29	10	U	U	U	U	U	U	U	4 F	N/S	N/S
flourene	50	6 F	U	U	U	U	U	U	U	U	U	N/S	N/S
phenanthrene	50	27	5 F	U	U	U	U	2 F	U	2 F	4 F	N/S	N/S
pyrene	50	25	8 F	3	U	4 F	4 F	2 F	3 F	U	4 F	N/S	N/S
2,4,5-trichlorophenol	1*	U	U	3 M	U	U	U	U	U	U	U	N/S	N/S
2,4,6-trichlorophenol	1*	U	U	4 M	U	U	U	U	U	U	U	N/S	N/S
2,4-dichlorophenol	1*	U	U	5 M	U	U	U	U	U	U	U	N/S	N/S
2,4- dinitrophenol	1*	U	U	12 M	U	U	11 UJ	U	U	U	U	N/S	N/S
4,6-dinitro-2-methylphenol	1*	U	U	16 M	U	U	U	U	U	U	U	N/S	N/S
naphthalene	10	6 F	U	U	U	U	U	U	U	U	U	N/S	N/S
4-nitrophenol	1*	U	U	4 M	U	U	U	U	U	U	U	N/S	N/S
benzoic acid	U	U	U	U	U	U	13 UJ	U	18 R	U	U	N/S	N/S
Total SVOCs		148	30	10	0	6	25	8	3	6 F	17 F	N/S	N/S
Wet Chemistry Data (mg/L)													
nitrate	10000	N/A	0.8	U	U	U	0.063	U	U	0.29	0.06	U	0.12
sulfate	250000	N/A	U	11	4.7 B	4	9.3 B	25.5	17	6.3	4.4	N/S	N/S
sulfide		N/A	U	U	U	U	U	U	U	U	0.06 F	N/S	N/S
total alkalinity	--	N/A	202	156	204	150	160	159	167	352	222	202	186
Field Parameters													
dissolved iron (mg/L)		N/A	4	N/A	3	2.8	1.9	2.8	2.2	NA	1.8	1	3
pH		7.75	6.94	7.89	7.14	6.73	9.9	7.03	7.16	8.76	7.12	6.99	6.57
specific conductance (µS/cm)		721	751	686	615	594	531	590	600	830	64	77	90
temperature (degrees C)		12.48	9.1	10.8	14.4	11.8	9	11.56	13.38	13.82	8.5	11.1	14.2
dissolved oxygen (mg/L)		3.98	3.29	0.86	1.05	4.02	4.24	3.89	4.8	4.58	2.3	4.8	7.32
oxidation reduction potential (mV)		-99	-84	-118	-19	-65	-109	-130	-128	-113	-67	-84	-71

Notes

1 - Groundwater Standards are from Technical and Operational Guidance Series (TOGS) 1.1.1, June 1998. Amended in April 2000

2 - When the guidance value or standard is below the method detection limit, showing the method detection limit is considered acceptable for meeting the guidance value or standard

♦ - Concentrations are from duplicate sample, which was greater than the original sample.

– Indicates no NYS GA Groundwater Standard

B - The analyte was also detected in a blank.

F - Analyte was positively identified but the associated numerical value is below the reporting limit

J - Analyte was positively identified, quantitation is an approximation

M - Matrix effect present

N/A - Analyte was not analyzed during sampling

N/S- Analyte was not sampled.

R - The data is unusable due to deficiencies in the ability to analyze the sample and meet QC criteria.

U - The analyte was analyzed for, but not detected. The associated numerical value is at or below the method detection limit.

UJ - The analyte was not detected above the RL, however the quantitation is an approximation.

Table 3-2
Tank Farms 1 and 3 Detected Analytical Results (continued)

Monitoring Well ID	NYSDEC	TF3MW-124										
Sample ID	GW	TF3M12413AA	TF3M12413AA	TF3M12413BB	TF3M12414CA	TF3M12412DA	TF3M12413EA	TF3M12413HA	TF3M12413GB	TF3M12413HB	TF3M12413IB	Monitoring well not sampled after March 2004
Date of Collection	Standards[1]	12/13/01	2/25/02	6/18/02	9/13/02	12/12/2002	3/12/2003	6/19/2003	9/12/2003	12/12/2003	3/17/2004	
Sample Depth (ft)	(µg/L)	13	13	13	14	12	13	13	13	13	13	
VOCs (ug/L)												
1,2-dibromo-3-chloropropane	0.04	U	U	U	U	U	0.25 UJ	U	U	U	U	
acetone	50	U	U	U	U	U	U	U	U	4.4 F	3.3 F	
benzene	1	0.76 F	0.76	0.43 F	0.5	U	U	U	U	U	U	
1-chlorohexane	--	U	U	U	U	U	U	0.14 M	0.14 M	U	U	
1,2,3-trichloropropane	5	U	U	U	U	U	U	0.21 M	U	U	U	
1,2,4-trimethylbenzene	5	U	U	U	U	U	U	0.23 M	U	U	U	
1,3,5-trimethylbenzene	5	U	U	U	U	U	U	0.25 M	U	U	U	
chloromethane	5	U	U	U	U	0.22 F	U	U	U	U	U	
t-butylbenzene	5	0.45 F	0.3 F	U	U	U	U	U	U	U	U	
bromodichloromethane	50	U	U	U	U	U	U	0.11 M	U	U	U	
bromomethane	5	U	U	U	U	U	0.19 UJ	U	0.13 M	U	U	
isopropylbenzene	5	2.3	0.23 F	U	U	U	U	U	U	U	U	
p - isopropyltoluene	5	0.21 F	U	U	U	U	U	U	U	U	U	
sec - butylbenzene	5	0.47 F	U	U	U	U	U	U	U	U	U	
m,p-xylene	5	U	U	U	U	U	U	0.34 M	U	U	U	
2-hexanone	--	U	U	11	U	U	U	U	U	U	U	
toluene	5	U	U	U	U	U	U	0.17 M	U	U	U	
trichloroethylene	5	0.52 F	0.57	0.59	0.61	0.48 F	0.62 J	0.33 F	U	0.6 F	0.55 F	
styrene	5	U	U	U	U	U	U	0.12 M	U	U	U	
tetrachloroethylene	5	U	U	U	U	U	U	U	0.18 M	U	U	
trichlorofluoromethane	5	U	U	U	U	U	U	U	0.14 M	U	U	
Total VOCs		4.71	1.86	12.02	1.11	0.7	0.62	1.9	0.59	5 F	3.85 F	
SVOCs (µg/L)												
2,4,5-trichlorophenol	1*	U	U	3 M	U	U	3 UJ	U	U	U	U	
2,4,6-trichlorophenol	1*	U	U	4 M	U	U	4 UJ	U	U	U	U	
2,4-dichlorophenol	1*	U	U	5 M	U	U	4 UJ	U	U	U	U	
2,4-dinitrophenol	1*	U	U	12 M	UJ	U	11 UJ	U	U	U	U	
4,6-dinitro-2-methylphenol	1*	U	U	16 M	U	U	15 UJ	U	U	U	U	
4-nitrophenol	1*	U	U	4 M	U	U	3 UJ	U	U	U	U	
benzoic acid	--	U	U	U	U	U	13 UJ	17 R	17 R	U	U	
isophorone	50	U	U	U	U	U	5 UJ	R	U	U	U	
benzo(a)anthracene	1*	U	U	U	U	U	2 UJ	3 M	U	U	U	
Wet Chemistry Data (mg/L)												
nitrate	10000	N/A	U	U	U	U	0.12	0.056	U	U	U	
sulfate	250000	N/A	U	27.9	22 B	24.3	28.8 B	198	35.5	114	33.1 M	
sulfide		N/A	U	U	U	U	U	U	U	U	0.049 M	
total alkalinity	--	N/A	165	132	160	116	150	129	148	154	167	
Field Parameters												
dissolved iron (mg/L)		N/A	1.4	N/A	1.5	1.3	0.2	2.5	2	0.6	3.2	
pH		7.98	7.31	7.96	7.12	6.79	10.15	7.17	7.29	7.2	7.19	
specific conductance (µS/cm)		867	581	799	856	658	526	700	937	880	240	
temperature (degrees C)		13.68	10.4	11.6	15.6	13.3	9.6	11.52	14.95	14.1	8.63	
dissolved oxygen (mg/L)		3.88	3.35	0.63	1.56	3.98	4.61	3.9	5.52	8.17	2.6	
oxidation reduction potential (mV)		-73	-90	-129	4	-39	-107	-110	-128	-106	-10	

Notes.

1 - Groundwater Standards are from Technical and Operational Guidance Series (1OGS) 1.1.1, June 1998. Amended in April 2000

2 - When the guidance value or standard is below the method detection limit, showing the method detection limit is considered acceptable for meeting the guidance value or standard

* - Sum of total phenolic compounds may not exceed 1 ppm

♦ - Indicates higher value detected in the sample duplicate or during the dilution phase.

-- Indicates no NYS GA Groundwater Standard

F - Ananlyte was positively identified but the associated numerical value is below the reporting limit

M - Matrix effect present

N/A - Analyte was not analyzed during sampling

N.S- Analyte was not sampled.

U - The analyte was analyzed for, but not detected The associated numerical value is at or below the method detection limit.

UJ - The analyte was not detected above the RL, however the quantitation is an approximation.

Table 3-2
Tank Farms 1 and 3 Detected Analytical Results (continued)

Monitoring Well ID	NYSDEC	TF3MW-125							
Sample ID	GW	TF3M12513AA	TF3M12513BB	TF3M12514CA	TF3M12513DA	TF3M12513EA	TF3M12513FA	TF3M12514GB	Decomissioned in September 2003
Date of Collection	Standards[1]	2/12/02	6/19/02	9/13/02	12/20/2002	3/12/2003	6/23/2003	9/2/2003	
Sample Depth (ft)	(µg/L)	13	13	14	13	13	13	14	
VOCs (ug/L)									
1,2-dichloropropane	1	U	U	U	U	.32 UJ	U	U	
1,2,4-trimethylbenzene	5	81 ♦	48 ♦	56 ♦	29	28	23	36	
1,3,5-trimethylbenzene	5	33 ♦	19	21 ♦	14	10 M	8.3	13	
benzene	1	0.36 F	U	U	U	0.30 UJ	U	U	
n-butylbenzene	5	U	2.3	3 J	U	0.44 UJ	U	U	
sec-butylbenzene	5	2.7 ♦	2	2.6 ♦	1.4	1.8 M	U	U	
t-butylbenzene	5	1.6 ♦	0.98	1.3 ♦	0.9	0.92 J	U	U	
chloroethane	5	U	U	0.63	U	0.32 UJ	U	U	
chloromethane	5	U	U	0.66	U	0.28 UJ	U	U	
ethylbenzene	5	94 ♦	82 ♦	90 ♦	53	61 M	51	62	
isopropylbenzene	5	80 ♦	62 ♦	85 ♦	40	50 M	37	43	
p-isopropyltoluene	5	4.2 ♦	2.9 ♦	3.6	U	2.1 M	U	U	
methylene chloride	5	U	U	U	U	0.5	7 B	8.5	
methyl ethyl ketone	5	U	U	U	U	3.1 UJ	U	U	
n-propylbenzene	5	14	15	18 ♦	9.5	11 M	7.8	11	
naphthalene	10	U	11	14 ♦	7.8	10 J	6.8	9.1	
toluene	5	1.1 ♦	0.86	1.1 ♦	U	0.54 M	U	U	
o-xylene	5	2.5	1.1	1.4 ♦	0.87	0.78 M	U	U	
m,p-xylene	5	89 ♦	47 ♦	42 ♦	26	28 J	26	37	
Total VOCs		403.46	294.14	337.29	182.47	204.64	159.9	219.6	
SVOCs (µg/L)									
bis-(2-ethylhexyl) phthalate	5	5 F	U	U	U	U	U	U	
benzoic acid	--	U	U	U	U	U	17 R	18 R	
naphthalene	10	4 F	U	U	6 F	6 F	4 F	6 F	
phenanthrene	50	U	U	U	U	3 F	U	U	
pyrene	50	3 F	U	U	U	U	U	U	
2-methylnaphthalene	--	U	U	U	U	5 F	2 F	2 F	
bis (2-etylhexyl) phthalate	5	U	U	U	U	4 M	U	U	
Total SVOCs		12	0	0	6	18	6	8	
Wet Chemistry Data (mg/L)									
nitrate	10000	U	U	U	N/A	U	U	U	
sulfate	250000	U	5.4	5.2 B	2.7	10.9 B	39.7	4.3	
sulfide		U	U	U	U	1 M	U	U	
total alkalinity	--	106	97.6	137	96.3	143	116	116	
Field Parameters									
dissolved iron (mg/L)		3.5	N/A	5.6	4.4	2.8	3.5	N/S	
pH		6.64	6.55	6.9	6.87	6.84	6.8	N/S	
specific conductance (µS/cm)		380	403	422	481	391	228	N/S	
temperature (degrees C)		9.6	9.9	13	12.8	9.38	9.99	N/S	
dissolved oxygen (mg/L)		4.90	3.87	1.09	2.88	4.51	3.56	N/S	
oxidation reduction potential (mV)		-50	-83	-22	-112	-3	-132	N/S	

Notes:

1 - Groundwater Standards are from Technical and Operational Guidance Series (TOGS) 1.1.1, June 1998. Amended in April 2000

2 - When the guidance value or standard is below the method detection limit, abieving the method detection linut is considered acceptable for meeting the guidance value or standard

♦ - Indicates higher value detected in the sample duplicate or during the dilution phase.

