Figures

N
E
S

PEI

0 500 1000 1500 2000 ft

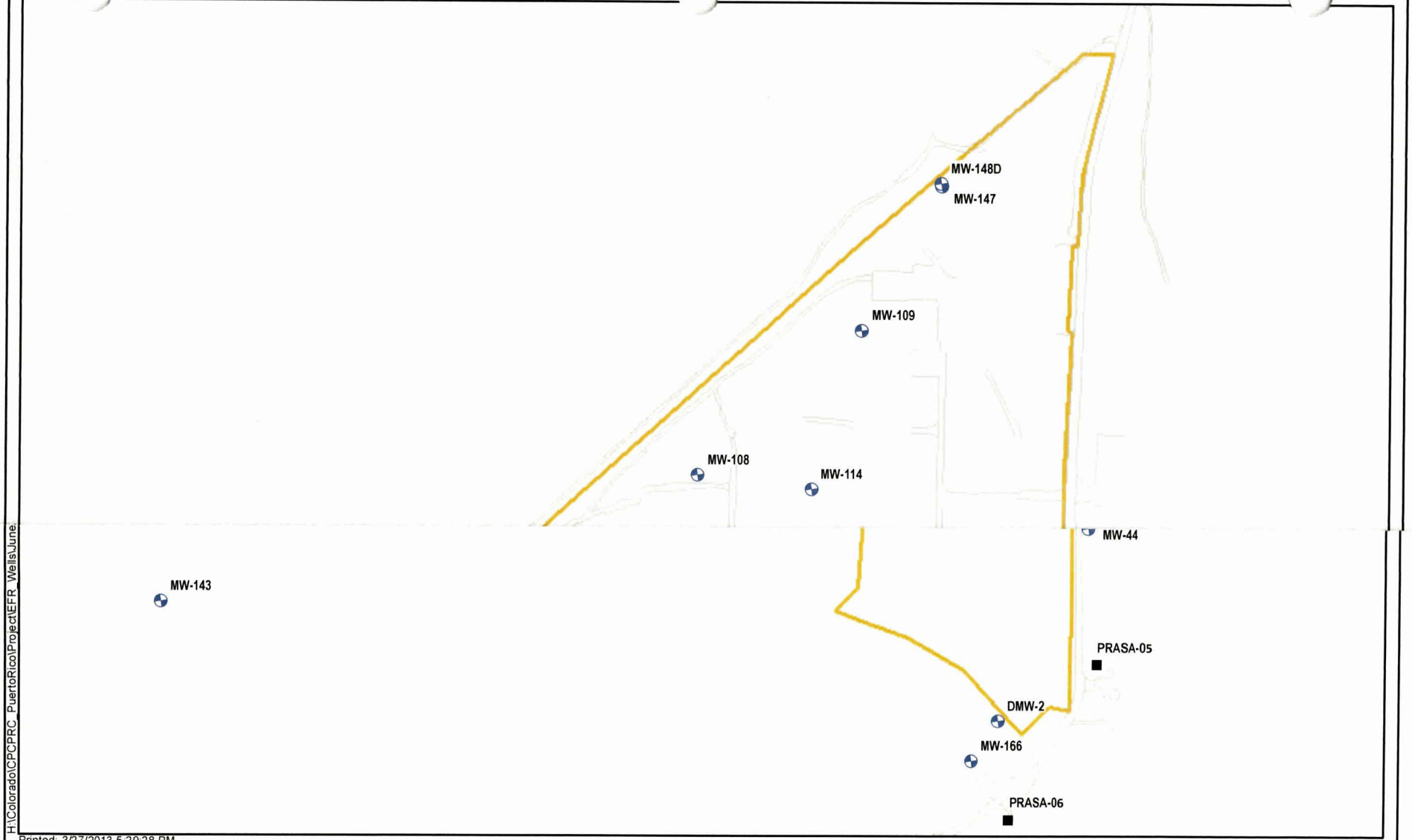
Figure 1-1

Facility Location Map

Chevron Phillips Chemical
Puerto Rico Core, LLC

Legend

Facility Boundary



Legend

- Existing Monitoring Well
- Proposed Monitoring Well
- PRASA Boring
- AOIs
- Road Right-of-Ways
- Facility Boundary

Figure 1-2
Supplemental RFI
Investigation Locations

Chevron Phillips Chemical
Puerto Rico Core, LLC

N
Plant North

PEI

0 250 500
Feet

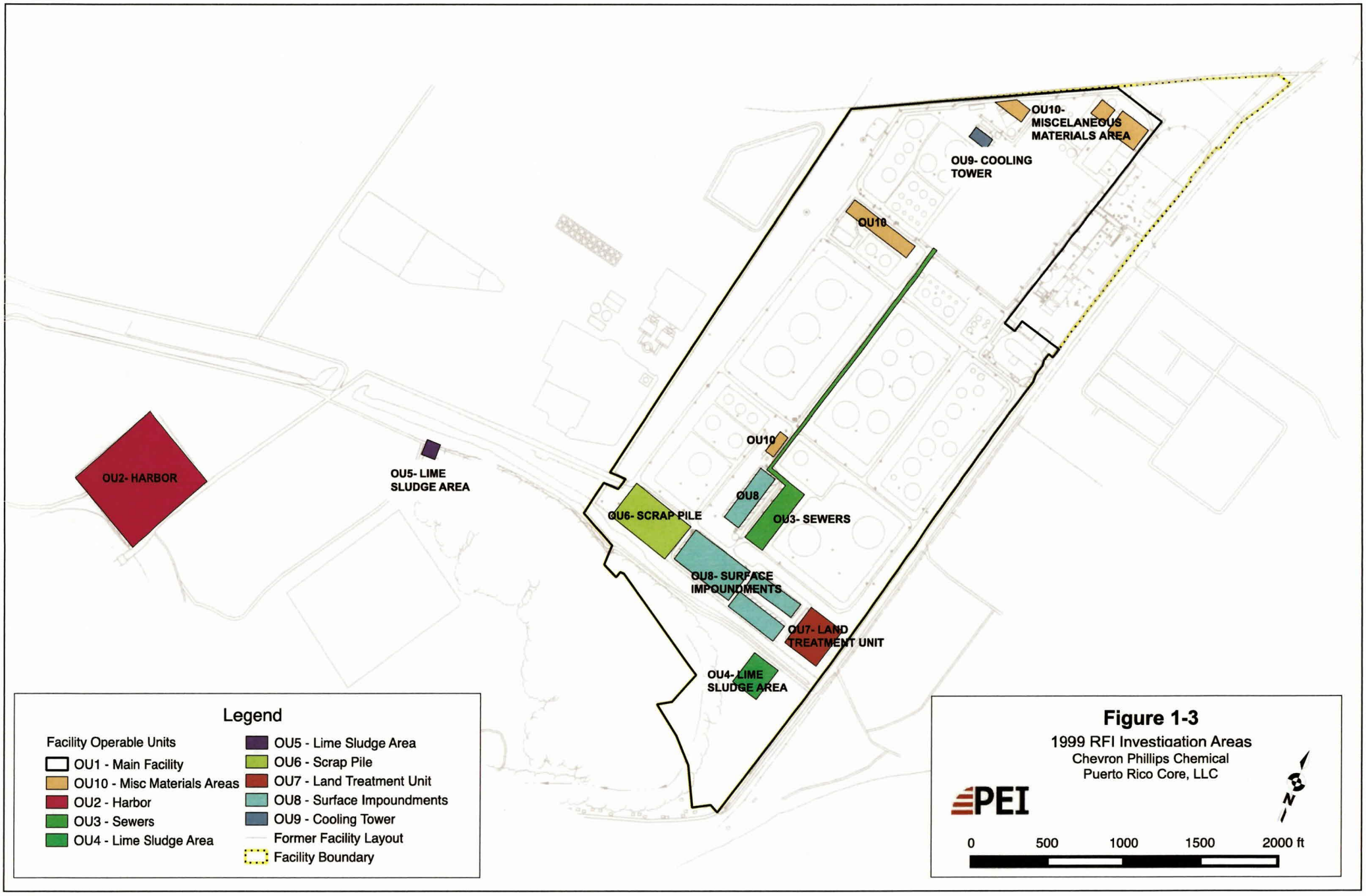


Figure 1-3

1999 RFI Investigation Areas

Chevron Phillips Chemical

Puerto Rico Core, LLC

N
W E
S

PEI

0 100 200 300 400 ft

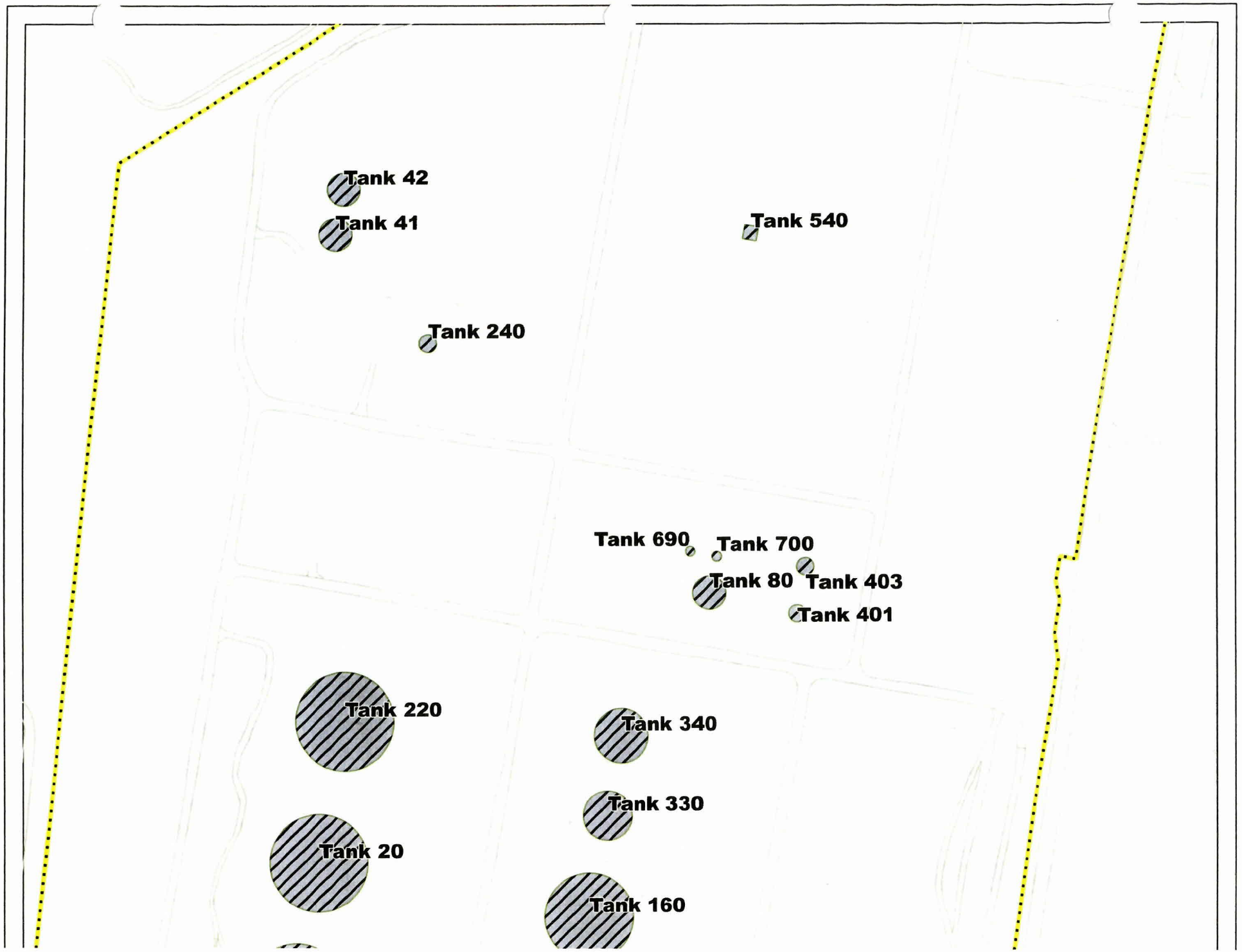
Figure 1-4

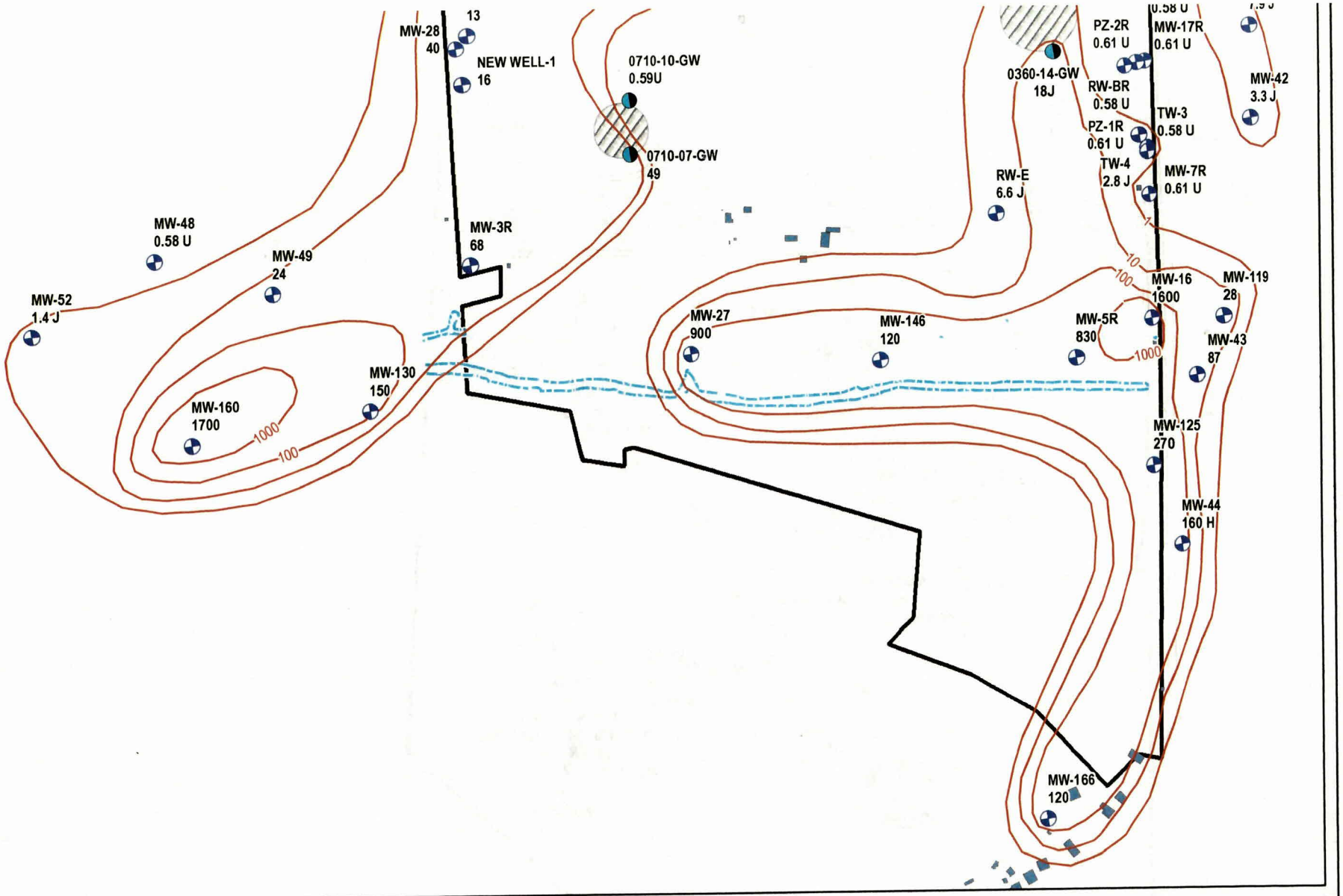
AOC Locations

Chevron Phillips Chemical
Puerto Rico Core, LLC

Legend

Right-of-Way
Facility Boundary
Areas of Concern


Tank 42
Tank 41
Tank 540
Tank 240
Tank 690
Tank 700
Tank 80
Tank 403
Tank 401
Tank 220
Tank 340
Tank 330
Tank 20
Tank 160



Document Path: \\SC-DC-WS\Greenville\gis_projects\Colorado\CPCPRC_PuertoRico\Project\AOC_sampling\2013April\AOC Sulfolane Upper GW.mxd

Printed: 4/23/2013 4:08:24 PM

Legend

- Monitoring Well
- Hydropunch Location
- Sulfolane Isoconcentration Line
- Effluent Channel
- Road Right-of-Way
- Existing Structure
- Areas of Concern
- Facility Boundary

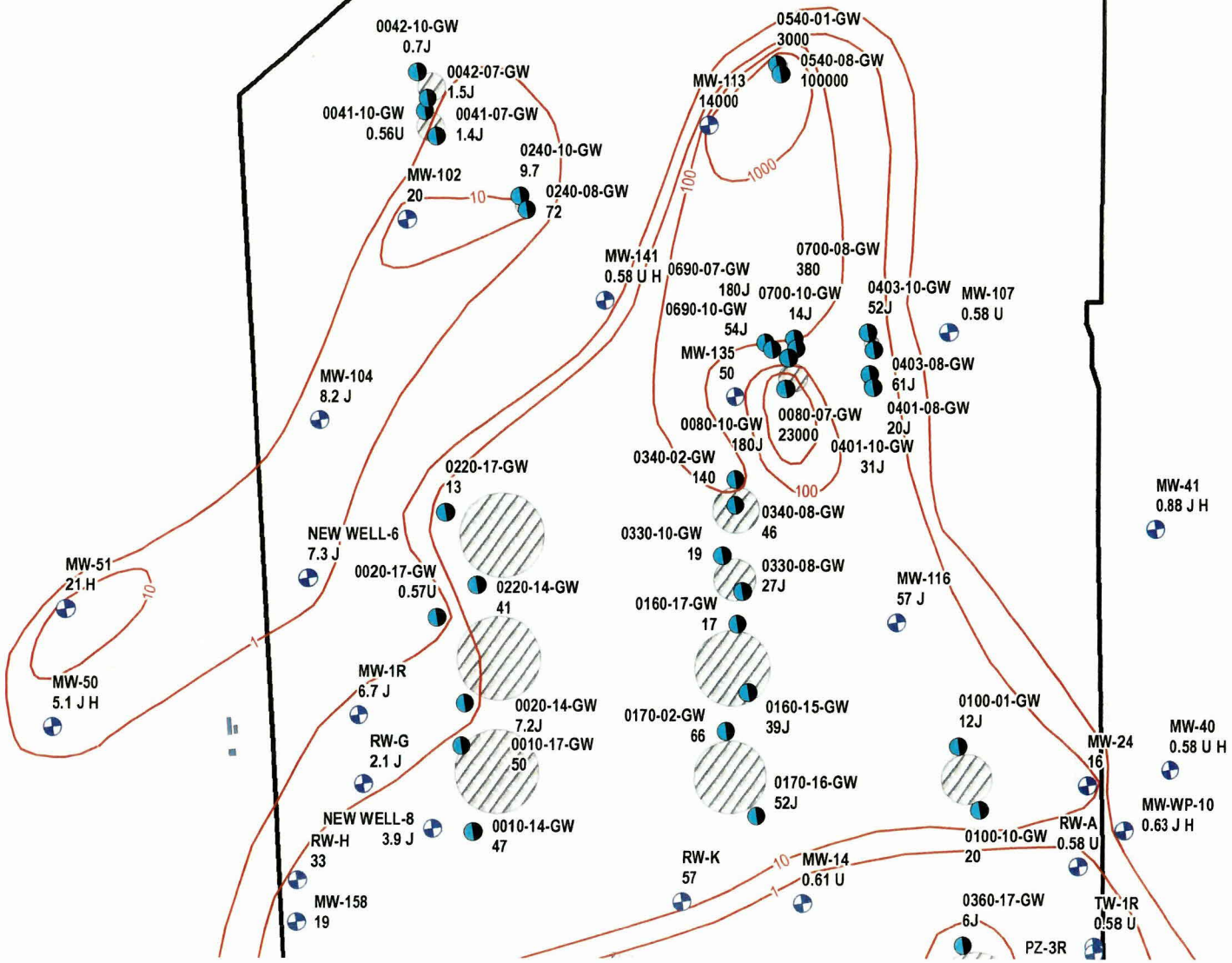
Figure 2-1 Sulfolane
June 2012
Upper Alluvial (µg/L)

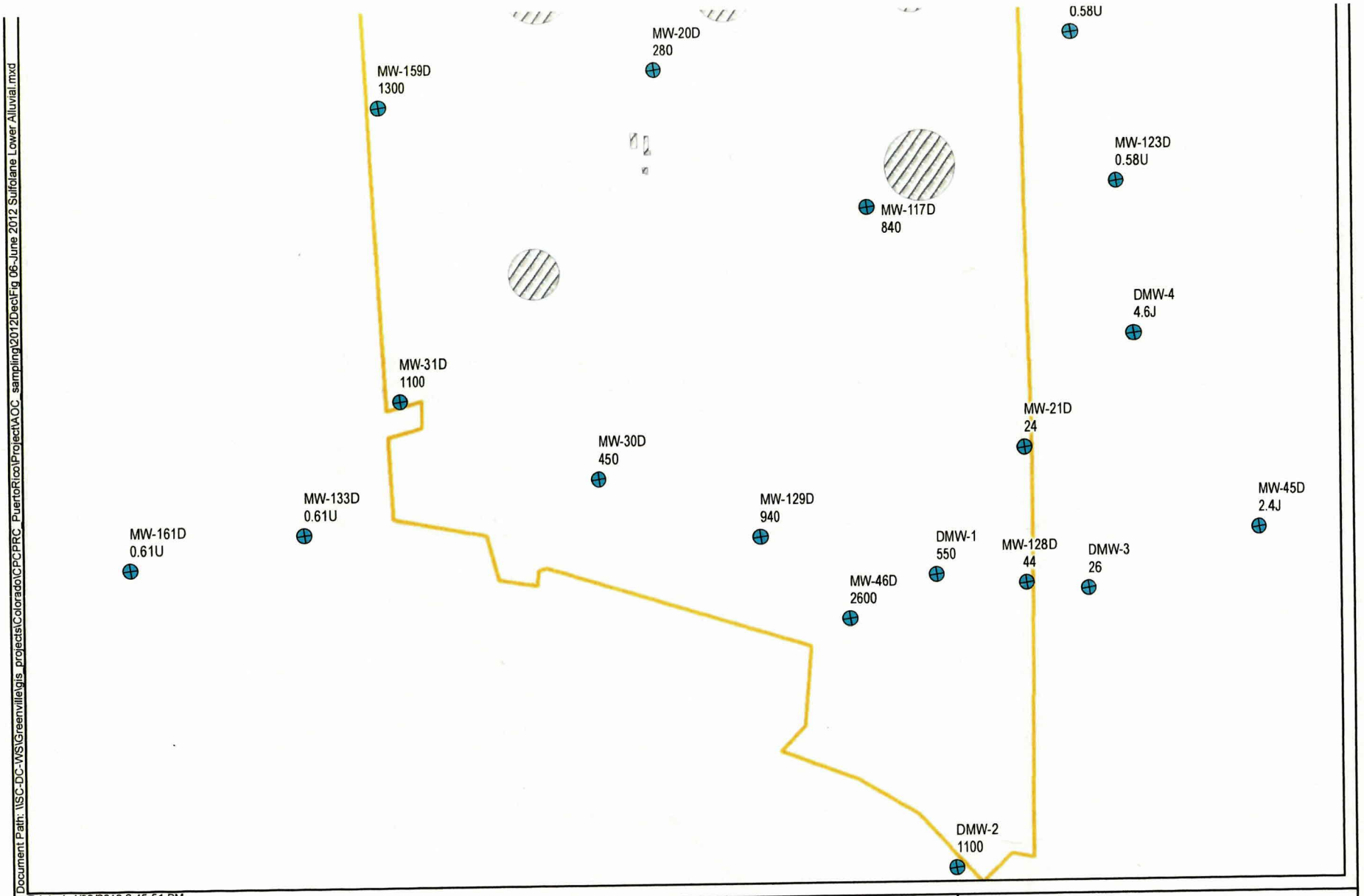
Chevron Phillips Chemical
Puerto Rico Core, LLC

N Plant North

PEI

0 200 400 600 Feet


0042-10-GW
0.7J
0042-07-GW
1.5J
0041-10-GW
0.56U
0041-07-GW
1.4J
0240-10-GW
9.7
MW-102
20
10
0240-08-GW
72
0540-01-GW
3000
0540-08-GW
100000
MW-113
14000
1000
100
MW-141
0.58 U H
0690-07-GW
180J
0700-08-GW
380
0700-10-GW
14J
0403-10-GW
52J
MW-107
0.58 U
0690-10-GW
54J
MW-135
50
0403-08-GW
61J
0080-07-GW
23000
0401-08-GW
20J
0080-10-GW
180J
0401-10-GW
31J
MW-104
8.2 J
0220-17-GW
13
0340-02-GW
140
0340-08-GW
46
MW-41
0.88 J H
NEW WELL-6
7.3 J
0330-10-GW
19
0330-08-GW
27J
MW-51
21.H
0020-17-GW
0.57U
0220-14-GW
41
MW-116
57 J
0160-17-GW
17
1
MW-50
5.1 J H
MW-1R
6.7 J
0020-14-GW
7.2J
0170-02-GW
66
0160-15-GW
39J
0100-01-GW
12J
MW-40
0.58 U H
RW-G
2.1 J
0010-17-GW
50
MW-24
16
0170-16-GW
52J
MW-WP-10
0.63 J H
NEW WELL-8
3.9 J
0010-14-GW
47
RW-H
33
RW-A
0.58 U
0100-10-GW
20
RW-K
57
MW-14
0.61 U
MW-158
19
0360-17-GW
6J
TW-1R
0.58 U
PZ-3R



