Norwalk Tank Farm Update

Defense Energy Support Center-

Americas West

Norwalk Tank Farm

Restoration Advisory Board

July 26, 2007

Presentation Overview

Topics to be Covered

- June/July 2007 Off-Site Investigation at Holifield Park
- Remediation Activities
- Central Plume Remediation
- Eastern Boundary Update

2007 Off-Site Investigation Objectives

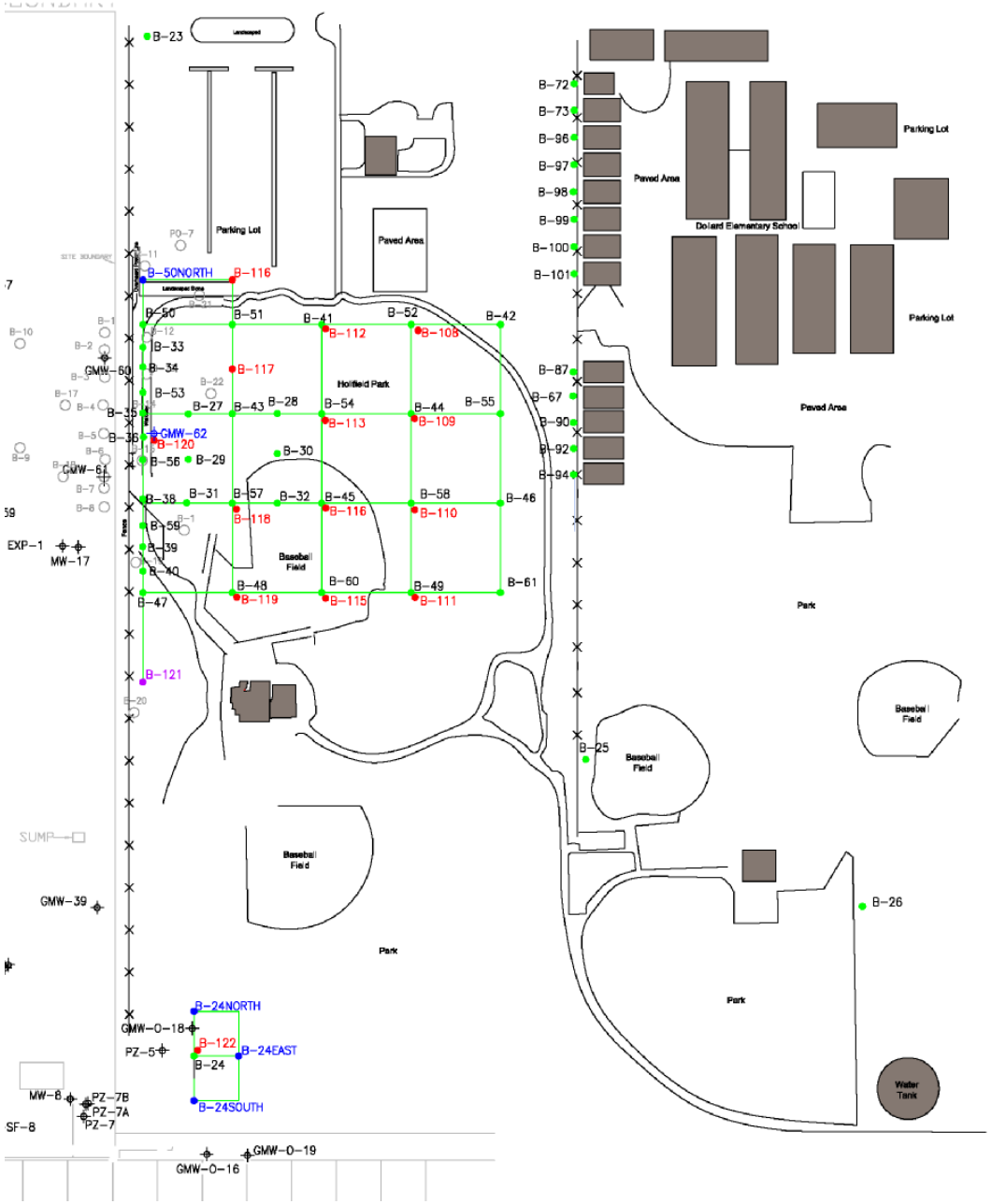
- Collect additional soil gas, soil, and groundwater samples beneath Holifield Park to better characterize impacts
- Determine if chemicals of concern in groundwater potentially impact Dolland Elementary
- Assess the potential for adverse human health effects using 2006 and 2007 data

Summary of Sampling Program

- Considering 2006 and 2007efforts, the following samples have been collected:
  - 168 soil gas samples
    - various depths - 5, 10, 15, 20, and 25 ft bgs
  - 78 soil samples
    - various depths - 5, 10, 15, 20, and 25 ft bgs
  - 40 hydropunch groundwater samples
    - various depths between 24 and 48 ft bgs
- One monitoring well was installed in Holifield Park.

Primary chemicals of concern include fuel-related chemicals (e.g., benzene)

2006 and 2007 Sampling Locations



LEGEND

- Phase I Soil & Soil Gas Sample Locations
- Phase II Soil Gas Step-Out Sample Locations
- Phase II DPT Soil/CPT Groundwater Sample Locations
- New Groundwater Monitoring Well Location

Notations:

ft - feet
bgs - below ground surface

Note:

Base map for the school zone and Holifield Park was created from a image obtained from Google Earth.

N

65 0 130

Scale in Feet

PARSONS

DEFENSE FUEL SUPPORT POINT

15306 Norwalk Boulevard,

NORWALK, CALIFORNIA

FIGURE 1
Soil Gas, Soil, and Groundwater Sampling Locations

Holifield Park and Dollard Elementary School

Photos from Field Activities

Well installation of GMW-62

Soil gas Summa sampling

Photos from Field Activities (Cont.)

