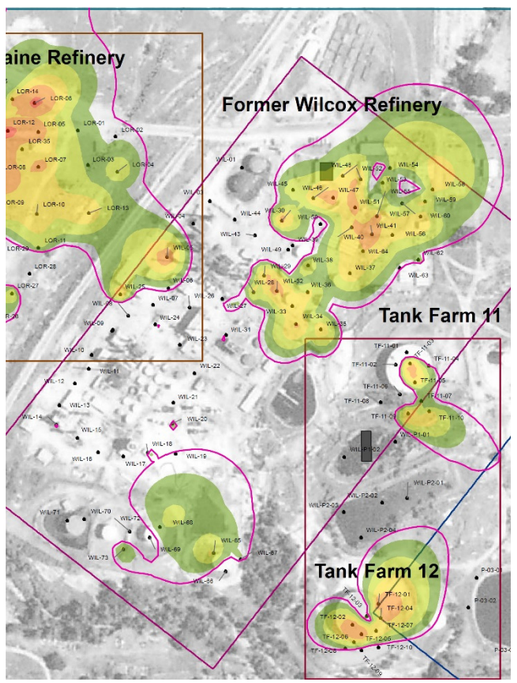

2D MAX PLUME

SEE SHEET 1B FOR 3-D OVERALL VIEW

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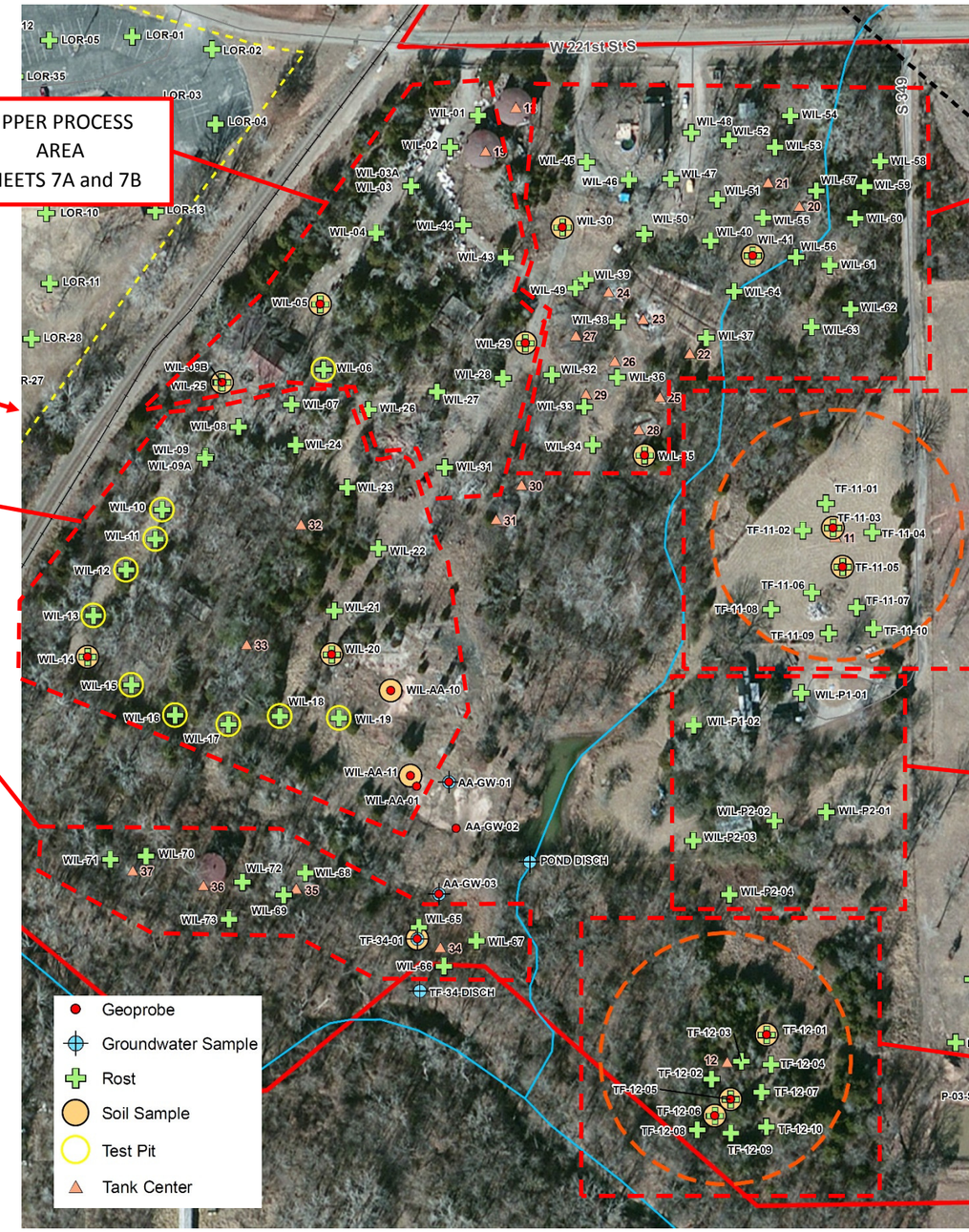
UPPER PROCESS AREA
SHEETS 7A and 7B

LOWER PROCESS AREA
SHEETS 6A and 6B

TANKS 34, 35, 36 and 37
SHEET 5



SAMPLE LOCATIONS

PRODUCT STORAGE AREA
SHEETS 8A, 8B, 8C, 8D, 8E, 8F, and 8G

TANK 11
SHEETS 2A and 2B

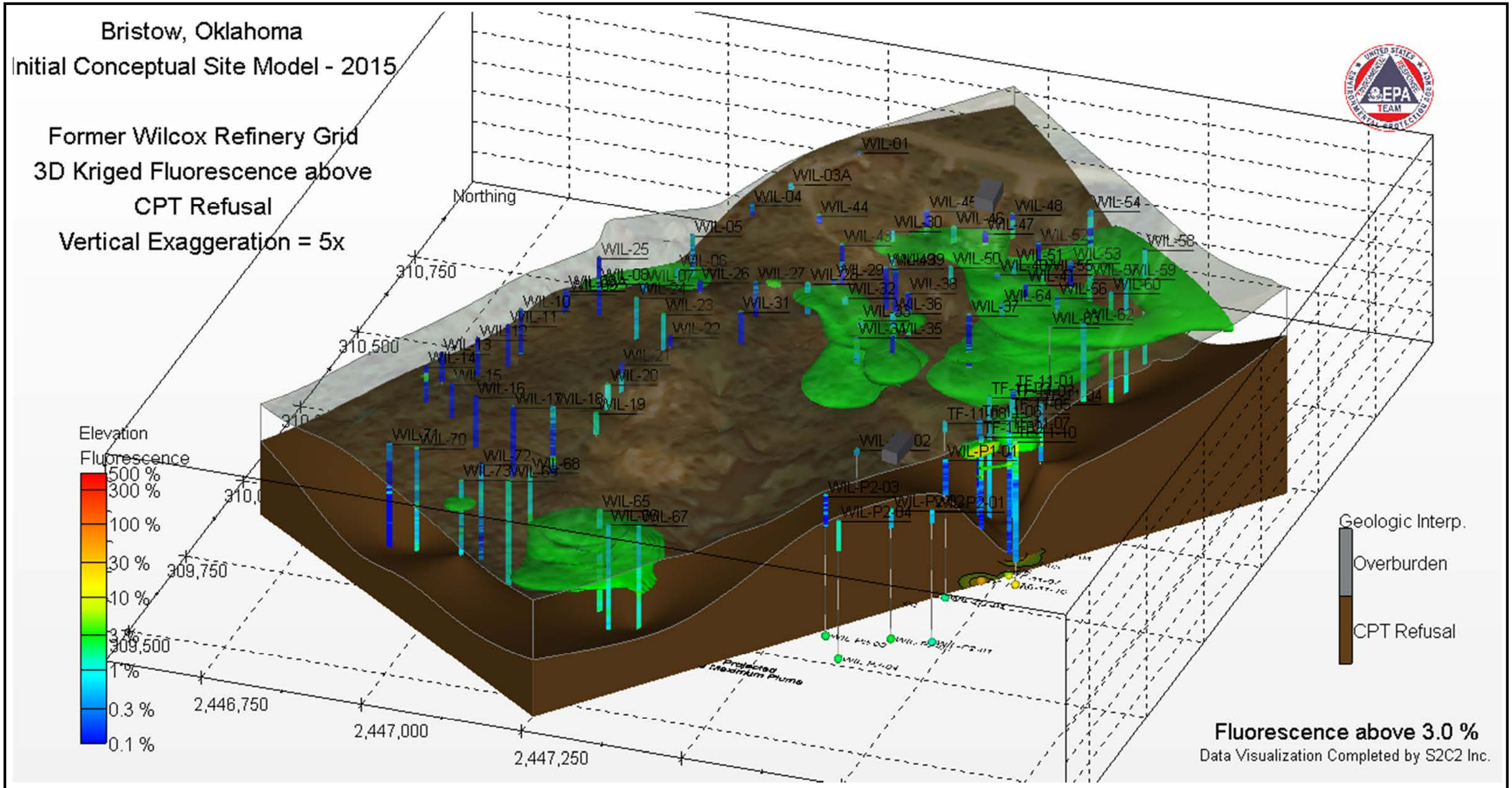
PONDS 1 and 2
SHEET 3

TANK 12
SHEETS 4A, 4B, and 4C

U.S. EPA Environmental Response Team
Scientific Engineering Response and Analytical Services
EP-W-09-031 W.A. #0-277

WILCOX REFINERY
OVERALL VIEW
Sheet 1A

9754949



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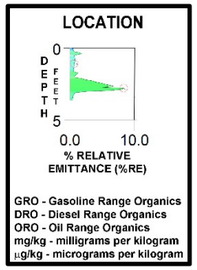
WILCOX REFINERY
3-D OVERALL VIEW
Sheet 1B



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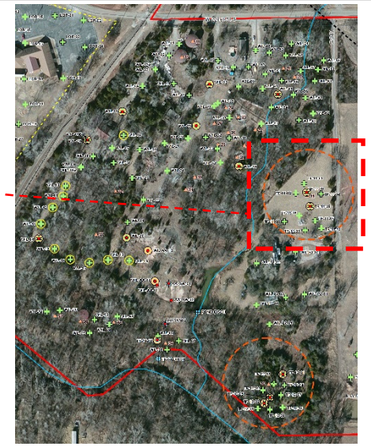
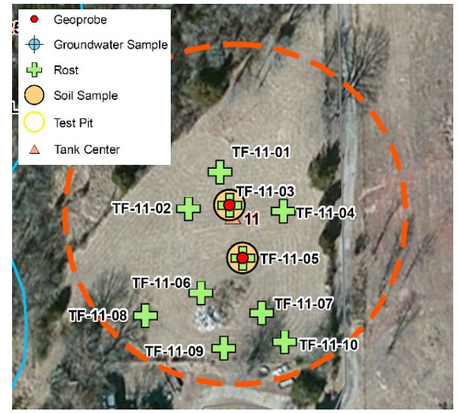
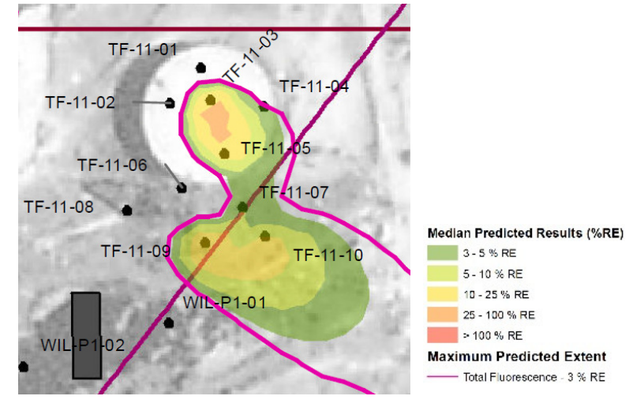
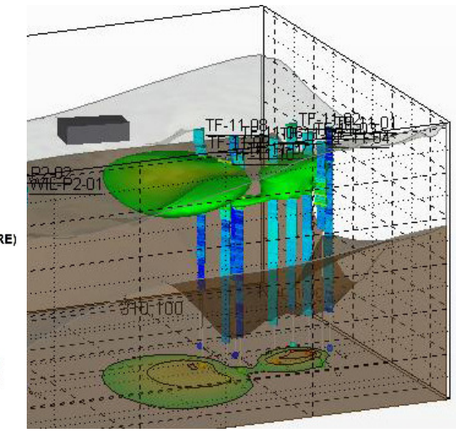




SAMPLE LOCATIONS

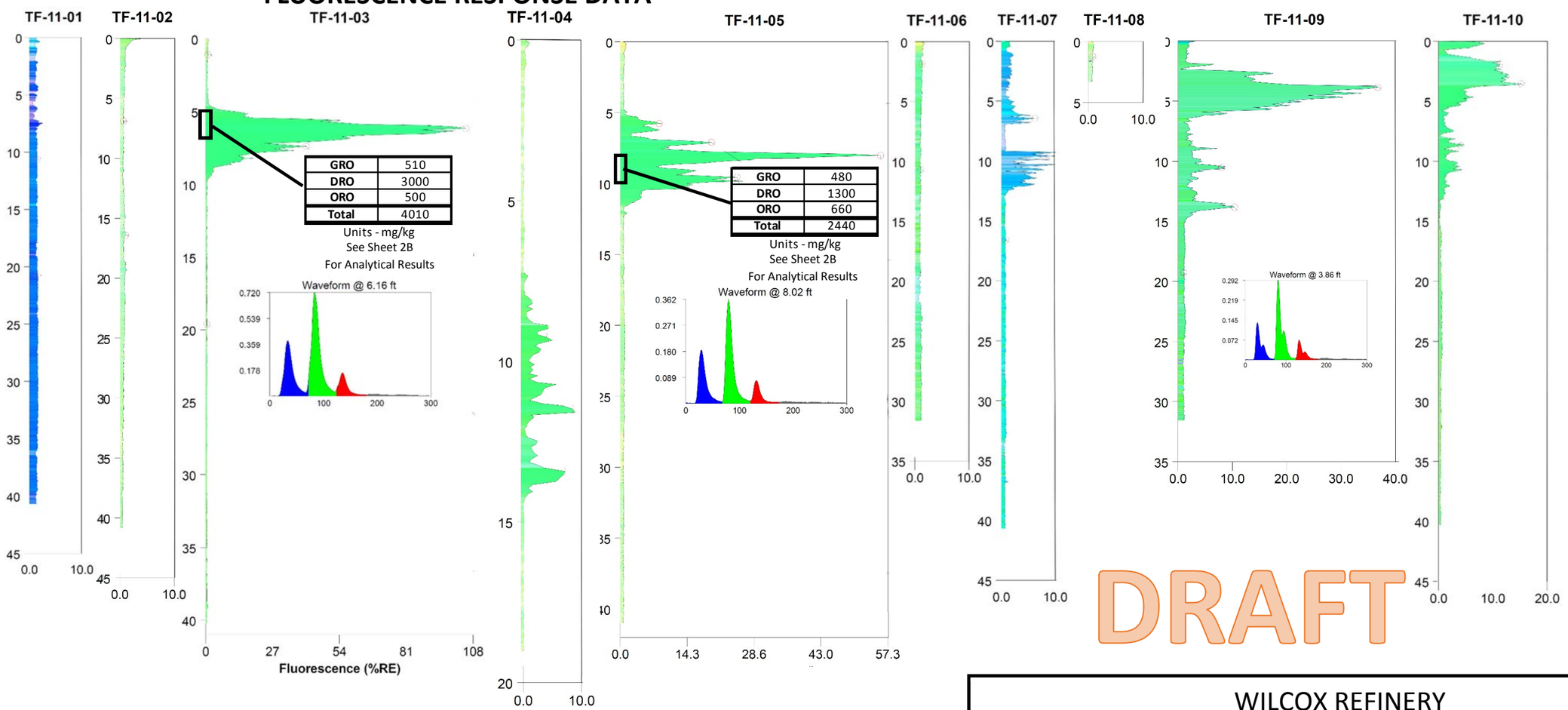


2-D MAX PLUME



3-D PLUME

FLUORESCENCE RESPONSE DATA



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Scientific Engineering Response and Analytical Services
EP-W-09-031 W.A. #0-277

