

# Commercial/Industrial Floodplain Development Permit

## Doddridge County, WV Floodplain Management

This permit has been issued to **EQT Production Company**, and is for the approved commercial and/or industrial development project associated with this permit that impacts the FEMA-designated floodplain and/or floodway of Doddridge County, WV, pursuant to the rules and regulations established by all applicable Federal, State and local laws and ordinances, including the Doddridge County Floodplain Ordinance. This permit must be posted at the site of work as to be clearly visible, and must remain posted during entirety of development.

### **Permit: #15-342 WEU 2 Well Pad Modification**

**Date Approved: 04/10/2015**

**Expires: N/A**

**Issued to: EQT Production Company**

**POC: Loco Corder  
304-848-0066**

**Company Address: 115 Professional Place  
Bridgeport, WV 26330**

**Project Address: West Union District**

**Lat/Long: 39.27442N/80.78506W**

**Purpose of development: Well pad modification project. Project does not impact floodplain.**

**Issued by: Edwin L. "Bo" Wriston, Doddridge County FPM (or designee)**

**Date: 04/10/2015**

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For additional information regarding this permit, please contact  
Doddridge County Floodplain Manager at 304.873.2631, or via email at  
doddridgecountyfpm@gmail.com  
118 East Court Street; West Union, WV 26456

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15-342

PROFESSIONAL ENERGY CONSULTANTS

FILED DIVISION OF SMITH LAND SURVEYING, INC.

March 24, 2015

Mr. Bo Wriston  
Floodplain Coordinator  
Doddridge County Commission  
118 East Court Street  
West Union, WV 26456

2015 MAR 26 AM 11:44

BETH A. ROGERS  
COUNTY CLERK  
DODDRIDGE COUNTY, WV

Re: EQT Production Company, WEU 2 Well Site  
Doddridge County, WV, SLS Project No. 8265

Mr. Wriston,

On behalf of EQT Production Company, Smith Land Surveying, Inc. would like to notify you that the attached WEU 2 Site Plan Modification has been submitted to the WVDEP. The current site consists of an access road and well pad. EQT is proposing to enlarge the existing well pad and to construct a flowback pit to aid in the development of 4 additional Marcellus Shale gas wells. The site entrance is located in Doddridge County, approximately 0.56 miles southwest of the junction of US. Rt. 50 and Co. Rt. 50/41. The entrance to the site is located at Latitude 39.27442, Longitude -80.78506 (NAD 83).

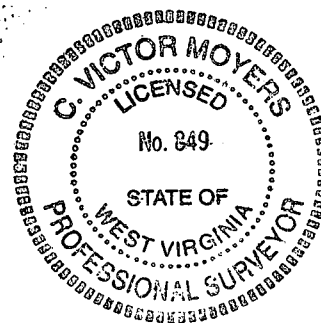
Based on the information presented on the site FIRM, this project is not located within FEMA Flood Zone. No fill shall be placed within the floodplain limits for this project. No other permitting is necessary for this project.

Included in the attachments are the following: cover letter, FEMA map with the site location, vicinity map, and site plans dated 3/06/15.

If you have any questions please feel free to contact me at (304) 462-5634 or Wes Wayne (Design Coordinator) with SLS at 304-904-9184 or [wwayne@slssurveys.com](mailto:wwayne@slssurveys.com), should you have any questions or comments.

Respectfully submitted,

C. Victor Moyers, P.S.



cc: Lacoa L. Corder, EQT Environmental Coordinator.

# WEU 2 WELL SITE; FEMA MAP



## NOTES

FEMA FIRM  
MAP # 54017C0120C

## SCALE

1 INCH = 2000-FEET

0' 2000' 4000' 6000'



JOB #: 8265  
DRAWN BY: K.E.S.  
DATE: 3/24/15  
SCALE: 1" = 2000'

## WEU 2 FEMA

THIS DOCUMENT WAS PREPARED BY:  
SMITH LAND SURVEYING, INC.  
FOR: EQT



Professional Energy Consultants  
A DIVISION OF SMITH LAND SURVEYING, INC.



(304) 462-5634

SURVEYORS  
ENGINEERS  
ENVIRONMENTAL  
PROJECT MGMT.

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# WEU 2 VICINITY MAP



## NOTES

USGS WEST UNION  
TOPO QUADRANGLE

SCALE  
1 INCH = 2000-FEET

0' 2000' 4000' 6000'



## WEU 2

THIS DOCUMENT WAS PREPARED BY:  
SMITH LAND SURVEYING, INC.  
FOR: EQT



**Professional Energy Consultants**  
A DIVISION OF SMITH LAND SURVEYING, INC.

**SLS**

(304) 462-5634

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# EQT

Where energy meets innovation.

JOB #: 8265  
DRAWN BY: K.E.S.  
DATE: 3/24/15  
SCALE: 1" = 2000'

STATE OF WEST VIRGINIA,  
COUNTY OF DODDRIDGE, TO WIT

I, Virginia Nicholson, Editor of THE  
HERALD RECORD, a weekly newspaper  
published regularly, in Doddridge County,  
West Virginia, Do Hereby Certify  
That the Accompanying Legal Notice  
entitled:

*Floodplain Permit*  
*# 15-342*

was published in said paper for *2*

successive weeks beginning with the issue  
of *April 7<sup>th</sup>* 2015 and  
ending with the issue of

*April 14<sup>th</sup>* 2015 and

that said notice contains *210*

WORD SPACE at *115* cents a word

amounts to the sum of \$ *24.15*

FOR FIRST PUBLICATION, SECOND  
PUBLICATION IS 75% OF THE FIRST  
PUBLICATION

\$ *18.12*  
and each publication thereafter

\$ *42.27* TOTAL

EDITOR

*Virginia Nicholson*

SWORN TO AND SUBSCRIBED

BEFORE ME THIS THE *14<sup>th</sup>* DAY  
OF *April* 2015

NOTARY PUBLIC

*Laura J. Stickel*



LEGAL ADVERTISEMENT:  
Doddridge County

Floodplain Permit Application  
Please take notice that on the 26th day of March, 2015  
EQT Production Company filed an application for a  
Floodplain Permit to develop land located at or about:  
West Union District 39.27442N/80.78506W Permit #15-  
342 WEU 2 Well Pad Expansion. (Note: This project is  
not within the floodplain.) The Application is on file  
with the Clerk of the County Court and may be inspected  
or copied during regular business hours. As this project is  
outside the FEMA identified floodplain of Doddridge  
County, Doddridge County Floodplain Management has  
no regulatory authority. Any interested persons who  
desire to comment shall present the same in writing by  
April 27, 2015.

Delivered to the:  
Clerk of the County Court  
118 E. Court Street, West Union, WV 26456  
Beth A. Rogers, Doddridge County Clerk  
Edwin L. "Bo" Wriston, Doddridge County Flood Plain  
Manager

4-7-2xb



# The Doddridge Independent

## The Doddridge Independent PUBLISHER'S CERTIFICATE

I, Michael D. Zorn, Publisher of The Doddridge Independent, A newspaper of general circulation published in the town of West Union, Doddridge County, West Virginia, do hereby certify that:

**EQT Production Company**

filed an application for a Floodplain Permit to develop land

located at or about:

**West Union District**

**39.27442N/80.78506W**

**Permit #15-342 WEU 2 Well Pad Expansion**

**(Note: This project is not within the floodplain)**

was published in The Doddridge Independent  
2 times commencing on Friday, April 17, 2015 and  
Ending on Friday, April 24, 2015 at the request of:

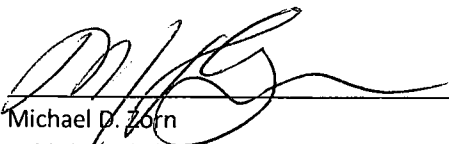
**Edwin Wriston, Doddridge County Floodplain  
Manager & Doddridge County Commission**

Given under my hand this Friday, April 24, 2015

The publisher's fee for said publication is:

**\$ 25.27 1st Run/\$ 18.95 Subsequent Runs**

**This Legal Ad Total: \$ 44.22**

  
Michael D. Zorn  
Publisher of The Doddridge Independent

Subscribed to and sworn to before me on

this date: 4/27/15



Notary Public in and for Doddridge County

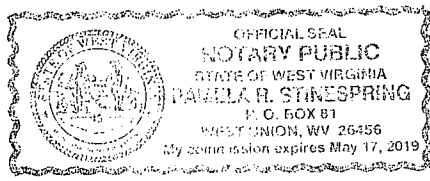
My Commission expires on

The 17<sup>th</sup> day of May 2015

Legal Advertisement: 4/13-4/20  
 Doddridge County  
 Floodplain Permit Application

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**Permit #15-342 WEU 2 Well Pad Expansion**  
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 writing by April 27, 2015, delivered to:  
 Clerk of the County Court  
 118 E. Court Street, West Union, WV 26456  
 Beth A Rogers, Doddridge County Clerk  
 Edwin L. "Bo" Wriston, Doddridge County Flood Plain Manager





# EQT WEU 2 SITE PLAN EQT PRODUCTION COMPANY

EXITING WELL NO. H7-WV 513369, H4-WV 512510, H6-WV 512512, H2-WV 512508, H3-WV 512509, H5-WV 512511, H1-WV 512507  
PROPOSED WELL NO. H8-WV 515875, H10-WV 515877, H9-WV 515676

## PROJECT INFORMATION

PROJECT NAME: EQT WEU 2

TAX PARCEL:  
WEST UNION DISTRICT, DODDRIDGE COUNTY, WV  
MAP 15 PARCEL 08  
MAP 16 PARCEL 16

SURFACE OWNER:  
RUTH R. DAVIES PIERCE, ET AL; C/O TOM DAVIES  
MAP 15, PARCEL 08  
WEST UNION DISTRICT, DODDRIDGE COUNTY, WV  
TOTAL PROPERTY AREA: 1457.95 +/- ACRES  
TOTAL DISTURBANCE AREA: 31.8 +/- ACRES

OIL AND GAS ROYALTY OWNER:  
MARY FARR SECRIST  
WEST UNION DISTRICT, DODDRIDGE COUNTY, WV  
TOTAL PROPERTY AREA: 1562 +/- ACRES

SITE LOCATION:  
THE EQT WEU 2 ACCESS ROAD ENTRANCE IS LOCATED 2,933' +/-  
SOUTHEAST OF THE JUNCTION OF US RT. 50 AND CO. RT. 50/41.  
THE WELL PAD IS LOCATED 1.4 MILES +/- SOUTHEAST OF THE  
JUNCTION OF US RT. 50 AND CO. RT. 50/41.

## LOCATION COORDINATES

EQT WEU 49 AND EQT WEU 2 CONSTRUCTION ENTRANCE  
LATITUDE: 39.27442 LONGITUDE: 80.78506 (NAD 83)

JUNCTION OF EQT WEU 49 AND EQT WEU 2 ACCESS ROADS  
LATITUDE: 39.27057 LONGITUDE: 80.78468 (NAD 83)

EQT WEU 2 WELL PAD CENTER  
LATITUDE: 39.27232 LONGITUDE: 80.77134 (NAD 83)

EQT WEU 2 FLOWBACK PIT CENTER  
LATITUDE: 39.27373 LONGITUDE: 80.76738 (NAD 83)

EQT WEU 49 STOCKPILE CENTER  
LATITUDE: 39.26243 LONGITUDE: 80.77994 (NAD 83)

## GENERAL DESCRIPTION

THE WELL PAD, ACCESS ROAD AND FLOWBACK PIT ARE BEING  
CONSTRUCTED TO AID IN THE DEVELOPMENT OF INDIVIDUAL  
MARCELLUS SHALE GAS WELLS.

## SITE DISTURBANCE COMPUTATIONS

WELL PAD AREA = 9.5 +/- ACRES  
FLOWBACK PIT AREA = 6.8 +/- ACRES  
WEU 49 STOCKPILE AREA = 10.3 +/- ACRES  
ACCESS ROAD AREA = 5.2 +/- ACRES  
TOTAL SITE DISTURBANCE AREA = 31.8 +/- ACRES

## ENTRANCE PERMIT

EQT PRODUCTION COMPANY WILL OBTAIN AN ENCROACHMENT PERMIT (FORM  
MM-109) FROM THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS, PRIOR TO COMMENCEMENT OF CONSTRUCTION  
ACTIVITIES.

## MISS UTILITY STATEMENT

MISS UTILITY OF WEST VIRGINIA WAS NOTED FOR THE LOCATING OF  
UTILITIES PRIOR TO THIS PROJECT DESIGN; TICKET #1503703961.  
IN ADDITION, MISS UTILITY WILL BE CONTACTED PRIOR TO START OF THE  
PROJECT.

## ENVIRONMENTAL NOTES

A WETLAND DELINEATION WAS PERFORMED ON DECEMBER 18 AND 22 2014, BY POTESTA &  
ASSOCIATES TO REVIEW THE SITE FOR WATERS AND WETLANDS THAT ARE MOST LIKELY  
WITHIN THE REGULATORY PURVIEW OF THE U.S. ARMY CORPS OF ENGINEERS (USACE)  
AND/OR THE WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION (WVDEP).  
THE JANUARY 19, 2015 REPORT FOR THE EQT WEU 2 SITE WAS PREPARED BY POTESTA &  
ASSOCIATES, INC., SUMMARIZES THE RESULTS OF THE FIELD DELINEATION. THE REPORT  
DOES NOT, IN ANY WAY, REPRESENT A JURISDICTIONAL DETERMINATION OF THE  
LANDWARD LIMITS OF WATERS AND WETLANDS WHICH MAY BE REGULATED BY THE USACE  
OR THE WVDEP. IT IS STRONGLY RECOMMENDED THAT THE AFOREMENTIONED AGENCIES  
BE CONSULTED IN AN EFFORT TO GAIN WRITTEN CONFIRMATION OF THE DELINEATION  
DESCRIBED BY THIS REPORT PRIOR TO ENGAGING CONSTRUCTION ON THE PROPERTY  
DESCRIBED HEREIN. THE DEVELOPER SHALL OBTAIN THE APPROPRIATE PERMITS FROM  
THE FEDERAL AND/OR STATE REGULATORY AGENCIES PRIOR TO ANY PROPOSED IMPACTS  
TO WATERS OF THE U.S., INCLUDING WETLAND FILLS AND STREAM CROSSINGS.

## GEOTECHNICAL NOTES

A SUBSURFACE GEOTECHNICAL INVESTIGATION HAS NOT BEEN PERFORMED AS OF  
02-20-2015. THE ENGINEER AND SURVEYOR ARE NOT RESPONSIBLE FOR UNFORESEEN  
SUBSURFACE IRREGULARITIES CAUSING ADDITIONAL WORK OR ADDITIONAL  
CONSTRUCTION MEASURES REQUIRED BEYOND THOSE STANDARD PRACTICES SHOWN ON  
THIS PLAN AS A RESULT OF ANY OTHER GEOTECHNICAL COMPLICATIONS ENCOUNTERED  
DURING CONSTRUCTION.

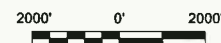
SITUATE ON THE WATERS OF TRIBUTARIES OF ARNOLD CREEK  
AND TRIBUTARIES OF MIDDLE ISLAND CREEK IN WEST UNION  
DISTRICT, DODDRIDGE COUNTY, WV



## RESTRICTIONS NOTES

1. THERE ARE INTERMITTENT/EPHEMERAL/PERENNIAL STREAMS WITHIN 100 FEET OF THE PROJECT LOD. THERE ARE NO WETLANDS, LAKES, PONDS, OR RESERVOIRS WITHIN 100 FEET OF THE LOD.
2. THERE ARE NO NATURALLY PRODUCING TROUT STREAMS WITHIN 300 FEET OF THE PAD AND LOD.
3. THERE ARE NO GROUNDWATER INTAKE OR PUBLIC WATER SUPPLY FACILITIES WITHIN 1000 FEET OF THE PAD AND LOD.
4. THERE ARE NO KNOWN EXISTING WATER WELLS OR DEVELOPED SPRINGS WITHIN 250 FEET OF THE WELL(S) BEING DRILLED. STANTEC AND SMITH LAND SURVEYING ARE NOT RESPONSIBLE FOR ANY EXISTING WATER WELL OR DEVELOPED SPRING DISCOVERED DURING CONSTRUCTION.
5. THERE ARE NO OCCUPIED DWELLING STRUCTURES WITHIN 625 FEET OF THE CENTER OF THE PAD.
6. THERE ARE NO AGRICULTURAL BUILDINGS LARGER THAN 2,500 SQUARE FEET WITHIN 625 FEET OF THE CENTER OF THE PAD.

WEST UNION QUADRANGLE  
WEST VIRGINIA  
7.5 MINUTE SERIES



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West Virginia State Law  
(Section XIV, Chapter 24-C)  
Requires that you call two  
business days before you dig in  
the state of West Virginia.  
IT'S THE LAW!!

## OPERATOR

EQT PRODUCTION COMPANY  
OPERATOR ID: 306686  
P.O. BOX 280  
BRIDGEPORT, WV 26630  
PHONE: (304) 348-3870

## ENGINEER

STANTEC CONSULTING, INC.  
111 ELKINS STREET  
FAIRMONT, WV 26554  
PHONE: (304) 367-9401

## SURVEYOR

SMITH LAND SURVEYING, INC.  
PO BOX 150  
226 WEST MAIN STREET  
GLENVILLE, WV 26351  
PHONE: (304) 462-5634

LIST OF DRAWINGS	
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3	OVERALL PLAN SHEET INDEX
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18 - 20	ACCESS ROAD PROFILES
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22 - 33	ACCESS ROAD CROSS SECTIONS
34 - 36	WELL PAD CROSS SECTIONS
37 - 38	FLOWBACK PIT CROSS SECTIONS
39 - 41	RECLAMATION PLAN
42	TYPICAL ACCESS ROAD SECTIONS
43 - 45	CONSTRUCTION DETAILS
46	CONSTRUCTION QUANTITIES

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EX. BOUNDARY LINE	— A —	PROP. CUT LINE	— C —
EX. EDGE OF ROAD PAVEMENT	— B —	PROP. FILL LINE	— F —
EX. GUARDRAIL	— G —	PROP. LIMITS OF DISTURBANCE	— D —
EX. FENCELINE	— X —	PROP. WELL HEAD	— H —
EX. GATE	— Y —	PROP. CONTAINMENT BERM	— I —
EX. OVERHEAD UTILITY	— E —	PROP. ROAD CENTERLINE	— J —
EX. OVERHEAD UTILITY RW	— F —	PROP. V-DITCH WITH CHECK DAMS	— K —
EX. UTILITY POLE	— P —	PROP. CULVERT	— L —
EX. GUY WIRE	— Q —	PROP. RIP-RAP OUTLET PROTECTION	— M —
EX. TELEPHONE LINE	— T —	PROP. RIP-RAP INLET PROTECTION	— N —
EX. GASLINE	— G —	PROP. COMPOST FILTERSOCK	— CF —
EX. GASLINE RW	— H —	PROP. TREELINE	— O —
EX. WATERLINE	— W —	PROP. STONE CONSTRUCTION ENTRANCE	— P —
EX. WATER WELL	— U —	X-SECTION GRID INDEX	— Q —
EX. GAS WELL	— V —	X-SECTION GRID INTERMEDIATE	— R —
EX. TREELINE	— T —	X-SECTION PROPOSED GRADE	— S —
EX. REFERENCE TREE	— T —	X-SECTION EXISTING GRADE	— S —
EX. DELINEATED STREAM	— S —		
EX. DELINEATED WETLAND	— S —		
EX. BUILDING	— S —		

Stantec



111 ELKINS STREET  
FAIRMONT, WV 26554  
PHONE: 304-367-9401



THIS DOCUMENT WAS  
PREPARED BY  
STANTEC  
FOR  
EQT PRODUCTION COMPANY

TITLE SHEET  
EQT WEU 2  
WEST UNION DISTRICT  
DODDRIDGE COUNTY, WV

DATE: 3-6-2015

SCALE: AS SHOWN

DESIGNED BY: CSH

FILE NO.: SLS-8265

SHEET 1 OF 46

REV.



## CONSTRUCTION NOTES

1. THE CONTRACTOR IS TO VERIFY FIELD CONDITIONS PRIOR TO AND DURING CONSTRUCTION AND WILL NOTIFY STANTEC AT (304) 367-9401 OR SMITH LAND SURVEYING AT (304) 462-5634 IMMEDIATELY OF ANY DISCREPANCIES BETWEEN ACTUAL FIELD CONDITIONS AND THE APPROVED PLAN. ANY WORK PERFORMED BY THE CONTRACTOR AFTER THE FINDING OF SUCH DISCREPANCIES, SHALL BE DONE AT THE CONTRACTOR'S RISK.
2. METHODS AND MATERIALS USED IN THE CONSTRUCTION OF THE IMPROVEMENTS HEREIN SHALL CONFORM TO THE CURRENT COUNTY CONSTRUCTION STANDARDS AND SPECIFICATIONS AND/OR CURRENT WVDEP EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICE MANUAL STANDARDS AND SPECIFICATIONS. SHOULD A CONFLICT BETWEEN THE DESIGN, SPECIFICATIONS, AND PLANS OCCUR, THE MOST STRINGENT REQUIREMENT WILL APPLY. THE APPROVAL OF THESE PLANS IN NO WAY RELIEVES THE DEVELOPER OR HIS AGENT OF THE RESPONSIBILITIES CONTAINED IN THE WVDEP EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICE MANUAL.
3. AN APPROVED SET OF PLANS AND ALL APPLICABLE PERMITS MUST BE AVAILABLE AT THE CONSTRUCTION SITE. ALSO, A REPRESENTATIVE OF THE DEVELOPER MUST BE AVAILABLE AT ALL TIMES.
4. THE CONTRACTOR SHALL PROVIDE ADEQUATE MEANS OF CLEANING MUD FROM TRUCKS AND/OR OTHER EQUIPMENT PRIOR TO ENTERING PUBLIC STREETS, AND IT IS THE CONTRACTOR'S RESPONSIBILITY TO CLEAN STREETS, ALLAY DUST, AND TO TAKE WHATEVER MEASURES ARE NECESSARY TO ENSURE THAT THE STREETS ARE MAINTAINED IN A CLEAN, MUD AND DUST FREE CONDITION AT ALL TIMES.
5. THE LOCATION OF EXISTING UTILITIES SHOWN IN THESE PLANS ARE FROM FIELD LOCATIONS. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO VERIFY THE EXACT HORIZONTAL AND VERTICAL LOCATION OF ALL EXISTING UTILITIES AS NEEDED PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL INFORM THE ENGINEER OF ANY CONFLICTS ARISING FROM HIS EXISTING UTILITY VERIFICATION AND THE PROPOSED CONSTRUCTION.
6. THE CONTRACTOR SHALL PROVIDE NOTIFICATION TO THE APPROPRIATE UTILITY COMPANY PRIOR TO CONSTRUCTION OF WATER AND/OR GAS PIPE LINES. INFORMATION SHOULD ALSO BE OBTAINED FROM THE APPROPRIATE AUTHORITY CONCERNING PERMITS, CUT SHEETS, AND CONNECTIONS TO EXISTING LINES.
7. THE CONTRACTOR WILL BE RESPONSIBLE FOR THE REPAIR OF ANY DAMAGES TO THE EXISTING STREETS AND UTILITIES WHICH OCCURS AS A RESULT OF HIS CONSTRUCTION PROJECT WITHIN OR CONTIGUOUS TO THE EXISTING RIGHT-OF-WAY.
8. WHEN GRADING IS PROPOSED WITHIN EASEMENTS OF UTILITIES, LETTERS OF PERMISSION FROM ALL INVOLVED COMPANIES MUST BE OBTAINED PRIOR TO GRADING AND/OR SITE DEVELOPMENT.
9. THE DEVELOPER WILL BE RESPONSIBLE FOR THE RELOCATION OF ANY UTILITIES WHICH IS REQUIRED AS A RESULT OF HIS PROJECT. THE RELOCATION SHOULD BE DONE PRIOR TO CONSTRUCTION.
10. THESE PLANS IDENTIFY THE LOCATION OF ALL KNOWN GRAVESITES. GRAVESITES SHOWN ON THIS PLAN WILL BE PROTECTED IN ACCORDANCE WITH STATE LAW. IN THE EVENT GRAVESITES ARE DISCOVERED DURING CONSTRUCTION, THE OWNER AND ENGINEER MUST BE NOTIFIED IMMEDIATELY.
11. THE CONTRACTOR(S) SHALL NOTIFY OPERATORS WHO MAINTAIN UNDERGROUND UTILITY LINES IN THE AREA OF PROPOSED EXCAVATING OR BLASTING AT LEAST TWO (2) WORKING DAYS, BUT NOT MORE THAN TEN (10) WORKING DAYS, PRIOR TO COMMENCEMENT OF EXCAVATING OR DEMOLITION.
12. THE CONTRACTOR IS TO CONTACT THE OPERATOR AND ENGINEER IF GROUNDWATER IS ENCOUNTERED DURING CONSTRUCTION. THE ENGINEER OR SURVEYOR IS NOT RESPONSIBLE FOR ANY BURIED WATER WELLS, SPRINGS OR ANY OTHER FEATURES UNCOVERED DURING CONSTRUCTION.
13. THE CONTRACTOR SHALL SCHEDULE A PRE-CONSTRUCTION MEETING WITH THE EROSION AND SEDIMENT CONTROL INSPECTOR TWO DAYS PRIOR TO THE START OF CONSTRUCTION.
14. EQT WILL PROVIDE ALL FILL MATERIAL TESTING REQUIRED DURING THE CONSTRUCTION OF THIS PROJECT. ALL MATERIAL TESTS SHALL BE CONDUCTED BY A CERTIFIED MATERIALS TESTING LABORATORY AND A CERTIFICATION OF THE MATERIALS TESTED SHALL BE PROVIDED BY A LICENSED PROFESSIONAL ENGINEER REPRESENTING THE LABORATORY. ALL TEST RESULTS SHALL BE SUBMITTED TO THE ENGINEER CERTIFYING THE CONSTRUCTED FACILITY. FAILURE TO CONDUCT THE DENSITY TEST SHALL BE CAUSE FOR NON-ACCEPTANCE OF THE CONSTRUCTED FACILITY.
15. THE CONTRACTOR IS RESPONSIBLE FOR CONSTRUCTING THE SITE IN ACCORDANCE WITH THE DESIGN PLANS AND CONSTRUCTION DOCUMENTS AND THE SCOPE OF WORK SHALL CONFORM WITH THE GRADES, BERMS, DEPTHS, DIMENSIONS, ETC. SHOWN HEREON.

