Sign In Sheet
For
Meeting with
Koch Nitrogen Company, LLC and the Kansas Department of Health and Environment
June 15, 2012
EPA Regional Office
Conference Room 3130

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RCRA
522419

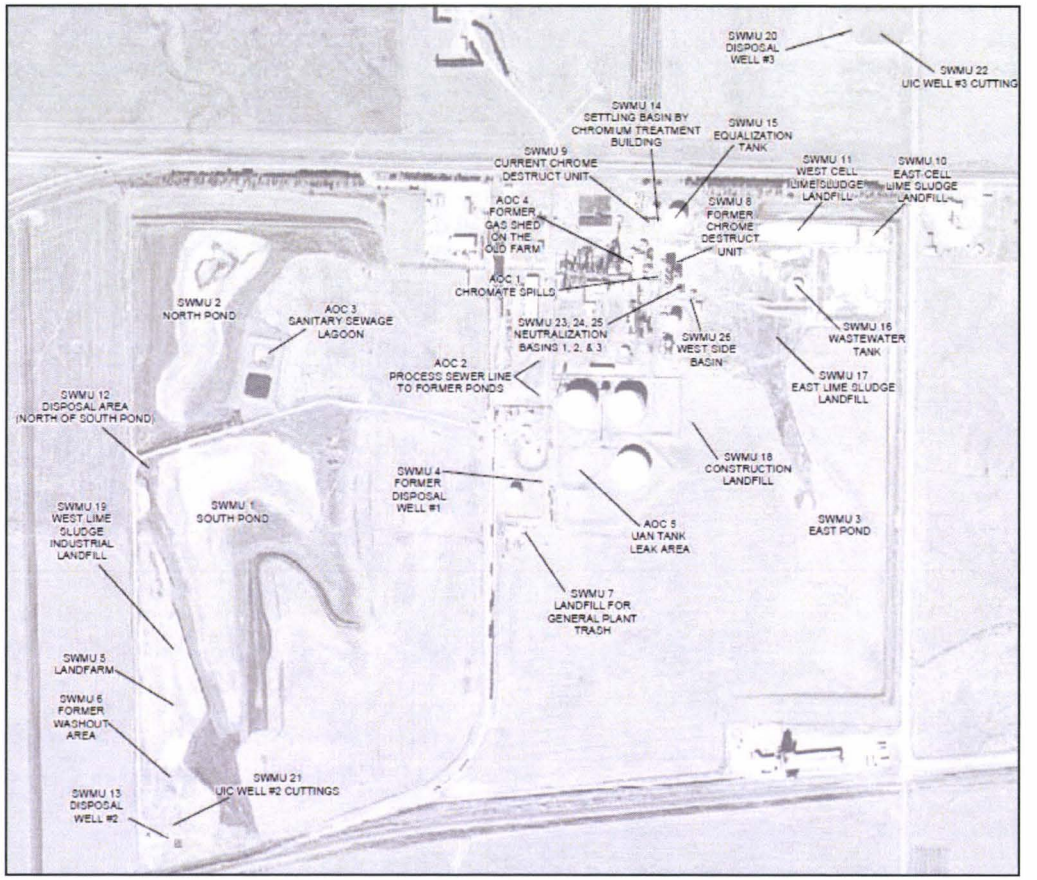
Project Review

KNC Dodge City Facility

15 June 2012

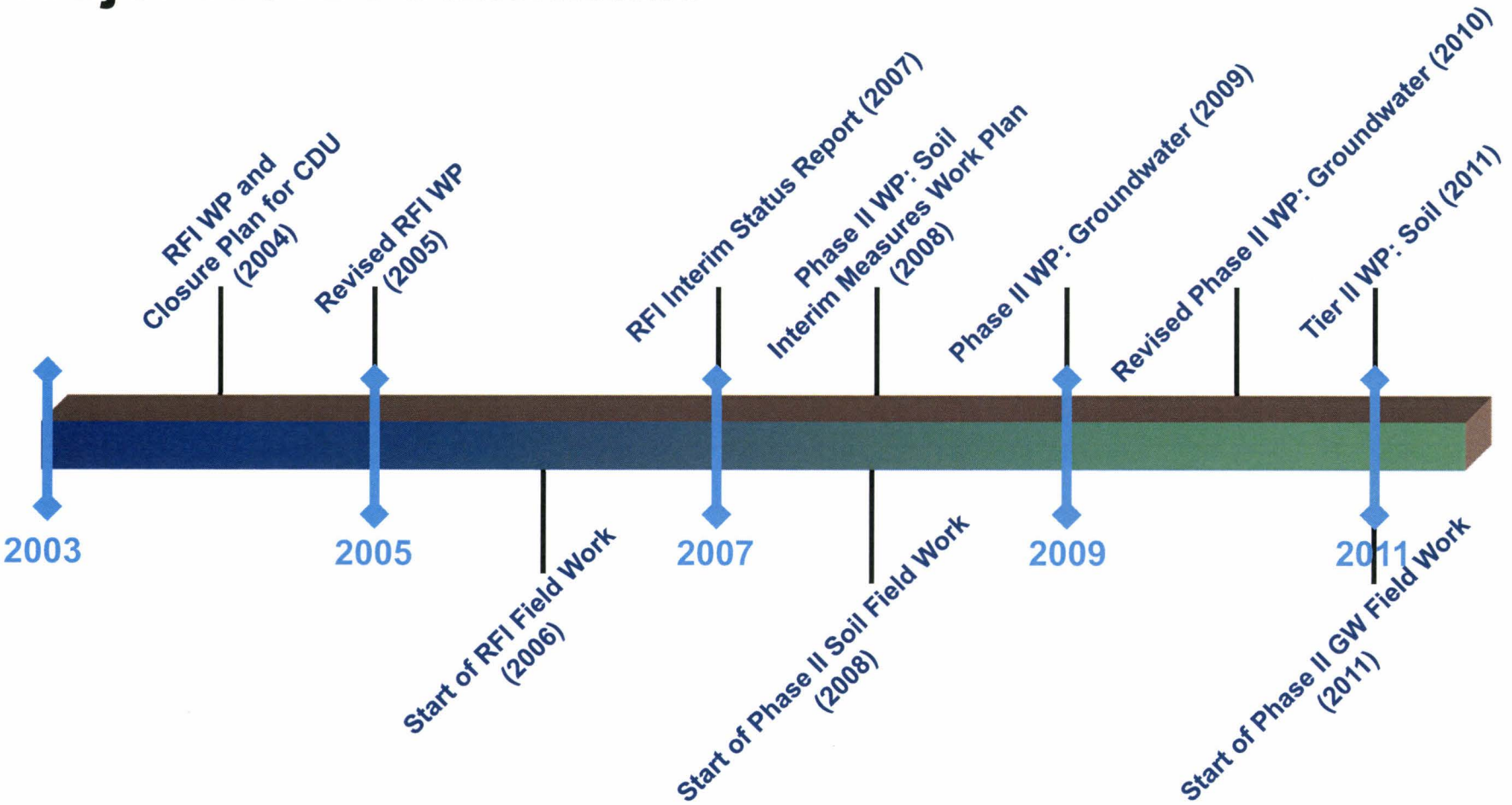
Discussion Outline

- **KNC RCRA Program History**
- **Tier II Work Plan**
  - **Approach**
  - **Hexavalent Chromium**
- **Path Forward**
  - **Delineation Completion**
  - **RFI Report**
  - **Corrective Measures Study**
  - **Corrective Measures**



KNC RCRA Program History

Major RCRA Submittals

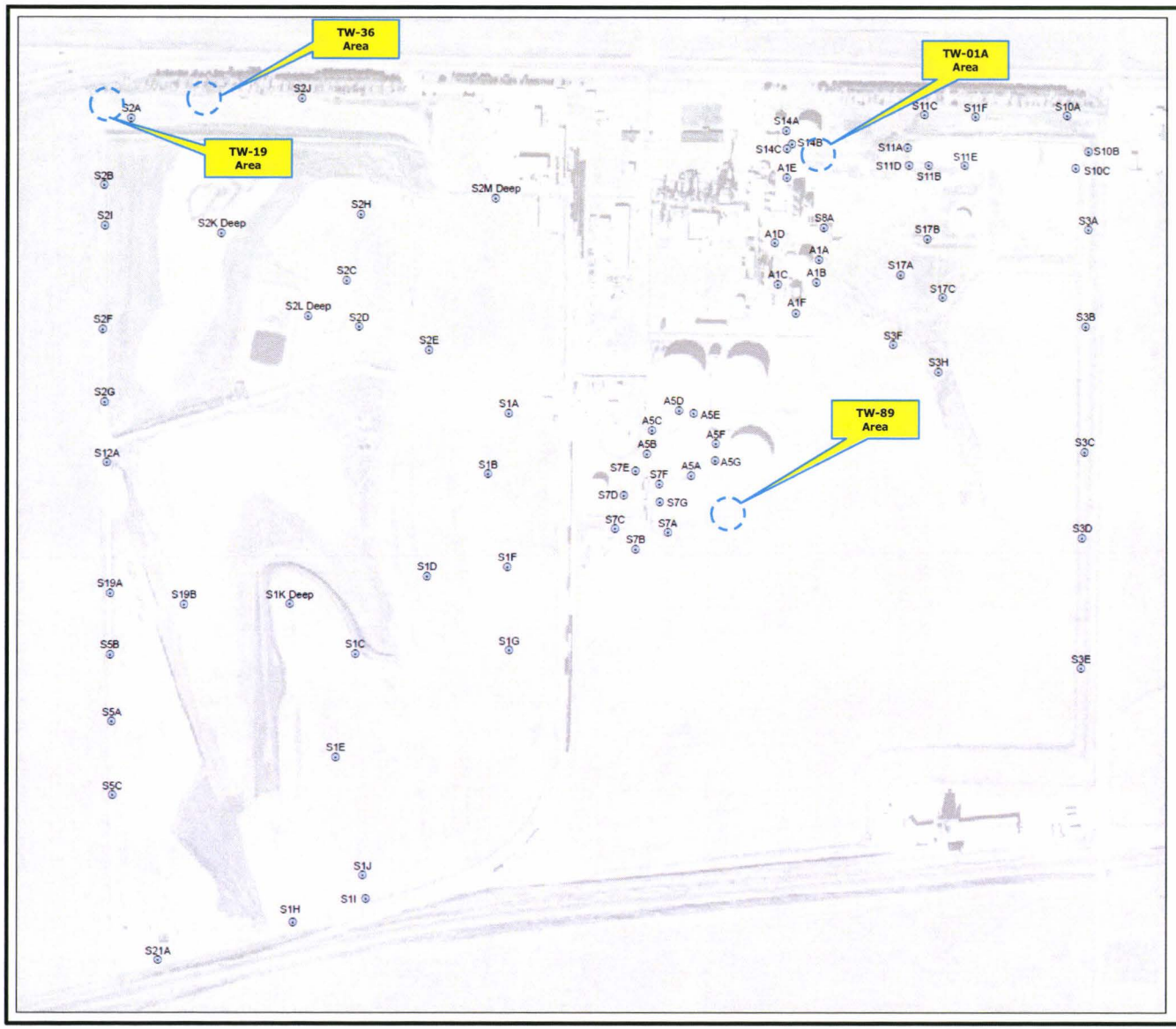


Field Activities

Tier II Overview

- **Phase I and Phase II soil sampling has:**
  - **Identified COCs in each SWMU/AOC**
  - **Identified major source areas**
  - **Provided delineation of individual COCs in many areas**
- **Tier II Objective**
  - **Complete delineation activities, to the extent possible, with a program that focuses on identifying the extent of COCs identified in Phase I and II**

Tier II Soils Work Plan



LEGEND

⊕ PROPOSED BORING LOCATION

NOTE:

PROPOSED BORING LOCATIONS ARE APPROXIMATE. FINAL BORING LOCATIONS MAY BE MODIFIED BASED ON SPACING AND ACCESS REQUIREMENTS FOR THE DRILL RIG, AND/OR TO AVOID OVERHEAD UTILITIES AND/OR UNDERGROUND STRUCTURES AND CONVEYANCES.