WILCOX REFINERY
TANK 11
Sheet 2A

U.S. EPA Environmental Response Team
Scientific Engineering Response and Analytical Services
EP-W-09-031 W.A. #0-277

Loc	Analyte	Result	Q	Action Limit	AC
TF-11-03 5 to 7.5 Ft bgs	Cyclohexane	**2000**		6500000	HI=1
	Methylcyclohexane	**10000**		NP	HI=1
	1,2-Dibromoethane	290	U	36	1E6
	Isopropylbenzene	**2000**	J^	1900000	HI=1
	1,2-Dibromo-3-chloropropane	290	U	5.3	1E6
	2,2'-Oxybis(1-chloropropane)	7700	U*	4900	1E6
	Hexachloroethane	4000	U*	1800	1E6
	4-Chloroaniline	7700	U*	2700	1E6
	Hexachlorobutadiene	4000	U*	1200	1E6
	2-Methylnaphthalene	**970**	*	240000	HI=1
	2-Methylnaphthalene	**1500**		240000	HI=1
	Hexachlorocyclo-pentadiene	7700	U	1800	HI=1
	2,6-Dinitrotoluene	4000	U*	360	1E6
	2,4-Dinitrotoluene	4000	U*	1700	1E6
	Fluorene	**120**		2400000	HI=1
	4-Chlorophenyl-phenyl ether	4000	U	NP	HI=1
	4,6-Dinitro-2-methylphenol	7700	U*	5100	HI=1
	Hexachlorobenzene	4000	U*	210	1E6
	Atrazine	7700	U*	2400	1E6
	Phenanthrene	**550**		NP	HI=1
	Anthracene	**110**		18000000	HI=1
	3,3'-Dichlorobenzidine	7700	U*	1200	1E6
	Benzo(a)anthracene	4000	U*	160	1E6
	Chrysene	**48**		15000	1E6
	Benzo(b)fluoranthene	**17**	LJ	160	1E6
	Benzo(b)fluoranthene	4000	U*	160	1E6
	Benzo(k)fluoranthene	4000	U*	1600	1E6
	Benzo(a)pyrene	39	U	16	1E6
	Benzo(a)pyrene	4000	U*	16	1E6
	Indeno(1,2,3-cd)pyrene	4000	U*	160	1E6
	Dibenzo(a,h)anthracene	39	U	16	1E6
	Dibenzo(a,h)anthracene	4000	U*	16	1E6

Units - µg/kg

Loc	Analyte	Result	Q	Action Limit	AC
TF-11-05 8 to 10 Ft bgs	Vinyl chloride	2700	UJ	590	1E6
	Chloroform	2700	U	320	1E6
	Carbon tetrachloride	2700	U	650	1E6
	Benzene	2700	U	1200	1E6
	1,2-Dichloroethane	2700	U	460	1E6
	Trichloroethene	2700	U	940	1E6
	Methylcyclohexane	**23000**		NP	HI=1
	1,2-Dichloropropane	2700	U	1000	1E6
	Bromodichloromethane	2700	U	290	1E6
	1,1,2-Trichloroethane	2700	U	1100	1E6
	Dibromochloromethane	2700	U	750	1E6
	1,2-Dibromoethane	2700	U	36	1E6
	m, p-Xylene	2700	U	NP	HI=1
	Isopropylbenzene	**450**	LJ	1900000	HI=1
	1,1,2,2-Tetrachloroethane	2700	U	600	1E6
	1,4-Dichlorobenzene	2700	U	2600	1E6
	1,2-Dibromo-3-chloropropane	2700	U	5.3	1E6
	2,2'-Oxybis(1-chloropropane)	7600	U*	4900	1E6
	Hexachloroethane	3900	U*	1800	1E6
	4-Chloroaniline	7600	U*	2700	1E6
	Hexachlorobutadiene	3900	U*	1200	1E6
	2-Methylnaphthalene	**470**	*	240000	HI=1
	2-Methylnaphthalene	**1000**		240000	HI=1
	Hexachlorocyclo-pentadiene	7600	U	1800	HI=1
	2,6-Dinitrotoluene	3900	U*	360	1E6
	Dibenzofuran	**37**	LJ	73000	HI=1
	2,4-Dinitrotoluene	3900	U*	1700	1E6
	Fluorene	**110**		2400000	HI=1
	4-Chlorophenyl-phenyl ether	3900	U	NP	HI=1
	4,6-Dinitro-2-methylphenol	7600	U*	5100	HI=1
	Hexachlorobenzene	3900	U*	210	1E6
	Atrazine	7600	U*	2400	1E6
	Phenanthrene	**360**		NP	HI=1
	Anthracene	**93**		18000000	HI=1
	Fluoranthene	**22**	LJ	2400000	HI=1
	Pyrene	**96**		1800000	HI=1
	3,3'-Dichlorobenzidine	7600	U*	1200	1E6
	Benzo(a)anthracene	**20**	LJ	160	1E6
	Benzo(a)anthracene	3900	U*	160	1E6
	Chrysene	**69**		15000	1E6
	Benzo(b)fluoranthene	3900	U*	160	1E6
	Benzo(b)fluoranthene	**40**		160	1E6
	Benzo(k)fluoranthene	**16**	LJ	1600	1E6
	Benzo(k)fluoranthene	3900	U*	1600	1E6
	Benzo(a)pyrene	**32**	LJ	16	1E6
	Benzo(a)pyrene	3900	U*	16	1E6
	Indeno(1,2,3-cd)pyrene	**26**	LJ	160	1E6
	Indeno(1,2,3-cd)pyrene	3900	U*	160	1E6
	Dibenzo(a,h)anthracene	39	U	16	1E6
	Dibenzo(a,h)anthracene	3900	U*	16	1E6
	Benzo(g,h,i)perylene	**52**		NP	HI=1

Units - µg/kg

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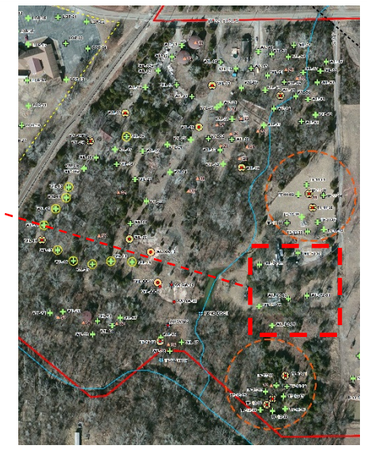
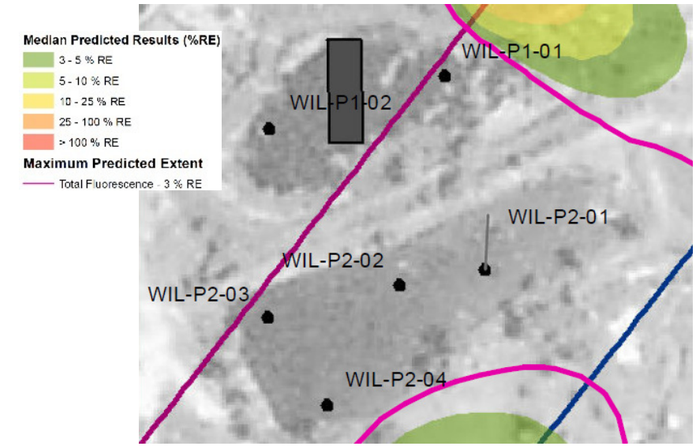
WILCOX REFINERY
TANK 11
Sheet 2B

This Sheet

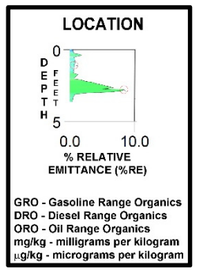


SAMPLE LOCATIONS



2-D MAX PLUME

FLUORESCENCE RESPONSE DATA



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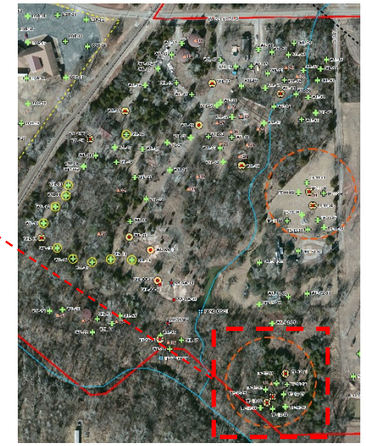
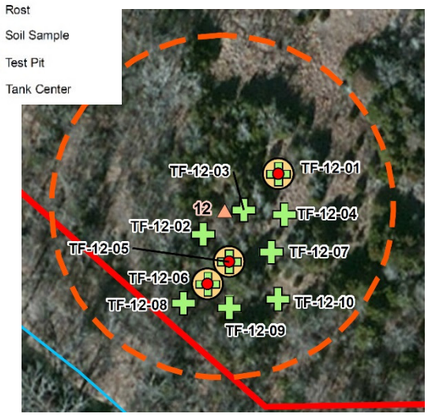
WILCOX REFINERY
PONDS 1 and 2
Sheet 3

FLUORESCENCE RESPONSE DATA

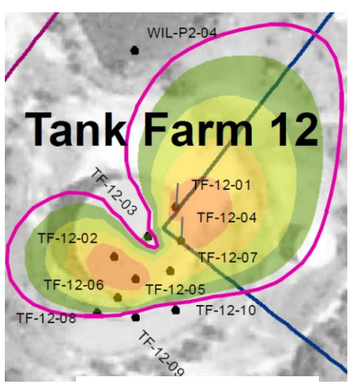
This Sheet



- Geoprobe
- Groundwater Sample
- Rost
- Soil Sample
- Test Pit
- Tank Center



SAMPLE LOCATIONS

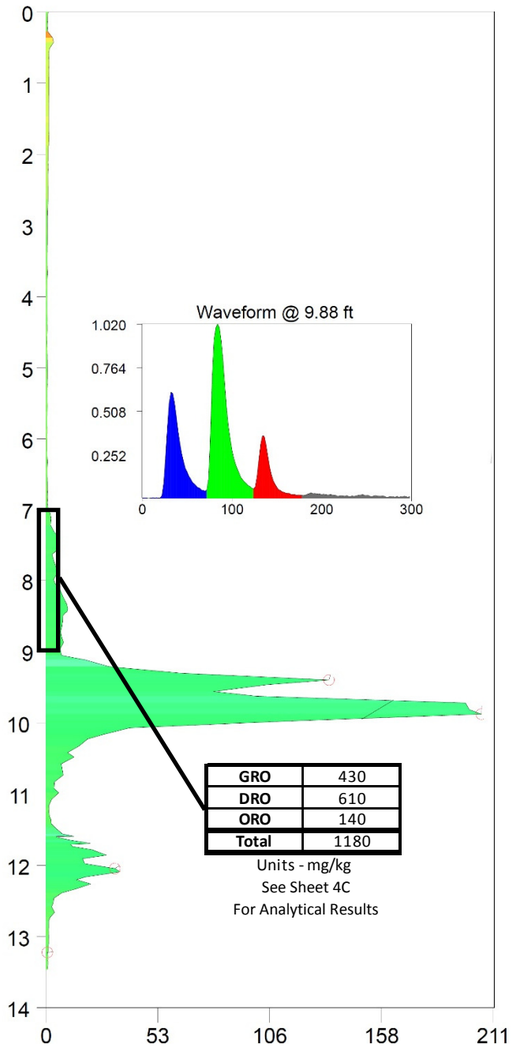


2-D MAX PLUME

Median Predicted Results (%RE)
- 3 - 5 % RE
- 5 - 10 % RE
- 10 - 25 % RE
- 25 - 100 % RE
- > 100 % RE

Maximum Predicted Extent
- Total Fluorescence - 3 % RE

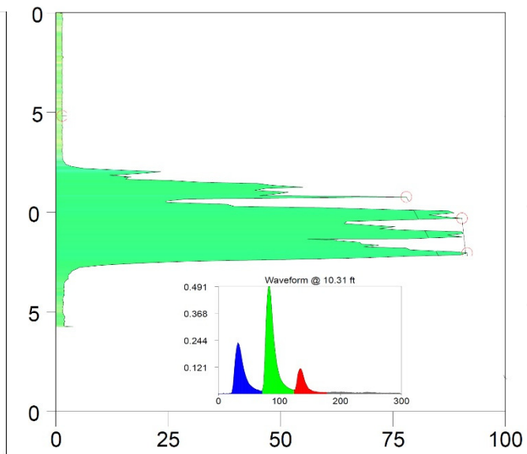
TF-12-01



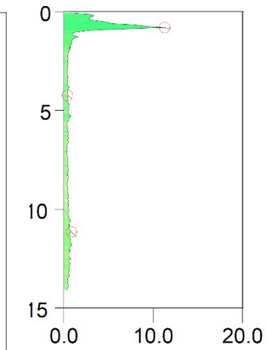
GRO	430
DRO	610
ORO	140
Total	1180

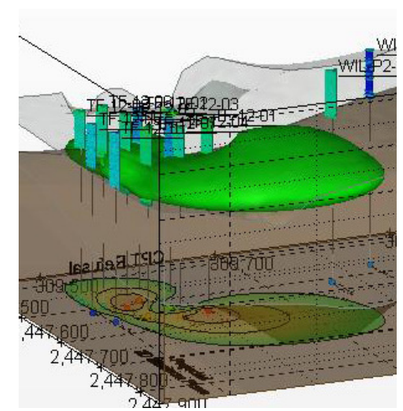
Units - mg/kg
See Sheet 4C
For Analytical Results