## MAINTENANCE PROGRAM

1. BMPS WILL BE INSPECTED ON A WEEKLY BASIS AND AFTER EACH MEASUREABLE RAINFALL EVENT DURING THE ACTIVE CONSTRUCTION PHASE OF THE PROJECT.
2. ALL REVEGETATED ACCESS ROADS AND FACILITIES ARE TO BE MAINTAINED THROUGHOUT THE LIFE OF THE PROJECT.
3. CULVERTS, ROAD DITCHES, BROAD-BASED DIPS, DIVERSION DITCHES, AND ROCK CHECK DAMS MUST BE MAINTAINED IN PROPER WORKING ORDER AND WILL BE CLEANED OUT, REPAIRED, OR REPLACED AS NECESSARY.
4. SEDIMENT SHOULD BE REMOVED FROM COMPOST FILTER SOCK WHERE ACCUMULATIONS REACH HALF THE ABOVE GROUND HEIGHT OF THE FILTER SOCK. REPLACE SECTIONS OF FAILED FILTER SOCK IMMEDIATELY. REMOVE ENTIRE FILTER SOCK UPON COMPLETION OF PROJECT AND ESTABLISHMENT OF VEGETATIVE GROWTH.
5. ALL AREAS OF EARTH DISTURBANCE WILL BE REPAIRED WHERE SIGNS OF ACCELERATED EROSION ARE DETECTED.
6. SEEDING AND MULCHING WILL BE REPEATED IN THOSE AREAS THAT APPEAR TO BE FAILING OR HAVE FAILED.

## CONSTRUCTION SEQUENCE

THE DEVELOPMENT OF THE SITE SHALL BE CONSISTENT WITH THE FOLLOWING GENERAL SEQUENCE OF CONSTRUCTION. THE CONTRACTOR SHALL IMPLEMENT, MAINTAIN, AND OPERATE ALL PROPOSED EROSION AND SEDIMENT CONTROL MEASURES TO EFFECTIVELY MITIGATE THE HAZARD OF ACCELERATED EROSION AND SEDIMENTATION TO ACCEPTABLE LEVELS. MINOR DEVIATIONS FROM THIS SEQUENCE SHALL BE EXECUTED BY THE PROJECT'S SUPERINTENDENT AS NEEDED TO ELIMINATE ANY POTENTIAL EROSION CONDITION THAT MAY ARISE FOR THE DURATION OF THE PROJECT. THE WVDEP OFFICE OF OIL AND GAS SHALL BE NOTIFIED OF ANY AND ALL SUCH DEVIATIONS FROM THE APPROVED PLANS.

1. HOLD A PRE-CONSTRUCTION CONFERENCE WITH THE CONTRACTOR AND THE APPROPRIATE EROSION AND SEDIMENT CONTROL INSPECTOR 48 HOURS PRIOR TO BEGINNING WORK TO REVIEW THE CONSTRUCTION DRAWING AND PROVIDE ANY REQUESTED GUIDANCE.
2. STAKE THE LIMITS OF CONSTRUCTION.
3. INSTALL THE STONE CONSTRUCTION ENTRANCE AS SHOWN ON THE PLANS.
4. INSTALL ALL BMPS NECESSARY TO BEGIN GRADING OF THE SITE AS SHOWN ON THE PLANS AND DETAILS.
5. UTILIZE THE EXISTING ACCESS ROAD TO ACCESS THE PROJECT SITE. UPGRADE THE EXISTING ACCESS ROAD WHERE NECESSARY AS DIRECTED BY EQT PRODUCTION COMPANY OR AN AUTHORIZED REPRESENTATIVE.
6. CLEAR AND GRUB THE WELL PAD EXPANSION AREA AND FLOWBACK PIT IF NECESSARY. ALL WOODY MATERIAL, BRUSH, TREES, STUMPS, LARGE ROOTS, BOULDERS, AND DEBRIS SHALL BE CLEARED FROM THE SITE AREA AND KEPT NEARBY FOR PROPER CONSTRUCTION, INCLUDING THE INSTALLATION OF ANY NECESSARY SEDIMENT CONTROLS, UNLESS OTHERWISE DIRECTED BY EQT. TREES SIX INCHES IN DIAMETER AND LARGER SHALL BE CUT AND LOGS STACKED. SMALLER TREES, BRUSH, AND STUMPS SHALL BE CUT AND/OR GRUBBED AND WINDROWED IN APPROPRIATE AREAS FOR USE AS SEDIMENT BARRIERS AT WATER DRAINAGE OUTLETS, WINDROWED BELOW THE WELL SITE, USED FOR WILDLIFE HABITAT, REMOVED FROM THE SITE, OR DISPOSED OF BY OTHER METHODS APPROVED BY DEP.
7. STRIP THE TOPSOIL FROM THE WELL PAD EXPANSION AREAS AND FLOWBACK PIT AREA IF NECESSARY. ALL STRIPPED TOPSOIL SHALL BE STOCKPILED ON SITE AND IMMEDIATELY STABILIZED. ADDITIONAL BMP MEASURES SHALL BE CONSTRUCTED AROUND TOPSOIL STOCKPILES, IF NECESSARY.
8. CONSTRUCT THE EXPANDED WELL PAD AND CONTAINMENT BERM AND ACCESS ROAD TO THE PROPOSED FLOWBACK PIT. CONSTRUCT FLOWBACK PIT AS WELL PAD CONSTRUCTION PROGRESSES. AS FILL SLOPES ARE CONSTRUCTED, INSTALL SLOPE INTERRUPTION COMPOST FILTER SOCK AS LABELED ON THE PLANS AND SHOWN ON THE DETAILS.
9. FINALIZE GRADING OF THE WELL PAD AND FLOWBACK PIT AND IMMEDIATELY STABILIZE THE OUTER AREAS OF THE WELL PAD AND PIT. THE WELL PAD AND MANIFOLD PAD AND TURNAROUND AREAS SHALL BE STABILIZED WITH GEOTEXTILE FABRIC AND STONE. STABILIZE ALL SIDE SLOPES WITH COCONUT EROSION CONTROL BLANKETS. APPLY SEED AND MULCH TO ALL DISTURBED AREAS. THIS SHALL BE INCLUDED IN ALL AREAS THAT WILL NOT BE SUBJECT TO REGULAR TRAFFIC ACTIVITY (TO BE STABILIZED WITH STONE), OR ANY DISTURBED AREA THAT WILL NOT BE RE-DISTURBED BEFORE SITE RECLAMATION BEGINS.
10. PRIOR TO THE INSTALLATION OF THE FLOWBACK PIT LINER SYSTEM, EQT SHALL CONTACT THE ENGINEER/SURVEYOR TO COMPLETE AN AS-BUILT SURVEY OF THE CONSTRUCTED PIT/BERM TO ENSURE CONFORMANCE WITH THE DESIGN DRAWINGS. THE AS-BUILT WILL BE REVIEWED BY THE ENGINEER AND THE CONTRACTOR IS RESPONSIBLE FOR ANY CORRECTIVE ACTION DEEMED NECESSARY BY THE ENGINEER FOR ANY DEVIATION(S) FROM THE DESIGN DRAWINGS.
11. INSTALL THE LINER SYSTEM AND PERIMETER SAFETY FENCE WITH GATE AND EMERGENCY LIFE LINE AS SHOWN ON THE PLANS.
12. ONCE THE FLOWBACK PIT HAS BEEN CONSTRUCTED AND LINER SYSTEM COMPLETED, SUBMIT THE AS-BUILT CERTIFICATION FOR THE FACILITIES TO THE WVDEP OFFICE OF OIL AND GAS PRIOR TO PLACING FLUIDS IN EITHER STRUCTURE.
13. PREVIOUSLY DISTURBED AREAS AND IMMEDIATE DOWN SLOPE AREAS SHALL BE INSPECTED AFTER EACH RAINFALL STORM EVENT AND MONITORED WEEKLY FOR SIGNS OF ACCELERATED EROSION. IMPLEMENT ADDITIONAL BMPS AS DEEMED NECESSARY. THESE INSPECTIONS SHALL CONTINUE DURING THE DURATION OF THE PROJECT AND SUBSEQUENT SITE RECLAMATION.
14. COMMENCE THE DRILLING ACTIVITY.
15. ONCE DISTURBED AREAS HAVE BEEN RE-VEGETATED AND STABILIZED FOLLOWING RECLAMATION, THE TEMPORARY BMPS IN THOSE AREAS MAY BE REMOVED. CONTINUE TO MONITOR THESE AREAS TO ENSURE A UNIFORM RATE OF 70% VEGETATIVE COVERAGE IS MAINTAINED. ANY AREAS FOUND TO BE DEFFICIENT SHALL BE RE-SEEDING AND MULCHED.

## SITE CLEANUP & RECYCLE PROGRAM

1. GARBAGE, FUELS OR ANY SUBSTANCE HARMFUL TO HUMAN, AQUATIC OR FISH LIFE, WILL BE PREVENTED FROM ENTERING SPRINGS, STREAMS, PONDS, LAKES, WETLANDS OR ANY WATER COURSE OR WATER BODY.
2. OILS, FUELS, LUBRICANTS AND COOLANTS WILL BE PLACED IN SUITABLE CONTAINERS AND DISPOSED PROPERLY.
3. ALL TRASH AND GARBAGE WILL BE COLLECTED AND DISPOSED PROPERLY.
4. ALL SEDIMENT REMOVED FROM SEDIMENT CAPTURING DEVICES SHALL BE PLACED ON THE TOPSOIL STOCKPILE, THEN SEEDED AND MULCHED, AS NECESSARY. ALTERNATIVELY, THE REMOVED SEDIMENT CAN BE TRANSPORTED TO A SITE WITH AN APPROVED PERMIT.

## FLOWBACK PIT CONSTRUCTION STANDARDS

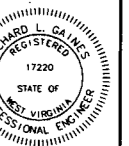
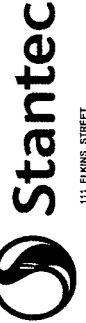
THE DESIGN, CONSTRUCTION, AND REMOVAL OF EMBANKMENTS ASSOCIATED WITH FLOWBACK PITS FOR OIL AND GAS WELLS MUST BE ACCOMPLISHED IN SUCH A MANNER AS TO PROTECT THE HEALTH AND SAFETY OF THE PEOPLE, THE NATURAL RESOURCES, AND ENVIRONMENT OF THE STATE. THE PIT EMBANKMENTS SHALL BE DESIGNED, CONSTRUCTED, AND MAINTAINED TO BE STRUCTURALLY SOUND AND REASONABLY PROTECTED FROM UNAUTHORIZED ACTS OF THIRD PARTIES.

1. THE FOUNDATION FOR THE FLOWBACK PIT EMBANKMENT MUST BE STRIPPED AND GRUBBED TO A MINIMUM DEPTH OF 2 FEET PRIOR TO PLACEMENT AND COMPACTION OF EARTHEN FILL MATERIAL. NO EMBANKMENT FILL SHALL BE PLACED ON FROZEN MATERIAL.
2. ANY SPRINGS ENCOUNTERED WITHIN THE FOUNDATION AREA SHALL BE DRAINED TO OUTSIDE/DOWNSTREAM TOE OF EMBANKMENT. CONSTRUCTED DRAIN SECTION SHALL BE AN EXCAVATED 2' X 2' TRENCH AND BACK FILLED WITH TYPE A SAND, COMPACTED BY HAND TAMPER. NO GEOTEXTILES SHALL BE USED TO LINE TRENCH. THE LAST 3 FEET OF DRAIN AT THE DOWNSTREAM END SHALL BE CONSTRUCTED WITH AASHTO #8 MATERIAL.
3. SOILS FOR EARTHEN EMBANKMENT CONSTRUCTION SHALL BE LIMITED TO TYPES GC, GM, SC, SM, CL, OR ML (ASTM-D2487 - UNIFIED SOILS CLASSIFICATION). SOILS MUST CONTAIN A MINIMUM OF 20% PF PLUS NO. 200 SIEVE AND BE "WELL GRADED" MATERIAL WITH NO COBBLES OR BOULDER SIZE MATERIAL MIXED WITH CLAY. A MINIMUM OF THREE SAMPLES SHALL BE CLASSIFIED.
4. THE EARTHEN EMBANKMENT SHALL BE COMPACTED BY A VIBRATING SHEEPSFOOT ROLLER. THE LIFTS MUST BE IN HORIZONTAL LAYERS WITH A MAXIMUM LOOSE LIFT THICKNESS OF 12" AND MAXIMUM PARTICLE SIZE LESS THAN 6". ALL FILL SHALL BE COMPACTED TO 95% PER THE STANDARD PROCTOR TEST (ASTM-D-698).
5. THE PLACEMENT OF ALL FILL MATERIAL SHALL BE FREE OF WOOD, STUMPS AND ROOTS, LARGE ROCKS AND BOULDERS, AND ANY OTHER NONCOMPACTABLE SOIL MATERIAL. THE EMBANKMENT SHALL BE COMPACTED TO A MINIMUM OF VISIBLE NON-MOVEMENT, HOWEVER, THE COMPACTION EFFORT SHALL NOT EXCEED THE OPTIMUM MOISTURE LIMITS.
6. THE EMBANKMENT TOP SHALL BE A MINIMUM OF 15 FEET IN WIDTH.
7. THE MINIMUM INSIDE SIDESLOPES SHALL BE 3H:1V AND OUTSIDE SIDESLOPES SHALL BE 2H:1V, UNLESS OTHERWISE SPECIFIED.
8. ALL EXPOSED EMBANKMENT SLOPES NOT COVERED BY COMPACTED ROCKFILL OR RIPRAP SHALL BE LIMED, FERTILIZED, SEEDED AND MULCHED. PERMANENT VEGETATIVE GROUND COVER IN COMPLIANCE WITH THE WVDEP EROSION AND SEDIMENT CONTROL FIELD MANUAL MUST BE ESTABLISHED UPON THE COMPLETION OF THE PIT CONSTRUCTION. EMBANKMENTS SHALL BE MAINTAINED WITH A GRASSY VEGETATIVE COVER AND FREE OF BRUSH AND/OR TREES.
9. A MINIMUM OF 2 FEET OF FREEBOARD SHALL BE MAINTAINED AT ALL TIMES DURING THE OPERATION OF THE PIT.
10. ALL EMBANKMENT CONSTRUCTION AND COMPACTION TESTING SHALL BE PROVIDED BY EQT

## FLOWBACK PIT LINER SYSTEM NOTES

THE DESIGNED FLOWBACK PIT FACILITY SHALL BE FULLY LINED WITH A GEOSYNTHETIC LINER SYSTEM. LINERS SHALL BE INSTALLED IN ACCORDANCE TO MANUFACTURER'S SPECIFICATIONS.

1. THE SUB-BASE SHALL BEAR THE WEIGHT OF THE LINER SYSTEM, WATER, AND EQUIPMENT OPERATING ON THE PIT WITHOUT CAUSING OR ALLOWING A FAILURE OF THE LINER SYSTEM.
2. THE SUB-BASE SHALL BE COMPACTED TO ACCOMMODATE POTENTIAL SETTLEMENT WITHOUT DAMAGE TO THE LINER SYSTEM.
3. THE UPPER 6" OF THE SUB-BASE SHALL BE COMPACTED TO A STANDARD PROCTOR DENSITY OF AT LEAST 95%.
4. THE SUB-BASE SHALL BE HARD, UNIFORM, SMOOTH AND FREE OF DEBRIS, ROCK FRAGMENTS, PLANT MATERIAL AND OTHER FOREIGN MATERIAL.
5. THE SUB-BASE SHALL BE COVERED WITH NON-WOVEN GEOTEXTILE FABRIC TO CUSHION THE PRIMARY LINER AND ALLOW FOR ADEQUATE VENTING BETWEEN THE PRIMARY LINER AND THE SUB-BASE TO PREVENT THE ENTRAPMENT OF GASES BENEATH THE LINER SYSTEM.
6. THE PIT AREA SHALL BE DRAINED AND COMPLETELY DRY PRIOR TO THE PLACEMENT OF THE PRIMARY LINER. THE PRIMARY LINER SHALL MEET ALL WVDEP GUIDELINES FOR MINIMUM THICKNESS AND SHALL PREVENT THE MIGRATION OF WATER THROUGH THE LINER TO THE GREATEST DEGREE THAT IS TECHNOLOGICALLY POSSIBLE.
7. THE PRIMARY LINER SHALL FULLY COVER THE BOTTOM AND SIDEWALLS OF THE PIT.
8. AN ANCHOR TRENCH SHALL BE EXCAVATED COMPLETELY AROUND THE PERIMETER OF THE PIT AREA AT THE PLANNED ELEVATION OF THE TOP OF THE LINING. THE TRENCH SHALL BE A MINIMUM 36 INCHES DEEP AND 24 INCHES WIDE.
9. ALL ELEMENTS OF THE LINER SYSTEM SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS. ALL SEAMS AND SEALS AROUND ANY PROJECTIONS SHALL BE SEALED AND TESTED IN A METHOD APPROVED BY THE MANUFACTURER.
10. GAS RELIEF VENTS SHALL BE PROVIDED ALONG THE TOP OF THE LINER AND WITHIN ONE FOOT OF THE PERIMETER OF THE PIT TO ALLOW GASES TO ESCAPE FROM UNDER THE GEOMEMBRANE. MAXIMUM SPACING FOR VENTS SHALL BE 30 FEET.
11. WATER LEVEL MARKINGS SHALL BE CLEARLY PAINTED (1" INCREMENTS) ON THE LINER SYSTEM TO IDENTIFY THE WATER SURFACE ELEVATION.



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GENERAL NOTES  
EQT WEU 2  
WEST UNION DISTRICT  
DODDRIDGE COUNTY, WV

DATE: 3-6-2015

SCALE: AS SHOWN

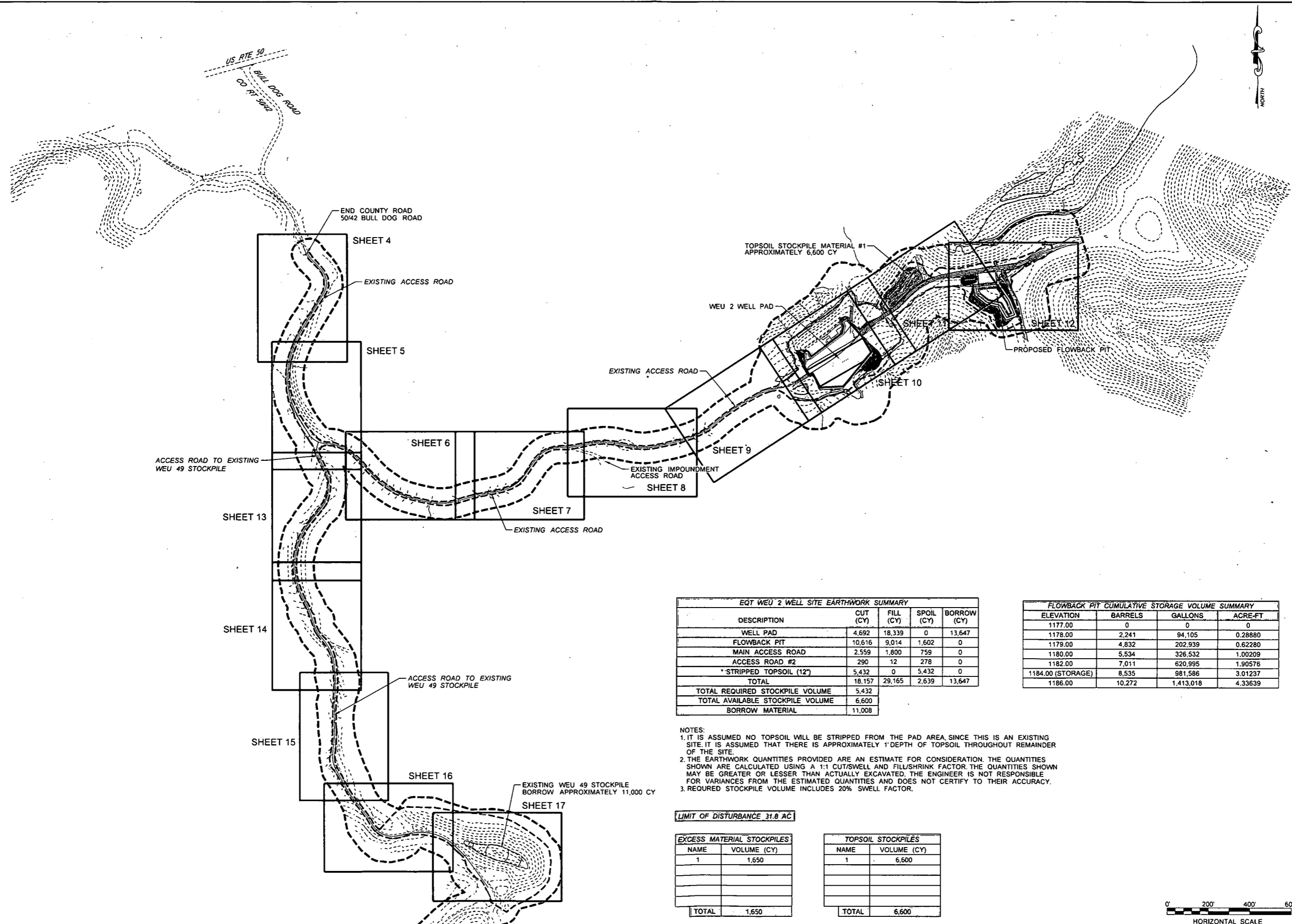
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SHEET 2 OF 46

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**EQT WEU 2 WELL SITE EARTHWORK SUMMARY**

DESCRIPTION	CUT (CY)	FILL (CY)	SPOIL (CY)	BORROW (CY)
WELL PAD	4,692	18,339	0	13,647
FLOWBACK PIT	10,616	9,014	1,602	0
MAIN ACCESS ROAD	2,559	1,800	759	0
ACCESS ROAD #2	290	12	278	0
*STRIPPED TOPSOIL (12")	5,432	0	5,432	0
<b>TOTAL</b>	<b>18,157</b>	<b>29,165</b>	<b>2,639</b>	<b>13,647</b>
<b>TOTAL REQUIRED STOCKPILE VOLUME</b>	<b>5,432</b>			
<b>TOTAL AVAILABLE STOCKPILE VOLUME</b>	<b>6,600</b>			
<b>BORROW MATERIAL</b>	<b>11,008</b>			

**FLOWBACK PIT CUMULATIVE STORAGE VOLUME SUMMARY**

ELEVATION	BARRELS	GALLONS	ACRE-FT
1177.00	0	0	0
1178.00	2,241	94,105	0.28880
1179.00	4,832	202,939	0.62280
1180.00	5,534	326,532	1.00209
1182.00	7,011	620,995	1.90576
1184.00 (STORAGE)	8,535	981,586	3.01237
1186.00	10,272	1,413,018	4.33639

**NOTES:**

- IT IS ASSUMED NO TOPSOIL WILL BE STRIPPED FROM THE PAD AREA, SINCE THIS IS AN EXISTING SITE. IT IS ASSUMED THAT THERE IS APPROXIMATELY 1" DEPTH OF TOPSOIL THROUGHOUT REMAINDER OF THE SITE.
- THE EARTHWORK QUANTITIES PROVIDED ARE AN ESTIMATE FOR CONSIDERATION. THE QUANTITIES SHOWN ARE CALCULATED USING A 1:1 CUT/SWELL AND FILLSHRINK FACTOR. THE QUANTITIES SHOWN MAY BE GREATER OR LESSER THAN ACTUALLY EXCAVATED. THE ENGINEER IS NOT RESPONSIBLE FOR VARIANCES FROM THE ESTIMATED QUANTITIES AND DOES NOT CERTIFY TO THEIR ACCURACY.
- REQUIRED STOCKPILE VOLUME INCLUDES 20% SWELL FACTOR.