CPT Rig and Hydropunch sampling

Soil Gas Results Table

Location	Sample Depth (ft)	TPH as Gasoline	Benzene	Toluene	Ethyl-benzene	m-Xylene & p-Xylene	o-Xylene	MTBE
Reporting Limit		2100	6.4	7.5	8.7	8.7	8.7	7.2
B50NORTH	5	19,000	ND	41	15	49	15	ND
	10	20,000	ND	17	9.4	20	5.2	ND
	15	26,000	ND	19	15	67	22	ND
	20	23,000	ND	8	ND	11	3.3	ND
	25	21,000	ND	8.3	4.8	19	6.1	ND
	25 (dup)	20,000	ND	6.7	ND	9.2	3.4	ND
B24NORTH	5	13,000	ND	16	ND	13	3.7	ND
	15	19,000	ND	5.8	ND	11	3.9	ND
	25	16,000	ND	5.3	ND	13	3.8	13
B24EAST	5	14,000	ND	13	ND	16	5.8	ND
	15	8,800	ND	12	ND	18	6.7	ND
	25	22,000	ND	10	4.7	22	6.6	3.7
B24SOUTH	5	5,200,000	**450**	970	800	6,300	2,200	ND
	15	24,000	13	41	17	100	53	64
	25	300,000,000	**6,500,000**	**10,000,000**	200,000	**570,000**	140,000	**6,800,000**
	25 (dup)	300,000,000	**6,200,000**	**10,000,000**	190,000	**520,000**	120,000	**6,700,000**
Preliminary Screening Level		--	84	320,000	2,300,000	820,000	740,0000	8,600

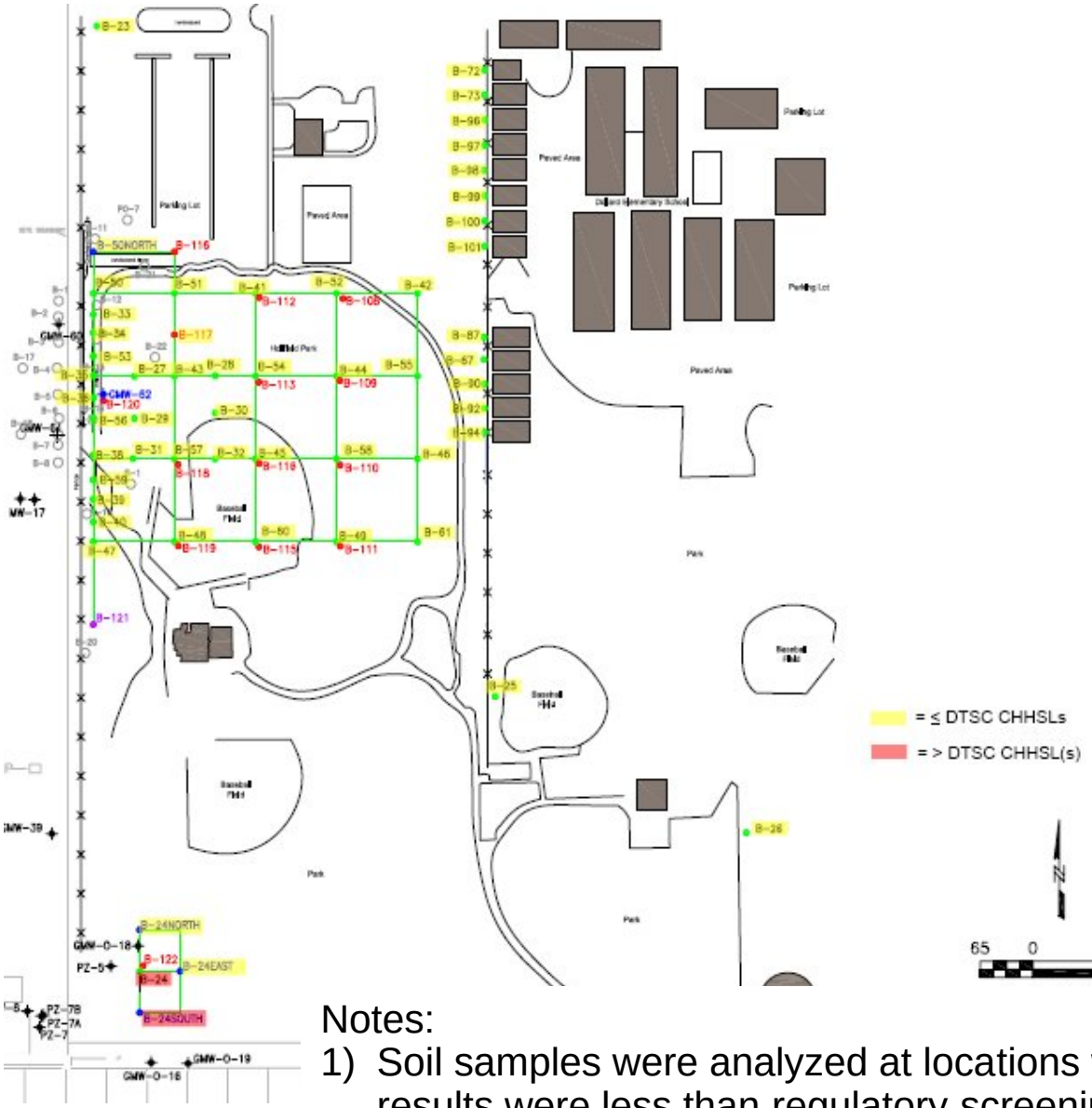
Samples collected on July 2, 2007; all units µg/m^3.

Soil Results Table

Location	Sample Depth (ft)	Soil Behavior Type at Sample Depth (from CPT data)	Soil Type at Sample Depth (observed in field)	TPH as Gasoline	TPH as Fuel	Benzene	Toluene
Preliminary Screening Level				100	1000	0.011	0.3
B-108	5	Sand & silty sand	Silty fine sand	<0.24	<5.0	0.0017	0.0016
	10	Sand & silty sand	Fine sand & silt layers	<0.26	<5.0	0.0022	0.0016
B-109	5	Sand & silty sand	Silty fine sand	0.64	<5.0	0.0035	0.0016
	10	Sandy silt	Fine sand & silt layers	0.28	<5.0	<0.00012	<0.00013
	20	Sandy silt/silty sand & sand	Fine sand	<0.22	<5.0	0.0021	0.0018
B-112	5	Sand & silty sand	Silty fine sand	<0.058	<4.8	0.0013	0.00098
B-113	10	Sand & silty sand	Fine sand & silt layers	<0.058	<4.8	0.0024	0.0019
B-115	10	Sandy silt & silt	Fine sandy silt	<0.058	<4.8	0.0011	<0.00013
B-116	5	Sand & silty sand	Silty sand	<0.23	<5.0	0.002	0.00099
B-117	10	Sand & silty sand	Fine sandy silt	<0.058	<4.8	0.0023	0.002
B-118	10	Sand & silty sand	Silt	<0.058	<4.8	0.0019	0.0022
B-119	10	Sandy silt & clayey silt	Silty clay	<0.058	<4.8	0.0016	0.0014
B-120	10	Silty sand & sandy silt	Silty fine sand	<0.058	<4.8	0.00089	<0.00013
	25	Clay & silty clay	Silty fine sand	<0.22	<5.0	<0.00085	0.00087
B-121	10	Sand & silty sand	Silty sand	<0.26	<5.0	<0.0014	0.0013

Samples collected June 25-29, 2007; all units mg/kg. Other VOCs were not detected.