TF-12-02



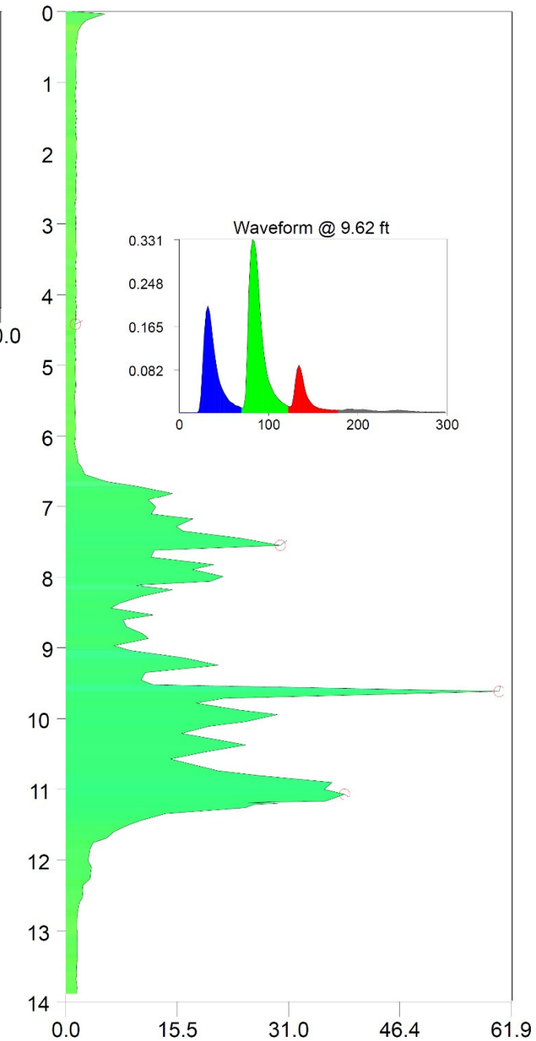
TF-12-03





3-D PLUME

TF-12-04



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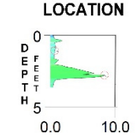
LOCATION



GRO - Gasoline Range Organics
DRO - Diesel Range Organics
ORO - Oil Range Organics
mg/kg - milligrams per kilogram
µg/kg - micrograms per kilogram

U.S. EPA Environmental Response Team
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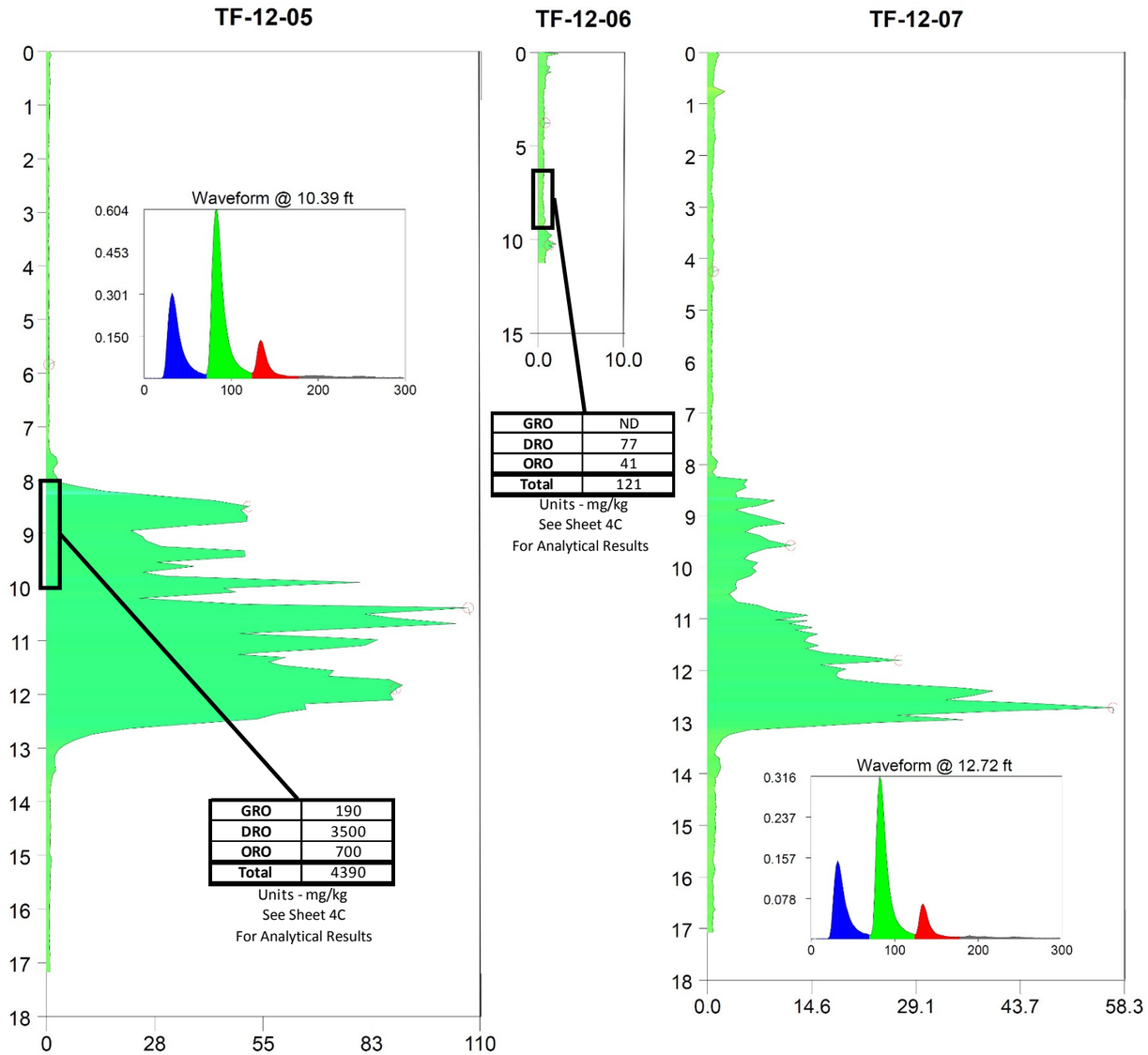
WILCOX REFINERY
TANK 12
Sheet 4A

SAMPLE LOCATIONS

- Geoprobe
- Groundwater Sample
- Rost
- Soil Sample
- Test Pit
- Tank Center

FLUORESCENCE RESPONSE DATA

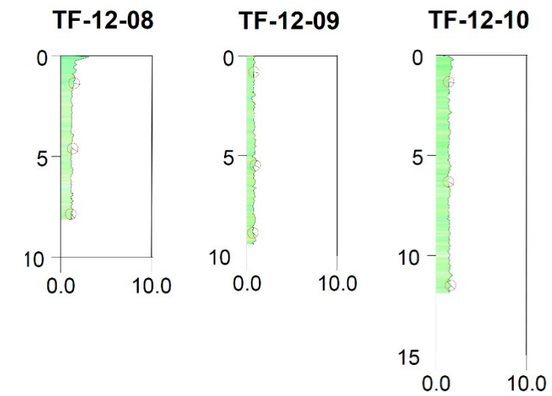


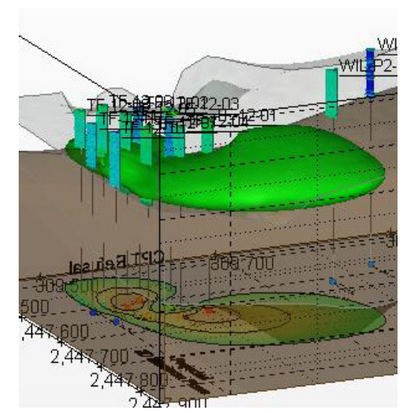
GRO	190
DRO	3500
ORO	700
Total	4390

Units - mg/kg
See Sheet 4C
For Analytical Results

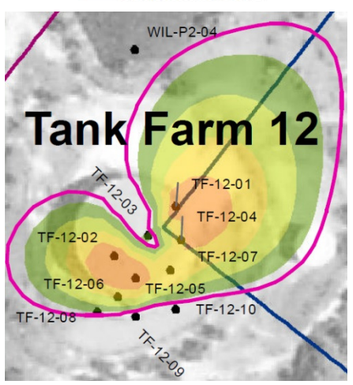
GRO	ND
DRO	77
ORO	41
Total	121

Units - mg/kg
See Sheet 4C
For Analytical Results



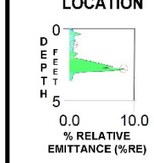


3-D PLUME



2-D MAX PLUME

LOCATION



GRO - Gasoline Range Organics
DRO - Diesel Range Organics
ORO - Oil Range Organics
mg/kg - milligrams per kilogram
µg/kg - micrograms per kilogram

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Scientific Engineering Response and Analytical Services
EP-W-09-031 W.A. #0-277

WILCOX REFINERY
TANK 12
Sheet 4B

U.S. EPA Environmental Response Team
Scientific Engineering Response and Analytical Services
EP-W-09-031 W.A. #0-277

Loc	Analyte	Result	Q	Action Limit	AC
TF-12-01 7 to 9 Ft bgs	Vinyl chloride	2600	UJ	590	1E6
	Chloroform	2600	U	320	1E6
	Cyclohexane	**2800**		6500000	HI=1
	Carbon tetrachloride	2600	U	650	1E6
	Benzene	2600	U	1200	1E6
	1,2-Dichloroethane	2600	U	460	1E6
	Trichloroethene	2600	U	940	1E6
	Methylcyclohexane	**13000**		NP	HI=1
	1,2-Dichloropropane	2600	U	1000	1E6
	Bromodichloromethane	2600	U	290	1E6
	1,1,2-Trichloroethane	2600	U	1100	1E6
	Dibromochloromethane	2600	U	750	1E6
	1,2-Dibromoethane	2600	U	36	1E6
	m, p-Xylene	2600	U	NP	HI=1
	Isopropylbenzene	**800**	LJ	1900000	HI=1
	1,1,2,2-Tetrachloroethane	2600	U	600	1E6
	1,2-Dibromo-3-chloropropane	2600	U	5.3	1E6
	2,2'-Oxybis(1-chloropropane)	7400	U*	4900	1E6
	Hexachloroethane	3800	U*	1800	1E6
	4-Chloroaniline	7400	U*	2700	1E6
	Hexachlorobutadiene	3800	U*	1200	1E6
	2-Methylnaphthalene	**500**	*	240000	HI=1
	2-Methylnaphthalene	**800**		240000	HI=1
	Hexachlorocyclo-pentadiene	7400	U	1800	HI=1
	2,6-Dinitrotoluene	3800	U*	360	1E6
	Dibenzofuran	**30**	LJ	73000	HI=1
	2,4-Dinitrotoluene	3800	U*	1700	1E6
	Fluorene	**88**		2400000	HI=1
	4-Chlorophenyl-phenyl ether	3800	U	NP	HI=1
	4,6-Dinitro-2-methylphenol	7400	U*	5100	HI=1
	Hexachlorobenzene	3800	U*	210	1E6
	Atrazine	7400	U*	2400	1E6
	Phenanthrene	**440**		NP	HI=1
	Anthracene	**77**		18000000	HI=1
	3,3'-Dichlorobenzidine	7400	U*	1200	1E6
	Benzo(a)anthracene	3800	U*	160	1E6
	Chrysene	**35**	LJ	15000	1E6
	Benzo(b)fluoranthene	3800	U*	160	1E6
	Benzo(k)fluoranthene	3800	U*	1600	1E6
	Benzo(a)pyrene	39	U	16	1E6
	Benzo(a)pyrene	3800	U*	16	1E6
	Indeno(1,2,3-cd)pyrene	3800	U*	160	1E6
	Dibenzo(a,h)anthracene	39	U	16	1E6
	Dibenzo(a,h)anthracene	3800	U*	16	1E6

Units - µg/kg

Loc	Analyte	Result	Q	Action Limit	AC
TF-12-05 8 to 10 Ft bgs	Cyclohexane	**440**	Jv	6500000	HI=1
	Methylcyclohexane	**1600**	Jv	NP	HI=1
	Bromodichloromethane	300	UJv	290	1E6
	1,2-Dibromoethane	300	UJv	36	1E6
	Isopropylbenzene	**46**	LJ	1900000	HI=1
	1,2-Dibromo-3-chloropropane	300	UJv	5.3	1E6
	2,2'-Oxybis(1-chloropropane)	7500	U*	4900	1E6
	Hexachloroethane	3900	U*	1800	1E6
	Naphthalene	**240**		130000	HI=1
	4-Chloroaniline	7500	U*	2700	1E6
	Hexachlorobutadiene	3900	U*	1200	1E6
	2-Methylnaphthalene	**710**	*	240000	HI=1
	2-Methylnaphthalene	**1800**		240000	HI=1
	Hexachlorocyclo-pentadiene	7500	U	1800	HI=1
	2,6-Dinitrotoluene	3900	U*	360	1E6
	2,4-Dinitrotoluene	3900	U*	1700	1E6
	Fluorene	**230**		2400000	HI=1
	4-Chlorophenyl-phenyl ether	3900	U	NP	HI=1
	4,6-Dinitro-2-methylphenol	7500	U*	5100	HI=1
	Hexachlorobenzene	3900	U*	210	1E6
	Atrazine	7500	U*	2400	1E6
	Phenanthrene	**700**		NP	HI=1
	Anthracene	**120**		18000000	HI=1
	3,3'-Dichlorobenzidine	7500	U*	1200	1E6
	Benzo(a)anthracene	3900	U*	160	1E6
	Chrysene	**72**		15000	1E6
	Benzo(b)fluoranthene	3900	U*	160	1E6
	Benzo(k)fluoranthene	3900	U*	1600	1E6
	Benzo(a)pyrene	38	U	16	1E6
	Benzo(a)pyrene	3900	U*	16	1E6
	Indeno(1,2,3-cd)pyrene	3900	U*	160	1E6
	Dibenzo(a,h)anthracene	38	U	16	1E6
	Dibenzo(a,h)anthracene	3900	U*	16	1E6

Units - µg/kg

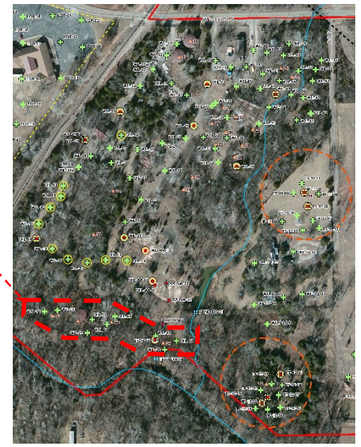
Loc	Analyte	Result	Q	Action Limit	AC
TF-12-06 7 to 9 Ft bgs	Di-n-butylphthalate	**88**	LJ	6300000	HI=1
	Butylbenzylphthalate	**910**		290000	1E6
	Benzo(a)anthracene	180	U*	160	1E6
	Bis(2-ethylhexyl)phthalate	**670**		38000	HI=1
	Di-n-octylphthalate	**630**		630000	HI=1
	Benzo(b)fluoranthene	180	U*	160	1E6
	Benzo(a)pyrene	37	U	16	1E6
	Benzo(a)pyrene	180	U*	16	1E6
	Indeno(1,2,3-cd)pyrene	180	U*	160	1E6
	Dibenzo(a,h)anthracene	37	U	16	1E6
	Dibenzo(a,h)anthracene	180	U*	16	1E6