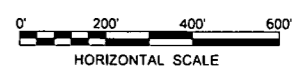
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**EXCESS MATERIAL STOCKPILES**

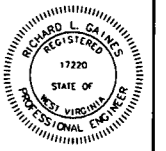
NAME	VOLUME (CY)
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<b>TOTAL</b>	<b>1,650</b>

**TOPSOIL STOCKPILES**

NAME	VOLUME (CY)
1	6,600
<b>TOTAL</b>	<b>6,600</b>



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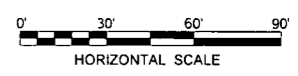
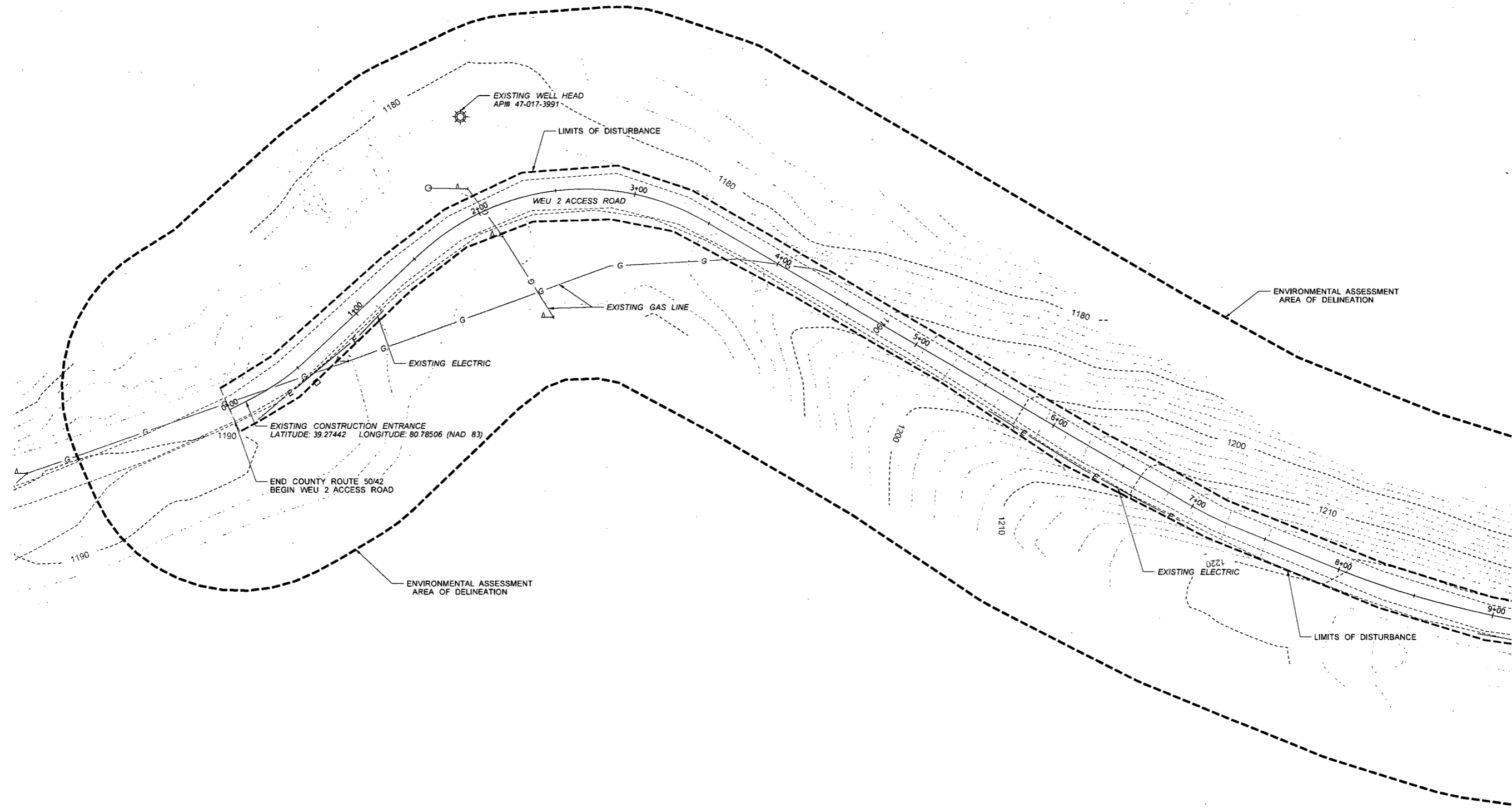
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OVERALL PLAN SHEET INDEX  
**EQT WEU 2**  
 WEST UNION DISTRICT  
 DODDRIDGE COUNTY, WV

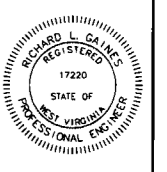
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 FILE NO.: SLS-8265  
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# WEU 2 SITE PLAN

EXISTING WELL NO. H7-WV 513369, H4-WV 512510, H6-WV 512512, H2-WV 512508, H3-WV 512509, H5-WV 512511, H1-WV 512507  
 PROPOSED WELL NO. H8-WV 515875, H10-WV 515877, H9-WV 515876



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SITE PLAN  
**EQT WEU 2**  
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FILE NO.: SLS-8265
SHEET 4 OF 46
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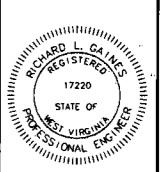
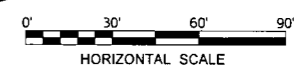
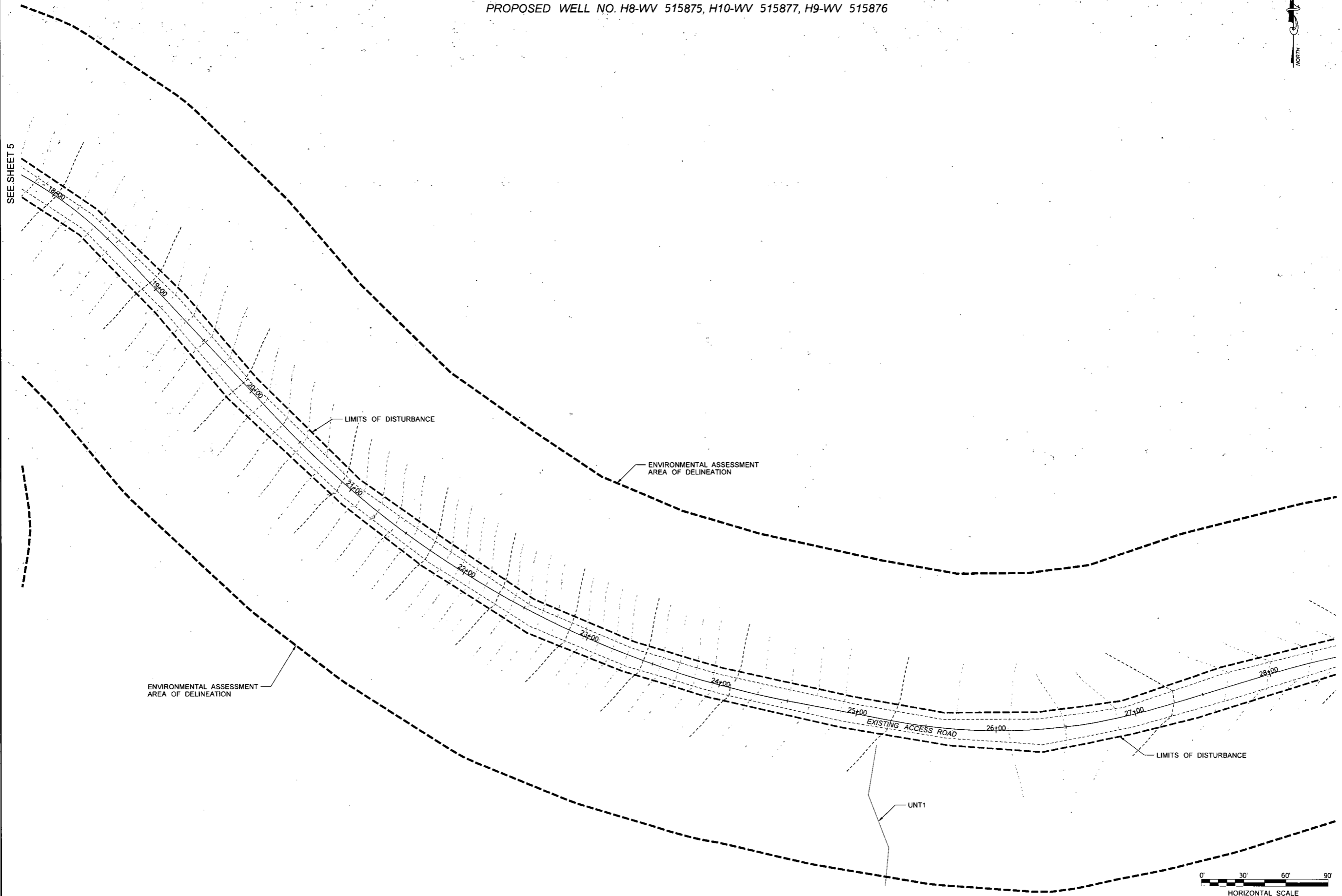
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**EQT WEU 2**  
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SHEET 6 OF 46
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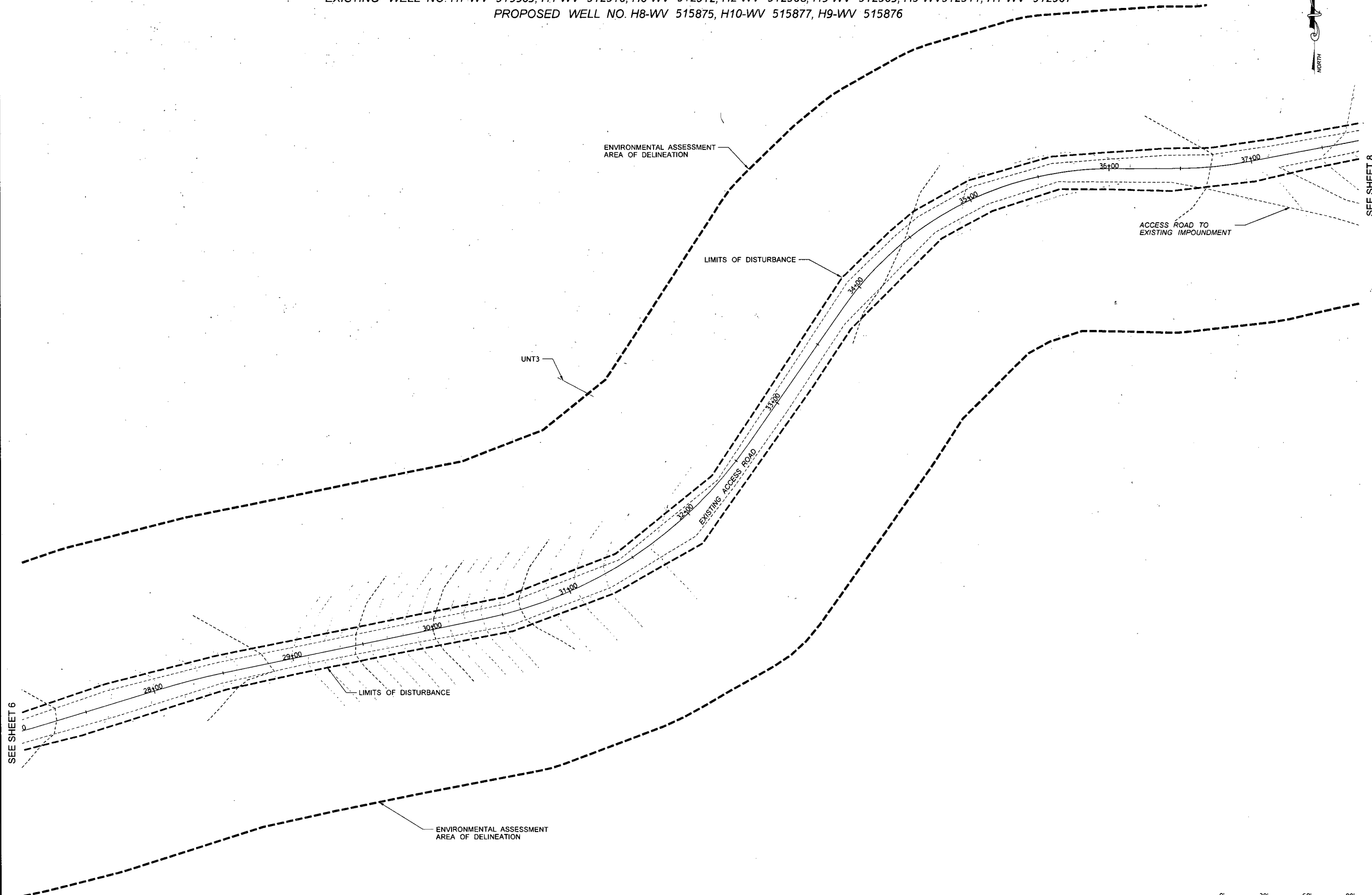
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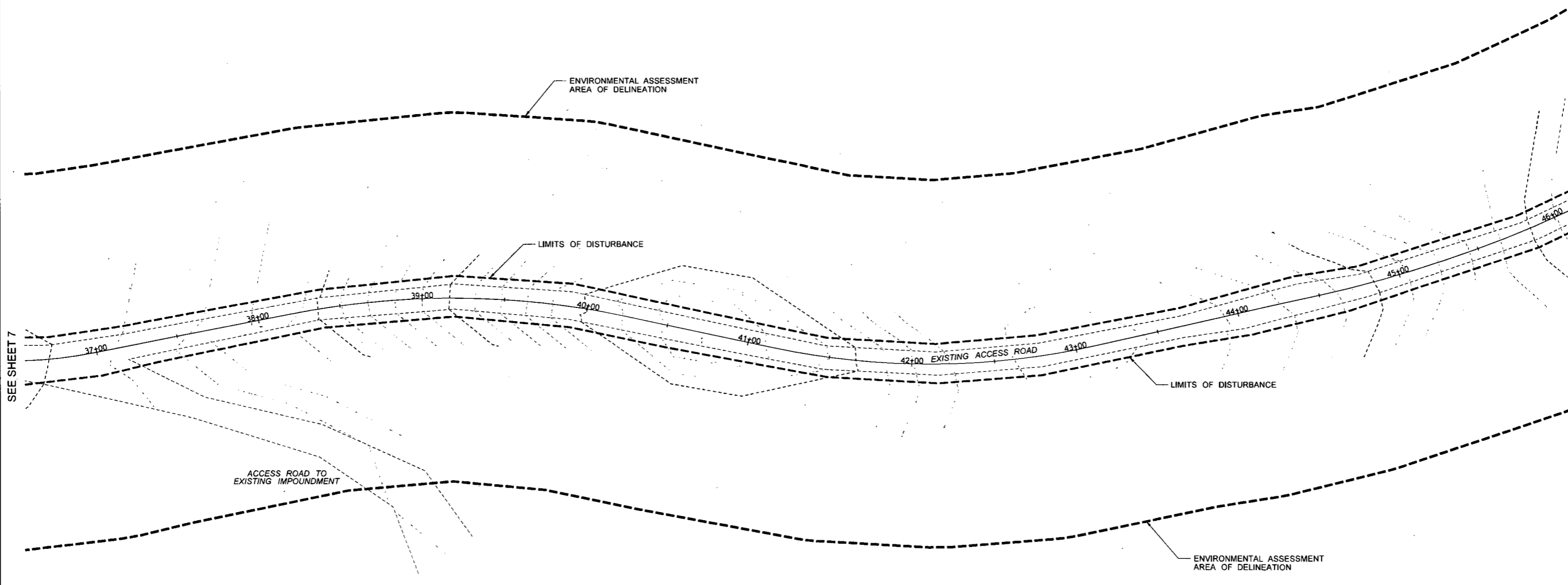
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WEST UNION DISTRICT  
DODDRIDGE COUNTY, WV

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ACCESS ROAD TO  
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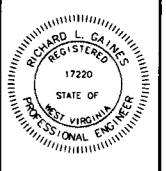
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AREA OF DELINEATION

LIMITS OF DISTURBANCE

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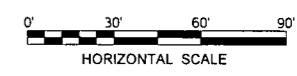
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SITE PLAN  
**EQT WEU 2**  
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SHEET 8 OF 46  
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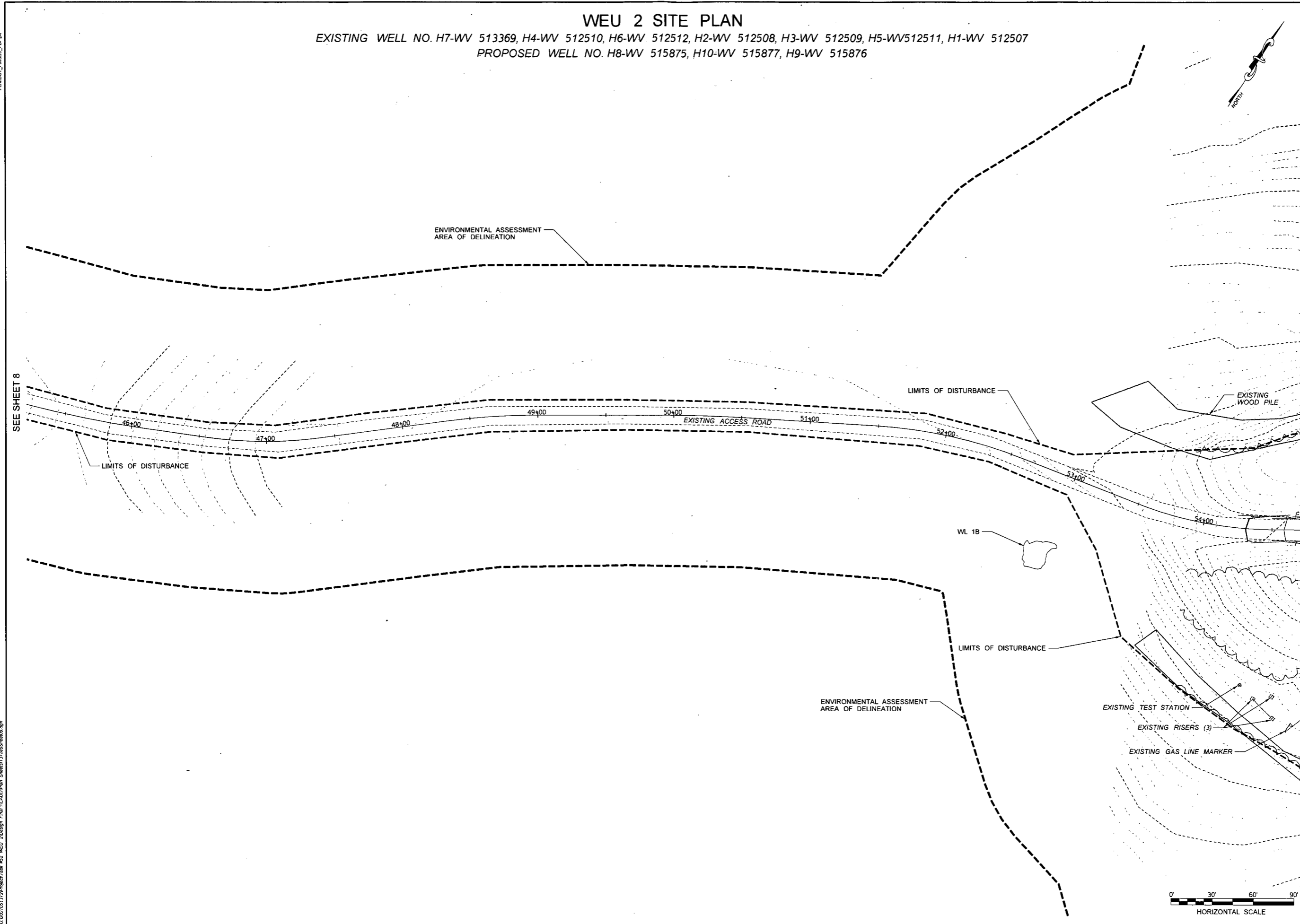


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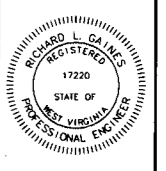
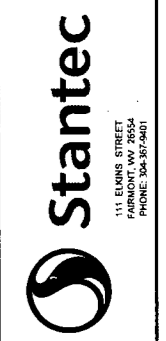
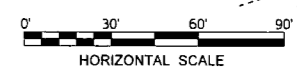
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SITE PLAN  
**EQT WEU 2**  
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DATE: 3-6-2015
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SHEET 9 OF 46
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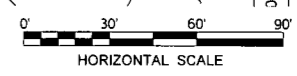
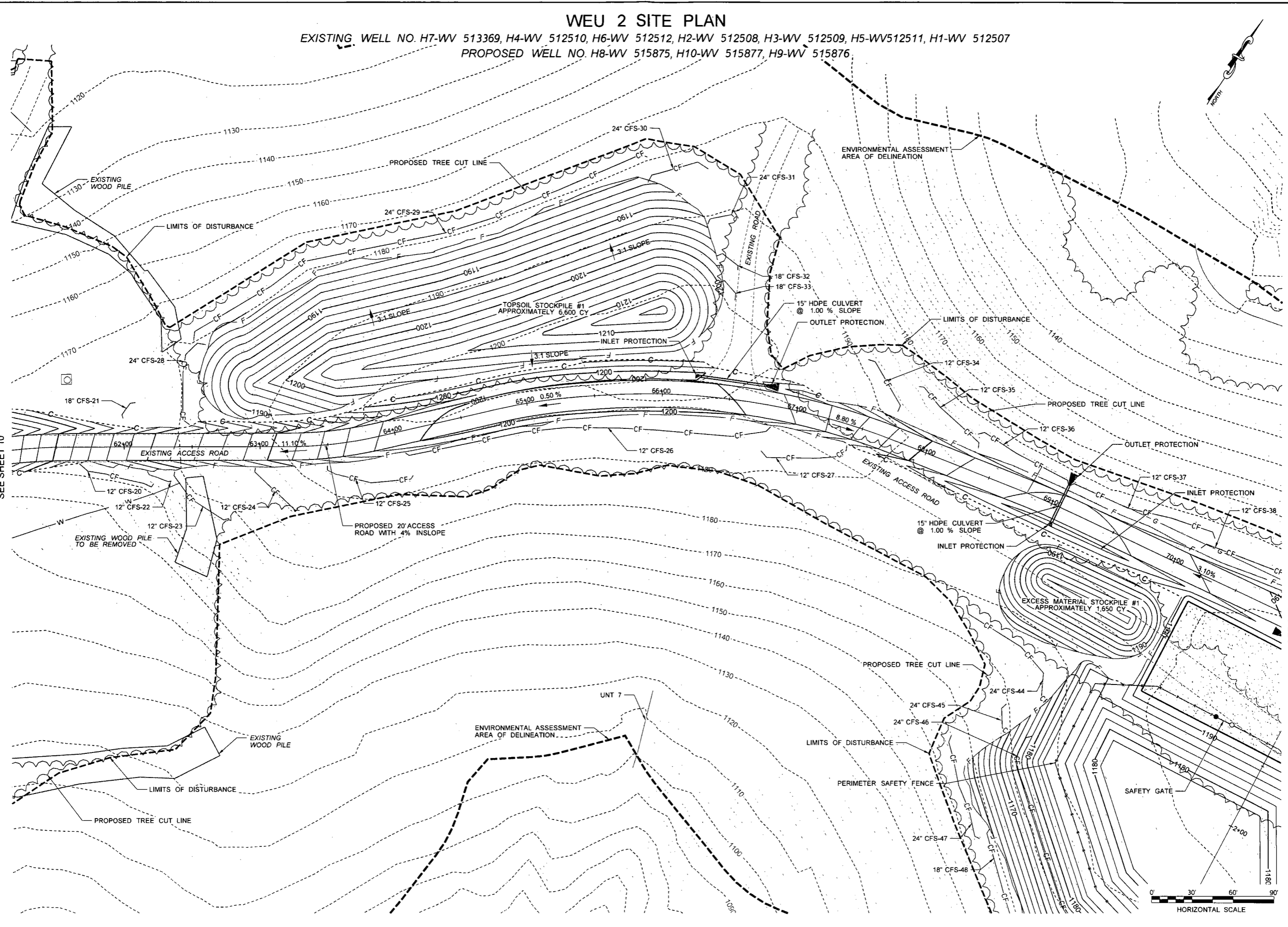


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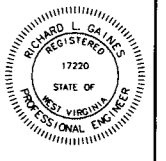
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SITE PLAN  
**EQT WEU 2**  
 WEST UNION DISTRICT  
 DODDRIDGE COUNTY, WV

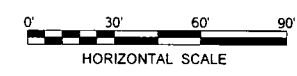
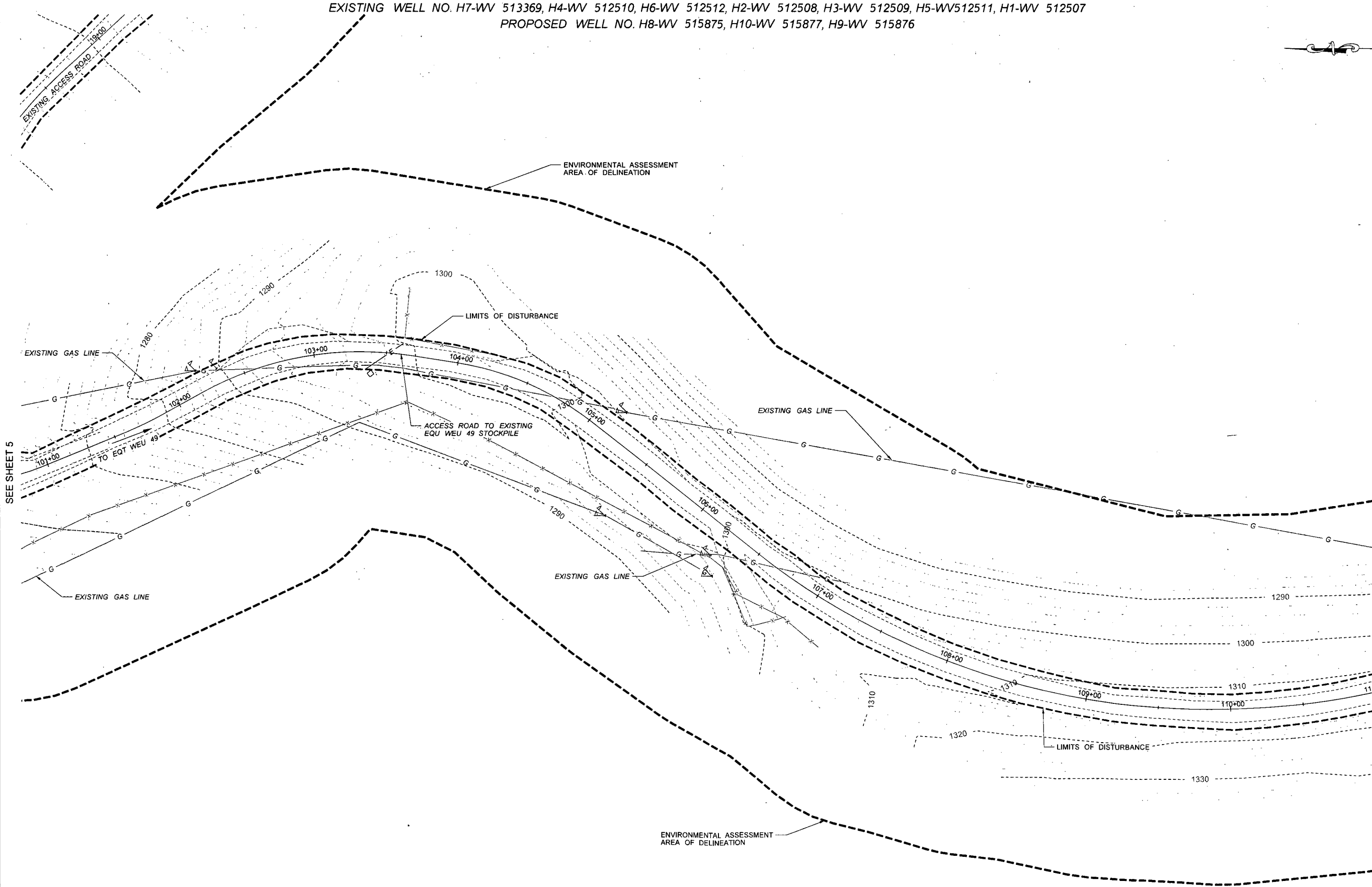
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 DESIGNED BY: CSH  
 FILE NO.: SLS-8265  
 SHEET 11 OF 46  
 REV.