Document Path: \\SC-DC-WS\Greenville\gis_projects\Colorado\CPCPRC_PuertoRico\Project\AOC_sampling\2012Dect\Fig 06-June 2012 Sulfolane Lower Alluvial.mxd

Printed: 4/22/2013 2:45:51 PM

Legend

- Monitoring Well
- Facility Boundary
- Road Right-of-Ways
- Areas of Concern

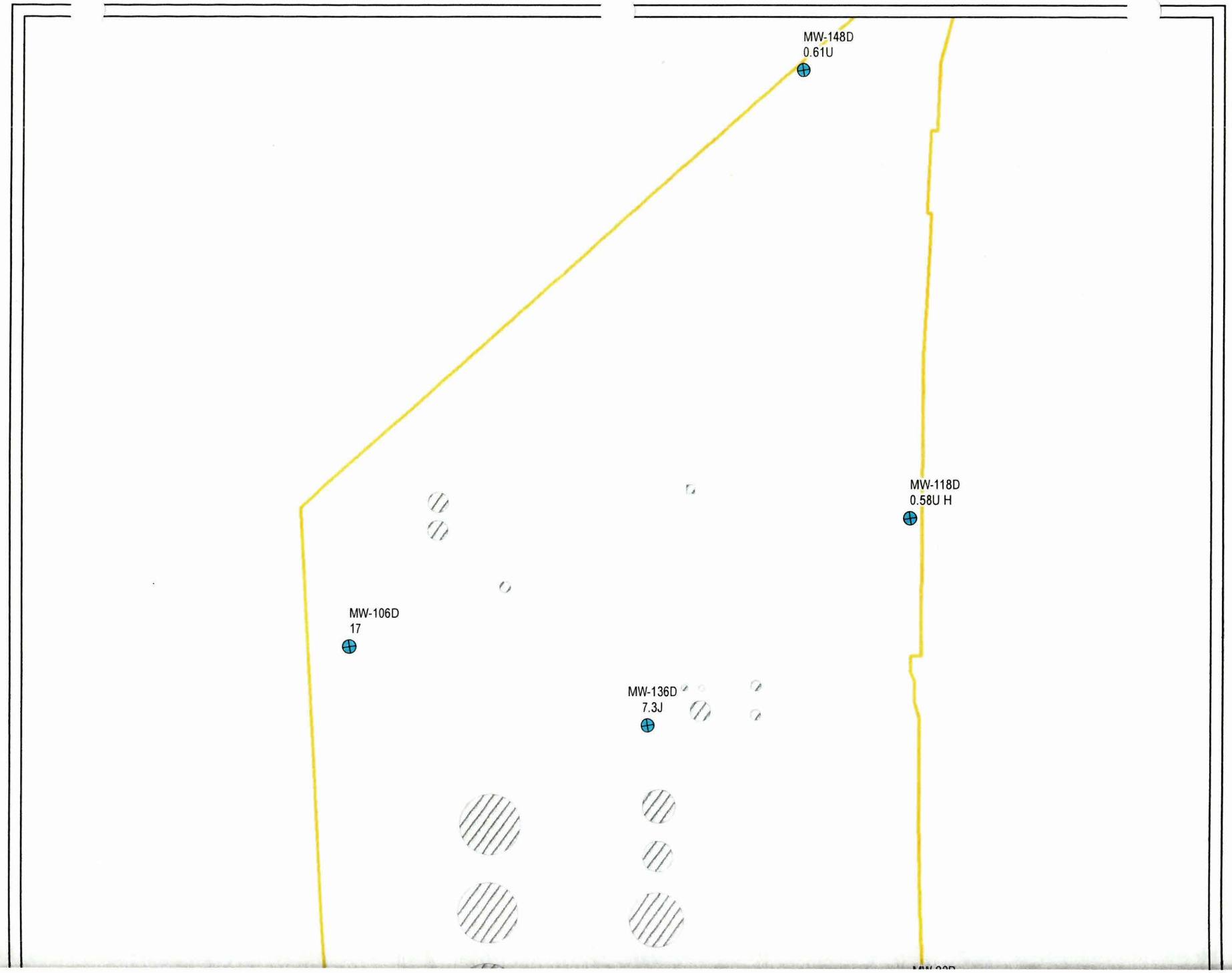
Figure 2-2 Sulfolane
June 2012
Lower Alluvial (ug/L)

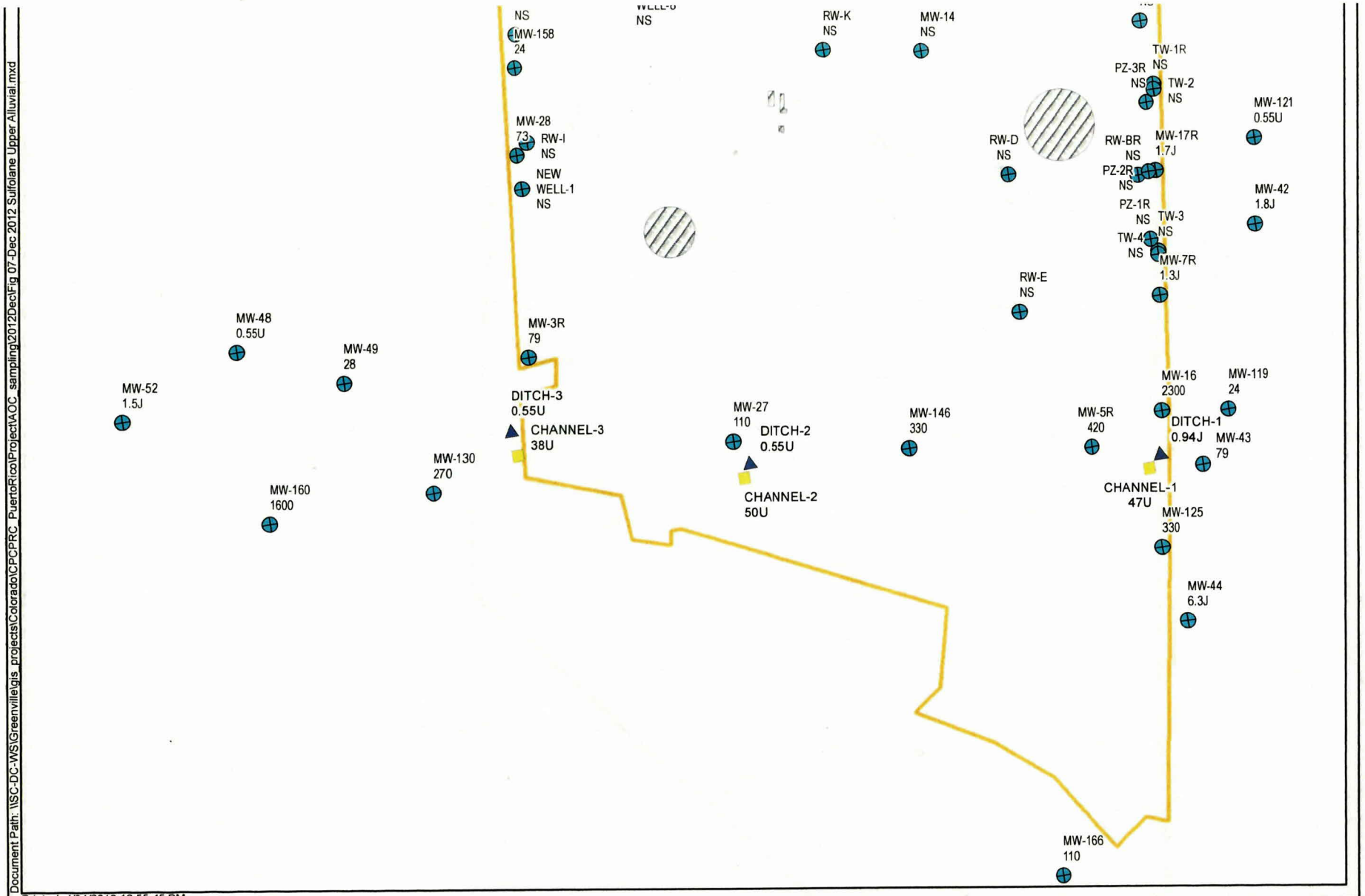
Chevron Phillips Chemical
Puerto Rico Core, LLC

N Plant North

PEI

0 200 400 600 Feet


MW-148D
0.61U
MW-118D
0.58U H
MW-106D
17
MW-136D
7.3J



Document Path: \\SC-DC-WS\Greenville\gis_projects\Colorado\CPCPRC_PuertoRico\Project\AOC_sampling\2012Dec\Fig 07-Dec 2012 Sulfolane Upper Alluvial.mxd

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Legend

- Monitoring Well
- Sediment Sample Location (ug/Kg)
- Surface Water Sample Location (ug/L)
- Road Right-of-Ways
- Facility Boundary
- Areas of Concern

NS - Not Sampled in December 2012

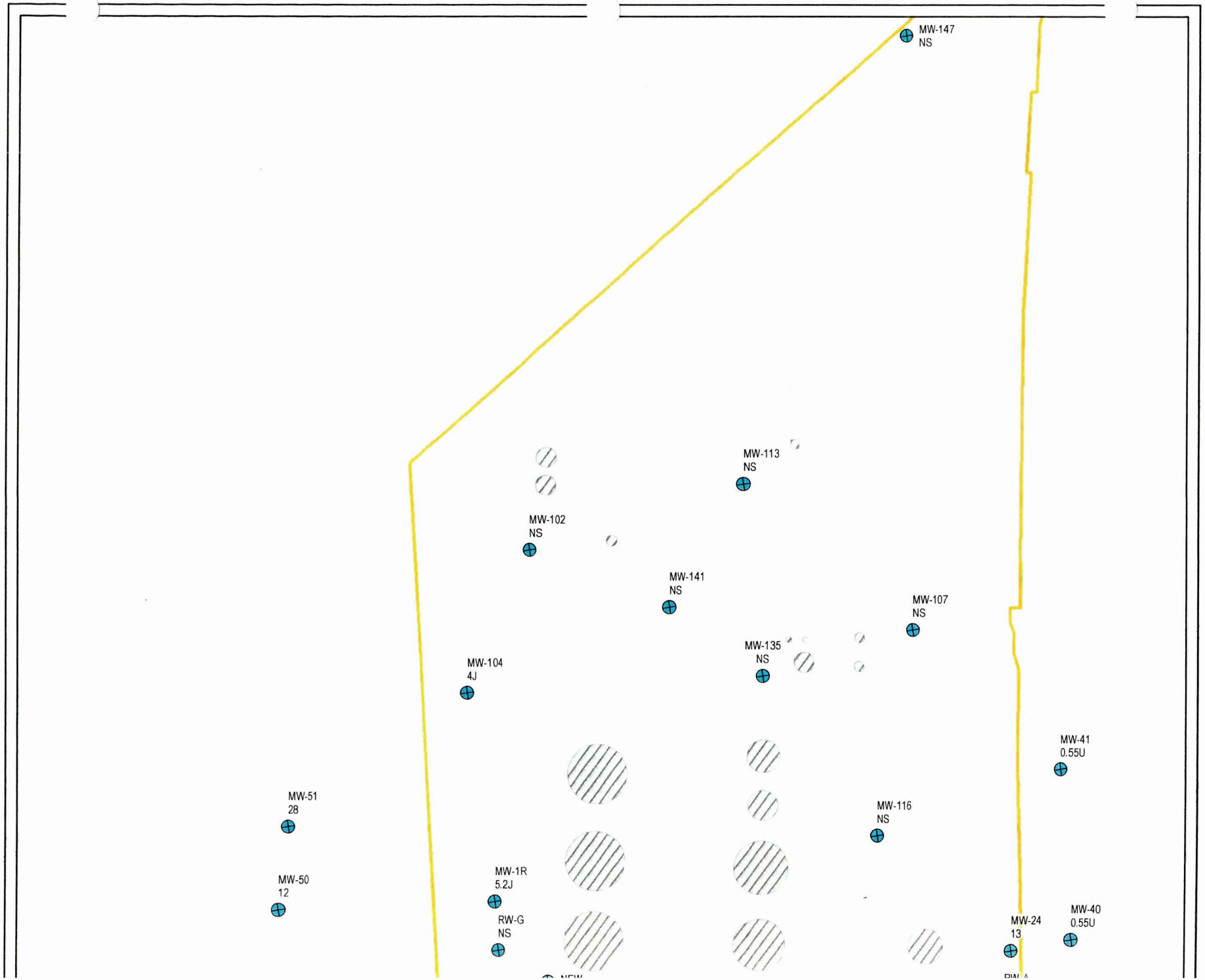
Figure 2-3 Sulfolane December 2012 Upper Alluvial (ug/L)

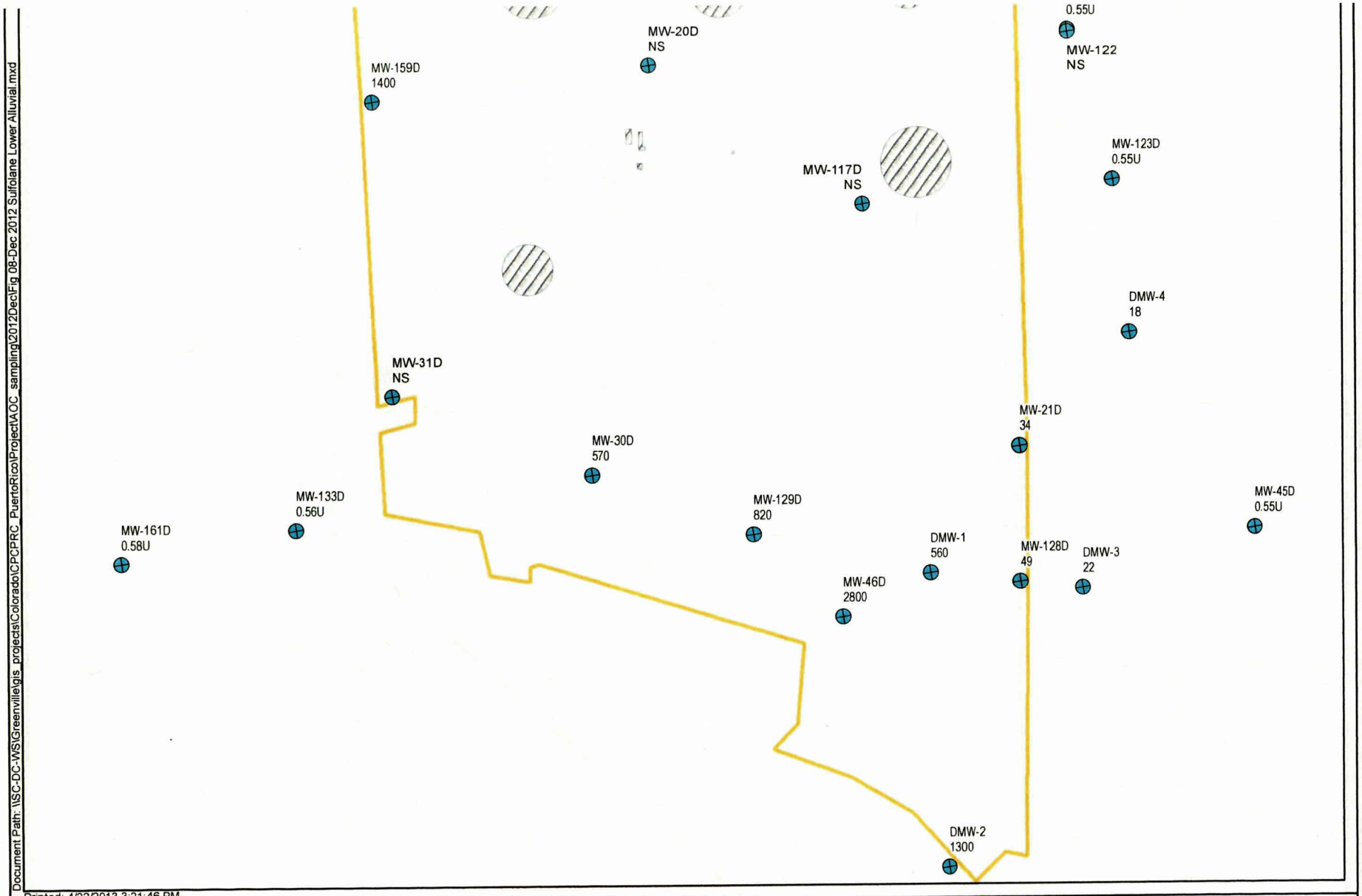
Chevron Phillips Chemical
Puerto Rico Core, LLC

N Plant North

PEI

0 200 400 600 Feet


MW-147
NS
MW-113
NS
MW-102
NS
MW-141
NS
MW-107
NS
MW-135
NS
MW-104
4J
MW-41
0.55U
MW-51
28
MW-116
NS
MW-50
12
MW-1R
5.2J
RW-G
NS
MW-24
13
MW-40
0.55U



Document Path: \\SC-DC-WS\Greenville\gis_projects\Colorado\CPCPRC_PuertoRico\Project\AOC_sampling\2012Dec\Fig_08-Dec 2012 Sulfolane Lower Alluvial.mxd

Printed: 4/22/2013 3:21:46 PM

Legend

- Monitoring Well
- Road Right-of-Ways
- Areas of Concern
- Facility Boundary

NS - Not Sampled in December 2012

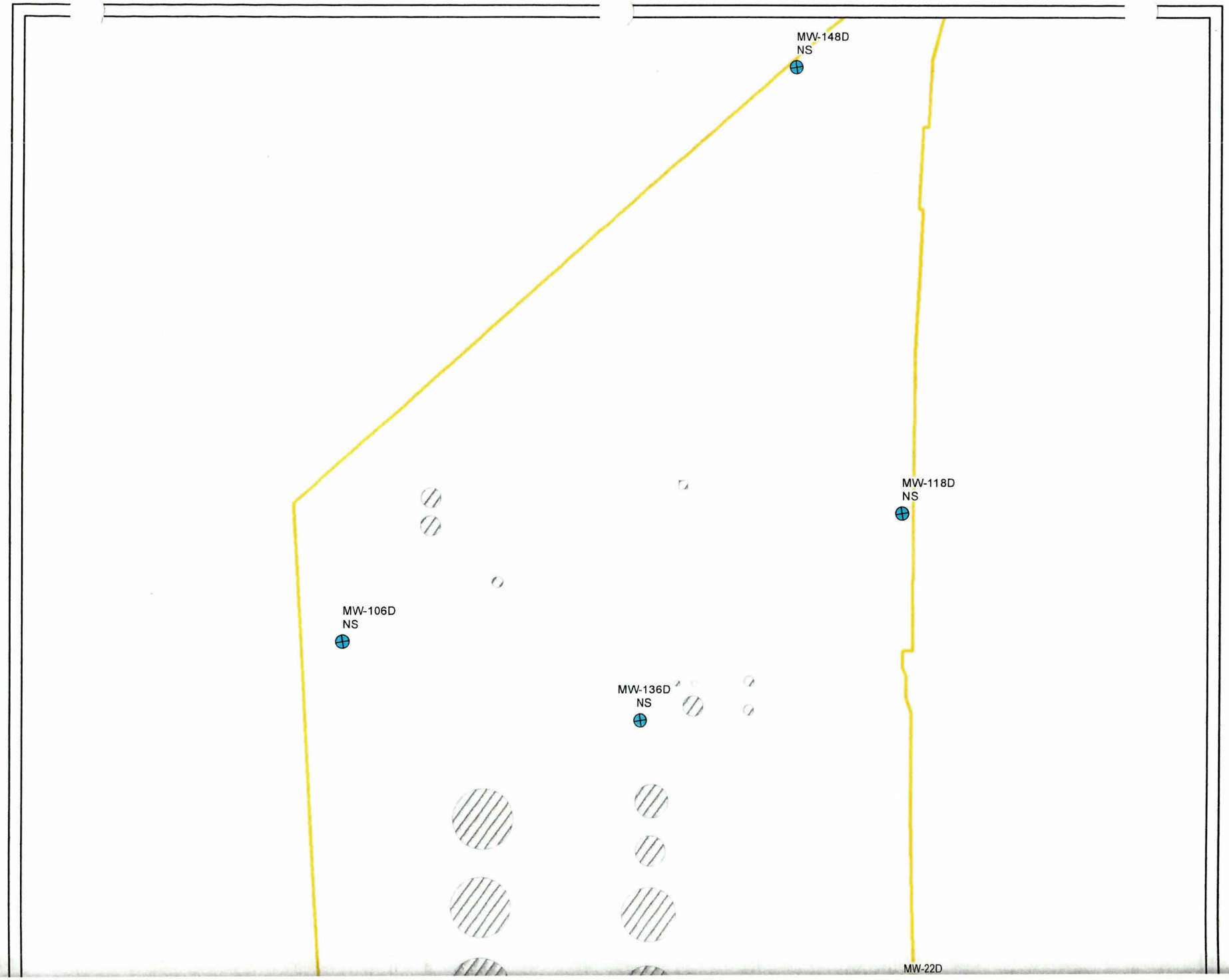
Figure 2-4 Sulfolane December 2012 Lower Alluvial (ug/L)

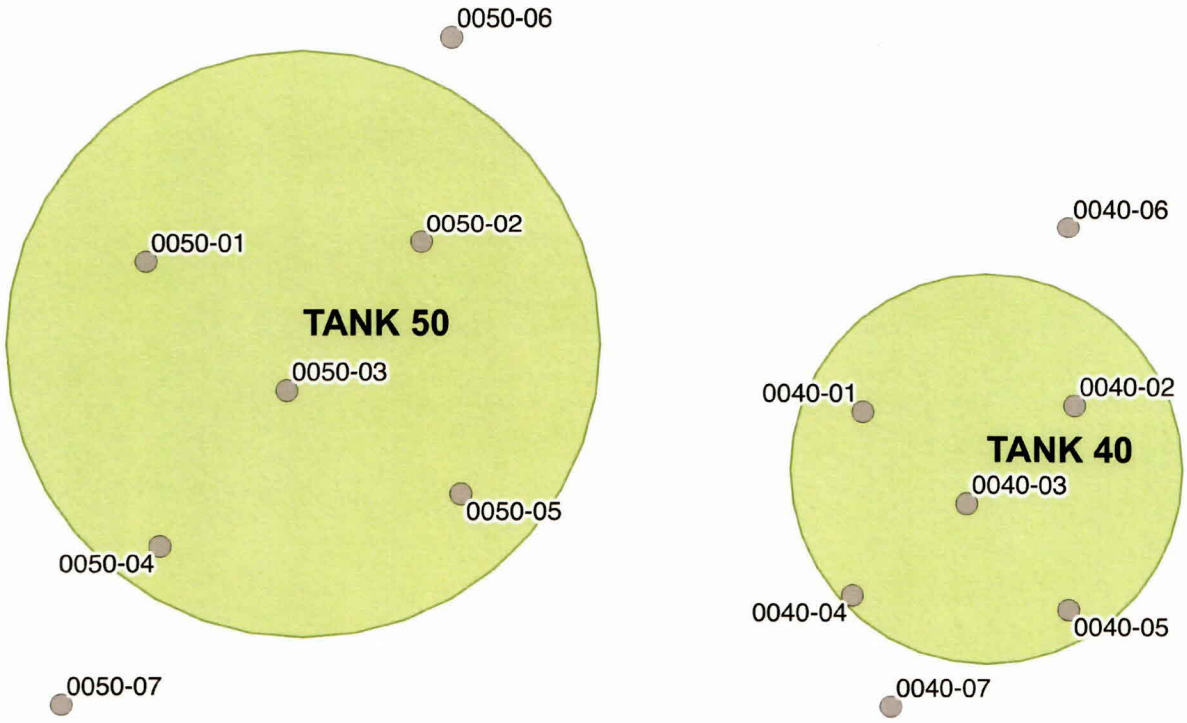
Chevron Phillips Chemical
Puerto Rico Core, LLC

N
Plant North

PEI

0 200 400 600 Feet


MW-148D
NS
MW-118D
NS
MW-106D
NS
MW-136D
NS
MW-22D



N
E
S

PEI

0 50 100 150 200 ft

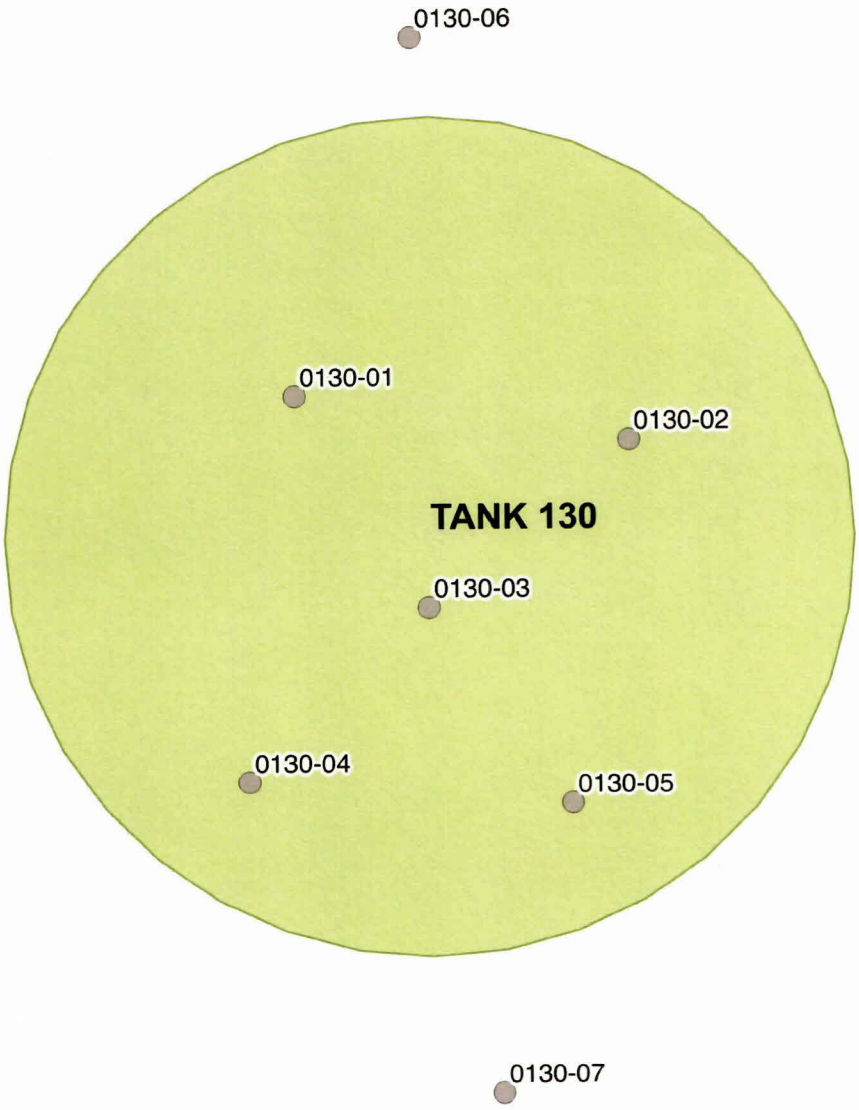
Figure 3-1

Tank 40 and Tank 50
Boring Locations
Chevron Phillips Chemical
Puerto Rico Core, LLC