Units - µg/kg

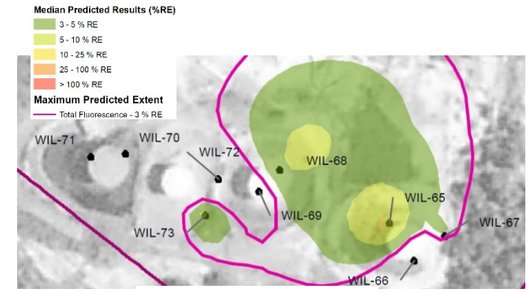
DRAFT

WILCOX REFINERY
TANK 12
Sheet 4C

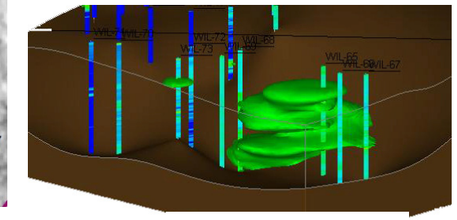
This Sheet



SAMPLE LOCATIONS



2-D MAX PLUME



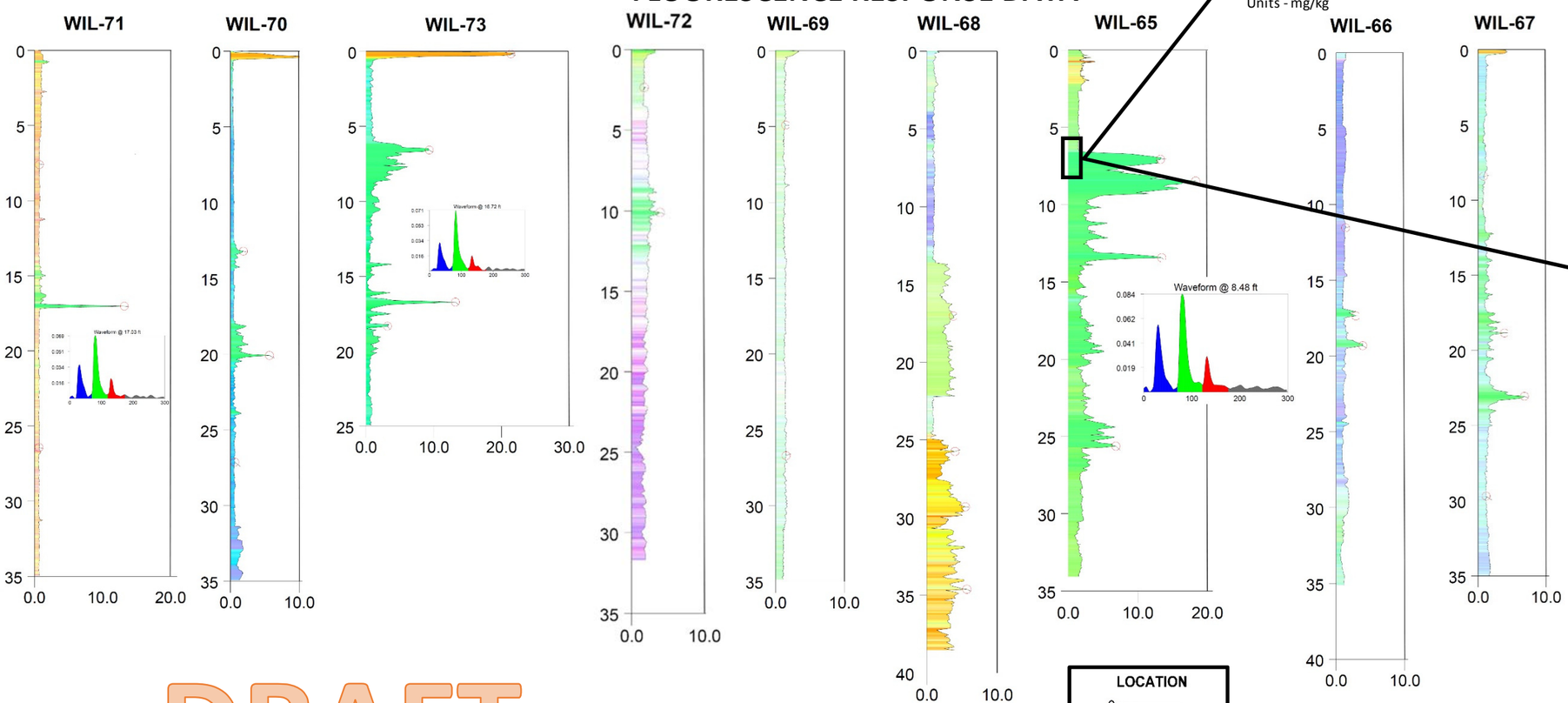
3-D PLUME

See Sheet 2B
For Analytical Results

GRO	900
DRO	10000
ORO	1700
Total	12600

Units - mg/kg

FLUORESCENCE RESPONSE DATA

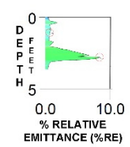


Loc	Analyte	Result	Q	Action Limit	AC
TF-34-01 6 to 8 Ft bgs	Chloroform	1200		320	1E6
	Cyclohexane	13000	J^	6500000	HI=1
	Benzene	750	J^	1200	1E6
	Methylcyclohexane	32000		NP	HI=1
	Bromodichloromethane	350	U	290	1E6
	Toluene	4100	J^	4900000	HI=1
	1,2-Dibromoethane	350	U	36	1E6
	Ethylbenzene	9200	J^	5800	1E6
	o-Xylene	15000		650000	HI=1
	m, p-Xylene	32000		NP	HI=1
	Isopropylbenzene	3300	J^	1900000	HI=1
	1,2-Dibromo-3-chloropropane	350	U	5.3	1E6
	2,2'-Oxybis(1-chloropropane)	8400	U*	4900	1E6
	Hexachloroethane	4300	U*	1800	1E6
	Naphthalene	2900	*	130000	HI=1
	Naphthalene	2200	*	130000	HI=1
	4-Chloroaniline	8400	U*	2700	1E6
	Hexachlorobutadiene	4300	U*	1200	1E6
	2-Methylnaphthalene	5200	*	240000	HI=1
	2-Methylnaphthalene	4800		240000	HI=1
	Hexachlorocyclo-pentadiene	8400	U	1800	HI=1
	1,1'-Biphenyl	190	*	47000	HI=1
	2,6-Dinitrotoluene	4300	U*	360	1E6
	2,4-Dinitrotoluene	4300	U*	1700	1E6
	Fluorene	1400	*	2400000	HI=1
	4-Chlorophenyl-phenyl ether	4300	U	NP	HI=1
	4,6-Dinitro-2-methylphenol	8400	U*	5100	HI=1
	Hexachlorobenzene	4300	U*	210	1E6
	Atrazine	8400	U*	2400	1E6
	Phenanthrene	4000	*	NP	HI=1
	Phenanthrene	3000	*	NP	HI=1
	Anthracene	690	*	18000000	HI=1
	Fluoranthene	670	*	2400000	HI=1
	Pyrene	5100	*	1800000	HI=1
	3,3'-Dichlorobenzidine	8400	U*	1200	1E6
	Benzo(a)anthracene	620	*	160	1E6
	Benzo(a)anthracene	4300	U*	160	1E6
	Chrysene	1600	*	15000	1E6
	Chrysene	510	*	15000	1E6
	Benzo(b)fluoranthene	300	*	160	1E6
	Benzo(b)fluoranthene	4300	U*	160	1E6
	Benzo(k)fluoranthene	54	*	1600	1E6
	Benzo(k)fluoranthene	4300	U*	1600	1E6
	Benzo(a)pyrene	470	*	16	1E6
	Benzo(a)pyrene	4300	U*	16	1E6
	Indeno(1,2,3-cd)pyrene	51	*	160	1E6
	Indeno(1,2,3-cd)pyrene	4300	U*	160	1E6
	Dibenzo(a,h)anthracene	23	*	16	1E6
	Dibenzo(a,h)anthracene	4300	U*	16	1E6
	Benzo(g,h,i)perylene	110	*	NP	HI=1

Units - µg/kg

DRAFT

LOCATION



GRO - Gasoline Range Organics
DRO - Diesel Range Organics
ORO - Oil Range Organics
mg/kg - milligrams per kilogram
µg/kg - micrograms per kilogram

U.S. EPA Environmental Response Team
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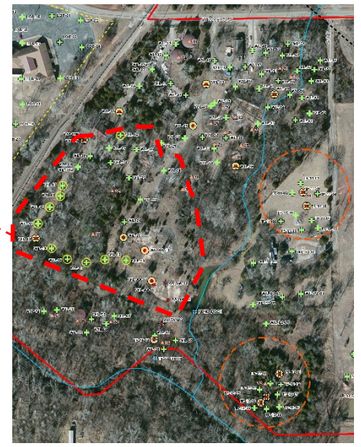
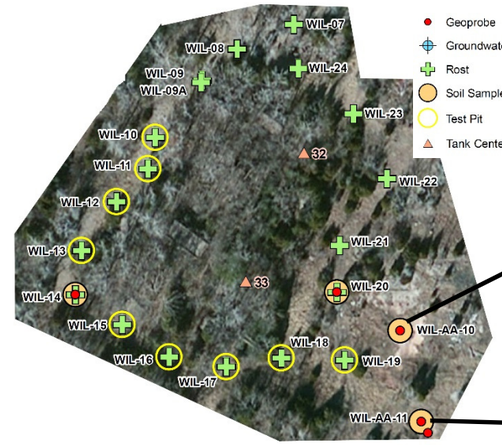
EP-W-09-031 W.A. #0-277

WILCOX REFINERY
TANKS 34, 35, 36 and 37
Sheet 5

This Sheet





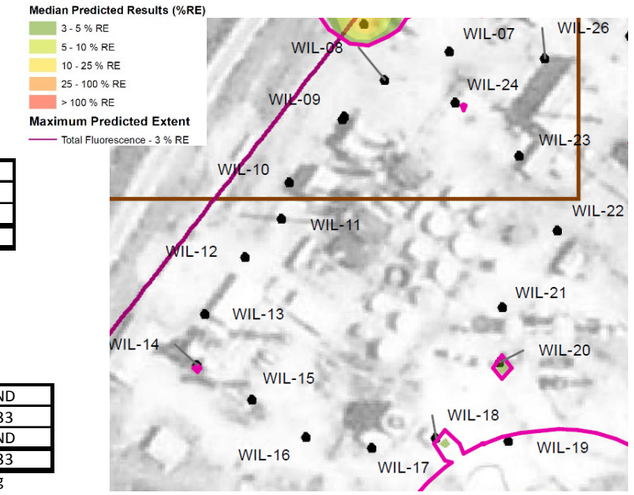
SAMPLE LOCATIONS

GRO	5.1
DRO	300
ORO	89
Total	394

Units - mg/kg
See Sheet 6B
For Analytical Results

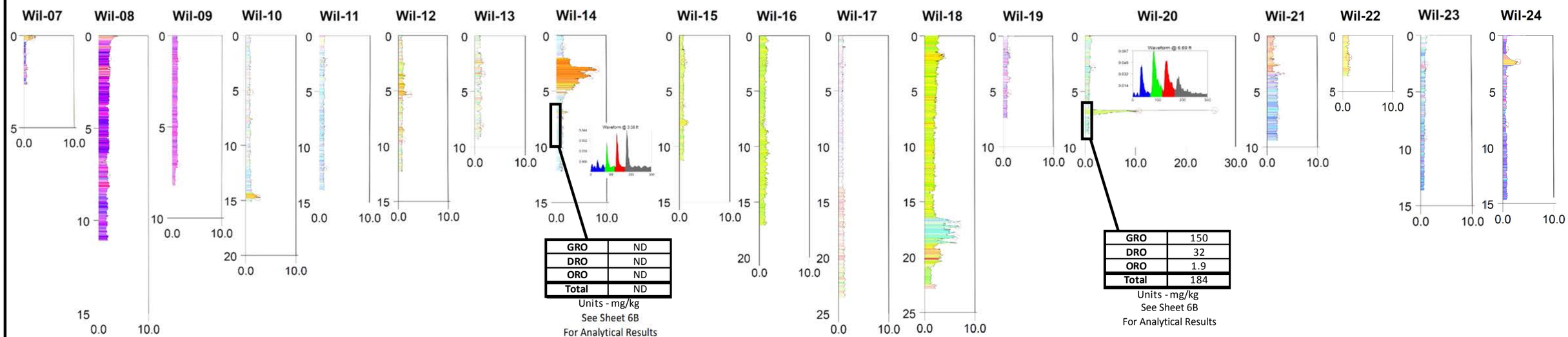
GRO	ND
DRO	33
ORO	ND
Total	33

Units - mg/kg
See Sheet 6B
For Analytical Results



2D MAX PLUME

FLUORESCENCE RESPONSE DATA



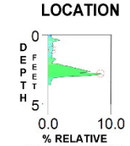
GRO	ND
DRO	ND
ORO	ND
Total	ND

Units - mg/kg
See Sheet 6B
For Analytical Results

GRO	150
DRO	32
ORO	1.9
Total	184

Units - mg/kg
See Sheet 6B
For Analytical Results

LOCATION



GRO - Gasoline Range Organics
DRO - Diesel Range Organics
ORO - Oil Range Organics
mg/kg - milligrams per kilogram
µg/kg - micrograms per kilogram

DRAFT

U.S. EPA Environmental Response Team
Scientific Engineering Response and Analytical Services
EP-W-09-031 W.A. #0-277

WILCOX REFINERY
LOWER PROCESS AREA
Sheet 6A

U.S. EPA Environmental Response Team
Scientific Engineering Response and Analytical Services
EP-W-09-031 W.A. #0-277

Loc	Analyte	Result	Q	Action Limit	AC
WIL-14 7 to 10 Ft bgs	Acetone	**8.1**	LJ	61000000	HI=1
	Naphthalene	**44**	*	130000	HI=1
	2-Methylnaphthalene	**56**	*	240000	HI=1
	Phenanthrene	**35**	LJ	NP	HI=1
	Benzo(a)anthracene	200	U*	160	1E6
	Benzo(b)fluoranthene	200	U*	160	1E6
	Benzo(a)pyrene	39	U	16	1E6
	Benzo(a)pyrene	200	U*	16	1E6
	Indeno(1,2,3-cd)pyrene	200	U*	160	1E6
	Dibenzo(a,h)anthracene	39	U	16	1E6
	Dibenzo(a,h)anthracene	200	U*	16	1E6