-- Indidcates no NYS GA Groundwater Standard

B - The analyte was also detected in a blank.

F - Ananlyte was positively identified but the associated numerical value is below the reporting limit

J - Analyte was positively identified, quantitation is an approximation

N/A - Analyte was not analyzed during sampling

N/S- Analyte was uot sampled.

U - The analyte was analyzed for, but not detected. The associated numerical value is at or below the method detection limit.

UJ - The analyte was not detected above the RL. However the quantitation is an approximation.

Table 3-2
Tank Farms 1 and 3 Detected Analytical Results (continued)

Monitoring Well ID	NYSDEC	TF3MW-126										
Sample ID	GW	TF3M112613AA	TF3M112613BB	TF3M12614CA	TF3M12612DA	TF3M12613EA	TF3M12613FA	TF3M12614GB	TF3M12612HB	TF3M12613IB	TF3M12613JB	TF3M12613KB
Date of Collection	Standards[1]	2/12/02	6/19/02	9/13/02	12/20/2002	3/12/03	6/20/03	9/12/2003	12/12/2003	3/18/2004	6/17/2004	9/13/2004
Sample Depth (ft)	(µg/L)	13	13	14	12	13	13	14	12	13	13	13
VOCs (ug/L)												
1,2-dichloropropane	1	U	U	0.42 F	U	U	U	U	U	U	U	U
1,2,4-trimethylbenzene	5	0.55	U	1.6	U	U	U	U	U	U	0.39 F	U
acetone	50	U	U	U	U	U	U	U	5.7 F	U	U	U
n-butylbenzene	5	7.8	4.7	U	U	U	U	U	U	U	U	U
sec-butylbenzene	5	11	6.5	6	2.4	2.4	1.9 J ♦	1.8	1.1	1.4	2	1.2
t-butylbenzene	5	2.5	1.5	1.5	1.4	0.88	0.6 F ♦	1.2	1.4	1.1	1.6	1.5
chloromethane	5	U	U	U	0.26 F	U	U	U	U	U	U	U
ethylbenzene	5	U	0.37 F	U	U	U	U	U	U	U	U	U
isopropylbenzene	5	11	4.2	8.1	3.1	U	0.35 F ♦	1.6	1	1.1	3	0.39 F
p-isopropyltoluene	5	1	0.38 F	0.31 F	0.3 F	U	U	U	U	2.5	U	3.2
methyl ethyl ketone	5	U	U	U	U	1.6 UJ	U	U	U	U	U	U
n-propylbenzene	5	18	2.9	6.9	1	0.99	0.33 F ♦	0.77 F	0.49 F	0.83 F	0.8 F	U
Total VOCs		51.85	20.55	24.41	8.46	4.27	3.18	5.37	9.69	6.93	7.79	6.29
SVOCs (µg/L)												
benzoic acid	--	U	U	U	U	U	17 R	17 R	U	U	N/S	N/S
2-methylnaphthalene	--	12	U	10	U	U	U	U	U	U	N/S	N/S
Wet Chemistry Data (mg/L)												
nitrate	10000	U	U	U	N/A	U	U	U	U	0.58	0.18	0.065
sulfate	250000	U	13.8	4.9 B	8.9	16.8 B	50	9.2	35.4	22.7	N/S	N/S
sulfide		U	U	U	U	U	U	U	U	U	N/S	N/S
total alkalinity	--	267	220	233	182	233	241	243	400	308	275	218
Field Parameters												
dissolved iron (mg/L)		3.5	N/A	5.4	6	3.4	4.4	2.5	1.8	2	3.2	4.8
pH		7.12	6.64	6.74	6.94	6.9	7.15	7.17	6.7	6.95	7.11	6.88
specific conductance (µS/cm)		451	479	660	590	509	414	581	686	68	58	59
temperature (degrees C)		10	9.8	13.2	12.7	9.6	10.11	13.32	12.52	8.5	9.9	13.4
dissolved oxygen (mg/L)		5.18	3.51	1.13	2.18	4.5	3.75	3.54	0.9	4.8	2.9	6.08
oxidation reduction potential (mV)		-84	-91	-8	-118	-30	-125	-152	-122	-70	-104	-100

Notes:

1 - Groundwater Standards are from Technical and Operational Guidance Series (TOGS) 1.1.1, June 1998. Amended in April 2000

2 - When the guidance value or standard is below the method detection limit, ahieving the method detection limit is considered acceptable for meeting the guidance value or standard

♦ - Indicates higher value detected in the sample duplicate or during the dilution phase.

-- Indidcates no NYS GA Groundwater Standard

B - The analyte was also detected in a blank.

F - Ananlyte was positivcly identified but the associated numerical value is below the reporting limit

J - Analyte was positively identified, quantitation is an approximation

N/A - Aualyte was not analyzed during sampling

N/S- Analyte was not sampled.

U - The analyte was analyzed for, but not detected. The associated numerical value is at or below the method detection limit.

UJ - The analyte was not detected above the RL. However the quantitation is an approximation.

Table 3-2
Tank Farms 1 and 3 Detected Analytical Results (continued)

Monitoring Well ID	NYSDEC	TF3MW-127										
Sample ID	GW	TF3M12713AA	TF3M12713BB	TF3M12714CA	TF3M12712DA	TF3M12713EA	TF3M12713FA	TF3M12713GB	TF3M12713HB	TF3M12713IB	TF3M12713JB	TF3M12713KB
Date of Collection	Standards[1]	2/12/02	6/19/02	9/13/02	12/20/2002	3/12/2003	6/20/2003	9/12/2003	12/12/2003	3/17/2004	6/17/2004	9/13/2004
Sample Depth (ft)	(ug/L)	13	13			13	13	13		13	13	13
VOCs (ug/L)												
1,2,4-trimethylbenzene	5	180 ♦	16	190 ♦	14	15	5.6	56 J	56	21	72	43
1,3,5-trimethylbenzene	5	66 ♦	6.6	74 ♦	7.9	6.3	2.5	30	20	7.1	0.83 F	13
benzene	1	2.6	0.94	5.7	1.3	0.54	2.2	5.2	2.1	2.9	4.2	3.3
n-butylbenzene	5	9	1.2	U	U	U	U	3.5	U	U	0.87 F	0.64 F
sec-butylbenzene	5	12	2.1	15 ♦	2.7	1.5	1.3	6.7	5.1	2.7	3.2	2.7
t-butylbenzene	5	1.7	0.24 F	1.7 ♦	0.34 F	U	U	0.87 F	0.52 F	0.26 F	0.87 F	U
chloroethane	5	U	U	0.44 F	U	U	U	U	U	U	U	U
chloromethane	5	U	U	0.47 F	U	U	U	U	U	U	U	U
ethylbenzene	5	81	15	120 B	20	35	12	41 J	47	25	50	26
isopropylbenzene	5	37	5.9	67 ♦	8.7	7.6	3.1	24	18	8.6	18	10
p-isopropyltoluene	5	14	1.3	11	1.2	0.56	U	2.5	1.7	0.48 F	1.7 F	0.89 F
methyl ethyl ketone	5	U	U	U	U	1.6 UJ	U	U	U	U	U	U
n-propylbenzene	5	48	7.3	80 ♦	9.6	7.1	3.1	28	20	7.7	19	11
naphthalene	10	U	5.1	44	7.6 J	8.5	2.2	22	19	8.2	19	12
trichloroethylene	5	0.54	0.44 F	0.26 F	0.49 F	0.43 F	U	0.23 F	U	U	U	U
toluene	5	U	U	1.2	U	U	U	U	U	U	U	U
m,p-xylene	5	45	7	49	7.7	20	4.6	45	40	18	41	24
methylene chloride	5	U	U	U	U	U	U	U	0.8 F	U	2.2	0.53 F
Total VOCs		451.84	62.12	659.77	73.83	82.53	36.6	220	230.22	101.94	230.67	147.06
SVOCs (µg/L) MCL[2]												
2-methylnaphthalene	--	35	23	140	9 F	8 F	3 F	9 F	2 F	U	N/S	N/S
benzo(a)anthracene	0.002	5 F	U	25 F	2 F	U	U	U	U	U	N/S	N/S
acenaphthene	20	4 F	U	U	U	U	U	U	U	U	N/S	N/S
anthracene	50	4 F	U	U	U	U	U	U	U	U	N/S	N/S
benzo(a)pyrene	ND	3 F	U	U	U	U	U	U	U	U	N/S	N/S
benzo(b)flouranthene	0.002	3 F	U	U	U	U	U	U	U	U	N/S	N/S
benzoic acid	--	U	U	U	U	U	17 R	17 R	U	U	N/S	N/S
bis(2-ethylhexyl)phthalate	5	2 F	U	26 F	U	U	U	U	U	U	N/S	N/S
chrysene	0.002	4 F	U	28 F	U	U	U	U	U	U	N/S	N/S
flouranthene	50	17	4 F	U	U	U	U	U	U	U	N/S	N/S
flourene	50	U	U	U	U	U	U	U	U	U	N/S	N/S
naphthalene	10	23	20	110	9 F	12	8 F	12	6 F	3 F	N/S	N/S
phenanthrene	50	13	4 F	53	4 F	U	U	U	2 F	U	N/S	N/S
pyrene	50	14	3 F	30 F	3 F	U	U	U	U	U	N/S	N/S
Total SVOCs		127	54	412	27	20	11	21	10	3	N/S	N/S
Wet Chemistry Data (mg/L)												
nitrate	10000	0.11	U	U	N/A	U	0.055	U	0.15	0.83	0.36	0.13
sulfate	250000	U	24.8	14.8	11.5	10.6 B	14.2	21	21.6	24.8	N/S	N/S
sulfide		U	U	U	U	U	U	U	U	0.061 F	N/S	N/S
total alkalinity	--	284	218	268	214	252	253	231	389	233 B	341	246
Field Parameters												
dissolved ron (mg/L)		3.2	N/A	6.5	3.5	2	1.8	4	2.5	2	2.8	1
pH		6.81	7.85	6.56	7.03	7.08	7.15	7.07	6.44	7.07	6.99	7.59
specific conductance (µS/cm)		524	752	839	566	451	353	517	543	76	81	68.8
temperature (degrees C)		9.6	10.2	13.3	11.5	8.3	9.37	13.22	11.69	7.79	9.9	13.2
dissolved oxygen (mg/L)		3.55	0.8	1.2	2.66	4.88	4.02	6.28	3.41	4.1	2.9	4.59
oxidation reduction potential (mV)		-90	-111	6	-99	52	-89	-129	-73	-21	-70	-38

Notes.

1 - Groundwater Standards are from Technical and Operational Guidance Series (TOGS) 1.1.1, June 1998. Amended in April 2000

* - Sum of total phenolic compounds may not exceed 1 ppm

♦ - Concentrations are from duplicate sample or dilution, which was greater than the original sample

-- Indidcates no NYS GA Groundwater Standard

B - The analyte was also detected in a blank

F - Ananlyte was positively identified but the associated numerical value is below the reporting limit

J - Analyte was positively identified, quantitation is an approximation

N/A - Analyte was not analyzed during sampling

ND - Analyte must be non detect. Any reported detection must be treated as an exceedance of groundwater standards.

N/S- Analyte was not sampled.

U - The analyte was analyzed for, but not detected The associated numerical value is at or below the method detection limit.

UJ - The analyte was not detected above the RL, however the quantitation is an approximation.

