CBFO Approach for Discharge Permit DP-831 Modification Application

April 1, 2003

David Emery *DOE*

Dr. E. B. Nuckols *DOE*

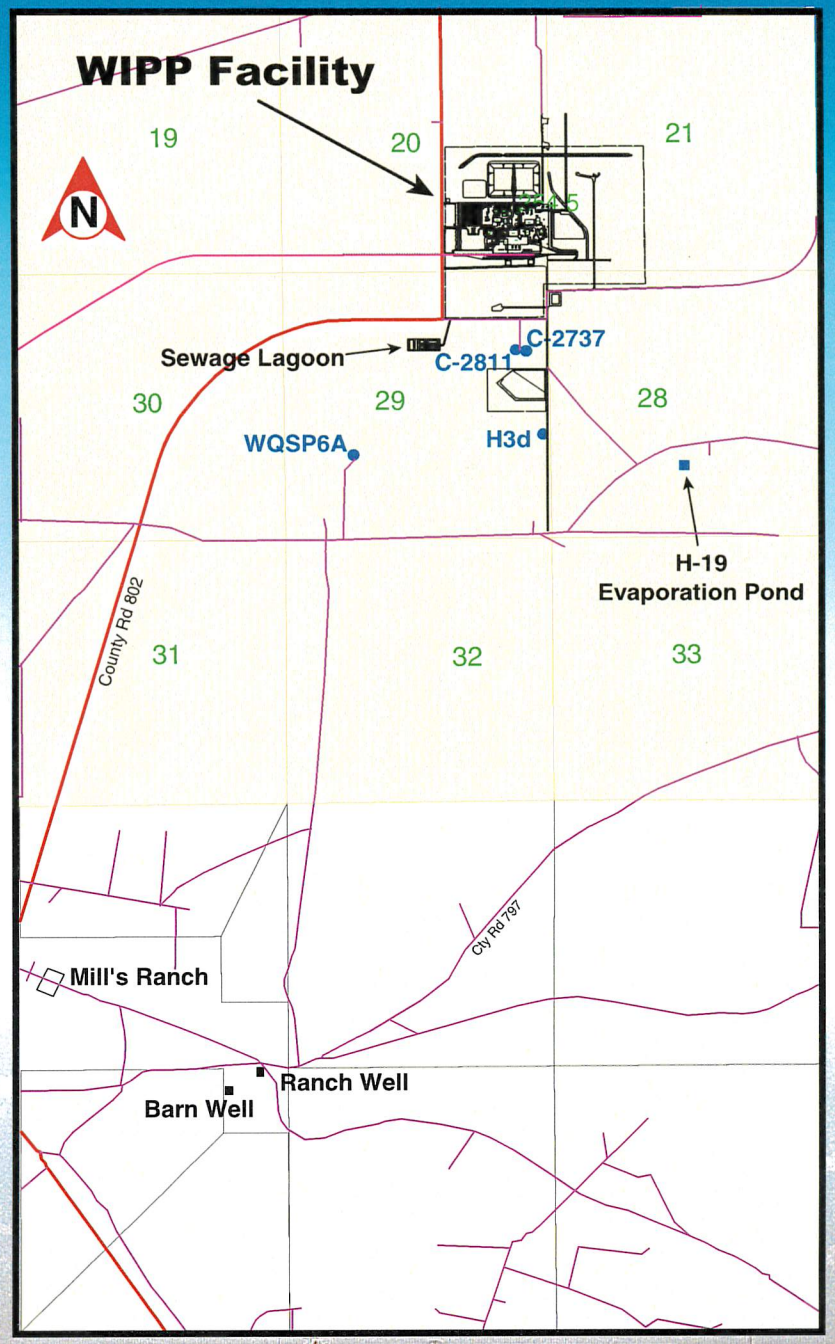
Dale Bignell *WTS*

Keith Gordon *CTAC*

ENTERED

030401

General Location



Progress Since October 2002

Accomplishments

- Draft Water Budget Analysis
- Field geophysics
- Source control strategy

TDS & Water Infiltration Controls

Source Control Actions

- Assessment
  - Total Dissolved Solids (TDS)
  - Water infiltration

Planned Activities

Planned Activities

- Salt Storage Area
- Salt Pile Evaporation Pond
- Evaporation Basin A (Detention Basin A)
- Evaporation Basin B (Pond 1 / Pond 2)
- Submission of Permit Application

Solutions

Expected Results

- Source control
- Migration Control

Implementation

Implementation Priorities

Accomplishments

- Draft "Water Budget Analysis of Shallow Subsurface Water"
- Initiated geophysical field work (time domain electro magnetic technique) in early February 2003 to delineate lateral and vertical extent of shallow subsurface water lens
- Developed comprehensive strategy to control TDS and water migration into subsurface

Source Control Actions

Assessment

Location	Estimated Seepage Volume*	
Salt Storage Area	90% TDS	37% water
Salt Pile Evaporation Pond	10% TDS	26% water
Detention Basin A	0% TDS	28% water
Pond 1/Pond 2	0% TDS	9% water
Total	100%	100%

** Using MODFLOW simulation*

Planned Activities

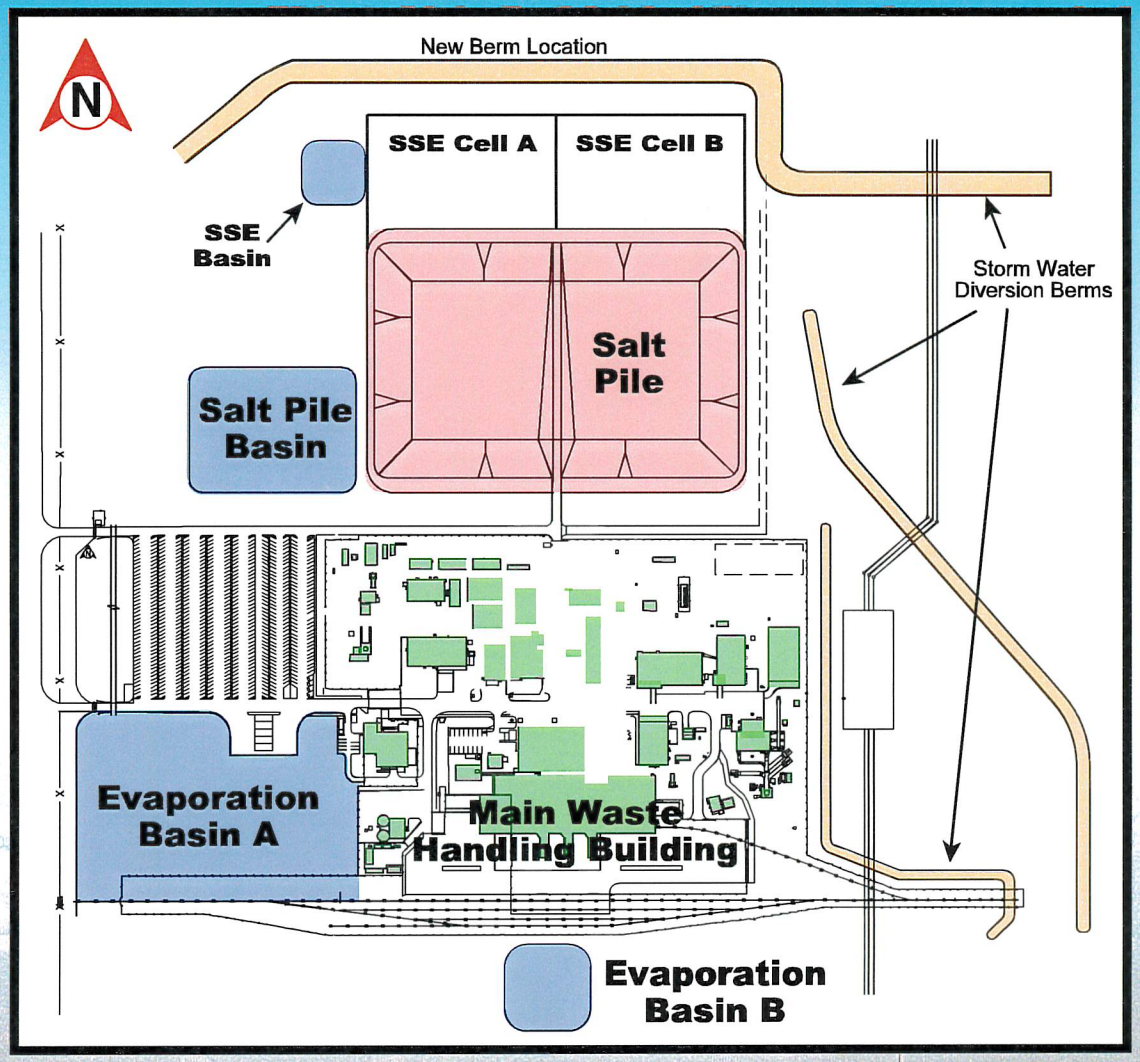
TDS Control

- Salt Pile Cap
- Cell A
- Cell B
- Salt Storage Extension Basin (SSE)