Units - µg/kg

Loc	Analyte	Result	Q	Action Limit	AC
WIL-AA-10 8 to 10 Ft bgs	Acetone	**140**		61000000	HI=1
	2-Butanone	**38**		27000000	HI=1
	Cyclohexane	**6.3**		6500000	HI=1
	Benzene	**4.6**	LJ	1200	1E6
	Methylcyclohexane	**23**		NP	HI=1
	Toluene	**9**		4900000	HI=1
	Ethylbenzene	**8.9**		5800	1E6
	o-Xylene	**12**		650000	HI=1
	m, p-Xylene	**25**		NP	HI=1
	Isopropylbenzene	**2.3**	LJ	1900000	HI=1
	Phenol	**5100**	LJ	19000000	HI=1
	2-Methylphenol	**28000**		3200000	HI=1
	2,2'-Oxybis(1-chloropropane)	7500	U*	4900	1E6
	4-Methylphenol	**27000**		6300000	HI=1
	Hexachloroethane	3800	U*	1800	1E6
	2,4-Dimethylphenol	**50000**		1300000	HI=1
	4-Chloroaniline	7500	U*	2700	1E6
	Hexachlorobutadiene	3800	U*	1200	1E6
	Hexachlorocyclo-pentadiene	7500	U	1800	HI=1
	2,6-Dinitrotoluene	3800	U*	360	1E6
	2,4-Dinitrotoluene	3800	U*	1700	1E6
	4-Chlorophenyl-phenyl ether	3800	U	NP	HI=1
	4,6-Dinitro-2-methylphenol	7500	U*	5100	HI=1
	Hexachlorobenzene	3800	U*	210	1E6
	Atrazine	7500	U*	2400	1E6
	3,3'-Dichlorobenzidine	7500	U*	1200	1E6
	Benzo(a)anthracene	3800	U*	160	1E6
	Benzo(b)fluoranthene	3800	U*	160	1E6
	Benzo(k)fluoranthene	3800	U*	1600	1E6
	Benzo(a)pyrene	38	U	16	1E6
	Benzo(a)pyrene	3800	U*	16	1E6
	Indeno(1,2,3-cd)pyrene	3800	U*	160	1E6
	Dibenzo(a,h)anthracene	38	U	16	1E6
	Dibenzo(a,h)anthracene	3800	U*	16	1E6

Units - µg/kg

DRAFT

Loc	Analyte	Result	Q	Action Limit	AC
WIL-20 7 to 9 Ft bgs	Acetone	**50**		61000000	HI=1
	2-Butanone	**13**		27000000	HI=1
	Cyclohexane	**35**	Jv	6500000	HI=1
	Benzene	**1.4**	LJ	1200	1E6
	Methylcyclohexane	**100**	Jv	NP	HI=1
	Ethylbenzene	**43**		5800	1E6
	Isopropylbenzene	**25**		1900000	HI=1
	Naphthalene	**56**	*	130000	HI=1
	2-Methylnaphthalene	**160**	*	240000	HI=1
	1,1'-Biphenyl	**16**	LJ	47000	HI=1
	Acenaphthene	**23**	LJ	3600000	HI=1
	Fluorene	**29**	LJ	2400000	HI=1
	Phenanthrene	**76**	*	NP	HI=1
	Phenanthrene	**170**		NP	HI=1
	Anthracene	**22**	LJ	18000000	HI=1
	Fluoranthene	**23**	LJ	2400000	HI=1
	Pyrene	**45**	*	1800000	HI=1
	Pyrene	**91**		1800000	HI=1
	Benzo(a)anthracene	**39**	LJ	160	1E6
	Benzo(a)anthracene	200	U*	160	1E6
	Chrysene	**36**	*	15000	1E6
	Chrysene	**86**		15000	1E6
	Bis(2-ethylhexyl)phthalate	**19**	LJ	38000	HI=1
	Benzo(b)fluoranthene	**26**	LJ	160	1E6
	Benzo(b)fluoranthene	200	U*	160	1E6
	Benzo(k)fluoranthene	**11**	LJ	1600	1E6
	Benzo(a)pyrene	**21**	LJ	16	1E6
	Benzo(a)pyrene	200	U*	16	1E6
	Indeno(1,2,3-cd)pyrene	**21**	LJ	160	1E6
	Indeno(1,2,3-cd)pyrene	200	U*	160	1E6
	Dibenzo(a,h)anthracene	**18**	LJ	16	1E6
	Dibenzo(a,h)anthracene	200	U*	16	1E6
	Benzo(g,h,i)perylene	**26**	LJ	NP	HI=1

Units - µg/kg

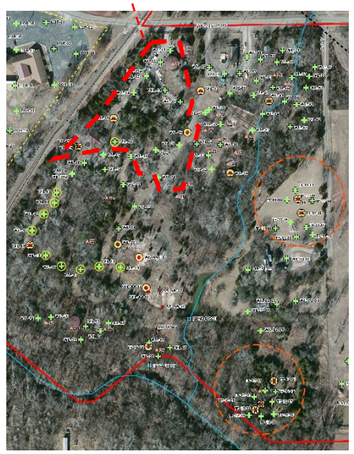
Loc	Analyte	Result	Q	Action Limit	AC
WIL-AA-11 6 to 8 Ft bgs	Acetone	**82**		61000000	HI=1
	2-Butanone	**29**		27000000	HI=1
	Benzene	**4.1**	LJ	1200	1E6
	Toluene	**9.8**		4900000	HI=1
	o-Xylene	**4.6**	LJ	650000	HI=1
	m, p-Xylene	**7.4**		NP	HI=1
	Phenol	**1300**	LJ	19000000	HI=1
	2-Methylphenol	**6200**		3200000	HI=1
	4-Methylphenol	**5000**		6300000	HI=1
	Hexachloroethane	2000	U*	1800	1E6
	2,4-Dimethylphenol	**7100**		1300000	HI=1
	4-Chloroaniline	3900	U*	2700	1E6
	Hexachlorobutadiene	2000	U*	1200	1E6
	Hexachlorocyclo-pentadiene	3900	U	1800	HI=1
	2,6-Dinitrotoluene	2000	U*	360	1E6
	2,4-Dinitrotoluene	2000	U*	1700	1E6
	Hexachlorobenzene	2000	U*	210	1E6
	Atrazine	3900	U*	2400	1E6
	3,3'-Dichlorobenzidine	3900	U*	1200	1E6
	Benzo(a)anthracene	2000	U*	160	1E6
	Benzo(b)fluoranthene	2000	U*	160	1E6
	Benzo(k)fluoranthene	2000	U*	1600	1E6
	Benzo(a)pyrene	41	U	16	1E6
	Benzo(a)pyrene	2000	U*	16	1E6
	Indeno(1,2,3-cd)pyrene	2000	U*	160	1E6
	Dibenzo(a,h)anthracene	41	U	16	1E6
	Dibenzo(a,h)anthracene	2000	U*	16	1E6

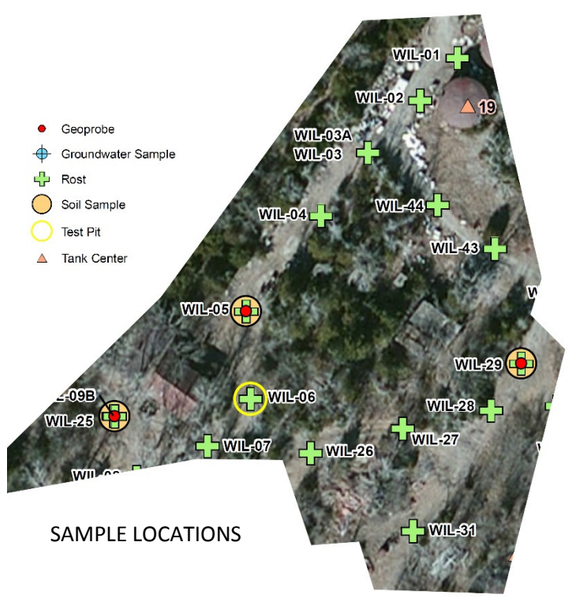
Units - µg/kg

WILCOX REFINERY
LOWER PROCESS AREA
Sheet 6B

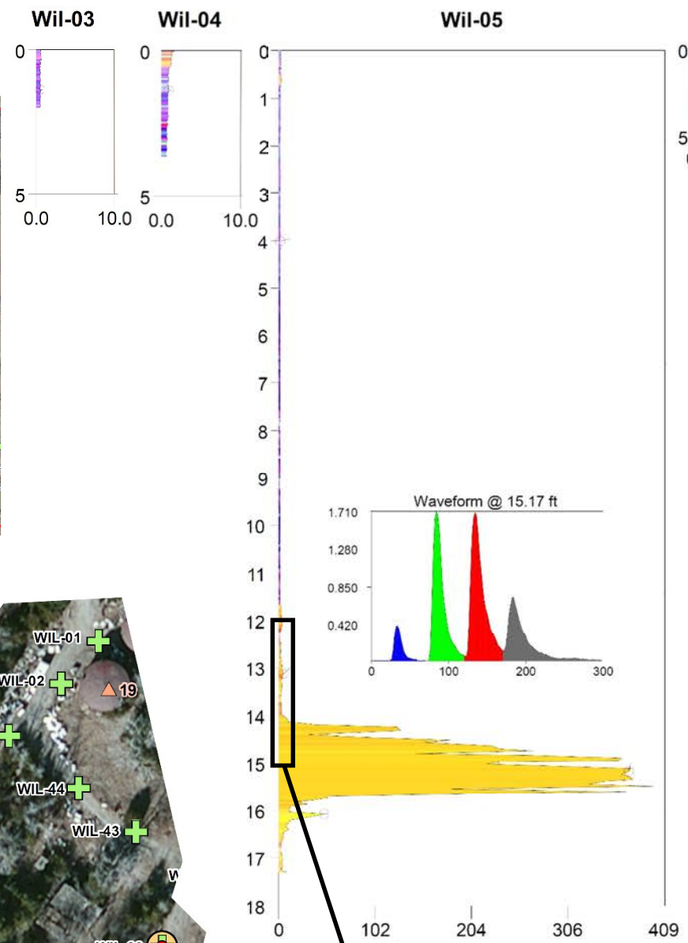
FLUORESCENCE RESPONSE DATA

This Sheet



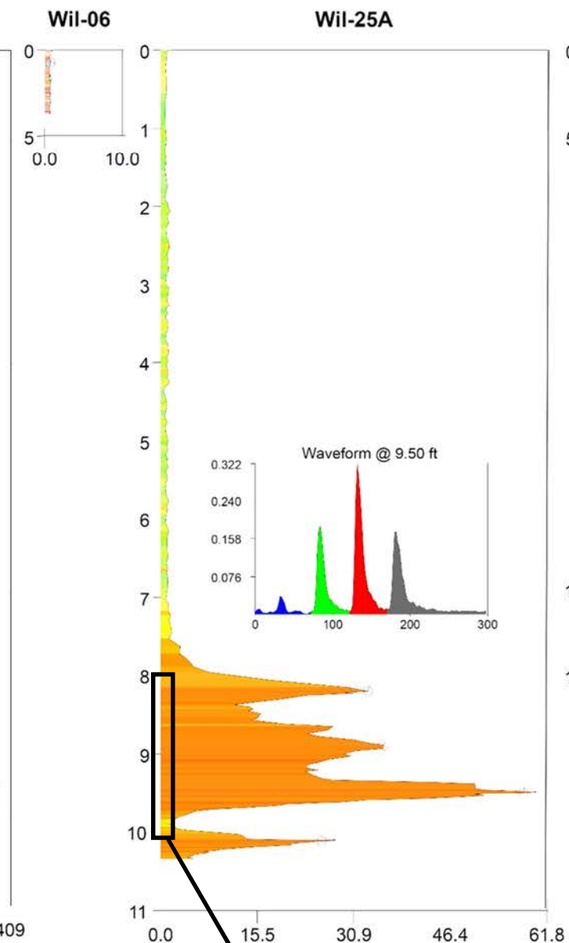


SAMPLE LOCATIONS



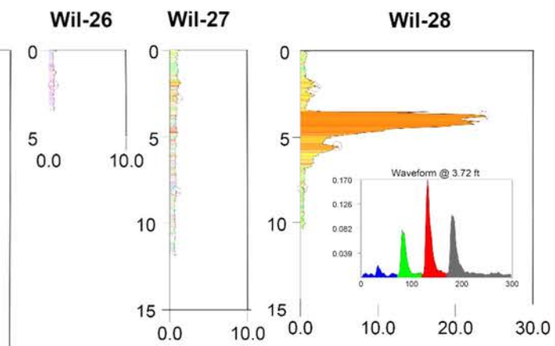
GRO	ND
DRO	2.4 J
ORO	ND
Total	2.4 J

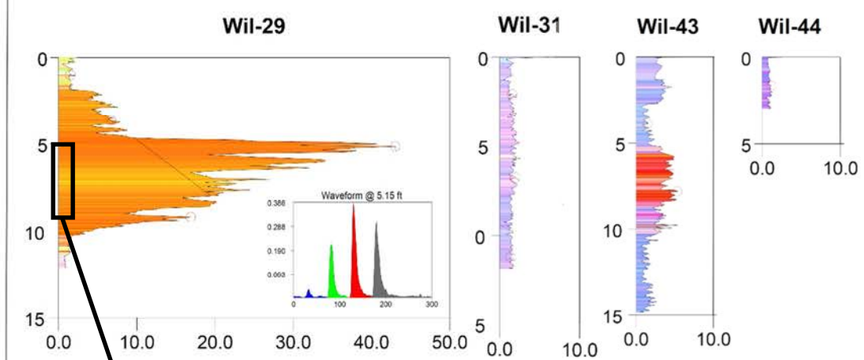
Units - mg/kg
See Sheet 7B
For Analytical Results



GRO	3.5
DRO	920
ORO	250
Total	1174

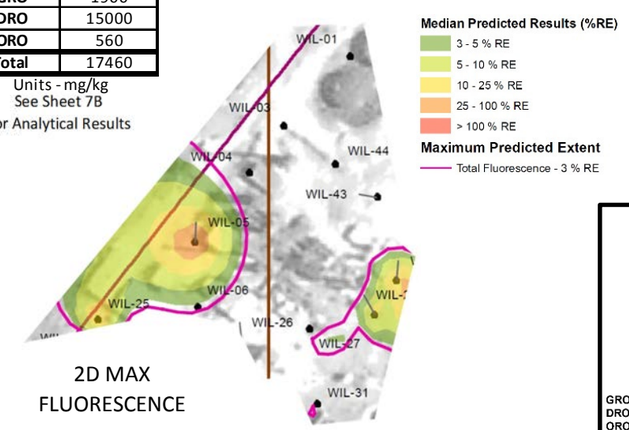
Units - mg/kg
See Sheet 7B
For Analytical Results



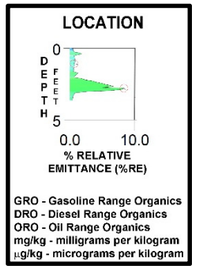


GRO	1900
DRO	15000
ORO	560
Total	17460

Units - mg/kg
See Sheet 7B
For Analytical Results



2D MAX
FLUORESCENCE



GRO - Gasoline Range Organics
DRO - Diesel Range Organics
ORO - Oil Range Organics
mg/kg - milligrams per kilogram
µg/kg - micrograms per kilogram