-N-

500 0 500

Feet

PROPOSED TIER II BORING LOCATIONS

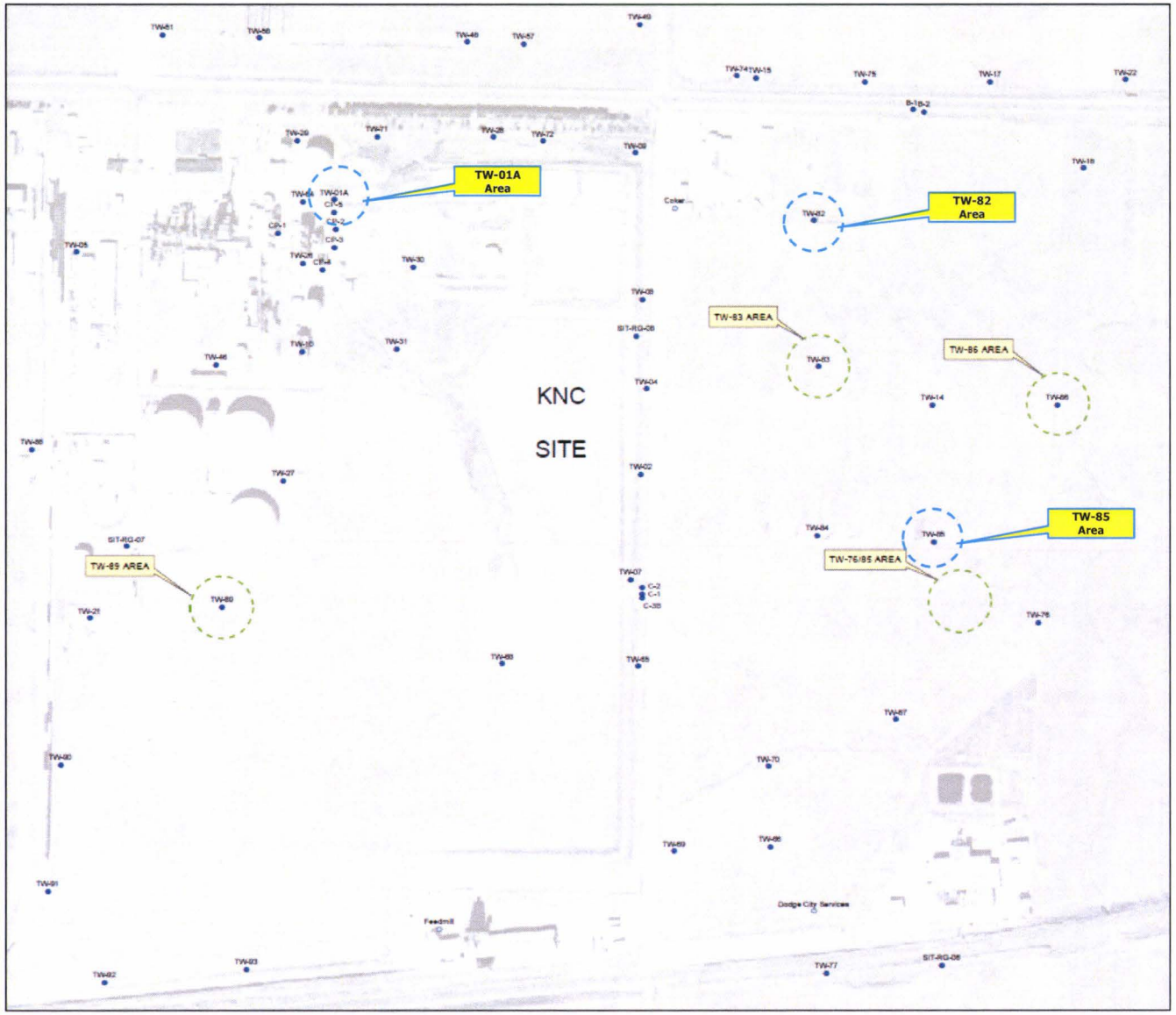
PREPARED BY:

KOCH

KOCH NITROGEN COMPANY
11559 US HIGHWAY 50 - P.O. BOX 1337
DODGE CITY, KS 67801

PROJECT NO.	FIGURE NO. 3
DATE. JUNE 2011	REVISION NO.

Tier II Soils Work Plan – Additional Spill Areas



LEGEND

- MONITORING WELL LOCATION
- PRIVATE WELL LOCATION
- NEW SPILL AREAS (TW-36 NOT POSTED)

-N-

500 0 500

Feet

ADDITIONAL SPILL AREAS

PREPARED BY:

KOCH

KOCH NITROGEN COMPANY

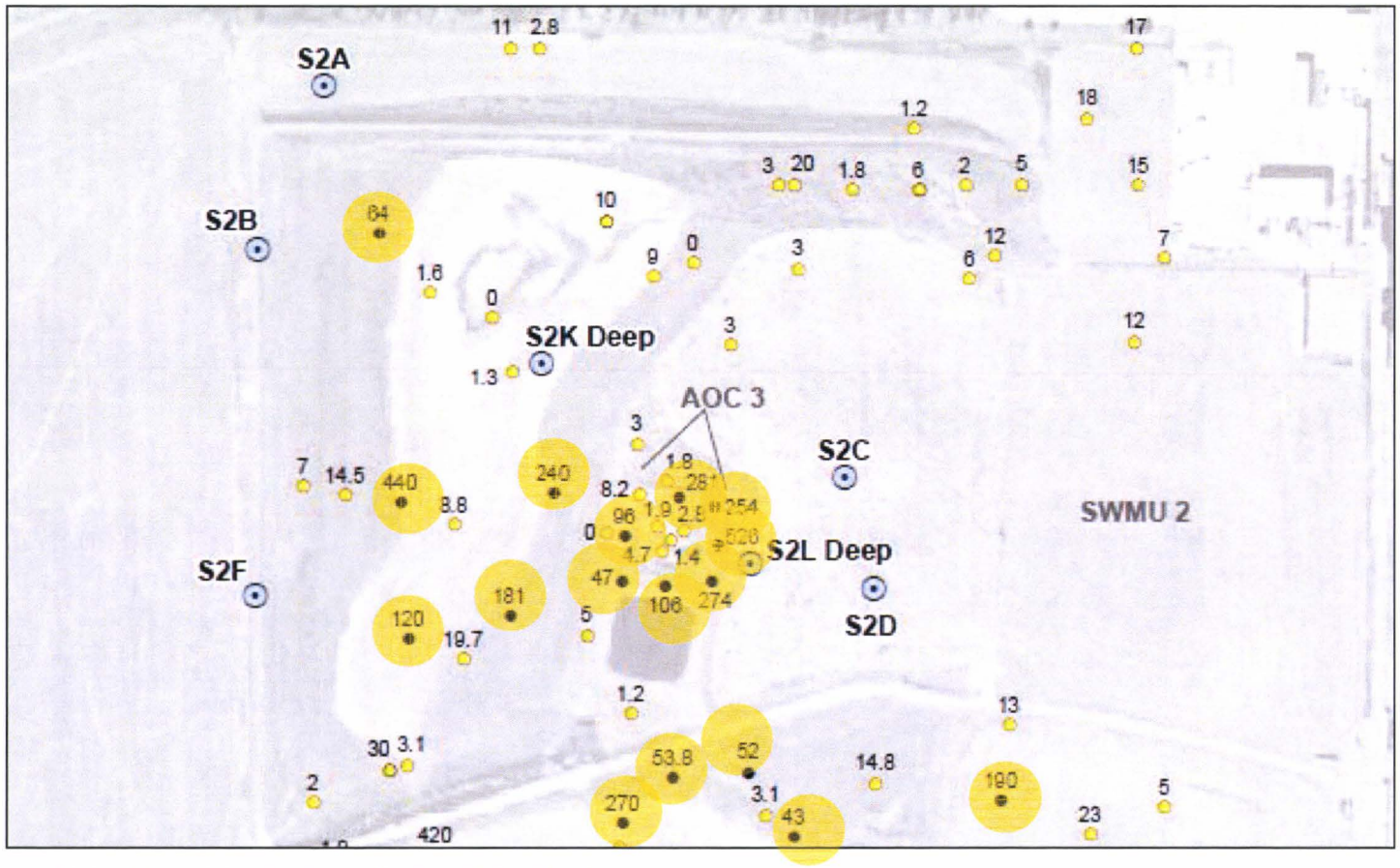
11559 US HIGHWAY 50 - P.O. BOX 1337

DODGE CITY, KS 67801

PROJECT NO.	FIGURE NO. 2
DATE. JUNE 2011	REVISION NO.

Tier II Soils Work Plan – Approach

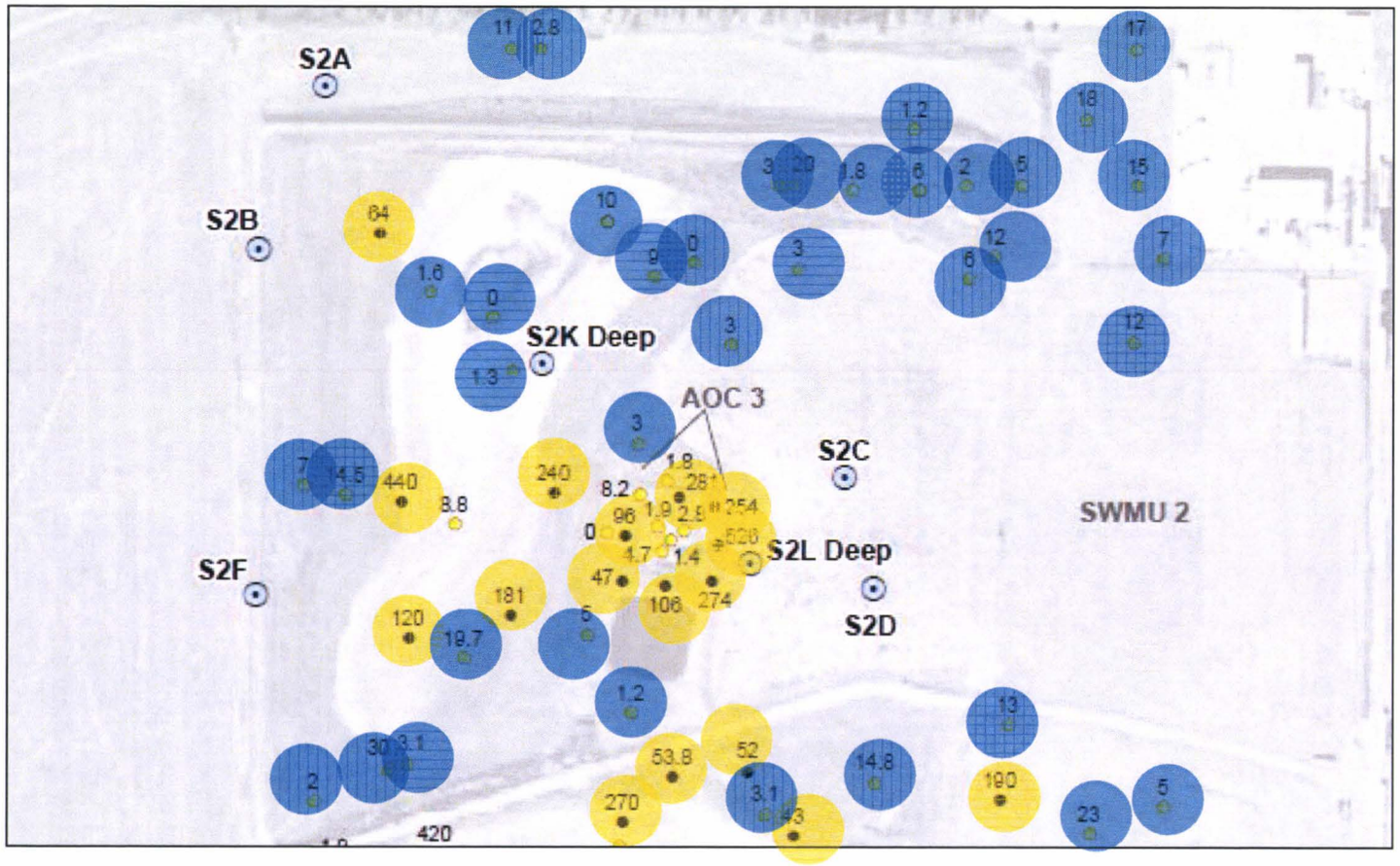
- **Identify soil concentrations greater than background or KDHE values**



Nitrate+Nitrite as N in West Study Area (0.5 – 2 FT BGS)

Tier II Soils Work Plan – Approach

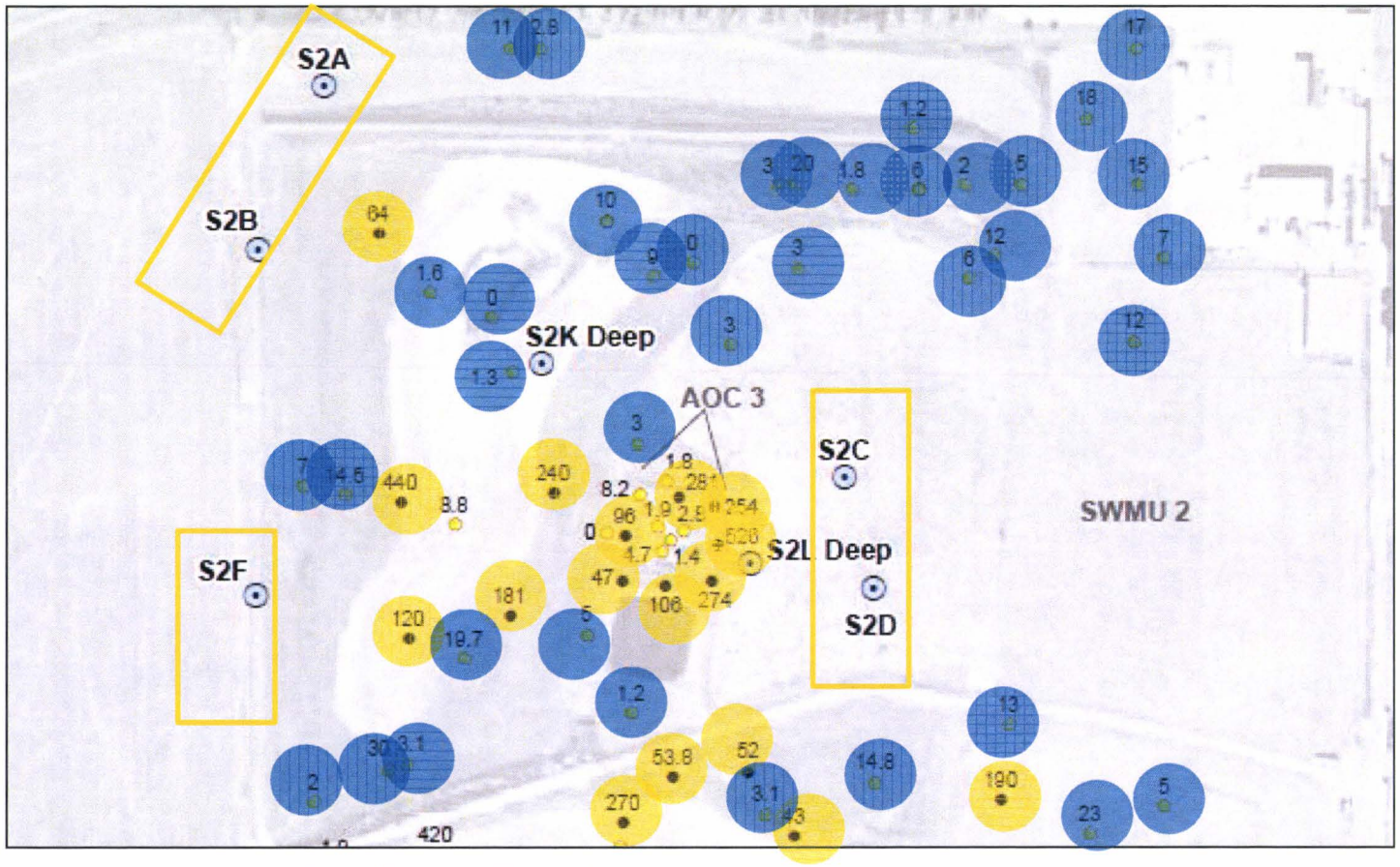
- **Identify soil concentrations less than background or KDHE values that provide lateral delineation**