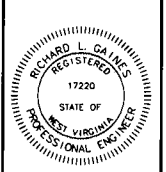
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EXISTING WELL NO. H7-WV 513369, H4-WV 512510, H6-WV 512512, H2-WV 512508, H3-WV 512509, H5-WV 512511, H1-WV 512507  
 PROPOSED WELL NO. H8-WV 515875, H10-WV 515877, H9-WV 515876



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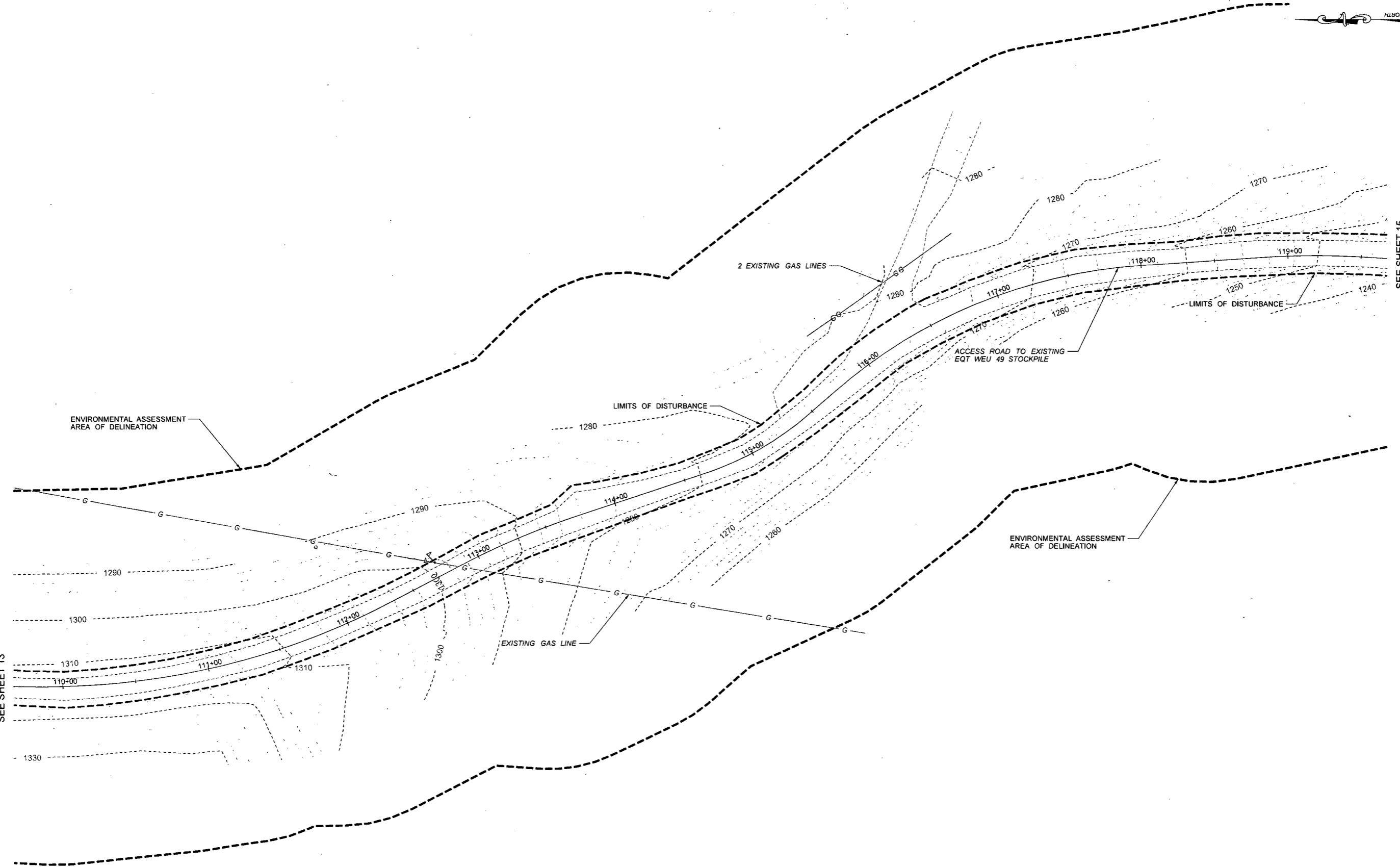
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**EQT WEU 2**  
 WEST UNION DISTRICT  
 DODDRIDGE COUNTY, WV

DATE: 3-6-2015
SCALE: AS SHOWN
DESIGNED BY: CSH
FILE NO.: SLS-8265
SHEET 13 OF 46
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# WEU 2 SITE PLAN

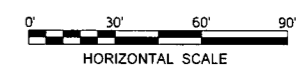
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PROPOSED WELL NO. H8-WV 515875, H10-WV 515877, H9-WV 515876



SEE SHEET 13

SEE SHEET 15

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Sheet: 14 of 46



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SITE PLAN  
EQT WEU 2  
WEST UNION DISTRICT  
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DATE: 3-6-2015
SCALE: AS SHOWN
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FILE NO.: SLS-8265
SHEET 14 OF 46
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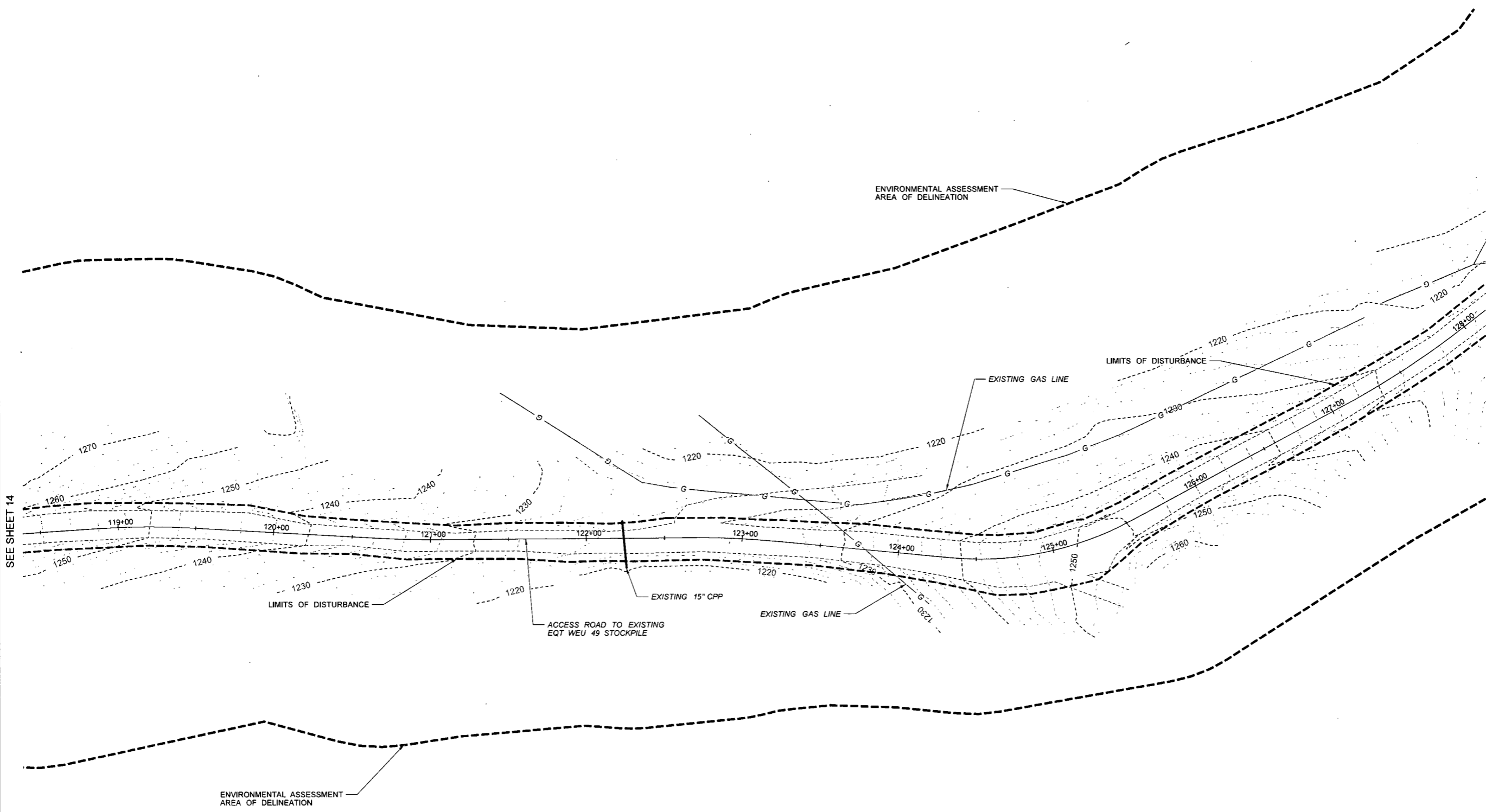


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# WEU 2 SITE PLAN

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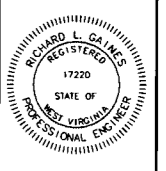
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SEE SHEET 14

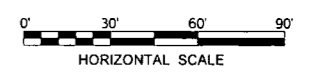
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SITE PLAN  
**EQT WEU 2**  
WEST UNION DISTRICT  
DODDRIDGE COUNTY, WV



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SCALE: AS SHOWN
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FILE NO.: SLS-8265
SHEET 15 OF 46
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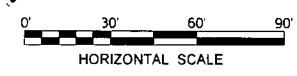
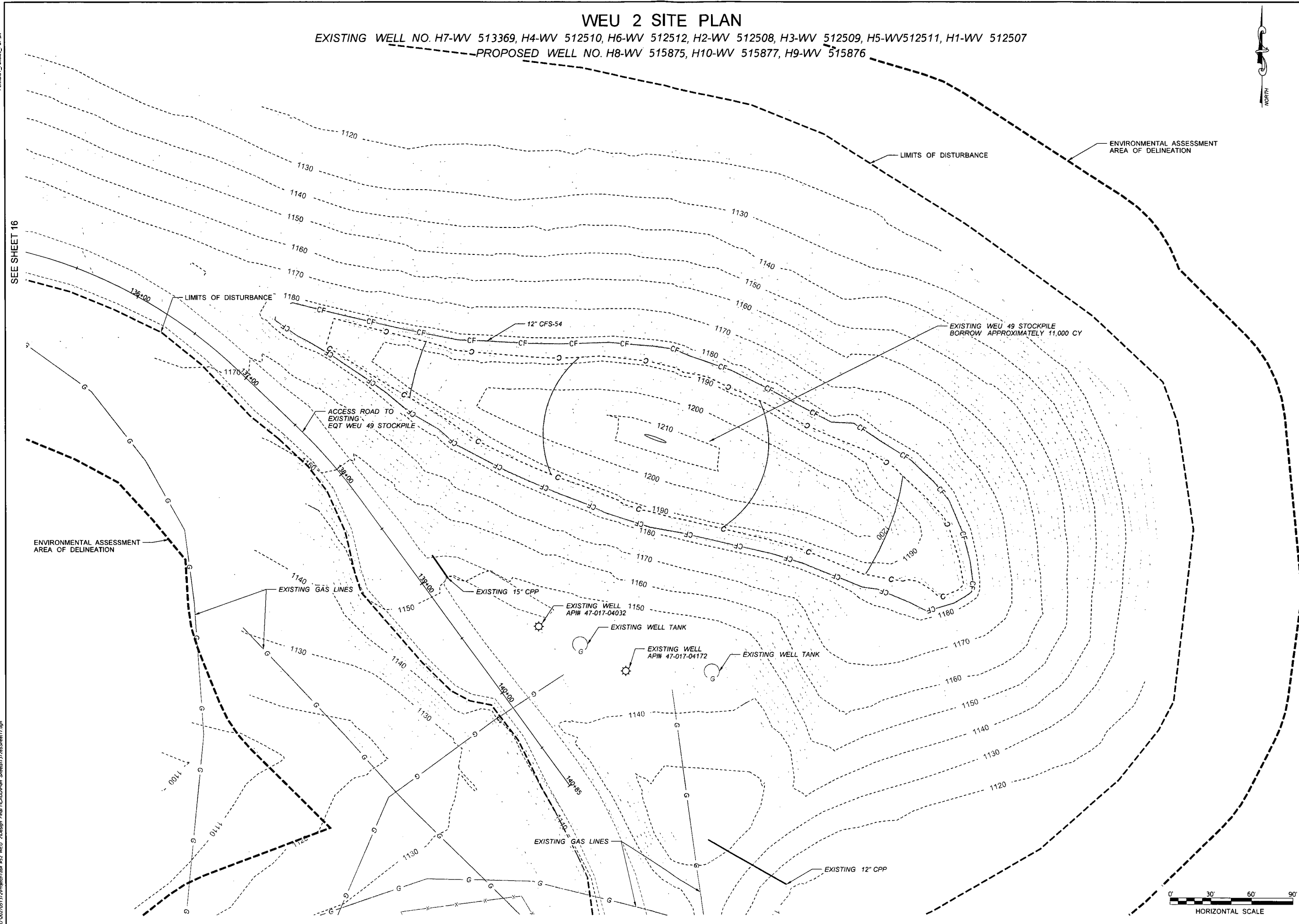
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EXISTING WELL NO. H7-WV 513369, H4-WV 512510, H6-WV 512512, H2-WV 512508, H3-WV 512509, H5-WV 512511, H1-WV 512507

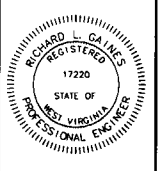
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SEE SHEET 16



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SITE PLAN  
**EQT WEU 2**  
 WEST UNION DISTRICT  
 DODDRIDGE COUNTY, WV

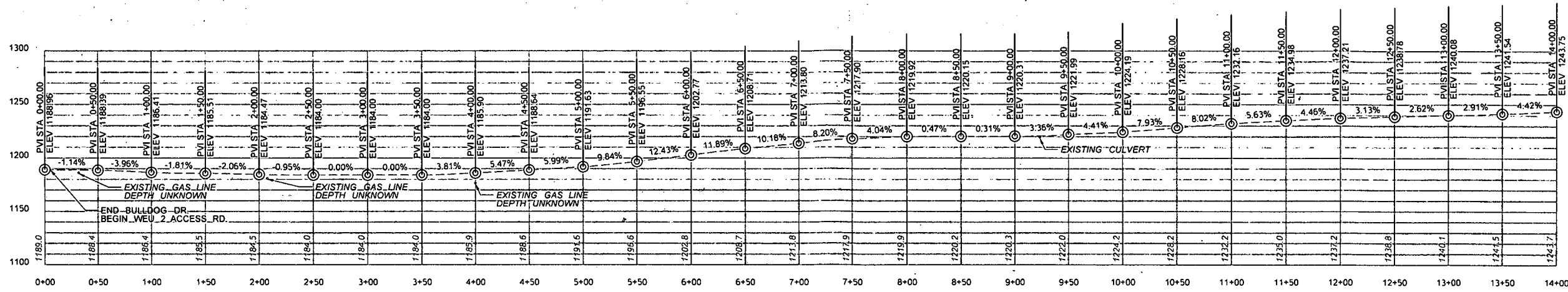
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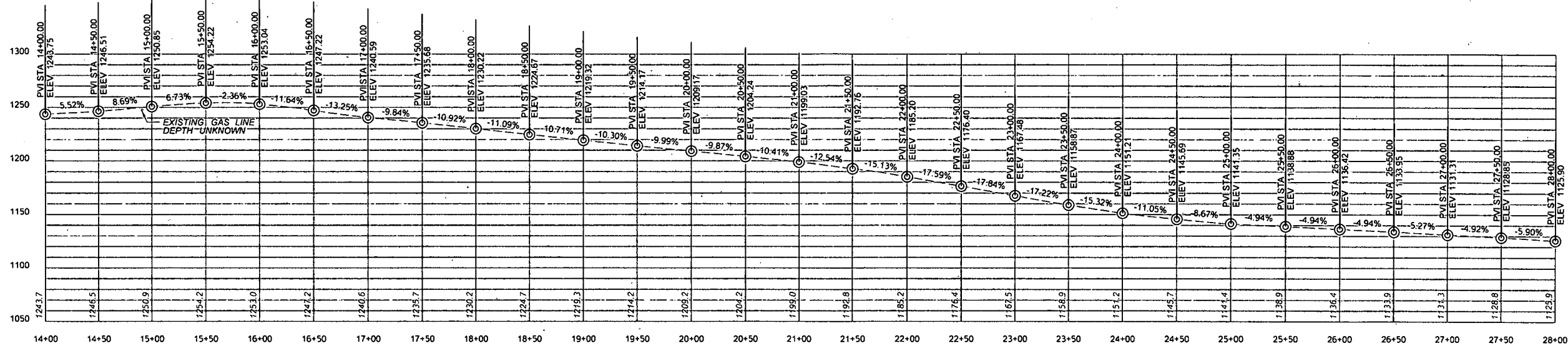


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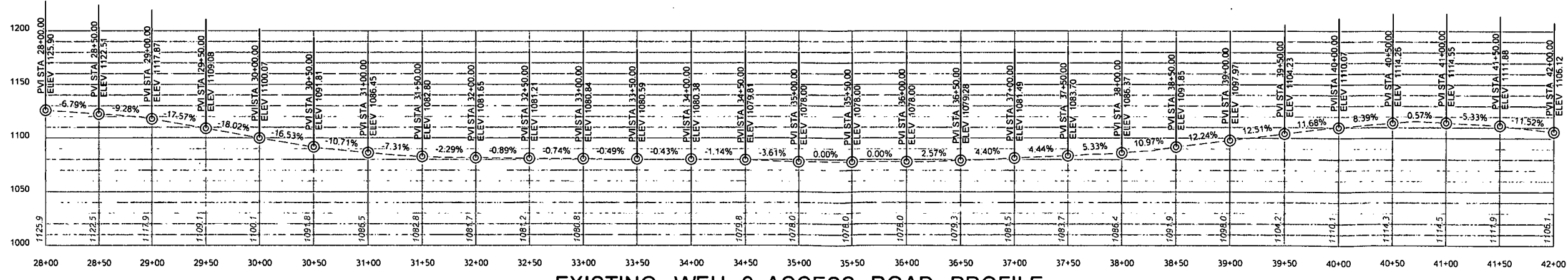
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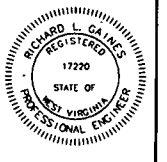
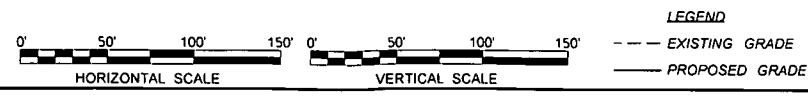
EXISTING WEU 2 ACCESS ROAD PROFILE



EXISTING WEU 2 ACCESS ROAD PROFILE



EXISTING WEU 2 ACCESS ROAD PROFILE



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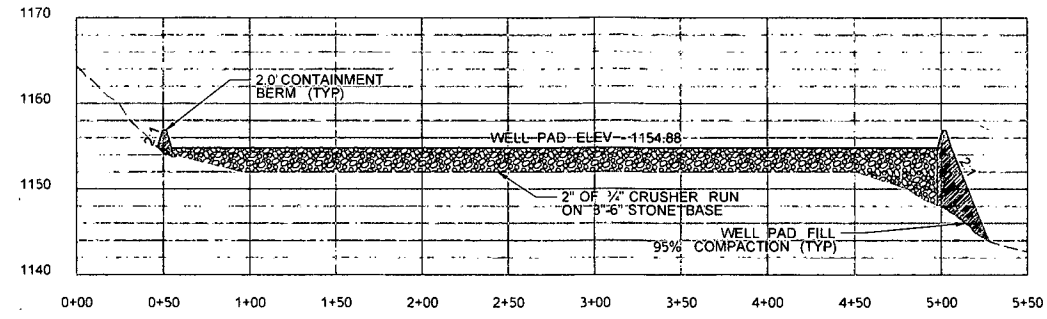
ACCESS ROAD PROFILES  
**EQT WEU 2**  
 WEST UNION DISTRICT  
 DODDRIDGE COUNTY, WV

DATE: 3-6-2015
SCALE: AS SHOWN
DESIGNED BY: CSH
FILE NO.: SLS-8265
SHEET 18 OF 46
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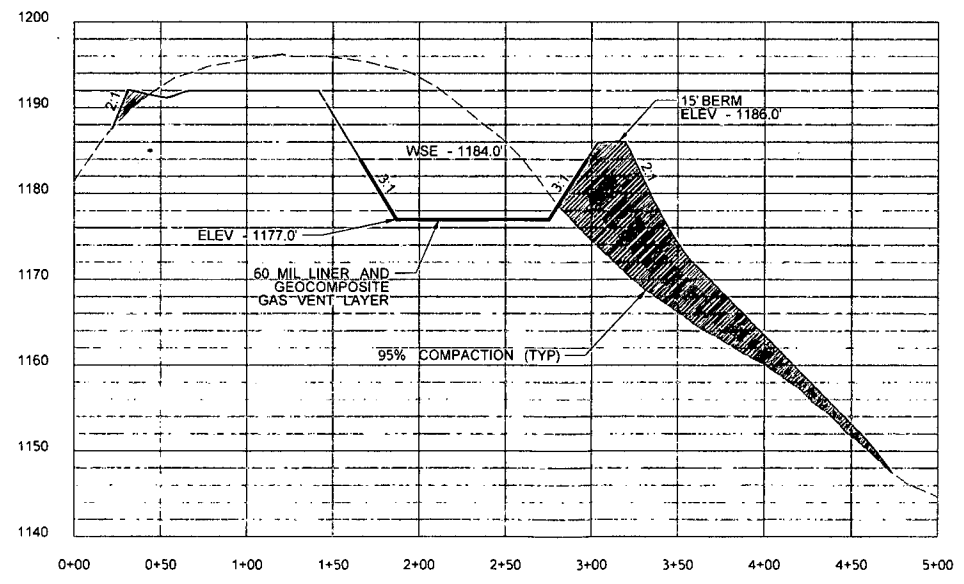




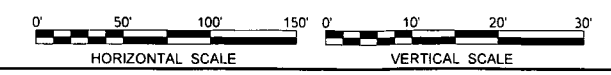




WELL PAD PROFILE



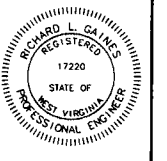
FLOWBACK PIT PROFILE



LEGEND  
 --- EXISTING GRADE  
 ——— PROPOSED GRADE



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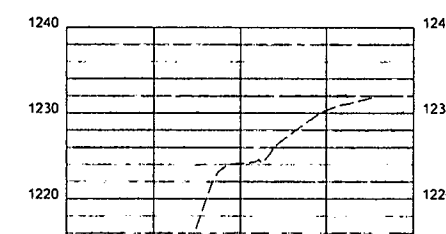
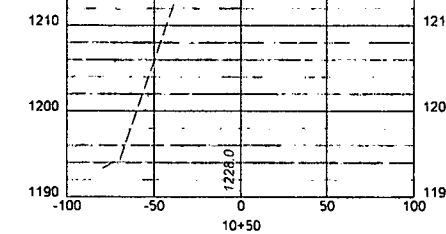
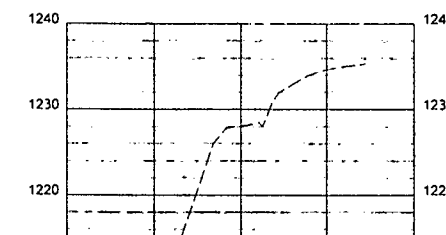
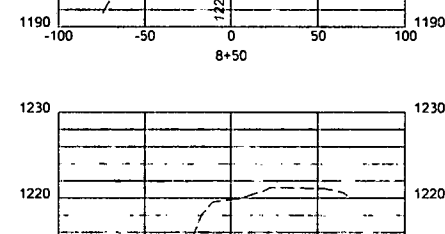
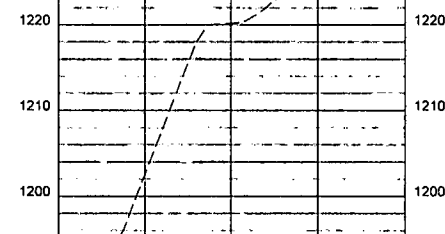
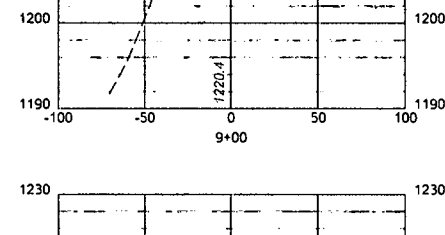
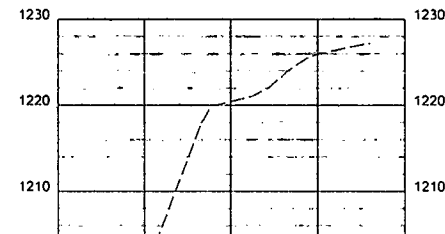
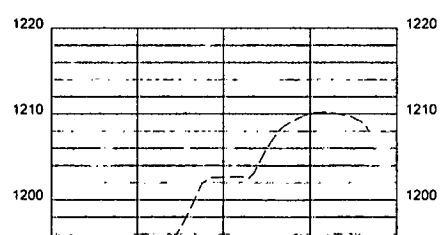
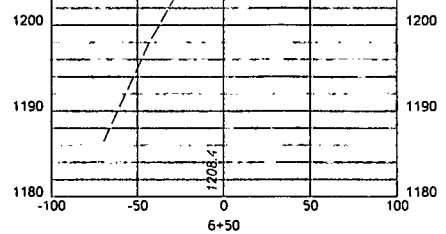
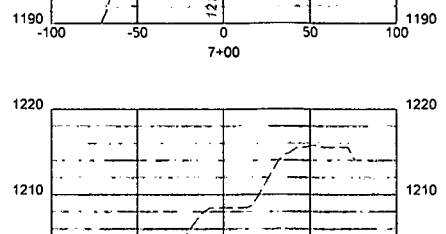
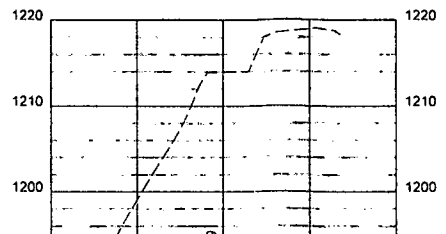
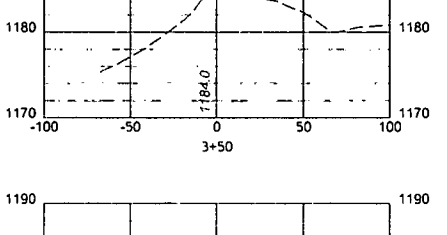
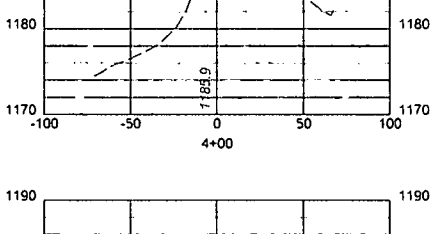
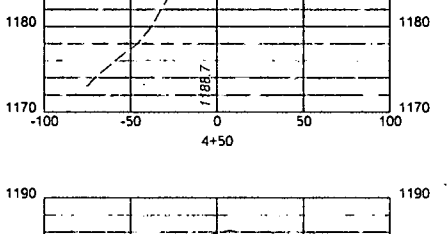
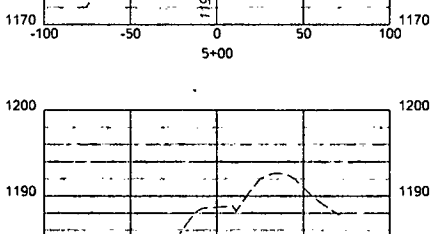
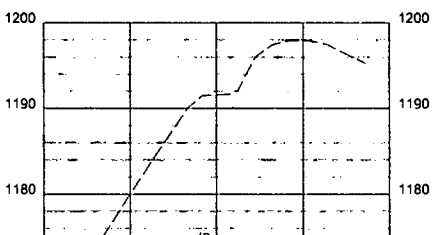
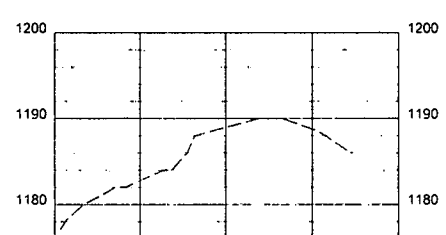
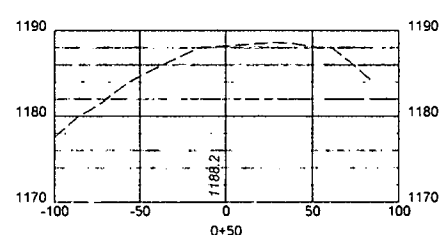
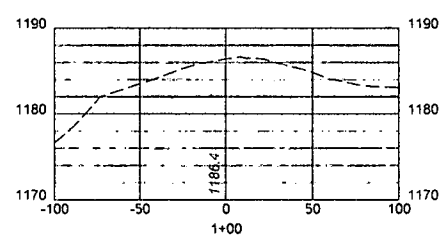
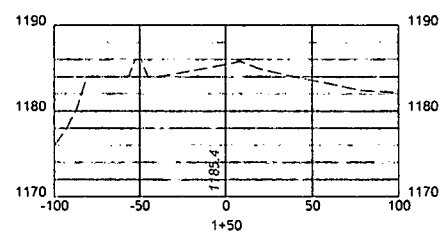
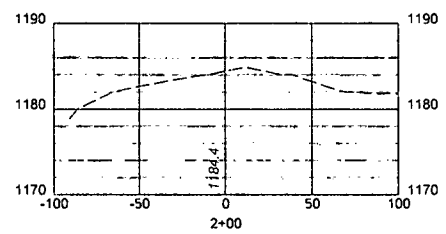
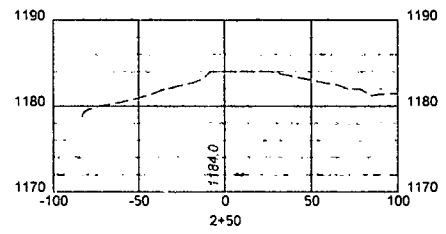
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WELL PAD AND FLOWBACK PIT PROFILES  
**EQT WEU 2**  
 WEST UNION DISTRICT  
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DATE: 3-6-2015  
 SCALE: AS SHOWN  
 DESIGNED BY: CSH  
 FILE NO.: SLS-8265  
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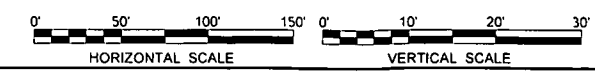
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1. ALL FILL AREAS WILL UTILIZE A TOE BENCH AND WILL BE "KEYED IN". FILL WILL BE PLACED IN 12" MAXIMUM LOOSE LIFTS, MAXIMUM PARTICLE SIZE OF 6", COMPACTED TO 95% PER STANDARD PROCTOR (ASTM D-598) WITH A VIBRATING SHEEPSFOOT ROLLER, AND ON A LEVEL SURFACE SEE TOE BENCH DETAIL.