Extent of Soil Gas and Soil Impacts



- 2007 results were consistent with 2006 results
- Less than regulatory screening values in northern investigative area, including along Dolland Elementary property line
- Benzene exceeded preliminary screening level in some samples from the southern area.

Notes:

1) Soil samples were analyzed at locations with soil gas detections and soil results were less than regulatory screening levels.
2) Validation of 2007 results is in progress.

Groundwater Results Table

Location	Sample Depth (ft)	TPH as Fuel	TPH as Gasoline	Benzene	Toluene	Ethyl-benzene	p/m-Xylene	o-Xylene	MTBE
Reporting Limit		100	100	0.5	0.5	0.5	0.5	0.5	0.5
Preliminary Screening Level		500	500	1	150	300	1800	1800	13
B-108	31-35	480	ND c/	ND	ND	ND	ND	ND	ND
	36-40	400	ND	ND	ND	ND	ND	ND	ND
B-109	36-40	110	ND	ND	ND	ND	ND	ND	ND
B-110	31-35	390	ND	ND	ND	ND	ND	ND	ND
	36-40	200	ND	ND	ND	ND	ND	ND	ND
B-111	26-30	380	ND	ND	ND	ND	ND	ND	ND
	31-35	110	ND	ND	ND	ND	ND	ND	ND
	36-40	ND	ND	ND	ND	ND	ND	ND	ND
B-112	31-35	200	ND	ND	ND	ND	ND	ND	ND
B-113	36-40	ND	ND	**1.0**	ND	1.1	ND	ND	ND
B-114	31-35	140	ND	ND	ND	ND	ND	ND	ND
	36-40	170	ND	ND	ND	ND	ND	ND	ND
B-115	24-28	380	ND	0.51	1.3	ND	ND	ND	ND
	31-35	100	ND	ND	ND	ND	ND	ND	ND
	36-40	150	ND	ND	ND	ND	ND	ND	ND
B-116	30-35	120	ND	ND	ND	ND	ND	ND	ND
	36-40	170	ND	ND	ND	ND	ND	ND	ND
	41-45	230	ND	ND	ND	ND	ND	ND	ND

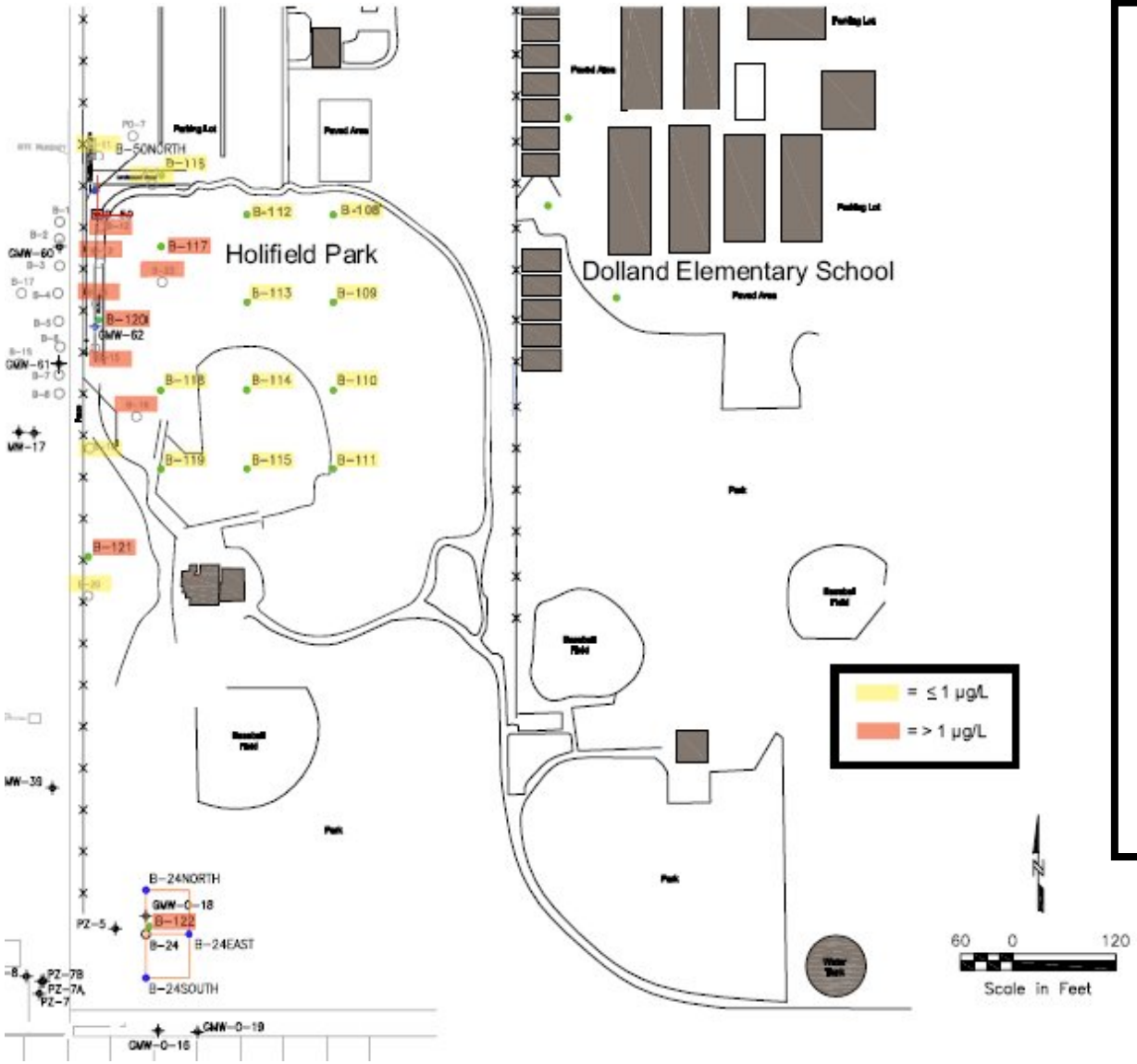
Samples collected June 25-29, 2007; all units µg/L.