Legend

Borehole Locations

Former Tank Locations



N
E
S

0 50 100 150 200 ft

PEI

Figure 3-2

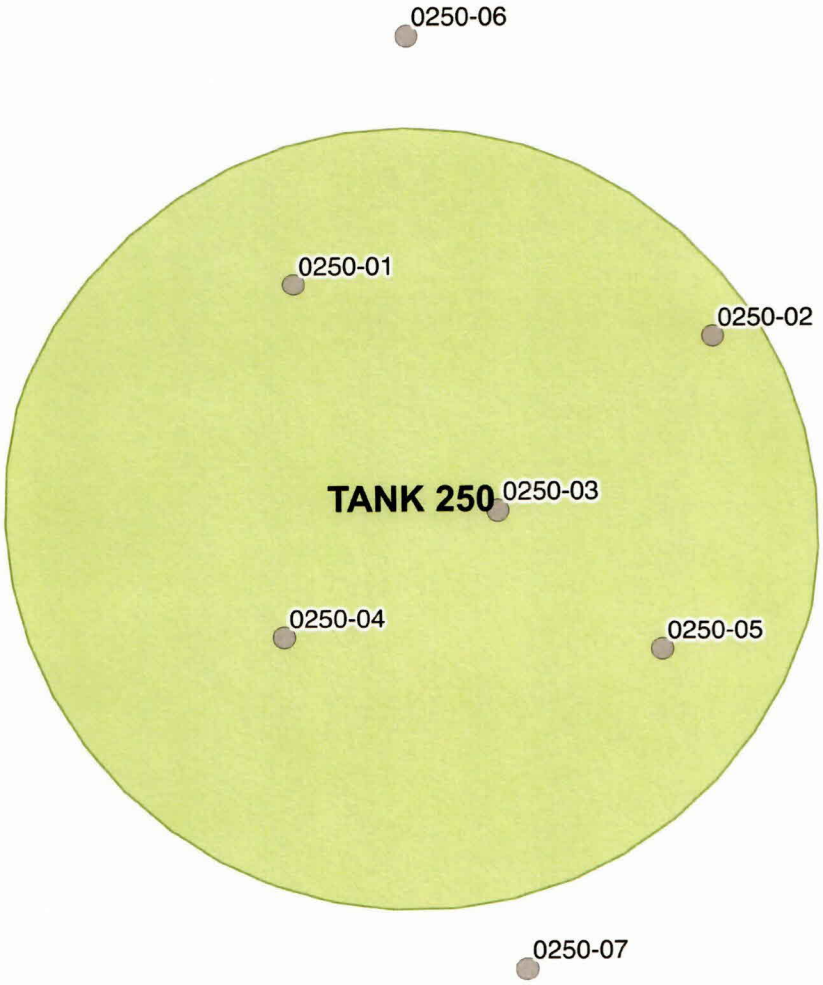
Tank 130 Boring Locations

Chevron Phillips Chemical
Puerto Rico Core, LLC

Legend

Borehole Locations

Former Tank Locations



N
E
S

0 15 30 45 60 ft

PEI

Figure 3-3

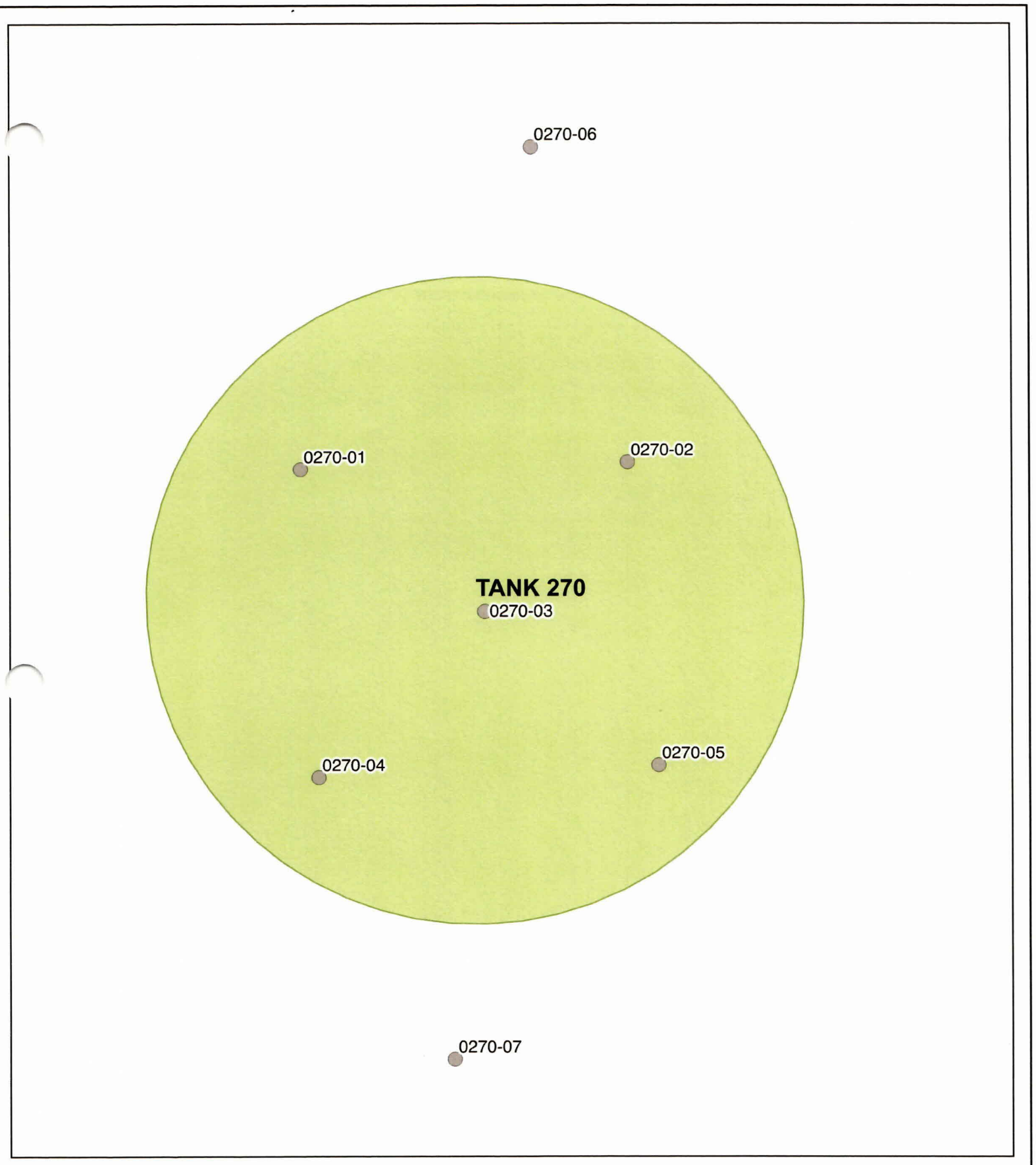
Tank 250 Boring Locations

Chevron Phillips Chemical
Puerto Rico Core, LLC

Legend

Borehole Locations

Former Tank Locations



N
E
S

0 25 50 75 100 ft

PEI

Figure 3-4

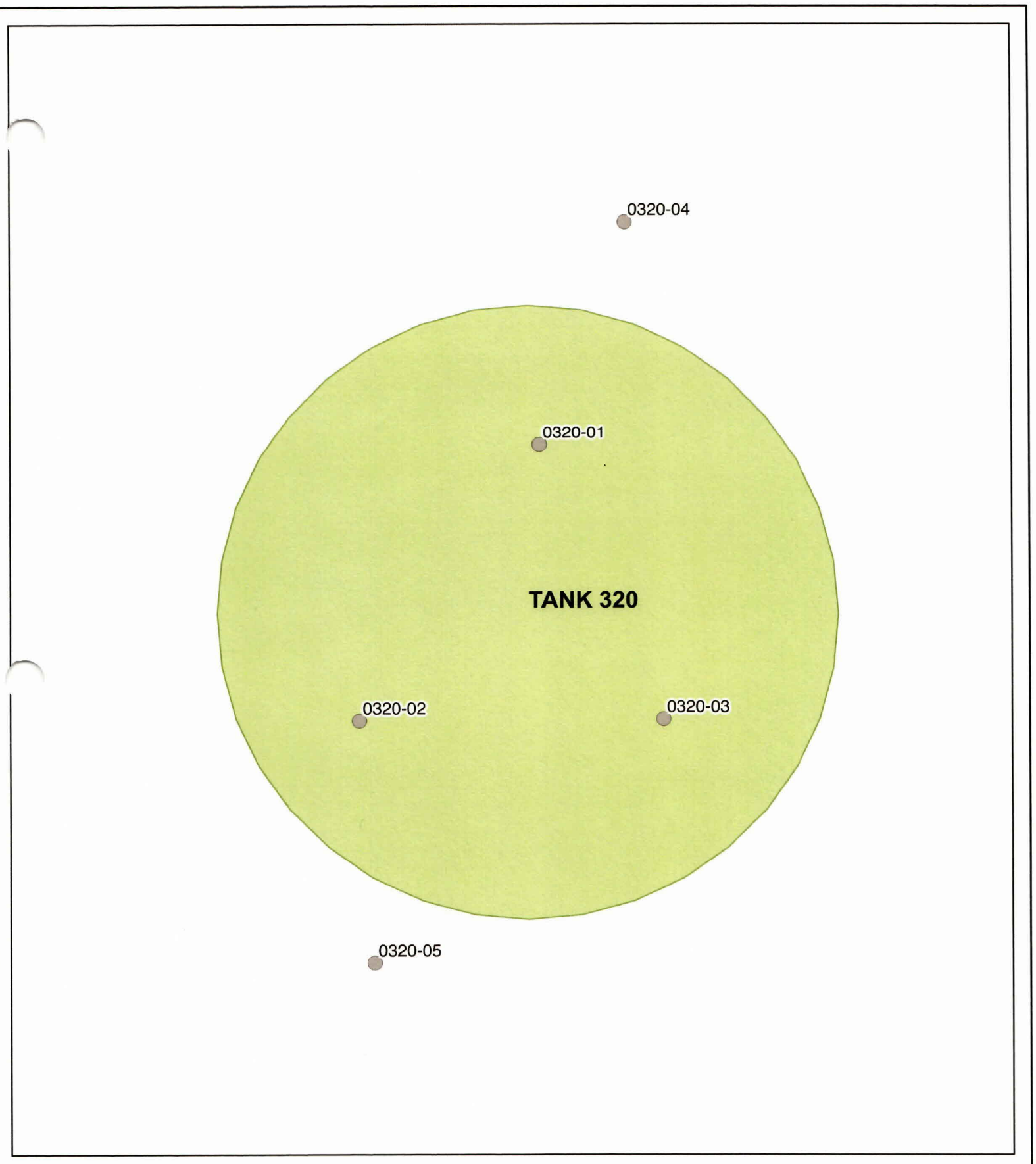
Tank 270 Boring Locations

Chevron Phillips Chemical
Puerto Rico Core, LLC

Legend

Borehole Locations

Former Tank Locations



N
E
S

PEI

0 10 20 30 40 ft

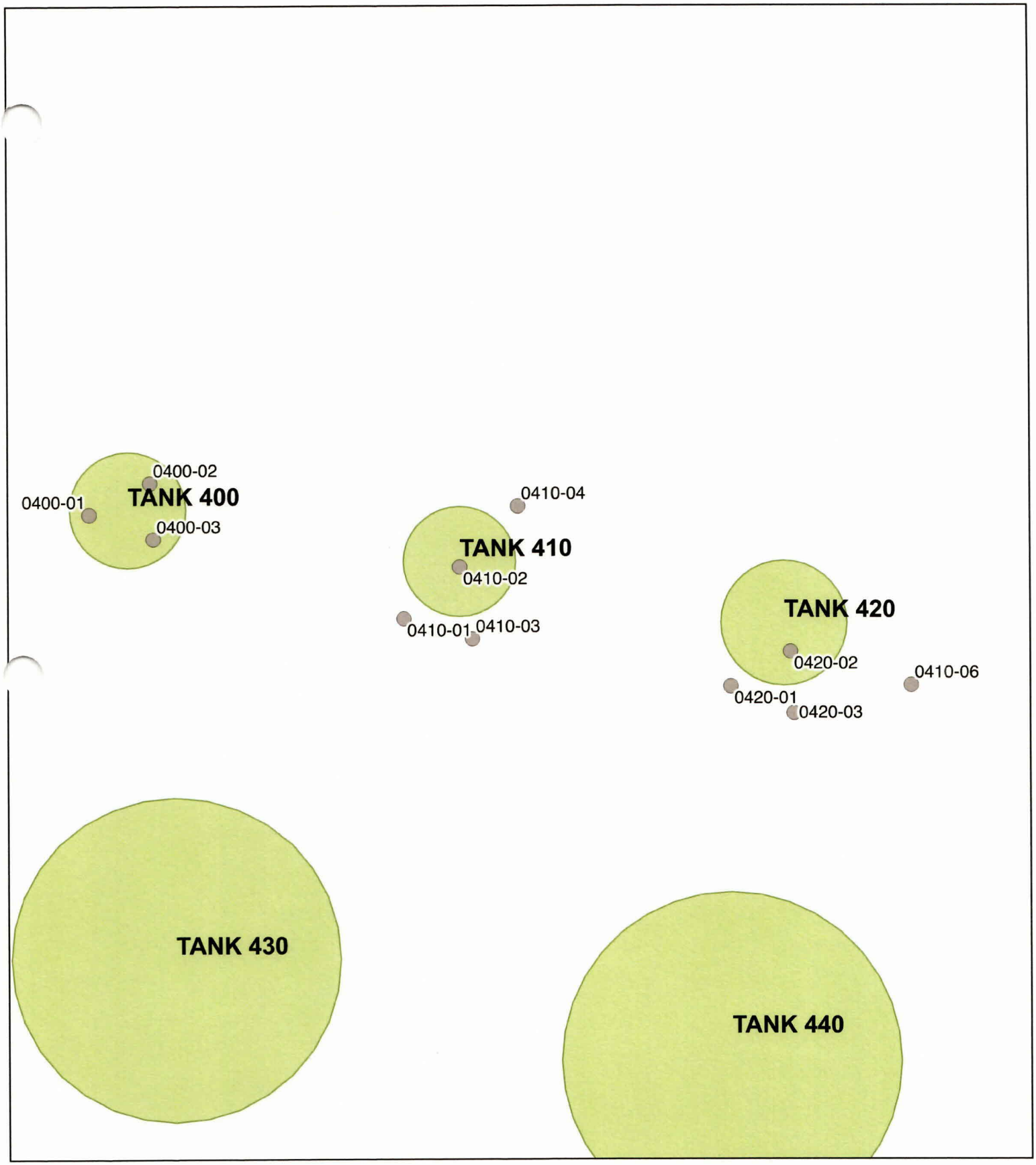
Figure 3-5

Tank 320 Boring Locations

Chevron Phillips Chemical
Puerto Rico Core, LLC

Legend

- Borehole Locations
- Former Tank Locations



N
E
S

0 25 50 75 100 ft

PEI

Figure 3-6

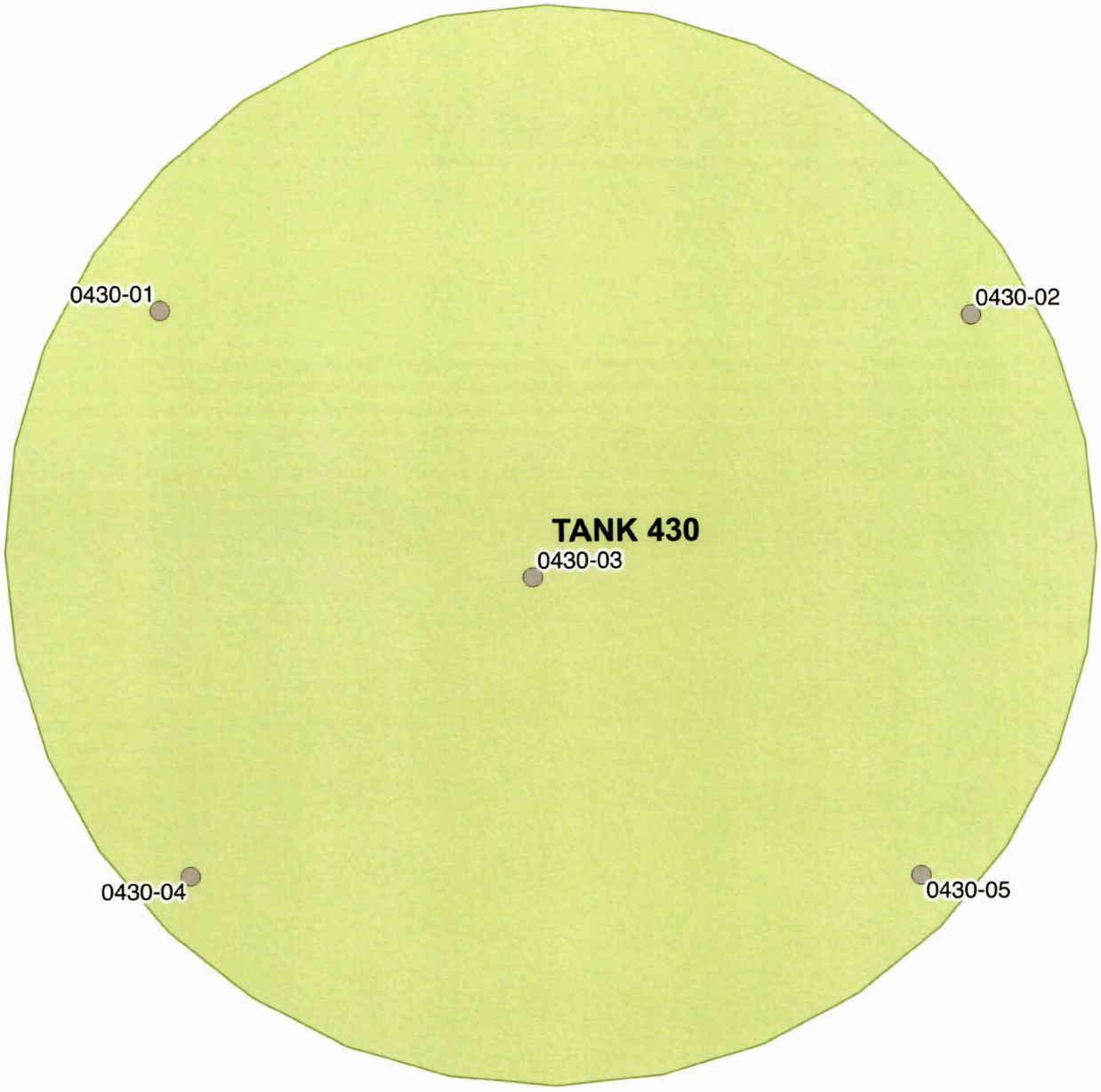
Tank 400, Tank 410, and
Tank 420 Boring Locations

Chevron Phillips Chemical
Puerto Rico Core, LLC

Legend

Borehole Locations

Former Tank Locations



N
E
S

PEI

0 15 30 45 60 ft

Figure 3-7

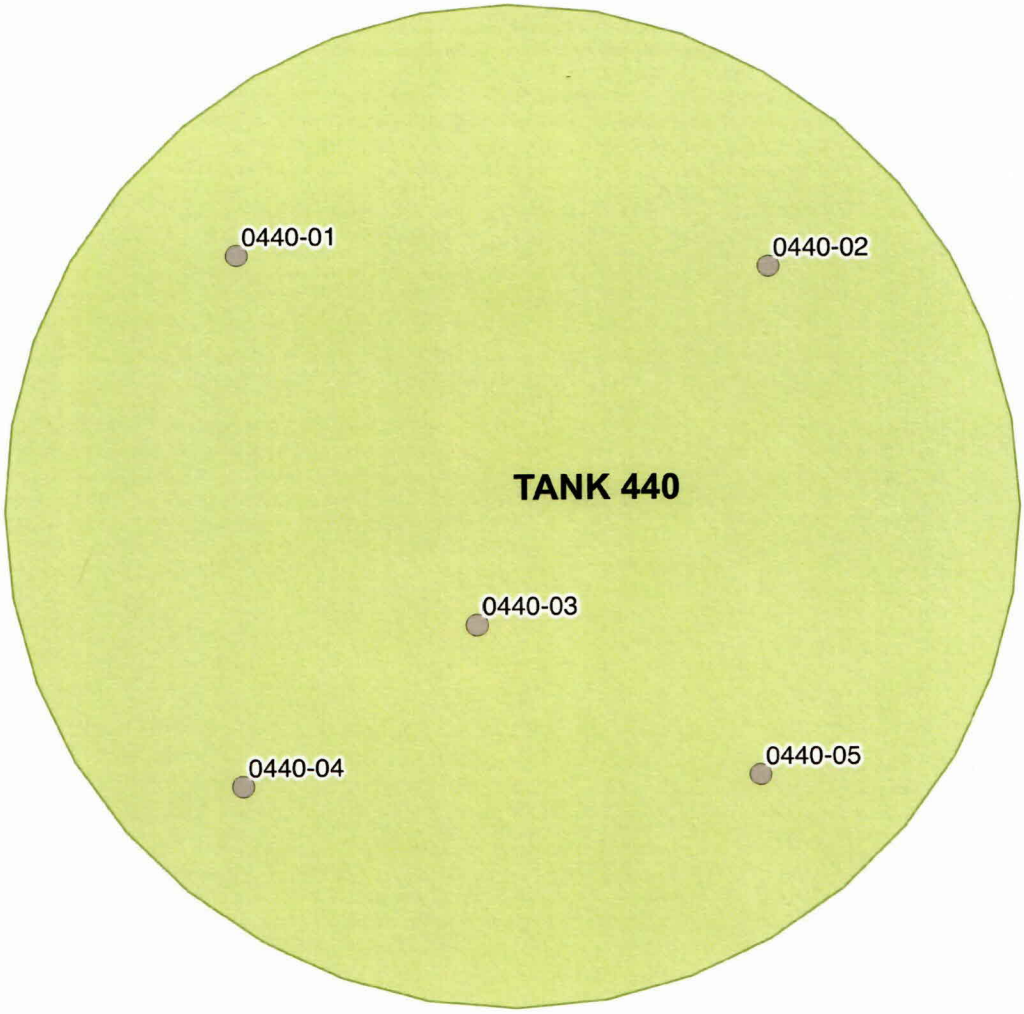
Tank 430 Boring Locations

Chevron Phillips Chemical
Puerto Rico Core, LLC

Legend

Borehole Locations

Former Tank Locations



N
E
S

PEI

0 25 50 75 100 ft

Figure 3-8

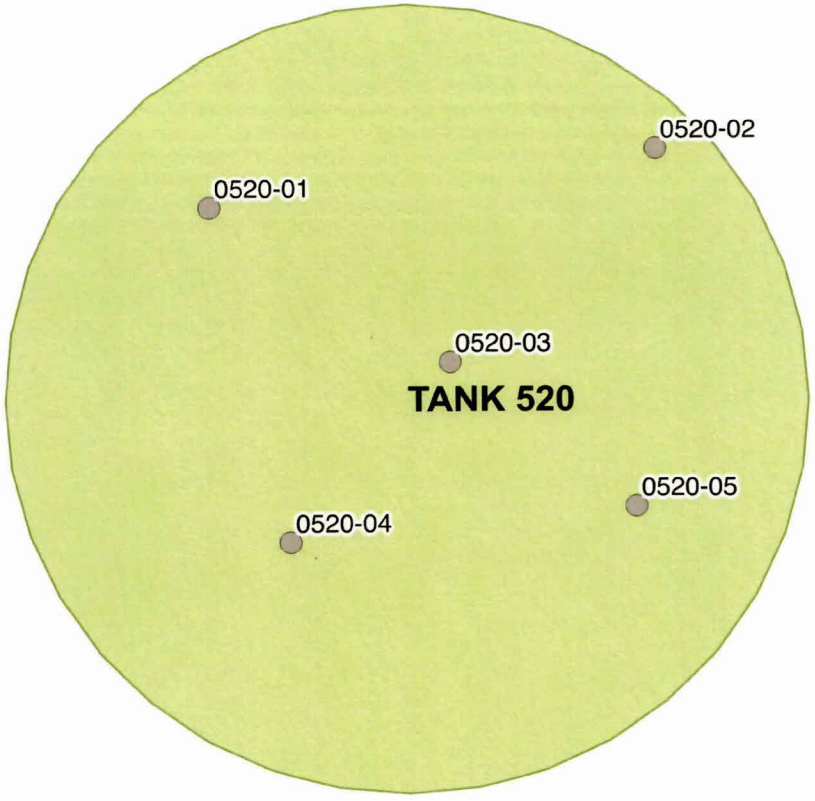
Tank 440 Boring Locations

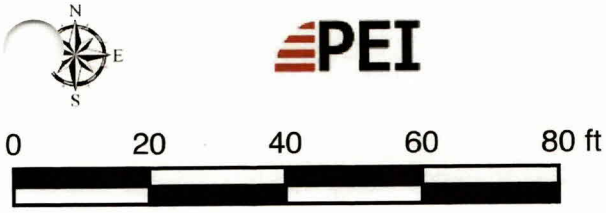
Chevron Phillips Chemical
Puerto Rico Core, LLC