Infiltration Control

- Salt Pile Basin
- Evaporation Basin A
- Evaporation Basin B

DP Application



Expected Results

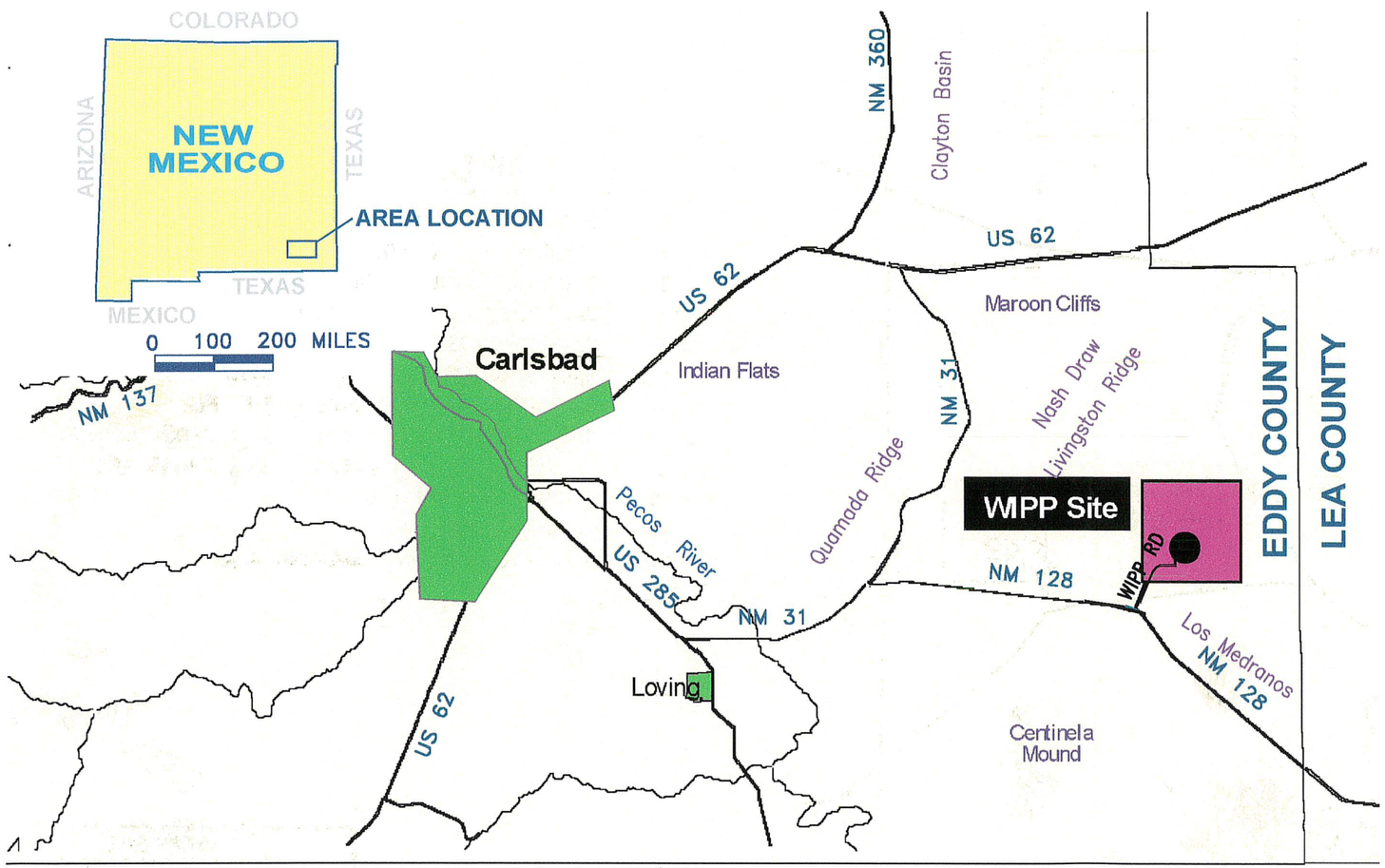
- Elimination of solute and water infiltration
- Drastic reduction in driving hydraulic head

Implementation Priorities

Permit Application Submittal	Priority 1
TDS Control	
▪ Cell A	Priority 2
▪ SSE Basin	Priority 3
▪ Salt Pile Cap	Priority 4
▪ Cell B	Priority 8
Infiltration Control	
▪ Salt Pile Basin	Priority 5
▪ Evaporation Basin A	Priority 6
▪ Evaporation Basin B	Priority 7

WASTE ISOLATION PILOT PROJECT
CONCEPTUAL DESIGN FOR INFILTRATION CONTROLS

EDDY COUNTY, NEW MEXICO
MARCH 2003



ADAPTED FROM DBSA 03/03

SITE LOCATION MAP

0 2.5 5 MILES

NORTH

LIST OF DRAWINGS

1 SITE LOCATION MAP AND DRAWING INDEX
2 EXISTING SITE CONDITIONS
3 PROPOSED INFILTRATION CONTROLS
4 SALT STORAGE AREA – SITE IMPROVEMENTS
5 SALT STORAGE PILE : S–N CROSS SECTION
6 SALT STORAGE PILE : W–E CROSS SECTION
7 SALT STORAGE EXTENSION – SITE PLAN
8 SALT STORAGE EXTENSION – S–N CROSS SECTION
9 SALT STORAGE EXTENSION – W–E CROSS SECTION
10 ENGINEERING DETAILS
11 DRAINAGE DETAILS
12 SALT STORAGE AREA GRADING PLAN

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WIPP SITE
INFILTRATION CONTROLS
SITE LOCATION MAP
DRAWING INDEX

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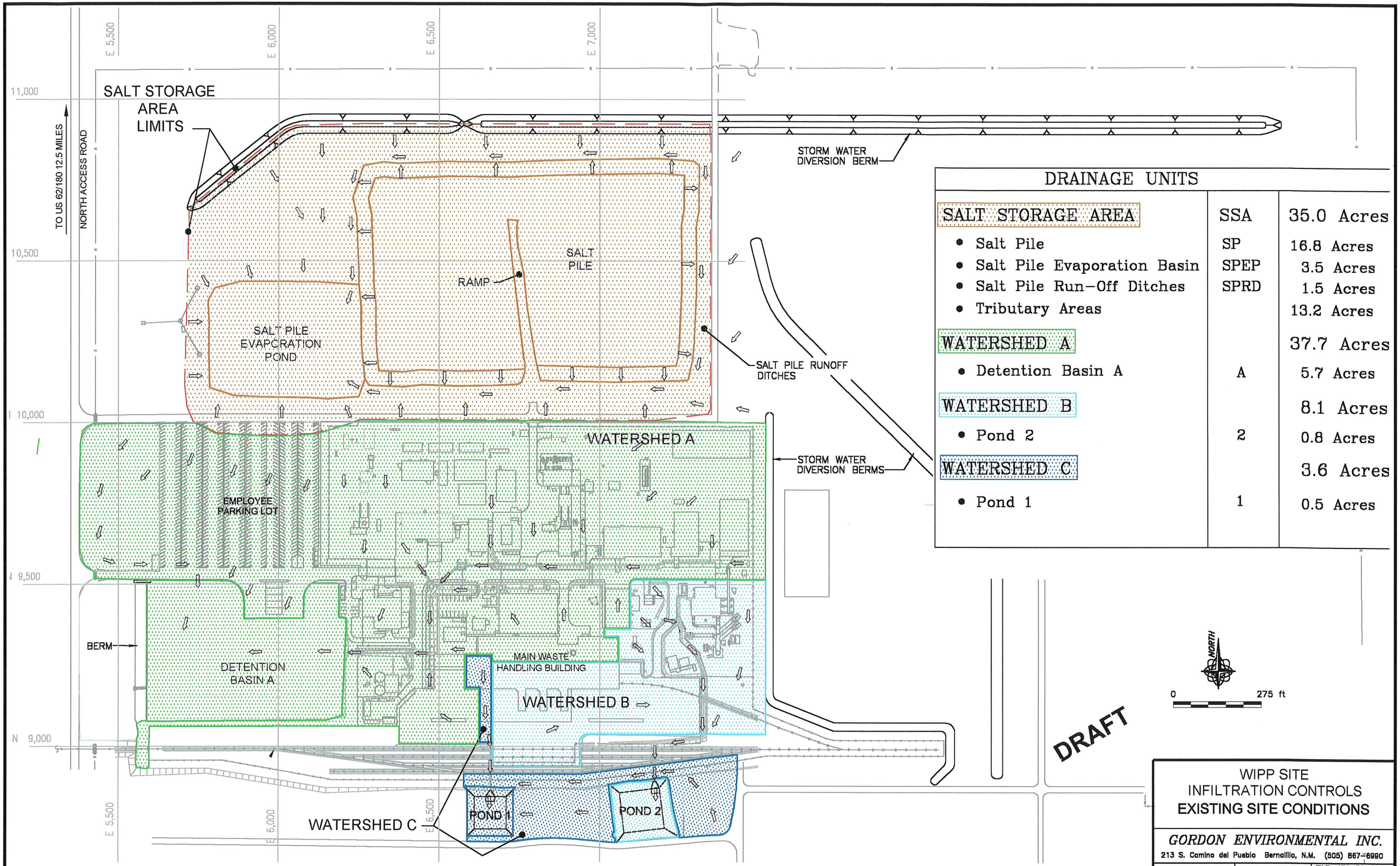