Table 3-2
Tank Farms 1 and 3 Detected Analytical Results (continued)

Monitoring Well ID	NYSDEC	TF3MW-128										
Sample ID	GW	TF3M112813AA	TF3M112813BB	TF3M12814CA	TF3M12813DA	TF3M12814EA	TF3M12813FA	TF3M12814GB	TF3M12813HB	TF3M12813IB	TF3M12814JB	TF3M12813KB
Date of Collection	Standards[1]	2/12/02	6/19/02	9/13/02	12/20/2002	3/12/2003	6/20/2003	9/11/2003	12/12/2003	3/17/2004	6/17/2004	9/13/2004
Sample Depth (ft)	(ug/L)	13	13	14	13	14	13	14	13	13	14	13
VOCs (ug/L)												
1,2,4-trimethylbenzene	5	140 ♦	98 ♦	53	33	31	60 ♦	44	24	16	32	20
1,3,5-trimethylbenzene	5	54	39 ♦	23	14	10	24 ♦	18	7.9	5.5	12	6.7
acetone	50	U	U	U	U	U	U	U	3.4 F	U	U	U
benzene	1	4.2	2.2 ♦	3.3	1.4	0.62	0.99 ♦	1.4	0.42 F	0.63	0.8	0.42 F
n-butylbenzene	5	6	3.6	U	U	U	U	3	0.89 F	U	0.74 F	0.59 F
sec-butylbenzene	5	9.3	6.8	6	3.1	2	4.5 ♦	3.8	1.2	1.4	2.2	1.5
t-butylbenzene	5	1.2	0.75	0.8	0.42 F	0.24 F	0.3 F	0.47 F	U	U	0.3 F	U
chloroethane	5	U	U	0.29 F	U	U	U	U	U	U	U	U
chloromethane	5	U	U	0.31 F	U	U	U	U	U	U	U	U
ethylbenzene	5	98 ♦	58 ♦	54 B	19	12	22 ♦	21	9.1	10	15	8.6
isopropylbenzene	5	32	21 ♦	24	9.3	5.5	10 ♦	9.8	3.9	4.7	7.3	3.9
p-isopropyltoluene	5	40	17 ♦	19	9.8	3.9	5.6 ♦	3.8	1.2	2	5.3	2.4
methyl ethyl ketone	5	U	U	U	U	U	U	U	U	U	U	U
n-propylbenzene	5	41	30 ♦	30	13	7.3	16 ♦	14	5.4	5.2	9.6	5.5
naphthalene	10	U	23	30	9.9 J	5.4	9	8.3	3.1	4.8	6.5	3.4
toluene	5	1 ♦	0.5	0.36 F	0.23 F	U	U	U	U	U	U	U
o-xylene	5	1.1	U	0.44 F	0.25 F	U	U	U	U	U	U	U
m,p-xylene	5	82	47 ♦	32 B	14	11	21 ♦	20	9.4	8.4	14	8
Total VOCs		427.8	346.85	276.5	127.4	88.96	173.39	147.57	69.91	58.63	105.74	61.01
SVOCs (µg/L) MCL[2]												
2-methylnaphthalene	--	24	17	12	U	4 F	6 F	8 F	U	5 F	N/S	N/S
benzo(a)anthracene	0.002	U	U	U	2 F	U	U	U	U	U	N/S	N/S
acenaphthene	20	8 F	U	5 F	U	U	U	U	U	U	N/S	N/A
anthracene	50	5 F	U	U	U	U	U	U	U	U	N/S	N/S
benzoic acid	--	U	U	U	U	13 UJ	17 R	18 R	U	U	N/S	N/S
dibenzofuran	--	4 F	U	U	U	U	U	U	U	U	N/S	N/S
flouranthene	50	6 F	U	U	U	U	U	U	U	U	N/S	N/S
flourene	50	6 F	U	U	U	U	U	U	U	U	N/S	N/S
naphthalene	10	26	15	17	6 F	4 F	5 F	7 F	U	4 F	N/S	N/S
phenanthrene	50	20	4 F	8 F	U	U	U	U	U	U	N/S	N/S
pyrene	50	4 F	U	3	U	U	U	U	U	U	N/S	N/S
Total SVOCs		103	32	45	8 F	8 F	11 F	15 F	0	9 F	N/S	N/S
Wet Chemistry Data (mg/L)												
nitrate	10000	U	U	U	N/A	0.73	0.32	U	0.074	0.19	U	U
sulfate	250000	12.9	6.1	5.8	31.8	9.3 B	25.8	6.1	4	2.6	N/S	N/S
sulfide		U	U	U	U	U	U	U	U	U	N/S	N/S
total alkalinity	--	247	233	293	212	203	253	329	573	314 B	362	371
Field Parameters												
dissolved iron (mg/L)		0.7	N/A	3.2	1.6	0	1.6	0.4	0.2	0.4	0.5	0
pH		7.29	7.74	7.13	7.05	7.34	7.05	7.09	5.83	6.8	6.72	7.21
specific conductance (µS/cm)		377	457	612	609	338	609	500	659	75	75	76.5
temperature (degrees C)		9.7	9.9	13.4	11.2	6.72	11.2	12.05	10.83	7.92	9.8	13.4
dissolved oxygen (mg/L)		4.8	1.81	4.46	4.27	6.89	4.27	5.89	3.48	4.2	5.3	5.93
oxidation reduction potential (mV)		-124	-90	-15	-79	162	-79	-61	246	91	-12	65

Notes:

1 - Groundwater Standards are from Technical and Operational Guidance Series (TOGS) 1.1.1, June 1998. Amended in April 2000

* - Sum of total phenolic compounds may not exceed 1 ppm.

♦ - Concentrations are from duplicate sample or dilution, which was greater than the original sample

-- Indidcates no NYS GA Groundwater Standard

B - The analyte was also detected in a blank.

F - Ananlyte was positively identified but the associated numerical value is below the reporting limit

J - Analyte was positively identified, quantitation is an approximation

N/A - Analyte was not analyzed during sampling

ND - Analyte must be non detect. Any reported detection must be treated as an exceedance of groundwater standards.

N/S- Analyte was not sampled.

U - The analyte was analyzed for, but not detected. The associated numerical value is at or below the method detection limit.

UJ - The analyte was not detected above the RL, however the quantitation is an approximation.

Table 3-2
Tank Farms 1 and 3 Detected Analytical Results (continued)

Monitoring Well ID	NYSDEC	TF3MW-129									
Sample ID	GW	TF3M12918AA	TF3M12918BB	TF3M12915CA	TF3M12917DA	TF3M12918EA	TF3M12918FA	TF3M12918GB	TF3M12918HB	TF3M12918IB	
Date of Collection	Standards[1]	2/12/02	6/19/02	9/13/02	12/20/2002	3/12/2003	6/20/03	9/12/03	12/12/2003	3/17/2004	
Sample Depth (ft)	(µg/L)	13	13	15	17	18	17	18	18	18	
VOCs (ug/L)											
1,1,1-trichloroethane	5	U	0.41 F	0.25 F	U	0.35 F	0.24 F	U	U	U	
1,3,5-trimethylbenzene	5	U	U	U	U	U	U	U	U	0.39 F	
acetone	50	U	U	U	U	U	U	U	4.4 F	U	
benzene	1	0.44 F	U	U	U	U	0.61	0.58	0.31 F	2.2	
chloroform	7	U	0.45 F	U	U	0.31 F	0.39 F	0.22 F	0.21 F	U	
sec - butylbenzene	5	0.21 F	U	U	U	U	U	U	U	U	
ethylbenzene	5	0.78	0.25 F	0.42 F	0.23 F	1.1	0.95 F	1.2	0.61 F	3.9	
isopropylbenzene	5	1	0.29 F	0.34 F	U	1.3	0.65 F	0.67 F	0.3 F	4.5	
n-propylbenzene	5	U	U	U	U	U	U	U	U	0.22 F	
naphthalene	10	U	U	U	UJ	0.21 F	U	U	U	U	
trichloroethylene	5	0.34 F	0.41 F	0.32 F	0.4 F	0.33 F	0.2 F	0.27 F	0.3 F	0.28 F	
o-xylene	5	U	U	U	U	U	U	U	U	0.31 F	
Total VOCs		2.77	1.81	1.33	0.63	3.6	3.04	2.94	6.13	11.8	
SVOCs (µg/L)											
bis(2-ethylhexyl)phthalate	5	3 F	U	U	U	U	U	U	U	U	
benzoic acid	--	U	U	U	U	U	17 R	7 R	U	U	
di-n-butyl phthalate	50	3 F	U	U	U	U	U	U	U	U	
flouranthene	50	23	4 F	4 F	5 F	4 F	U	U	U	U	
phenanthrene	50	8 F	U	U	U	U	U	U	U	U	
pyrene	50	16	U	3 F	4 F	3 F	U	2 F	U	U	
Total SVOCs		53	4 F	7 F	9 F	7 F	0	2 F	0	0	
Wet Chemistry Data (mg/L)											
nitrate	10000	0.22	0.28	0.14	N/A	0.46	0.84	0.4	0.82	0.8	
sulfate	250000	U	14.7	17.6	9.3	14.2 B	24	12.6	23.6	18.3	
sulfide	--	U	U	U	U	U	U	U	U	U	
total alkalinity	--	216	208	223	149	202	235	221	324	175 B	
Field Parameters											
dissolved iron (mg/L)		0.3	N/A	0.2	0.4	0.2	0.02	0	0.6	0.5	
pH		7.17	7.59	6.75	7.39	9.09	7.39	7.37	6.83	7.17	
specific conductance (µS/cm)		563	478	537	512	439	293	480	584	61	
temperature (degrees C)		11	11	12.4	12.7	11.1	11.12	12.06	12.86	10.48	
dissolved oxygen (mg/L)		3.90	1.36	1.22	3.09	3.97	3.89	5.06	7.71	3.2	
oxidation reduction potential (mV)		-59	-75	29	-50	-73	-61	-102	-43	151	

Monitoring well not sampled after 3/2004

Notes:

1 - Groundwater Standards are from Technical and Operational Guidance Series (TOGS) 1.1.1, June 1998. Amended in April 2000

♦ - Indicates higher value detected in the sample duplicate or during the dilution phase.

-- Indidcates no NYS GA Groundwater Standard

F - Ananlyte was positively identified but the associated numerical value is below the reporting limit

N/A - Analyte was not analyzed during sampling

U - The analyte was analyzed for, but not detected. The associated numerical value is at or below the method detection limit.

Table 3-2
Tank Farms 1 and 3 Detected Analytical Results (continued)

Monitoring Well ID	NYSDEC	TF3MW-130									
Sample ID	GW	TF3M13016AA	TF3M13017BB	TF3M13018CA	TF3M13016DA	TF3M13017EA	TF3M13017FA	TF3M13017GB	TF3M13017HB	TF3M13017IB	
Date of Collection	Standards[1]	2/12/02	6/19/02	9/13/02	12/20/2002	3/12/2003	6/23/2003	9/12/2003	12/12/2003	3/17/2004	
Sample Depth (ft)	(µg/L)	16	16	16	16	17	17	17	17	17	
VOCs (ug/L)											
1,1,2-trichloroethane	1	1.1	U	U	U	U	U	U	U	U	
1,2,4-trimethylbenzene	5	12	U	0.75	0.59	0.37 F	0.67 F	0.87 F	0.83 F	1.8	
1,3,5-trimethylbenzene	5	2.5	U	U	U	U	0.37 F	0.74 F	0.89 F	U	
bromodichloromethane	5	0.25 F	U	U	U	U	U	U	U	U	
chloroethane	5	U	U	0.25 F	0.26 F	U	U	U	U	U	
chloroform	7	0.25 F	U	U	U	U	U	U	U	U	
sec - butylbenzene	5	0.61	U	1.2	0.21 F	U	U	0.65 F	0.39 F	0.48 F	
ethylbenzene	5	1.7	0.74	0.98 B	1.3	0.68	0.41 F	3.8	3.3	1.7	
isopropylbenzene	5	2.4	0.23 F	1.2	1.4	0.46 F	0.72 F	1.8	2.5	2.3	
methylene chloride	5	U	U	U	U	0.53	U	U	U	U	
p-isopropyltoluene	5	0.45 F	U	0.49 F	U	U	U	U	U	U	
n-propylbenzene	5	1.3	U	1.4	0.78	0.44 F	0.34 F	2.4	2	2.1	
naphthalene	10	U	0.53 F	0.61 F	1.9	0.47 F	1.7	0.98 F	3	1	
o-xylene	5	1.3	0.26 F	U	0.47 F	U	U	0.48 F	0.55	0.38 F	
m,p-xylene	5	1.5	0.47 F	U	0.38 F	U	U	1.4 F	1.1 F	0.68 F	
Total VOCs		25.36	2.23	6.88	7.29	2.95	4.21	13.12	14.56	48.78	
SVOCs (µg/L)											
bis(2-ethylhexyl)phthalate	5	U	U	2 F ♦	U	U	U	U	U	U	
benzoic acid	--	U	U	U	U	U	17 R	7 R	U	U	
Wet Chemistry Data (mg/L)											
nitrate	10000	0.29	1.5	U	N/A	1.3	1.8	0.86	1.5	0.75	
sulfate	250000	48	13.1	12.3	70	13.2 B	17.6	8.4	13.2	12.6	
sulfide	--	U	U	U	U	U	U	U	U	0.056 F	
total alkalinity	--	225	136	246	120	157	149	212	240	137 B	
Field Parameters											
dissolved iron (mg/L)		1	N/A	0.6	0.8	0.4	0	0	0.2	0	
pH		6.92	7.18	7.11	7	7.02	6.63	7.1	6.18	6.76	
specific conductance (µS/cm)		465	301	591	340	345	226	412	343	50	
temperature (degrees C)		10.3	10.2	13	12.6	9.88	10.34	12.88	12.89	9.38	
dissolved oxygen (mg/L)		3.69	2.57	1.22	3.65	5.19	6.3	4.48	3.81	2.7	
oxidation reduction potential (mV)		-41	4	-12	-17	163	32	-38	48	81	

Monitoring well not sampled after 3/2004

Notes:

1 - Groundwater Standards are from Technical and Operational Guidance Series (TOGS) 1.1.1, June 1998. Amended in April 2000

♦ - Indicates higher value detected in the sample duplicate or during the dilution phase.

-- Indidcates no NYS GA Groundwater Standard

F - Ananlyte was positively identified but the associated numerical value is below the reporting limit

N/A - Analyte was not analyzed during sampling

U - The analyte was analyzed for, but not detected. The associated numerical value is at or below the method detection limit.