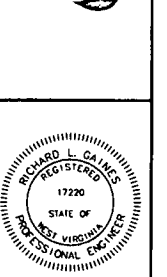
### EXISTING WEU 2 ACCESS ROAD



**LEGEND**  
 - - - EXISTING GRADE  
 — PROPOSED GRADE



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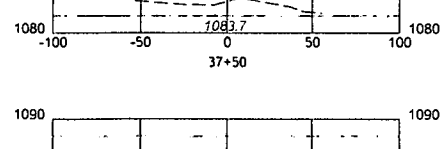
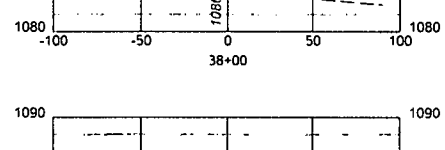
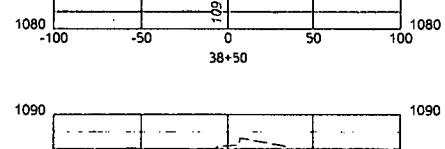
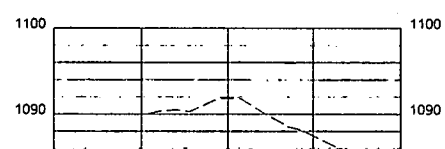
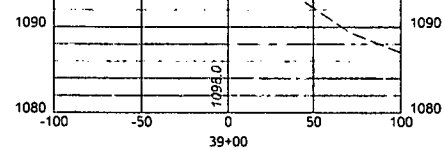
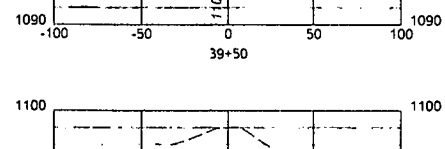
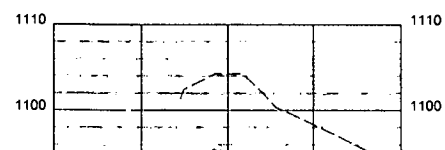
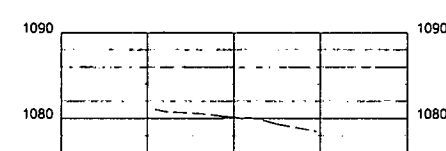
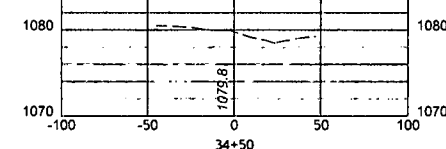
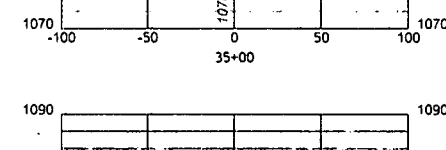
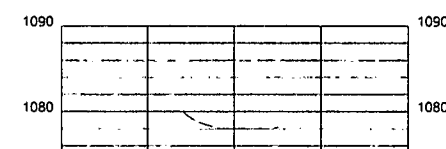
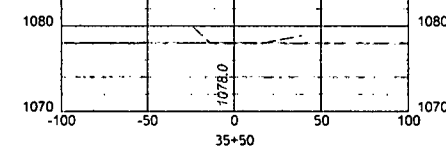
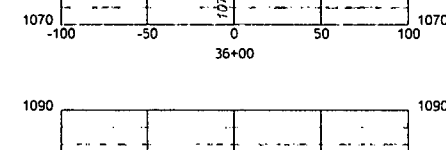
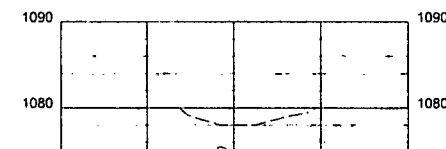
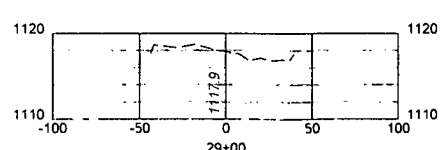
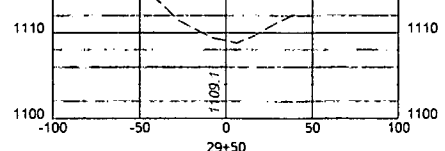
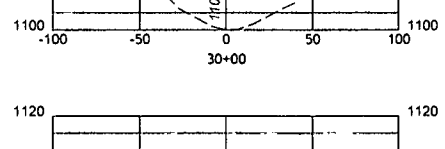
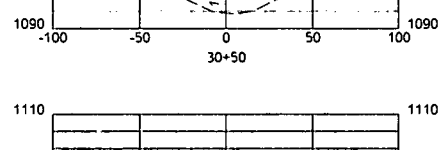
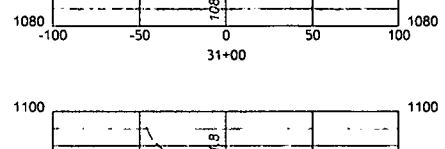
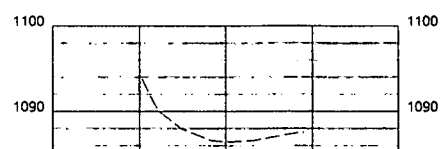
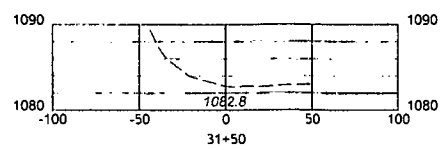
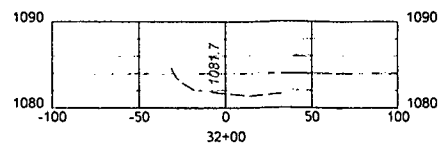
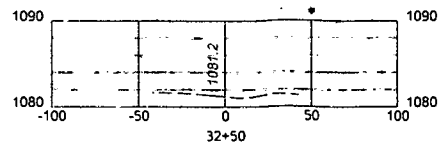
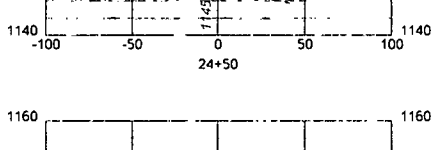
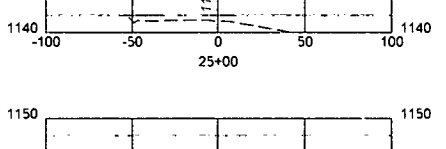
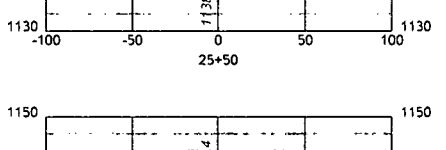
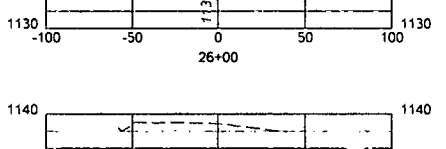
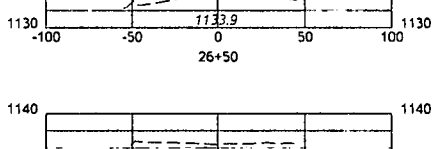
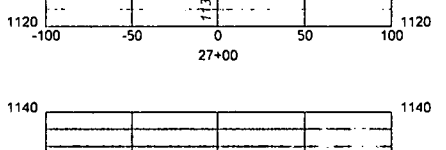
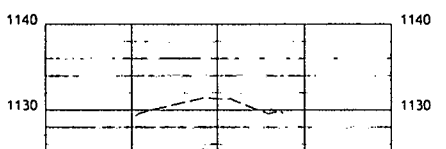
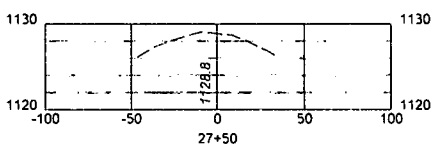
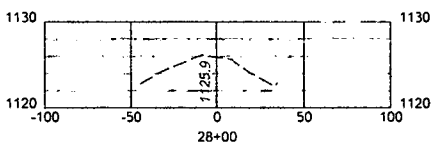
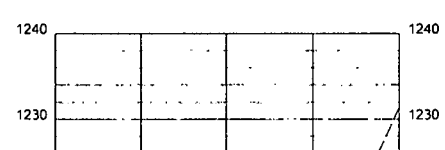
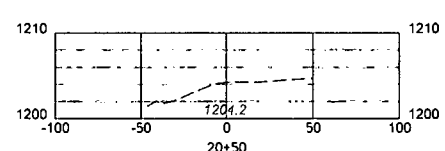
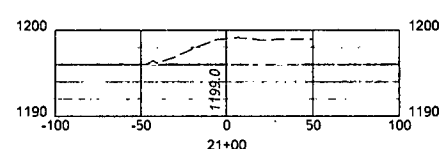
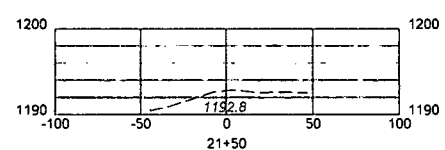
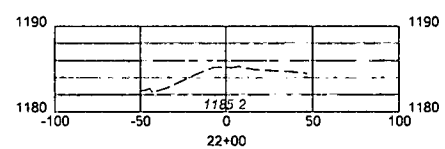
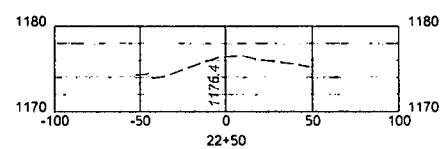
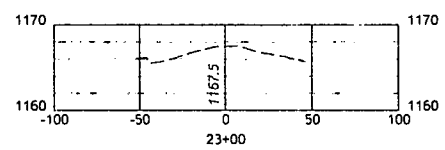
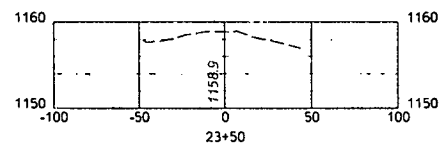
ACCESS ROAD CROSS SECTIONS  
**EQT WEU 2**  
 WEST UNION DISTRICT  
 DODDRIDGE COUNTY, WV

DATE: 3-6-2015  
 SCALE: AS SHOWN  
 DESIGNED BY: CSH  
 FILE NO.: SLS-8265  
 SHEET 22 OF 46  
 REV:



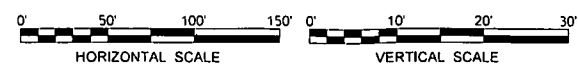
Energy 2013  
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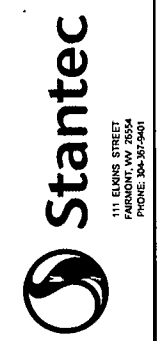


1. ALL FILL AREAS WILL UTILIZE A TOE BENCH AND WILL BE "KEYED IN". FILL WILL BE PLACED IN 12" MAXIMUM LOOSE LIFTS MAXIMUM PARTICLE SIZE OF 6" COMPACTED TO 95% PER STANDARD PROCTOR (ASTM D-698) WITH A VIBRATING SHEEPSFOOT ROLLER, AND ON A LEVEL SURFACE SEE TOE BENCH DETAIL.

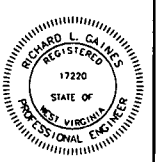
EXISTING WEU 2 ACCESS ROAD



LEGEND  
 --- EXISTING GRADE  
 — PROPOSED GRADE



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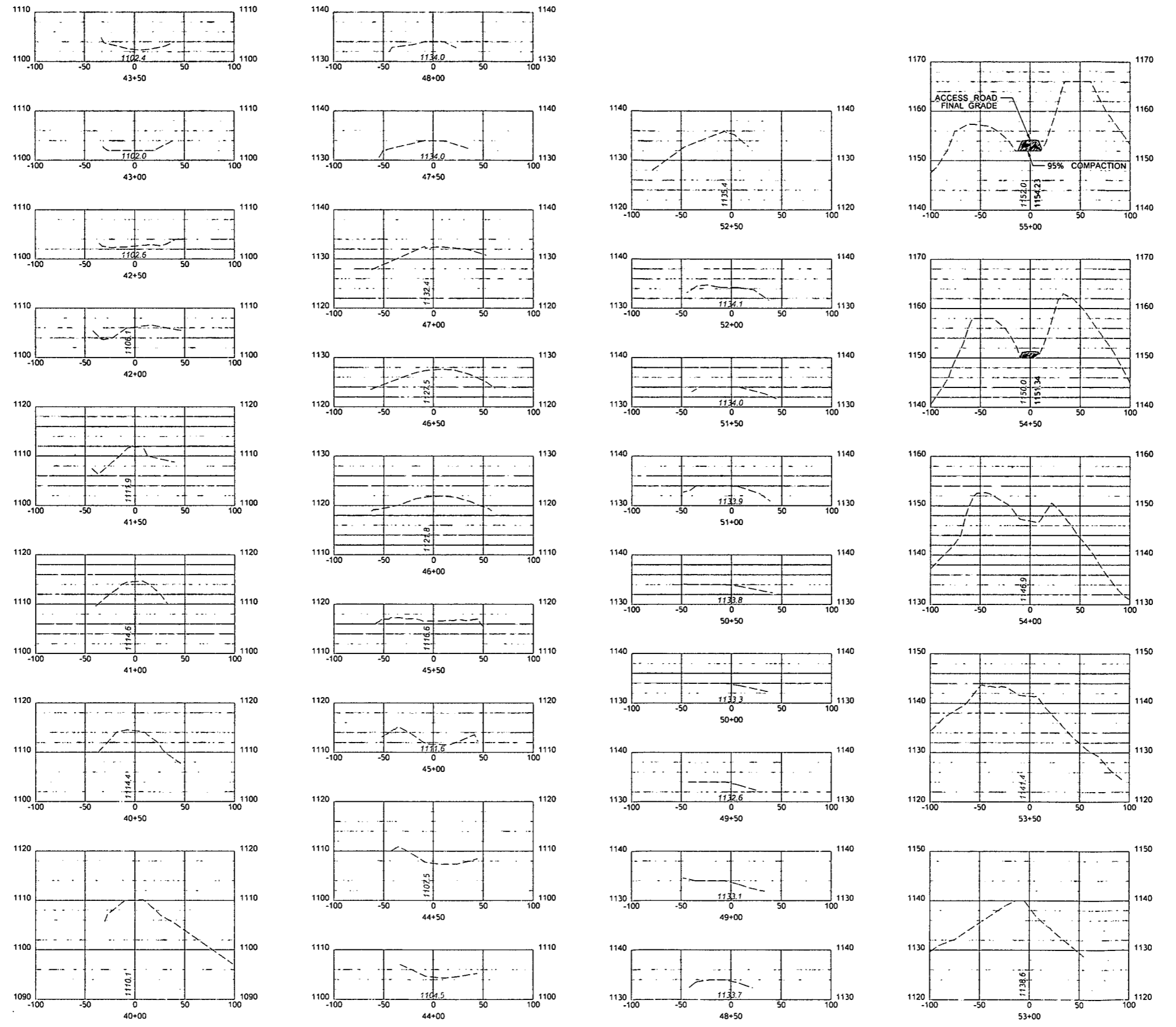


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ACCESS ROAD CROSS SECTIONS  
 EQT WEU 2  
 WEST UNION DISTRICT  
 DODDRIDGE COUNTY, WV

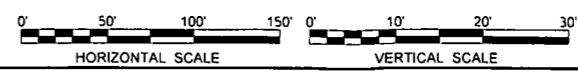
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 SCALE: AS SHOWN  
 DESIGNED BY: CSH  
 FILE NO.: SLS-8265  
 SHEET 24 OF 46  
 REV:





1. ALL FILL AREAS WILL UTILIZE A TOE BENCH AND WILL BE "KEYED IN". FILL WILL BE PLACED IN 12" MAXIMUM LOOSE LIFTS, MAXIMUM PARTICLE SIZE OF 6", COMPACTED TO 95% PER STANDARD PROCTOR (ASTM D-698) WITH A VIBRATING SHEEPSFOOT ROLLER, AND ON A LEVEL SURFACE SEE TOE BENCH DETAIL.

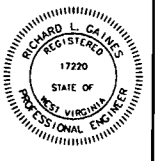
EXISTING WEU 2 ACCESS ROAD



LEGEND  
 --- EXISTING GRADE  
 — PROPOSED GRADE



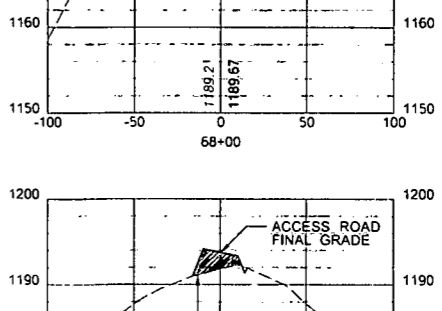
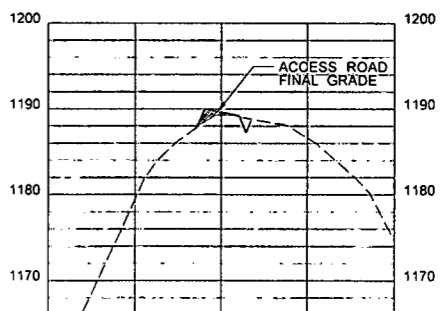
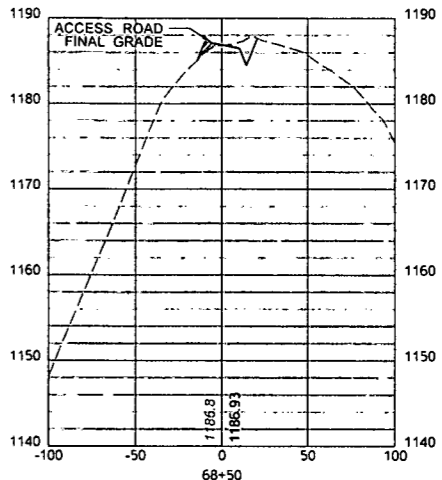
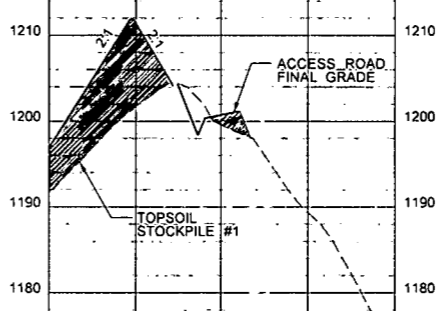
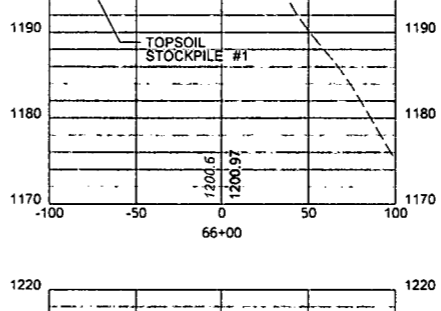
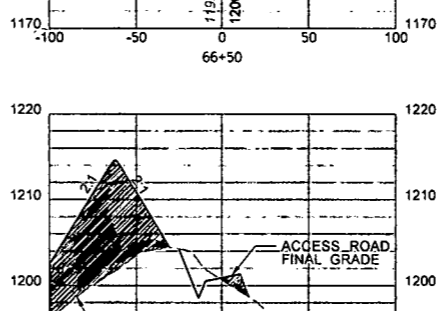
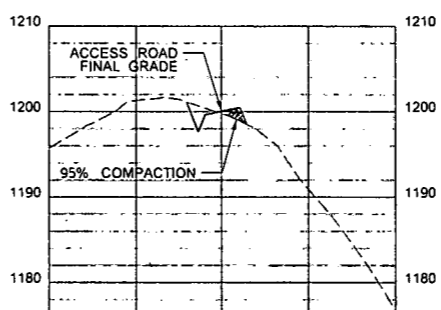
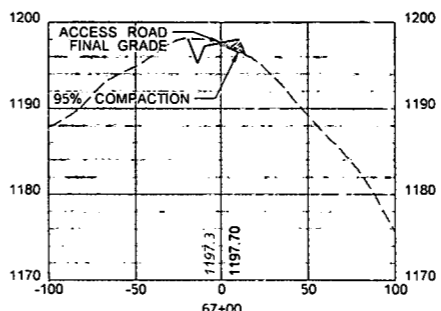
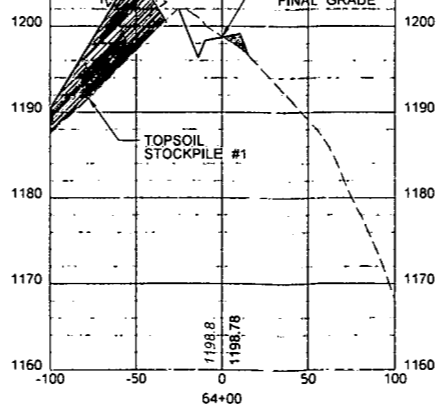
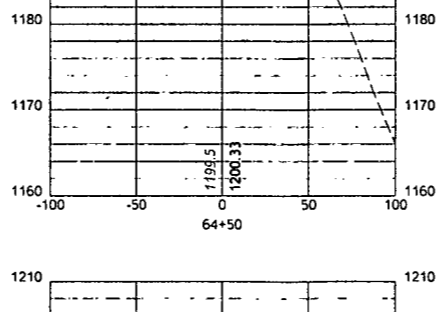
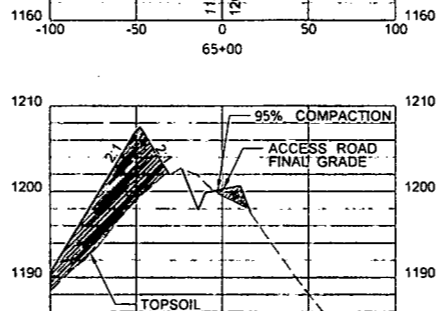
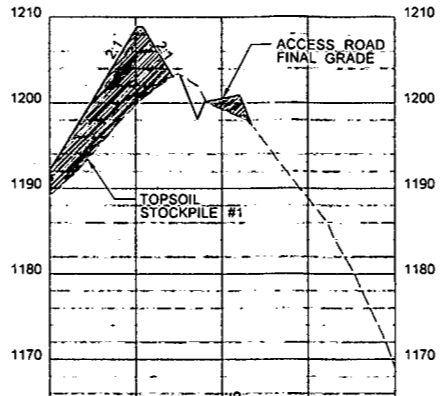
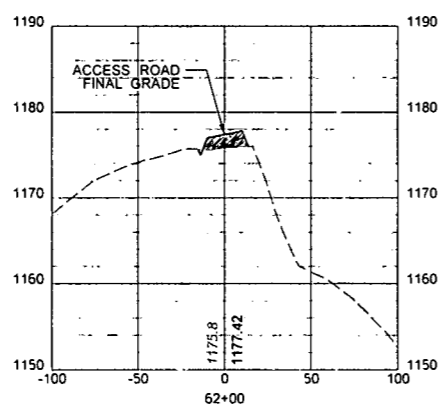
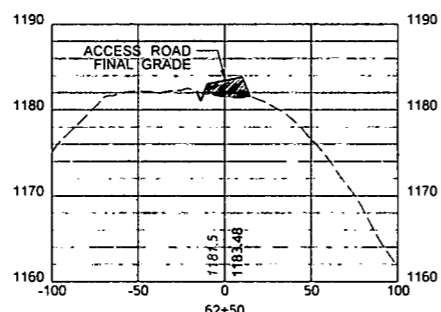
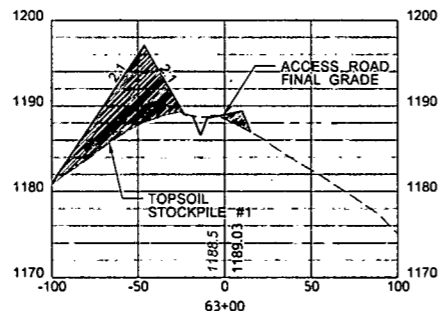
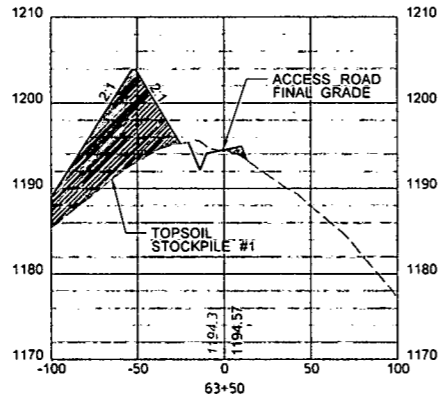
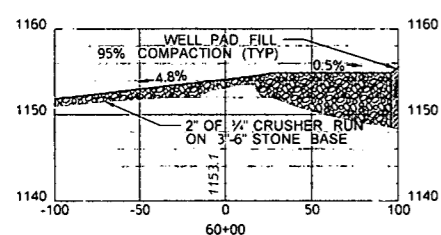
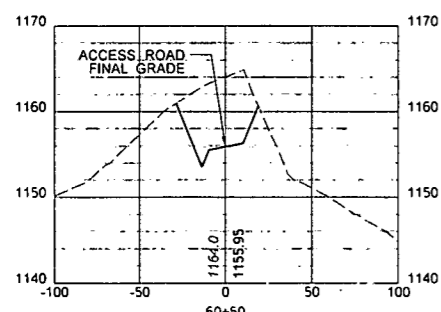
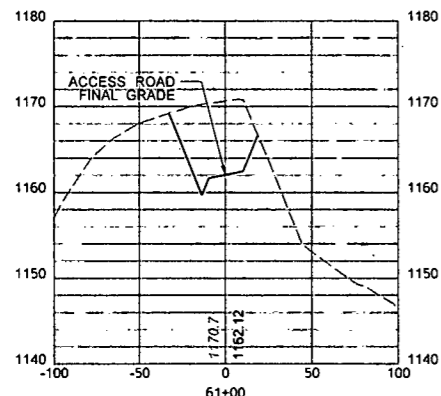
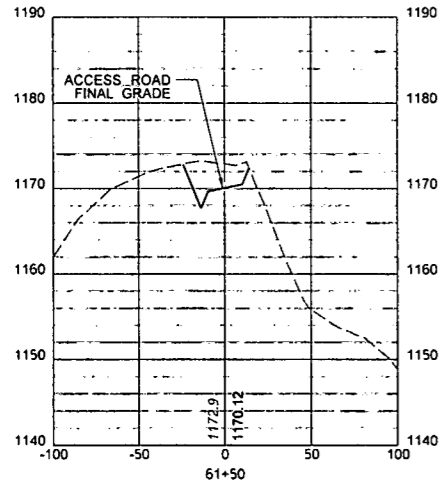
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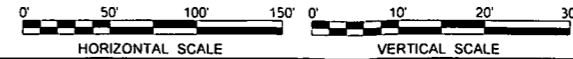
ACCESS ROAD CROSS SECTIONS  
 EQT WEU 2  
 WEST UNION DISTRICT  
 DODDRIDGE COUNTY, WV