Legend

Borehole Locations

Former Tank Locations





PEI

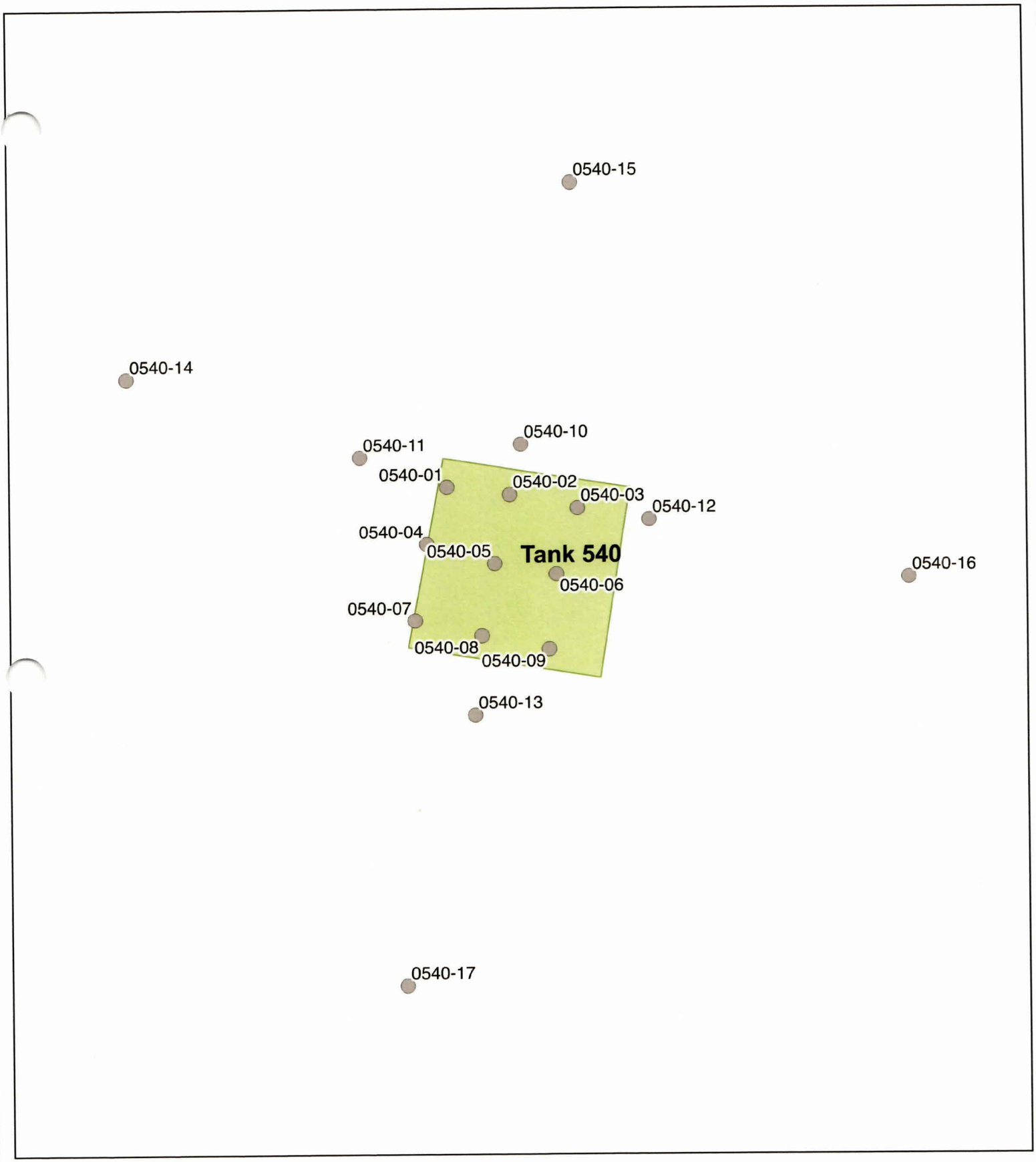
Figure 3-9

Tank 520 Boring Locations

Chevron Phillips Chemical
Puerto Rico Core, LLC

Legend

- Borehole Locations
- Former Tank Locations



N
E
S

PEI

0 10 20 30 40 ft

Figure 3-10

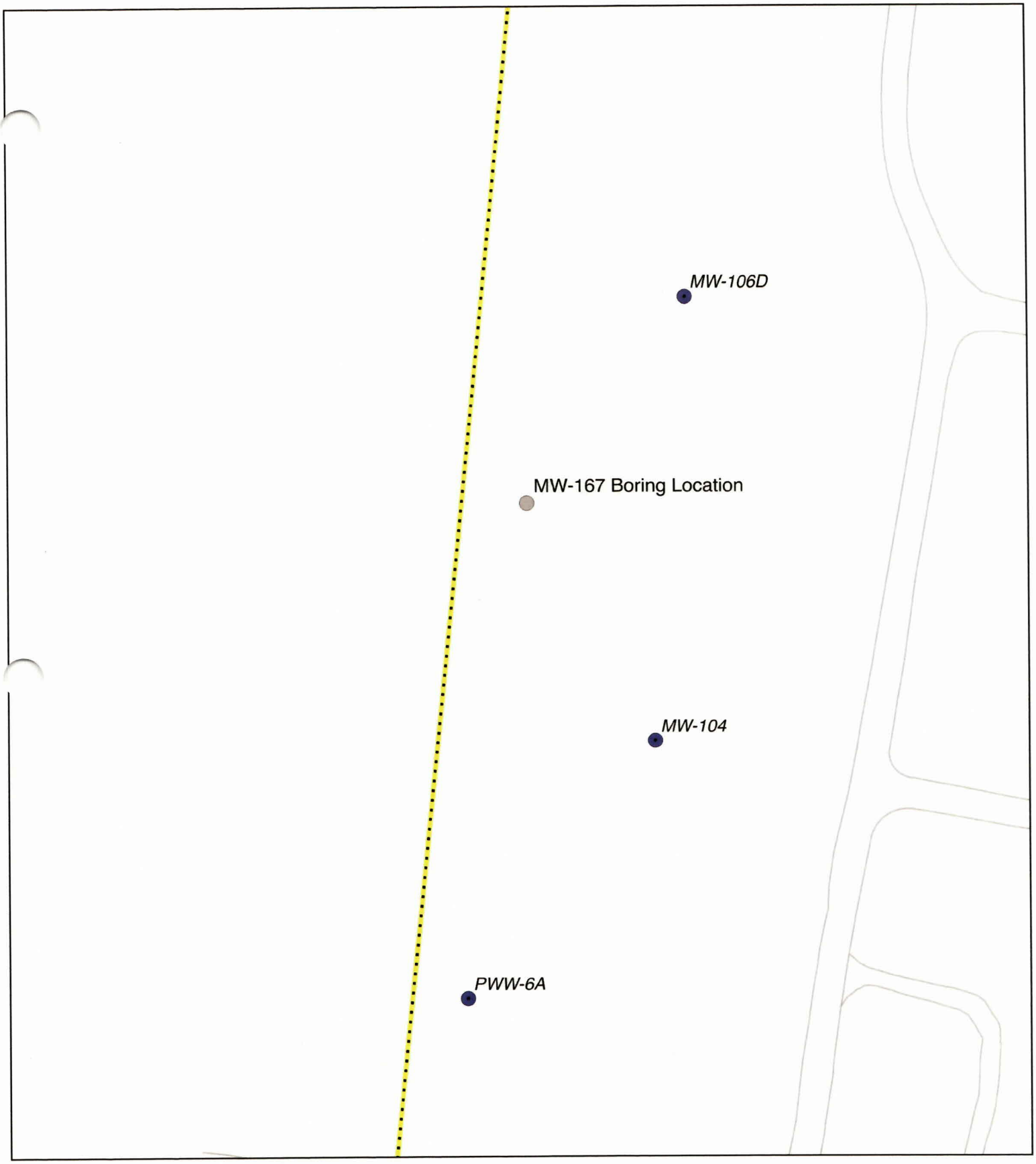
Tank 540 Boring Locations

Chevron Phillips Chemical
Puerto Rico Core, LLC

Legend

Borehole Locations

Former Tank Locations



N
E
S

0 50 100 150 200 ft

PEI

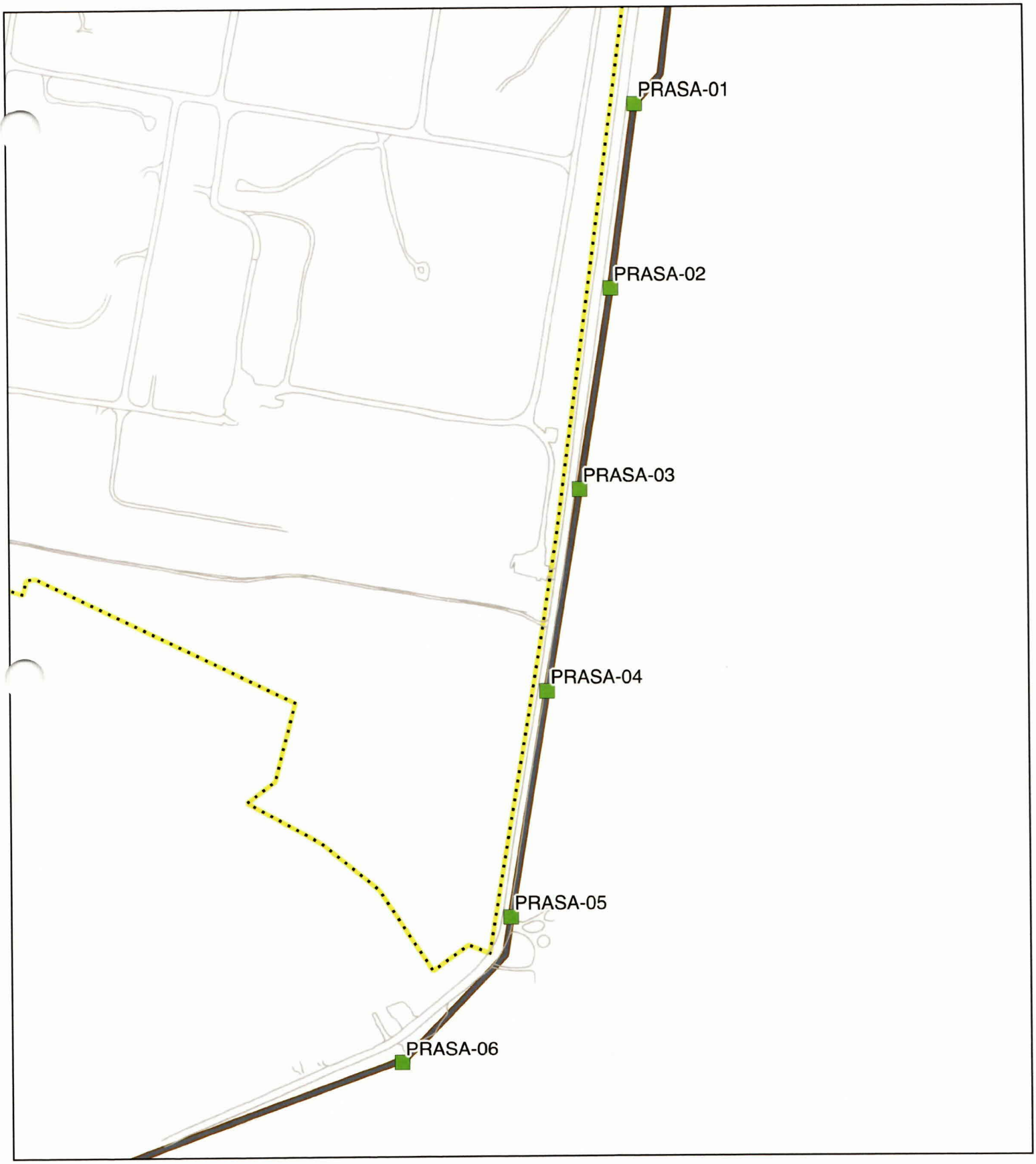
Figure 3-11

MW-167 Boring Location

Chevron Phillips Chemical
Puerto Rico Core, LLC

Legend

- MW-167 Boring Location
- Monitoring Well Location
- Road Right-of-Ways
- Facility Boundary



N
E
S

PEI

0 250 500 750 1000 ft

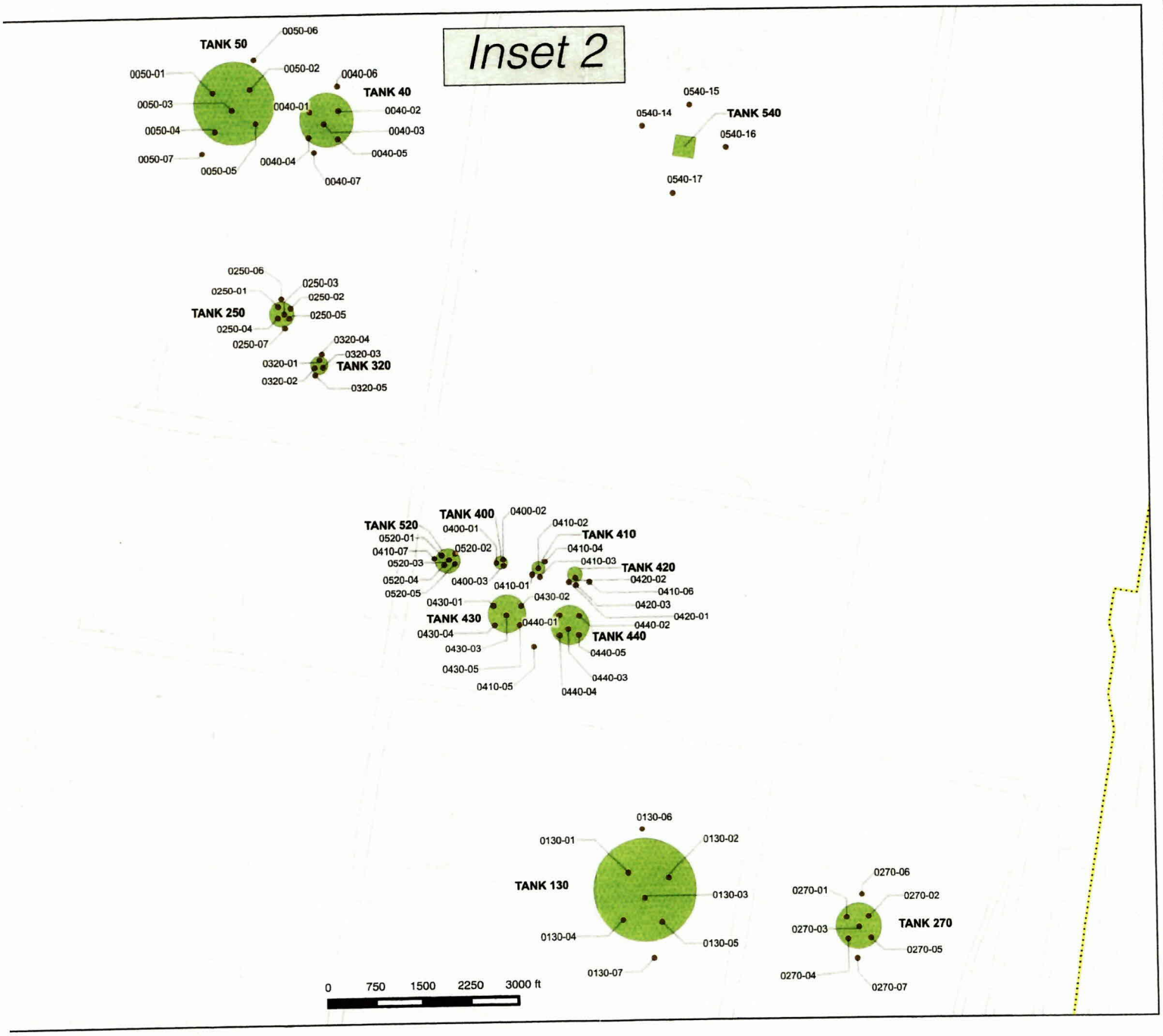
Figure 3-12

PRASA Boring Locations

Chevron Phillips Chemical
Puerto Rico Core, LLC

Legend

- Borehole Location
- Right-of-Way
- PRASA Effluent Pipeline
- Facility Boundary



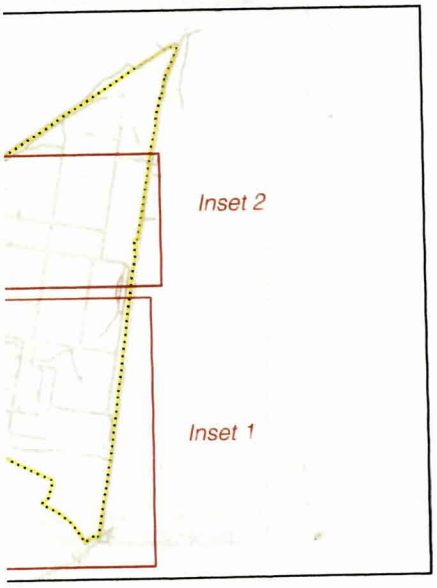


Figure 3-13

SRFI Surface and Subsurface Investigation Locations

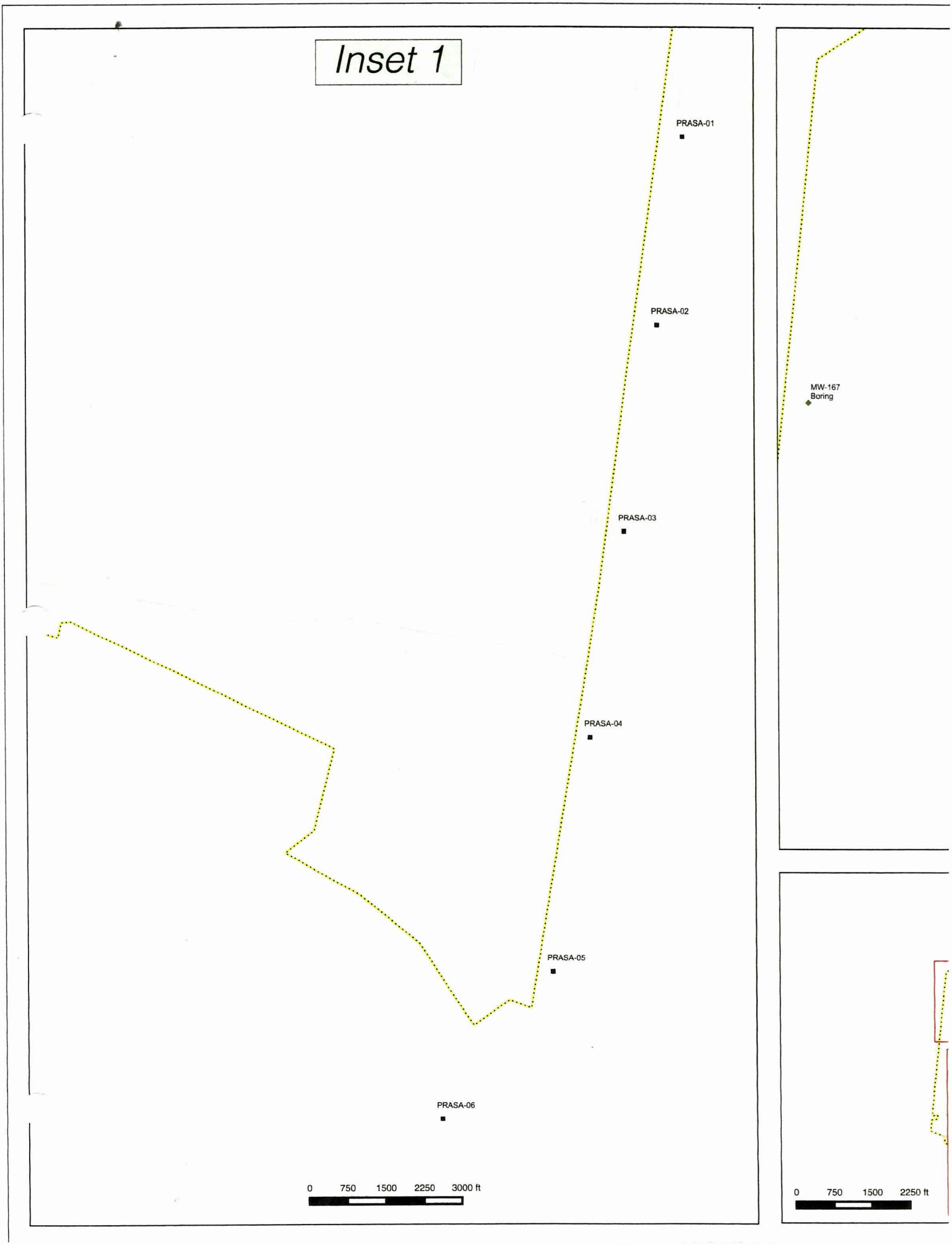
Chevron Phillips Chemical
Puerto Rico Core, LLC

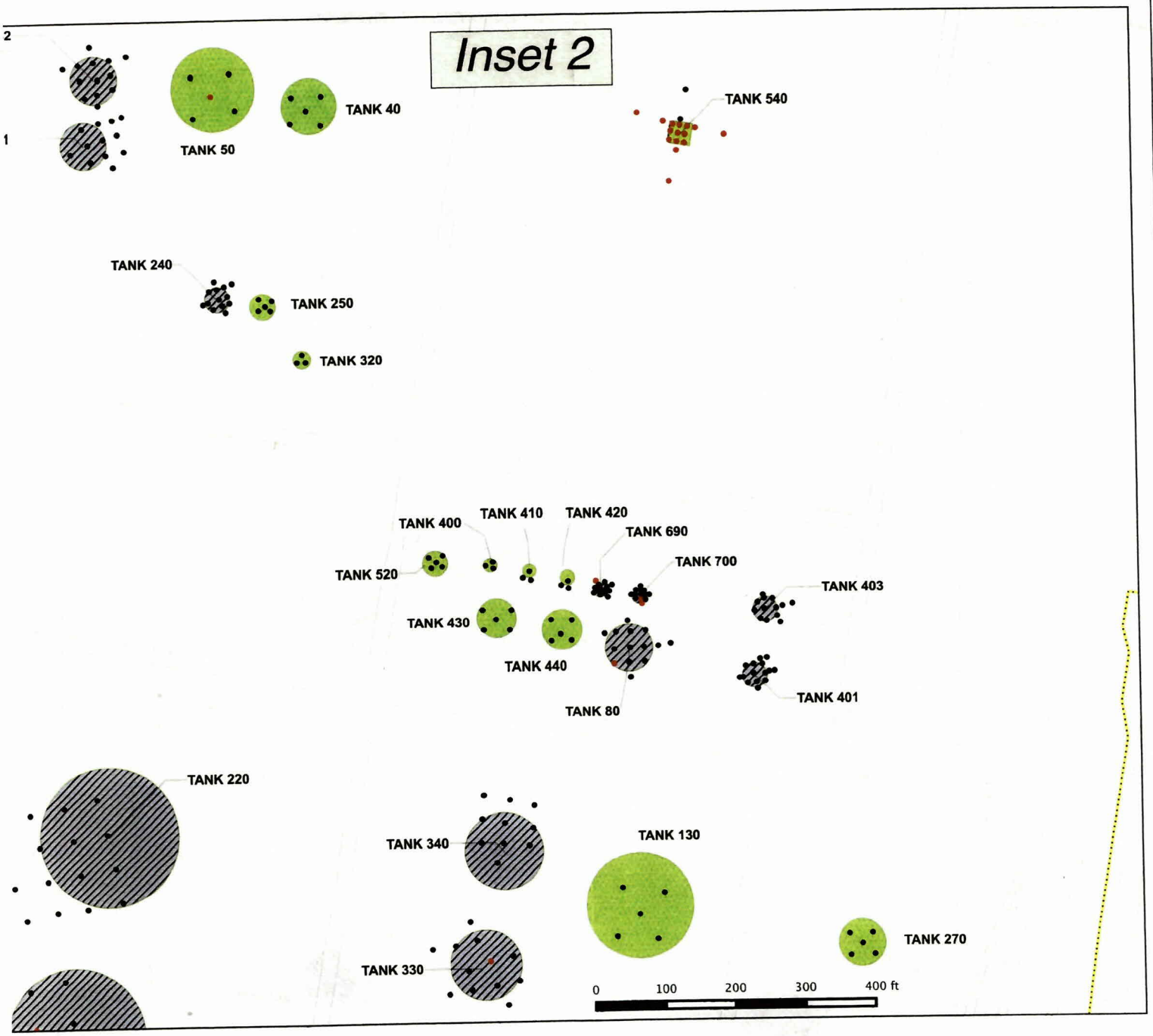
Legend

- AOI Boring Location
- PRASA Boring Location
- MW-167 Boring
- Right-of-Way
- AOI Location
- Facility Boundary

PEI

N
W E
S


Inset 1
PRASA-01
PRASA-02
PRASA-03
PRASA-04
PRASA-05
PRASA-06
0 750 1500 2250 3000 ft
MW-167
Boring
0 750 1500 2250 ft