U.S. EPA Environmental Response Team
Scientific Engineering Response and Analytical Services
EP-W-09-031 W.A. #0-277

DRAFT

WILCOX REFINERY
UPPER PROCESS AREA
Sheet 7A

U.S. EPA Environmental Response Team
Scientific Engineering Response and Analytical Services
EP-W-09-031 W.A. #0-277

Loc	Analyte	Result	Q	Action Limit	AC
WIL-29 5 to 8 Ft bgs	Cyclohexane	**15000**		6500000	HI=1
	Benzene	**1500**		1200	1E6
	Methylcyclohexane	**26000**		NP	HI=1
	1,2-Dichloropropane	**620**		1000	1E6
	Toluene	**1700**		4900000	HI=1
	1,2-Dibromoethane	250	U	36	1E6
	Ethylbenzene	**7400**		5800	1E6
	o-Xylene	**2000**		650000	HI=1
	m, p-Xylene	**6100**		NP	HI=1
	Isopropylbenzene	**1700**		1900000	HI=1
	1,2-Dibromo-3-chloropropane	250	U	5.3	1E6
	1,4-Dioxane	**3.4**	LJ	5300	1E6
	2,2'-Oxybis(1-chloropropane)	7600	U*	4900	1E6
	Hexachloroethane	3900	U*	1800	1E6
	Naphthalene	**8300**	*	130000	HI=1
	Naphthalene	**52000**	J	130000	HI=1
	4-Chloroaniline	7600	U*	2700	1E6
	Hexachlorobutadiene	3900	U*	1200	1E6
	2-Methylnaphthalene	**92000**	*	240000	HI=1
	2-Methylnaphthalene	**17000**	*	240000	HI=1
	Hexachlorocyclo-pentadiene	7600	U	1800	HI=1
	1,1'-Biphenyl	**520**	*	47000	HI=1
	1,1'-Biphenyl	**200**	J	47000	HI=1
	2,6-Dinitrotoluene	3900	U*	360	1E6
	Acenaphthene	**2900**	*	3600000	HI=1
	Acenaphthene	**5400**		3600000	HI=1
	2,4-Dinitrotoluene	3900	U*	1700	1E6
	Fluorene	**3400**	*	2400000	HI=1
	Fluorene	**6700**		2400000	HI=1
	4-Chlorophenyl-phenyl ether	3900	U	NP	HI=1
	4,6-Dinitro-2-methylphenol	7600	U*	5100	HI=1
	Hexachlorobenzene	3900	U*	210	1E6
	Atrazine	7600	U*	2400	1E6
	Phenanthrene	**9500**	*	NP	HI=1
	Phenanthrene	**19000**		NP	HI=1
	Anthracene	**4900**	*	18000000	HI=1
	Anthracene	**4500**		18000000	HI=1
	Fluoranthene	**1000**	*	2400000	HI=1
	Fluoranthene	**1700**		2400000	HI=1
	Pyrene	**6800**	*	1800000	HI=1
	Pyrene	**6800**		1800000	HI=1
	3,3'-Dichlorobenzidine	7600	U*	1200	1E6
	Benzo(a)anthracene	**1300**	*	160	1E6
	Benzo(a)anthracene	**2300**		160	1E6
	Chrysene	**4000**	*	15000	1E6
	Chrysene	**2600**	*	15000	1E6
	Benzo(b)fluoranthene	**470**	*	160	1E6
	Benzo(b)fluoranthene	**750**		160	1E6
	Benzo(k)fluoranthene	3900	U*	1600	1E6
	Benzo(k)fluoranthene	**160**		1600	1E6
	Benzo(a)pyrene	**550**	*	16	1E6
	Benzo(a)pyrene	**1000**		16	1E6
	Indeno(1,2,3-cd)pyrene	3900	U*	160	1E6
	Indeno(1,2,3-cd)pyrene	**180**		160	1E6
	Dibenzo(a,h)anthracene	3900	U*	16	1E6
	Dibenzo(a,h)anthracene	**200**		16	1E6
	Benzo(g,h,i)perylene	**330**		NP	HI=1

Units - µg/kg

Loc	Analyte	Result	Q	Action Limit	AC
WIL-05 12 to 15 Ft bgs	Acetone	**18**		61000000	HI=1
	1,2-Dibromo-3-chloropropane	5.7	U	5.3	1E6
	Naphthalene	**22**	*	130000	HI=1
	2-Methylnaphthalene	**30**	*	240000	HI=1
	Benzo(a)anthracene	200	U*	160	1E6
	Benzo(b)fluoranthene	200	U*	160	1E6
	Benzo(a)pyrene	40	U	16	1E6
	Benzo(a)pyrene	200	U*	16	1E6
	Indeno(1,2,3-cd)pyrene	200	U*	160	1E6
	Dibenzo(a,h)anthracene	40	U	16	1E6
	Dibenzo(a,h)anthracene	200	U*	16	1E6

Units - µg/kg

Loc	Analyte	Result	Q	Action Limit	AC
WIL-25 8 to 10 Ft bgs	Methylene chloride	**38**	LJ	57000	1E6
	1,2-Dibromoethane	280	U	36	1E6
	1,2-Dibromo-3-chloropropane	280	U	5.3	1E6
	Hexachlorocyclo-pentadiene	1900	U	1800	HI=1
	2,6-Dinitrotoluene	970	U*	360	1E6
	Hexachlorobenzene	970	U*	210	1E6
	Phenanthrene	**32**	LJ	NP	HI=1
	Pyrene	**49**		1800000	HI=1
	3,3'-Dichlorobenzidine	1900	U*	1200	1E6
	Benzo(a)anthracene	970	U*	160	1E6
	Benzo(b)fluoranthene	970	U*	160	1E6
	Benzo(a)pyrene	39	U	16	1E6
	Benzo(a)pyrene	970	U*	16	1E6
	Indeno(1,2,3-cd)pyrene	970	U*	160	1E6
	Dibenzo(a,h)anthracene	39	U	16	1E6
	Dibenzo(a,h)anthracene	970	U*	16	1E6

Units - µg/kg

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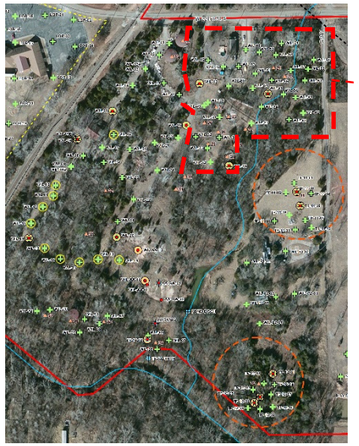
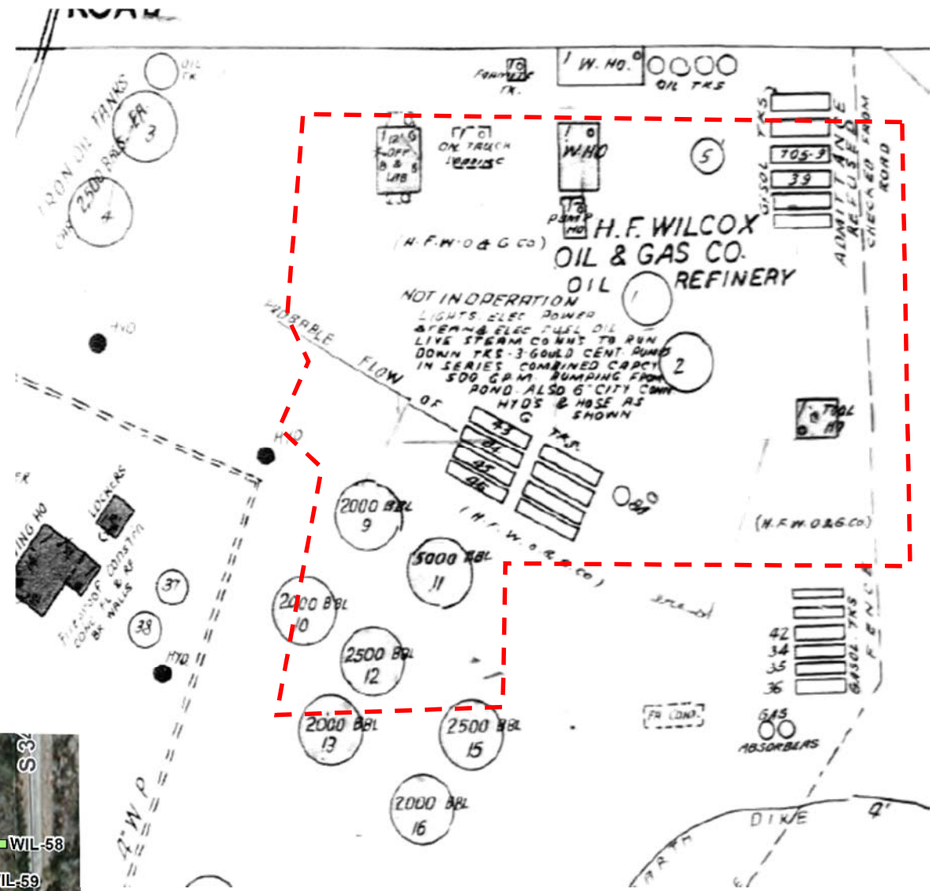
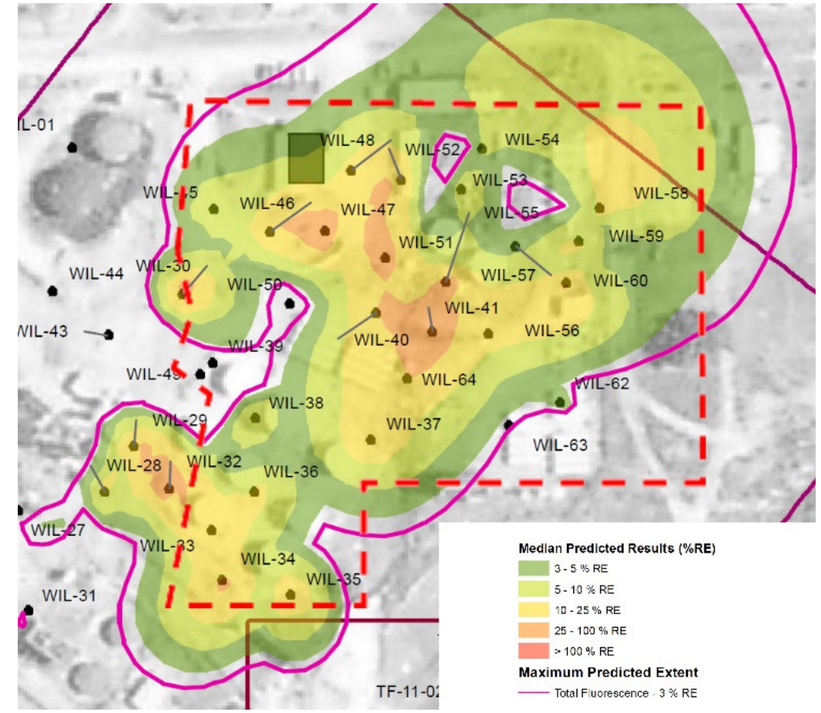
WILCOX REFINERY
UPPER PROCESS AREA
Sheet 7B



SHEET 8



SANBORN MAP



2D MAX
FLUORESCENCE

SAMPLE LOCATIONS

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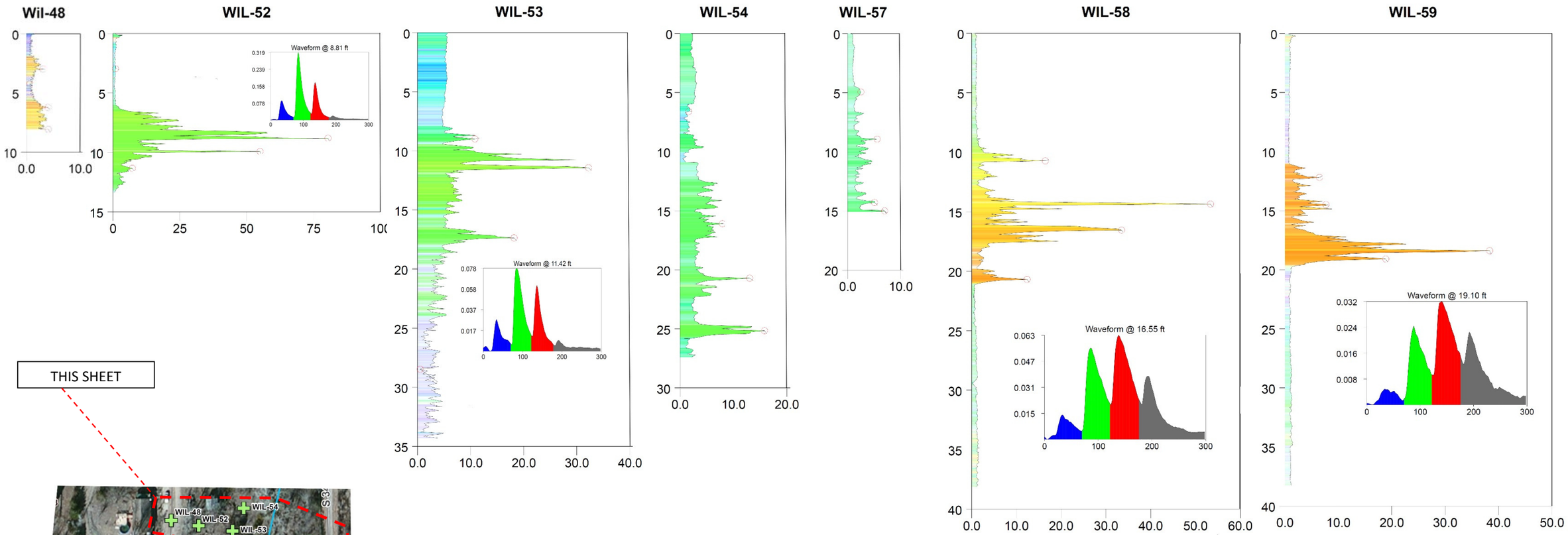
WILCOX REFINERY
PRODUCT STORAGE AREA
Sheet 8A

FLUORESCENCE RESPONSE DATA



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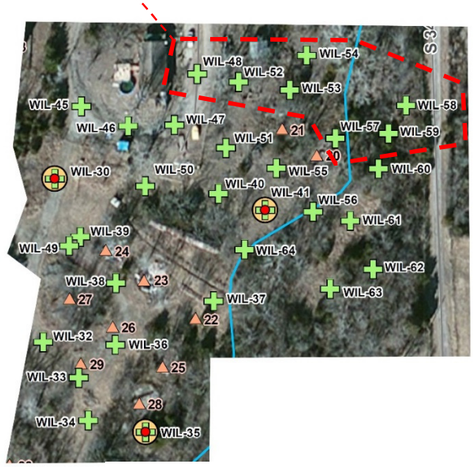