DATE: 3-6-2015  
 SCALE: AS SHOWN  
 DESIGNED BY: CSH  
 FILE NO.: SLS-0265  
 SHEET 25 OF 46  
 REV:



1. ALL FILL AREAS WILL UTILIZE A TOE BENCH AND WILL BE "KEYED IN". FILL WILL BE PLACED IN 12" MAXIMUM LOOSE LIFTS. MAXIMUM PARTICLE SIZE OF 6" COMPACTED TO 95% PER STANDARD PROCTOR (ASTM D-698) WITH A VIBRATING SHEEPSFOOT ROLLER, AND ON A LEVEL SURFACE SEE TOE BENCH DETAIL.

ACCESS ROAD TO FLOWBACK PIT



LEGEND  
 --- EXISTING GRADE  
 --- PROPOSED GRADE

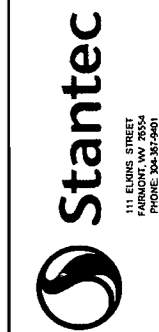
ACCESS ROAD CROSS SECTIONS  
 EQT WEU 2  
 WEST UNION DISTRICT  
 DODDRIDGE COUNTY, WV

DATE: 3-6-2015  
 SCALE: AS SHOWN  
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 FILE NO.: SLS-0265  
 SHEET 26 OF 46  
 REV:

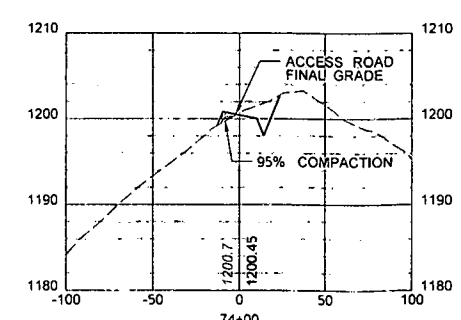
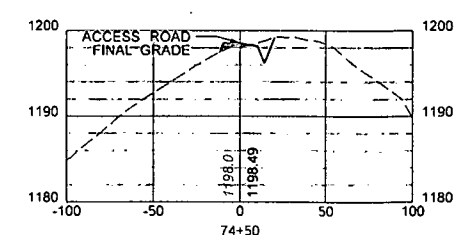
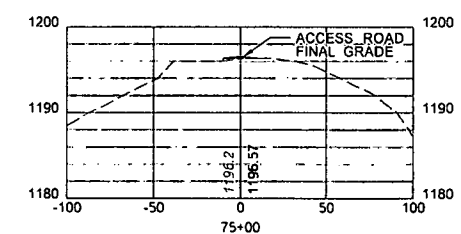
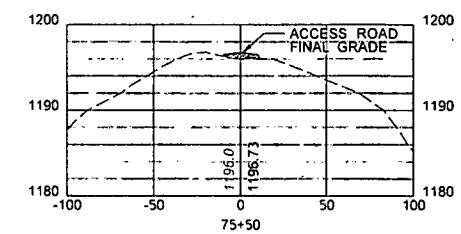
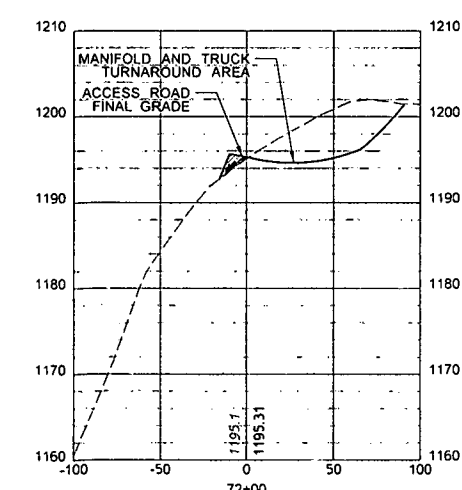
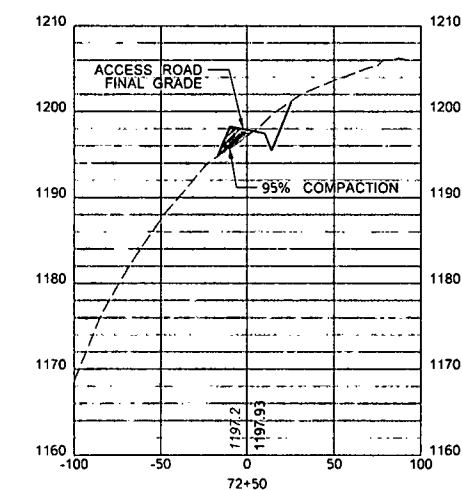
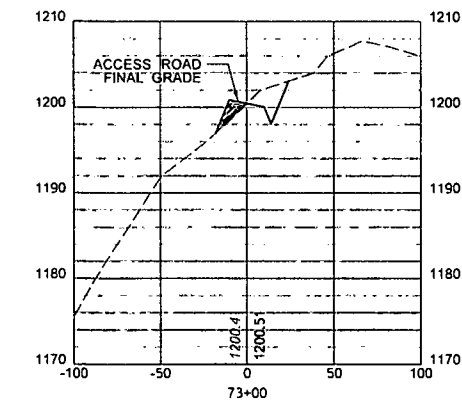
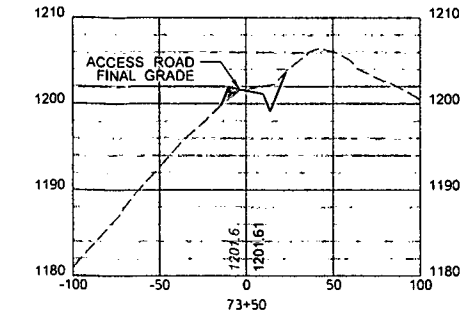
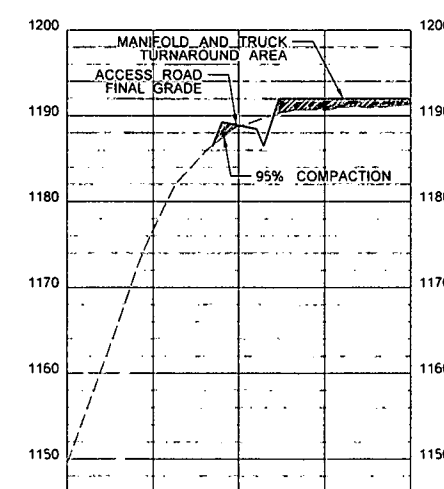
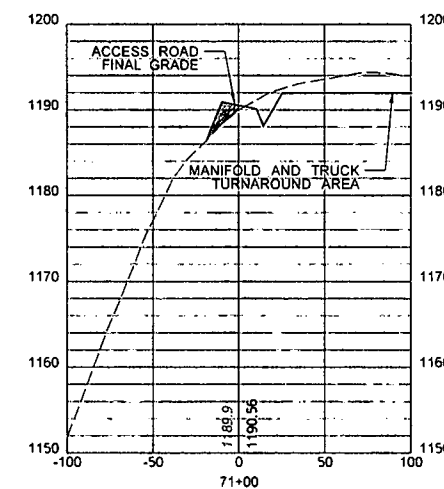
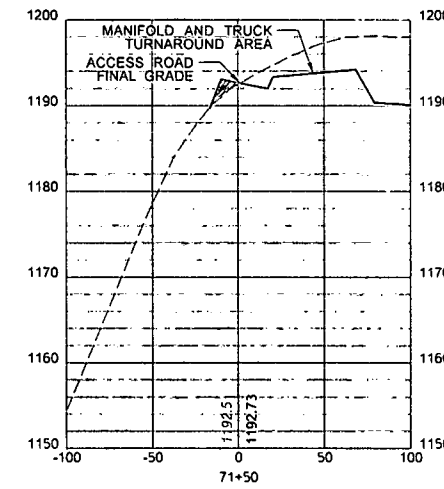
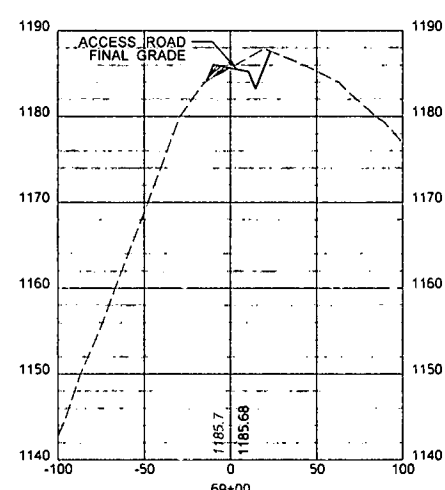
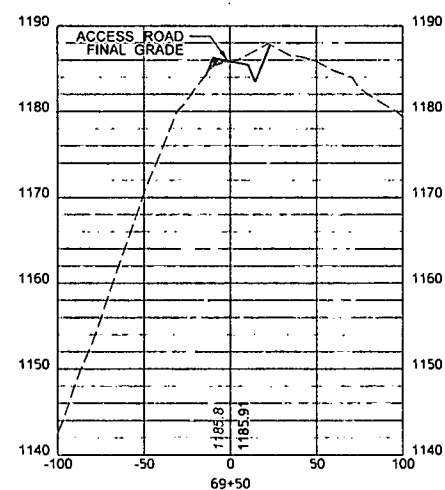
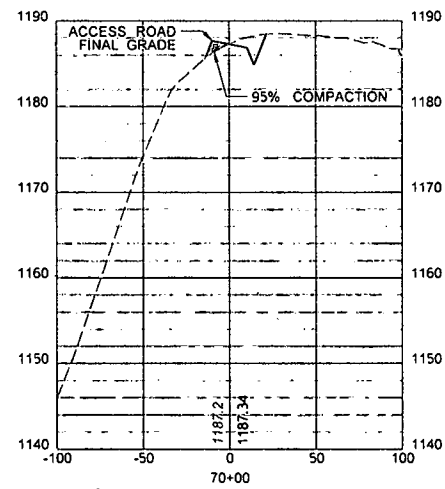
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 A DIVISION OF SLS SURVEYS & ENGINEERING, INC.  
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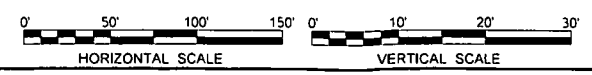
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1. ALL FILL AREAS WILL UTILIZE A TOE BENCH AND WILL BE "KEYED IN". FILL WILL BE PLACED IN 12" MAXIMUM LOOSE LIFTS, MAXIMUM PARTICLE SIZE OF 6", COMPACTED TO 95% PER STANDARD PROCTOR (ASTM D-698) WITH A VIBRATING SHEEPSFOOT ROLLER AND ON A LEVEL SURFACE SEE TOE BENCH DETAIL.



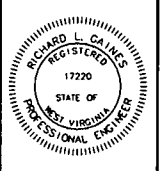
ACCESS ROAD TO FLOWBACK PIT



LEGEND  
 --- EXISTING GRADE  
 — PROPOSED GRADE

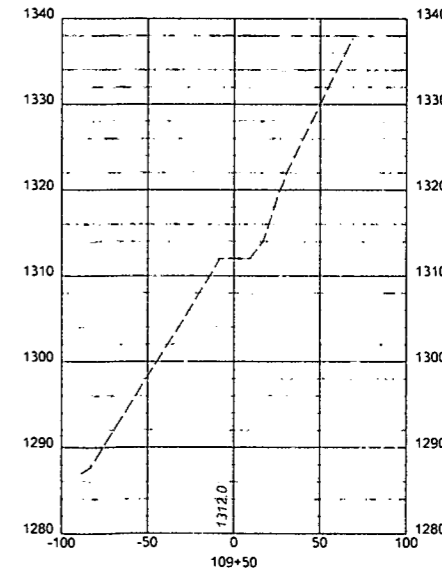
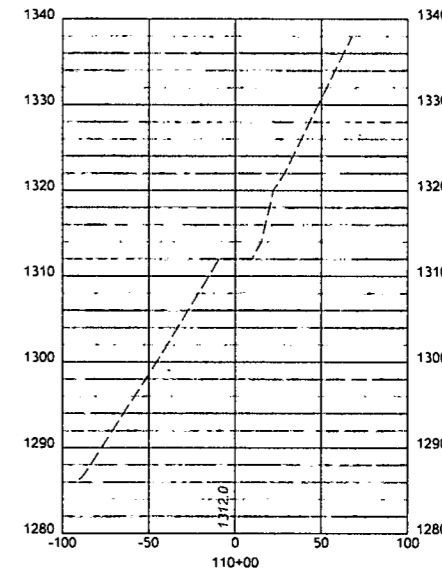
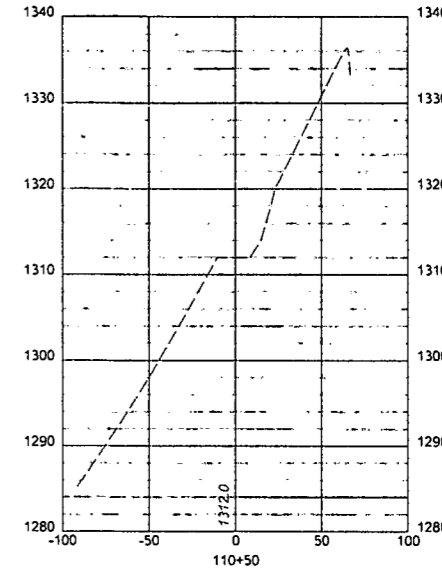
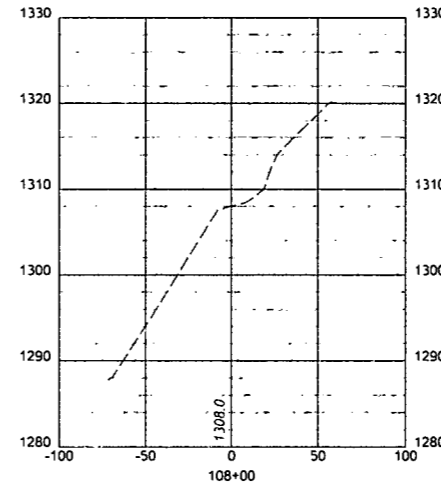
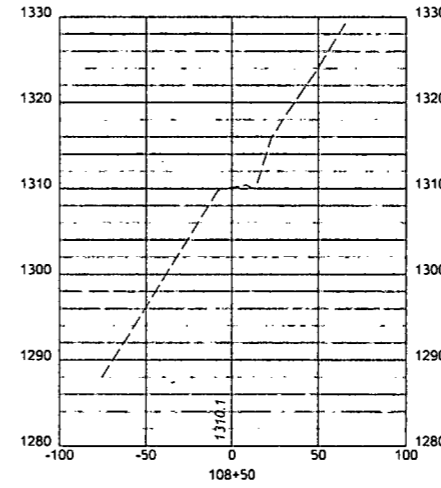
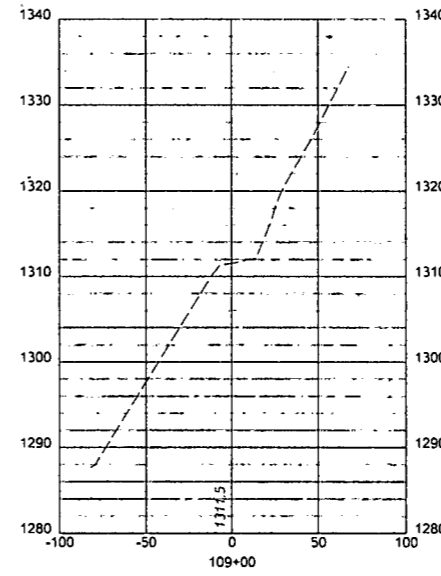
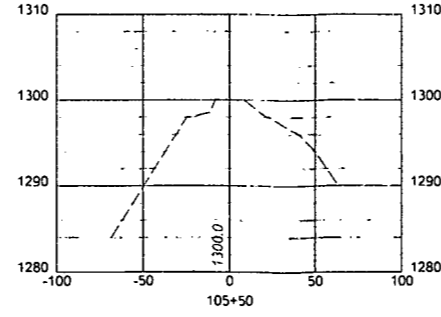
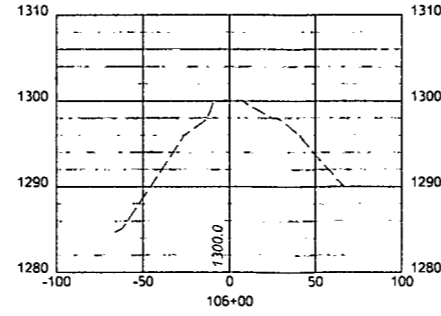
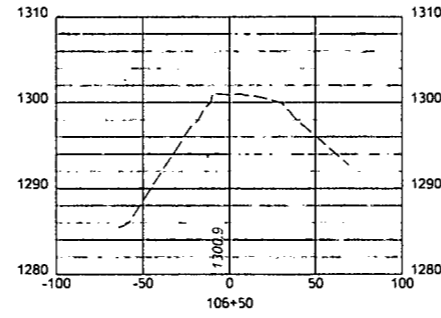
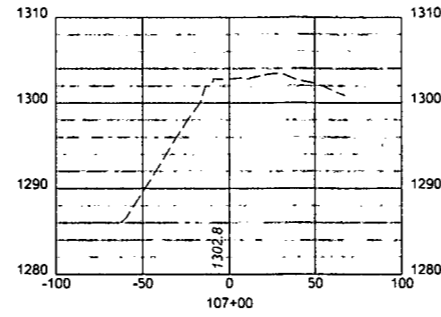
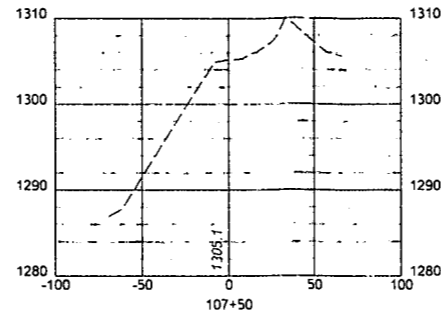
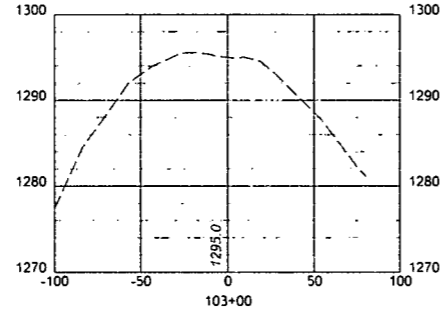
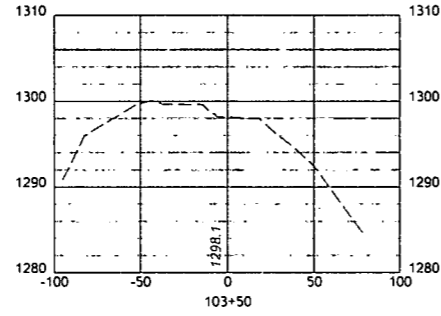
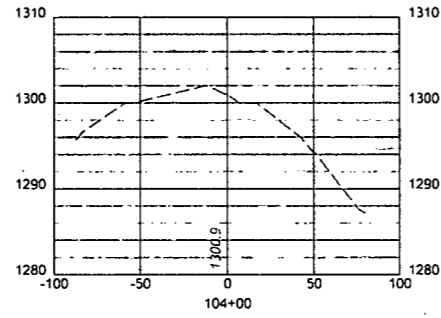
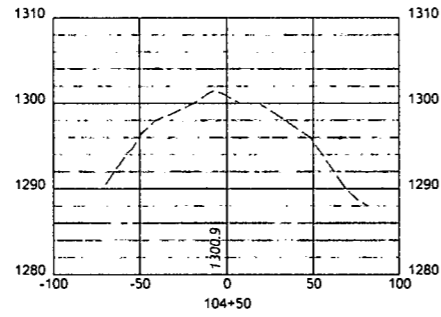
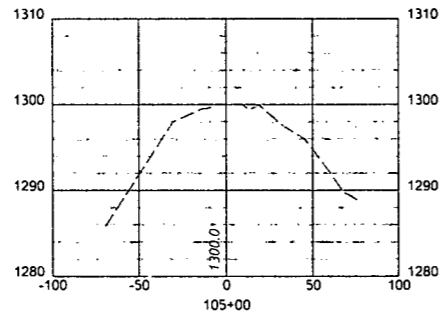
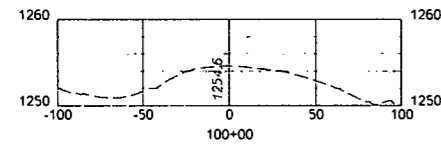
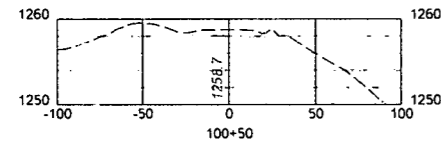
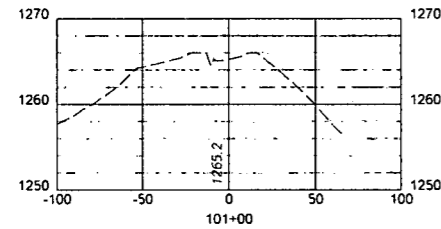
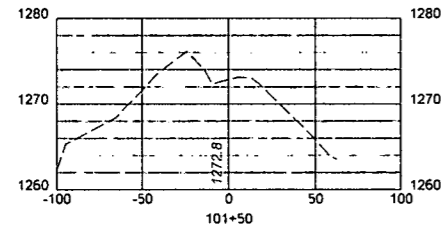
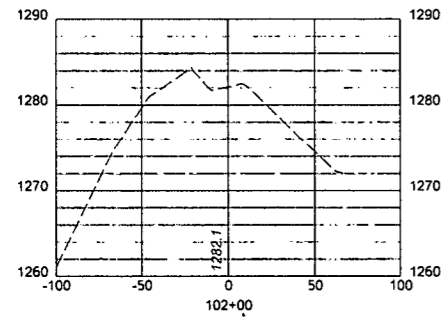
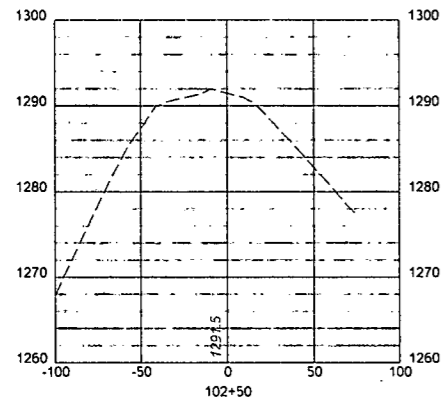
ACCESS ROAD CROSS SECTIONS  
 EQT WEU 2  
 WEST UNION DISTRICT  
 DODDRIDGE COUNTY, WV

DATE: 3-6-2015  
 SCALE: AS SHOWN  
 DESIGNED BY: CSH  
 FILE NO.: SLS-8265  
 SHEET 27 OF 46  
 REV:



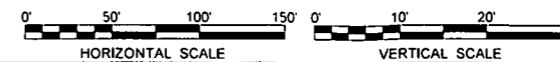
Professional Energy Consultants  
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Stantec  
 111 ELKINS STREET  
 FARMINGTON, WV 26034  
 PHONE: 304-924-9261



1. ALL FILL AREAS WILL UTILIZE A TOE BENCH AND WILL BE "KEYED IN". FILL WILL BE PLACED IN 12" MAXIMUM LOOSE LIFTS, MAXIMUM PARTICLE SIZE OF 6", COMPACTED TO 95% PER STANDARD PROCTOR (ASTM D-698) WITH A VIBRATING SHEEPSFOOT ROLLER, AND ON A LEVEL SURFACE SEE TOE BENCH DETAIL.