Groundwater Results Table (Cont.)

Location	Sample Depth	TPH as Fuel	TPH as Gasoline	Benzene	Toluene	Ethyl-benzene	p/m-Xylene	o-Xylene	MTBE
Reporting LImit		100	100	0.5	0.5	0.5	0.5	0.5	0.5
Preliminary Screening Level		500	500	1	150	300	1800	1800	13
B-117	30-35	ND	ND	**350**	21	**640**	**2700**	820	ND
	36-40	ND	ND	**2.5**	0.64	5.2	20	5.5	ND
	41-45	ND	ND	ND	ND	0.95	3.6	0.97	ND
B-118	30-35	**25000**	**19000**	ND	6.7	**720**	360	130	ND
	36-40	420	330	ND	ND	1.7	1.2	ND	ND
B-119	36-40	160	ND	ND	ND	ND	ND	ND	ND
B-120	31-36	**30000**	**37000**	**5700**	**11000**	**1500**	**5500**	**2400**	ND
	38-42	310	**860**	**130**	32	47	56	25	ND
	38-42 (dup)	330	**850**	**130**	32	54	59	27	ND
	44-48	**1200**	**7600**	**2900**	28	**560**	1400	680	ND
B-121	29-35	ND	ND	**1.7**	3.3	1.5	5.1	2.5	1.3
	36-40	ND	ND	ND	0.56	ND	0.57	ND	0.71
B-122	25-30	**5700**	**86000**	**28000**	**11000**	**2200**	**6400**	**3500**	**38000**
	33-37	**3000**	**3400**	**30**	1.8	3.2	2.2	1.1	**5800**
	33-37 (dup)	**3400**	**4700**	**1500**	1.9	16	1.6	0.79	**18000**
	38-42	**910**	**1400**	**96**	24	6.2	13	6.7	**190**

Samples collected June 25-29, 2007; all units µg/L.

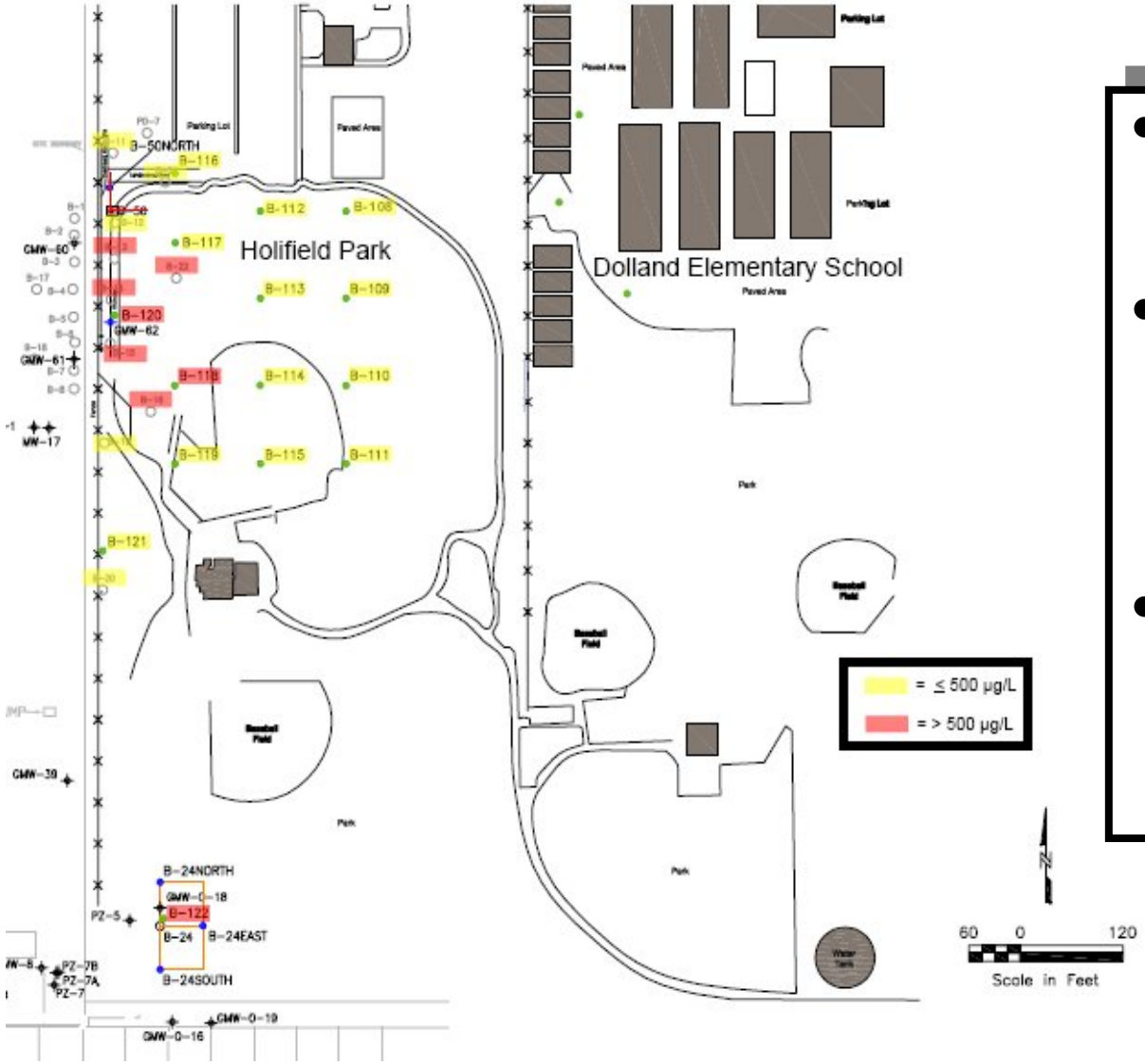
Benzene Groundwater Impacts



- 2007 results were consistent with previous findings
- Benzene extends ~120 ft east under the park, but was not detected in samples farther east (1 µg/L regulatory level)
- Benzene in southern area was consistent with existing data in this area of known impact.