Table 3-2
Tank Farms 1 and 3 Detected Analytical Results (continued)

Monitoring Well ID	NYSDEC	TF3MW-131				TF3MW-132				TF3MW-133			
Sample ID	GW	TF3M13117HB	TF3M13114IB	TF3M13115JB	TF3M13115KB	TF3M13217HB	TF3M13217IB	TF3M13217JB	TF3M13217KB	TF3M13316HB	TF3M13317IB	TF3M13316JB	TF3M13316KB
Date of Collection	Standards[1]	11/25/2003	3/17/2004	6/17/2004	9/13/2004	11/25/2003	3/17/2004	6/17/2004	9/13/2004	11/25/2003	3/17/2004	6/17/2004	9/13/2004
Sample Depth (ft)	(µg/L)	17	14	15	15	17	17	16	17	17	16	16	16
VOCs (ug/L)													
1,2,4-trimethylbenzene	5	U	U	U	U	U	U	U	U	80	72	49	15
1,3,5-trimethylbenzene	5	U	U	U	U	U	U	U	U	44	26	16	6.2
acetone	5	U	U	1.5 F	U	U	U	1.8 F	1.9 F	U	U	U	U
chloroform	7	0.34 F	U	0.55	0.4 F	0.93	U	0.79	0.63 B	U	U	U	U
cis-1,2-dichloroethylene	5	U	U	U	U	U	U	0.21 F	0.22 F	U	U	U	U
sec - butylbenzene	5	U	U	U	U	U	U	U	U	11	12	8.4	4.8
ethylbenzene	5	U	U	U	U	U	U	U	U	U	0.73 F	0.97 F	U
isopropylbenzene	5	U	U	U	U	U	U	U	U	13	20	14	5.3
methylene chloride	5	U	U	U	U	U	U	U	U	2.9 B	0.56 F	1.8 F	U
p-isopropyltoluene	5	U	U	U	U	U	U	U	U	18	3.5	1.9 F	0.8 F
n-butylbenzene	5	U	U	U	U	U	U	U	U	5.1	3.1	1.8 F	0.77 F
n-propylbenzene	5	U	U	U	U	U	U	U	U	16	20	14	6.6
naphthalene	10	U	U	U	U	U	U	U	U	3.7	5.2	3	0.87 F
trichloroethylene	5	0.43 F	0.32 F	0.36 F	0.38 F	0.8 F	0.67 F	0.64 F	0.69 F	U	U	U	U
t-butylbenzene	5	U	U	U	U	U	U	U	U	1.9	1.3 F	1 F	0.54 F
m,p-xylene	5	U	U	U	U	U	U	U	U	8.2	5	3.4 F	1.2 F
Total VOCs		0.77 F	0.32 F	2.41	0.78 F	1.73	0.67	3.44	3.44	200.9	169.39	115.27	42.08
SVOCs (µg/L)													
2-methylnapthalene	--	U	U	N/S	N/S	U	U	N/S	N/S	15	9 F	N/S	N/S
naphthalene	10	U	U	N/S	N/S	U	U	N/S	N/S	3 F	3 F	N/S	N/S
Total SVOCs		0	0	N/S	N/S	0	0	N/S	N/S	18	12 F	N/S	N/S
Wet Chemistry Data (mg/L)													
nitrate	10000	1	1.1	1.1	0.73	2	2	1.8	1.6	0.064	0.45	0.14	0.098
sulfate	250000	16.7	14.9	N/A	N/A	19.3	20.4	N/A	N/A	36.8	9.4	N/S	N/S
sulfide	--	U	0.26 F	N/A	N/A	U	U	N/A	N/A	U	U	N/S	N/S
total alkalinity	--	416	146 B	200	226	346	182 B	268	236	310	153 B	263	223
Field Parameters													
dissolved iron (mg/L)		0	N/A	0	0	0.8	0	0	0	0.8	1.8	3.3	2.8
pH		5.9	6.89	6.98	7.46	6.02	7.18	7.13	7.31	6.61	7.05	7.15	7.29
specific conductance (µS/cm)		626	80	0.11	84.8	682	66	63	76.7	542	41	58	62.7
temperature (degrees C)		13.15	9.21	11	14.6	12.03	9.94	10.1	12.1	11.63	8.12	9.7	12.7
dissolved oxygen (mg/L)		2.43	1.6	4.8	3.64	2.63	2.9	4.9	6.52	1.1	2.8	4.1	3.82
oxidation reduction potential (mV)		249	169	59	154	274	169	77	269	-101	-37	-96	-94

Notes:

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♦ - Indicates higher value detected in the sample duplicate or during the dilution phase.

-- Indidcates no NYS GA Groundwater Standard

F - Ananlyte was positively identified but the associated numerical value is below the reporting limit

N/A - Analyte was not analyzed during sampling

N/S- Analyte was not sampled.

U - The analyte was analyzed for, but not detected. The associated numerical value is at or below the method detection limit.

Figure 3-3
Tank Farms 1 and 3 SRA VOC Concentrations and Groundwater Elevation Trends

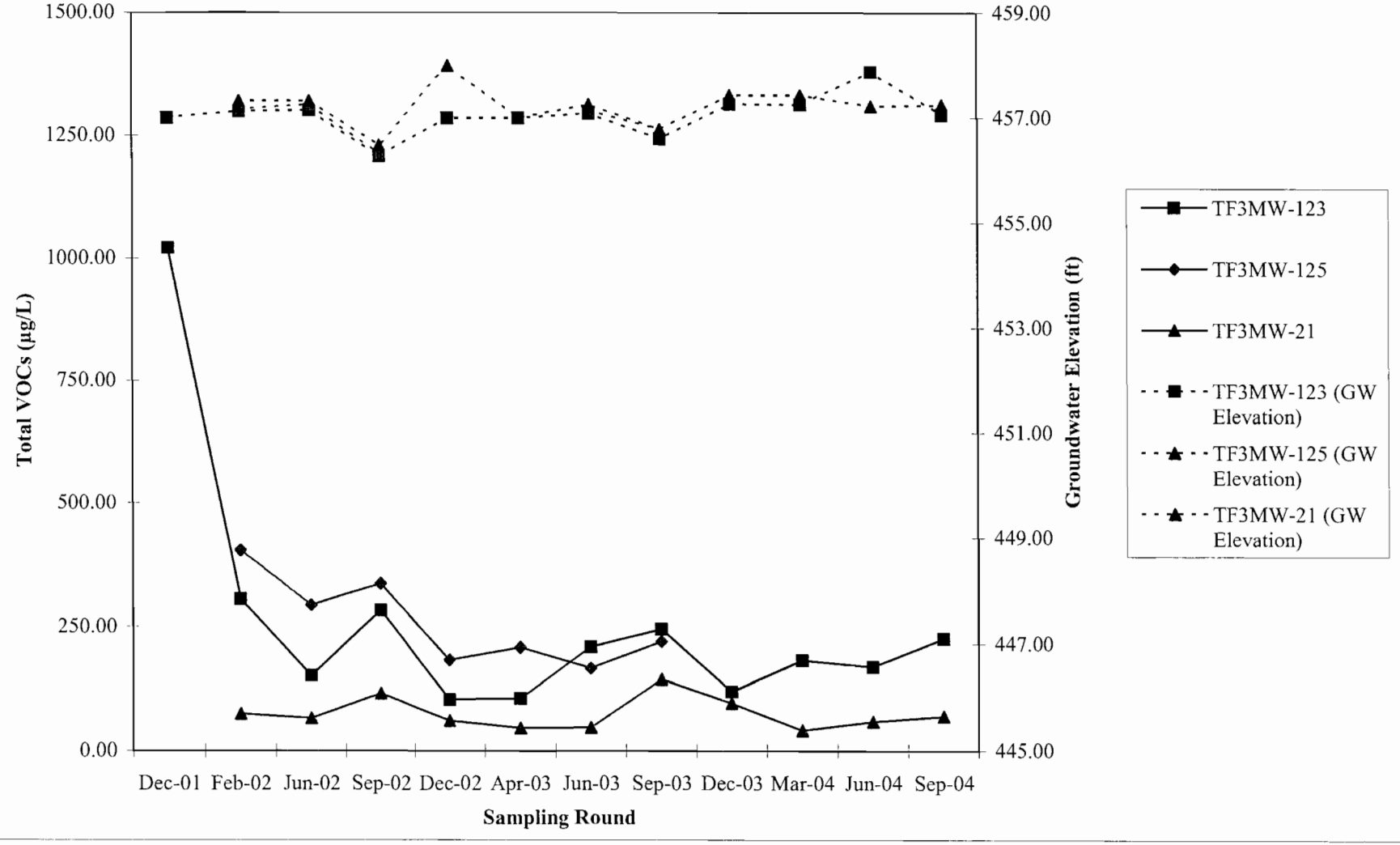
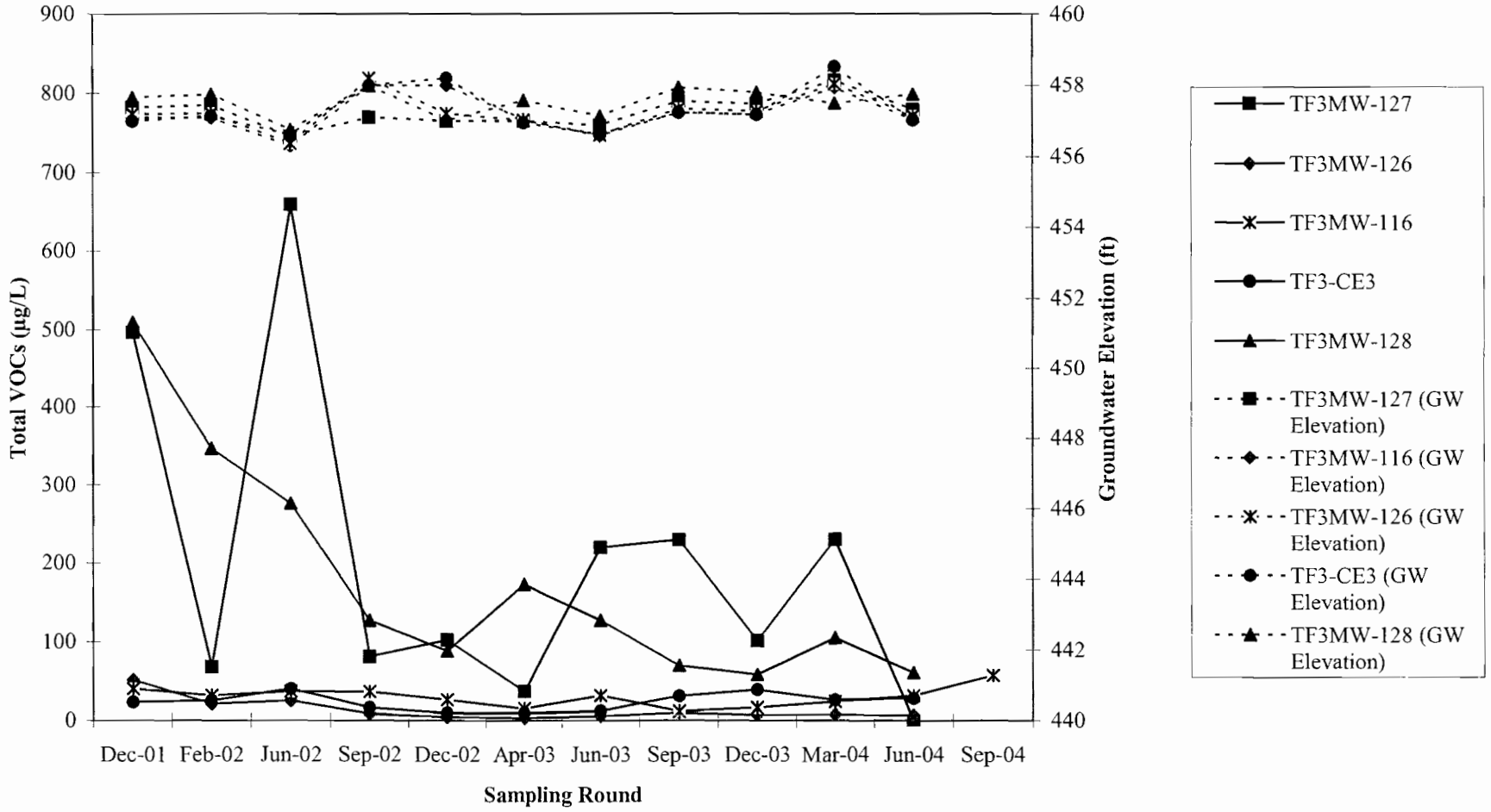


Figure 3-4
Tank Farms 1 and 3 SRA VOC Concentrations and Groundwater Elevation Trends



-121, -123, -124 were sampled along Brooks Road to assess the downgradient migration of the plume. Samples were not analyzed for natural attenuation parameters during this sampling round. TF3MW-123 reported several VOC exceedances and three SVOC exceedances. TF3MW-116 and -118 contained two and one VOC exceedances, respectively, while TF3MW-119 contained one VOC and several SVOC exceedances. No exceedances were reported in monitoring wells TF3MW-117, -120, -121 and -124.