### EXISTING WEU 49 ACCESS ROAD

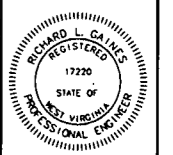


**LEGEND**

- - - EXISTING GRADE
- PROPOSED GRADE

ACCESS ROAD CROSS SECTIONS  
**EQT WEU 2**  
 WEST UNION DISTRICT  
 DODDRIDGE COUNTY, WV

DATE: 3-6-2015  
 SCALE: AS SHOWN  
 DESIGNED BY: CSH  
 FILE NO: SLS-8265  
 SHEET 28 OF 46  
 REV:



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 PROJECT MGMT.  
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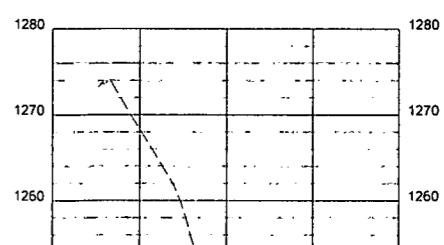
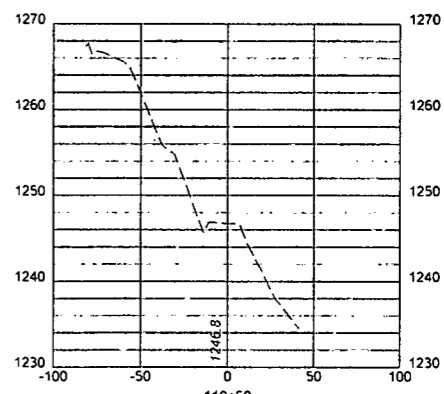
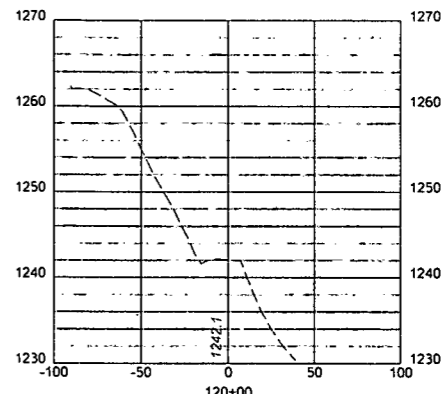
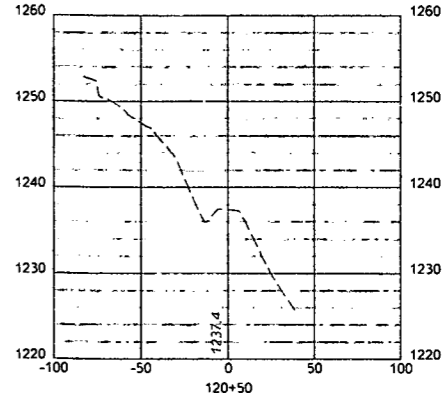
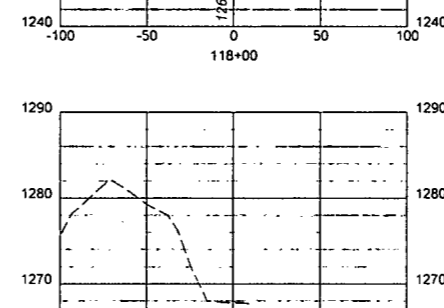
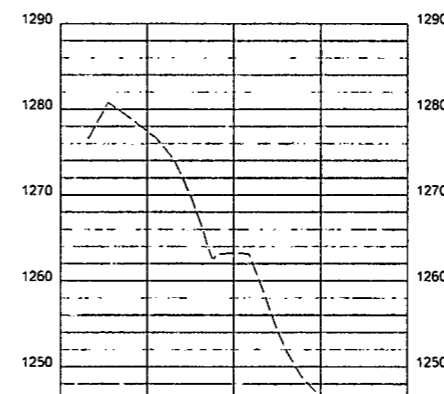
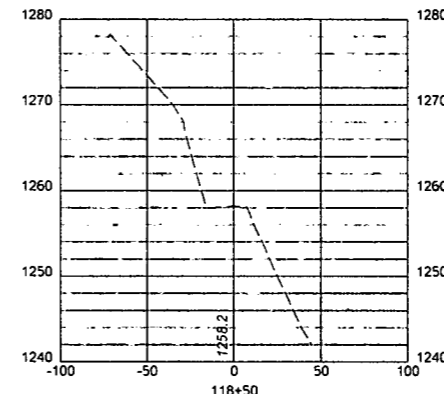
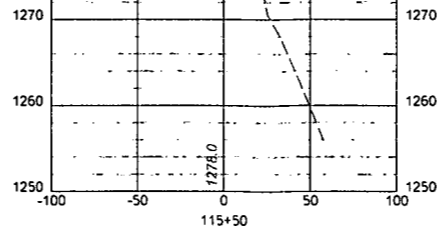
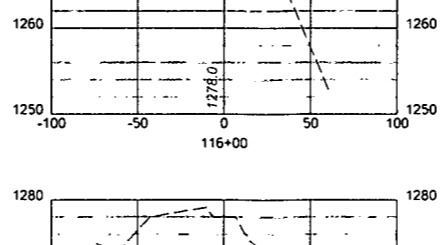
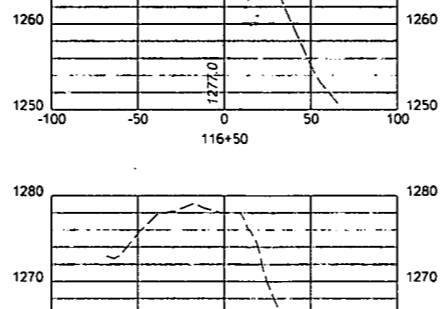
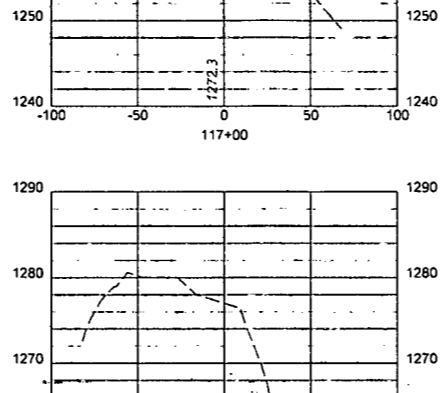
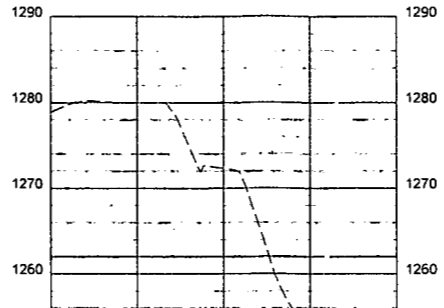
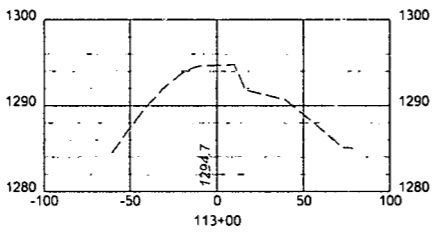
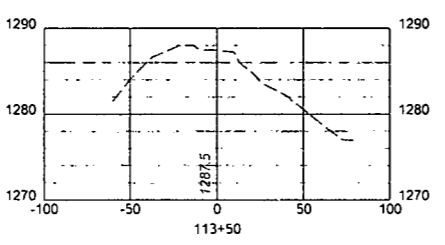
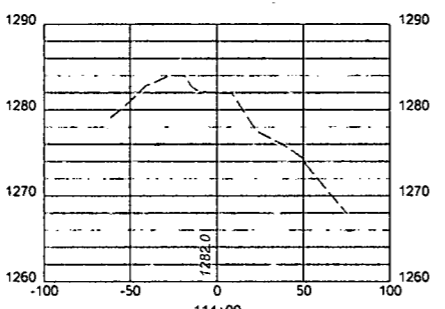
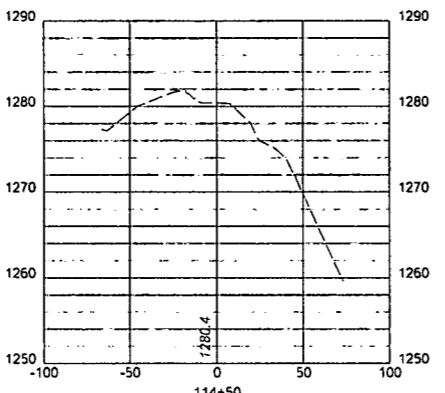
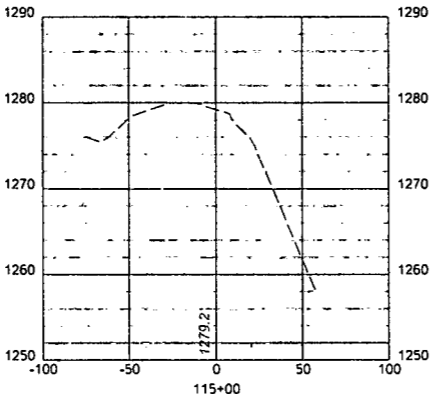
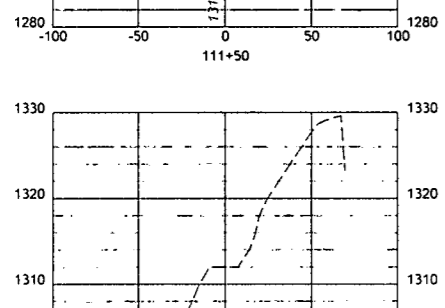
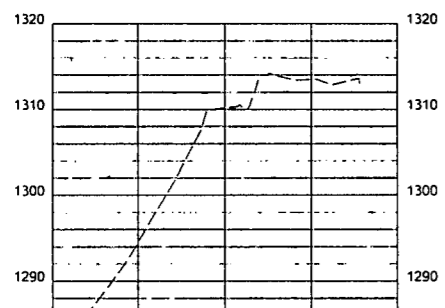
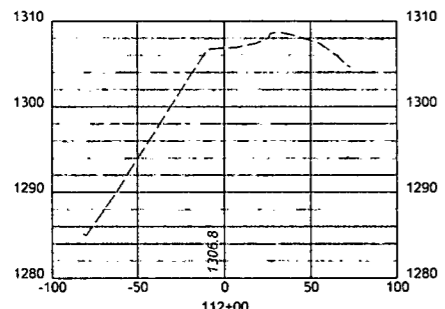
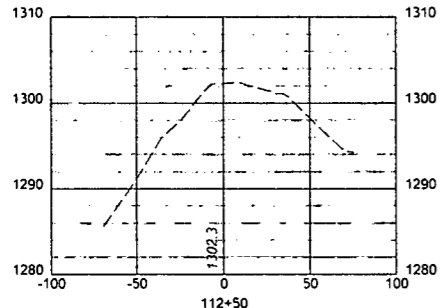
**Stantec**  
 111 ELKINS STREET  
 PARKERSBURG, WV 26104  
 PHONE: 304-591-9601



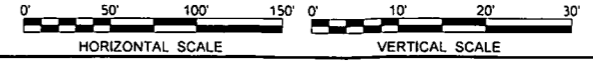
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1. ALL FILL AREAS WILL UTILIZE A TOE BENCH AND WILL BE "KEYED IN". FILL WILL BE PLACED IN 12" MAXIMUM LOOSE LIFTS, MAXIMUM PARTICLE SIZE OF 6", COMPACTED TO 95% PER STANDARD PROCTOR (ASTM D-698) WITH A VIBRATING SHEEPSFOOT ROLLER, AND ON A LEVEL SURFACE SEE TOE BENCH DETAIL.



### EXISTING WEU 49 ACCESS ROAD



**LEGEND**  
 - - - EXISTING GRADE  
 — PROPOSED GRADE

ACCESS ROAD CROSS SECTIONS  
**EQT WEU 2**  
 WEST UNION DISTRICT  
 DODDRIDGE COUNTY, WV

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 FOR:  
 EDT PRODUCTION COMPANY



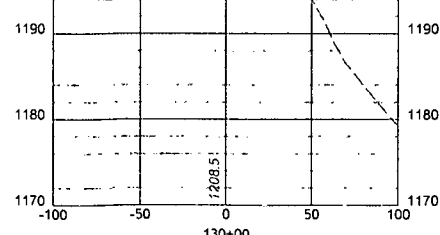
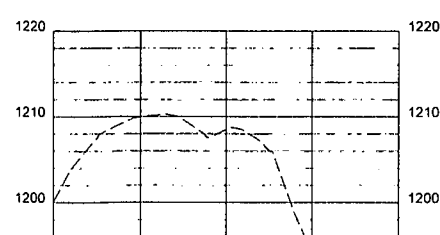
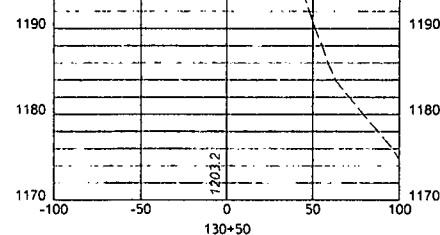
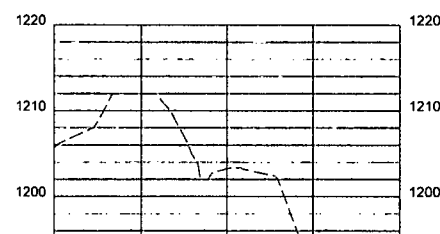
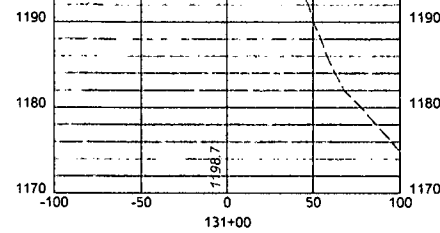
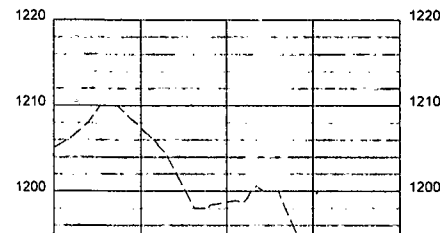
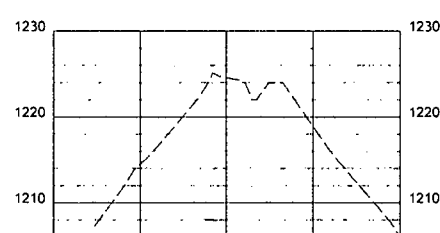
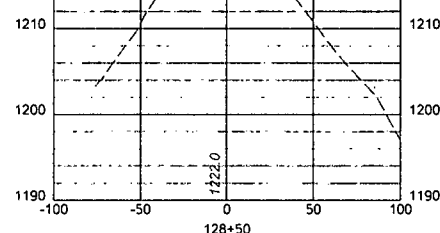
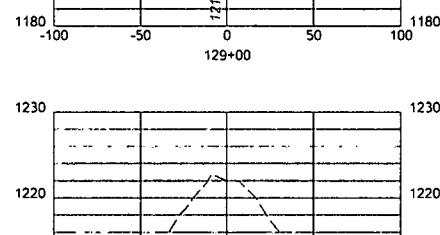
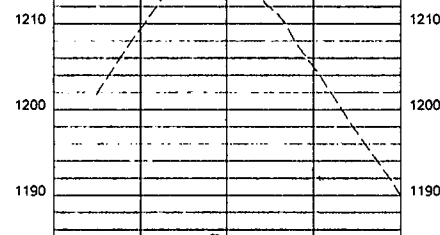
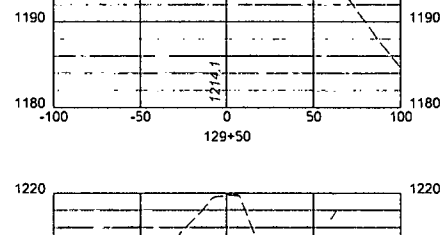
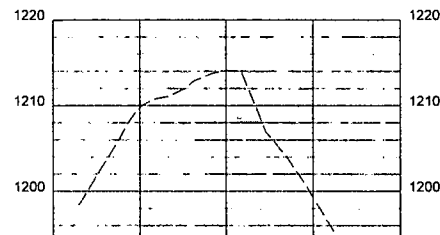
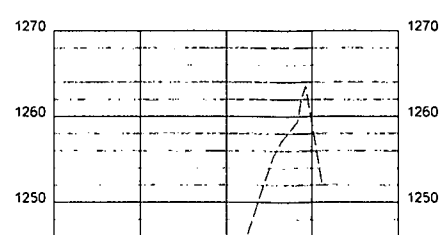
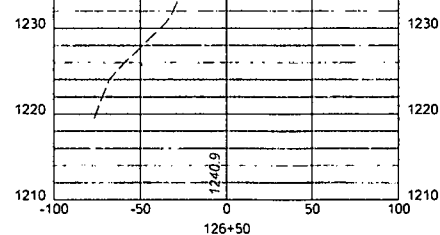
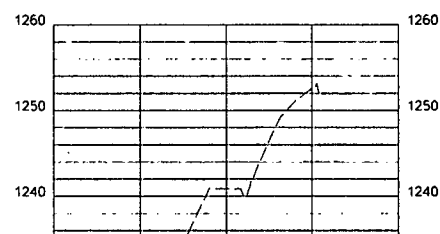
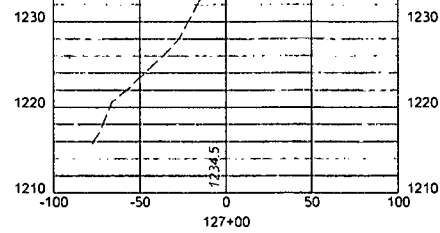
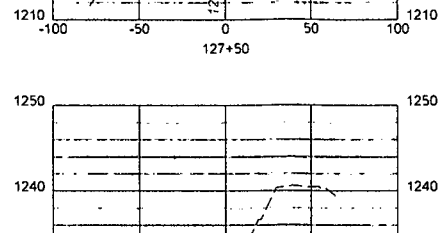
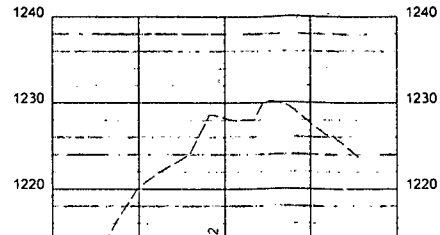
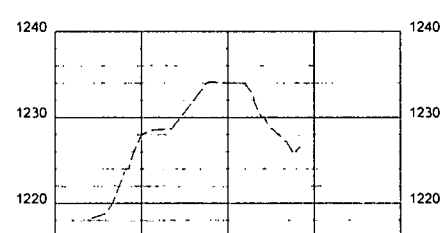
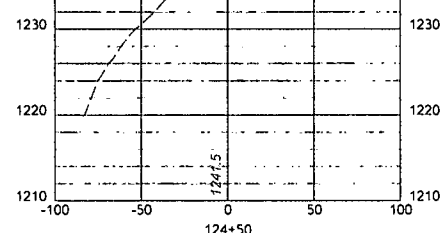
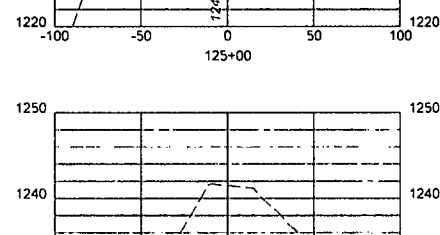
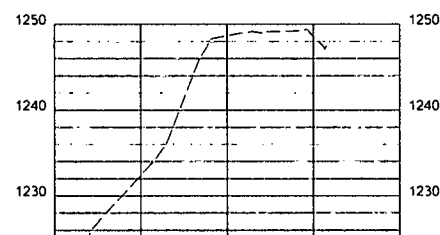
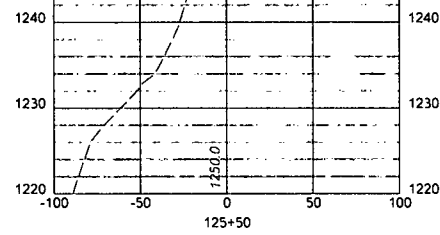
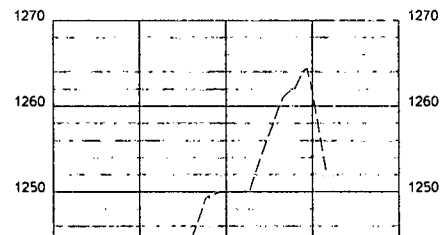
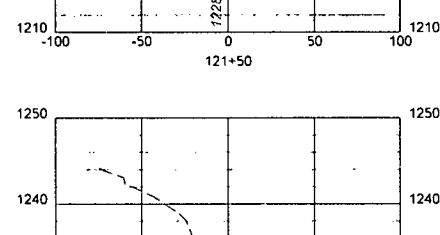
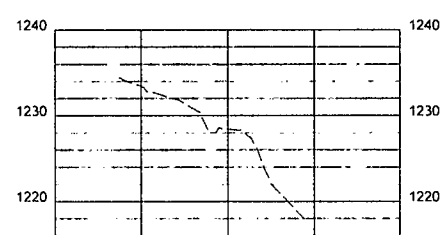
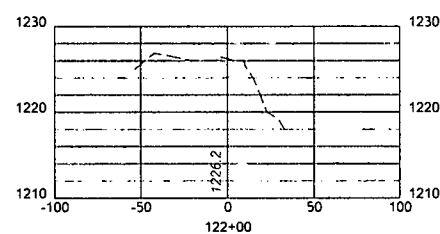
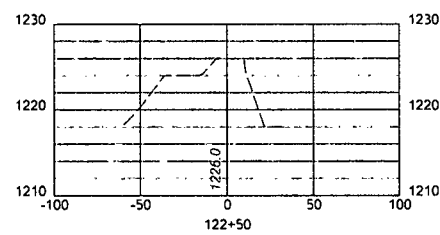
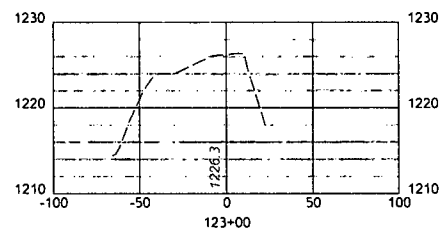
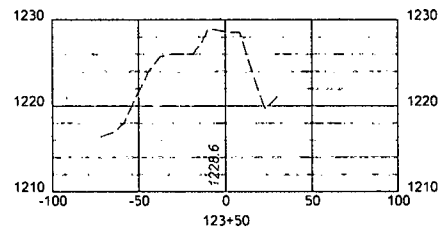
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**Stantec**  
 111 ELMNS STREET  
 FARMINGTON, WV 26034  
 PROJECT: 240-2019-01

DATE: 3-6-2015  
 SCALE: AS SHOWN  
 DESIGNED BY: CSH  
 FILE NO.: SLS-8265  
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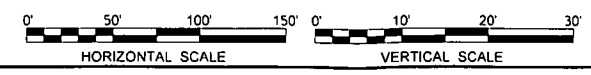
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1. ALL FILL AREAS WILL UTILIZE A TOE BENCH AND WILL BE "KEYED IN". FILL WILL BE PLACED IN 12" MAXIMUM LOOSE LIFTS. MAXIMUM PARTICLE SIZE OF 6" COMPACTED TO 95% PER STANDARD PROCTOR (ASTM D-698) WITH A VIBRATING SHEEPSFOOT ROLLER AND ON A LEVEL SURFACE SEE TOE BENCH DETAIL.