Note: Validation of results in progress

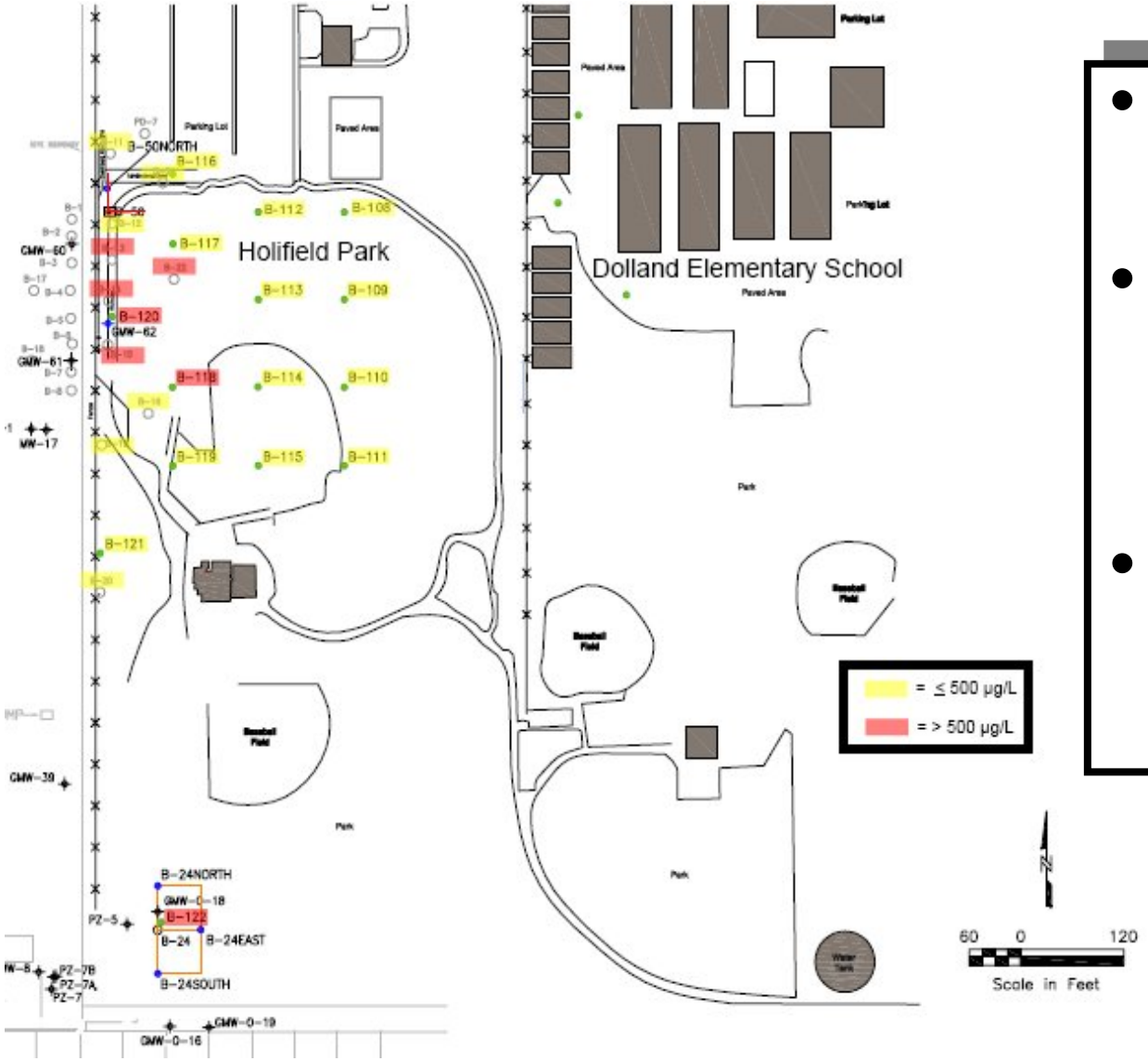
Total Petroleum Hydrocarbons as “Gasoline” (TPHg) Groundwater Impacts



- 2007 results were consistent with previous findings
- TPHg extends ~120 ft east under the park, but was not detected in samples farther east (500 µg/L action level)
- TPHg in southern area was consistent with existing data in this area of known impact.

Note: Validation of results in progress

Total Petroleum Hydrocarbons as “Fuel” (TPHf) Groundwater Impacts



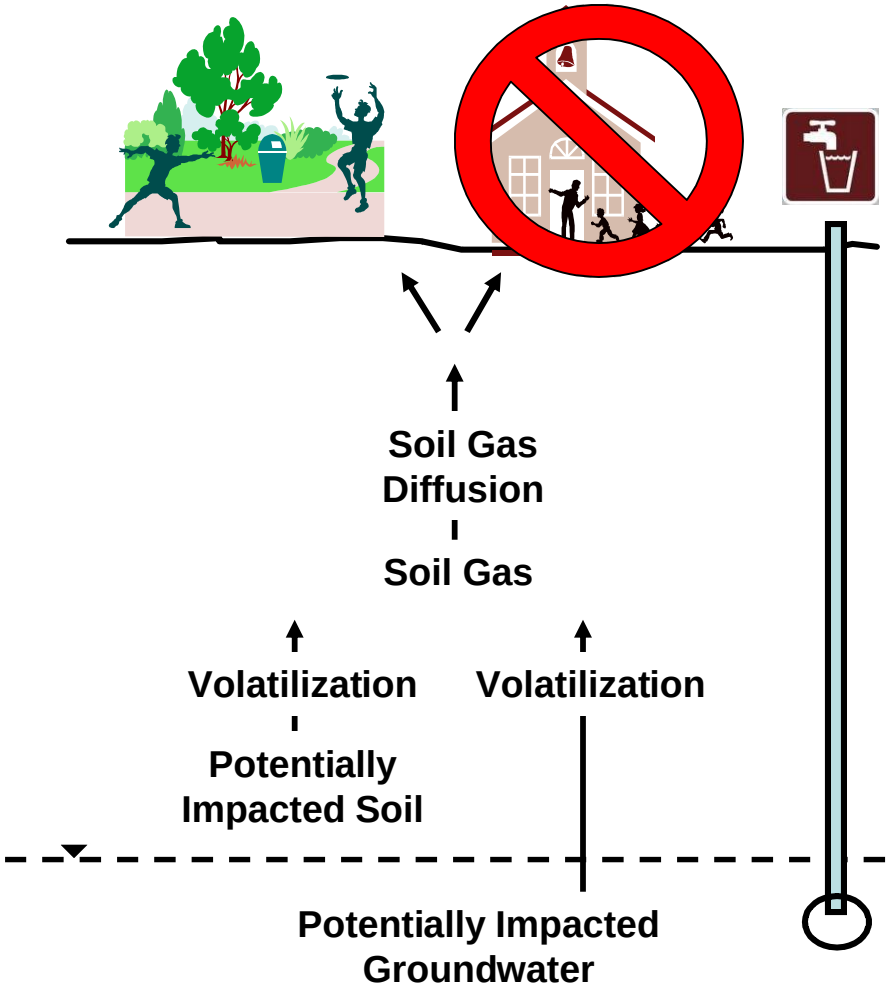
- 2007 results were consistent with previous findings
- TPHf extends ~120 ft east under the park, but was not detected in samples farther east (500 µg/L action level)
- TPHf in southern area was consistent with existing data in this area of known impact.