- Minimum VOC exceedance: 5.6 µg/L for 2-dibromo-3-chloropropane at TF3MW-123
- Maximum VOC exceedance: 480 µg/L for isopropylbenzene at TF3MW-123
- Maximum total VOCs: 1,021 µg/L at TF3MW-123
- Maximum SVOC exceedance: 16 µg/L for bis(2-ethylhexyl)phthlate at TF3MW-123
- Maximum total SVOCs: 148 µg/L at TF3MW-123

February 2002:

Monitoring wells TF3CE-3, TF3MW-21, -116, -126, and -130 contained only VOC exceedances, while TF3MW-119, -123, -125, -127, and -128 showed exceedances for VOCs and SVOCs. Monitoring wells TF3MW-2, -25, -117, -118, -120, -121, -124, and -129 showed no exceedances of NYS Groundwater Standards. In March 2002, monitoring wells TF3MW-118 through -121 were decommissioned due to site construction that changed the site topography and usage. Following completion of site construction, replacement monitoring wells will be installed to monitor plume migration.

- Minimum VOC exceedance: 5.1 µg/L of n-butylbenzene at TF3MW-21
- Maximum VOC exceedance: 140 µg/L of 1,2,4-trimethylbenzene at TF3MW-128
- Maximum total VOCs: 510 µg/L at TF3MW-128
- Maximum SVOC exceedance: 26 µg/L of naphthalene at TF3MW-128
- Maximum total SVOCs: 127 µg/L at TF3MW-127

June 2002:

Monitoring wells TF3-CE3, TF3MW-21, -116, -117, -123, -125,-126, -127, and -128 contained VOC or SVOC exceedances. TF3MW-21, -116, -117, and -123 showed SVOC exceedances that were qualified with an "M" qualifier that indicated a matrix effect was present. Monitoring wells TF3MW-2, -25, -124, -129, and -130 showed no exceedances of NYS Groundwater Standards.

- Minimum VOC exceedance: 5.8 µg/L of n-propylbenzene at TF3CE-3
- Maximum VOC exceedance: 98 µg/L of 1,2,4-trimethylbenzene at TF3MW-128
- Maximum total VOCs: 294 µg/L at TF3MW-125
- Maximum SVOC exceedance: 20 µg/L of naphthalene at TF3MW-127
- Maximum total SVOCs: 54 µg/L at TF3MW-127

September 2002:

Monitoring wells TF3-CE3, TF3MW-21, -116, -117, -123, -125, and -126 contained only VOC exceedances. Monitoring wells TF3MW-127 and -128 contained VOC and SVOC exceedances. Monitoring wells TF3MW-2, -25, -117, -124, -129, and -130 showed no exceedances of NYS Groundwater Standards.

- Minimum VOC exceedance: 5.7 µg/L of benzene at TF3MW-127
- Maximum VOC exceedance: 190 µg/L of 1,2,4-trimethylbenzene at TF3MW-127
- Maximum total VOCs: 659.77 µg/L at TF3MW-127
- Maximum SVOC exceedance: 110 µg/L of naphthalene at TF3MW-127
- Maximum total SVOCs: 412 µg/L at TF3MW-127

December 2002:

Monitoring wells TF3-CE3, TF3MW-21, -116, and -125 contained VOC exceedances. Monitoring wells TF3MW-123, -127, and -128 contained both VOC and minor SVOC exceedances. Monitoring wells TF3MW-2, -25, -117, -124, -126, -129, and -130 showed no exceedances of NYS Groundwater Standards.

- Minimum VOC exceedance: 5.1 µg/L of isopropylbenzene at TF3-CE3
- Maximum VOC exceedance: 53 µg/L for isopropylbenzene at TF3MW-123 and ethylbenzene at TF3MW-125
- Maximum total VOCs: 182 µg/L at TF3MW-125
- Maximum SVOC exceedance: 2 F µg/L at TF3MW-127 and -128 for benzo(a)anthracene
- Maximum total SVOCs: 27 µg/L at TF3MW-127

March 2003:

Monitoring wells TF3MW-21, -117, -123, -125, -127, and -128 contained only VOC exceedances. No SVOC exceedances were detected, except for naphthalene, also a VOC, at TF3MW-127. Monitoring wells TF3-CE3, TF3MW-2, -25, -116, -117, -124, -126, -129, and -130 showed no exceedances of NYS Groundwater Standards.

- Minimum VOC exceedance: 5.2 J for n-propylbenzene for TF3MW-21
- Maximum VOC exceedance: 61 M µg/L for ethylbenzene for TF3MW-125
- Maximum total VOCs: 205 µg/L at TF3MW-125

June 2003:

Monitoring wells TF3MW-21, -116, -117, -123, -125, -127, and -128 contained only VOC exceedances. No SVOC exceedances were detected. Monitoring wells TF3-CE3, TF3MW-2, -25, -124, -126, -129, and -130 showed no exceedances of NYS Groundwater Standards.

- Minimum VOC exceedance: 5.2 J µg/L for n-propylbenzene at TF3MW-21
- Maximum VOC exceedance: 120 µg/L for isopropylbenzene at TF3MW-123
- Maximum total VOCs: 209 µg/L at TF3MW-123

September 2003:

Monitoring wells TF3MW-21, -117, -123, -125, -127, and -128 contained only VOC exceedances. No SVOC exceedances were detected, except for naphthalene, also a VOC, at TF3MW-127. Monitoring wells TF3-CE3, TF3MW-2, -25, -116, -124, -126, -129, and -130 showed no exceedances of NYS Groundwater Standards.

- Minimum VOC exceedance: 5.2 µg/L for benzene at TF3MW-127 and n-butylbenzene at TF3MW-123
- Maximum VOC exceedance: 130 µg/L for isopropylbenzene at TF3MW-123
- Maximum total VOCs: 245 µg/L for TF3MW-123

In September 2003, monitoring wells TF3MW-25 and -125 were decommissioned due to site construction at the Tank Farms 1 and 3 site. As with previously decommissioned monitoring wells, replacement monitoring wells will be installed following completion of site construction and evaluation of the LTM monitoring well network. In addition, in November 2003, TF3MW-131, -132, and -133 were installed in the central portion of the Tank Farm 1 and 3 site.

December 2003:

Monitoring wells TF3-CE3, TF3MW-21, -116, -117, -123, -125, -127, -128, and -133 contained only VOC exceedances. No SVOC exceedances were detected. Monitoring wells TF3MW-2, -25, -124, -126, -129, -130, -131, and -132 showed no exceedances of NYS Groundwater Standards.

- Minimum VOC exceedance: 2.1 µg/L for benzene at TF3MW-127
- Maximum VOC exceedance: 80 µg/L for 1,2,4-trimethylbenzene at TF3MW-133
- Maximum total VOCs: 230 µg/L for TF3MW-127

March 2004:

Monitoring wells TF3-CE3, TF3MW-21, -116, -117, -123, -125, -127, -128, -129 and -133 contained only VOC exceedances. No SVOC exceedances were detected. Monitoring wells TF3MW-2, -25, -124, -126, -130, -131, and -132 showed no exceedances of NYS Groundwater Standards.

- Minimum VOC exceedance: 2.2 µg/L for benzene at TF3MW-129
- Maximum VOC exceedance: 110 µg/L for isopropylbenzene at TF3MW-123
- Maximum total VOCs: 182 µg/L for TF3MW-123

Following the March 2004 sampling round SVOCs, sulfate and sulfide were no longer sampled for at the Tank Farms 1 & 3 site. In addition, monitoring wells TF3MW-2, -25, -124, -125, -129, and -130 are no longer sampled because previous sampling data showed an absence of contamination.

June 2004:

Monitoring wells TF3-CE3, TF3MW-21, -116, -117, -123, -125, -127, -128, and -133 contained VOC exceedances. Monitoring wells -126, -131, and -132 showed no exceedances of NYS Groundwater Standards.

- Minimum VOC exceedance: 4.2 µg/L for benzene at TF3MW-127
- Maximum VOC exceedance: 85 µg/L for isopropylbenzene at TF3MW-123
- Maximum total VOCs: 230.67 µg/L for TF3MW-127

September 2004:

Replacement monitoring wells TF3MW-119R and TF3MW-121R were installed prior to the September 2004 sampling round. Replacement monitoring well TF3MW-125R could not be installed due to the installation of new site utilities that obstruct the installation of the replacement well. Monitoring wells TF3-CE3, TF3MW-21, -116, -117, -119R, -123, -125, -127, -128, and -133 contained VOC exceedances. Monitoring wells -126, -131, and -132 showed no exceedances of NYS Groundwater Standards.

- Minimum VOC exceedance: 3.3 µg/L for benzene at TF3MW-127
- Maximum VOC exceedance: 120 µg/L for isopropylbenzene at TF3MW-123
- Maximum total VOCs: 225.4 µg/L for TF3MW-123

Natural Attenuation

Natural attenuation includes any reduction in concentration as a result of any of the natural attenuation processes, including dilution, dispersion, sorption, volatilization, biodegradation /biotransformation, and abiotic degradation/transformation.

Groundwater samples collected were also analyzed for the following geochemical indicator parameters: alkalinity, dissolved ferrous iron, nitrate, sulfate, and sulfide. These parameters can be used to document if the groundwater conditions support *biological* natural attenuation processes, particularly hydrocarbon biodegradation. These parameters help to identify if groundwater conditions are aerobic or anaerobic, and to indicate if other alternate electron acceptors are available to assist in the biodegradation of remaining COCs.

Microorganisms obtain energy for cell production and maintenance by catalyzing the transfer of electrons from electron donors to electron acceptors. This process results in the oxidation of the electron donor (which, in this case, is benzene, toluene, ethylbenzene and xylene (BTEX)/Total Petroleum Hydrocarbons (TPH), and the reduction of the electron acceptor. In most scenarios, Dissolved Oxygen (DO) is the primary electron acceptor. After DO is consumed, anaerobic microorganisms generally use electron acceptors in the following order of preference – nitrate, ferric iron, sulfate, and carbon dioxide (Wiedemeier et al., 1995). Anaerobic destruction of BTEX is associated with the reduction of nitrate, solubilization of iron, reduction of sulfate, and production of methane (the latter of which is not included in the list of those geochemical parameters analyzed). Each of these parameters will be reviewed in the following subsections. Please refer to Table 3-3 for natural attenuation parameter results.

Dissolved Oxygen (DO)

Oxygen is the most thermodynamically preferred electron acceptor and is normally depleted in areas with relatively higher BTEX/TPH concentrations. The Tank Farms site contained data within normal DO ranges but did show lower readings during the June (summer) and September (fall) 2002 sampling rounds at several well locations (TF3-CE3, TF3MW-21, -116, -123, -124, -127, -128, and -129). No correlation could be found between depleted DO levels within plume boundaries or at contaminated monitoring wells. Please note that DO levels were measured in the field from samples collected with a disposable bailer and do not necessarily represent subsurface conditions.

Nitrate

After the DO has been consumed, nitrate is used as an alternate electron acceptor for anaerobic biodegradation. In this process, nitrate (NO_3^-) is converted to nitrite (NO_2^-); therefore, nitrate depletion relative to background conditions can be an indication of biological activity. Depleted nitrate conditions appear to exist at monitoring wells within most of the designated plume areas. Nitrate levels in three uncontaminated and upgradient/crossgradient monitoring wells (TF3MW-2, -25, -130, -131, and -132) contained positive detections of nitrate generally within the range of 0.8 to 2 mg/L. These monitoring wells also showed no contamination during sample analysis.

Monitoring wells within the eastern plume show mostly depleted or undetectable nitrate levels. Downgradient well TF3-CE3 showed some nitrate depletion, with levels between 0.087 and 0.71 mg/L that are higher than the source area but lower than uncontaminated upgradient or crossgradient wells. Downgradient wells TF3MW-116 through -119R and -126 also showed depleted or undetectable nitrate ranges of 0-0.58 mg/L with no or low levels of contamination. In addition, uncontaminated well TF3MW-124 and contaminated wells TF3MW-21, -123, and -125 within the western plume boundary along Brooks Road showed depleted or undetectable levels of nitrate when compared to uncontaminated upgradient wells discussed above. It should be noted that downgradient replacement monitoring well TF3MW-121R showed a positive detection of nitrate at 1.2 mg/L for the September 2004 sampling round. The absence of nitrate in within-plume and downgradient wells suggests biological activity associated with nitrate reduction has consumed the available nitrate in areas affected with relatively higher levels of contamination.

Dissolved Iron

After DO and nitrate have been depleted by microbial activity, ferric iron (Fe^{3+}) is used as an electron acceptor during anaerobic biodegradation of hydrocarbons. Ferric iron is reduced to ferrous iron (Fe^{2+}), which is soluble in groundwater, and is therefore an indicator of microbial degradation activity. The presence of ferrous iron above background levels is indicative of anaerobic consumption of petroleum hydrocarbons via iron reduction. Low dissolved iron levels were identified at upgradient/crossgradient uncontaminated locations TF3MW-2, -25, -129, and -130, with an approximate range of 0-1.8 mg/L. Monitoring wells within the Building 147 plume (TF3MW-127, -128, and TF3-CE3) as well as downgradient wells TF3MW-116, -117, and -126 contained relatively higher levels (1-6.5 mg/L) of ferrous iron than upgradient, uncontaminated wells described above. The western plume along Brooks Road shows similar results with contaminated wells TF3MW-21, -123, and, -125 showing relatively elevated ferrous iron levels (1.6 – 5.6 mg/L). Crossgradient well TF3MW-124 showed slightly elevated levels 0.2 –3.2 mg/L, while downgradient uncontaminated monitoring wells TF3MW-118, -120, and -121 all showed undetectable ferrous iron levels. Monitoring wells TF3MW-119 and TF3MW-119R, located downgradient of TF3MW-123, did show an elevated level of 2 mg/L during the February 2002 and September 2004 sampling round in addition to minor SVOC contamination for the 2002 sampling round. The presence of ferrous iron above background levels within plume boundaries is indicative of anaerobic degradation of petroleum hydrocarbons in the vicinity of these wells.