Nitrate+Nitrite as N in West Study Area (0.5 – 2 FT BGS)

Tier II Soils Work Plan – Approach

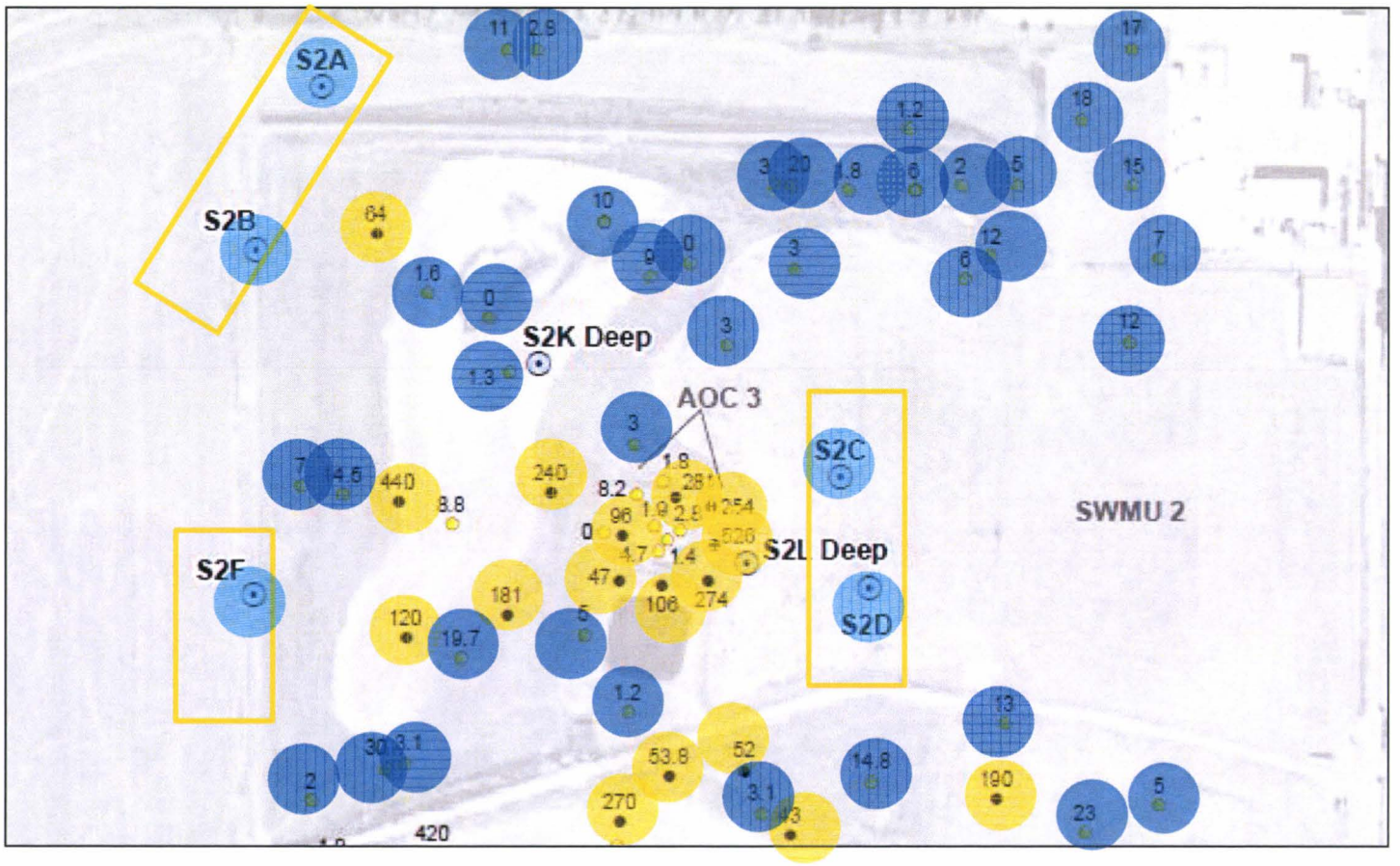
- **Identify general areas where new samples are required to put lateral boundaries on COC at each depth**



Nitrate+Nitrite as N in West Study Area (0.5 – 2 FT BGS)

Tier II Soils Work Plan – Approach

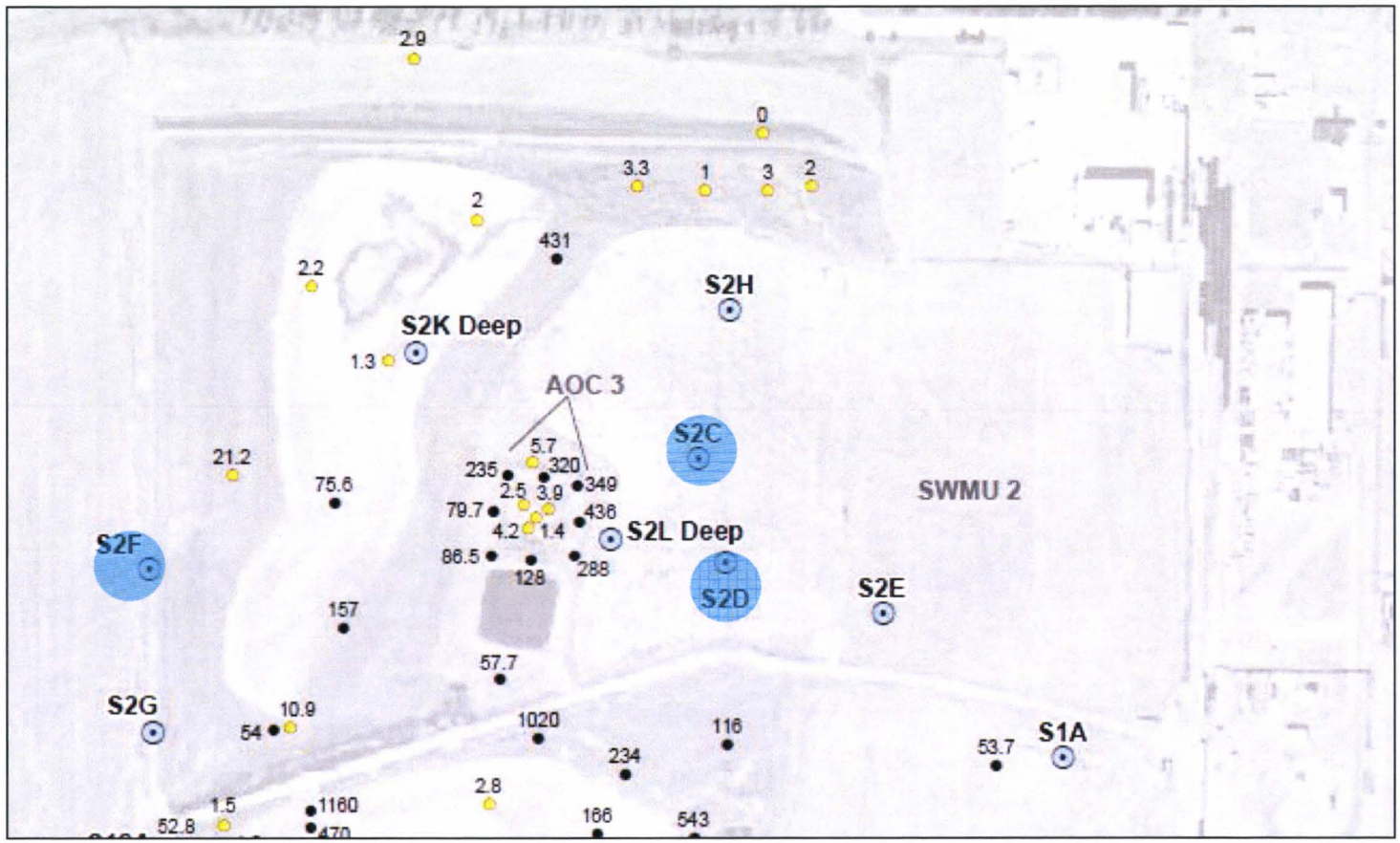
- **Propose sampling locations to best estimate COC lateral boundaries at each depth**



Nitrate+Nitrite as N in West Study Area (0.5 – 2 FT BGS)

Tier II Soils Work Plan – Approach

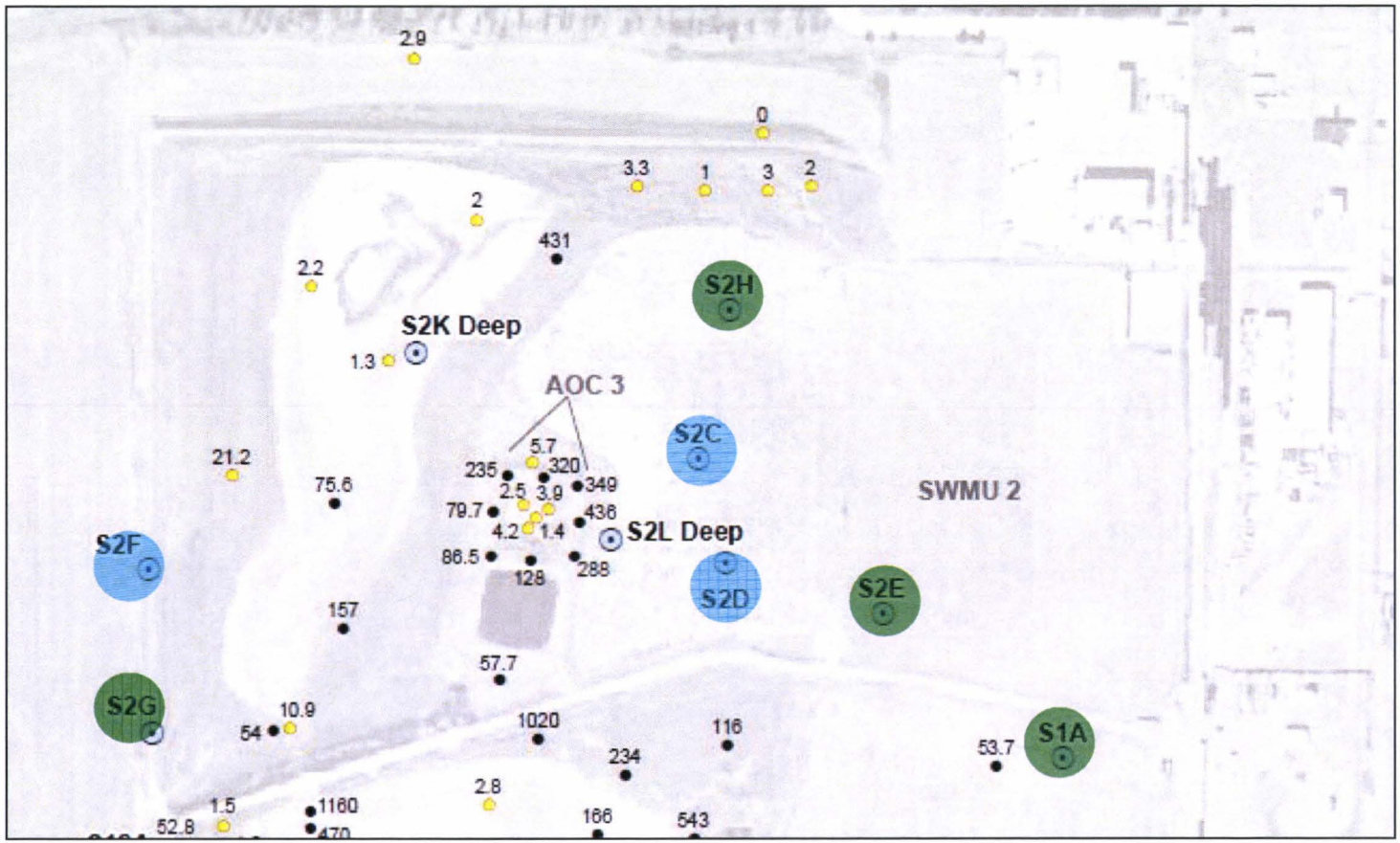
- **To the extent possible, use borings for delineation with depth**



Nitrate+Nitrite as N in West Study Area (2 – 4 FT BGS)