SAMPLE LOCATIONS

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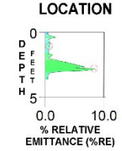
LOCATION



GRO - Gasoline Range Organics
DRO - Diesel Range Organics
ORO - Oil Range Organics
mg/kg - milligrams per kilogram
µg/kg - micrograms per kilogram

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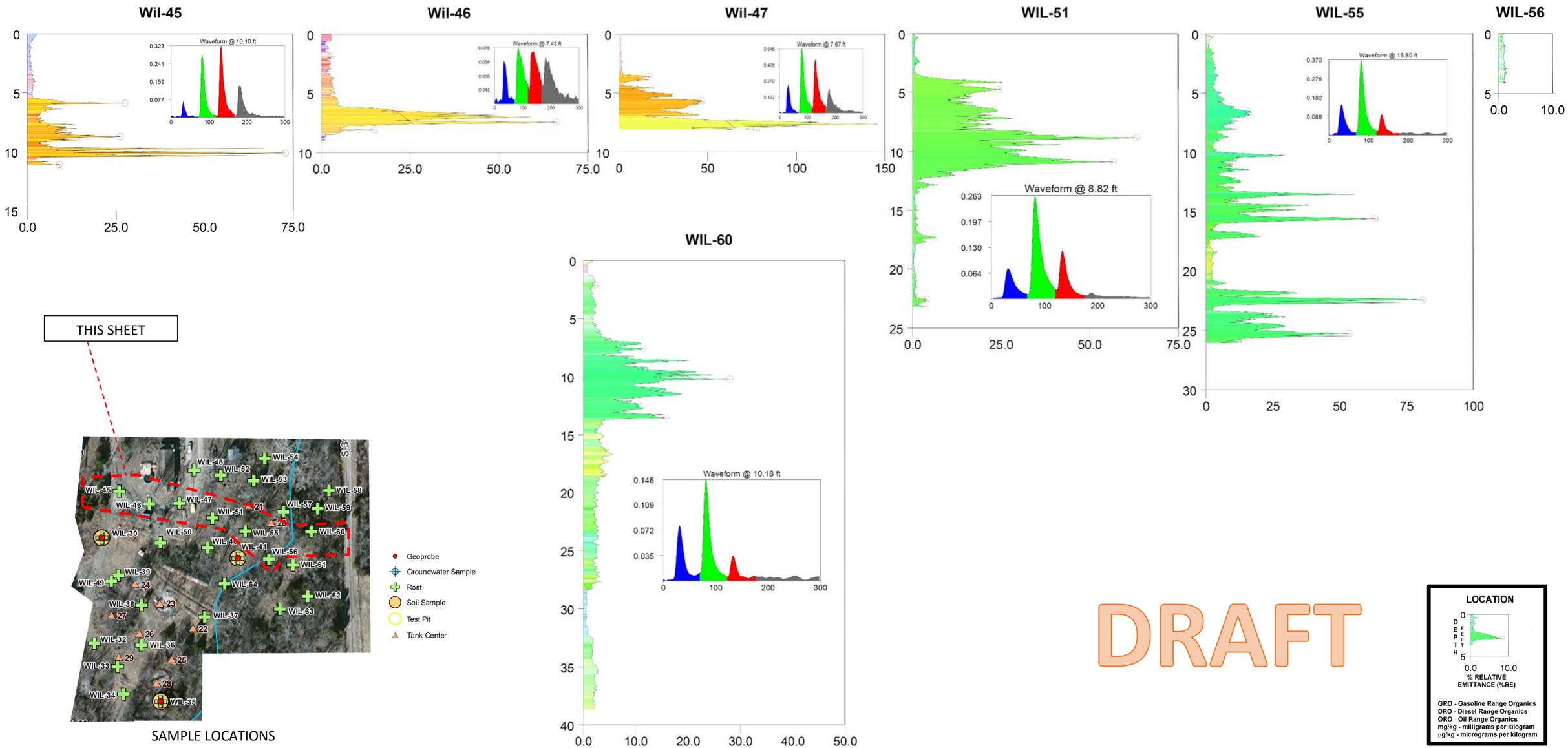
WILCOX REFINERY
PRODUCT STORAGE AREA
Sheet 8B

FLUORESCENCE RESPONSE DATA



SAMPLE LOCATIONS

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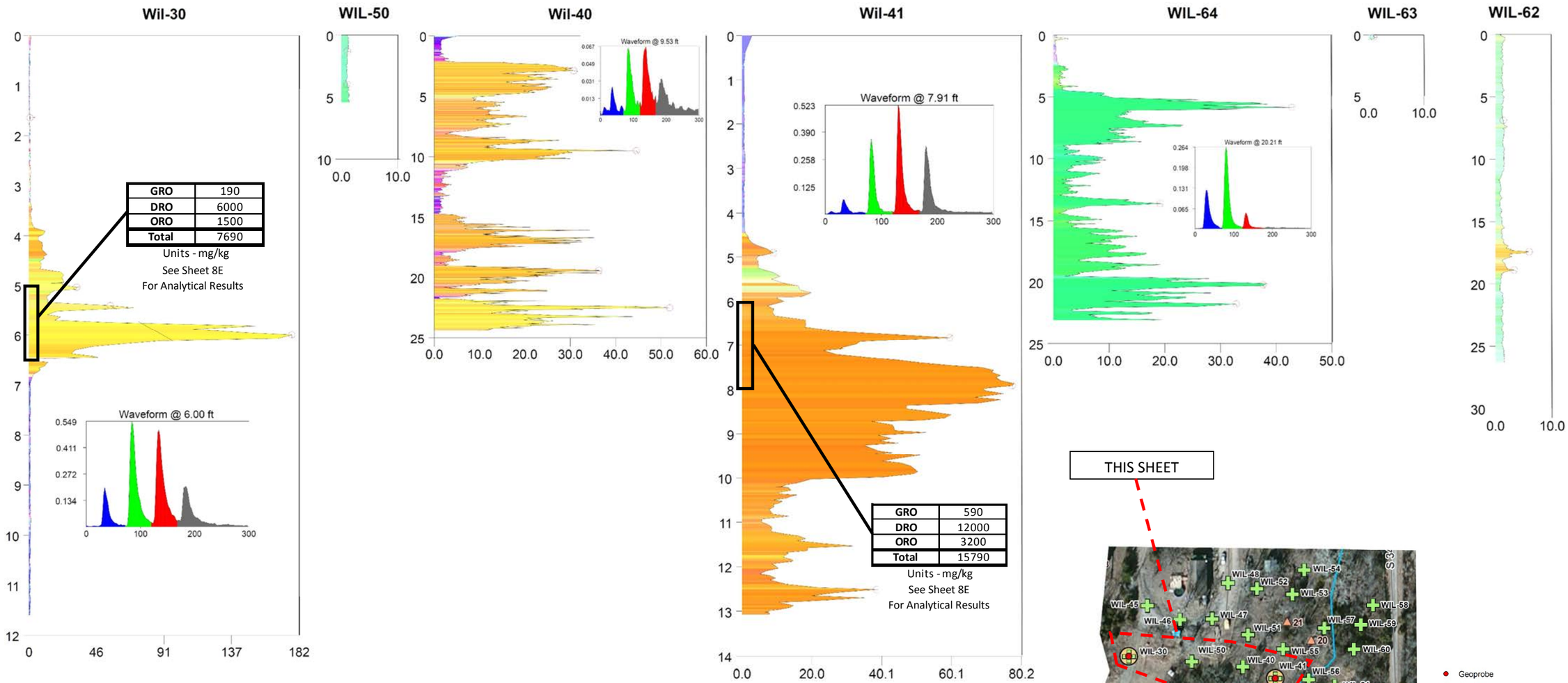
WILCOX REFINERY
PRODUCT STORAGE AREA
Sheet 8C

FLUORESCENCE RESPONSE DATA



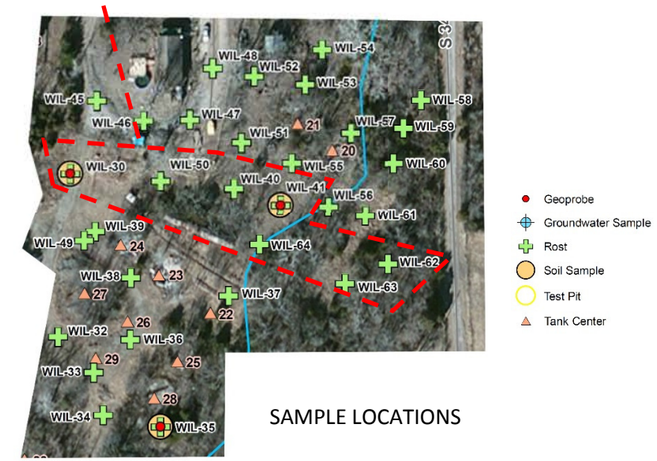
GRO	190
DRO	6000
ORO	1500
Total	7690

Units - mg/kg
See Sheet 8E
For Analytical Results

GRO	590
DRO	12000
ORO	3200
Total	15790

Units - mg/kg
See Sheet 8E
For Analytical Results

THIS SHEET



SAMPLE LOCATIONS

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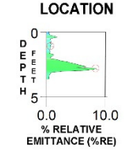
LOCATION



GRO - Gasoline Range Organics
DRO - Diesel Range Organics
ORO - Oil Range Organics
mg/kg - milligrams per kilogram
µg/kg - micrograms per kilogram

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WILCOX REFINERY
PRODUCT STORAGE AREA
Sheet 8D

U.S. EPA Environmental Response Team
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Loc	Analyte	Result	Q	Action Limit	AC
WIL-30 5 to 6.5 Ft bgs	Methylene chloride	**27**	LJ	57000	1E6
	Cyclohexane	**7000**	J^	6500000	HI=1
	Methylcyclohexane	**7900**		NP	HI=1
	1,2-Dibromoethane	260	U	36	1E6
	Isopropylbenzene	**580**		1900000	HI=1
	1,2-Dibromo-3-chloropropane	260	U	5.3	1E6
	2,2'-Oxybis(1-chloropropane)	7300	U*	4900	1E6
	Hexachloroethane	3800	U*	1800	1E6
	Naphthalene	**3800**	*	130000	HI=1
	Naphthalene	**1400**	*	130000	HI=1
	4-Chloroaniline	7300	U*	2700	1E6
	Hexachlorobutadiene	3800	U*	1200	1E6
	2-Methylnaphthalene	**8200**	*	240000	HI=1
	2-Methylnaphthalene	**5100**	J	240000	HI=1
	Hexachlorocyclo-pentadiene	7300	U	1800	HI=1
	2,6-Dinitrotoluene	3800	U*	360	1E6
	2,4-Dinitrotoluene	3800	U*	1700	1E6
	Fluorene	**130**	J	2400000	HI=1
	4-Chlorophenyl-phenyl ether	3800	U	NP	HI=1
	4,6-Dinitro-2-methylphenol	7300	U*	5100	HI=1
	Hexachlorobenzene	3800	U*	210	1E6
	Atrazine	7300	U*	2400	1E6
	Phenanthrene	**770**	*	NP	HI=1
	Phenanthrene	**1800**	J	NP	HI=1
	Fluoranthene	**160**	J	2400000	HI=1
	Pyrene	**380**	*	1800000	HI=1
	Pyrene	**950**		1800000	HI=1
	3,3'-Dichlorobenzidine	7300	U*	1200	1E6
	Benzo(a)anthracene	3800	U*	160	1E6
	Benzo(a)anthracene	210		160	1E6
	Chrysene	**400**		15000	1E6
	Benzo(b)fluoranthene	3800	U*	160	1E6
	Benzo(b)fluoranthene	**91**		160	1E6
	Benzo(k)fluoranthene	**19**	LJ	1600	1E6
	Benzo(k)fluoranthene	3800	U*	1600	1E6
	Benzo(a)pyrene	3800	U*	16	1E6
	Benzo(a)pyrene	140		16	1E6
	Indeno(1,2,3-cd)pyrene	**34**	LJ	160	1E6
	Indeno(1,2,3-cd)pyrene	3800	U*	160	1E6
	Dibenzo(a,h)anthracene	26	LJ	16	1E6
	Dibenzo(a,h)anthracene	3800	U*	16	1E6
	Benzo(g,h,i)perylene	**110**		NP	HI=1