Sulfate

Sulfate is the next thermodynamically preferred alternate electron acceptor and is used by microbes once the oxygen, nitrate, and ferric iron have been depleted by the anaerobic biodegradation of hydrocarbons. Sulfate is converted to sulfide in the subsurface during anaerobic biodegradation, often forming hydrogen sulfide gas, which produces a "rotten egg" odor. This process results in a depletion of sulfate and the production of sulfide. Sulfide may not always be detected in groundwater samples, however, because it commonly forms metal

sulfide precipitates and falls out of solution. Sulfate levels at upgradient/crossgradient uncontaminated locations TF3MW-2, -25, -129, and -130 did not differ significantly when compared to contaminated, within-plume wells TF3MW-21, -123, -125, -127, and -128. Sulfide was detected during the March 2004 sampling round, but was identified just above the detection limit at wells TF3-CE3, TF3MW-116, -123, -127, -130, -131, -132 and -133. These results indicate that sulfate reduction is not a significant process for the potential anaerobic completion of petroleum hydrocarbons at the site and was not sampled for after the March 2004 sampling round.

Alkalinity

Aerobic biodegradation (during the oxidation of hydrocarbon) uses oxygen to oxidize (destroy) the hydrocarbon and produces carbon dioxide by the process known as mineralization. When carbon dioxide is produced, it increases the alkalinity, or the water's ability to buffer an acid, and can therefore be an indicator of biological activity. In general, areas contaminated with hydrocarbons exhibit a higher total alkalinity than background areas. Changes in alkalinity are most pronounced during aerobic respiration, denitrification, iron reduction, and sulfate reduction. Generally higher (>200 mg/L) alkalinity levels were measured in downgradient or within-plume wells (TF3-CE3, TF3MW-116, -117, -120, -121, -126, -127 and -128) than other wells at the site, with levels generally less than 200 mg/L. It should be noted that alkalinity levels are most likely to be higher in wells downgradient of the plumes; some of the highest levels reported above 300 mg/L were associated with wells TF3CE-3 and TF3MW-116, -117, -126, and -128. These results are indicative of active (albeit, limited) biodegradation of petroleum hydrocarbons at the site.

pH

Hydrocarbon-degrading microbes are active within a pH range of 5 to 9 standard units (s.u.). There was no clear correlation with pH and contaminant locations. All pH readings are within normal ranges with no discernable trends identified between pH levels and seasonal variations or contaminant levels between wells.

Temperature

Groundwater temperature affects the rate of biodegradation, and for every 10 °C increase in temperature between 5 and 25 °C, biodegradation rates may double. The highest groundwater temperatures were found during the fall and winter sampling rounds and the lowest observed during spring and summer sampling, with temperatures falling within normal variation. The temperature discrepancy may be caused by buried steam heat piping at the site which is active during fall, winter and early spring.

Specific Conductance

Specific conductance is a measure of a groundwater's ability to conduct electricity. As the concentration of ions in solution increases, the specific conductance increases. Specific

conductance was found to be highest during the summer and fall (June and September) sampling round and lowest during the winter (December, February) sampling.

Redox (Reduction/Oxidation Potential)

The redox potential of groundwater is a measure of electron activity and is an indicator of the relative tendency of a solution to accept or transfer electrons. The redox potential of groundwater typically ranges from –400 mV to +800 mV. Positive redox values (redox > 0) indicate oxidizing (and generally aerobic) conditions (i.e., loss of electrons) and negative measurement (redox < 0) indicate reducing (and generally anaerobic) conditions (i.e., gain of electrons). Redox conditions are usually mediated by biological activity. Positive redox measurements are generally favorable for hydrocarbon biodegradation. Mostly, there appears to be site-wide negative redox measurements throughout, except for TF3MW-121 (which was decommissioned and replaced by TF3MW-121R), TF3MW-2, -128, -129, -130, -131, and -132 during the past sampling rounds. These measurements are consistent with the observation of ongoing anaerobic processes such as nitrate and iron reduction, therefore the potential for significant biodegradation is severely limited.

3.5 CONCLUSIONS AND RECOMMENDATIONS

The 2002 source removal excavation (Parsons, 2003) positively affected localized groundwater conditions. Removal of the residual soil contamination continued into the saturated zone where contamination was located and stopped any additional leaching of contamination to groundwater from the vadose zone. Future sampling rounds will identify and track any further changes in groundwater contamination that was influenced by the excavation.

Monitoring wells TF3MW-123, -125, -127, -128, and -133 appear to be the most contaminated wells, with primarily VOC contamination. Contaminant levels in sampled wells appear to be attenuating, with downgradient locations showing no increases in contamination. Significant SVOC contamination has not been observed since the December 2002 round and SVOC sampling was discontinued after the March 2004 sampling round. Based on the December 2001 through September 2004 quarterly sampling and review of analytical results, a groundwater plume exists as shown on Figure 3-2.

Groundwater contamination data and review of natural attenuation parameters does show definite seasonal fluctuations. In addition to the decline of total VOC levels over time, nitrate depletion, ferrous iron production, and increased alkalinity have provided the best evidence of natural attenuation provided by biodegradation at the site. No definable trends or attenuation mechanisms were identified using sulfate and sulfide levels. Generally, low levels of sulfate indicate that sulfate reduction is not a major anaerobic pathway for the site and were not sampled for after March 2004. In general, biodegradation processes appear to be severely electron acceptor-limited at the site.

Future monitoring rounds will include recently installed monitoring wells and will illustrate any future trends that may develop. Recommendations are as follows:

- Addition of electron acceptor by means of ORC® injection is recommended and would likely aid ongoing biodegradation and speed VOC depletion rates. ORC® injection is planned to be performed after the spring sampling round (March 2005).

The original LTM plan is summarized in Table 3-2, and has been optimimized as summarized in Table 3-4. A modified LTM network is listed in Table 3-4 and shown on Figure 3-2.

Table 3-4
Tank Farms 1 & 3 Proposed Future LTM Sampling

Sampling Locations	Sampling Rationale	Target Analytes/ Method Numbers	Sampling Frequency	Evaluation Criteria/ Modification Justification
TF3-CE3	Within plume	VOCs (AFCEE QAPP 3.1 List)/SW8260	Quarterly	Quarterly monitoring with semi-annual evaluation and recommendations.
TF3MW-21	Within plume			
TF3MW-116	Within plume			
TF3MW-117	Crossgradient of plume			
TF3MW-123	Within plume			
TF3MW-126	Within plume			
TF3MW-127	Within plume			
TF3MW-128	Within plume			
TF3MW-131	Upgradient of plume			
TF3MW-132	Upgradient of plume			
TF3MW-133	Within plume			
Recommended LTM Changes				
Analysis/Frequency Changes				
Added Sampling Locations				
TF3MW-119R	Downgradient of plume	VOCs and SVOCs(AFCEE QAPP 3.1 List)/SW8260 and SW8270	Quarterly	Quarterly monitoring with semi-annual evaluation and recommendations. SVOC analysis was added due to previous identification of SVOC contamination. Monitoring well locations were replacements for previous well locations.
TF3MW-121R	Downgradient of plume			

Table 3-4 (continued)
Tank Farms 1 & 3 Proposed Future LTM Sampling

Removed Sampling Locations				
TF3MW-118 TF3MW-119 TF3MW-120 TF3MW-121	Downgradient of plume Downgradient of plume Downgradient of plume Downgradient of plume	VOCs (AFCEE QAPP 3.1 List)/SW8260	Quarterly	Decomissioned March 2002 due to site construction.
TF3MW-1 TF3MW-25 TF3MW-125	Within plume Crossgradient of plume Within plume	VOCs (AFCEE QAPP 3.1 List)/SW8260	Quarterly	Destroyed 2003 due to site construction.
TF3MW-124 TF3MW-129 TF3MW-130	Crossgradient of plume Upgradient of plume Upgradient of plume	VOCs (AFCEE QAPP 3.1 List)/SW8260	Quarterly	Not sampled following LTM network data review.

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4 SITE T-9 AOC (IRP SITE SS-25, NYSDEC Spill #9702173)

The closure of NYSDEC Spill #9702173 was recommended in the July 2004 semi-annual report and was accepted by the NYSDEC in a letter dated September 24, 2004 which is included in Appendix A.

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5 BUILDING 43 SRA (IRP SITE ST-26, NYSDEC Spill #9204543 and #9313076)

5.1 SITE LOCATION AND HISTORY

The Building 43 SRA is located adjacent to the T-9 Site and was used as a Base gas station. Five 10,000-gallon USTs [USTs 43-1 through -5] (installed in 1985) holding diesel and gasoline were located in a grassy area on the northeast side of the gas station. Two additional USTs (43-6 and -7) at the site were used to store and dispense deicing liquid (these USTs are still located on the site). The gas station was used until 1998 and USTs 43-1 through -5 were removed in 2000.

Records indicate several spills associated with the Building 43 SRA. Currently only two spill numbers (9204543 [associated with USTs 43-1,-2,-3,-4, and -5] and 9313076 [associated with OWS 43-1]) are open with the NYSDEC. The site was classified as an SRA in the 1992 Federal Facility Agreement (FFA) for Griffiss AFB.

Oil Water Separator (OWS)/UST-43 was used to collect and treat surface runoff from the gas station. The OWS was located 50 feet west of Building 43. The 1,000-gallon UST was placed on the north side of the separator unit. In November 2000, the OWS unit and petroleum storage tank were taken out of service and replaced with the existing OWS 43-2 in June 2001.

5.2 DESCRIPTION OF PREVIOUS SAMPLING AND INVESTIGATIONS

Storm events in the 1990s caused the OWS at the site to overflow and the discharge flowed south to a ditch east of Turner Street. Soil sampling was performed in the ditch and no petroleum contamination was found (LAW, February 1995). Groundwater was sampled from three monitoring wells (B43MW-1, -2, and -3). Samples from monitoring well B43MW-2 indicated VOC and SVOC detections above the NYS Groundwater Standards.

In 1997, PEER performed soil gas testing as part of their site investigation at the Building 43 AOC. One location (north of the gas station) of the 33 locations tested using the soil gas method indicated a concentration of toluene at 15 ppb. Fourteen temporary piezometers were installed by PEER for groundwater sampling. Geoprobe® testing was used for additional soil sampling. Groundwater was collected from the 14 piezometers and B43MW-2. Ten VOCs and one SVOC were detected in exceedance of the NYS Groundwater Standards at B43MW-2. Fifty-four soil samples were collected from 26 Geoprobe® locations; one sample was collected from 2 to 6 ft bgs and one from 6 to 10 ft bgs. The results indicated soil contamination surrounded the Building 43 AOC. Therefore, the site was divided into Area A, B, and C (Figure 5-1). Area A is from Brooks Road northwest of Building 43 and south to Turner Street. Area B is from Turner Street south of Building 43 to the northeast corner of the building. Area C is the area northeast of Building 43 and across Brooks Road.