Tier II Soils Work Plan – Approach

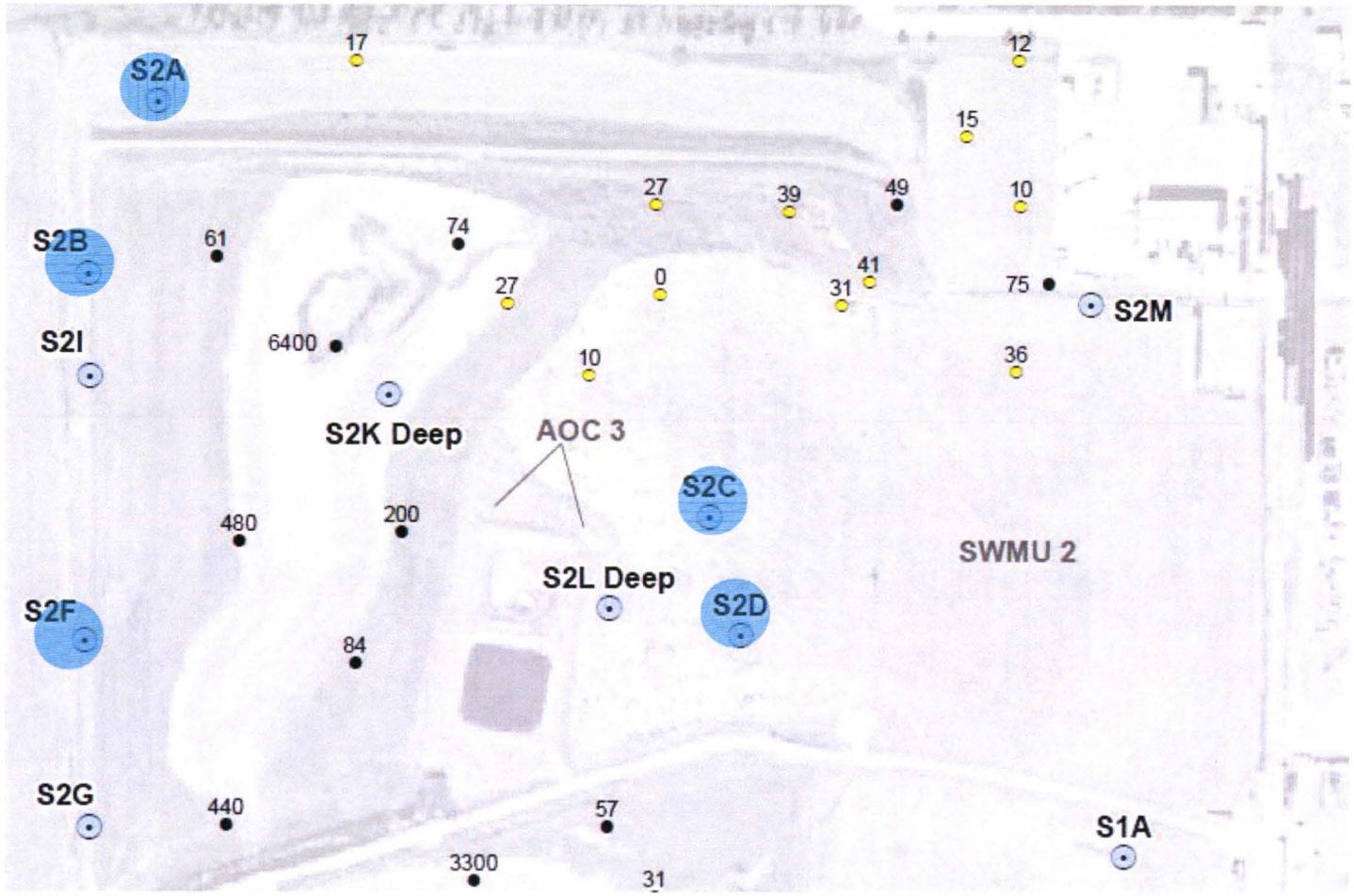
- **Add new borings, as needed, to provide additional delineation**



Nitrate+Nitrite as N in West Study Area (2 – 4 FT BGS)

Tier II Soils Work Plan – Approach

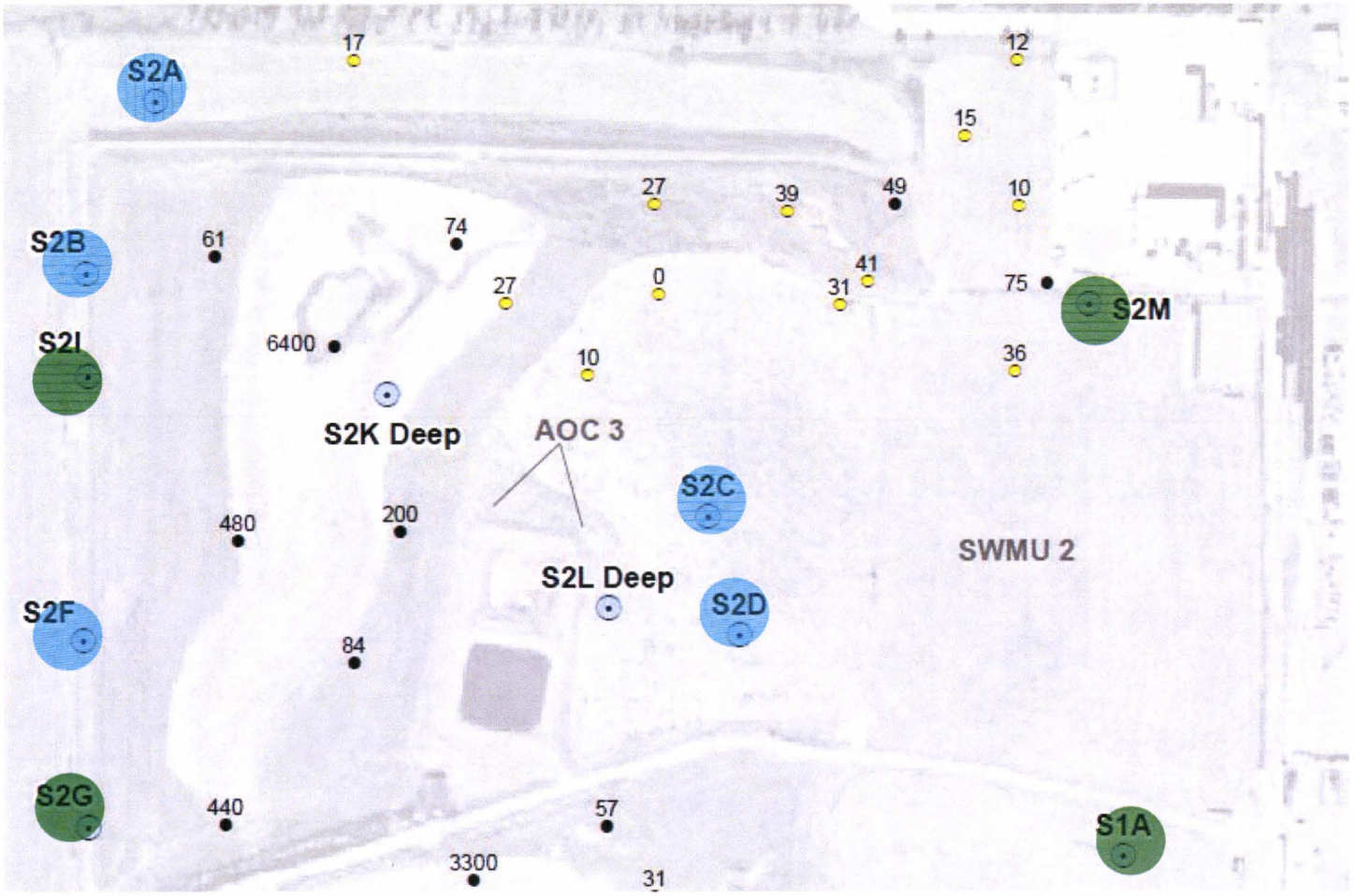
- **To the extent possible, use borings identified for NO_3+NO_2 as N and other COCs for other COC delineation**



Sulfate in West Study Area (0 – 0.5 FT BGS)

Tier II Soils Work Plan – Approach

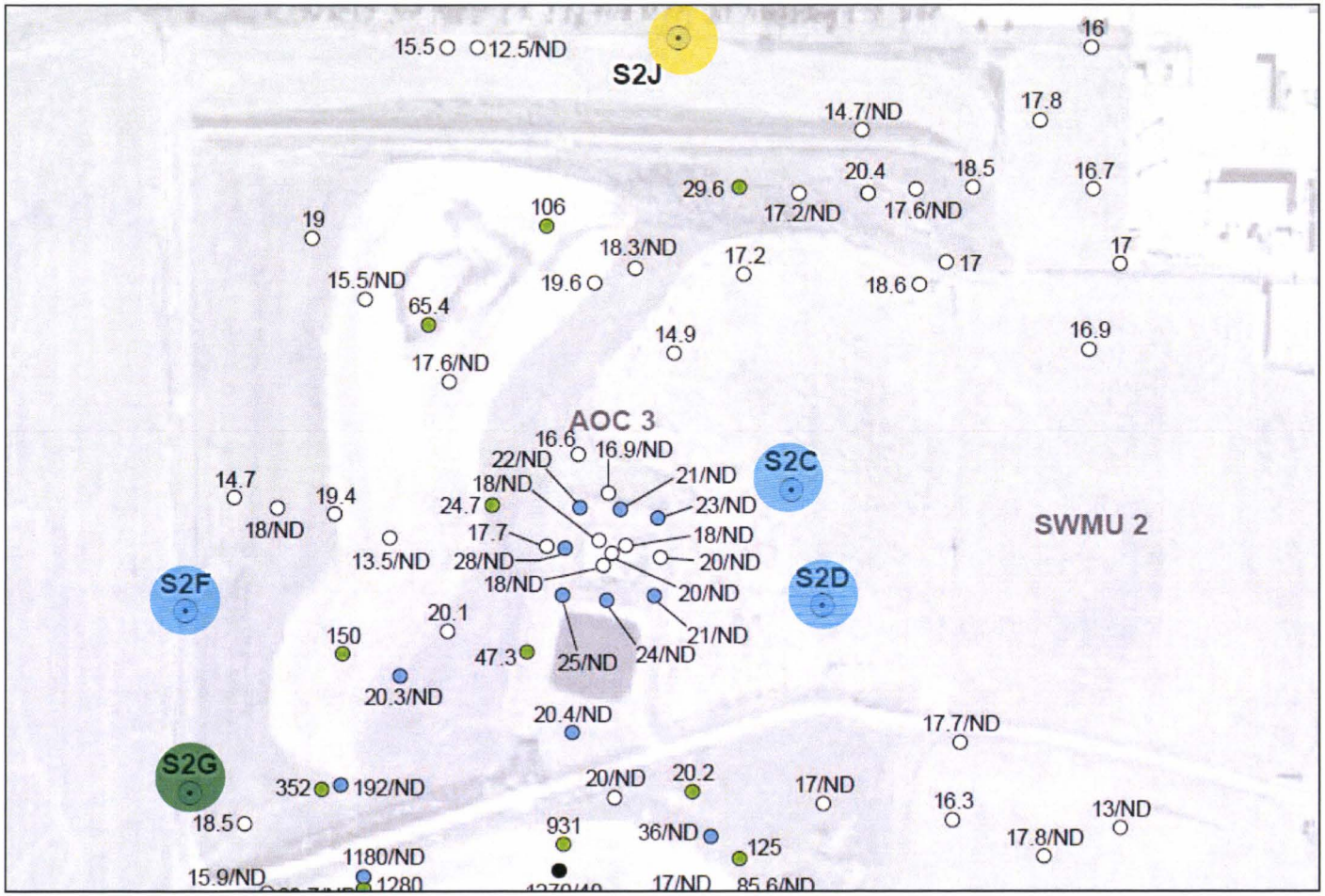
- **Add new borings, as needed to provide additional delineation**



Sulfate in West Study Area (0 – 0.5 FT BGS)

Tier II Soils Work Plan – Approach

- **To the extent possible, use borings identified for NO_3+NO_2 as N and other COCs for other COC delineation**



Chromium in West Study Area (0.5 – 2.0 FT BGS)

Table 1
Proposed Sample Location, Depth, and Analytical Summary
Phase III Soils Work Plan

SWMU/AOC Number/Name	Boring ID	Depth (FT BGS)																Analyses/Test Methods
		0-0.5	0.5-2	2-4	4-6	6-8	8-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	
West Study Area																		
SWMU 1/South Pond	S1A	TC SO	SO	N SO	N SO	N SO	N SO	N SO	N	N								Soil (surface and subsurface samples) analysis for: nitrate/nitrite (EPA SM4500NO3-F), total chromium (EPA 6010B) and sulfate (EPA 9056)
	S1B	TC SO	SO	N SO	N SO	N SO	N SO	N SO	N	N								
	S1C	SO	SO	N SO	N SO	N SO	N SO	N SO	N	N	N	N	N					
	S1D	SO	SO	N SO	N SO	N SO	N SO	N SO	N	N	N	N	N					
	S1E	SO	SO	N SO	N SO	N SO	N SO	N SO	N									
	S1F	N			N													
	S1G	N																
	S1H	N																
	S1I	N																
	S1J	N SO	SO	SO	SO	SO	SO	SO										
	S1K(Deep)	N SO	N SO	N SO	N SO	N SO	N SO	N SO	N	N	N	N	N	N	N	N	N	

Notes:
FT BGS - feet below ground surface
N - Depth where Nitrate + Nitrite as N analysis is proposed
TC - Depth where total chromium analysis is proposed
HC - Depth where hex and total chromium analyses are proposed
SO - depth where sulfate analysis is proposed
VOC - Depth where VOC analysis is proposed
SVOC - Depth where SVOC analysis is proposed

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Phase III Soils Work Plan

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SWMU 2/North Pond AOC-3/Sanitary Sewage Lagoon	S2A	N SO	N SO	SO	SO	SO	SO	SO										Soil (surface and subsurface samples) analysis for: nitrate/nitrite (EPA SM4500NO3-F), total chromium (EPA 6010B) and sulfate (EPA 9056)
	S2B	N TC SO	N SO	SO	SO	SO	SO	SO										
	S2C	N TC SO	N TC SO	N SO	N SO	N SO	N SO	N SO	N	N	N	N	N					
	S2D	N TC SO	N TC SO	N SO	N TC SO	N TC SO	N SO	N SO	N	N	N	N	N					
	S2E			N	N	N	N	N	N	N								
	S2F	TC SO	N TC SO	N SO	N SO	N SO	N SO	N SO										
	S2G	TC SO	TC SO	N SO	N SO	N SO	N SO	N SO	N	N								
	S2H			N	N TC	N	N	N	N	N	N	N						
	S2I	SO	SO	SO	N SO	SO	SO											
	S2J	TC	TC	TC	TC		N	N	N	N	N	N						
	S2K (Deep)	N SO	N SO	N SO	N SO	N SO	N SO	N SO	N	N	N	N	N	N	N	N	N	
	S2L(Deep)	N SO	N SO	N SO	N SO	N SO	N SO	N SO	N	N	N	N	N	N	N	N	N	
	S2M	SO	SO	SO	SO	SO	SO	SO										