DRAINAGE UNITS		
SALT STORAGE AREA	SSA	35.0 Acres
• Salt Pile	SP	16.8 Acres
• Salt Pile Evaporation Basin	SPEP	3.5 Acres
• Salt Pile Run-Off Ditches	SPRD	1.5 Acres
• Tributary Areas		13.2 Acres
WATERSHED A		37.7 Acres
• Detention Basin A	A	5.7 Acres
WATERSHED B		8.1 Acres
• Pond 2	2	0.8 Acres
WATERSHED C		3.6 Acres
• Pond 1	1	0.5 Acres

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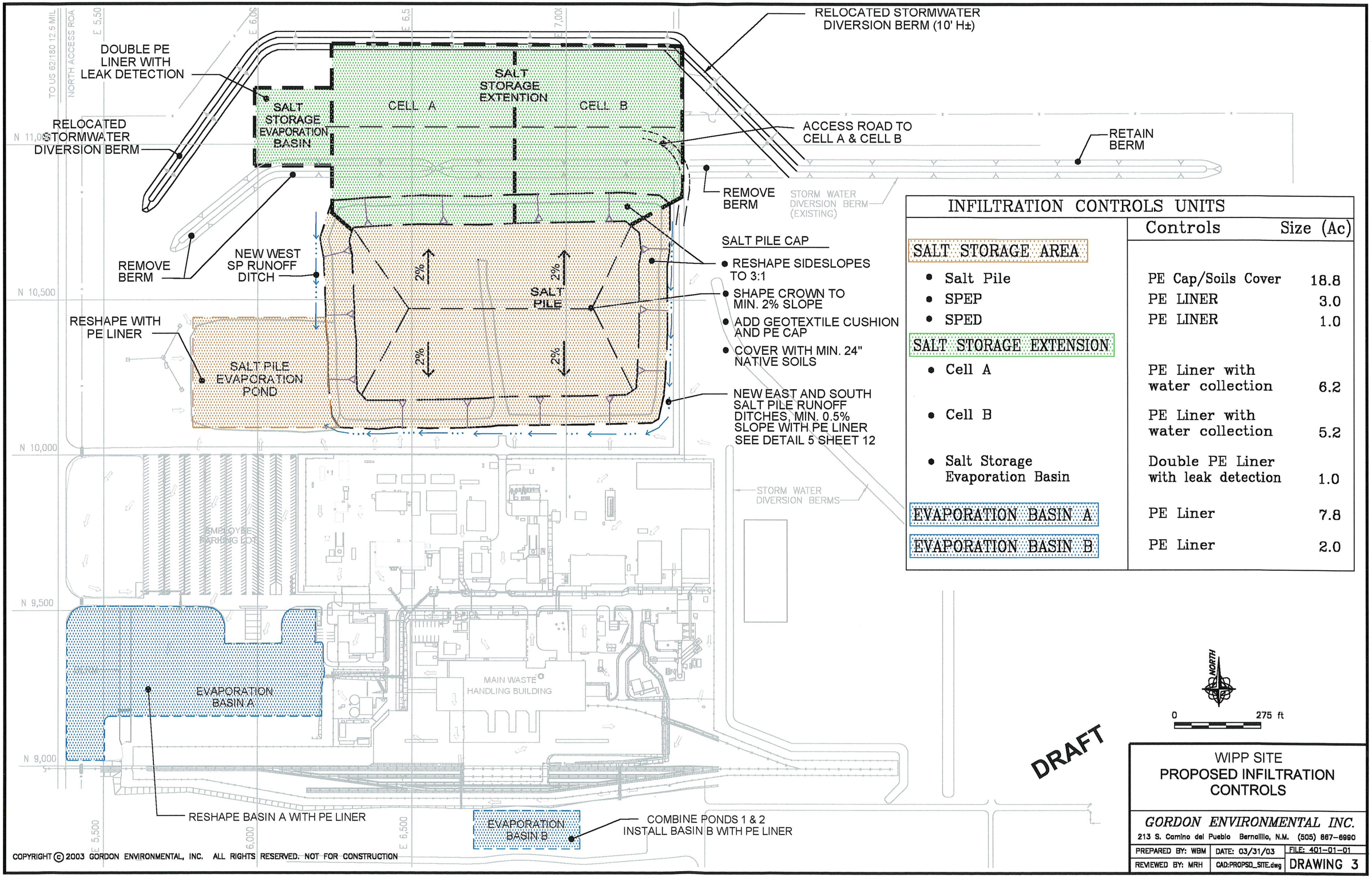

INFILTRATION CONTROLS UNITS

	Controls	Size (Ac)
SALT STORAGE AREA		
• Salt Pile	PE Cap/Soils Cover	18.8
• SPEP	PE LINER	3.0
• SPED	PE LINER	1.0
SALT STORAGE EXTENSION		
• Cell A	PE Liner with water collection	6.2
• Cell B	PE Liner with water collection	5.2
• Salt Storage Evaporation Basin	Double PE Liner with leak detection	1.0
EVAPORATION BASIN A	PE Liner	7.8
EVAPORATION BASIN B	PE Liner	2.0

WIPP SITE
PROPOSED INFILTRATION CONTROLS

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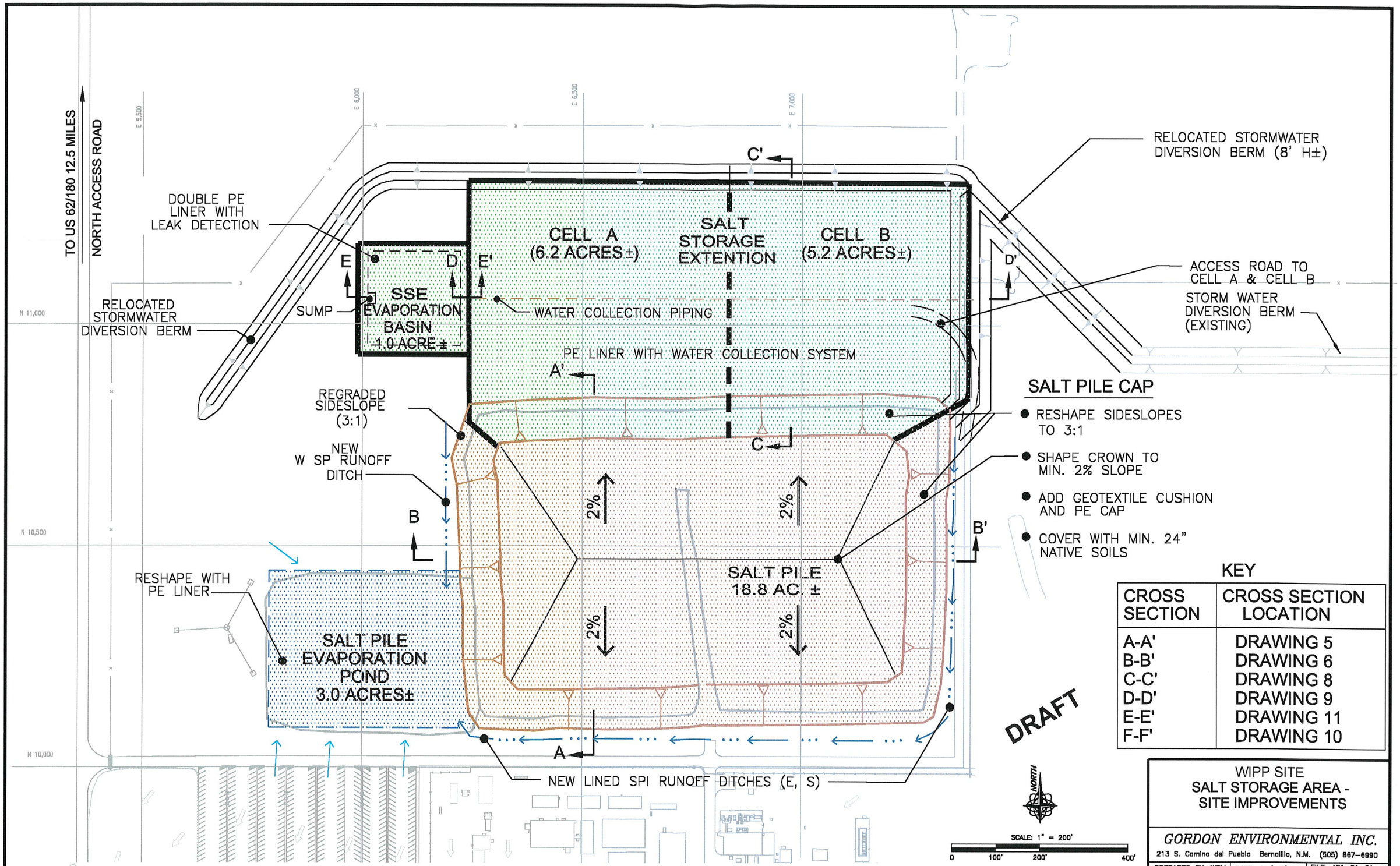