Note: Validation of results in progress

How a Person Might be Exposed to Chemicals in Groundwater

- **Chemicals are volatilized into outdoor air (current)**
- **Chemicals are volatilized into indoor air (current/future)**
- **Groundwater is used for drinking water (future)**

Primary chemicals of concern in groundwater at Holifield Park include fuel-related chemicals (e.g., benzene)



Procedure for Assessing Potential Human Health Effects

- Measured concentrations compared with preliminary regulatory/risk screening levels
  - Concentrations below screening levels do NOT pose a significant threat
  - Concentrations above screening levels need further evaluation but do not necessarily indicate unacceptable risks
- Comparison values (screening levels):
  - Soil Gas: CalEPA (2005) CHHSLs for ***vapor intrusion*** into indoor air;
  - Groundwater: CalEPA ***drinking water*** criteria (or USEPA Region 9 if no CalEPA value)
  - Soil: USEPA Region 9 (2004) ***risk-based*** criteria

Off-Site Investigation Conclusions

- 2 distinct impacted areas identified in Holifield Park:
  1. Northern area around the newly-installed monitoring well, GMW-62
  2. Southern portion of the park near B-24/B-122
- Northern impacted area is perhaps related to existing on-site activities.
- Southern impacted area appears related to area of known release already being remediated.
- The on-going remediation systems in the northern area consist of biosparging, soil vapor extraction, and total fluids and groundwater extraction.
- The on-going remediation systems in the southern portion include soil vapor extraction, total fluids extraction, and groundwater extraction and are related to KMEP's response to a release from a 24" block valve in April 1994.
- Remediation systems for each area will be evaluated and/or expanded as needed to ensure clean up goals are met within the time frames presented in the revised RAPs for both KMEP and DESC.

Off-Site Investigation Conclusions (Continued)

- All soil gas concentrations in northern investigative area, including Dolland Elementary school property line samples, were less than CalEPA screening levels.

Adverse health effects from inhalation of chemicals volatilized from beneath northern park area are NOT expected

- Regulatory screening levels were exceeded near southern area (around B-24).
  - These exceedances were not unexpected give the proximity of this sample location to the 24” block valve release area
  - KMEP is currently conducting SVE, product recovery, and groundwater extraction in this area

Off-Site Investigation Conclusions (Continued)

- Groundwater concentrations exceeded screening levels at some locations in the northern investigative area; area of impact has been delineated and is limited to approximately 120 ft east of the fence line that borders the site and Holifield park.

- Regulatory screening levels were exceeded near southern area (around B-24).
  - These exceedances were not unexpected given the proximity of this sample location to the 24” block valve release area
  - KMEP is currently conducting SVE, product recovery, and groundwater extraction in this area

Remediation Activities

- Installed Absorbent Socks
  (GMW-21, GMW-58, TF-9, TF-17, TF-18, TF-20, and PZ-3)
- Finished Pipe Declogging
- Installed a Power Supply for PLC
- Installed a Variable Frequency Drive on Air Stripper Motor
- Replaced Pump P-102 for Air Stripper (Contd.)

Remediation Activities

- Recharged and Certified all the Fire Extinguishers
- Completed installation of three groundwater extraction wells (GW-13, GW-14, GW-15)
- Bought and installed two Rediflo Submersible pumps in GW-13, GW-15

(Contd.)

Remediation Activities

- Installed an Eye Wash Station

- Bought a Sump for the Air Stripper

  (Yet to install)

- Bought a fiber-glass, rounded top & bottom, 60 gpm capacity Carbon Vessel

  (Yet to install)