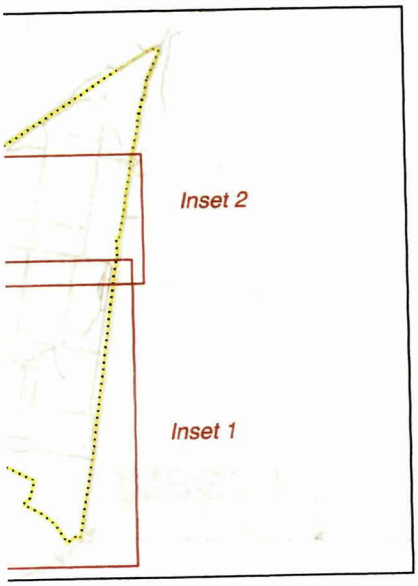


Figure 3-14

AOC and SRFI Investigation Locations-Sulfolane Surface Soil

Chevron Phillips Chemical
Puerto Rico Core, LLC

Legend

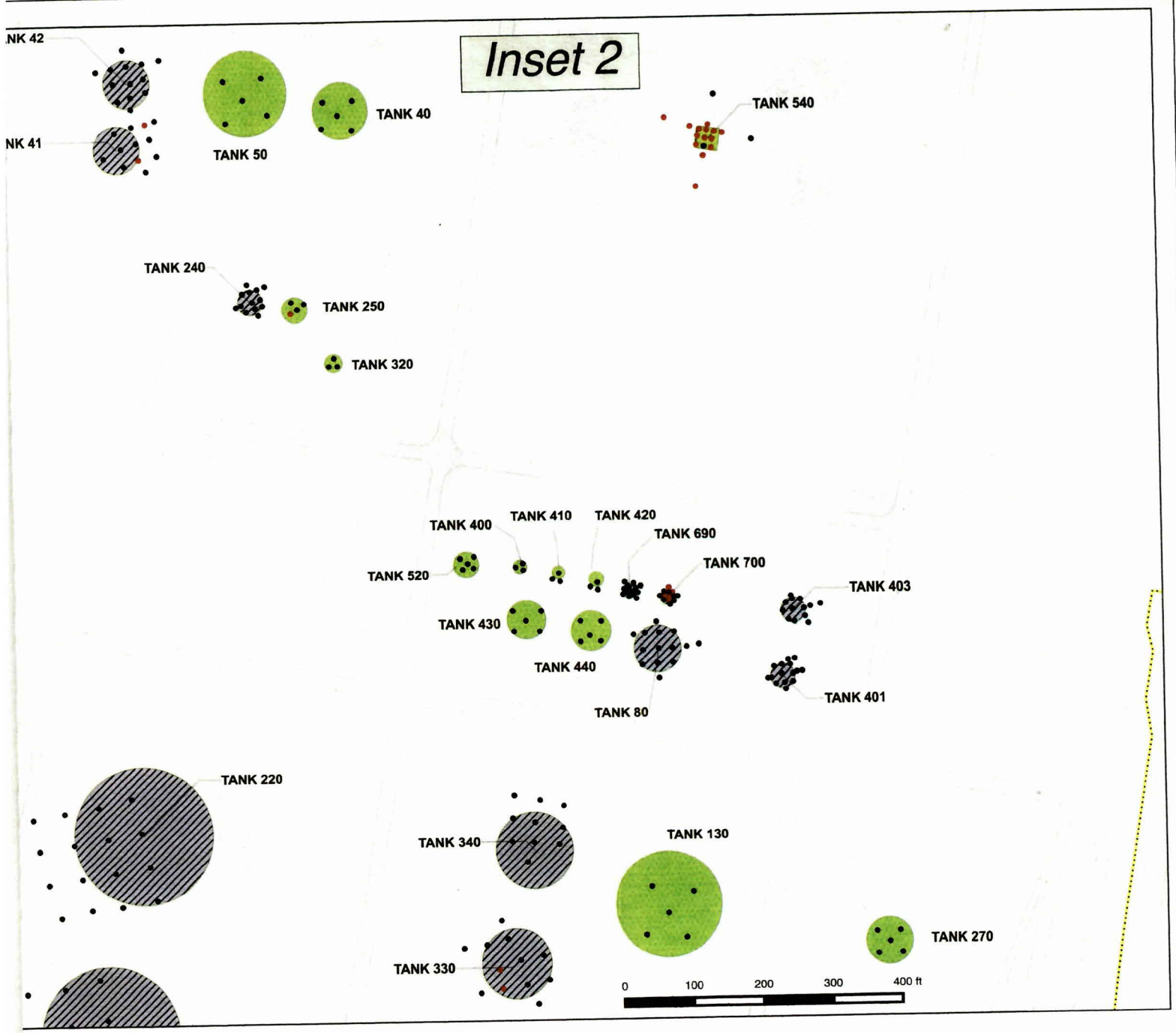
- Sulfolane Samples < 3.2 ug/Kg
- Sulfolane Samples > 3.2 ug/Kg
- road_line
- Facility Boundary
- Areas of Interest
- Areas of Concern

Note: Sample locations 0040-07, 0050-06, 0050-07, 0130-06, 0130-07, 0250-06, 0250-07, 0270-06, 0270-07, 0320-04, 0320-05, 0410-04, 0410-05, 0410-06, 0410-07 are groundwater sample locations and not represented on this map

PEI

N
W
E
S

Inset 1
TANK 330
TANK 270
TANK 20
TANK 160
TANK 170
TANK 10
TANK 100
TANK 360
TANK 710
0
200
400
600
800 ft
0
750
1500
2250 ft



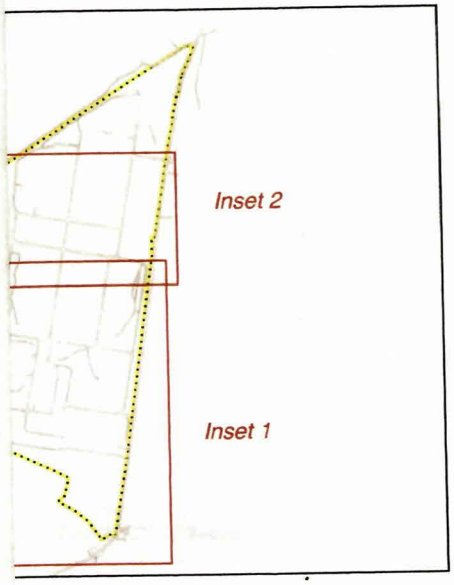


Figure 3-15

AOC and SRFI Investigation Locations-Sulfolane Subsurface Soil

Chevron Phillips Chemical
Puerto Rico Core, LLC

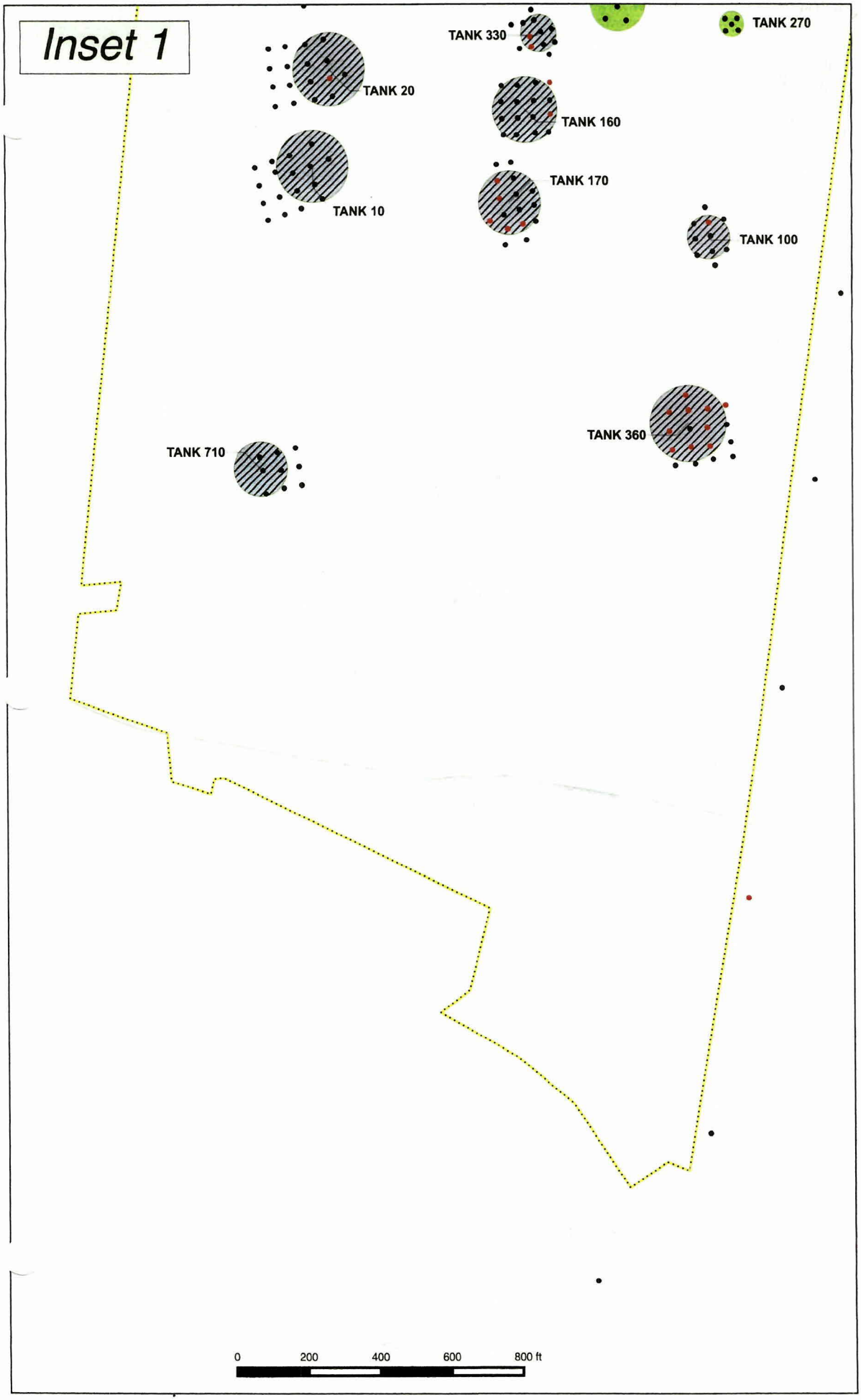
Legend

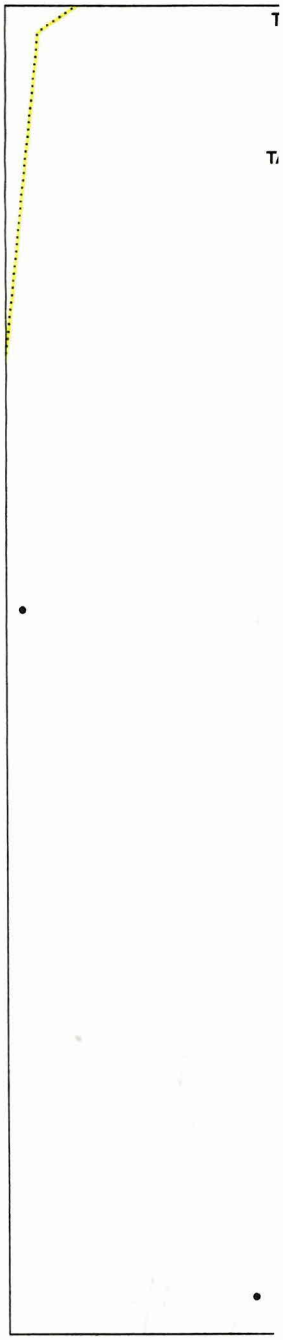
- Sulfolane Samples > 3.2 ug/Kg
- Sulfolane Samples < 3.2 ug/Kg
- Right-of-Way
- Facility Boundary
- Areas of Interest
- Areas of Concern

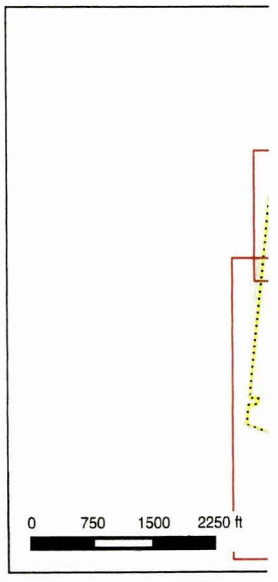
Note: Sample locations 0040-07, 0050-06, 0050-07, 0130-06, 0130-07, 0250-06, 0250-07, 0270-06, 0270-07, 0320-04, 0320-05, 0410-04, 0410-05, 0410-06, 0410-07 are groundwater sample locations and not represented on this map

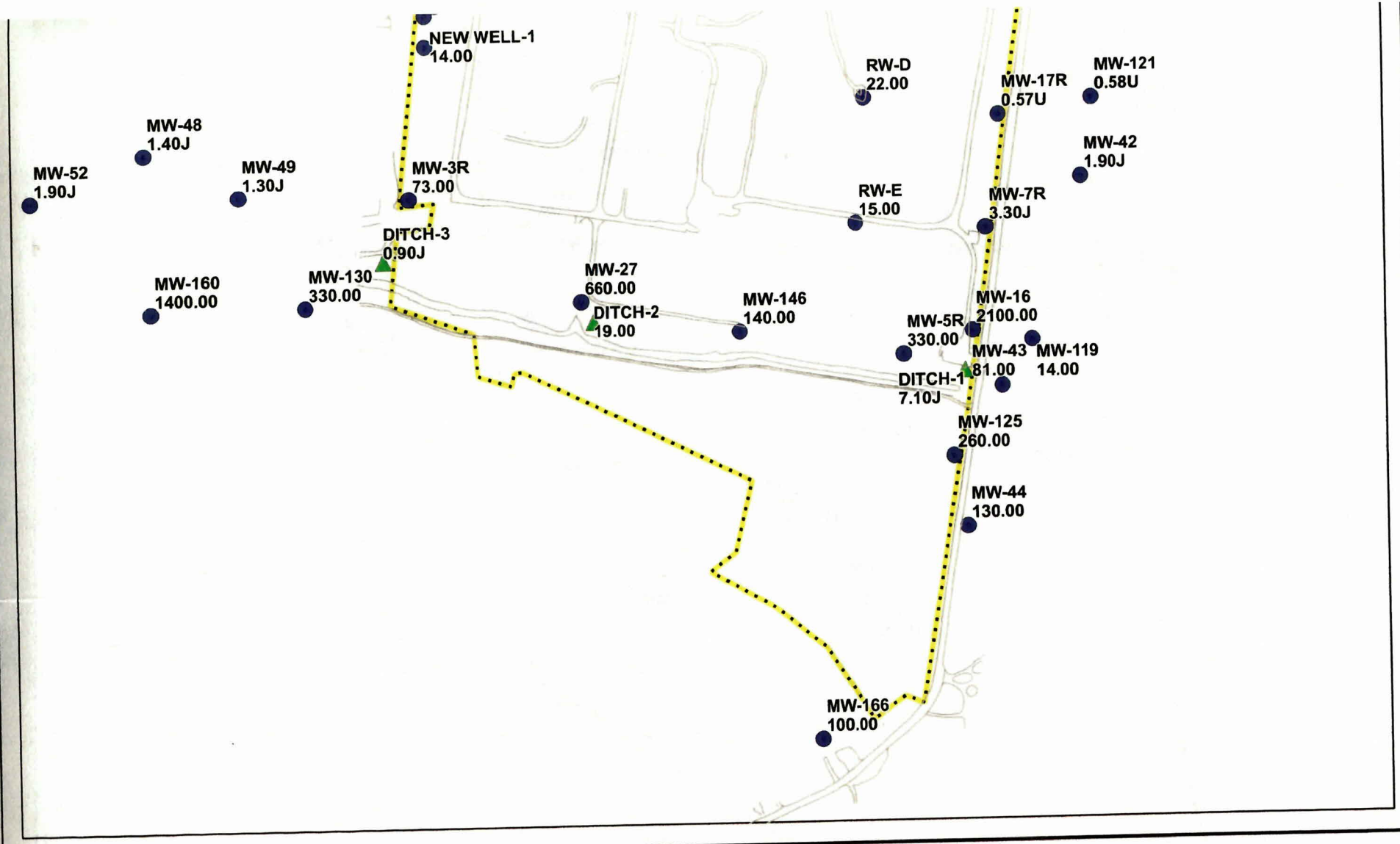
PEI

N
W
E
S


Inset 1
TANK 330
TANK 270
TANK 20
TANK 160
TANK 10
TANK 170
TANK 100
TANK 360
TANK 710
0
200
400
600
800 ft




0
750
1500
2250 ft



N
W E
S

0 250 500 750 1000 ft

PEI

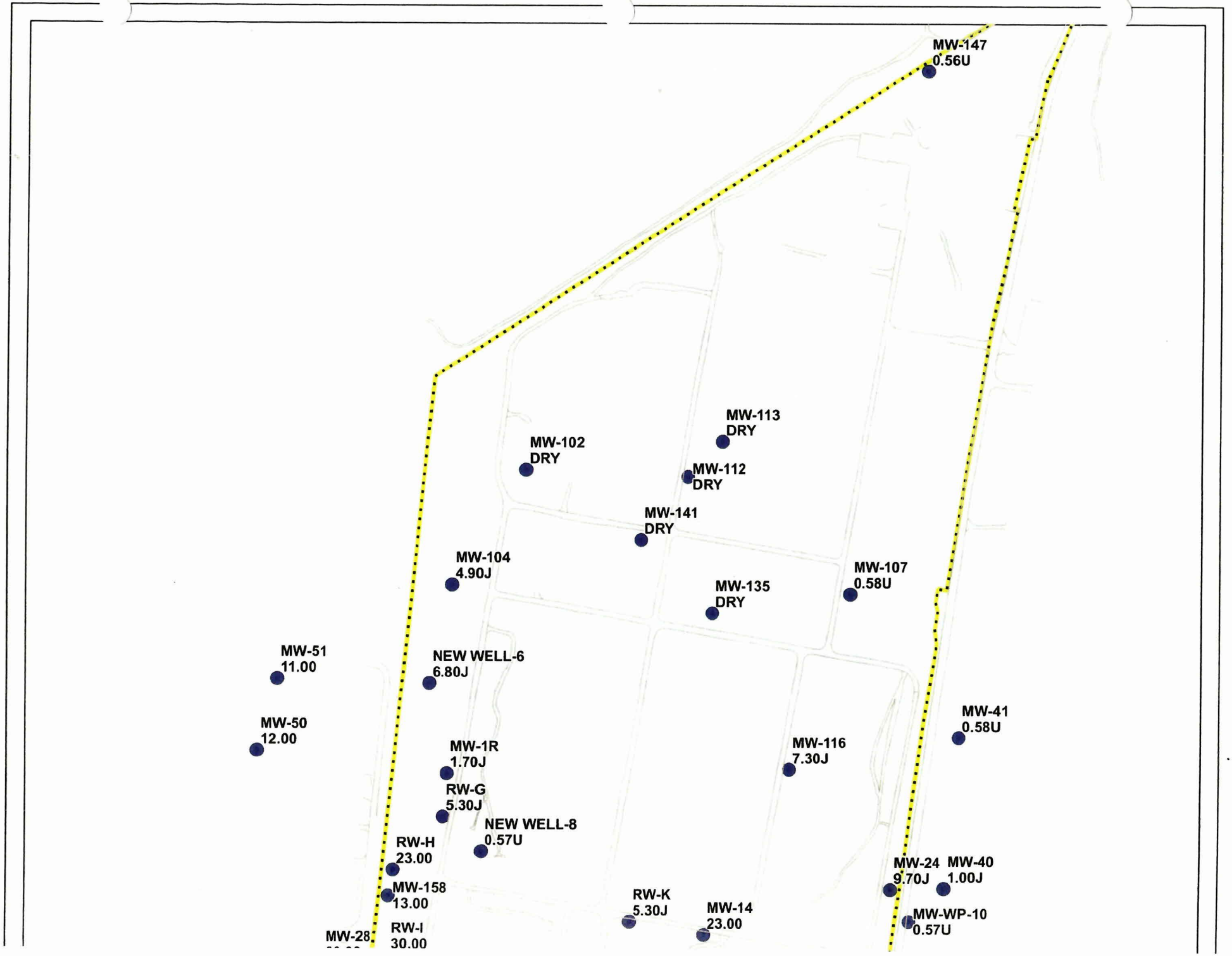
Figure 3-16

Upper Alluvial Sulfolane-
June 2013

Chevron Phillips Chemical
Puerto Rico Core, LLC

Legend

- Surface Water Sample Location
- Monitoring Well
- Right-of-Way
- Facility Boundary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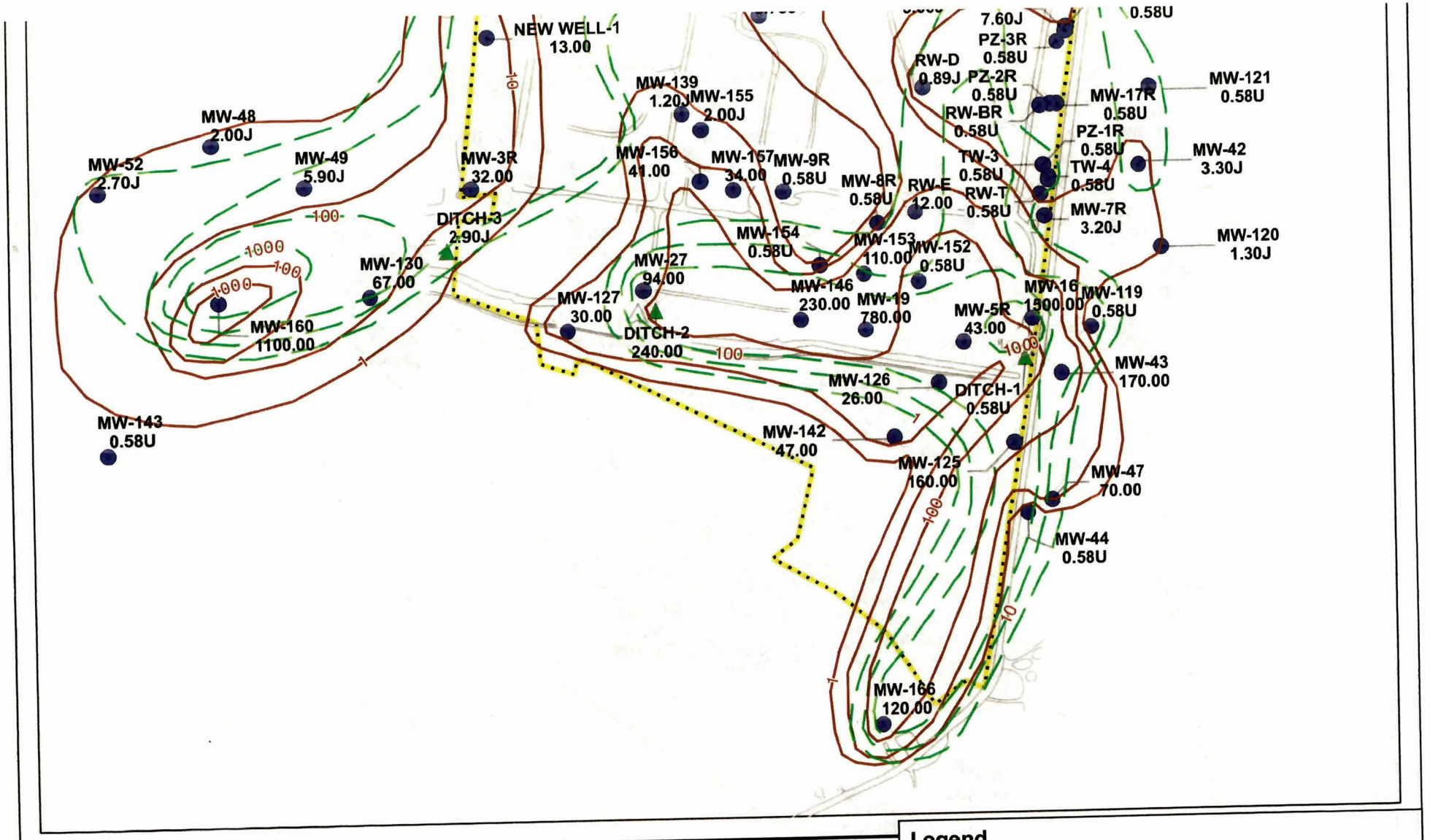
MW-113
DRY
MW-102
DRY
MW-112
DRY
MW-141
DRY
MW-104
4.90J
MW-107
0.58U
MW-135
DRY
MW-51
11.00
NEW WELL-6
6.80J
MW-41
0.58U
MW-50
12.00
MW-1R
1.70J
MW-116
7.30J
RW-G
5.30J
NEW WELL-8
0.57U
RW-H
23.00
MW-24
9.70J
MW-40
1.00J
MW-158
13.00
RW-K
5.30J
MW-14
23.00
MW-WP-10
0.57U
MW-28
RW-I
30.00