KEY

CROSS SECTION	CROSS SECTION LOCATION
A-A'	DRAWING 5
B-B'	DRAWING 6
C-C'	DRAWING 8
D-D'	DRAWING 9
E-E'	DRAWING 11
F-F'	DRAWING 10

WIPP SITE
SALT STORAGE AREA - SITE IMPROVEMENTS

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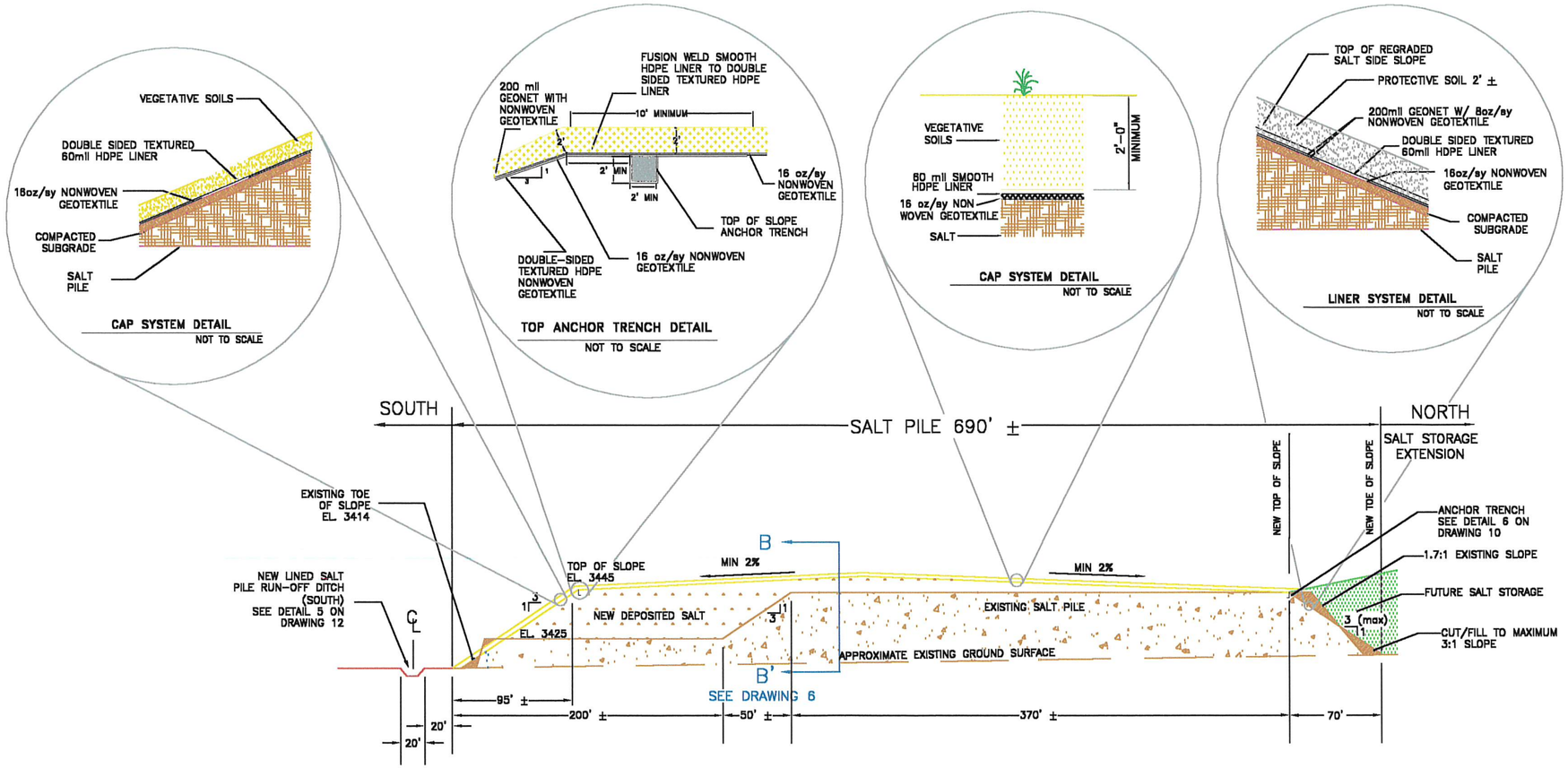
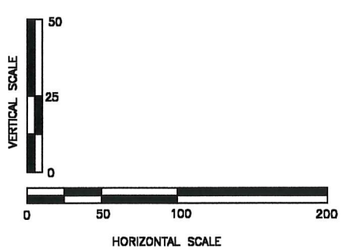
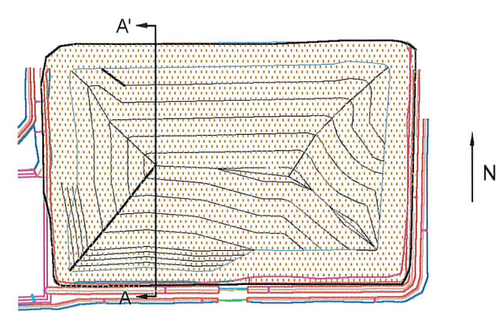


SECTION A - A'
SALT STORAGE PILE: SOUTH-NORTH CROSS SECTION





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WIPP SITE
SALT STORAGE PILE
S-N CROSS SECTION

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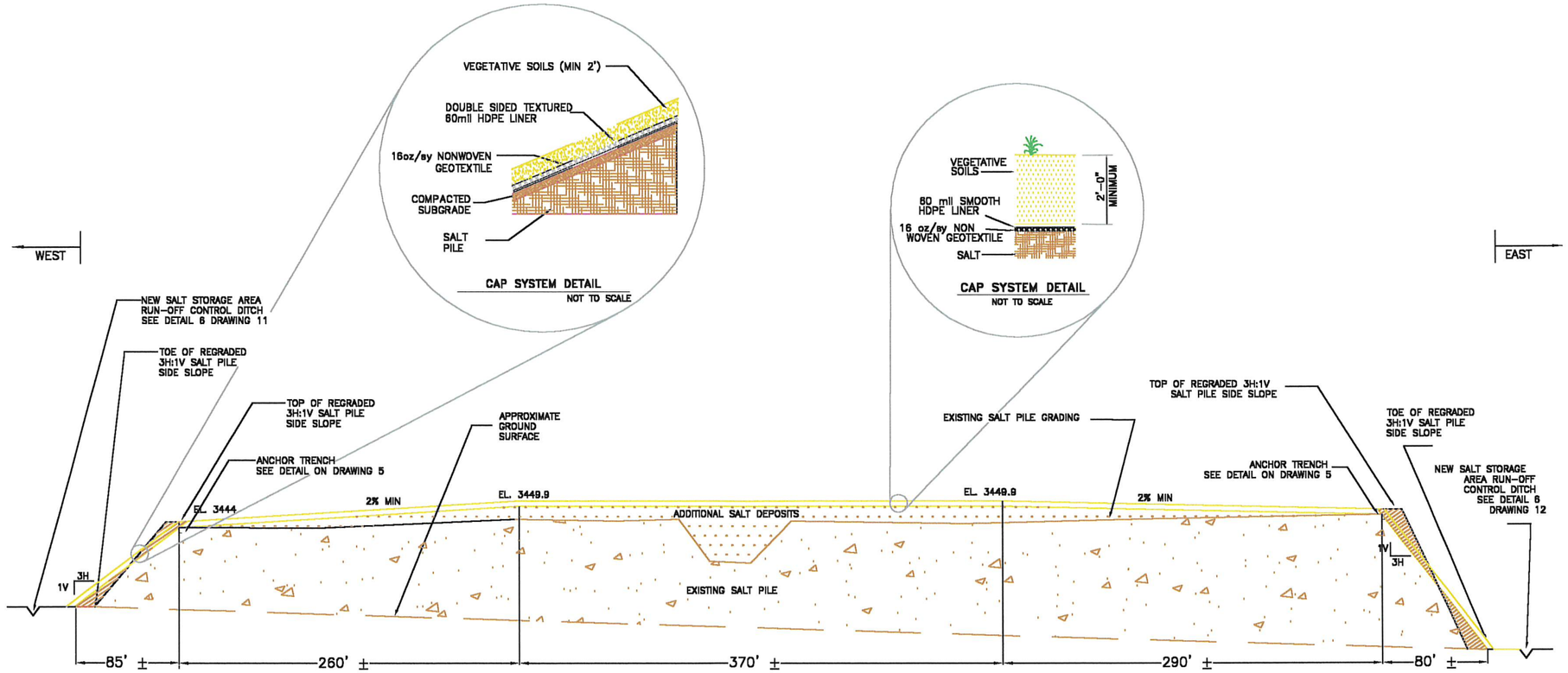
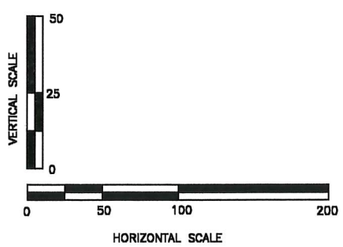
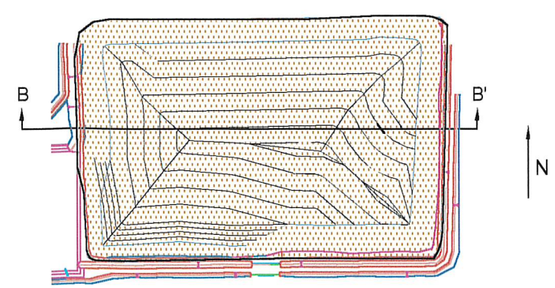