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SWMU 5/ Landfarm	S5A	TC SO	TC SO	N TC SO	N TC SO	N TC SO	TC SO	SO	TC	TC	TC	TC						Soil (surface and subsurface samples) analysis for: nitrate/nitrite (EPA SM4500NO3-F), total chromium (EPA 6010B) and sulfate (EPA 9056)
	S5B	TC SO	TC SO	SO	TC SO	SO	SO	SO										
	S5C	TC SO	TC SO	TC SO	SO	SO	TC SO	SO										
SWMU 12/Disposal Area (N of S Pond)	S12A	N TC SO	TC SO	N SO	N TC SO	N SO	N SO	N SO	N	N								Soil (surface and subsurface samples) analysis for: nitrate/nitrite (EPA SM4500NO3-F), total chromium (EPA 6010B) and sulfate (EPA 9056)
SWMU 19/ West Lime Sludge Industrial Landfill	S19A	N TC SO	TC SO	N TC SO SVOC	N SO	SO	SO	SO										Soil (surface and subsurface samples) analysis for: nitrate/nitrite (EPA SM4500NO3-F), total chromium (EPA 6010B), sulfate (EPA 9056) and semi-volatile organic compounds (EPA 8270C)
	S19B	SO	SO	SO SVOC	SO	SO	SO	SO										
SWMU 21 / UIC Well #2 Cuttings	S21A				TC		TC											Soil (surface and subsurface samples) analysis for total chromium (EPA 6010B)

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		0-0.5	0.5-2	2-4	4-6	6-8	8-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	
East Study Area																		
SWMU 3 / East Pond	S3A	TC SO	TC SO	N TC SO	N TC SO	TC SO	TC SO	SO	SO									Soil (surface and subsurface samples) analysis for: nitrate/nitrite (EPA SM4500NO3-F), total chromium (EPA 6010B) and sulfate (EPA 9056)
	S3B	TC SO	SO	SO	SO	SO	SO	SO	SO									
	S3C	TC																
	S3D	TC																
	S3E	TC																
	S3F	SO	SO	SO	SO	SO	SO	SO	SO									
	S3G	SO	SO	SO	SO	SO	SO	SO	SO									
	S3H	SO	SO	SO	SO	SO	SO	SO	SO									

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SWMU 10 / East Cell Lime Sludge Landfill	S10A	SO	N TC SO	SO	SO	SO	SO	SO	SO									Soil (surface and subsurface samples) analysis for: nitrate/nitrite (EPA SM4500NO3-F), total chromium (EPA 6010B) and sulfate (EPA 9056)
	S10B	TC SO	TC SO	N TC SO	N TC SO	TC SO	SO	TC SO	TC SO		TC	TC						
	S10C	TC SO	TC SO	N TC SO	N TC SO	TC SO	SO	TC SO	TC SO		TC	TC						
SWMU 11 / West Cell Lime Sludge Landfill	S11A	N TC SO	N TC SO	N TC SO	N TC SO	TC SO	SO	SO	SO									Soil (surface and subsurface samples) analysis for: nitrate/nitrite (EPA SM4500NO3-F), total chromium (EPA 6010B) and sulfate (EPA 9056)
	S11B	N TC SO	N TC SO	N TC SO	N TC SO	SO	SO	SO	SO									
	S11C	N TC SO	N TC SO	N TC SO	N TC SO	TC SO	SO	SO	SO									
	S11D	N TC SO	N TC SO	N TC SO	N TC SO	TC SO	SO	SO	SO									
	S11E	TC SO	TC SO	TC SO	TC SO	TC SO	SO	SO	SO									
	S11F	N TC SO	N TC SO	N TC SO	N TC SO	SO	SO	SO	SO									
SWMU 17 / East Lime Sludge Landfill	S17A	TC SO	N TC SO	N TC SO	N TC SO	N TC SO	SO	SO	SO									Soil (surface and subsurface samples) analysis for: nitrate/nitrite (EPA SM4500NO3-F), total chromium (EPA 6010B) and sulfate (EPA 9056)
	S17B	TC SO	N TC SO	N TC SO	N TC SO	N TC SO	TC SO	TC SO	TC SO									
	S17C	TC SO	TC SO	TC SO	TC SO	TC SO	TC SO	TC SO	TC SO									

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		0-0.5	0.5-2	2-4	4-6	6-8	8-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	
Central Processing Study Area																		
AOC 1 / Chromate Spills	A1A	N HC	N HC	N	N	N	N	N	N	N	N	N	N					Soil (surface and subsurface samples) analysis for: nitrate/nitrite (EPA SM4500NO3-F) total chromium (EPA 6010B) and hexavalent chromium (EPA 7196)
	A1B	N HC	N HC	N	N	N	N	N	N	N	N	N	N					
	A1C	N HC	N HC	N	N	N	N	N	N	N	N	N	N					
	A1D	N HC	N HC	N	N	N	N	N	N	N	N	N	N	N	N	N	N	
	A1E	HC	HC	HC	HC	HC	HC											
	A1F	N HC	N HC	N	N	N	N	N	N	N	N	N						
SWMU 8 / Former Chrome Destruct Unit	S8A		TC	TC	TC													Soil (surface and subsurface samples) analysis for total chromium (EPA 6010B)
SWMU 14 / Settling Basin by Chromium Treatment Building	S14A	N TC	N TC	N TC	N													Soil (surface and subsurface samples) analysis for: nitrate/nitrite (EPA SM4500NO3-F) and total chromium (EPA 6010B)
	S14B	N TC	N	N TC	N													
	S14C	N TC	N	N TC	N													

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		0-0.5	0.5-2	2-4	4-6	6-8	8-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	
Central Storage Study Area																		
AOC 5 / UAN Tank Leak Area	A5A	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Soil (surface and subsurface samples) analysis for nitrate/nitrite (EPA SM4500NO3-F)
	A5B	N	N	N														
	A5C	N	N	N														
	A5D	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	
	A5E	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	
	A5F			N														
	A5G			N	N	N												
SWMU 7 / Landfill for General Plant Trash	S7A	TC SO VOC	TC SO VOC	TC SO VOC	TC SO VOC	TC SO VOC	TC SO VOC	TC VOC										Soil (surface and subsurface samples) analysis for: nitrate/nitrite (EPA SM4500NO3-F), total chromium (EPA 6010B), sulfate (EPA 9056) and volatile organic compounds (EPA 8260B)
	S7B	TC SO VOC	TC SO VOC	TC SO VOC	TC SO VOC	TC SO VOC	TC SO VOC	TC VOC										
	S7C	TC SO VOC	TC SO VOC	TC SO VOC	TC SO VOC	SO VOC	SO VOC	VOC										
	S7D	TC SO VOC	TC SO VOC	TC SO VOC	TC SO VOC	TC SO VOC	TC SO VOC	TC VOC										
	S7E	TC VOC	TC VOC	TC VOC	TC VOC	TC VOC	TC VOC	TC VOC										
	S7F	TC VOC	TC VOC	TC VOC	TC VOC	TC VOC	TC VOC	TC VOC										
	S7G	TC VOC	TC VOC	TC VOC	TC VOC	TC VOC	TC VOC	TC VOC										

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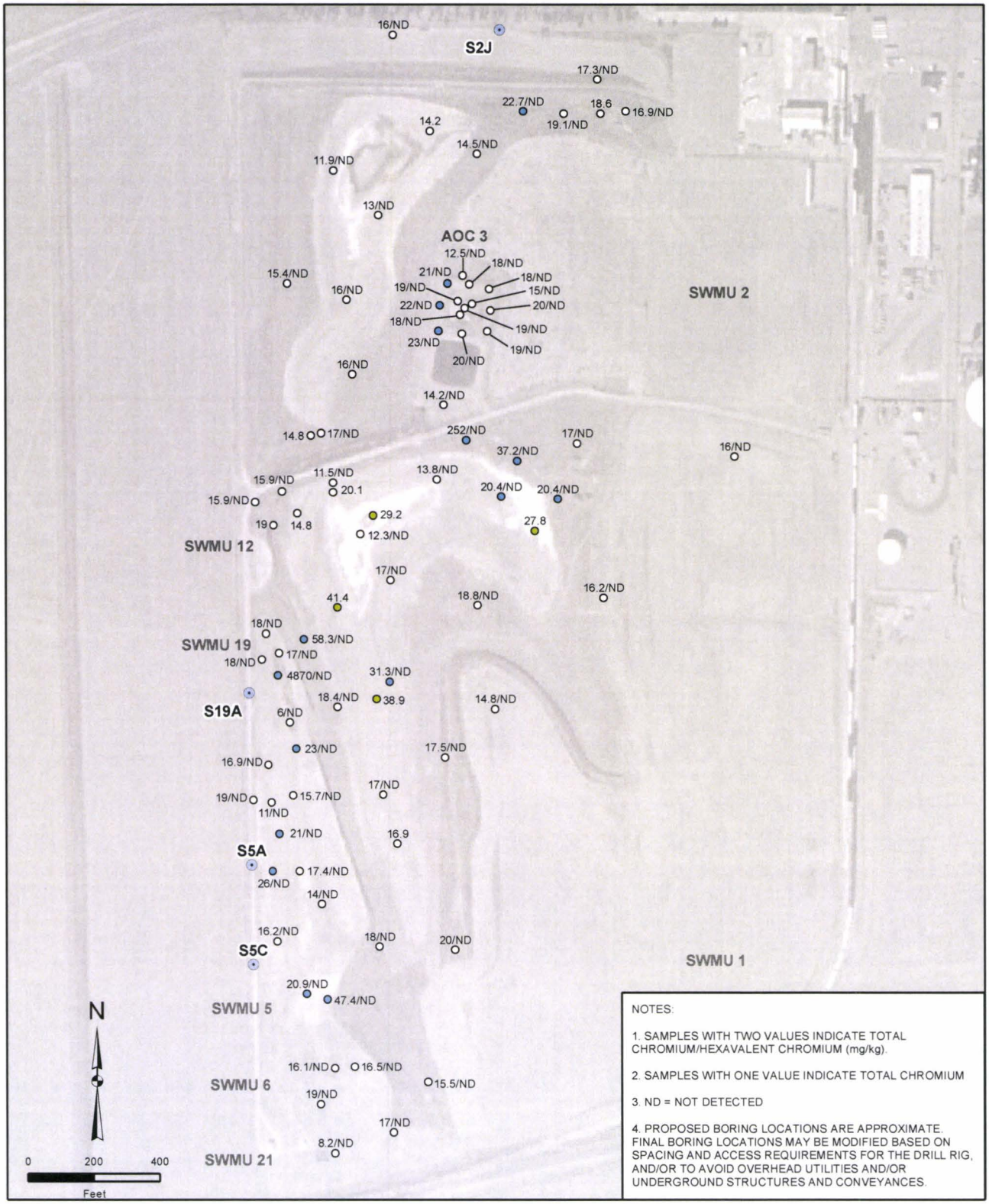
Additional Spill Areas																		
TW-89 Spill Area	S89A	N TC	N TC	N TC	N TC													Soil (surface and subsurface samples) analysis for: nitrate/nitrite (EPA SM4500NO3-F) and total chromium (EPA 6010B)
TW-83 Leakage	S83A	N TC	N TC	N TC	N TC													Soil (surface and subsurface samples) analysis for: nitrate/nitrite (EPA SM4500NO3-F) and total chromium (EPA 6010B)
	S83B	TC	TC	TC	TC													
TW-85/TW-67 Pipeline	S85A	TC	TC	TC	TC													Soil (surface and subsurface samples) analysis for total chromium (EPA 6010B)
	S85B	TC	TC	TC	TC													
	S85C	TC	TC	TC	TC													
	S85D	TC	TC	TC	TC													
	S85E	TC	TC	TC	TC													
TW-86	S86A	N TC	N TC	N TC	N TC													Soil (surface and subsurface samples) analysis for: nitrate/nitrite (EPA SM4500NO3-F) and total chromium (EPA 6010B)
	S86B	N TC	N TC	N TC	N TC													
	S86C	N TC	N TC	N TC	N TC													
	S86D	N TC	N TC	N TC	N TC													
	S86E	N TC	N TC	N TC	N TC													
	S86F	N TC	N TC	N TC	N TC													
	S86G	N TC	N TC	N TC	N TC													
TW-82 Line Break																		
TW-01A Coupling Leak																		
TW-85																		
TW-36																		

Notes:
FT BGS - feet below ground surface
N - Depth where Nitrate + Nitrite as N analysis is proposed
TC - Depth where total chromium analysis is proposed
HC - Depth where hex and total chromium analyses are proposed
SO - depth where sulfate analysis is proposed
VOC - Depth where VOC analysis is proposed
SVOC - Depth where SVOC analysis is proposed



NOTES:

1. SAMPLES WITH TWO VALUES INDICATE TOTAL CHROMIUM/HEXAVALENT CHROMIUM (mg/kg).

2. SAMPLES WITH ONE VALUE INDICATE TOTAL CHROMIUM

3. ND = NOT DETECTED

4. PROPOSED BORING LOCATIONS ARE APPROXIMATE. FINAL BORING LOCATIONS MAY BE MODIFIED BASED ON SPACING AND ACCESS REQUIREMENTS FOR THE DRILL RIG, AND/OR TO AVOID OVERHEAD UTILITIES AND/OR UNDERGROUND STRUCTURES AND CONVEYANCES.