N
W E
S

0 250 500 750 1000 ft

PEI

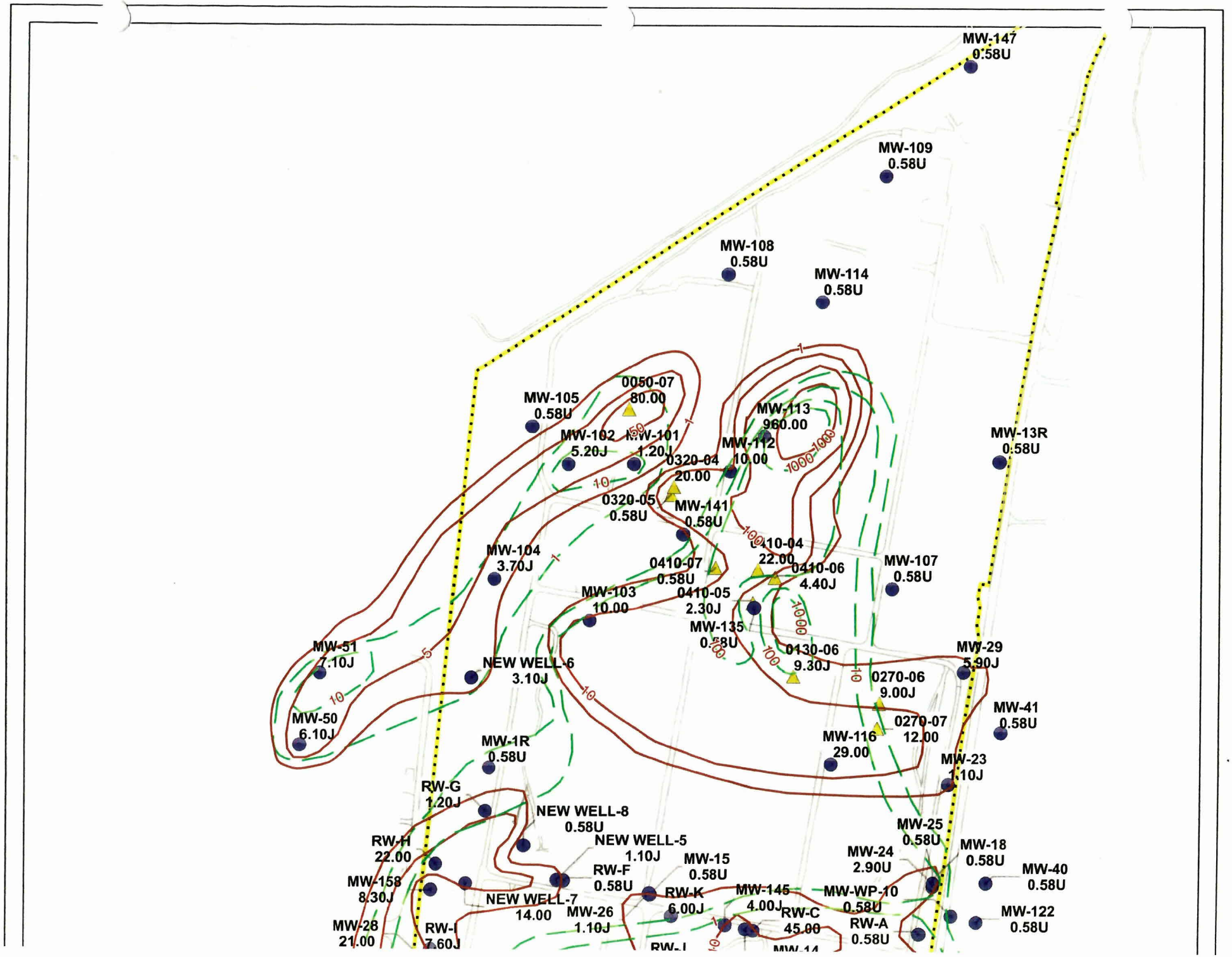
Figure 3-17

Upper Alluvial Sulfolane-
December 2013

Chevron Phillips Chemical
Puerto Rico Core, LLC

Legend

- Hydopunch Sample Location
- Surface Water Sample Location
- Monitoring Well
- Sulfolane Isoconcentration Contour- Dec 2013
- Sulfolane Isoconcentration Contour- June 2012
- Right-of-Way
- Facility Boundary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MW-109
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MW-108
0.58U
MW-114
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MW-105
0.58U
0050-07
80.00
MW-102
5.20J
MW-101
1.20J
MW-113
960.00
MW-112
10.00
0320-04
20.00
0320-05
0.58U
MW-141
0.58U
MW-13R
0.58U
MW-104
3.70J
0410-04
22.00
0410-07
0.58U
0410-06
4.40J
MW-107
0.58U
MW-103
10.00
0410-05
2.30J
MW-135
0.58U
0130-06
9.30J
MW-29
5.90J
MW-51
7.10J
NEW WELL-6
3.10J
0270-06
9.00J
MW-41
0.58U
MW-50
6.10J
0270-07
12.00
MW-116
29.00
MW-1R
0.58U
MW-23
1.10J
RW-G
1.20J
NEW WELL-8
0.58U
MW-25
0.58U
RW-H
22.00
NEW WELL-5
1.10J
MW-24
2.90U
MW-18
0.58U
MW-15
0.58U
RW-F
0.58U
MW-40
0.58U
MW-158
8.30J
NEW WELL-7
14.00
RW-K
6.00J
MW-145
4.00J
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MW-26
1.10J
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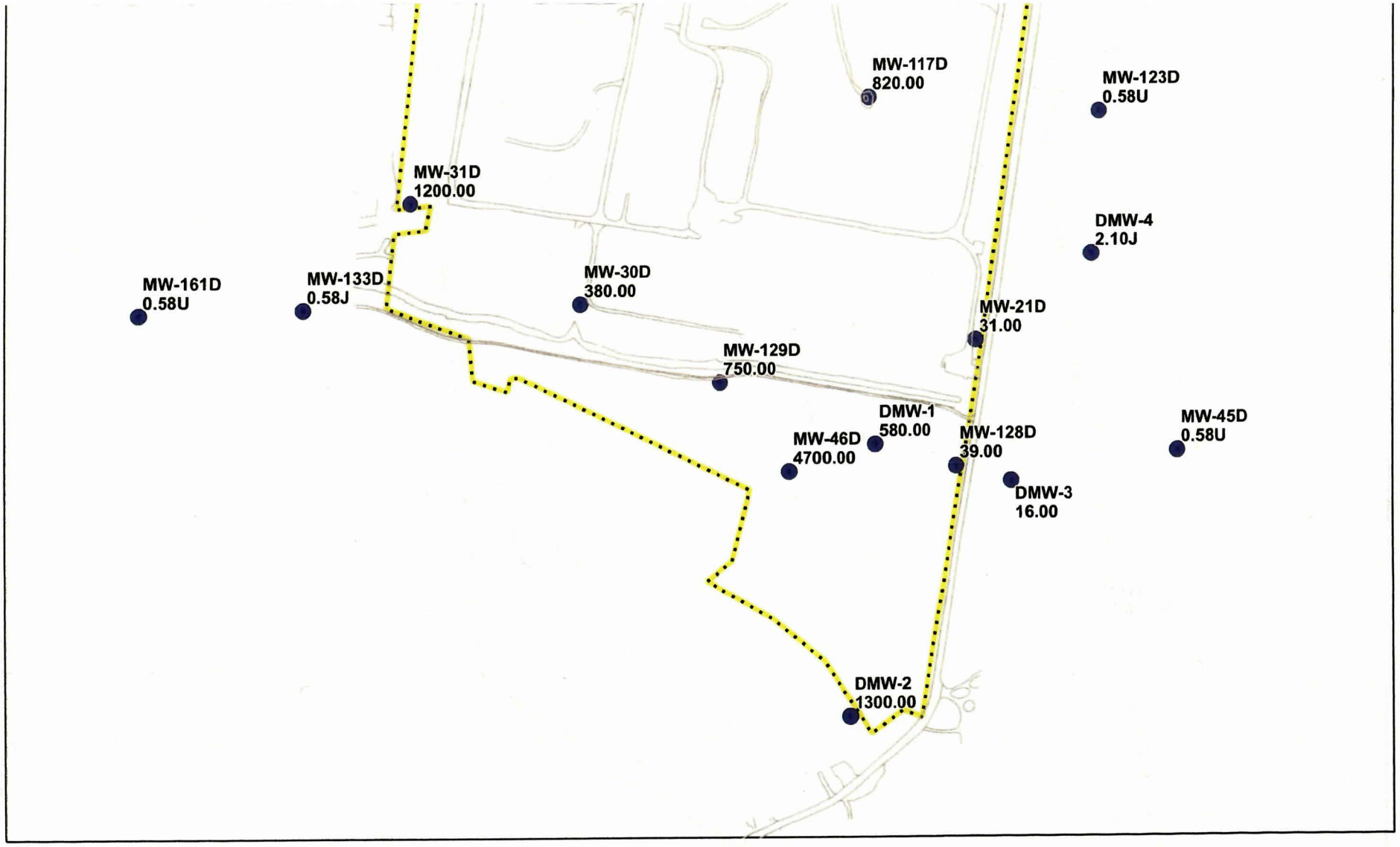
1
5
10
50
100
1000



N
W E
S

0 250 500 750 1000 ft

PEI

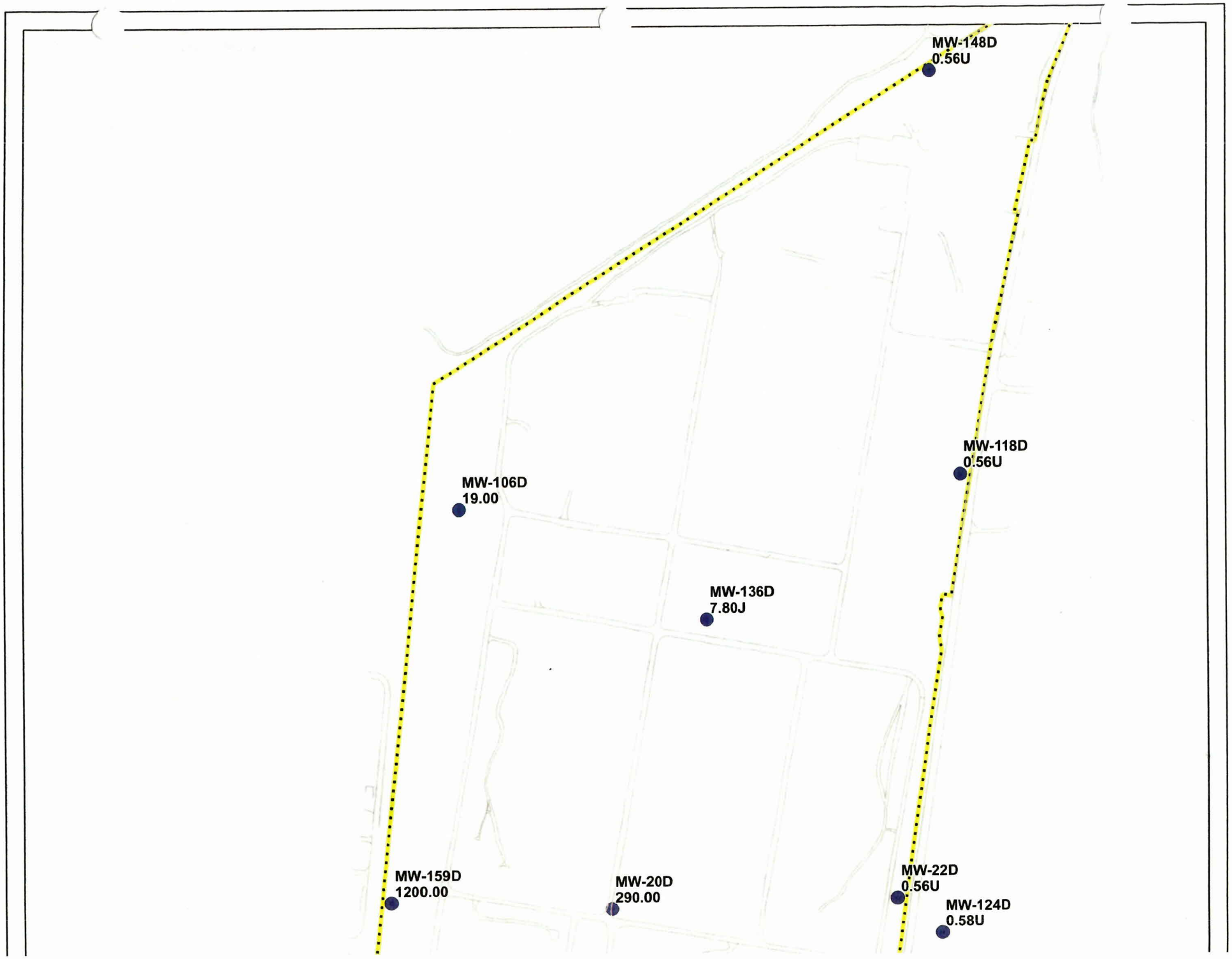
Figure 3-18

Lower Alluvial Sulfolane-
June 2013

Chevron Phillips Chemical
Puerto Rico Core, LLC

Legend

- Monitoring Well
- Right-of-Way
- Facility Boundary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MW-106D
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MW-136D
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MW-159D
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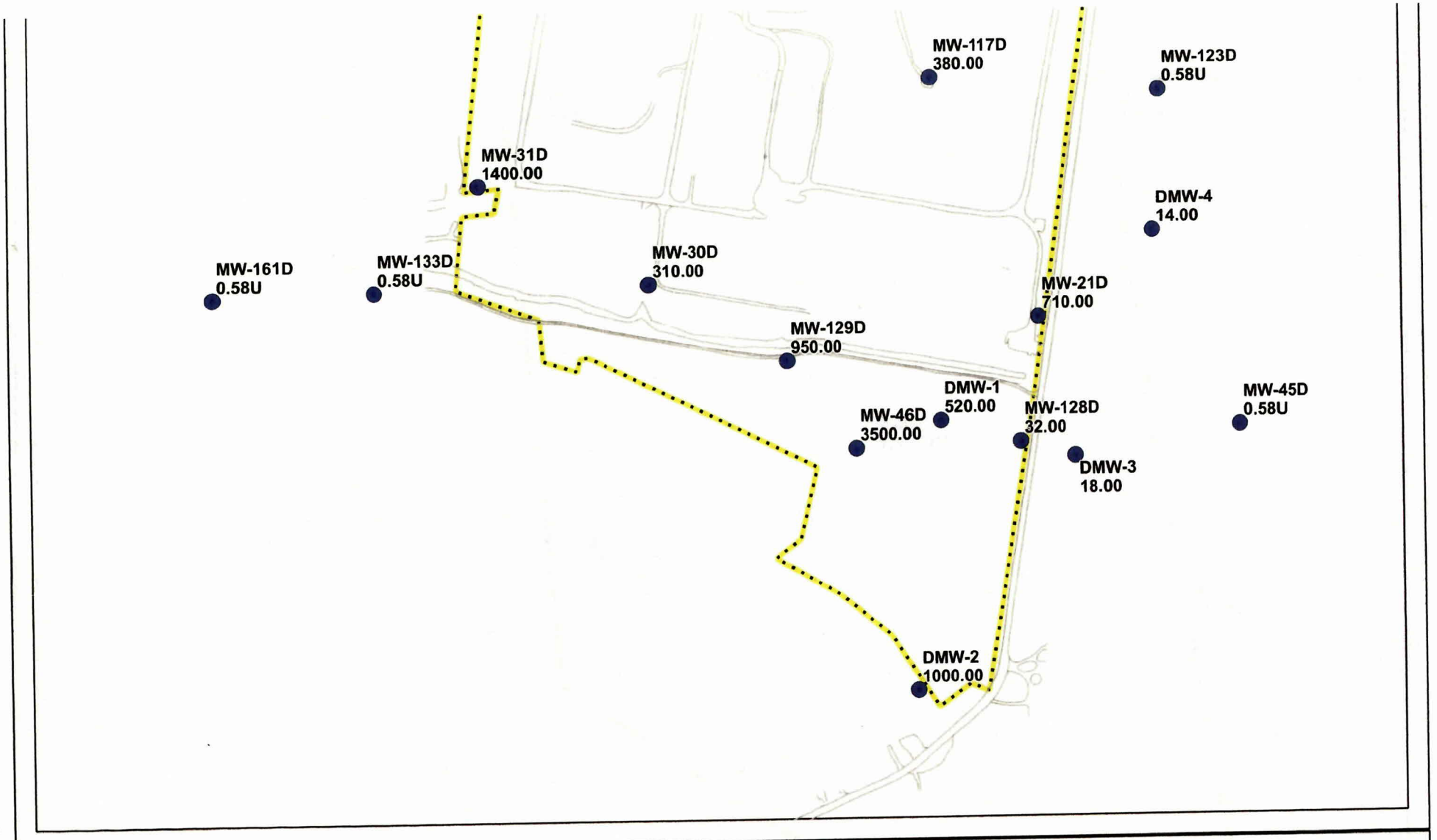
0.56U
MW-124D
0.58U



N
W E
S

PEI

0 250 500 750 1000 ft

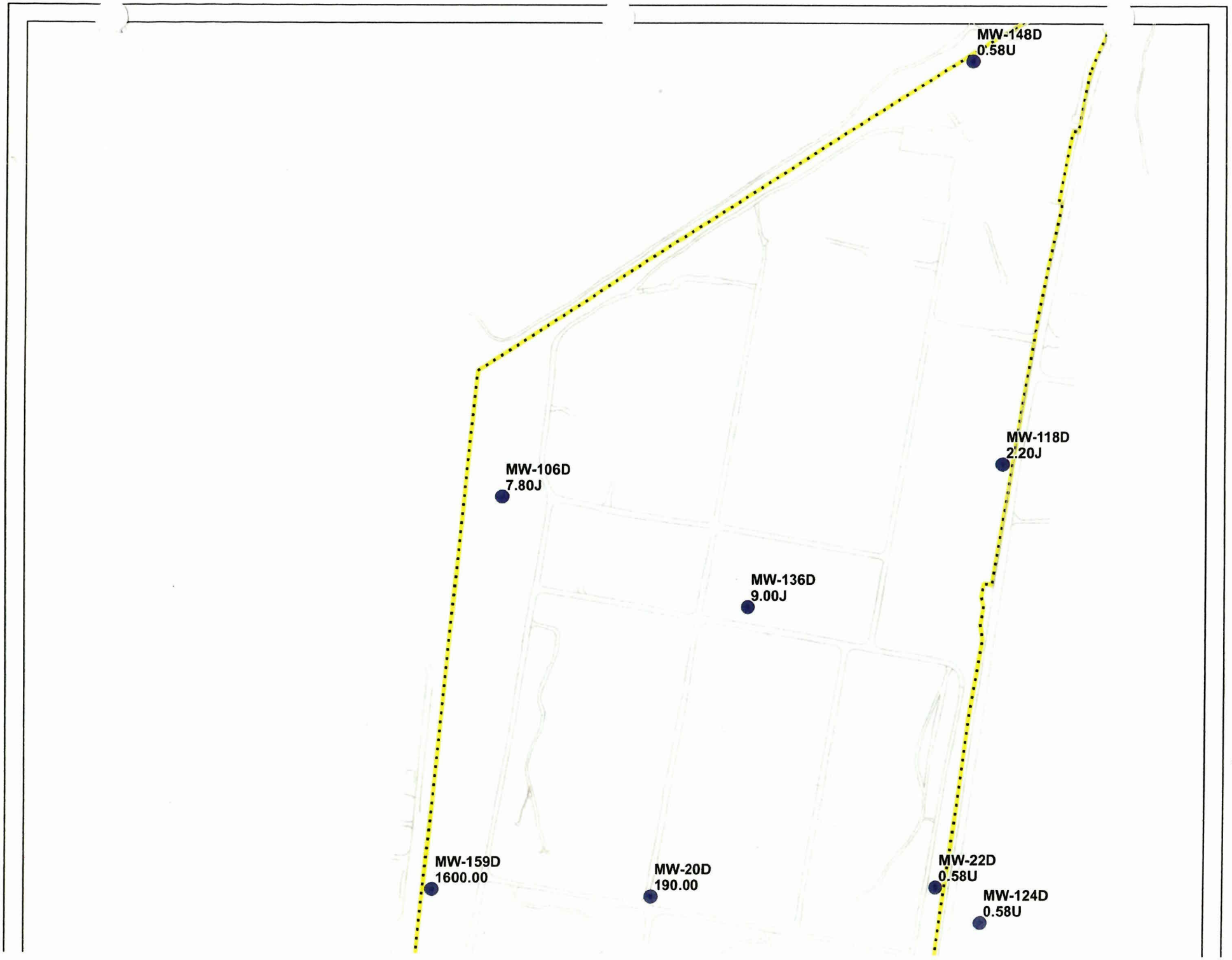
Figure 3-19

Lower Alluvial Sulfolane-
December 2013

Chevron Phillips Chemical
Puerto Rico Core, LLC

Legend

- Monitoring Well
- Road Right-of-Way
- Facility Boundary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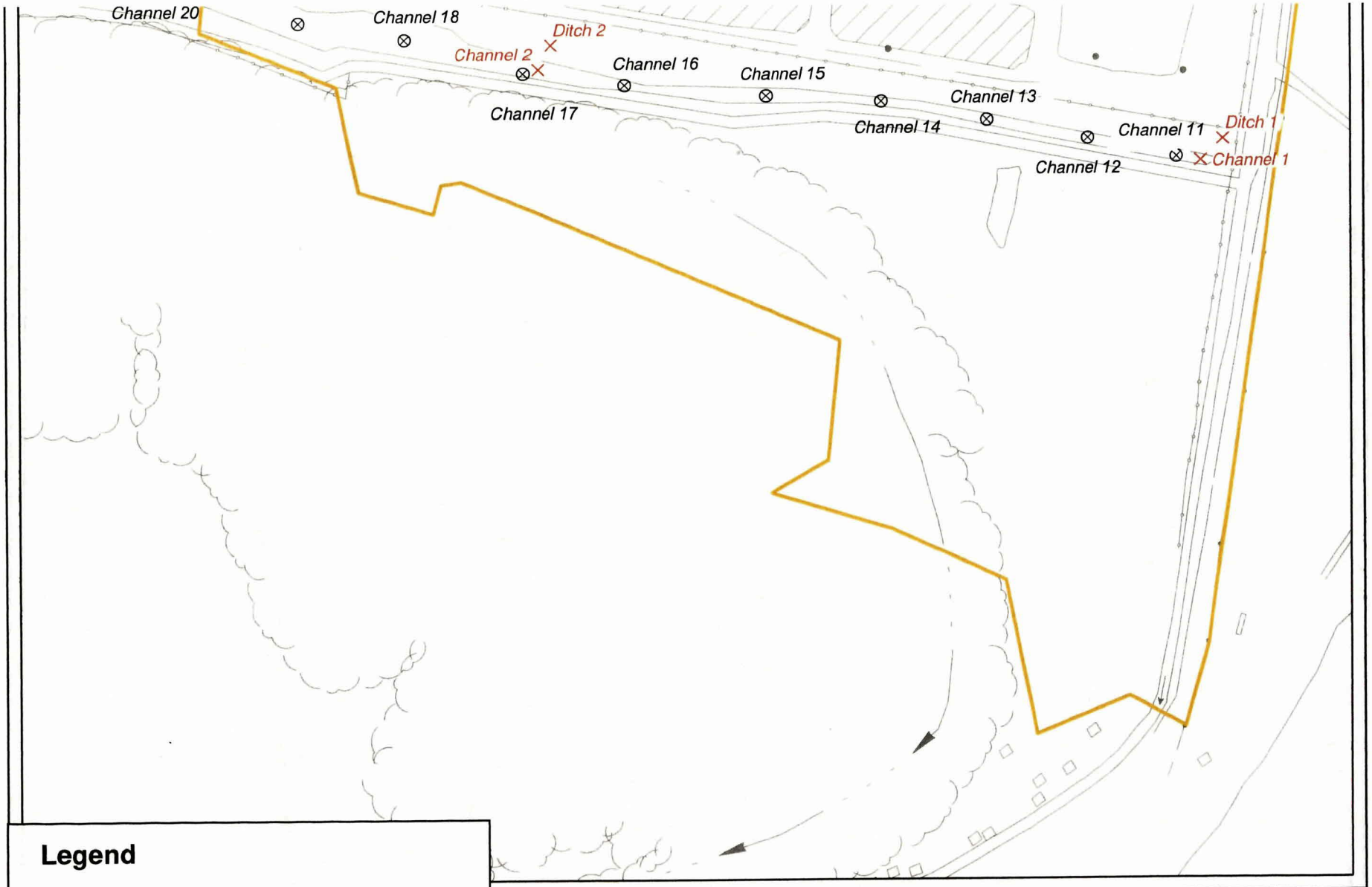
0.58U
MW-118D
2.20J
MW-106D
7.80J
MW-136D
9.00J
MW-159D
1600.00
MW-20D
190.00
MW-22D
0.58U
MW-124D
0.58U