SECTION B-B'

SALT STORAGE PILE: WEST-EAST CROSS SECTION





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WIPP SITE
SALT STORAGE PILE
W-E CROSS SECTION

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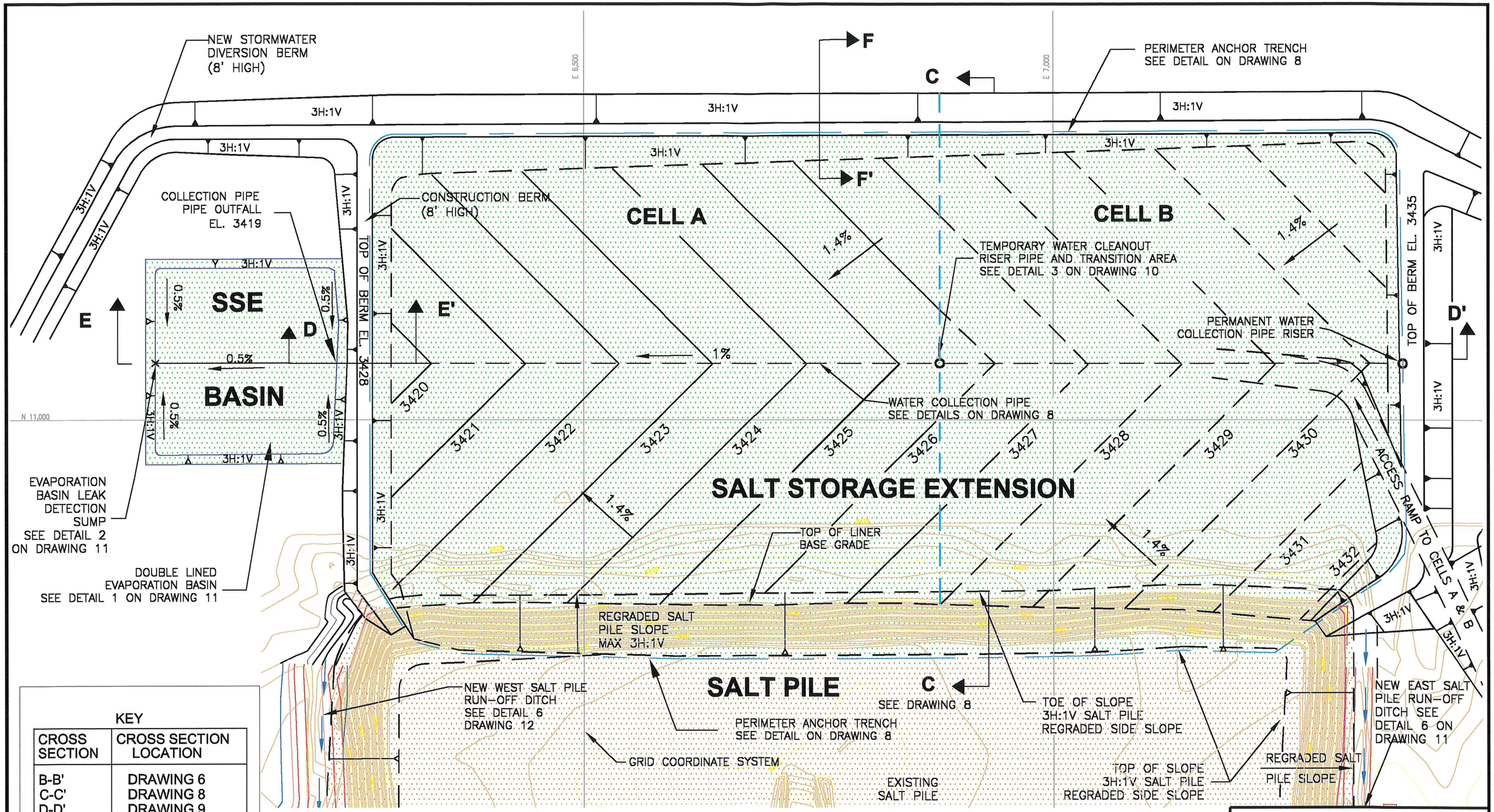

KEY

CROSS SECTION	CROSS SECTION LOCATION
B-B'	DRAWING 6
C-C'	DRAWING 8
D-D'	DRAWING 9
E-E'	DRAWING 11
F-F'	DRAWING 10

WIPP SITE
SALT STORAGE EXTENSION (SSE)
SITE PLAN

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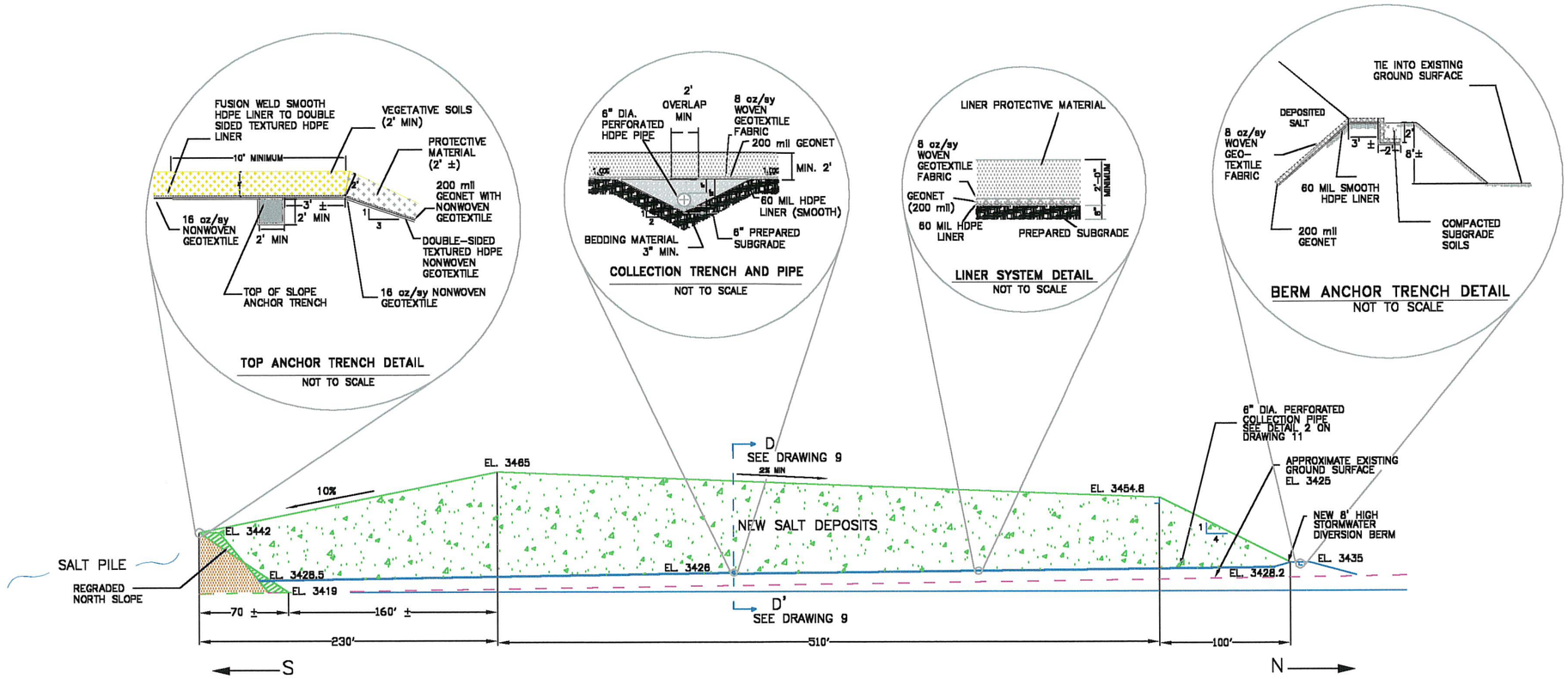
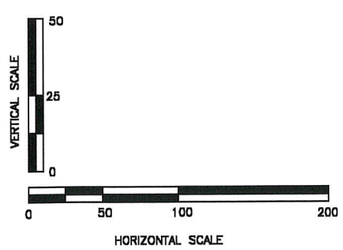
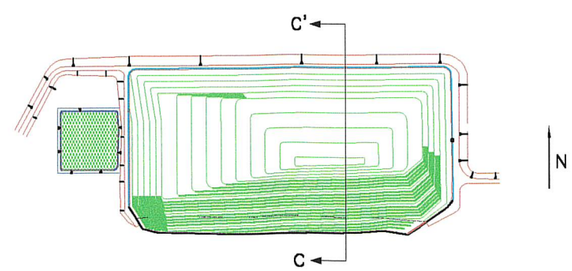