LEGEND

- TIER II SOIL SAMPLE FOR TOTAL CHROMIUM
- TOTAL CHROMIUM > 20.1 mg/kg AND HEXAVALENT CHROMIUM > 20 mg/kg
- TOTAL CHROMIUM > 20.1 mg/kg AND HEXAVALENT CHROMIUM <= 20 mg/kg
- TOTAL CHROMIUM > 20.1 mg/kg AND HEXAVALENT CHROMIUM NOT SAMPLED
- TOTAL CHROMIUM <= 20.1 mg/kg AND HEXAVALENT CHROMIUM <= 20 mg/kg OR NOT SAMPLED

TOTAL CHROMIUM AND HEXAVALENT CHROMIUM SAMPLE LOCATIONS IN SOIL 2-4 FT WEST STUDY AREA

PREPARED BY:

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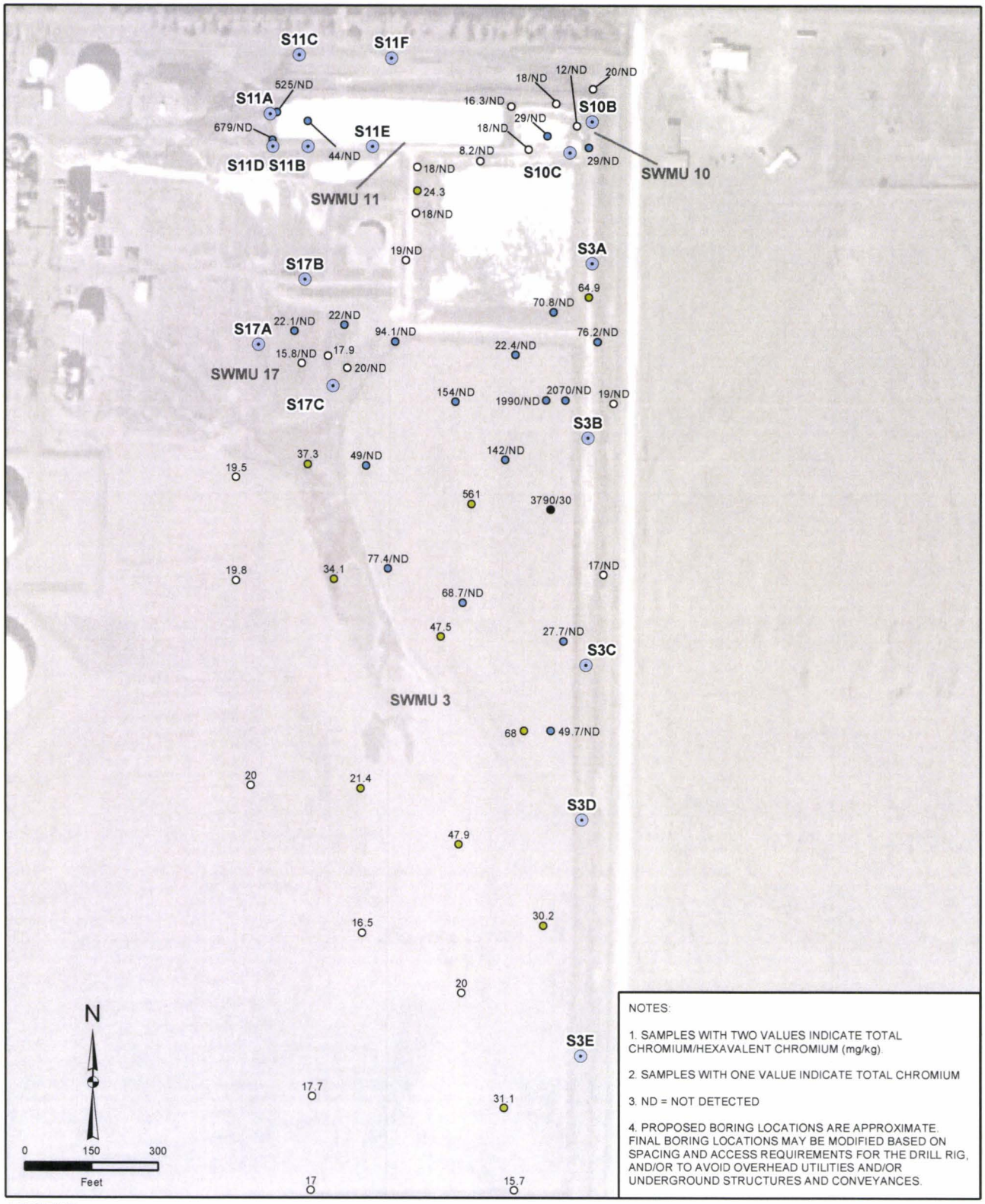
PROJECT.	FIGURE NO. C-3
DATE. JUNE 2012	FILE NO.



NOTES:

1. SAMPLES WITH TWO VALUES INDICATE TOTAL CHROMIUM/HEXAVALENT CHROMIUM (mg/kg).

2. SAMPLES WITH ONE VALUE INDICATE TOTAL CHROMIUM

3. ND = NOT DETECTED

4. PROPOSED BORING LOCATIONS ARE APPROXIMATE. FINAL BORING LOCATIONS MAY BE MODIFIED BASED ON SPACING AND ACCESS REQUIREMENTS FOR THE DRILL RIG, AND/OR TO AVOID OVERHEAD UTILITIES AND/OR UNDERGROUND STRUCTURES AND CONVEYANCES.

LEGEND

- TIER II SOIL SAMPLE FOR TOTAL CHROMIUM
- TOTAL CHROMIUM > 20.1 mg/kg AND HEXAVALENT CHROMIUM > 20 mg/kg
- TOTAL CHROMIUM > 20.1 mg/kg AND HEXAVALENT CHROMIUM <= 20 mg/kg
- TOTAL CHROMIUM > 20.1 mg/kg AND HEXAVALENT CHROMIUM NOT SAMPLED
- TOTAL CHROMIUM <= 20.1 mg/kg AND HEXAVALENT CHROMIUM <= 20 mg/kg OR NOT SAMPLED

TOTAL CHROMIUM AND HEXAVALENT CHROMIUM SAMPLE LOCATIONS IN SOIL 0-0.5 FT EAST STUDY AREA

PREPARED BY:

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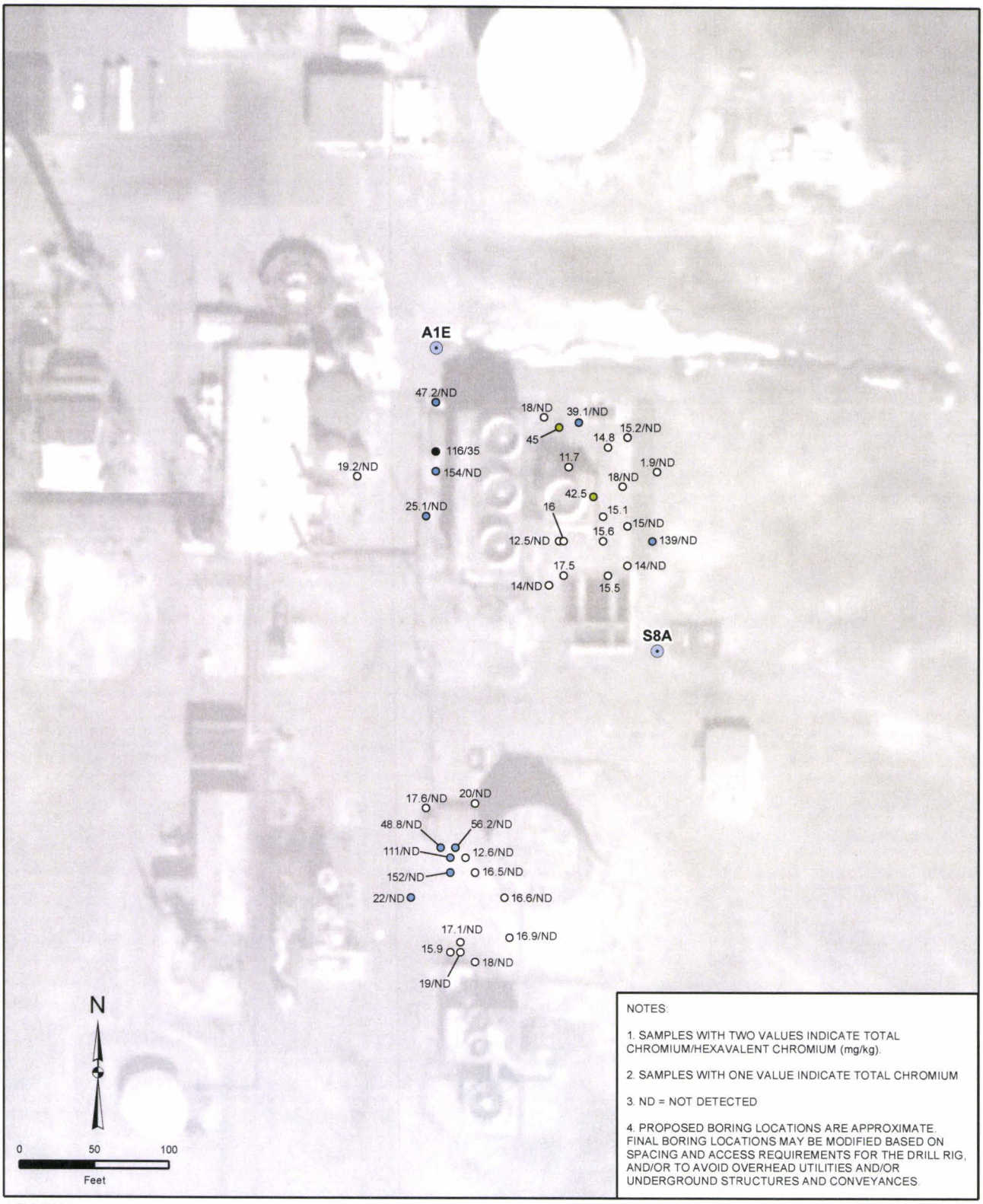
PROJECT.	FIGURE NO. C-15
DATE. JUNE 2012	FILE NO.



NOTES:

1. SAMPLES WITH TWO VALUES INDICATE TOTAL CHROMIUM/HEXAVALENT CHROMIUM (mg/kg).

2. SAMPLES WITH ONE VALUE INDICATE TOTAL CHROMIUM

3. ND = NOT DETECTED

4. PROPOSED BORING LOCATIONS ARE APPROXIMATE. FINAL BORING LOCATIONS MAY BE MODIFIED BASED ON SPACING AND ACCESS REQUIREMENTS FOR THE DRILL RIG, AND/OR TO AVOID OVERHEAD UTILITIES AND/OR UNDERGROUND STRUCTURES AND CONVEYANCES.

LEGEND

- TIER II SOIL SAMPLE FOR TOTAL CHROMIUM
- TOTAL CHROMIUM > 20.1 mg/kg AND HEXAVALENT CHROMIUM > 20 mg/kg
- TOTAL CHROMIUM > 20.1 mg/kg AND HEXAVALENT CHROMIUM <= 20 mg/kg
- TOTAL CHROMIUM > 20.1 mg/kg AND HEXAVALENT CHROMIUM NOT SAMPLED
- TOTAL CHROMIUM <= 20.1 mg/kg AND HEXAVALENT CHROMIUM <= 20 mg/kg OR NOT SAMPLED

TOTAL CHROMIUM AND HEXAVALENT CHROMIUM SAMPLE LOCATIONS IN SOIL 4-6 FT CENTRAL PROCESSING STUDY AREA

PREPARED BY:

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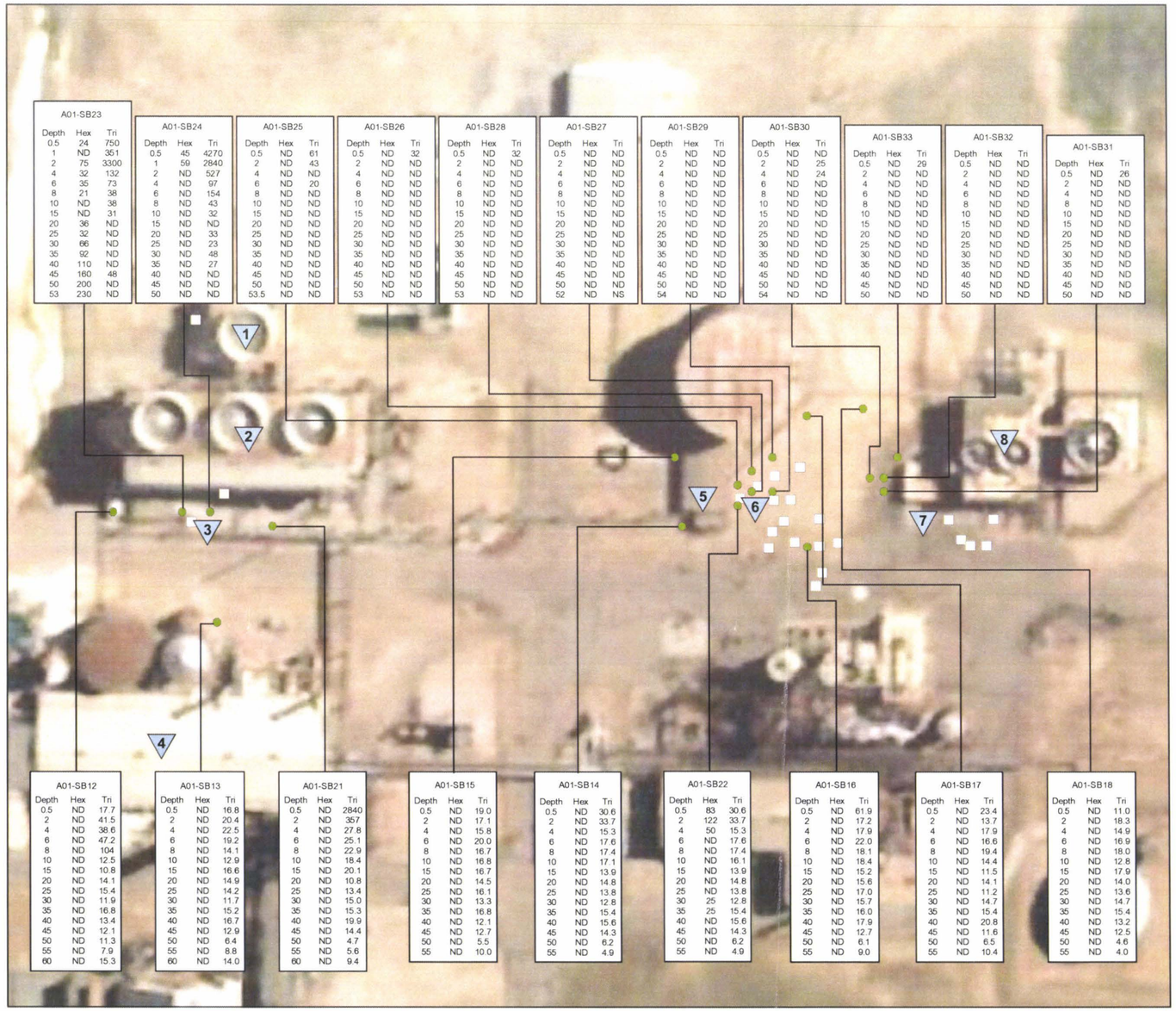
PROJECT.	FIGURE NO. C-30
DATE. JUNE 2012	FILE NO.