Legend

× Routine Surface Water and Sediment Sample Locations

⊗ Voluntary Sediment Sample Locations

Facility Boundary

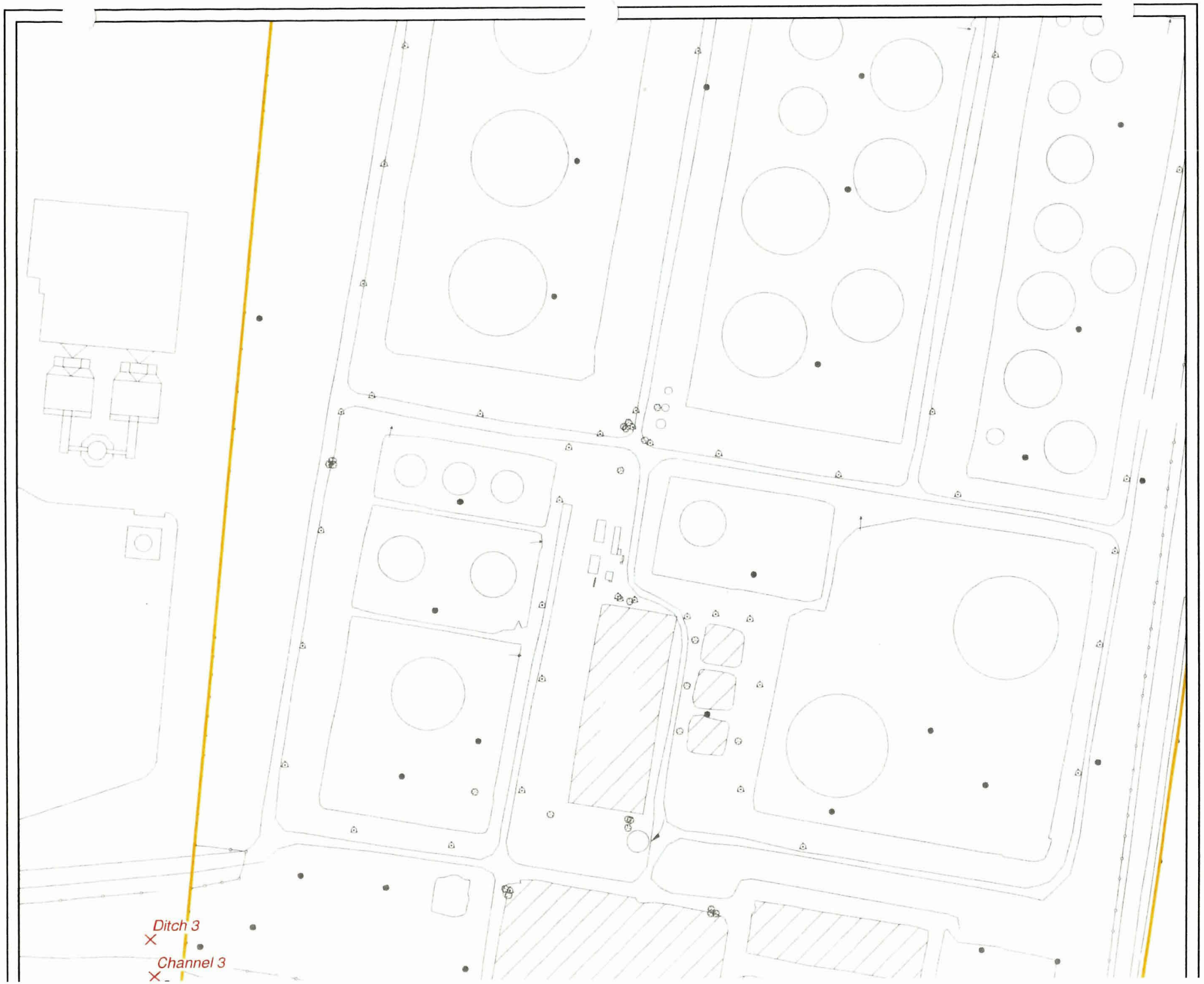
Figure 3-20 - Effluent Channel Samples

Chevron Phillips Chemical
Puerto Rico Core, LLC

N W E S

PEI

0 100 200 400 Feet


Ditch 3
Channel 3

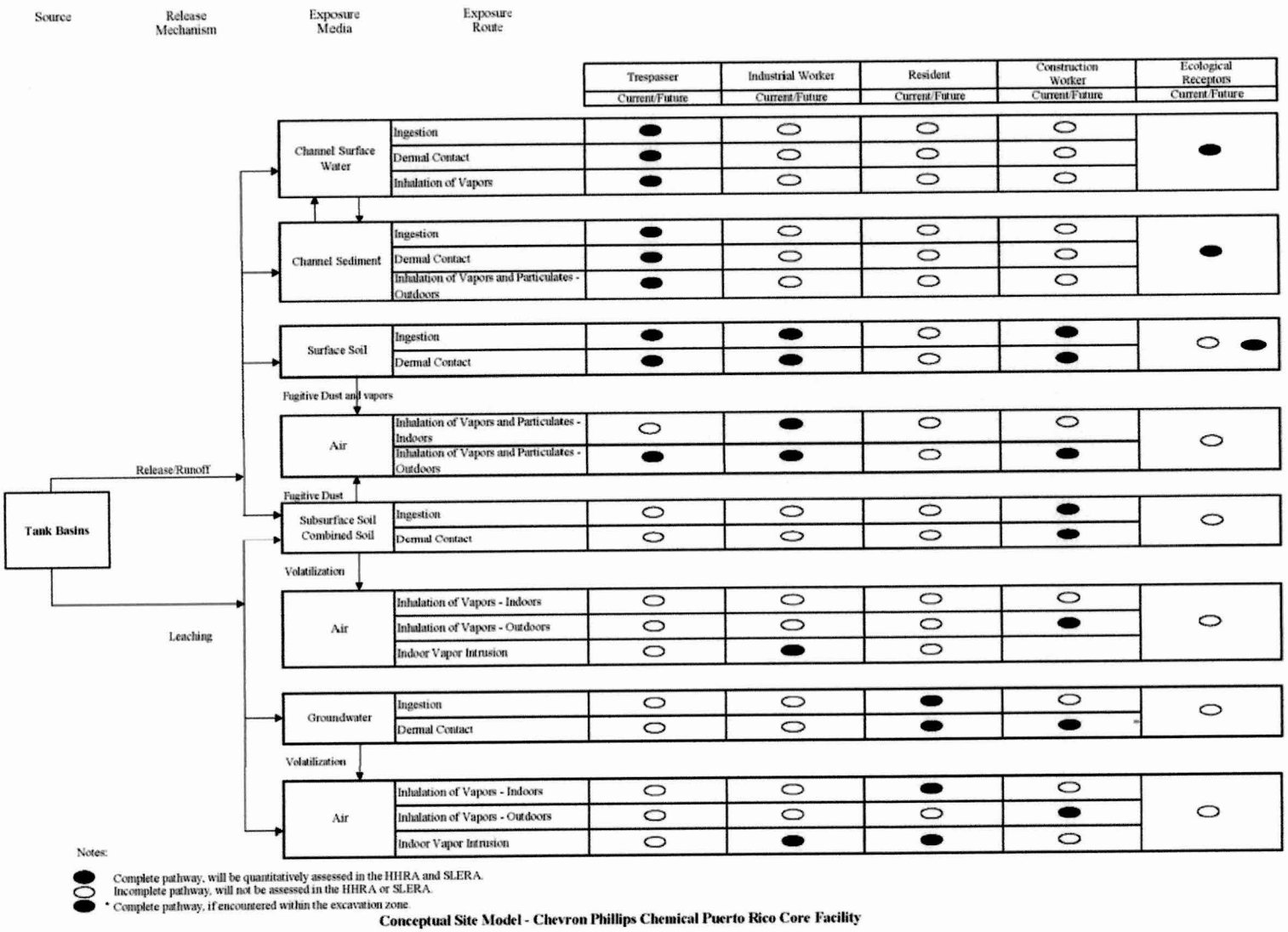


Figure 5-1. Conceptual Site Model.

Tables

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Table 2-1. Identified areas of interest.

Area	Tank Number/Feature	Former Tank Contents/Feature	Diameter (ft)	Height (ft)	Capacity (barrels)
Basin G	0040	MF Reformate	80	39.17	34,000
Basin G	0050	Sulfolane Charge	119	35.5	65,000
Basin B	0130	Blend Stock	150	47.66	142,000
Basin H	0250	Sulfolane	36	42	7,000
Basin C	0270	Sulfolane	67	40	23,000
Basin H	0320	Cyclohexane	25	41.5	3,000
Basin F	0400	Sulfolane Charge	20	18	900
Basin F	0410	Mixed Solvent	20	18	900
Basin F	0420	Process Water	20	18	900
Basin F	0430	Process Water	20	18	900
Basin F	0440	Equipment Washings	55	30	11,000
Basin F	0520	Mixed Solvent	35	24	4,000
Former Process Area	0540	Sulfolane	20	16	NA
Western Boundary	MW-167	New monitoring well to track groundwater quality at Western boundary	NA	NA	NA
PRASA Pipeline	PRASA pipeline	Six borings to characterize sulfolane in soil and groundwater offsite to the east.	NA	NA	NA
Groundwater	Site groundwater	Sampling all site monitoring wells	NA	NA	NA

Table 3-1. Tank 40 sample results.

Sample ID	Analyte	Result	Qualifier	Unit
0040-01-SO-02	Sulfolane	37	U	µg/Kg
0040-01-SO-19	Sulfolane	39	U	µg/Kg
0040-02-SO-02	Sulfolane	38	U	µg/Kg
0040-02-SO-20	Sulfolane	40	U	µg/Kg
0040-03-SO-02	Sulfolane	38	U	µg/Kg
0040-03-SO-19	Sulfolane	39	U	µg/Kg
0040-04-SO-02	Sulfolane	37	U	µg/Kg
0040-04-SO-20	Sulfolane	41	U	µg/Kg
0040-05-SO-02	Sulfolane	39	U	µg/Kg
0040-05-SO-20	Sulfolane	40	U	µg/Kg
0040-06-GW		No water present		
0040-07-GW		No water present		

µg/Kg = milligrams per Kilogram
U = constituent not detected above the associated result.

Table 3-2. Tank 50 sample results.

Sample ID	Analyte	Result	Qualifier	Unit
0050-01-SO-02	Sulfolane	37	U	µg/Kg
0050-01-SO-19	Sulfolane	34	U	µg/Kg
0050-02-SO-02	Sulfolane	37	U	µg/Kg
0050-02-SO-20	Sulfolane	34	U	µg/Kg
0050-03-SO-02	Sulfolane	490		µg/Kg
0050-03-SO-19	Sulfolane	39	U	µg/Kg
0050-04-SO-02	Sulfolane	39	U	µg/Kg
0050-04-SO-20	Sulfolane	35	U	µg/Kg
0050-05-SO-02	Sulfolane	39	U	µg/Kg
0050-05-SO-20	Sulfolane	39	U	µg/Kg
0050-06-GW		No water present		
0050-07-GW	Sulfolane	80		µg/L

µg/Kg = micrograms per Kilogram
µg/L = micrograms per Liter
U = constituent not detected above the associated result.

Table 3-3. Tank 130 sample results.

Sample ID	Analyte	Result	Qualifier	Unit
0130-01-SO-02	Sulfolane	38	U	µg/Kg
0130-01-SO-06	Sulfolane	38	U	µg/Kg
0130-02-SO-02	Sulfolane	37	U	µg/Kg
0130-02-SO-06	Sulfolane	39	U	µg/Kg
0130-03-SO-02	Sulfolane	38	U	µg/Kg
0130-03-SO-10	Sulfolane	41	U	µg/Kg
0130-04-SO-02	Sulfolane	37	U	µg/Kg
0130-04-SO-06	Sulfolane	38	U	µg/Kg
0130-05-SO-02	Sulfolane	38	U	µg/Kg
0130-05-SO-06	Sulfolane	38	U	µg/Kg
0130-06-GW	Sulfolane	9.3	J	µg/L
0130-07-GW	Sulfolane	17		µg/L

µg/Kg = micrograms per Kilogram
µg/L = micrograms per Liter
U = constituent not detected above the associated result; J = constituent present at estimated value.

Table 3-4. Tank 250 sample results.

Sample ID	Analyte	Result	Qualifier	Unit
0250-01-SO-02	Sulfolane	39	U	µg/Kg
0250-01-SO-18	Sulfolane	40	U	µg/Kg
0250-02-SO-02	Sulfolane	38	U	µg/Kg
0250-02-SO-19	Sulfolane	40	U	µg/Kg
0250-03-SO-02	Sulfolane	39	U	µg/Kg
0250-03-SO-18	Sulfolane	41	U	µg/Kg
0250-04-SO-02	Sulfolane	38	U	µg/Kg
0250-04-SO-19	Sulfolane	40	U	µg/Kg
0250-04-SO-20	Sulfolane	60	J	µg/Kg
0250-05-SO-02	Sulfolane	37	U	µg/Kg
0250-05-SO-17	Sulfolane	39	U	µg/Kg
0250-06-GW		No water present		
0250-07-GW		No water present		

µg/Kg = micrograms per Kilogram
U = constituent not detected above the associated result; J = constituent present at estimated value.

Table 3-5. Tank 270 sample results.

Sample ID	Analyte	Result	Qualifier	Unit
0270-01-SO-02	Sulfolane	39	U	µg/Kg
0270-01-SO-16	Sulfolane	40	U	µg/Kg
0270-02-SO-02	Sulfolane	39	U	µg/Kg
0270-02-SO-10	Sulfolane	35	U	µg/Kg
0270-03-SO-02	Sulfolane	40	U	µg/Kg
0270-03-SO-06	Sulfolane	39	U	µg/Kg
0270-04-SO-02	Sulfolane	39	U	µg/Kg
0270-04-SO-16	Sulfolane	42	U	µg/Kg
0270-05-SO-02	Sulfolane	38	U	µg/Kg
0270-05-SO-16	Sulfolane	40	U	µg/Kg
0270-06-GW	Sulfolane	9	J	µg/L
0270-07-GW	Sulfolane	12		µg/L

µg/Kg = micrograms per Kilogram
µg/L = micrograms per Liter
U = constituent not detected above the associated result; J = constituent present at estimated value.

Table 3-6. Tank 320 sample results.

Sample ID	Analyte	Result	Qualifier	Unit
0320-01-SO-02	Sulfolane	38	U	µg/Kg
0320-01-SO-15	Sulfolane	33	U	µg/Kg
0320-02-SO-02	Sulfolane	37	U	µg/Kg
0320-02-SO-15	Sulfolane	34	U	µg/Kg
0320-03-SO-02	Sulfolane	37	U	µg/Kg
0320-03-SO-15	Sulfolane	37	U	µg/Kg
0320-04-GW	Sulfolane	20		µg/L
0320-05-GW	Sulfolane	0.58	U	µg/L

µg/Kg = micrograms per Kilogram
µg/L = micrograms per Liter
U = constituent not detected above the associated result.

Table 3-7. Tank 400 sample results.

Sample ID	Analyte	Result	Qualifier	Unit
0400-01-SO-02	Sulfolane	37	U	µg/Kg
0400-01-SO-15	Sulfolane	39	U	µg/Kg
0400-02-SO-02	Sulfolane	35	U	µg/Kg
0400-02-SO-16	Sulfolane	39	U	µg/Kg
0400-03-SO-02	Sulfolane	38	U	µg/Kg
0400-03-SO-16	Sulfolane	42	U	µg/Kg

µg/Kg = micrograms per Kilogram
U = constituent not detected above the associated result.

Table 3-8. Tank 410 sample results.

Sample ID	Analyte	Result	Qualifier	Unit
0410-01-SO-02	Sulfolane	37	U	µg/Kg
0410-01-SO-16	Sulfolane	35	U	µg/Kg
0410-02-SO-02	Sulfolane	38	U	µg/Kg
0410-02-SO-16	Sulfolane	35	U	µg/Kg
0410-03-SO-02	Sulfolane	38	U	µg/Kg
0410-03-SO-15	Sulfolane	42	U	µg/Kg
0410-04-GW	Sulfolane	22		µg/L
0410-05-GW	Sulfolane	2.3	J	µg/L
0410-06-GW	Sulfolane	4.4	J	µg/L
0410-07-GW	Sulfolane	0.58	U	µg/L

µg/Kg = micrograms per Kilogram
µg/L = micrograms per Liter
U = constituent not detected above the associated result; J = constituent present at estimated value.

Table 3-9. Tank 420 sample results.

Sample ID	Analyte	Result	Qualifier	Unit
0420-01-SO-02	Sulfolane	37	U	µg/Kg
0420-01-SO-16	Sulfolane	41	U	µg/Kg
0420-02-SO-02	Sulfolane	38	U	µg/Kg
0420-02-SO-16	Sulfolane	38	U	µg/Kg
0420-03-SO-02	Sulfolane	38	U	µg/Kg
0420-03-SO-06	Sulfolane	36	U	µg/Kg

µg/Kg = micrograms per Kilogram
U = constituent not detected above the associated result.

Table 3-10. Tank 430 sample results.

Sample ID	Analyte	Result	Qualifier	Unit
0430-01-SO-02	Sulfolane	39	U	µg/Kg
0430-01-SO-15	Sulfolane	34	U	µg/Kg
0430-02-SO-02	Sulfolane	37	U	µg/Kg
0430-02-SO-15	Sulfolane	34	U	µg/Kg
0430-03-SO-02	Sulfolane	39	U	µg/Kg
0430-03-SO-15	Sulfolane	35	U	µg/Kg
0430-04-SO-02	Sulfolane	38	U	µg/Kg
0430-04-SO-15	Sulfolane	36	U	µg/Kg
0430-05-SO-02	Sulfolane	37	U	µg/Kg
0430-05-SO-15	Sulfolane	34	U	µg/Kg

µg/Kg = micrograms per Kilogram
U = constituent not detected above the associated result.

Table 3-11. Tank 440 sample results.

Sample ID	Analyte	Result	Qualifier	Unit
0440-01-SO-02	Sulfolane	38	U	µg/Kg
0440-01-SO-06	Sulfolane	37	U	µg/Kg
0440-02-SO-02	Sulfolane	36	U	µg/Kg
0440-02-SO-15	Sulfolane	35	U	µg/Kg
0440-03-SO-02	Sulfolane	39	U	µg/Kg
0440-03-SO-10	Sulfolane	38	U	µg/Kg
0440-04-SO-02	Sulfolane	38	U	µg/Kg
0440-04-SO-06	Sulfolane	37	U	µg/Kg
0440-05-SO-02	Sulfolane	38	U	µg/Kg
0440-05-SO-06	Sulfolane	38	U	µg/Kg

µg/Kg = micrograms per Kilogram
U = constituent not detected above the associated result.

Table 3-12. Tank 520 sample results.

Sample ID	Analyte	Result	Qualifier	Unit
0520-01-SO-02	Sulfolane	39	U	µg/Kg
0520-01-SO-10	Sulfolane	35	U	µg/Kg
0520-02-SO-02	Sulfolane	39	U	µg/Kg
0520-02-SO-10	Sulfolane	35	U	µg/Kg
0520-03-SO-02	Sulfolane	38	U	µg/Kg
0520-03-SO-10	Sulfolane	37	U	µg/Kg
0520-04-SO-02	Sulfolane	39	U	µg/Kg
0520-04-SO-13	Sulfolane	37	U	µg/Kg
0520-05-SO-02	Sulfolane	38	U	µg/Kg
0520-05-SO-12	Sulfolane	37	U	µg/Kg

µg/Kg = micrograms per Kilogram
U = constituent not detected above the associated result.

Table 3-13. Tank 540 sample results.

Sample ID	Analyte	Result	Qualifier	Unit
0540-14-SO-02	Sulfolane	160	J	µg/Kg
0540-14-SO-06	Sulfolane	79	J	µg/Kg
0540-15-SO-02	Sulfolane	37	U	µg/Kg
0540-15-SO-18	Sulfolane	40	U	µg/Kg
0540-16-SO-02	Sulfolane	170	J	µg/Kg
0540-16-SO-20	Sulfolane	39	U	µg/Kg
0540-17-SO-02	Sulfolane	1200		µg/Kg
0540-17-SO-20	Sulfolane	62	J	µg/Kg

µg/Kg = micrograms per Kilogram
U = constituent not detected above the associated result; J = constituent present at estimated value.

Table 3-14. Tank MW-167 sample results.

Sample ID	Analyte	Result	Qualifier	Unit
MW-167-01-SO-02	Sulfolane	40	U	µg/Kg
MW-167-01-SO-12	Sulfolane	35	U	µg/Kg
MW-167	Sulfolane	3.8	J	µg/L

µg/Kg = micrograms per Kilogram
µg/L = micrograms per Liter
U = constituent not detected above the associated result; J = constituent present at estimated value.

Table 3-15. PRASA pipeline area sample results.

Sample ID	Analyte	Result	Qualifier	Unit
PRASA-01-SS	Sulfolane	39	U	µg/Kg
PRASA-01-SO-10	Sulfolane	39	U	µg/Kg
PRASA-01-GW	Sulfolane	2.4	J	µg/L
PRASA-02-SS	Sulfolane	38	U	µg/Kg
PRASA-02-SO-10	Sulfolane	40	U	µg/Kg
PRASA-02-GW	Sulfolane	0.98	J	µg/L
PRASA-03-SS	Sulfolane	38	U	µg/Kg
PRASA-03-SO-10	Sulfolane	41	U	µg/Kg
PRASA-03-GW	Sulfolane	37		µg/L
PRASA-04-SS	Sulfolane	38	U	µg/Kg
PRASA-04-SO-10	Sulfolane	85	J	µg/Kg
PRASA-04-GW	Sulfolane	250		µg/L
PRASA-05-SS	Sulfolane	40	U	µg/Kg
PRASA-05-SO-08	Sulfolane	43	U	µg/Kg

Sample ID	Analyte	Result	Qualifier	Unit
PRASA-05-GW	Sulfolane	64		µg/L
PRASA-06-SS	Sulfolane	38	U	µg/Kg
PRASA-06-SO-06	Sulfolane	40	U	µg/Kg
PRASA-06-GW	Sulfolane	85		µg/L

µg/Kg = micrograms per Kilogram
µg/L = micrograms per Liter
U = constituent not detected above the associated result; J = constituent present at estimated value.

Table 3-16. Effluent Channel sediment sample results.

Sample ID	Sampling Date	Analyte	Result	Qualifier	Unit
CHANNEL-1	7/11/2013	Sulfolane	83	U	µg/Kg
CHANNEL-2	7/11/2013	Sulfolane	190	U	µg/Kg
CHANNEL-3	7/11/2013	Sulfolane	47	U	µg/Kg
CHANNEL-1	12/10/2013	Sulfolane	48	U	µg/Kg
CHANNEL-2	12/10/2013	Sulfolane	190	J	µg/Kg
CHANNEL-3	12/10/2013	Sulfolane	57	U	µg/Kg
CHANNEL-11	11/12/2013	Sulfolane	68	J	µg/Kg
CHANNEL-12	11/12/2013	Sulfolane	46	UJ	µg/Kg
CHANNEL-13	11/12/2013	Sulfolane	48	UJ	µg/Kg
CHANNEL-14	11/12/2013	Sulfolane	45	UJ	µg/Kg
CHANNEL-15	11/12/2013	Sulfolane	49	J	µg/Kg
CHANNEL-16	11/11/2013	Sulfolane	45	U	µg/Kg
CHANNEL-17	11/11/2013	Sulfolane	150	J	µg/Kg
CHANNEL-18	11/11/2013	Sulfolane	48	U	µg/Kg
CHANNEL-19	11/11/2013	Sulfolane	46	U	µg/Kg
CHANNEL-20	11/11/2013	Sulfolane	54	U	µg/Kg

µg/Kg = micrograms per Kilogram
U = constituent not detected above the associated result; J = constituent present at estimated value.

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Table 5-1. Exposure point concentrations.

Matrix	Analyte	Total Samples	Total Detects	Maximum Detected	Unit	95UCL	95UCL Basis
MW	Sulfolane	231	165	14,000	µg/L	569.9	95UCL
MW_MWD	Sulfolane	316	223	14,000	µg/L	574.6	95UCL
MWD	Sulfolane	85	58	4,700	µg/L	991.8	95UCL
SB	Sulfolane	317	43	370,000	µg/Kg	12,357	95UCL
SD	Sulfolane	16	4	190	µg/Kg	74.37	95UCL
SS	Sulfolane	322	40	17,000,000	µg/Kg	396,338	95UCL
SS_SB	Sulfolane	639	83	17,000,000	µg/Kg	198,389	95UCL
SW	Sulfolane	6	5	240	µg/L	60.14	95UCL

MW = Upper Alluvial groundwater
MWD = Lower Alluvial groundwater
MW_MWD = combined groundwater
SB = subsurface soil
SD = sediment
SS = surface soil
SS_SB = combined soil
SW = surface water

Table 5-2. Residential cumulative risk.

Media	Pathway	HI	% HI
Combined Groundwater	**Ingestion**	**4.E+01**	99.9%
	Dermal	5.E-02	0.1%
	Inhalation	-	-
	Subtotal	**4.E+01**	100%
	TOTAL	**4.E+01**	100%

Table. 5-3. Resident scenario – child, combined Upper and Lower Aquifer groundwater, potential noncarcinogenic risk.

						Ingestion		Dermal			Inhalation				Total
Chemical	**Cas No.**	**Analysis**	**RfDo**	**RfCi (mg/M³)**	**EPC (mg/L)**	**CDI (mg/Kg-day)**	**HI**	**GI Factor**	**CDI (mg/Kg-day)**	**HI**	**K_Res**	**IC (mg/m³)**	**EC (mg/m³)**	**HI**	**HI**
Sulfolane	126-33-0	SVOC	1.00E-03	2.00E-03	5.75E-01	3.67E-02	4.E+01	5.00E-01	4.69E-05	5.E-02	-	-	-	-	**4.E+01**

General Intake Parameters	**Units**		**Value**
Target Excess Lifetime Cancer Risk (TR_Res)	--	TR_Res	1.00E-06
Target Hazard Index (THI_Res)	--	THI_Res	1
Body Weight Adult (BW_Res)	Kg	BW_Res	70
Body Weight Child (BW_C)	Kg	BW_C	15
Averaging Time, Cancer (ATc_Res)	Yr	ATc_Res	70
Averaging Time, Non-Cancer (ATn_Res)	Yr	ATn_Res	24
Averaging Time, Non-Cancer (ATn_C)	Yr	ATn_C	6
Exposure Frequency (EF_Res)	Days/yr	EF_Res	350
Exposure Time - Showering Child (ET_C)	Hrs	ET_C	1
Exposure Time - Showering (ET_Res)	Hrs	ET_Res	0.58
Exposure Duration (ED_Res)	Yr	ED_Res	30
Exposure Duration Child (ED_C)	Yr	ED_C	6
Water Ingestion Rate - Adult (IRw_Res)	L/day	IRw_Res	2
Water Ingestion Rate - Adult (IRw_C)	L/day	IRw_C	1
Water Ingestion Factor - Age adjusted (IRw_aa)	L-year/Kg-day	IRw_aa	1.09
Air Inhalation Exposure Time (ETRes	days/day	ET_Res_MW	1.00
Air Inhalation Rate - Adult (IRa_Res)	M³/day	IRa_Res	20
Air Inhalation Rate - Child (IRa_C)	M³/day	IRa_C	10
Air Inhalation Factor - Age adjusted (IRa_aa)	M³-yr/Kg-day	IRa_aa	10.9
Volatilization Factor, Water (K_Res)	L/m3	K_Res	-
Skin Surface Area - Adult (SA_Res)	cm²/day	SA_Res	18000
Skin Surface Area - Child (SA_C)	cm²/day	SA_C	6600
Skin Factor - Age adjusted (SA_aa)	cm²-yr/Kg-day	SA_aa	6240
Dermal Permeability (PC)	cm/hr	PC	chem-spec

Ingestion CDI = EPC*IRw_C*EF_C*ED_C/BW_C/ATn_C/365

Dermal CDI = EPC*SA_WC*PC*ET_WC*EF_WC*ED_WC*0.001/BW_WC/AT/365

Inhalation IC = EPC*K_Res

Inhalation EC = IC*EF_Res*ED_C/ATn_C/365

ELCR = CDI * SF

Dermal HI = CDI/RfDo/GI Factor

HI = CDI/RfD

Table 5-4. Industrial worker cumulative risk.