SECTION C' - C
SALT STORAGE EXTENSION- SOUTH TO NORTH CROSS SECTION





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WIPP SITE
SALT STORAGE EXTENSION
S-N CROSS SECTION

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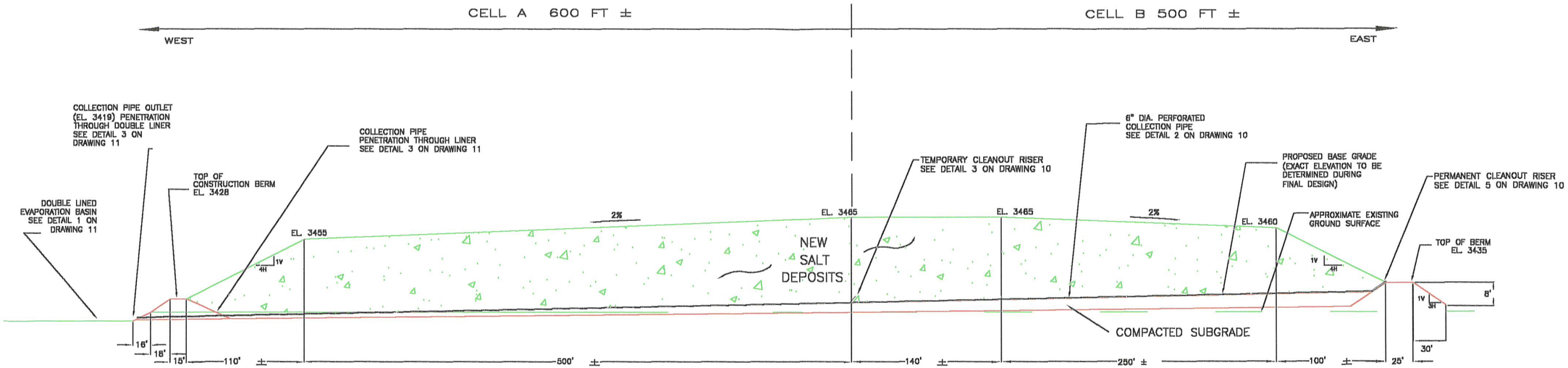
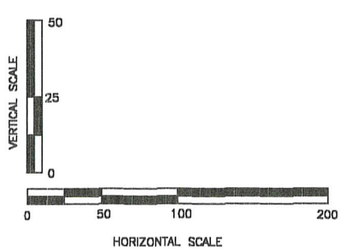
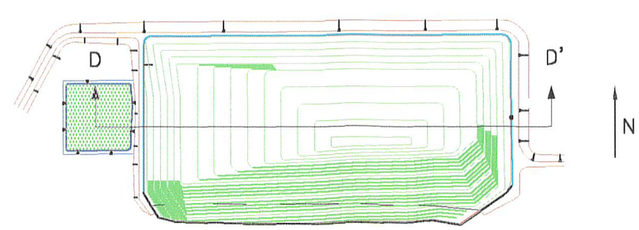


SECTION D - D'

SALT STORAGE EXTENSION: WEST-EAST CROSS SECTION





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WIPP SITE
SALT STORAGE EXTENSION
W-E CROSS SECTION

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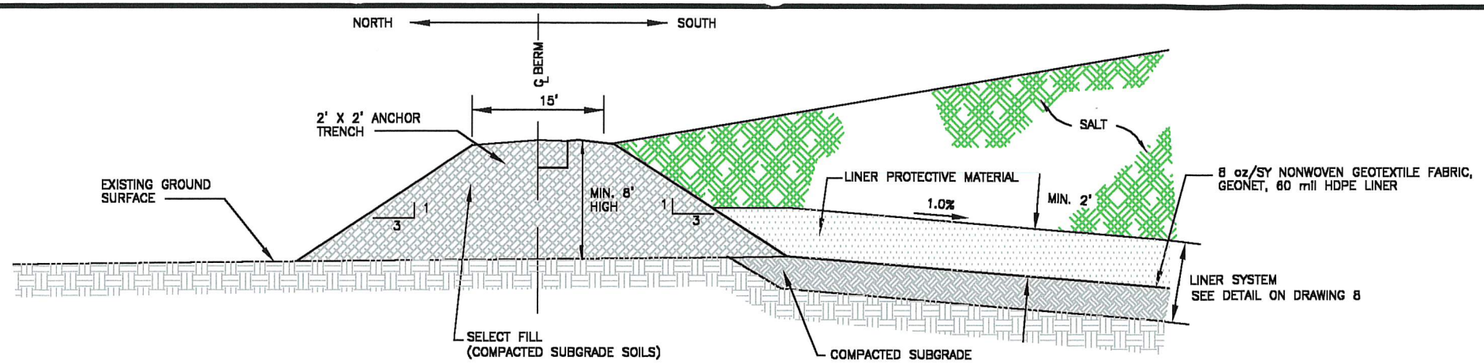
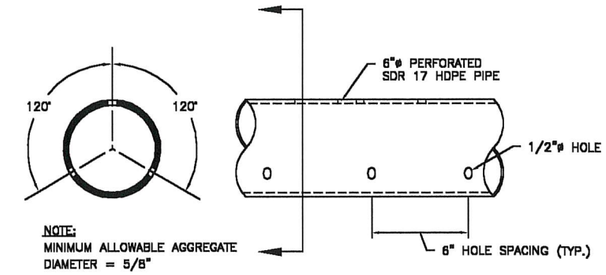