Absorbent Sock Details

A. Sock Size = 2 inch

B. Outside Diameter = 1.7 inches

C. Length = 3 feet, 3 inches

D. Weight (Net) = 3.0 lb

E. Canister Material = Stainless Steel Type 304, Perforated

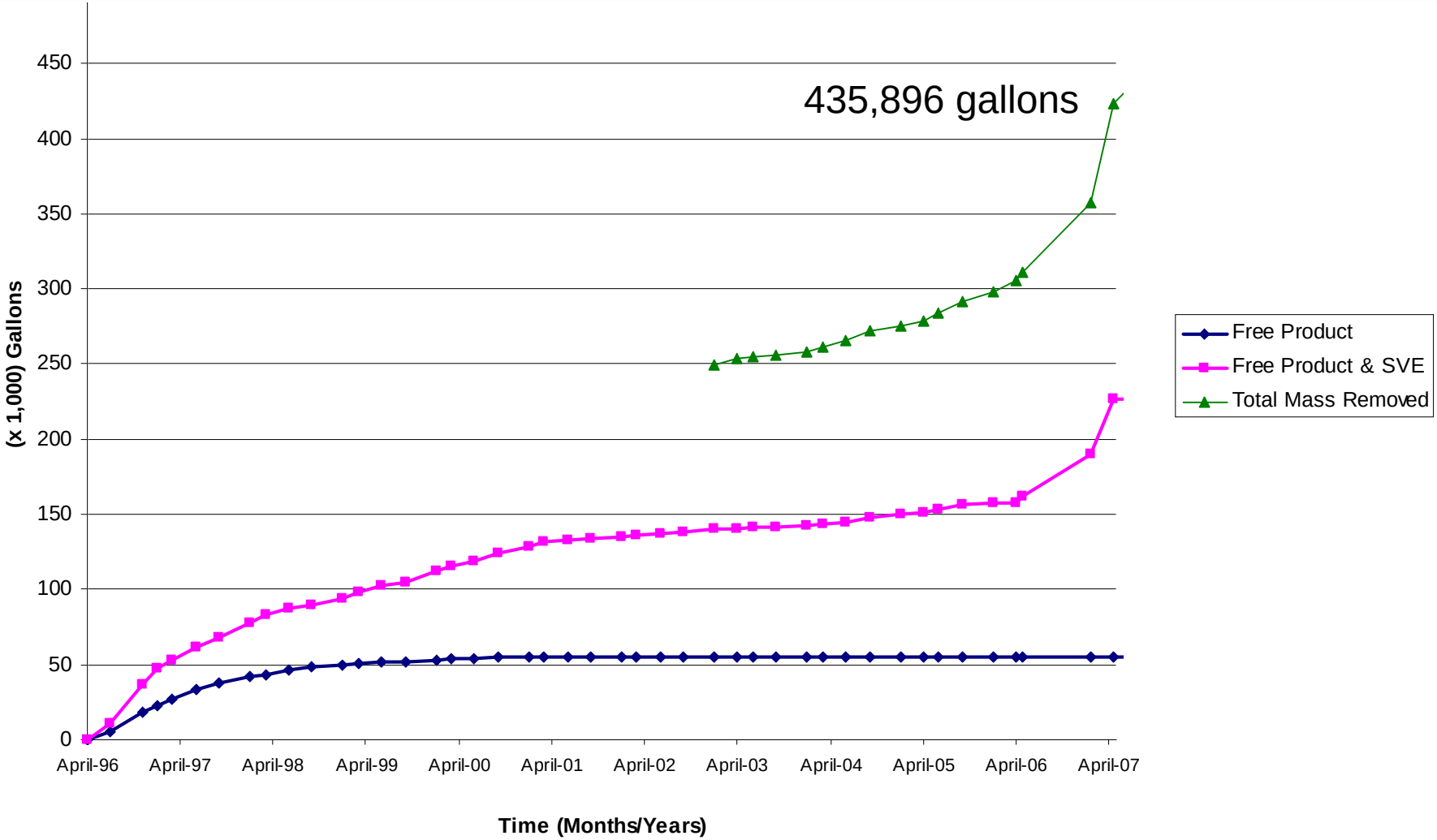
F. Absorbent Sock Material = Polypropylene Fibrous material in white fabric sock – hydrophobic (oleophilic) material

G. Rated Absorption = 3 US Gal. Per Case

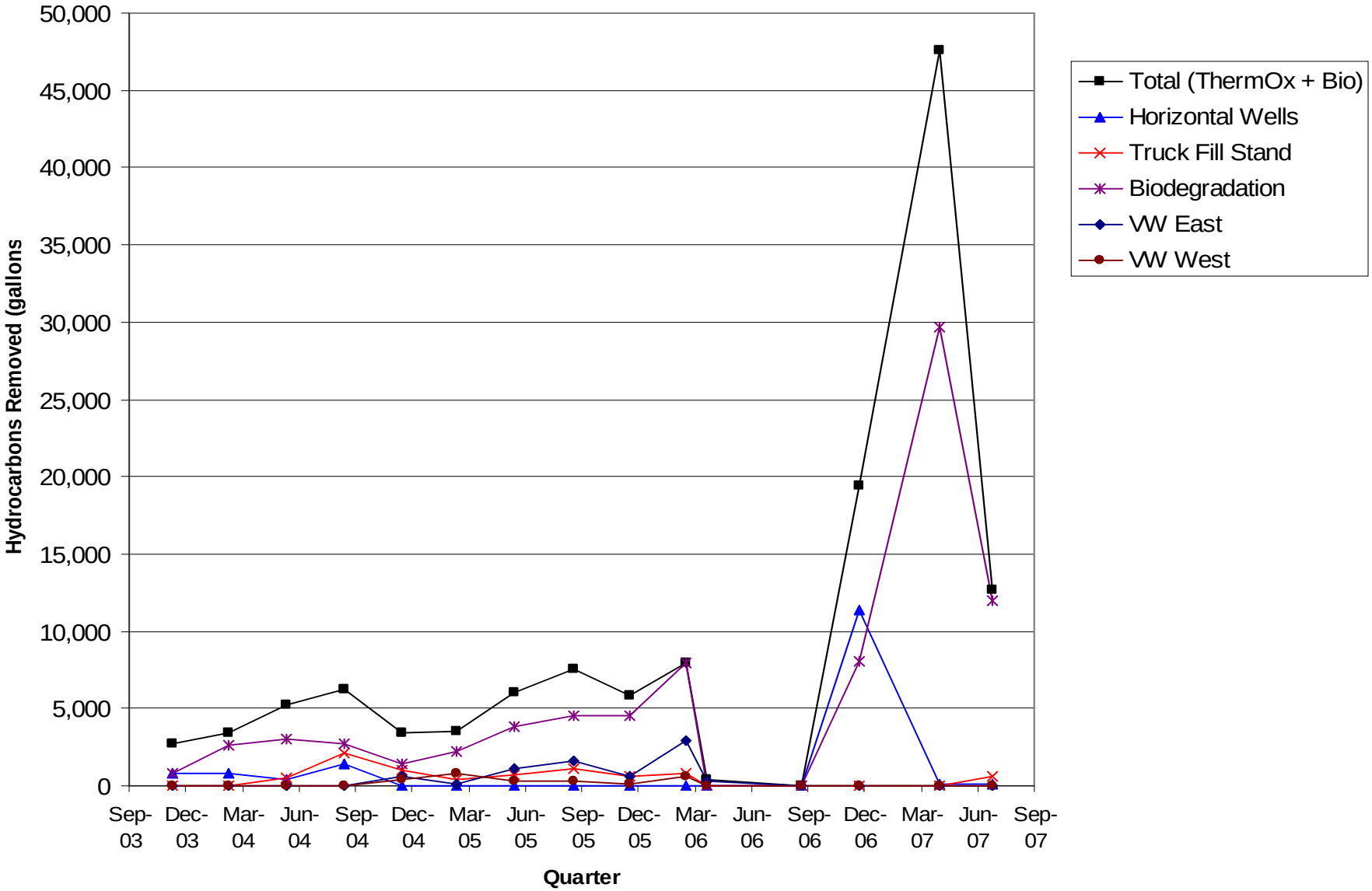
Central Plume Remediation

- System Performance since April 1996
  - Total Hydrocarbons Mass Removed: 435,896 gallons.
    - Approx. 227,191 gallons recycled and destroyed
      - 55,538 gallons of free product recovered
      - 1,397 gallons of dissolved-phase hydrocarbons recovered
      - 152,112 gallons of volatile hydrocarbons recovered through SVE
    - Estimated 208,705+ gallons of hydrocarbons destroyed due to enhanced biodegradation
  - 43.5 M gallons of water treated