Units - µg/kg

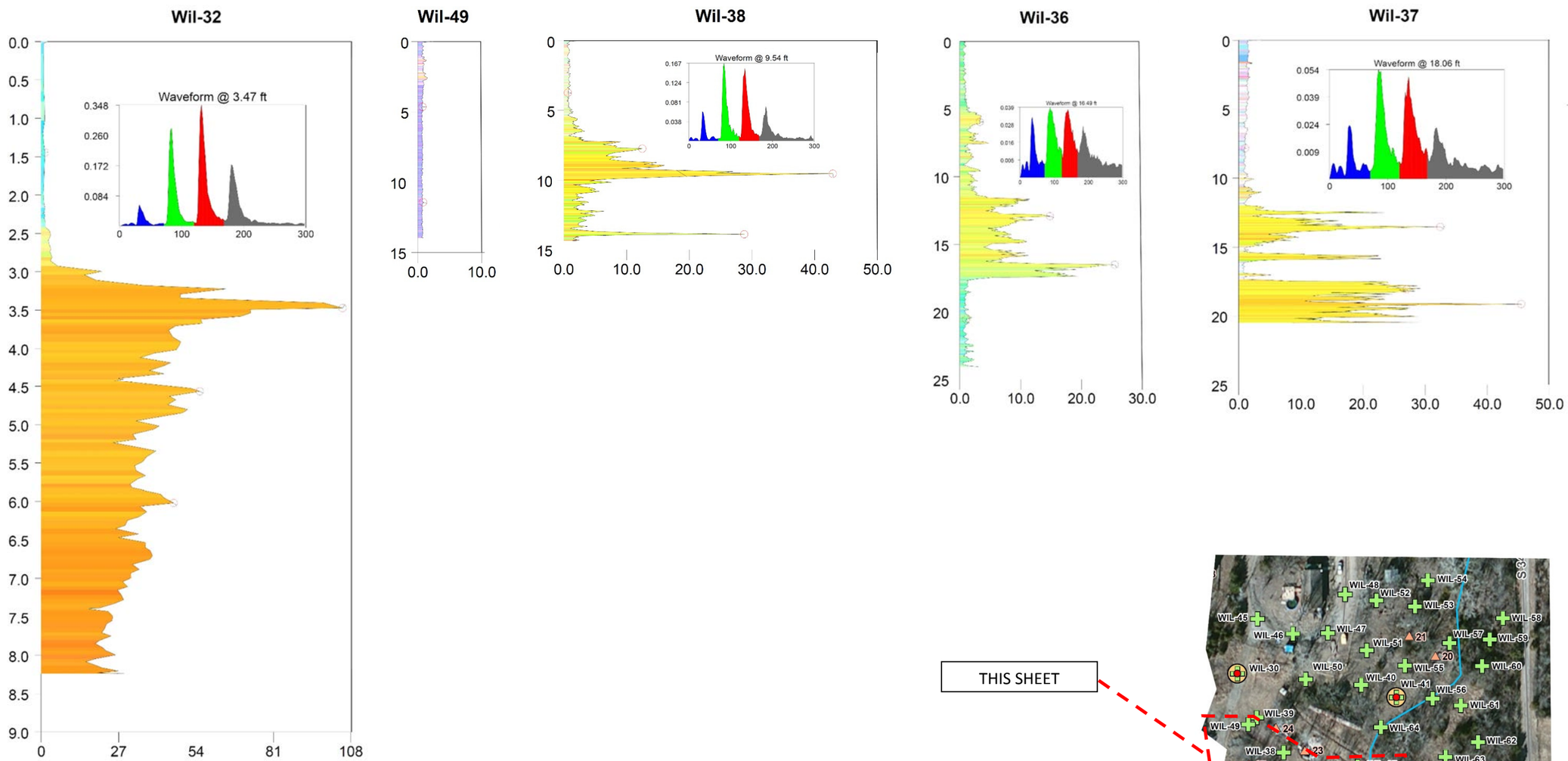
Loc	Analyte	Result	Q	Action Limit	AC
WIL-41 6 to 8 Ft bgs	Chloroform	350	U	320	1E6
	Cyclohexane	**11000**	J^	6500000	HI=1
	Methylcyclohexane	**19000**		NP	HI=1
	Bromodichloromethane	350	U	290	1E6
	1,2-Dibromoethane	350	UJv	36	1E6
	o-Xylene	**210**	LJ	650000	HI=1
	Isopropylbenzene	**1300**	J^	1900000	HI=1
	1,2-Dibromo-3-chloropropane	350	U	5.3	1E6
	2,2'-Oxybis(1-chloropropane)	16000	U*	4900	1E6
	N-Nitroso-di-n propylamine	8100	U*	78	1E6
	Hexachloroethane	8100	U*	1800	1E6
	Nitrobenzene	8100	U*	5100	1E6
	Naphthalene	**9900**	*	130000	HI=1
	Naphthalene	**5500**	*	130000	HI=1
	4-Chloroaniline	16000	U*	2700	1E6
	Hexachlorobutadiene	8100	U*	1200	1E6
	2-Methylnaphthalene	**22000**	*	240000	HI=1
	2-Methylnaphthalene	**37000**		240000	HI=1
	Hexachlorocyclo-pentadiene	16000	U	1800	HI=1
	2,6-Dinitrotoluene	8100	U*	360	1E6
	Acenaphthene	**1300**	*	3600000	HI=1
	2,4-Dinitrotoluene	8100	U*	1700	1E6
	Fluorene	**980**	*	2400000	HI=1
	4-Chlorophenyl-phenyl ether	8100	U	NP	HI=1
	4,6-Dinitro-2-methylphenol	16000	U*	5100	HI=1
	Hexachlorobenzene	8100	U*	210	1E6
	Atrazine	16000	U*	2400	1E6
	Phenanthrene	**8300**	*	NP	HI=1
	Phenanthrene	**12000**		NP	HI=1
	Anthracene	**1500**	*	18000000	HI=1
	Fluoranthene	**150**	*	2400000	HI=1
	Pyrene	**5300**	*	1800000	HI=1
	Pyrene	**4500**	*	1800000	HI=1
	3,3'-Dichlorobenzidine	16000	U*	1200	1E6
	Benzo(a)anthracene	1500	*	160	1E6
	Benzo(a)anthracene	1300	*	160	1E6
	Chrysene	**4100**	*	15000	1E6
	Chrysene	**2900**	*	15000	1E6
	Benzo(b)fluoranthene	8100	U*	160	1E6
	Benzo(b)fluoranthene	1000		160	1E6
	Benzo(k)fluoranthene	8100	U*	1600	1E6
	Benzo(k)fluoranthene	**120**		1600	1E6
	Benzo(a)pyrene	8100	U*	16	1E6
	Benzo(a)pyrene	950		16	1E6
	Indeno(1,2,3-cd)pyrene	8100	U*	160	1E6
	Indeno(1,2,3-cd)pyrene	**94**		160	1E6
	Dibenzo(a,h)anthracene	8100	U*	16	1E6
	Dibenzo(a,h)anthracene	100		16	1E6
	Benzo(g,h,i)perylene	**180**		NP	HI=1

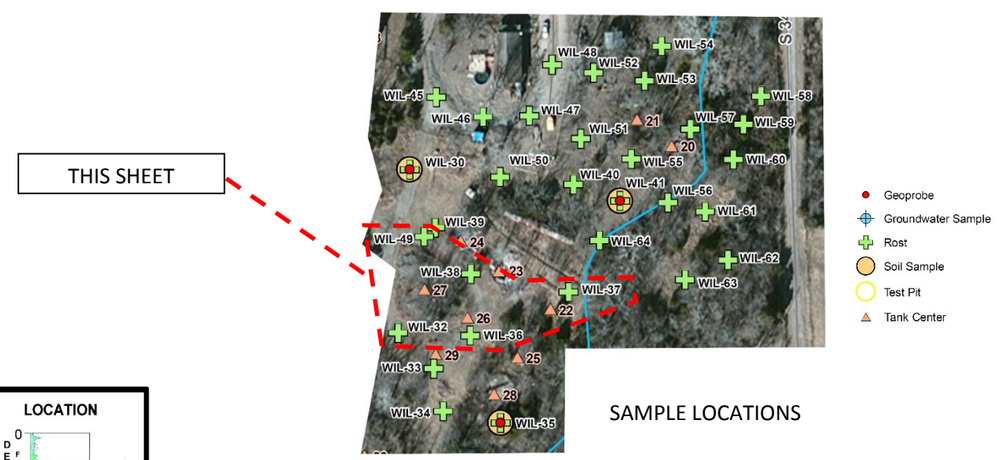
Units - µg/kg

DRAFT

WILCOX REFINERY
PRODUCT STORAGE AREA
Sheet 8E

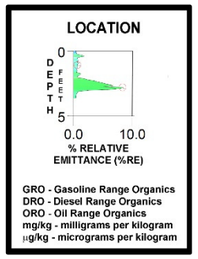
FLUORESCENCE RESPONSE DATA





SAMPLE LOCATIONS

DRAFT



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Scientific Engineering Response and Analytical Services
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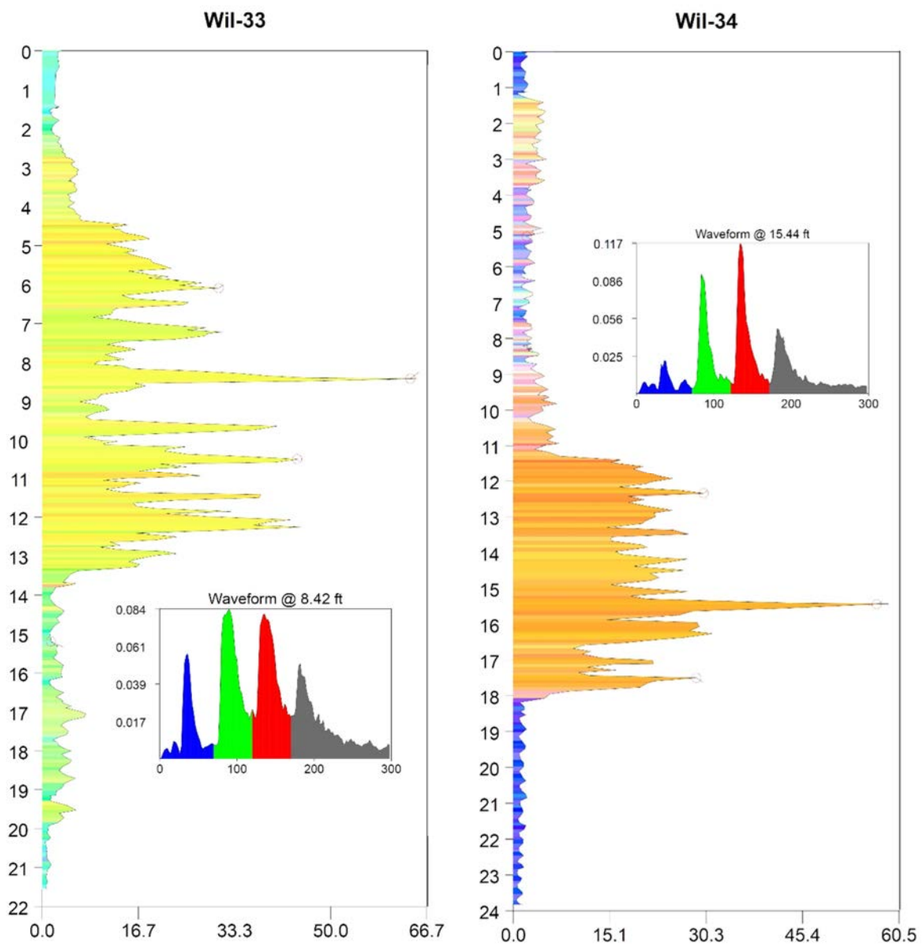
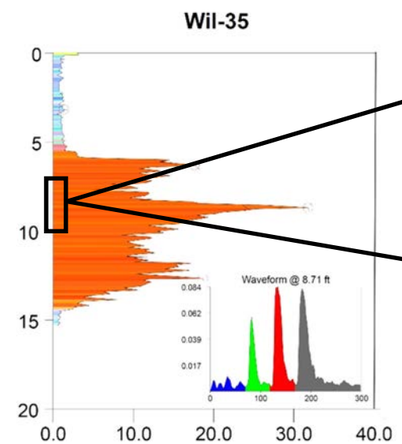
WILCOX REFINERY
PRODUCT STORAGE AREA
Sheet 8F

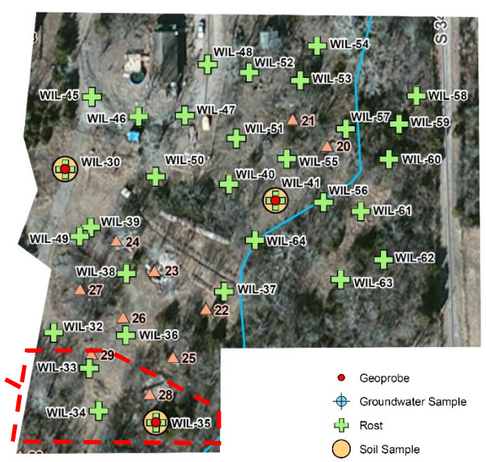
FLUORESCENCE RESPONSE DATA





GRO	3000
DRO	1000
ORO	60
Total	4060

Units - mg/kg



SAMPLE LOCATIONS

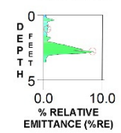
THIS SHEET

Loc	Analyte	Result	Q	Action Limit	AC
WIL-35 7 to 10 Ft bgs	Vinyl chloride	2800	UJ	590	1E6
	Chloroform	4100		320	1E6
	Cyclohexane	33000		6500000	HI=1
	Carbon tetrachloride	2800	U	650	1E6
	Benzene	1700	LJ	1200	1E6
	1,2-Dichloroethane	2800	U	460	1E6
	Trichloroethene	2800	U	940	1E6
	Methylcyclohexane	110000		NP	HI=1
	1,2-Dichloropropane	2200	LJ	1000	1E6
	Bromodichloromethane	2800	U	290	1E6
	Toluene	1900	LJ	4900000	HI=1
	1,1,2-Trichloroethane	2800	U	1100	1E6
	Dibromochloromethane	2800	U	750	1E6
	1,2-Dibromoethane	2800	U	36	1E6
	Ethylbenzene	47000		5800	1E6
	o-Xylene	2800	LJ	650000	HI=1
	m, p-Xylene	60000		NP	HI=1
	Isopropylbenzene	8800		1900000	HI=1
	1,1,2,2-Tetrachloroethane	2800	U	600	1E6
	1,4-Dichlorobenzene	2800	U	2600	1E6
	1,2-Dibromo-3-chloropropane	2800	U	5.3	1E6
	2,2'-Oxybis(1-chloropropane)	7800	U*	4900	1E6
	Hexachloroethane	4000	U*	1800	1E6
	Naphthalene	5300	*	130000	HI=1
	Naphthalene	2000	*	130000	HI=1
	4-Chloroaniline	7800	U*	2700	1E6
	Hexachlorobutadiene	4000	U*	1200	1E6
	2-Methylnaphthalene	6000	*	240000	HI=1
	2-Methylnaphthalene	3100	*	240000	HI=1
	Hexachlorocyclo-pentadiene	7800	U	1800	HI=1
	1,1'-Biphenyl	150		47000	HI=1
	2,6-Dinitrotoluene	4000	U*	360	1E6
	Acenaphthene	550		3600000	HI=1
	Dibenzofuran	400	J	73000	HI=1
	2,4-Dinitrotoluene	4000	U*	1700	1E6
	Fluorene	2600	*	2400000	HI=1
	4-Chlorophenyl-phenyl ether	4000	U	NP	HI=1
	4,6-Dinitro-2-methylphenol	7800	U*	5100	HI=1
	Hexachlorobenzene	4000	U*	210	1E6
	Atrazine	7800	U*	2400	1E6
	Phenanthrene	8500	*	NP	HI=1
	Phenanthrene	21000		NP	HI=1
	Anthracene	3700	*	18000000	HI=1
	Anthracene	1500	*	18000000	HI=1
	Carbazole	1400	LJ	NP	HI=1
	Fluoranthene	3300	*	2400000	HI=1
	Fluoranthene	1500	*	2400000	HI=1
	Pyrene	7200	*	1800000	HI=1
	Pyrene	5800	J	1800000	HI=1
	3,3'-Dichlorobenzidine	7800	U*	1200	1E6
	Benzo(a)anthracene	4900	*	160	1E6
	Benzo(a)anthracene	2000	*	160	1E6
	Chrysene	7600	*	15000	1E6
	Chrysene	4000	J	15000	1E6
	Benzo(b)fluoranthene	680	*	160	1E6
	Benzo(b)fluoranthene	1300	J	160	1E6
	Benzo(k)fluoranthene	4000	U*	1600	1E6
	Benzo(k)fluoranthene	220		1600	1E6
	Benzo(a)pyrene	630	*	16	1E6
	Benzo(a)pyrene	1400	J	16	1E6
	Indeno(1,2,3-cd)pyrene	290	J	160	1E6
	Indeno(1,2,3-cd)pyrene	4000	U*	160	1E6
	Dibenzo(a,h)anthracene	330	J	16	1E6
	Dibenzo(a,h)anthracene	4000	U*	16	1E6
	Benzo(g,h,i)perylene	400	J	NP	HI=1

Units - µg/kg

DRAFT

LOCATION



GRO - Gasoline Range Organics
DRO - Diesel Range Organics
ORO - Oil Range Organics
mg/kg - milligrams per kilogram
µg/kg - micrograms per kilogram

WILCOX REFINERY
PRODUCT STORAGE AREA
Sheet 8G

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