1/10 STORM WATER DIVERSION BERM
SECTION F-F' NOT TO SCALE



2/10 PERFORATED COLLECTION PIPE
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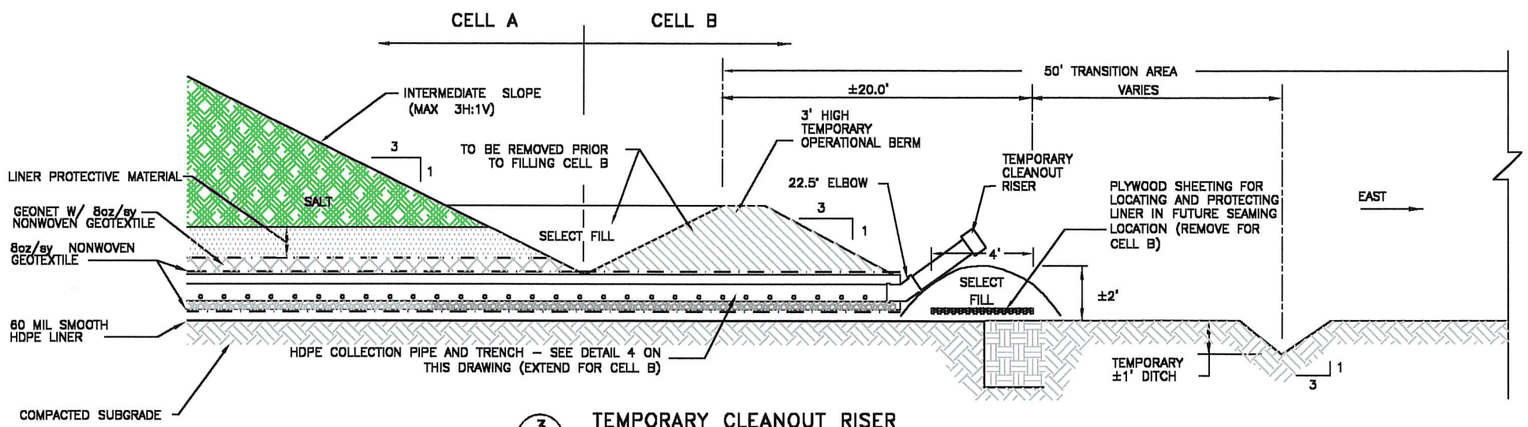
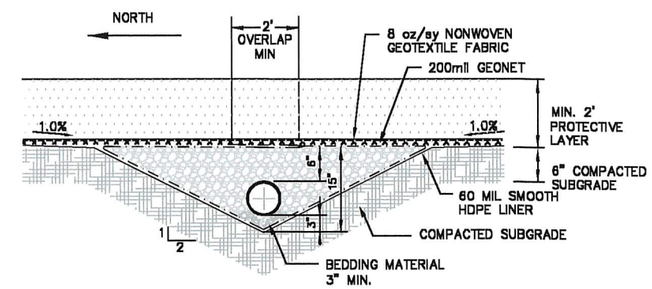


3/10 TEMPORARY CLEANOUT RISER
SECTION VIEW NOT TO SCALE



4/10 HDPE COLLECTION PIPE AND TRENCH
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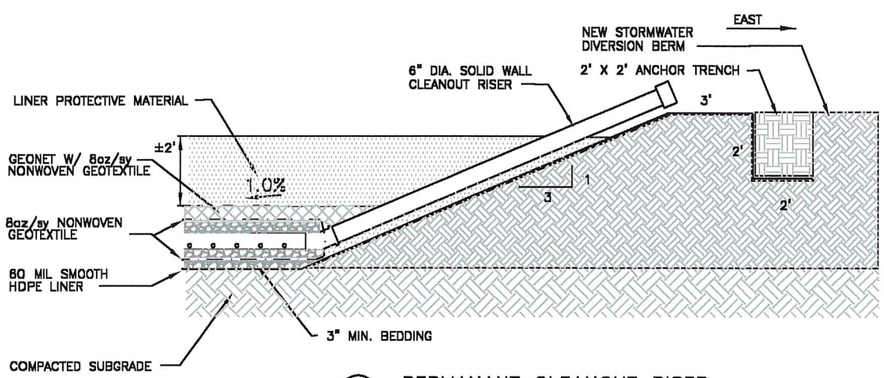

5/10 PERMANANT CLEANOUT RISER
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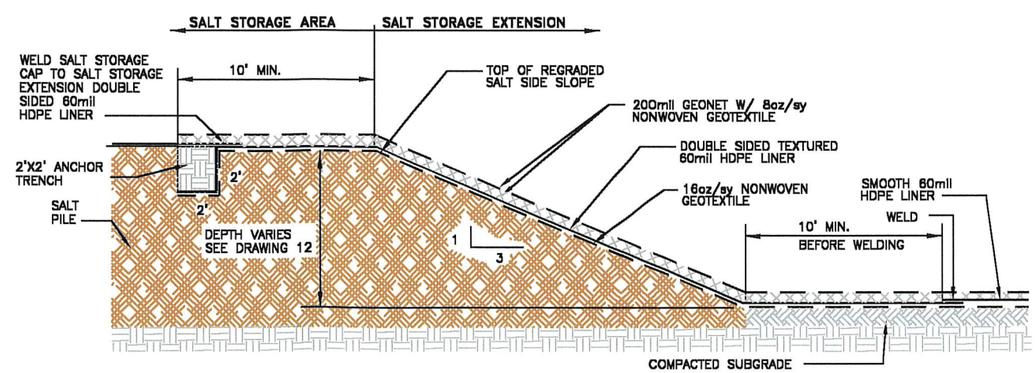

6/10 SALT STORAGE AREA REGRADED NORTH SIDE SLOPE
LINER NOT TO SCALE

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WIPP SITE
SALT STORAGE EXTENSION
ENGINEERING DETAILS

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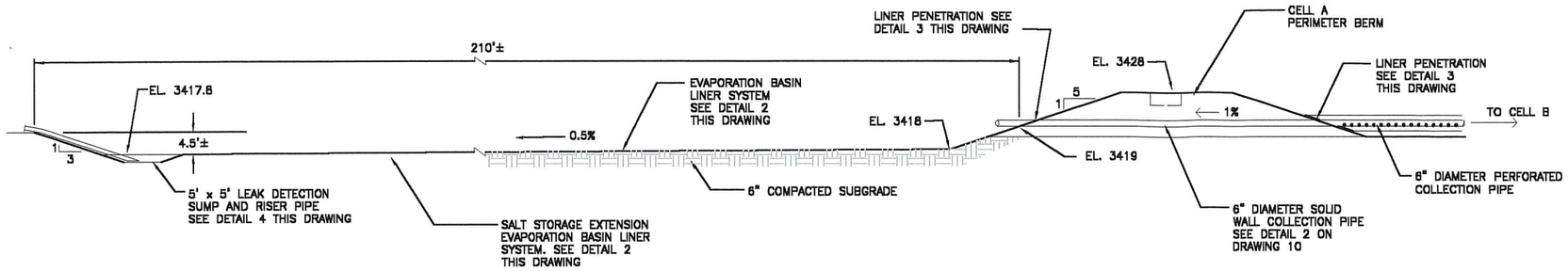
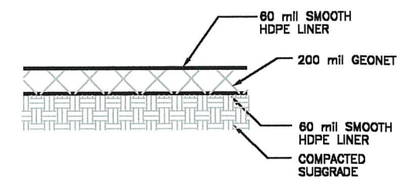


1/11 SALT STORAGE EXTENSION EVAPORATION BASIN
SECTION E–E'
NOT TO SCALE



2/11 SALT STORAGE EXTENSION EVAPORATION BASIN
LINER SYSTEM
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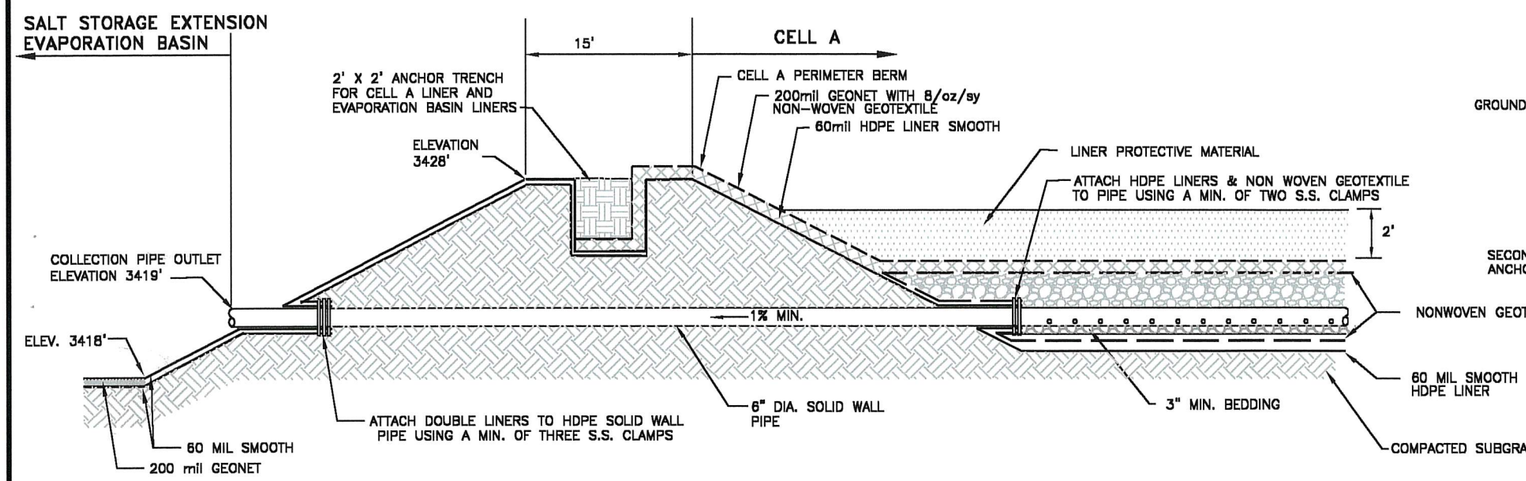