A01-SB23

Depth	Hex	Tri
0.5	24	750
1	ND	351
2	75	3300
4	32	132
6	35	73
8	21	38
10	ND	38
15	ND	31
20	36	ND
25	32	ND
30	66	ND
35	92	ND
40	110	ND
45	160	48
50	200	ND
53	230	ND

A01-SB24

Depth	Hex	Tri
0.5	45	4270
1	59	2840
2	ND	527
4	ND	97
6	ND	154
8	ND	43
10	ND	32
15	ND	ND
20	ND	33
25	ND	23
30	ND	48
35	ND	27
40	ND	ND
45	ND	ND
50	ND	ND

A01-SB25

Depth	Hex	Tri
0.5	ND	61
2	ND	43
4	ND	ND
6	ND	20
8	ND	ND
10	ND	ND
15	ND	ND
20	ND	ND
25	ND	ND
30	ND	ND
35	ND	ND
40	ND	ND
45	ND	ND
50	ND	ND
53.5	ND	ND

A01-SB26

Depth	Hex	Tri
0.5	ND	32
2	ND	ND
4	ND	ND
6	ND	ND
8	ND	ND
10	ND	ND
15	ND	ND
20	ND	ND
25	ND	ND
30	ND	ND
35	ND	ND
40	ND	ND
45	ND	ND
50	ND	ND
53	ND	ND

A01-SB28

Depth	Hex	Tri
0.5	ND	32
2	ND	ND
4	ND	ND
6	ND	ND
8	ND	ND
10	ND	ND
15	ND	ND
20	ND	ND
25	ND	ND
30	ND	ND
35	ND	ND
40	ND	ND
45	ND	ND
50	ND	ND
53	ND	ND

A01-SB27

Depth	Hex	Tri
0.5	ND	ND
2	ND	ND
4	ND	ND
6	ND	ND
8	ND	ND
10	ND	ND
15	ND	ND
20	ND	ND
25	ND	ND
30	ND	ND
35	ND	ND
40	ND	ND
45	ND	ND
50	ND	ND
52	ND	NS

A01-SB29

Depth	Hex	Tri
0.5	ND	ND
2	ND	ND
4	ND	ND
6	ND	ND
8	ND	ND
10	ND	ND
15	ND	ND
20	ND	ND
25	ND	ND
30	ND	ND
35	ND	ND
40	ND	ND
45	ND	ND
50	ND	ND
54	ND	ND

A01-SB30

Depth	Hex	Tri
0.5	ND	ND
2	ND	25
4	ND	24
6	ND	ND
8	ND	ND
10	ND	ND
15	ND	ND
20	ND	ND
25	ND	ND
30	ND	ND
35	ND	ND
40	ND	ND
45	ND	ND
50	ND	ND
54	ND	ND

A01-SB33

Depth	Hex	Tri
0.5	ND	29
2	ND	ND
4	ND	ND
6	ND	ND
8	ND	ND
10	ND	ND
15	ND	ND
20	ND	ND
25	ND	ND
30	ND	ND
35	ND	ND
40	ND	ND
45	ND	ND
50	ND	ND

A01-SB32

Depth	Hex	Tri
0.5	ND	ND
2	ND	ND
4	ND	ND
6	ND	ND
8	ND	ND
10	ND	ND
15	ND	ND
20	ND	ND
25	ND	ND
30	ND	ND
35	ND	ND
40	ND	ND
45	ND	ND
50	ND	ND

A01-SB31

Depth	Hex	Tri
0.5	ND	26
2	ND	ND
4	ND	ND
8	ND	ND
10	ND	ND
15	ND	ND
20	ND	ND
25	ND	ND
30	ND	ND
35	ND	ND
40	ND	ND
45	ND	ND
50	ND	ND

A01-SB12

Depth	Hex	Tri
0.5	ND	17.7
2	ND	41.5
4	ND	38.6
6	ND	47.2
8	ND	104
10	ND	12.5
15	ND	10.8
20	ND	14.1
25	ND	15.4
30	ND	11.9
35	ND	16.8
40	ND	13.4
45	ND	12.1
50	ND	11.3
55	ND	7.9
60	ND	15.3

A01-SB13

Depth	Hex	Tri
0.5	ND	16.8
2	ND	20.4
4	ND	22.5
6	ND	19.2
8	ND	14.1
10	ND	12.9
15	ND	16.6
20	ND	14.9
25	ND	14.2
30	ND	11.7
35	ND	15.2
40	ND	16.7
45	ND	12.9
50	ND	6.4
55	ND	8.8
60	ND	14.0

A01-SB21

Depth	Hex	Tri
0.5	ND	2840
2	ND	357
4	ND	27.8
6	ND	25.1
8	ND	22.9
10	ND	18.4
15	ND	20.1
20	ND	10.8
25	ND	13.4
30	ND	15.0
35	ND	15.3
40	ND	19.9
45	ND	14.4
50	ND	4.7
55	ND	5.6
60	ND	9.4

A01-SB15

Depth	Hex	Tri
0.5	ND	19.0
2	ND	17.1
4	ND	15.8
6	ND	20.0
8	ND	16.7
10	ND	16.8
15	ND	16.7
20	ND	14.5
25	ND	16.1
30	ND	13.3
35	ND	16.8
40	ND	12.1
45	ND	12.7
50	ND	5.5
55	ND	10.0

A01-SB14

Depth	Hex	Tri
0.5	ND	30.6
2	ND	33.7
4	ND	15.3
6	ND	17.6
8	ND	17.4
10	ND	17.1
15	ND	13.9
20	ND	14.8
25	ND	13.8
30	ND	12.8
35	ND	15.4
40	ND	15.6
45	ND	14.3
50	ND	6.2
55	ND	4.9

A01-SB22

Depth	Hex	Tri
0.5	83	30.6
2	122	33.7
4	50	15.3
6	ND	17.6
8	ND	17.4
10	ND	16.1
15	ND	13.9
20	ND	14.8
25	ND	13.8
30	25	12.8
35	25	15.4
40	ND	15.6
45	ND	14.3
50	ND	6.2
55	ND	4.9

A01-SB16

Depth	Hex	Tri
0.5	ND	61.9
2	ND	17.2
4	ND	17.9
6	ND	22.0
8	ND	18.1
10	ND	18.4
15	ND	15.2
20	ND	15.6
25	ND	17.0
30	ND	15.7
35	ND	16.0
40	ND	17.9
45	ND	12.7
50	ND	6.1
55	ND	9.0

A01-SB17

Depth	Hex	Tri
0.5	ND	23.4
2	ND	13.7
4	ND	17.9
6	ND	16.6
8	ND	19.4
10	ND	14.4
15	ND	11.5
20	ND	14.1
25	ND	11.2
30	ND	14.7
35	ND	15.4
40	ND	20.8
45	ND	11.6
50	ND	6.5
55	ND	10.4

A01-SB18

Depth	Hex	Tri
0.5	ND	11.0
2	ND	18.3
4	ND	14.9
6	ND	16.9
8	ND	18.0
10	ND	12.8
15	ND	17.9
20	ND	14.0
25	ND	13.6
30	ND	14.7
35	ND	15.4
40	ND	13.2
45	ND	12.5
50	ND	4.6
55	ND	4.0

LEGEND

- AOC 1 SOIL SAMPLE FROM SOIL INVESTIGATION PHASE I THROUGH PHASE II - TIER 1
- FORMER (1992 AND 2003) SAMPLE LOCATION
- 1 COOLING TOWER ADDITION
- 2 AMMONIA PLANT COOLING TOWER
- 3 PIPE LEAK LOCATION
- 4 UTILITY PLANT
- 5 FIRE PUMP BUILDING
- 6 NORTH CHROMATE TANK LOCATION
- 7 SOUTH CHROMATE TANK LOCATION
- 8 UAN PLANT COOLING TOWER

NOTES:

1. DATA BOXES INDICATE THE CONCENTRATIONS OF HEXAVALENT (Hex) CHROMIUM AND TRIVALENT (Tri) CHROMIUM AT THEIR RESPECTIVE SAMPLE DEPTHS.

2. TRIVALENT CHROMIUM WAS NOT LABORATORY ANALYZED FOR SAMPLES A01-SB12 THROUGH A01-SB22. THE VALUES POSTED WERE CALCULATED BY SUBTRACTING THE HEXAVALENT CHROMIUM VALUES FROM THE TOTAL CHROMIUM VALUES FOR THESE SAMPLES.

3. ALL CONCENTRATIONS = mg/kg.

4. DEPTH UNITS = ft bgs.

5. ND = NOT DETECTED. DETECTION LIMITS FOR HEXAVALENT AND TRIVALENT CHROMIUM = 20 mg/kg.

6. NS = NOT SAMPLED

N

50 0 50

Feet

AOC 1

HEXAVALENT AND TRIVALENT CHROMIUM RESULTS FOR CHROMATE SPILL SOIL INVESTIGATION THROUGH PHASE II - TIER 1

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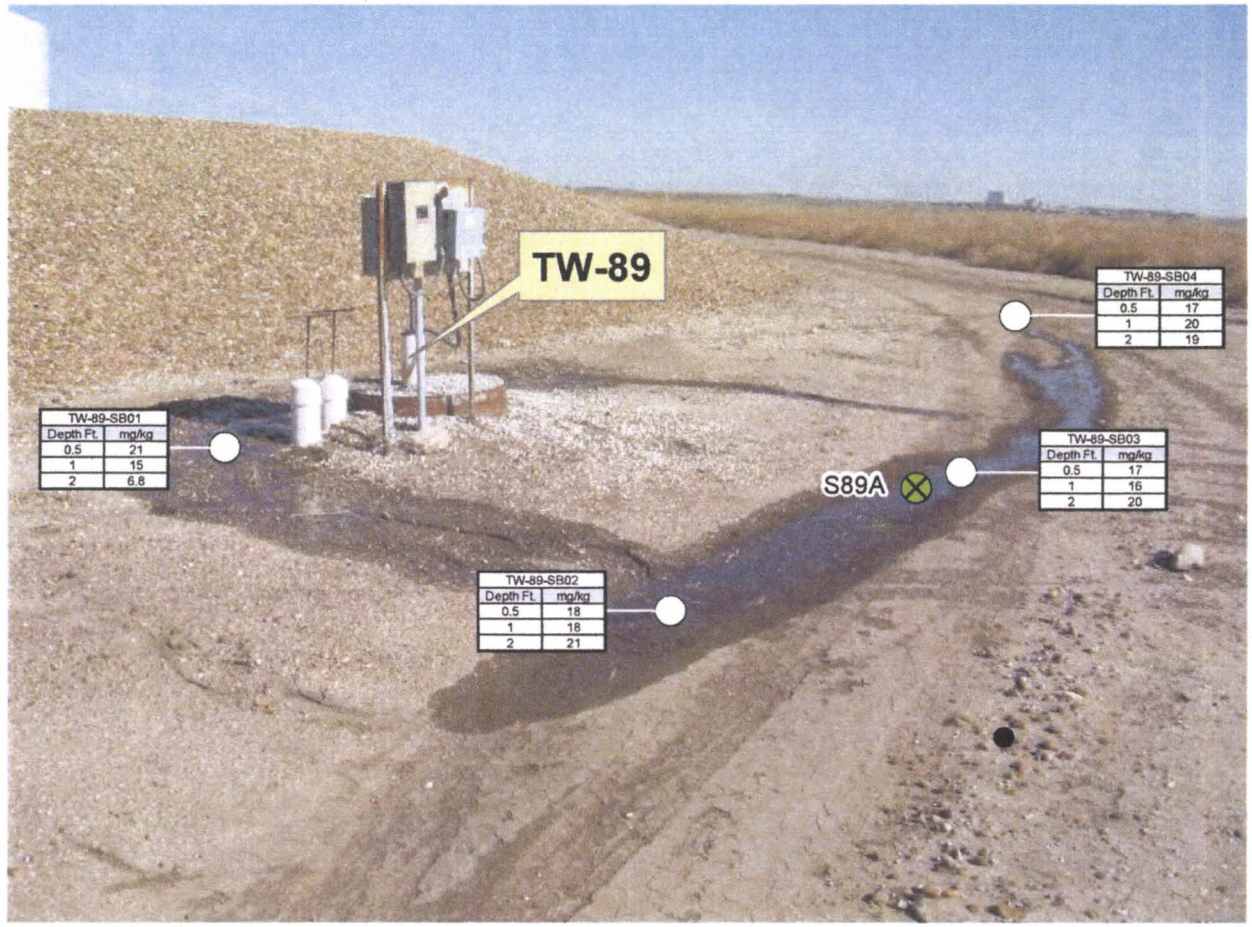
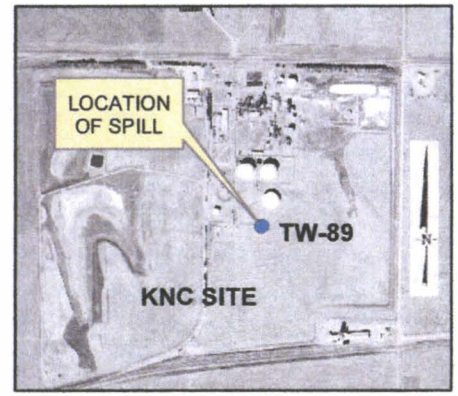
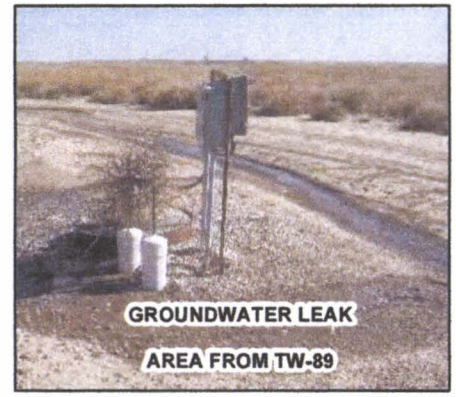
PROJECT NO.	FIGURE NO.
DATE. JULY 2009	FILE NO.