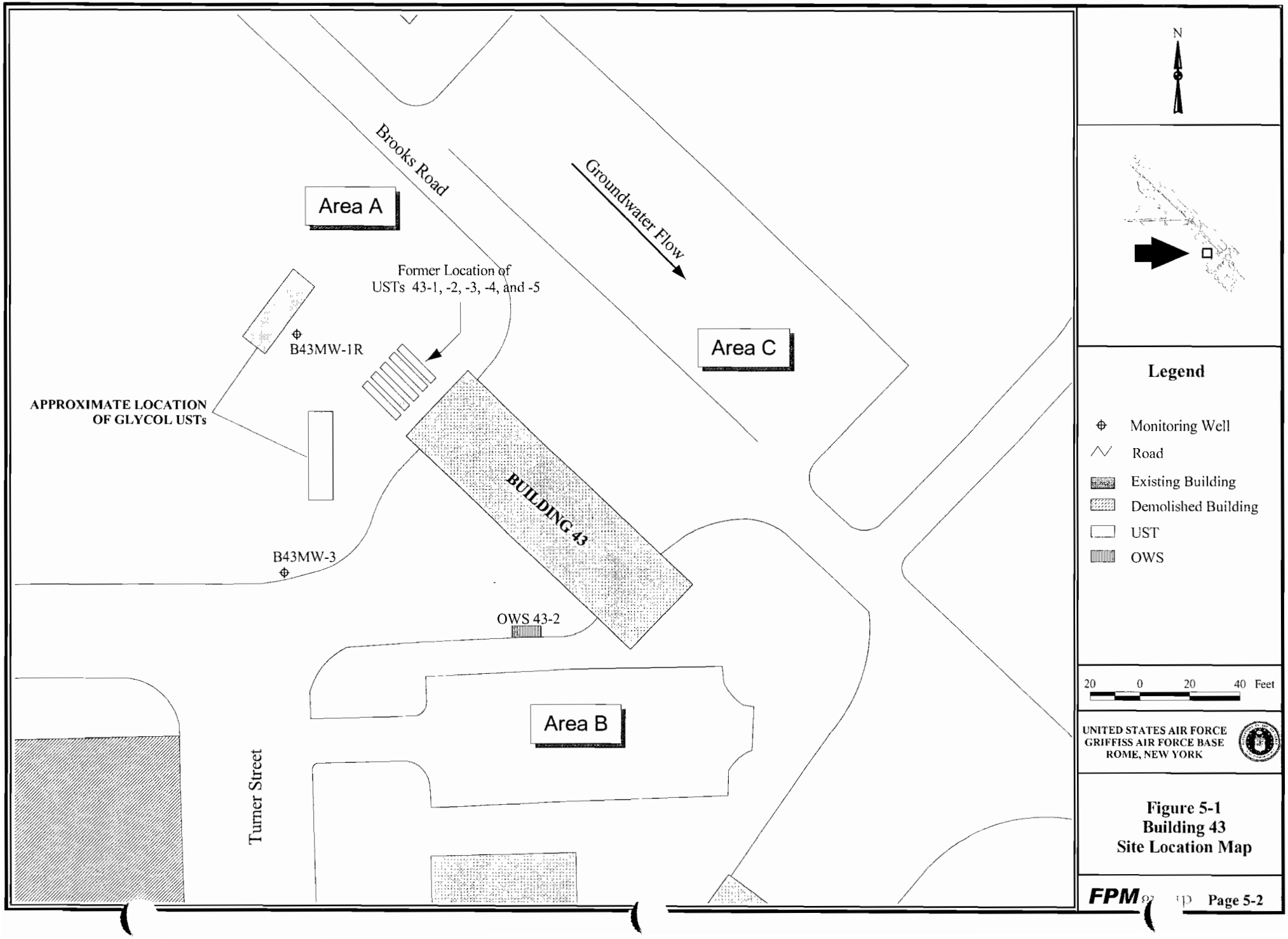


Figure 5-1
Building 43
Site Location Map

- Area A soil sampling showed one SVOC detection above NYSDEC STARS Guidance Values.
- Area B soil sampling indicated four SVOC detections above STARS Guidance Values.
- Area C soil sampling resulted in 11 locations with SVOC and three locations with VOC detections above STARS Guidance Values.

A removal action of the USTs started in September 2000. 1,500 gallons of petroleum/water was removed from the tanks and transported to Industrial Oil Tank Service Corporation, Oriskany, NY, for recycling. Once the USTs were free of hazardous liquids, they were removed and disposed of off-site. The soil was monitored using a photoionization detector (PID) during the tank removal. Contaminated soils were transported to the Apron 1 landfarm. Overexcavation was performed to remove the contaminated soil. Once the USTs were removed and the initial overexcavation was complete, composite soil samples were collected from the sidewalls and the bottom of the excavation pit and analyzed for VOCs and SVOCs in Area A (the area in which tanks were buried).

VOCs exceeding STARS Guidance Values were detected in two southwall samples and one bottom sample. Also, one SVOC, naphthalene, was detected above its STARS Guidance Value, in one sidewall sample.

Overexcavation of Area A was conducted in October 2000. The soil was retested and VOC contamination still existed on the south sidewall and continued overexcavation was necessary, which was accomplished on October 10, 2000. A total of 199 cubic yards of contaminated soil was excavated and transported to the Alert Apron Landfarm during two rounds of overexcavation. Testing was performed once the second overexcavation was completed and results confirmed that Area A was successfully remediated. The site was restored using 362 cubic yards of cobbles up to the top of the water table and 1,785 cubic yards of bioremediated soil from the water table to ground surface. About 152 tons of topsoil were placed, compacted, graded and seeded. The gravel road that traversed the site was restored by placing and compacting 12 cubic yards of crushed stone. Also, a fill pipe associated with UST 043-6, one of the glycol tanks, was restored.

Soil excavation was initiated on October 12, 2000 in Area B (south of Building 43) and continued until October 25, 2000. A PID was used to monitor the quality of the soil. The contaminated soil was transported directly to the Alert Apron Landfarm. As soil removal continued, composite samples were collected from the walls and floor of the excavation and analyzed for the VOCs and SVOCs. Twelve samples were collected on October 16 and 17, 2000 and eight more samples were collected on October 23, 2000. The analytical results of the initial round of Area B soil sampling found that the excavation's north, south and bottom samples indicated SVOC exceedances. To address the SVOC contamination, further overexcavation was conducted. Overexcavation soil samples were collected and analyzed for VOCs and SVOCs. The results were compared to TAGM 4046 Recommended Soil Cleanup Objectives (RSCOs).

SVOC exceedances were reported at three sample locations, further overexcavation was performed, and the contaminated soil was removed to the Alert Apron Landfarm. Between October 25 and 31, 2000, Area B excavation was backfilled to existing grade using approximately 755 cubic yards of bioremediated soil.

In November 2000, the associated OWS was removed. Two soil samples were collected from the OWS/UST excavation at 1 ft and 8 ft bgs and analyzed for VOCs, SVOCs, polychlorinated biphenyls (PCBs), and Target Analyte List (TAL) metals. Results indicated toluene, barium, calcium, and lead in exceedance at the shallow sample. 218 cubic yards of contaminated soil were removed from the site and transported to the Alert Apron Landfarm. Additionally, 65 cubic yards of clean rubble and 30 cubic yards of contaminated rubble were removed from the site, staged temporarily at the Alert Apron, and subsequently disposed of off-site. Monitoring well B43MW-2 was removed to facilitate removal of contaminated soil in the excavated pit. Ten composite soil samples were collected from the excavation pit on November 16, 2000; seven samples from the sidewalls and three samples were collected from the bottom of the excavation pit. Results indicated 22 VOC exceedances in the bottom and four in the sidewalls of the excavation pit. These contaminated areas were overexcavated in December 2000. The soil was moved to the Alert Apron Landfarm and additional soil sampling was performed with the collection of two more composite samples. Results indicated only one SVOC detection exceeding its respective STARS Guidance Value.

Restoration of the OWS pit began with the installation of a new OWS (OWS 43-2). The rest of the pit was backfilled with cobble, crushed stone, and sand.

Between June 10 and 18, 2001, isolated locations within Area B suspected of being contaminated were remediated. On June 11, 2001, three test pits were excavated at locations adjacent to the newly installed OWS to reestablish the edges of contaminated soil identified during the 2000 remedial activities. Excavated material from the test pits was transported to the Alert Apron landfarm for bioremediation. Confirmatory sampling was performed at all three test pits by collecting one bottom and one sidewall sample per test pit. At one sample location, several VOCs were detected, but at concentrations well below the TAGM 4046 RSCOs. Two locations indicated SVOC exceedances. Based on analytical results from the test pit samples and field observations during removal of the OWS unit in 2000, exploratory excavations were conducted.

On June 13, 2001, two 4-inch fiberglass fuel lines (supply and return) were encountered about 4 ft bgs running parallel to the south edge of the canopy. Strong petroleum odors were noted during the excavation of the trench. Approximately 55 cubic yards of rubble, including asphalt, were excavated from the soil, staged at the Alert Apron Landfarm, and subsequently disposed of off-site. The fuel lines were also removed, staged and later disposed of off-site as rubble. About 447 cubic yards of contaminated soil were taken to the Apron 1 Landfarm and stockpiled for bioremediation. The excavation extended west until clean fill at Area A was encountered, east to the northeast corner of the canopy (Test Pit 1), south to the OWS excavation clean fill, and north

to as close to the canopy as possible without undermining the stability of the building. Fuel lines were cut and capped at the edge of the canopy.

On June 18, 2001, four composite soil samples were collected from the eastern side of the excavation and analyzed for VOCs and SVOCs. These sampling locations were selected as clean fill was encountered in the other areas of the excavation. Results indicated no VOC or SVOC detections exceeding their respective TAGM 4046 Guidance Values.

During this final round of remedial activities, approximately 282 c.y. of additional contaminated soil excavated from the Building 43 SRA were transported to the Alert Apron Landfarm. 53 cubic yards of clean rubble/asphalt were generated, staged temporarily at the Alert Apron staging area, and subsequently disposed of off-site. Restoration of the Building 43 Site was partially completed in December 2000. During the months of June and July 2001, final restoration was completed. During that period, excavated areas were backfilled with 123 cubic yards of bioremediated soil and compacted. 40 tons of crushed stone were placed as sub-base in the excavation adjacent to Building 43 and a top slab was poured. Six cubic yards of 4,000-psi concrete was placed at the site and finished. Asphalt (190 tons) was placed at other areas of the site. About 43 tons of topsoil were spread at areas requiring seeding and graded. Final restoration was completed by the application of grass seed followed by mulch.

Monitoring wells B43MW-4, -5, -6, -7, -8, and -9 were installed by FPM in November 2003 (well installation logs are included in Appendix B). Soils were screened at 2-foot intervals. At the installation point for B43MW-9, a PID reading of 280 parts per million (ppm) was detected at the 4- to 6-foot interval, and soil was characterized as being grey to brown silt with an observable sheen. PID readings decreased from 140 ppm at 10- ft bgs to 10 ppm at 16-ft bgs. A soil sample B43S0904AA was collected from the 4-6 ft interval; Table 5-1 summarizes the analytical results. Delineation of the encountered soil contamination is planned.

5.3 LTM PLAN

Long-term monitoring is performed to assess the groundwater contamination at the area downgradient of Building 43 and Area C. The sampling locations consist of eight monitoring wells (B43MW-1R, -3, -4, -5, -6, -7, -8, and -9, shown in Figure 5-2). Sampling was conducted for four rounds on a quarterly basis in November 2003, March, July, and September 2004. Table 5-2 summarizes the LTM sampling and analysis plan.

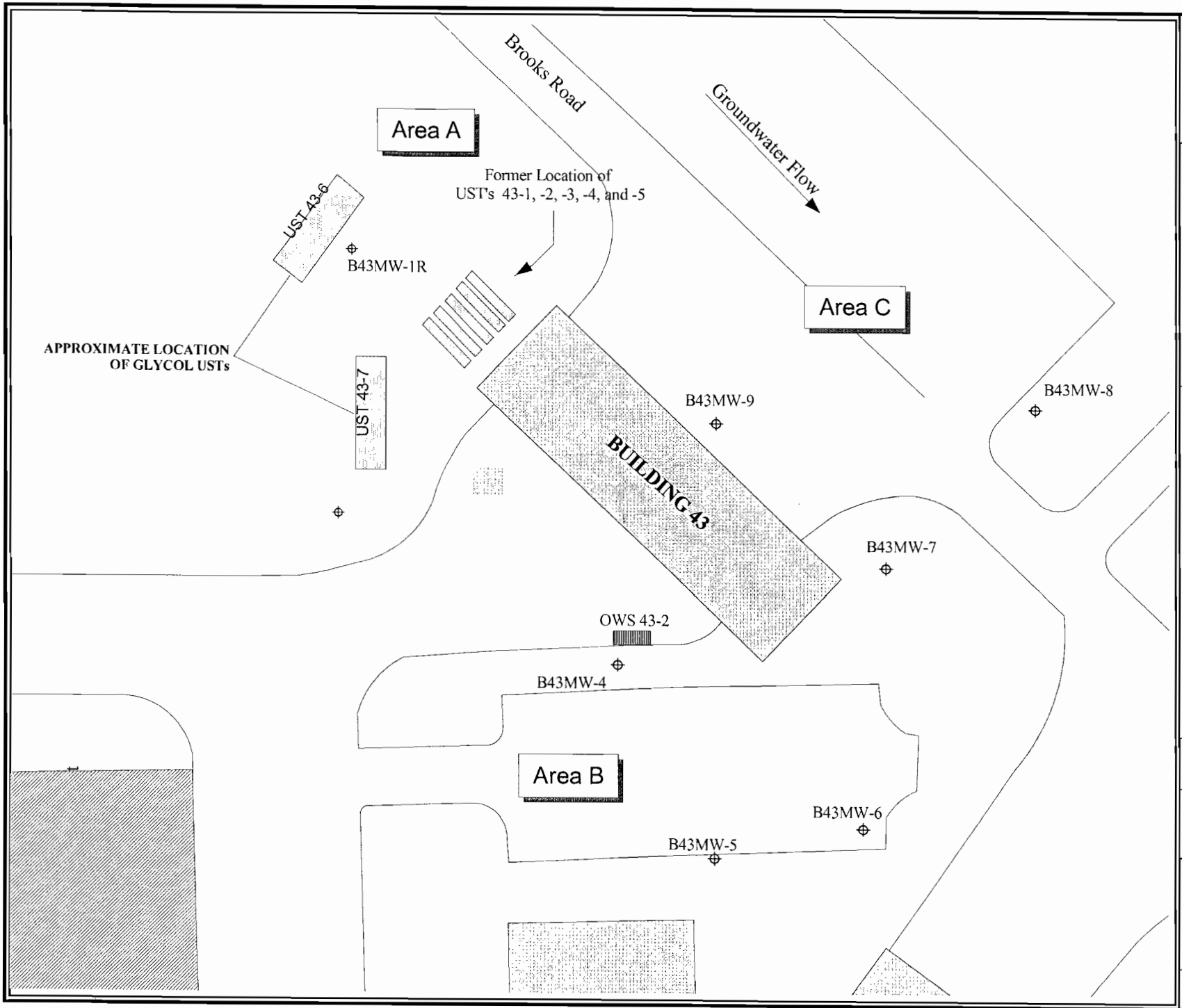
The objectives of the Building 43 LTM Program include the following:

- Monitor the presence of petroleum contamination within and downgradient of the site; and
- Characterize contamination and delineate localized groundwater flow.