3/11 LINER PENETRATION THROUGH BERM
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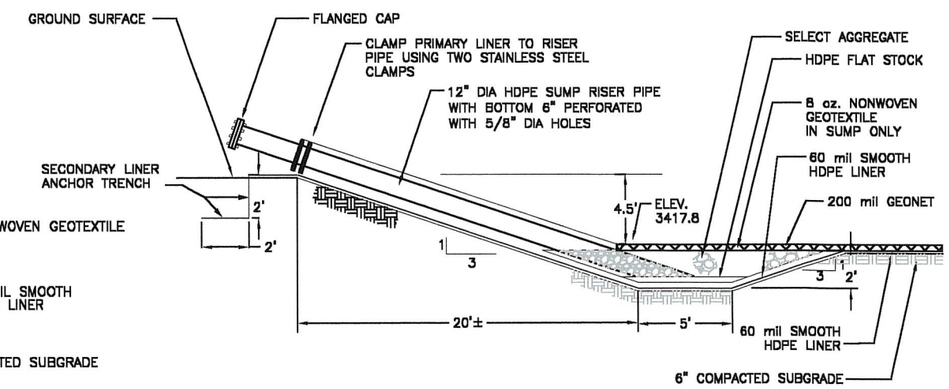
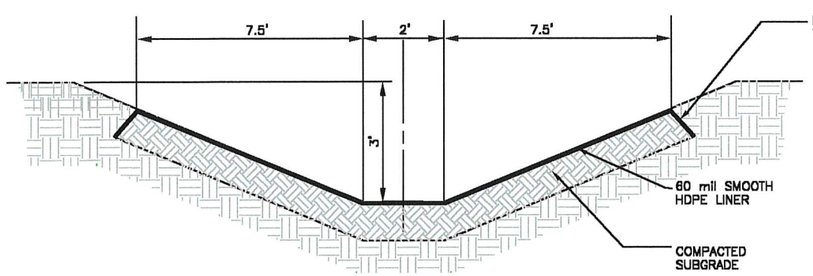
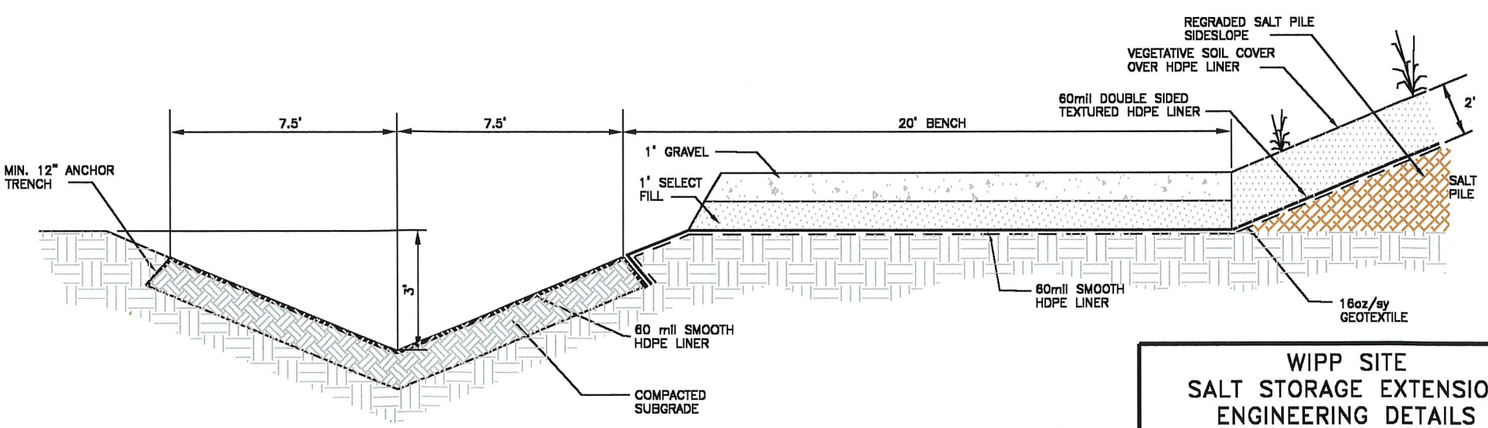


4/11 LEAK DETECTION SUMP AND RISER PIPE
NOT TO SCALE



5/11 SALT PILE RUNOFF DITCHES
SOUTH TRAPEZOID–DITCH DETAIL
SECTION VIEW
NOT TO SCALE



6/11 SALT PILE RUNOFF DITCHES
EAST & WEST V–DITCH DETAIL WITH BENCH
SECTION VIEW
NOT TO SCALE

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WIPP SITE
SALT STORAGE EXTENSION
ENGINEERING DETAILS
SSE EVAPORATION BASIN

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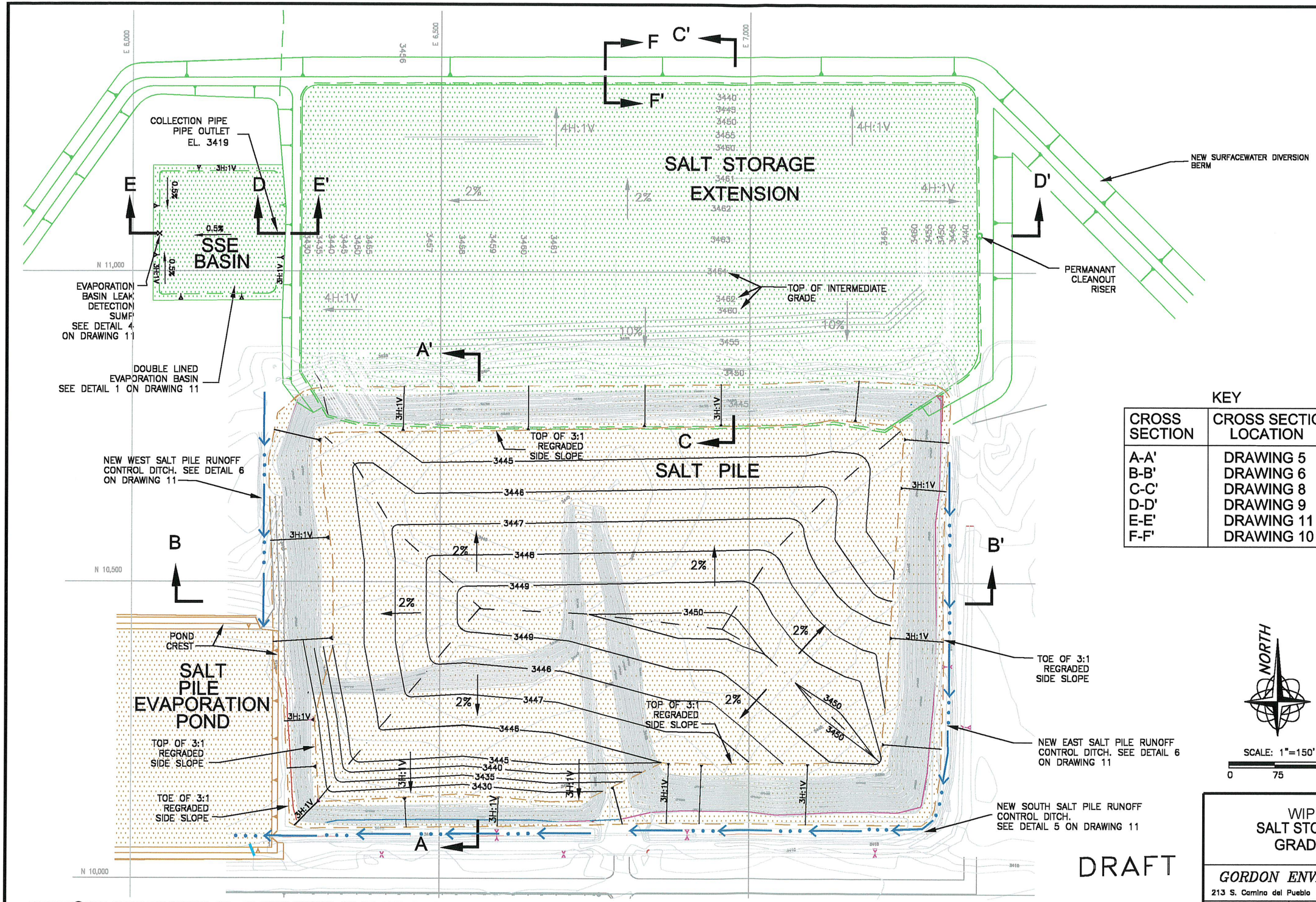

KEY

CROSS SECTION	CROSS SECTION LOCATION
A-A'	DRAWING 5
B-B'	DRAWING 6
C-C'	DRAWING 8
D-D'	DRAWING 9
E-E'	DRAWING 11
F-F'	DRAWING 10

WIPP SITE
SALT STORAGE AREA
GRADING PLAN

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