TW-89 GROUNDWATER LEAK AREA
LOOKING EAST AND PROPOSED SAMPLE LOCATION





LEGEND

- ⊗ PROPOSED SAMPLE LOCATION FOR TOTAL CHROMIUM
- ○ PREVIOUS SAMPLE LOCATION FROM JUNE 2010 ALONG WITH TOTAL CHROMIUM RESULTS

SAMPLING LOCATIONS FOR INVESTIGATION OF GROUND-WATER LEAK AT WELL TW-89

PREPARED BY: KOCH
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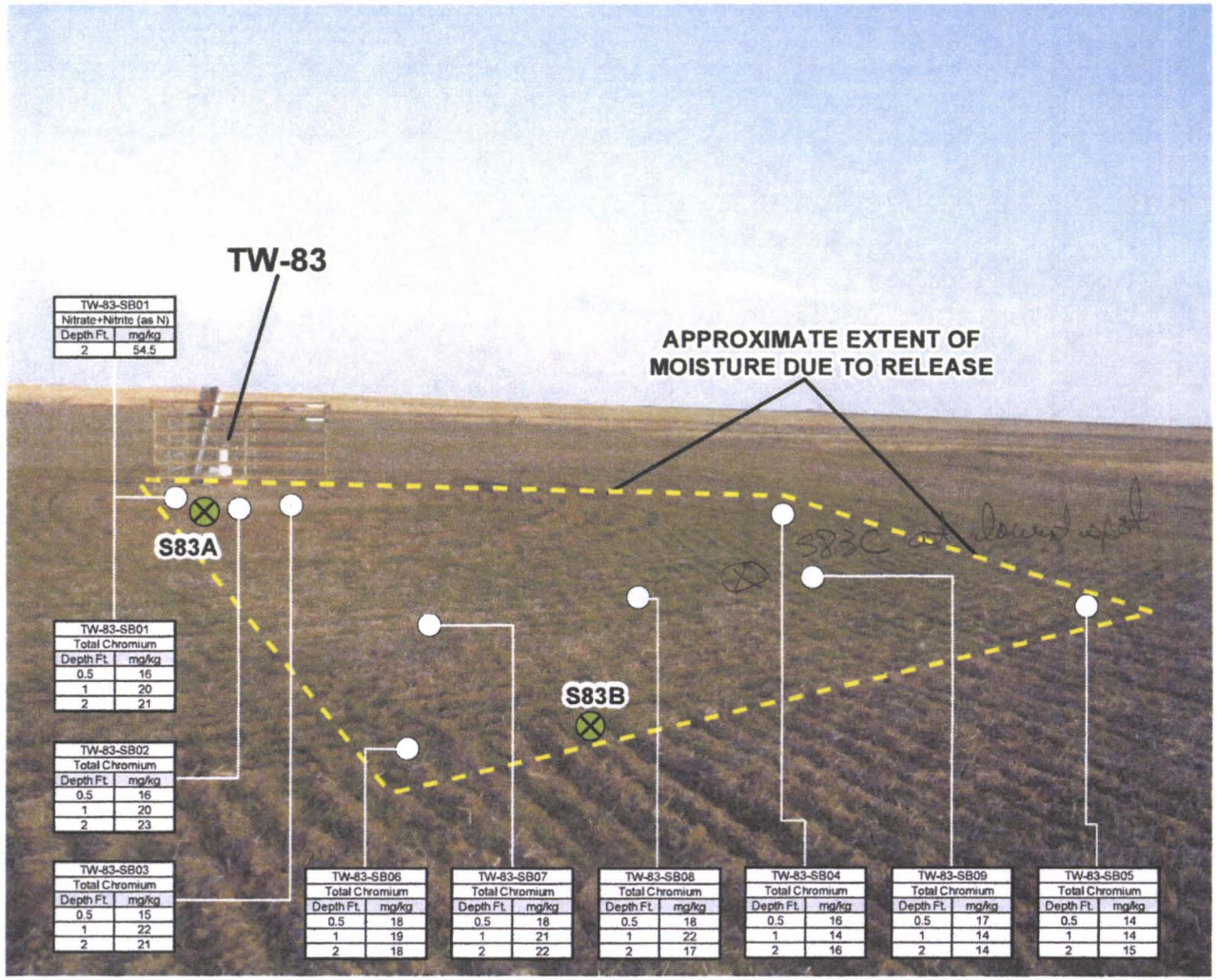
PROJECT NO.	FIGURE NO. F-4
DATE. JUNE 2010	FILE NO.



TW-83-SB01	
Nitrate+Nitrite (as N)	
Depth Ft.	mg/kg
2	54.5

TW-83-SB01	
Total Chromium	
Depth Ft.	mg/kg
0.5	16
1	20
2	21

TW-83-SB02	
Total Chromium	
Depth Ft.	mg/kg
0.5	16
1	20
2	23

TW-83-SB03	
Total Chromium	
Depth Ft.	mg/kg
0.5	15
1	22
2	21

TW-83-SB06	
Total Chromium	
Depth Ft.	mg/kg
0.5	18
1	19
2	18

TW-83-SB07	
Total Chromium	
Depth Ft.	mg/kg
0.5	18
1	21
2	22

TW-83-SB08	
Total Chromium	
Depth Ft.	mg/kg
0.5	18
1	22
2	17

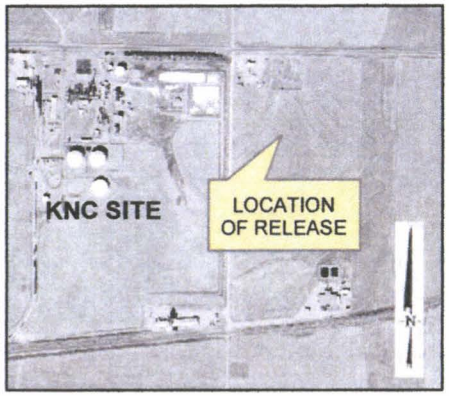
TW-83-SB04	
Total Chromium	
Depth Ft.	mg/kg
0.5	16
1	14
2	16

TW-83-SB09	
Total Chromium	
Depth Ft.	mg/kg
0.5	17
1	14
2	14

TW-83-SB05	
Total Chromium	
Depth Ft.	mg/kg
0.5	14
1	14
2	15

LOCATION OF RELEASE (LOOKING EAST) AND PROPOSED SAMPLES

Analyze for Hex down to 6'



LEGEND

- PROPOSED SAMPLE LOCATION FOR TOTAL CHROMIUM
- PREVIOUS SAMPLE LOCATION FROM JUNE 2010 ALONG WITH TOTAL CHROMIUM RESULTS

NOTE:

THE NITRATE+NITRITE (as N) VALUE OF 54.5 mg/kg, THE ONLY KDHE SCREENING VALUE EXCEEDANCE, IS ALSO INDICATED FOR TW-83-SB01 AT A DEPTH OF 2 FT BGS.

TW-83 LEAKAGE SAMPLING LOCATIONS

PREPARED BY:

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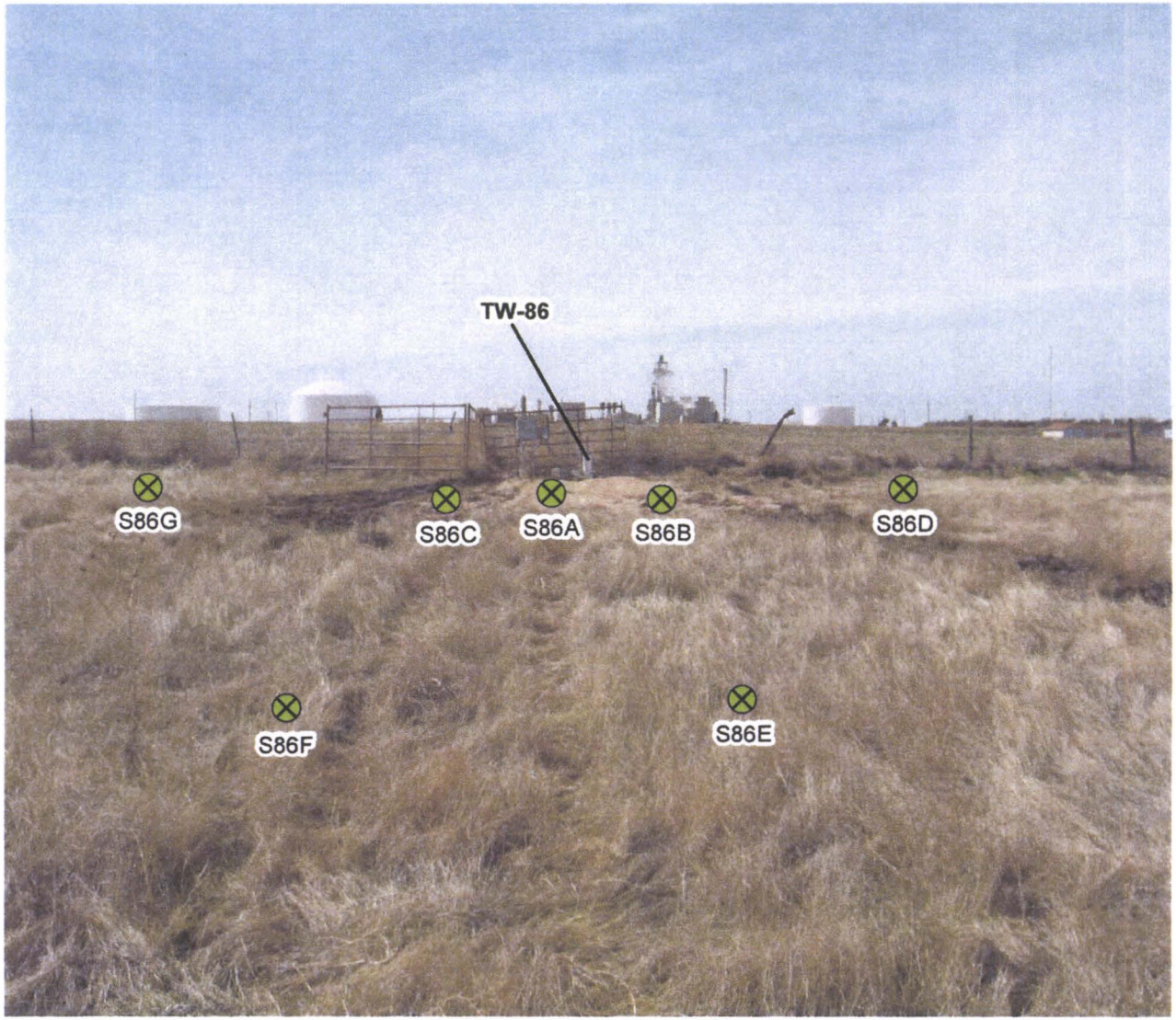
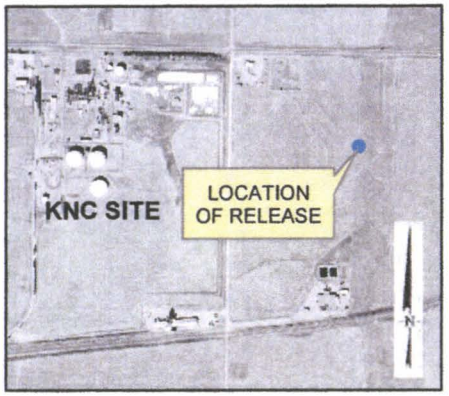
PROJECT NO.	FIGURE NO. F-2
DATE. JUNE 2011	FILE NO.



LOCATION OF RELEASE (LOOKING EAST)
AND PROPOSED SAMPLES



LEGEND

PROPOSED SAMPLE LOCATION FOR TOTAL CHROMIUM

Total + Hex

to 6'

TW-86 LEAKAGE
SAMPLING LOCATIONS

PREPARED BY:

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PROJECT NO.	FIGURE NO. F-3
DATE. JUNE 2011	FILE NO.