Media	Pathway	HI	% HI
Surface Soil	**Ingestion**	4.E-01	43%
	Dermal	5.E-01	57%
	Inhalation	4.E-05	0%
	Subtotal	9.E-01	100%
	TOTAL	9.E-01	100%

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Table 5-5. Industrial worker scenario, onsite soil, potential noncarcinogenic risk.

						Ingestion		Dermal				Inhalation				Total
Chemical	Cas No.	Analysis	RfDo	RfCi (mg/M³)	EPC (mg/Kg)	CDI (mg/Kg-day)	HI	ABS	GI Factor	CDI (mg/Kg-day)	HI	VFi	IC (mg/m³)	EC (mg/m³)	HI	HI
Sulfolane	126-33-0	SVOC	1.00E-03	2.00E-03	3.96E+02	3.88E-04	4.E-01	1.00E-01	5.00E-01	5.12E-04	5.E-01	-	3.66E-07	8.36E-08	4.E-05	9.E-01

General Intake Parameters	Units		Value
Target Excess Lifetime Cancer Risk (TR_SI)	--	TR_SI	1.00E-06
Target Hazard Index (THI_SI)	--	THI_SI	1
Body Weight Adult (BW_SI)	Kg	BW_SI	70
Averaging Time, Cancer (ATc_SI)	Yr	ATc_SI	70
Averaging Time, Non-Cancer (ATn_SI)	Yr	ATn_SI	25
Exposure Frequency (EF_SI)	Days/yr	EF_SI	250
Exposure Duration (ED_SI)	Yr	ED_SI	25
Soil Ingestion Rate - Adult (IRs_SI)	mg/day	IRs_SI	100
Air Inhalation Exposure Time (ET_IW)	days/day	ET_IW	0.33
Air Inhalation Rate - Adult (IRa_SI)	M³/day	IRa_SI	20
Particulate Emission Factor (PEF_SI)	M³/Kg	PEF_SI	1.08E+09
Volatilization Factor, Soil (VFc)	M³/Kg		chem-spec
Skin Surface Area - Adult (SA_SI)	cm²/day	SA_SI	3300
Adherence Factor Adult (AF_SI)	mg/cm²	AF_SI	0.2
Absorption Factor (ABS)	--		chem-spec
Gastro-intestinal Factor (GI Factor)	--		chem-spec

Ingestion CDI = EPC*IRs_SI*EF_SI*ED_SI*0.000001/BW_SI/AT/365

Dermal CDI = EPC*SA_SI*AF_SI*ABS*EF_SI*ED_SI*0.000001/BW_SI/AT/365/GI Factor

Inhalation IC = EPC*(1/PEF_SI+1/VFi), Inhalation EC = IC*EF_SI*ED_SI/ATc_SI/365

ELCR = CDI * SF

HI = CDI/RfD

						Ingestion		Dermal				Inhalation				Total
Chemical	Cas No.	Analysis	RfDo	RfCi (mg/M3)	EPC (mg/Kg)	CDI (mg/Kg-day)	HI	ABS	GI Factor	CDI (mg/Kg-day)	HI	VFi	IC (mg/m3)	EC (mg/m3)	HI	HI
Sulfolane	126-33-0	SVOC	1.00E-03	2.00E-03	4.04E+02	3.95E-04	4.E-01	1.00E-01	5.00E-01	5.22E-04	5.E-01	-	3.73E-07	8.52E-08	4.E-05	9.E-01

General Intake Parameters	Units		Value
Target Excess Lifetime Cancer Risk (TR_SI)	--	TR_SI	1.00E-06
Target Hazard Index (THI_SI)	--	THI_SI	1
Body Weight Adult (BW_SI)	Kg	BW_SI	70
Averaging Time, Cancer (ATc_SI)	Yr	ATc_SI	70

Ingestion CDI = EPC*IRs_SI*EF_SI*ED_SI*0.000001/BW_SI/AT/365

Averaging Time, Non-Cancer (ATn_SI)	Yr	ATn_SI	25
Exposure Frequency (EF_SI)	Days/yr	EF_SI	250
Exposure Duration (ED_SI)	Yr	ED_SI	25
Soil Ingestion Rate - Adult (IRs_SI)	mg/day	IRs_SI	100
Air Inhalation Exposure Time (ET_IW)	days/day	ET_IW	0.33
Air Inhalation Rate - Adult (IRa_SI)	M3/day	IRa_SI	20
Particulate Emission Factor (PEF_SI)	M3/Kg	PEF_SI	1.08E+09
Volatilization Factor, Soil (VFc)	M3/Kg		chem-spec
Skin Surface Area - Adult (SA_SI)	cm2/day	SA_SI	3300
Adherence Factor Adult (AF_SI)	mg/cm2	AF_SI	0.2
Absorption Factor (ABS)	--		chem-spec
Gastro-intestinal Factor (GI Factor)	--		chem-spec

Dermal CDI = EPC*SA_SI*AF_SI*ABS*EF_SI*ED_SI*0.000001/BW_SI/AT/365/GI Factor

Inhalation IC = EPC*(1/PEF_SI+1/VFi), Inhalation EC = IC*EF_SI*ED_SI/ATc_SI/365

ELCR = CDI * SF

HI = CDI/RfD

Table 5-6. Construction worker cumulative risk.

Media	Pathway	HI	% HI
Combined Soil	**Ingestion**	6.E-01	62.2%
	Dermal	4.E-01	37.3%
	Inhalation	3.E-03	0.3%
	Subtotal	**1.E+00**	99.8%
Groundwater	**Ingestion**	-	-
	Dermal	2.E-03	0.2%
	Inhalation	-	-
	Subtotal	2.E-03	0.2%
	TOTAL	**1.E+00**	100%

Media	Pathway	HI	% HI	ILCR	% ILCR
Combined Soil	**Ingestion**	6.E-01	62%	-	-
	Dermal	4.E-01	37%	-	-
	Inhalation	3.E-03	0%	-	-
	Subtotal	**1.E+00**	100%	-	-
Groundwater	**Ingestion**	-	0%	-	-
	Dermal	2.E-03	0%	-	-
	Inhalation	-	0%	-	-
	Subtotal	2.E-03	0%	-	-
	TOTAL	**1.E+00**	100%		

Table 5-7. Construction worker scenario, onsite combined soil, potential noncarcinogenic risk.

Chemical	Cas No.	Analysis	RfDo	RfCi (mg/M³)	EPC (mg/Kg)	Ingestion CDI (mg/Kg-day)	Ingestion HI	Dermal ABS	Dermal GI Factor	Dermal CDI (mg/Kg-day)	Dermal HI	Inhalation VFc	Inhalation IC (mg/m³)	Inhalation EC (mg/m³)	Inhalation HI	Total HI
Sulfolane	126-33-0	SVOC	1.00E-03	2.00E-03	1.98E+02	6.41E-04	6.E-01	1.00E-01	5.00E-01	3.84E-04	4.E-01	-	2.44E-05	5.56E-06	3.E-03	**1.E+00**

General Intake Parameters	Units		Value
Target Excess Lifetime Cancer Risk (TR_SC)	--	TR_SC	1.00E-06
Target Hazard Index (THI_SC)	--	THI_SC	1
Body Weight Adult (BW_SC)	Kg	BW_SC	70
Averaging Time, Cancer (ATc_SC)	Yr	ATc_SC	70
Averaging Time, Non-Cancer (ATn_SC)	Yr	ATn_SC	1
Exposure Frequency (EF_SC)	Days/yr	EF_SC	250
Exposure Duration (ED_SC)	Yr	ED_SC	1
Soil Ingestion Rate - Adult (IRs_SC)	mg/day	IRs_SC	330
Air Inhalation Exposure Time (ET_CW)	days/day	ET_CW	0.33
Air Inhalation Rate - Adult (IRa_SC)	M³/day	IRa_SC	20
Particulate Emission Factor (PEF_SC)	M³/Kg	PEF_SC	8.14E+06
Volatilization Factor, Soil (VFc)	M³/Kg		chem-spec
Skin Surface Area - Adult (SA_SC)	cm²/day	SA_SC	3300
Adherence Factor Adult (AF_SC)	mg/cm²	AF_SC	0.3
Absorption Factor (ABS_SC)	--	ABS_SC	chem-spec
Gastro-intestinal Factor (GI Factor)	--	GI	chem-spec

Ingestion CDI = EPC*IRs_SC*EF_SC*ED_SC*0.000001/BW_SC/AT/365

Dermal CDI = EPC*SA_SC*AF_SC*ABS*EF_SC*ED_SC*0.000001/BW_SC/AT/365/GI Factor

Inhalation IC = EPC*(1/PEF_SC+1/VFc), Inhalation EC = IC*EF_SC*ED_SC/ATn_SC/365

ELCR = CDI * SF

HI = CDI/RfD

Chemical	Cas No.	Analysis	RfDo	RfCi (mg/M3)	EPC (mg/Kg)	Ingestion CDI (mg/Kg-day)	Ingestion HI	Dermal ABS	Dermal GI Factor	Dermal CDI (mg/Kg-day)	Dermal HI	Inhalation VFc	Inhalation IC (mg/m3)	Inhalation EC (mg/m3)	Inhalation HI	Total HI
Sulfolane	126-33-0	SVOC	1.00E-03	2.00E-03	2.00E+02	6.47E-04	6.E-01	1.00E-01	5.00E-01	3.88E-04	4.E-01	-	2.46E-05	5.62E-06	3.E-03	1.E+00
							6.E-01				4.E-01				3.E-03	**1.E+00**

General Intake Parameters	Units		Value
Target Excess Lifetime Cancer Risk (TR_SC)	--	TR_SC	1.00E-06
Target Hazard Index (THI_SC)	--	THI_SC	1
Body Weight Adult (BW_SC)	Kg	BW_SC	70
Averaging Time, Cancer (ATc_SC)	Yr	ATc_SC	70
Averaging Time, Non-Cancer (ATn_SC)	Yr	ATn_SC	1

Ingestion CDI = EPC*IRs_SC*EF_SC*ED_SC*0.000001/BW_SC/AT/365

Dermal CDI = EPC*SA_SC*AF_SC*ABS*EF_SC*ED_SC*0.000001/BW_SC/AT/365/GI Factor

Exposure Frequency (EF_SC)	Days/yr	EF_SC	250
Exposure Duration (ED_SC)	Yr	ED_SC	1
Soil Ingestion Rate - Adult (IRs_SC)	mg/day	IRs_SC	330
Air Inhalation Exposure Time (ET_CW)	days/day	ET_CW	0.33
Air Inhalation Rate - Adult (IRa_SC)	M3/day	IRa_SC	20
Particulate Emission Factor (PEF_SC)	M3/Kg	PEF_SC	8.14E+06
Volatilization Factor, Soil (VFc)	M3/Kg		chem-spec
Skin Surface Area - Adult (SA_SC)	cm2/day	SA_SC	3300
Adherence Factor Adult (AF_SC)	mg/cm2	AF_SC	0.3
Absorption Factor (ABS_SC)	--		chem-spec
Gastro-intestinal Factor (GI Factor)	--		chem-spec

Inhalation IC = EPC*(1/PEF_SC+1/VFc), Inhalation EC = IC*EF_SC*ED_SC/ATn_SC/365

ELCR = CDI * SF

HI = CDI/RfD

Table 5-8. Construction worker scenario, combined groundwater, potential noncarcinogenic risk.

						Ingestion		Dermal			Inhalation				Total
Chemical	**Cas No.**	**Analysis**	**RfDo**	**RfCi (mg/M^3)**	**EPC (mg/L)**	**CDI (mg/Kg-day)**	**HI**	**GI Factor**	**CDI (mg/Kg-day)**	**HI**	**K_WC**	**IC (mg/m^3)**	**EC (mg/m^3)**	**HI**	**HI**
Sulfolane	126-33-0	SVOC	1.00E-03	2.00E-03	5.70E-01	-	-	5.00E-01	1.65E-06	2.E-03	-	-	-	-	2.E-03

General Intake Parameters	**Units**		**Value**
Target Excess Lifetime Cancer Risk (TR_WC)	--	TR_WC	1.00E-06
Target Hazard Index (THI_WC)	--	THI_WC	1
Body Weight Adult (BW_WC)	Kg	BW_WC	70
Averaging Time, Cancer (ATc_WC)	Yr	ATc_WC	70
Averaging Time, Non-Cancer (ATn_WC)	Yr	ATn_WC	1
Exposure Frequency (EF_WC)	Days/yr	EF_WC	25
Exposure Time (ET_WC)	Hrs	ET_WC	8
Exposure Duration (ED_WC)	Yr	ED_WC	1
Water Ingestion Rate - Adult (Irw_WC)	L/day	IRw_WC	
Air Inhalation Exposure Time (ET_CW)	days/day	ET_CW	0.33
Air Inhalation Rate - Adult (IRa_WC)	M^3/day	IRa_WC	20
Volatilization Factor, Water (K_WC)	L/m3	K_WC	-
Skin Surface Area - Adult (SA_WC)	cm^2/day	SA_WC	3300
Dermal Permeability (Kp)	cm/hr	Kp	chem-spec

Ingestion CDI = EPC*IRw_WC*EF_WC*ED_WC/BW_WC/AT/365

Dermal CDI = See Constructionworker_DAD GW.xls spreadsheet

Inhalation IC = EPC*K_WC

Inhalation EC = IC*EF_WC*ED_WC/ATn_WC/365

ELCR = CDI * SF

HI = CDI/RfD

Table 5-9. Trespasser cumulative risk.

Media	Pathway	HI	% HI
Surface Soil	**Ingestion**	9.E-02	25.6%
	Dermal	3.E-01	71.7%
	Inhalation	4.E-06	0.0%
	Subtotal	4.E-01	97.3%
Sediment	**Ingestion**	6.E-06	0.0%
	Dermal	5.E-05	0.0%
	Inhalation	8.E-10	0.0%
	Subtotal	5.E-05	0.0%
Surface Water	**Ingestion**	9.E-03	2.6%
	Dermal	2.E-04	0.1%
	Inhalation	-	-
	Subtotal	9.E-03	2.6%
	TOTAL	**1.E+00**	100%

Table 5-10. Trespasser scenario, surface soil, potential noncarcinogenic risk.

						Ingestion		Dermal				Inhalation				Total
Chemical	Cas No.	Analysis	RfDo	RfCi (mg/M³)	EPC (mg/Kg)	CDI (mg/Kg-day)	HI	ABS	GI Factor	CDI (mg/Kg-day)	HI	VFc	IC (mg/m³)	EC (mg/m³)	HI	HI
Sulfolane	126-33-0	SVOC	1.00E-03	2.00E-03	3.98E+02	9.22E-05	9.E-02	1.00E-01	5.00E-01	2.58E-04	3.E-01	-	3.73E-07	8.52E-09	4.E-06	4.E-01

General Intake Parameters	Units		Value
Target Excess Lifetime Cancer Risk (TR_TRES)	--	TR_TRES	1.00E-06
Target Hazard Index (THI_TRES)	--	THI_TRES	1
Body Weight Adult (BW_TRES)	Kg	BW_TRES	45
Averaging Time, Cancer (ATc_TRES)	Yr	ATc_TRES	70
Averaging Time, Non-Cancer (ATn_TRES)	Yr	ATn_TRES	12
Exposure Frequency (EF_TRES)	Days/yr	EF_TRES	50
Exposure Duration (ED_TRES)	Yr	ED_TRES	12
Water Ingestion Rate (IRw_TRES)	L/day	IRw_TRES	0.05
Sediment Ingestion Rate - Adult (IRs_TRES)	mg/day	IRsed_TRES	25
Soil Ingestion Rate - Adult (IRs_TRES)	mg/day	IRs_TRES	75
Air Inhalation Exposure Time (ET_Tres)	days/day	ET_Tres	0.17
Air Inhalation Rate - Adult (IRa_TRES)	M³/day	IRa_TRES	2.25
Particulate Emission Factor (PEF_TRES)	M³/Kg	PEF_TRES	1.08E+09
Volatilization Factor, Soil (VFc)	M³/Kg		chem-spec
Skin Surface Area - Adult (SA_TRES)	cm²/day	SA_TRES	3500
Adherence Factor Adult (AF_TRES)	mg/cm²	AF_TRES	0.3
Absorption Factor (ABS_TRES)	--	ABS_TRES	chem-spec
Gastro-intestinal Factor (GI Factor)	--	GI	chem-spec

Ingestion CDI = EPC*IRs_TRES*EF_TRES*ED_TRES*0.000001/BW_TRES/ATn_TRES/365

Dermal CDI = EPC*SA_TRES*AF_TRES*ABS*EF_TRES*ED_TRES*0.000001/BW_TRES/ATn_TRES/365/GI Factor

Inhalation IC = EPC*(1/PEF_TRES+1/VFc), Inhalation EC = IC*EF_TRES*ED_TRES/BW_TRES/ATn_TRES/365

ELCR = CDI * SF

HI = CDI/RfD

Table 5-11. Trespasser scenario, surface water, potential noncarcinogenic risk.

						Ingestion		Dermal			Inhalation				Total
Chemical	**Cas No.**	**Analysis**	**RfDo**	**RfCi (mg/M^3)**	**EPC (mg/L)**	**CDI (mg/Kg-day)**	**HI**	**GI Factor**	**CDI (mg/Kg-day)**	**HI**	**K_Tres**	**IC (mg/m^3)**	**EC (mg/m^3)**	**HI**	**HI**
Sulfolane	126-33-0	SVOC	1.00E-03	2.00E-03	6.01E-02	9.15E-06	9.E-03	5.00E-01	1.91E-07	2.E-04	-	-	-	-	9.E-03

General Intake Parameters	**Units**		**Value**
Target Excess Lifetime Cancer Risk (TR_TRES)	--	TR_TRES	1.00E-06
Target Hazard Index (THI_TRES)	--	THI_TRES	1
Body Weight Adult (BW_TRES)	Kg	BW_TRES	45
Averaging Time, Cancer (ATc_TRES)	Yr	ATc_TRES	70
Averaging Time, Non-Cancer (ATn_TRES)	Yr	ATn_TRES	12
Exposure Frequency (EF_TRES)	Days/yr	EF_TRES	50
Exposure Duration (ED_TRES)	Yr	ED_TRES	12
Water Ingestion Rate (IRw_TRES)	L/day	IRw_TRES	0.05
Soil Ingestion Rate - Adult (IRs_TRES)	mg/day	IRs_TRES	100
Air Inhalation Expsoure Time (ET_Tres)	days/day	ET_Tres	0.17
Air Inhalation Rate - Adult (IRa_TRES)	M^3/day	IRa_TRES	2.25
Particulate Emission Factor (PEF_TRES)	M^3/Kg	PEF_TRES	8.47E+08
Volatilization Factor, Soil (VFc)	M^3/Kg	VFc	chem-spec
Volatilization Factor, Water (K_Tres)	L/m3	K_Tres	-
Skin Surface Area - Adult (SA_TRES)	cm^2/day	SA_TRES	3500
Dermal contact time (t_Event)	hr/event	t_Event	2
Adherence Factor Adult (AF_TRES)	mg/cm^2	AF_TRES	0.3
Absorption Factor (ABS_TRES)	--	ABS_TRES	chem-spec
Gastro-intestinal Factor (GI Factor)	--	GI	chem-spec

Ingestion CDI = EPC*IRw_WC*EF_WC*ED_WC/BW_WC/AT/365

Dermal CDI = See Constructionworker_DAD GW.xls spreadsheet

Inhalation IC = EPC*K_Tres

Inhalation EC = IC*EF_Tres*ED_Tres/ATn_Tres/365

ELCR = CDI * SF

HI = CDI/RfD

						Ingestion		Dermal			Inhalation				Total
Chemical	**Cas No.**	**Analysis**	**RfDo**	**RfCi (mg/M^3)**	**EPC (mg/L)**	**CDI (mg/Kg-day)**	**HI**	**GI Factor**	**CDI (mg/Kg-day)**	**HI**	**K_Tres**	**IC (mg/m^3)**	**EC (mg/m^3)**	**HI**	**HI**
Sulfolane	126-33-0	SVOC	1.00E-03	2.00E-03	6.01E-02	9.15E-06	9.E-03	5.00E-01	1.91E-07	2.E-04	-	-	-	-	9.E-03

General Intake Parameters	**Units**		**Value**
Target Excess Lifetime Cancer Risk (TR_TRES)	--	TR_TRES	1.00E-06
Target Hazard Index (THI_TRES)	--	THI_TRES	1

Body Weight Adult (BW_TRES)	Kg	BW_TRES	45
Averaging Time, Cancer (ATc_TRES)	Yr	ATc_TRES	70
Averaging Time, Non-Cancer (ATn_TRES)	Yr	ATn_TRES	12
Exposure Frequency (EF_TRES)	Days/yr	EF_TRES	50
Exposure Duration (ED_TRES)	Yr	ED_TRES	12
Water Ingestion Rate (IRw_TRES)	L/day	IRw_TRES	0.05
Soil Ingestion Rate - Adult (IRs_TRES)	mg/day	IRs_TRES	100
Air Inhalation Expsoure Time (ET_Tres)	days/day	ET_Tres	0.17
Air Inhalation Rate - Adult (IRa_TRES)	M^3/day	IRa_TRES	2.25
Particulate Emission Factor (PEF_TRES)	M^3/Kg	PEF_TRES	8.47E+08
Volatilization Factor, Soil (VFc)	M^3/Kg	VFc	chem-spec
Volatilization Factor, Water (K_Tres)	L/m3	K_Tres	0.5
Skin Surface Area - Adult (SA_TRES)	cm^2/day	SA_TRES	3500
Dermal contact time (t_Event)	hr/event	t_Event	2
Adherence Factor Adult (AF_TRES)	mg/cm^2	AF_TRES	0.3
Absorption Factor (ABS_TRES)	--		chem-spec
Gastro-intestinal Factor (GI Factor)	--		chem-spec

Ingestion CDI	=	EPC*IRw_WC*EF_WC*ED_WC/BW_WC/AT/365			
Dermal CDI	=	See Constructionworker_DAD GW.xls spreadsheet			
Inhalation IC	=	EPC*K_Tres	Inhalation EC	=	IC*EF_Tres*ED_Tres/ATn_Tres/365
ELCR	=	CDI * SF			
HI	=	CDI/RfD			

Table 5-12. Trespasser scenario, sediment, potential noncarcinogenic risk.

Chemical	Cas No.	Analysis	RfDo	RfCi (mg/M³)	EPC (mg/Kg)	Ingestion CDI (mg/Kg-day)	Ingestion HI	Dermal ABS	Dermal GI Factor	Dermal CDI (mg/Kg-day)	Dermal HI	Inhalation VFc	Inhalation IC (mg/m³)	Inhalation EC (mg/m³)	Inhalation HI	Total HI
Sulfolane	126-33-0	SVOC	1.00E-03	2.00E-03	7.44E-02	5.66E-09	6.E-06	1.00E-01	5.00E-01	4.75E-08	5.E-05	-	6.87E-11	1.57E-12	8.E-10	5.E-05

General Intake Parameters	Units		Value
Target Excess Lifetime Cancer Risk (TR_TRES)	--	TR_TRES	1.00E-06
Target Hazard Index (THI_TRES)	--	THI_TRES	1
Body Weight Adult (BW_TRES)	Kg	BW_TRES	45
Averaging Time, Cancer (ATc_TRES)	Yr	ATc_TRES	70
Averaging Time, Non-Cancer (ATn_TRES)	Yr	ATn_TRES	12
Exposure Frequency (EF_TRES)	Days/yr	EF_TRES	50
Exposure Duration (ED_TRES)	Yr	ED_TRES	12
Water Ingestion Rate (IRw_TRES)	L/day	IRw_TRES	0.05
Sediment Ingestion Rate - Adult (IRs_TRES)	mg/day	IRsed_TRES	25
Soil Ingestion Rate - Adult (IRs_TRES)	mg/day	IRs_TRES	75
Air Inhalation Exposure Time (ET_Tres)	days/day	ET_Tres	0.17
Air Inhalation Rate - Adult (IRa_TRES)	M³/day	IRa_TRES	2.25
Particulate Emission Factor (PEF_TRES)	M³/Kg	PEF_TRES	1.08E+09
Volatilization Factor, Soil (VFc)	M³/Kg		chem-spec
Skin Surface Area - Adult (SA_TRES)	cm²/day	SA_TRES	3500
Adherence Factor Adult (AF_TRES)	mg/cm²	AF_TRES	0.3
Absorption Factor (ABS_TRES)	--	ABS_TRES	chem-spec
Gastro-intestinal Factor (GI Factor)	--	GI	chem-spec

Ingestion CDI = EPC*IRs_TRES*EF_TRES*ED_TRES*0.000001/BW_TRES/ATn_TRES/365

Dermal CDI = EPC*SA_TRES*AF_TRES*ABS*EF_TRES*ED_TRES*0.000001/BW_TRES/ATn_TRES/365/GI Factor

Inhalation IC = EPC*(1/PEF_TRES+1/VFc), Inhalation EC = IC*EF_TRES*ED_TRES/ATn_TRES/365

ELCR = CDI * SF

HI = CDI/RfD