Table 5-1
Building 43 Detected Soil Analytical Results (November 2003)

Monitoring Well ID	TAGM 4046 RSCOs (ppb)	B43MW-9
Sample ID		B43S0904AA
Date of Collection		Nov-03
Sample Depth (ft)		4-6
VOCs (µg/Kg)		
1,3,5-trimethylbenzene	3,300	58,000
1,2,4-trimethylbenzene	10,000	180,000
benzene	60	7,800
ethylbenzene	5,500	58,000
isopropylbenzene	2,300	8,100
m,p-xylene	1,200	240,000
n-butylbenzene	10,000	10,000
n-propylbenzene	3,700	26,000
naphthalene	13,000	28,000
o-xylene	1,200	100,000
p-isopropyltoluene		1,800
toluene	1,200	110,000
SVOCs (µg/Kg)		
acenaphthene	50,000	480 F
anthracene	41,000	920
benzo(a)anthracene	224	1,600
benzo(a)pyrene	61	1,400
benzo(k)fluoranthene	1,100	1,000
benzo(b)fluoranthene	1,100	1,200
benzo(g,h,i)perylene	50,000	880
chrysene	400	1,500
dibenz(a,h)anthracene	14	380 F
dibenzofuran	6,200	260 F
fluoranthene	50,000	3,400
fluorene	50,000	600 F
indeno(1,2,3-c,d)pyrene	3,200	700
naphthalene	13,000	910
phenanthrene	50,000	3,000
pyrene	30	3,200

Notes:
F - the analyte was detected above the MDL, but below the RL.
[ ] - Exceedance of TAGM RSCOs



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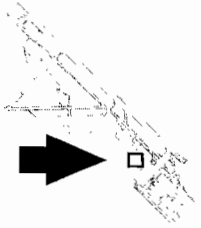

Legend

- Existing Monitoring Well
- Road
- Existing Building
- UST
- OWS

20 0 20 40 Feet

UNITED STATES AIR FORCE
GRIFFISS AIR FORCE BASE
ROME, NEW YORK

Figure 5-2
Building 43
Sampling Locations

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Table 5-2
Building 43 SRA Proposed Future LTM Sampling

Sampling Locations	Sampling Rationale	Target Analytes/ Method Numbers	Sampling Frequency	Evaluation Criteria/ Modification Justification
B43MW-1R B43MW-3 B43MW-4 B43MW-5 B43MW-6 B43MW-7 B43MW-8 B43MW-9	Upgradient of UST 43 -1 through -5 Upgradient of OWS 43-2 Downgradient of OWS 43-2 Downgradient of Area A and B Downgradient of Area A and B Downgradient of Area A and B Downgradient of Area C Within VOC contaminated area	VOCs (Target COCs[1]) /SW8260 SVOCs (AFCEE QAPP 3.1 List) /SW8270	Quarterly	No additional sampling recommended. Spill closure is recommended following evaluation of residual soil contamination at B43MW-9.

[1] Target COCs: The union of AFCEE QAPP 3.1 list and the EPA Target Compound List (includes all STARS VOC compounds).

All specified sampling locations were tested for VOCs using USEPA Method SW8260 (Full List) and SVOCs using USEPA Method SW8270 (Full List). One well was placed in (B43MW-9) and two wells were placed downgradient (B43MW-7 and -8) of Area C. Since groundwater contamination was found in Area B, one well was placed in (B43MW-4) and two wells are placed downgradient (B43MW-5 and -6) of the Area. For details regarding the sampling analysis and field activity procedures, refer to the FSP.

The determination of residual groundwater contamination and requirements for continued monitoring will be based on comparisons of the sample analytical data to the applicable regulatory criteria and guidelines. The criteria and guidelines applicable to the Building 43 AOC are the NYSDEC Ambient Water Quality Standards and Guidance Values, June 1998.

5.4 RESULTS

Monitoring wells B43MW-1R and -3 were sampled along with newly installed wells B43MW-4, -5, -6, -7, -8, and -9 in November 2003, March, July, and September 2004. Table 5-3 shows detected analytical results.

November 2003:

- No VOC or SVOC exceedances of the NYS Groundwater Standards were encountered in any of the monitoring wells sampled.

March 2004:

- No VOC or SVOC exceedances of the NYS Groundwater Standards were encountered in any of the monitoring wells sampled.

July 2004:

- No VOC or SVOC exceedances of the NYS Groundwater Standards were encountered in any of the monitoring wells sampled.

September 2004:

- No VOC or SVOC exceedances of the NYS Groundwater Standards were encountered in any of the monitoring wells sampled.

5.5 CONCLUSIONS AND RECOMMENDATIONS

During well installation, VOC soil contamination was reported in the vadose zone at B43MW-9 at a depth from 4 to 6 ft bgs; however, groundwater sampling results indicated minimal VOC

Table 5-3
Building 43 AOC Detected Analytical Results

Sample Location	NYS	B43MW-1R				B43MW-3			
Sample ID	Groundwater Standards	B43M01R13EB	B43M01R13FB	B4301R13GB	B43M01R13HB	B43M0312EB	B43M0313FB	B43M0312GB	B43M0312HB
Date of Collection		11/17/2003	3/10/2004	7/6/2004	9/29/2004	11/17/2003	3/10/2004	7/6/2004	9/29/2004
Depth to top of Groundwater	(µg/L)	13	13	13	13	12	13	12	12
VOCs (µg/L)									
1,1,1-Trichloroethane	5	U	U	U	U	U	U	U	0.24 F
1,1- dichloroethane	5	U	U	U	U	0.22 F	U	U	U
acetone	50	U	U	U	2.1 F	3.1 F	3.2 F	1.6 F	2.1 F
benzene	1	U	U	U	U	U	U	U	U
carbon disulfide		U	U	U	U	U	U	U	U
chloroform	7	U	U	U	U	U	U	U	U
Hexachlorobutadiene	0.5*	U	U	U	U	U	U	U	0.32 F
tert-butyl methyl ether	5	U	U	U	U	U	U	U	U
naphthalene	10	U	U	U	U	U	U	U	U
trichlorofluoromethane	5	U	U	U	U	U	U	U	U
SVOCs (µg/L)									
phenanthrene	50	U	U	U	U	U	U	U	U

Notes:
F = The analyte was detected above the MDL, but below the RL.
U = The analyte was not detected. The associated numerical value is at or below the method detection limit.
▭ = Exceedance of NYS Groundwater Standards.

Table 5-3
Building 43 AOC Detected Analytical Results

Sample Location	NYS	B43MW-4				B43MW-5			
Sample ID	Gronndwater	B43M0414AA	B43M0413BA	B43M0414GA	B43M0414HA	B43M0514AA	B43M0514BA	B43M0514GA	B43M0514GA
Date of Collection	Standards	11/17/2003	3/10/2004	7/6/2004	9/29/2004	11/17/2003	3/10/2004	7/6/2004	9/29/2004
Depth to top of Groundwater	(µg/L)	14	13	12	14	14	14	14	14
VOCs (µg/L)									
1,1,1-Trichloroethane	5	U	U	U	U	U	U	U	U
1,1- dichloroethane	5	U	U	U	U	U	0.38 F	0.54 F	0.59 F
acetone	50	U	U	U	U	U	U	U	U
benzene	1	U	U	U	U	U	U	U	U
carbon disulfide		U	U	0.24 F ♦	U	U	U	U	U
chloroform	7	U	U	U	U	U	U	U	U
Hexachlorobutadiene	0.5*	U	U		U	U	U	U	0.32 F
tert-butyl methyl ether	5	U	U	U	U	U	U	U	U
naphthalene	10	U	U	U	U	U	U	U	U
trichlorofluoromethane	5	0.52	U	0.22 F	0.5 F ♦	U	U	U	U
SVOCs (µg/L)									
phenanthrene	50	U	U	U	U	U	U	U	U

Notes:

F = The analyte was detected above the MDL, but below the RL.

U = The analyte was not detected. The associated numerical value is at or below the method detection limit.

▭ = Exceedance of NYS Groundwater Standards.

♦ = Higher Numerical value taken from the sample duplicate

Table 5-3
Building 43 AOC Detected Analytical Results

Sample Location	NYS	B43MW-6				B43MW-7			
Sample ID	Groundwater	B43M0614AA	B43M0614BA	B43M0614GA	B43M0614HA	B43M0715AA	B43M0714BA	B43M0715GA	B43M0715HA
Date of Collection	Standards	11/17/2003	3/10/2004	7/6/2004	9/29/2004	11/17/2003	3/10/2004	7/6/2004	9/29/2004
Depth to top of Groundwa	(µg/L)	14	14	14	14	15	14	15	15
VOCs (µg/L)									
1,1,1-Trichloroethane	5	U	U	U	U	U	U	U	U
1,1- dichloroethane	5	0.48 F	U	U	U	U	U	U	U
acetone	50	U	U	1.7 F	U	U	U	2 F	U
benzene	1	U	U	U	U	U	U	U	U
carbon disulfide		U	U	U	U	U	U	U	U
chloroform	7	U	U	U	U	0.55	U	U	U
Hexachlorobutadiene	0.5*	U	U		U	U	U	U	U
tert-butyl methyl ether	5	U	U	U	U	U	U	U	U
naphthalene	10	U	U	U	U	U	U	U	U
trichlorofluoromethane	5	U	U	U	U	U	U	U	U
SVOCs (µg/L)									
phenanthrene	50	U	U	U	U	U	U	U	U

Notes:
F = The analyte was detected above the MDL, but below the RL.
U = The analyte was not detected. The associated numerical value is at or below the method detection limit.
▭ = Exceedance of NYS Groundwater Standards.

Table 5-3
Building 43 AOC Detected Analytical Results

Sample Location	NYS	B43MW-8				B43MW-9			
Sample ID	Groundwater	B43M0813AA	B43M0813BA	B43M0813GA	B43M0813HA	B43M0912AA	B43M0912BA	B43M0912GA	B43M0912HA
Date of Collection	Standards	11/17/2003	3/10/2004	7/6/2004	9/29/2004	11/17/2003	3/10/2004	7/6/2004	9/29/2004
Depth to top of Groundwa	(µg/L)	13	13	13	13	12	12	12	12
VOCs (µg/L)									
1,1,1-Trichloroethane	5	U	U	U	U	U	U	U	U
1,1- dichloroethane	5	U	U	U	U	U	U	U	U
acetone	50	U	U	U	2.3	U	U	2.2 F	U
benzene	1	U	U	U	U	0.22 F	U	U	U
carbon disulfide		U	U	U	U	0.33 F	0.78 ♦	0.2 F	U
chloroform	7	0.45 F	U	U	U	U	U	U	U
Hexachlorobutadiene	0.5*	U	U		U	U	U	U	U
tert-butyl methyl ether	5	U	U	U	U	0.66 F ♦	U	U	U
naphthalene	10	2.5	U	U	U	U	U	U	U
trichlorofluoromethane	5	U	U	U	U	0.22 F	U	U	U
SVOCs (µg/L)									
phenanthrene	50	U	3 F	U	U	U	U	U	U

Notes:
F = The analyte was detected above the MDL, but below the RL.
U = The analyte was not detected. The associated numerical value is at or below the method detection limit.
▭ = Exceedance of NYS Groundwater Standards.
♦ = Higher numerical value was taken from the sample duplicate.

contamination at a depth of 12 ft bgs. Therefore, it is suspected that a confining layer exists in the area of B43MW-9.

The remaining monitoring wells at the site were sampled for four sampling rounds and confirmed the absence of groundwater contamination.

It is recommended that the contaminated soil in the area of B43MW-9 be delineated, and the residual contaminated soil excavated (approximately to a depth of 6 to 7 ft bgs).

No additional sampling is recommended and spill closure will be recommended following delineation/removal of contamination in the vadose zone. If additional contamination is identified, or if contamination has appeared to migrate during the removal action, additional groundwater sampling may be recommended in the future.

6 BUILDING 110 SRA (IRP SITE ST-36, NYSDEC SPILL #8603763)

The closure of NYSDEC Spill # 8603763 was recommended in the draft semi-annual report (FPM, July 2004). No additional sampling was completed and spill closure will be confirmed in writing by a NYSDEC letter that will be added to Appendix A.

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7 PUMPHOUSE 5 SRA, BUILDING 771 (IRP SITE ST-37, NYSDEC Spill # 8903144)

Six consecutive sampling rounds (ending in March 2004) have been performed confirming the absence of contamination of concern at the sampling locations; therefore, no further sampling is recommended at the Pumphouse 5 SRA. Site closure was approved by the NYSDEC on October 20, 2004. Full closure for the Pumphouse 5 SRA and the associated petroleum spill closure will be recommended once applicable results are obtained from the Landfarm/biopile confirmatory sampling.

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8 BUILDING 100 SRA (IRP SITE ST-51 and Former UST 131-2, NYSDEC Spill #9704490)

The closure of NYSDEC Spill #9704490 was recommended in the Draft semi-annual report (FPM, July 2004) and was accepted by the NYSDEC in a letter dated September 29, 2004 which is included in Appendix A.

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APPENDICES

(Appendices A through D are provided on the attached CD)