Hydrocarbon Mass Removal



Hydrocarbon Mass Removal – SVE System



Eastern Boundary Update

- Completed Piping for the SVE wells and the biosparge wells
- Performed startup test (baseline sampling)
  - Lab Samples for TO-3M and TO-15 analysis
  - Field Samples analyzed for DO, CO2, CH4,

Baseline SVE Startup Sample Results
(July, 2007)

VMP#	Time	Vacuum	Methane (ppm)	O2 (%)	CO2 (%)	Comments
28-5	11:04	0	330	16.6	2.5	
28-15.5	11:06	0	350	15.6	3.3	*
28-23	11:08	0	65	9.7	6.2	TO-15
27-5	11:20	0	350	18.4	1.3	
27-15.5	11:21	0	320	15.8	2.8	*
27-23	11:23	0	100	9.3	5.4	*
26-5	11:35	0	550	18.5	1.1	
26-15	11:37	0	530	15.9	2.0	*
26-23	11:39	0	290	10.3	5.0	*
25-5	12:07	0	550	18.0	1.5	
25-16.5	12:09	0	560	16.1	2.8	*
25-23	12:11	0	310	10.3	5.4	*
20-5	12:21	0	410	20.0	0.2	
20-15	12:23	0	490	17.9	1.5	*
20-22.5	12:25	0	0	2.3	5.0	*

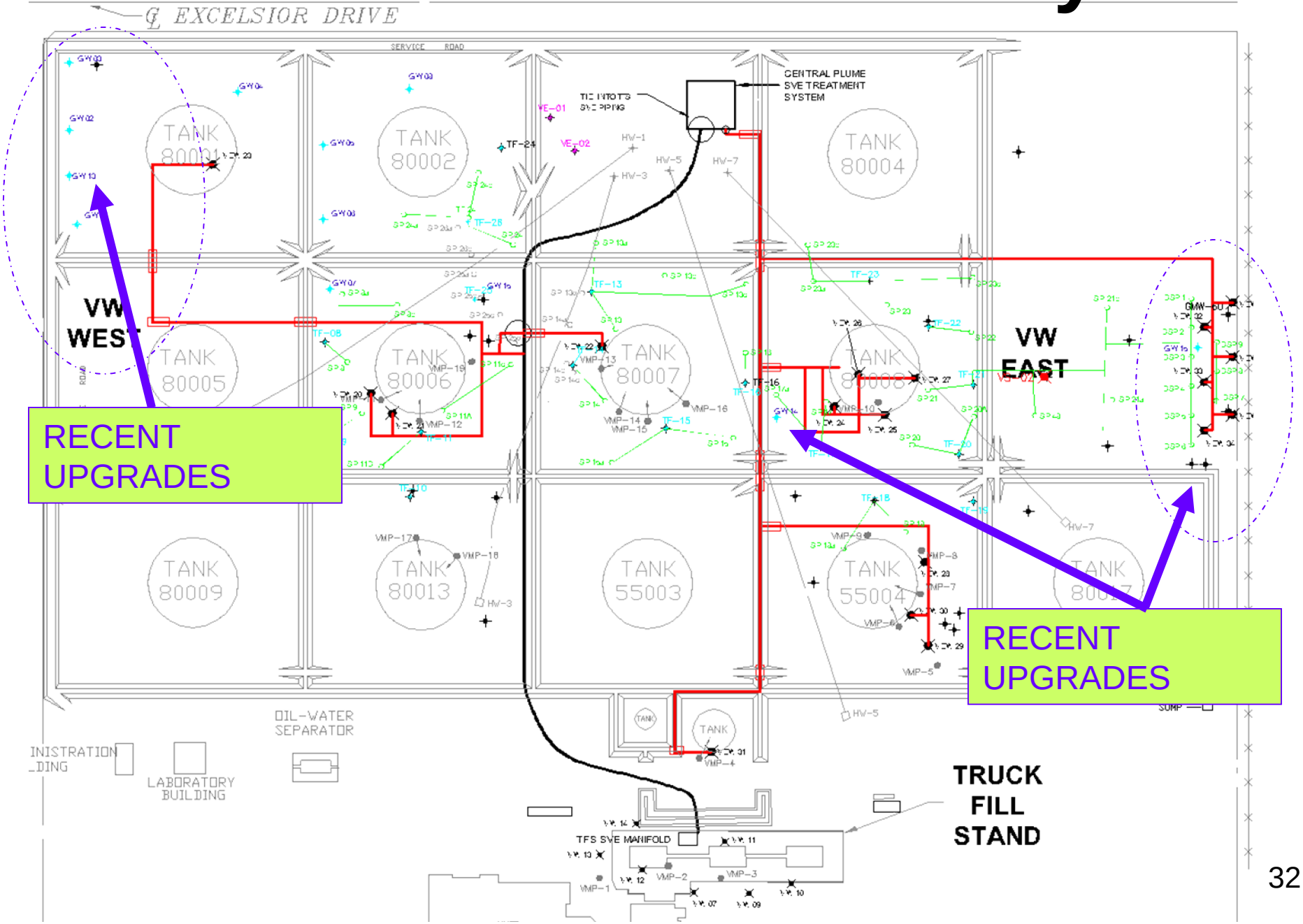
Baseline SVE Startup Sample Results
(July 2007)

VMP#	Time	Vacuum	Methane (ppm)	O2 (%)	CO2 (%)	Comments
24-5	12:35	0	600	20.5	0.0	
24-15	12:37	0	710	16.6	1.6	TO-15
24-23	12:39	0	390	7.5	5.3	*
21-5	12:44	0	580	20.5	0.1	
21-15	12:46	0	630	17.5	1.7	*
21-22.5	12:48	0	0	1.1	7.8	TO-15
23-5	12:54	0	630	20.3	0.2	
23-14.5	12:56	0	660	17.4	1.5	TO-15
23-22	12:58	0	230	6.0	5.5	*
22-5	13:04	0	610	19.5	0.5	
22-15	13:06	0	580	17.5	0.9	*
22-22.5	13:08	0	0	0	2.5	TO-15

Note: TPH as Gasoline was non-detect in all the laboratory samples.

Eastern Boundary Update

Revised Remediation Layout



Discussion