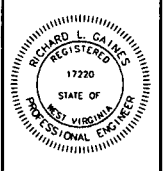
### EXISTING WEU 49 ACCESS ROAD



**LEGEND**  
 - - - EXISTING GRADE  
 — PROPOSED GRADE



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 (301) 482-6824

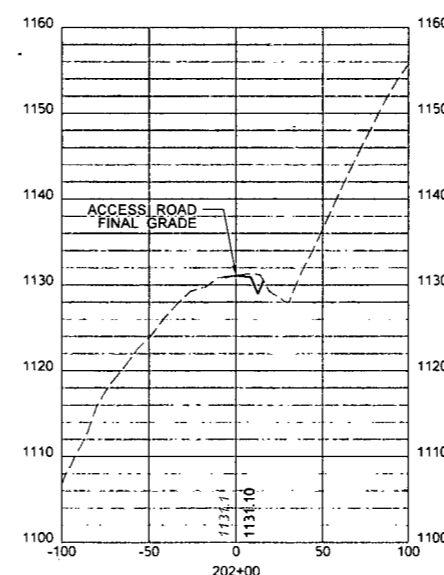
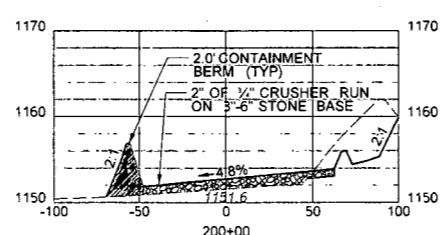
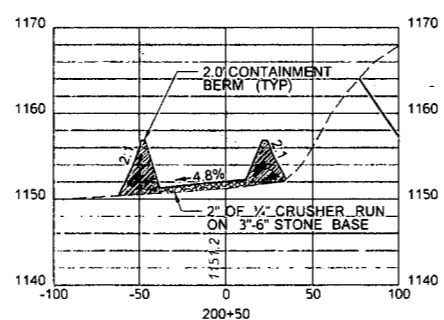
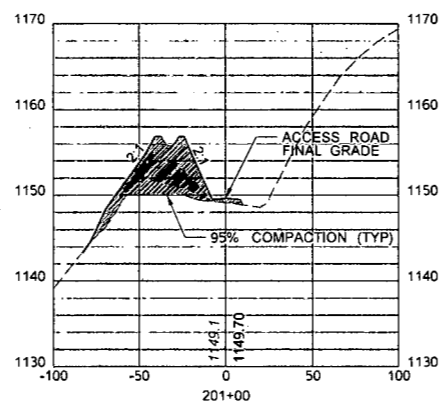
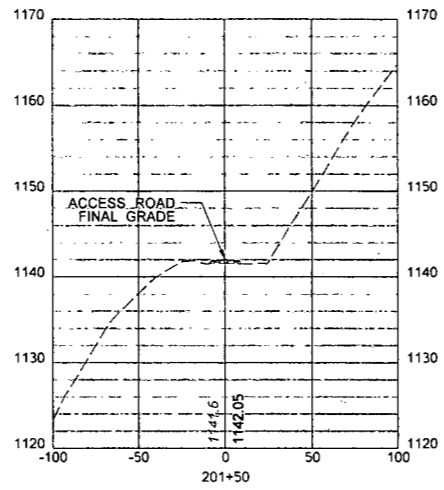


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ACCESS ROAD CROSS SECTIONS  
**EQT WEU 2**  
 WEST UNION DISTRICT  
 DODDRIDGE COUNTY, WV

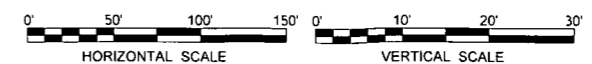
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 FILE NO.: SLS-6265  
 SHEET 30 OF 46  
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EXISTING PRIVATE ACCESS ROAD

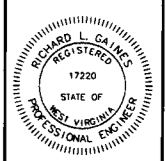
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LEGEND  
 --- EXISTING GRADE  
 — PROPOSED GRADE



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ACCESS ROAD CROSS SECTIONS  
 EQT WEU 2  
 WEST UNION DISTRICT  
 DODDRIDGE COUNTY, WV

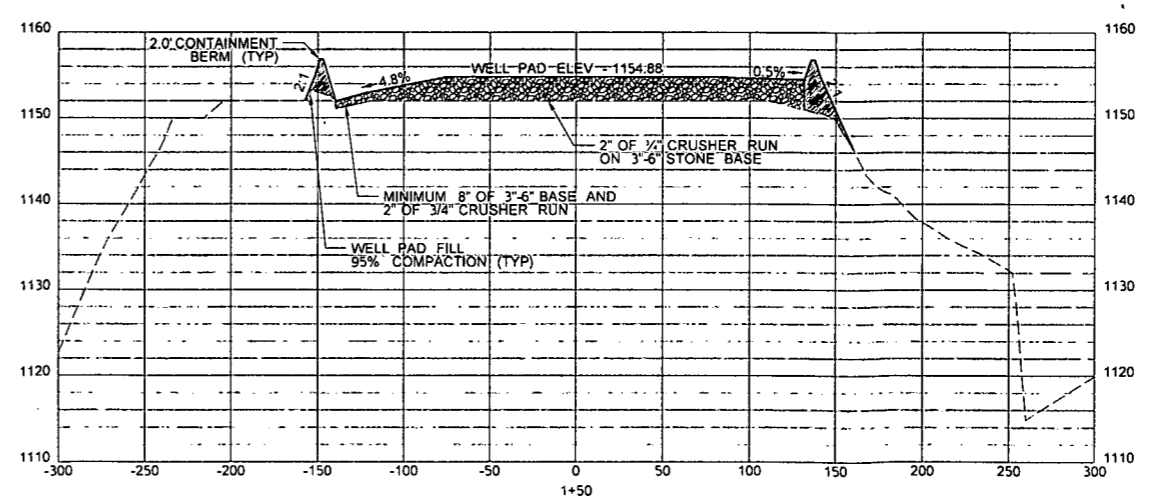
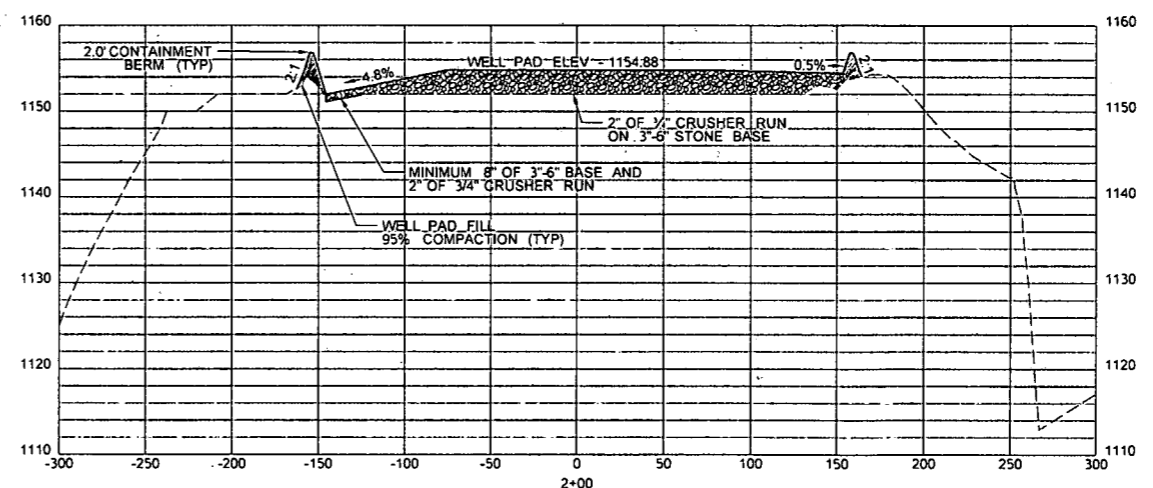
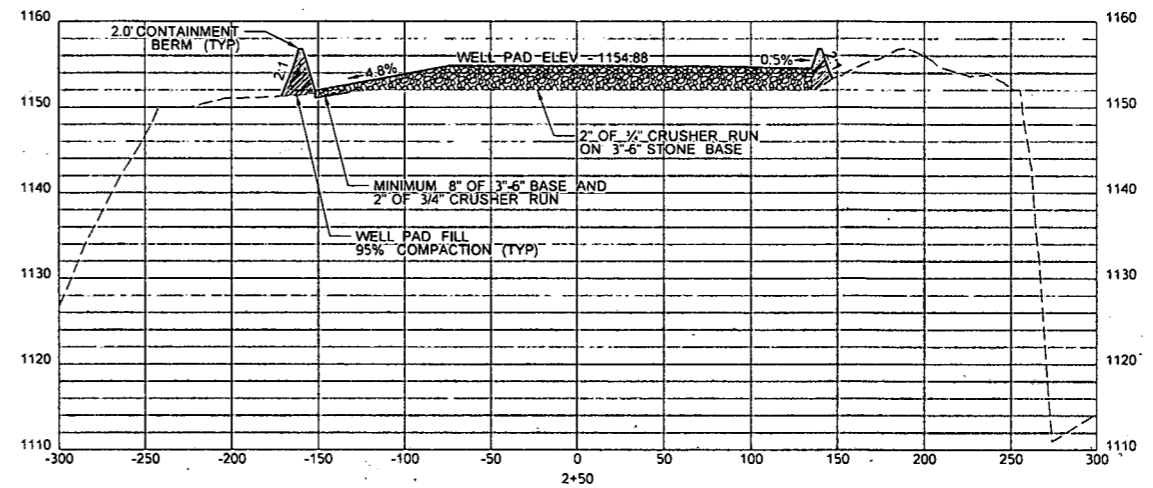
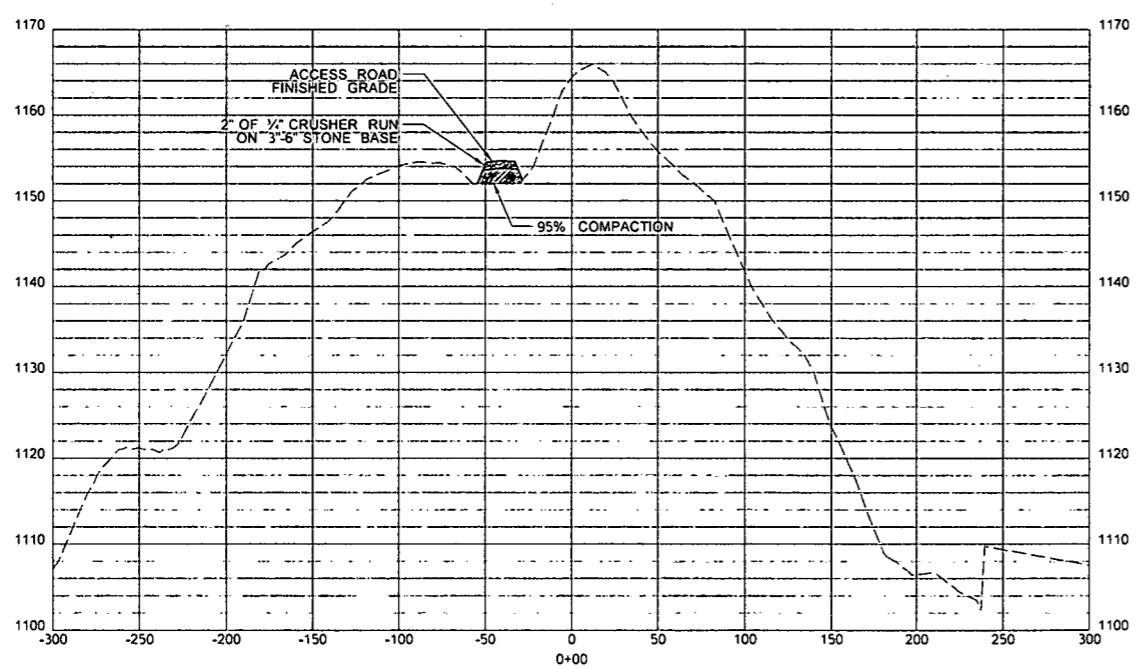
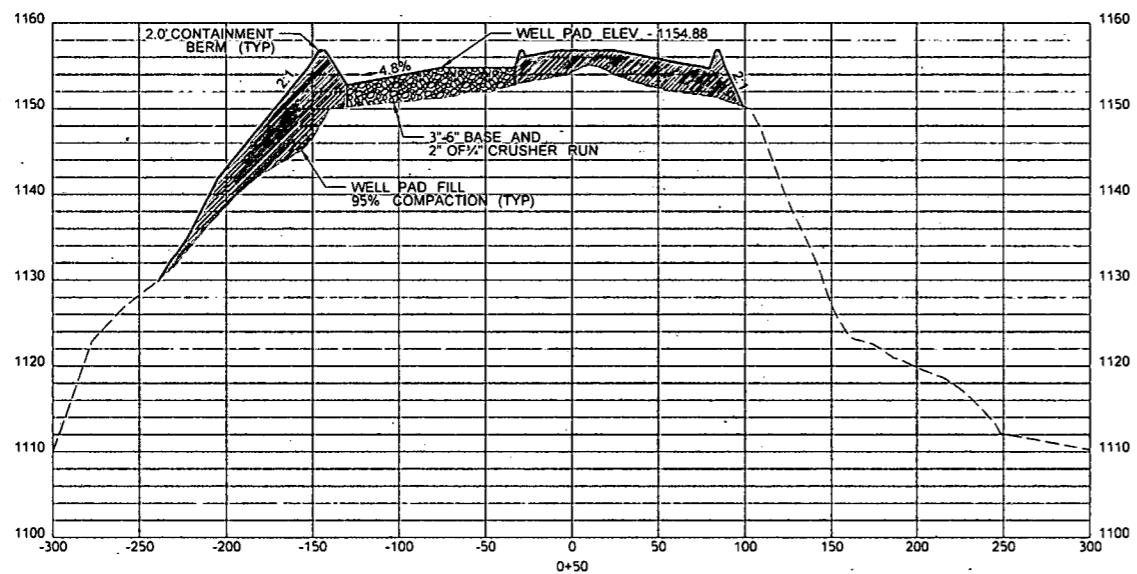
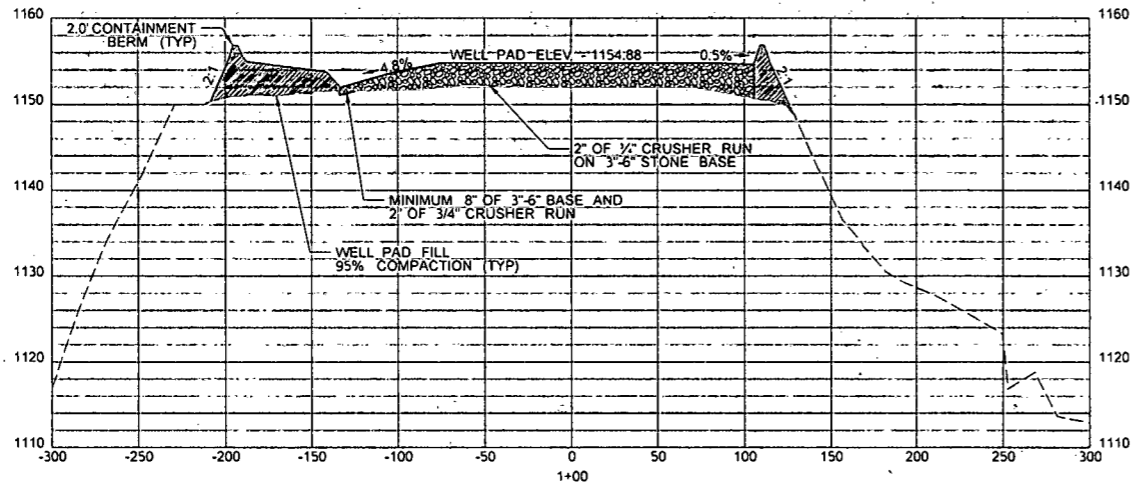
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 SHEET 32 OF 46  
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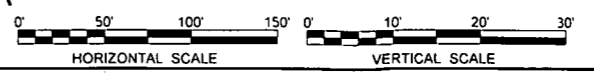
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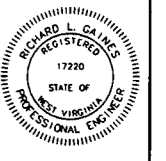
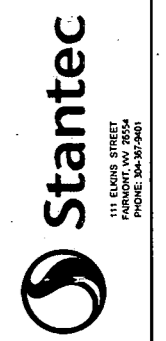


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WELL PAD CROSS SECTIONS ALONG SECTION LINE A-A



LEGEND  
 --- EXISTING GRADE  
 — PROPOSED GRADE

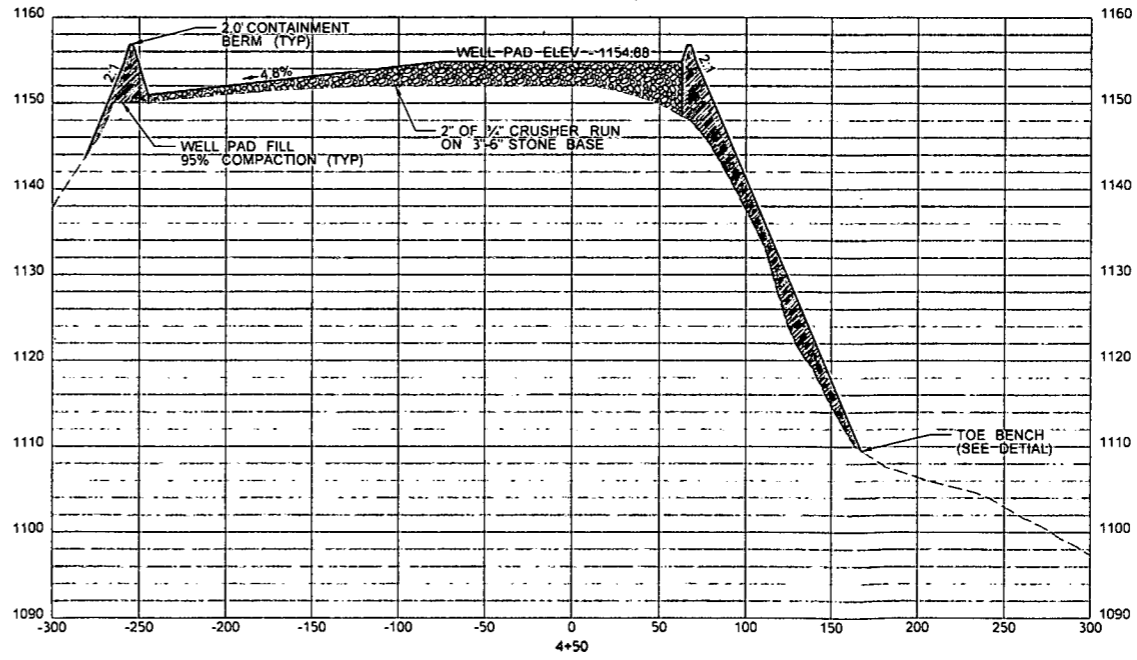
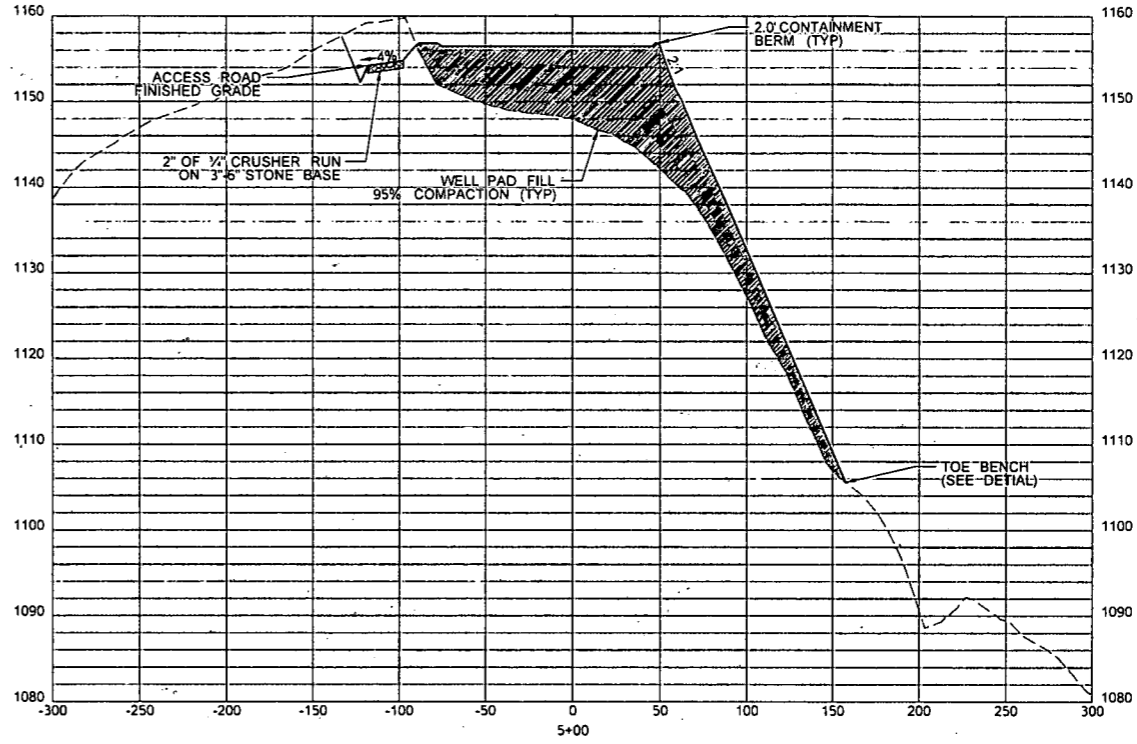
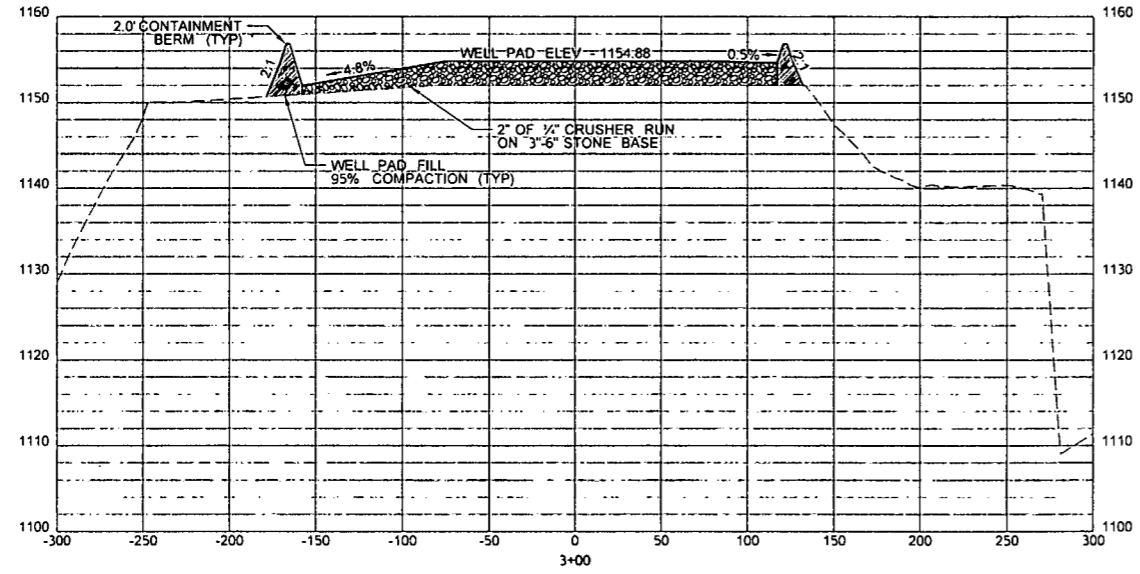
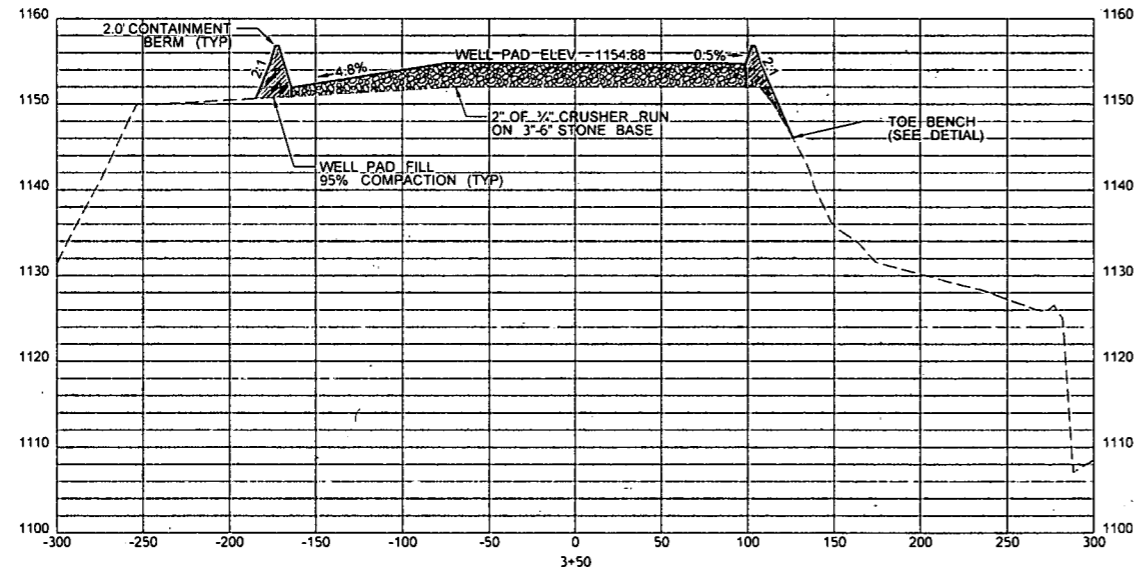
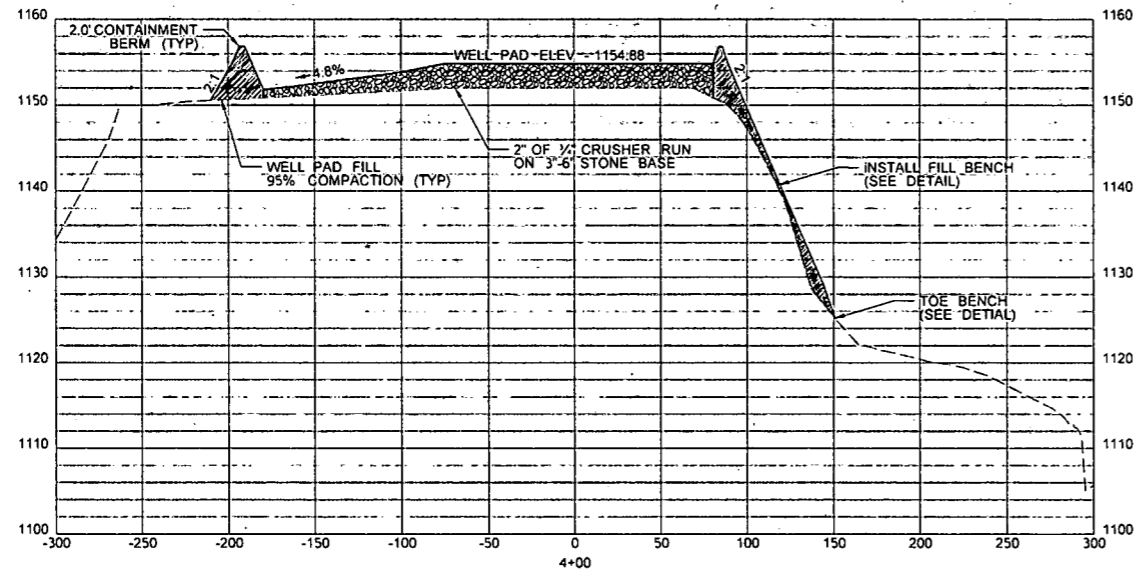


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WELL PAD CROSS SECTIONS ALONG SECTION LINE A-A  
 EQT WEU 2  
 WEST UNION DISTRICT  
 DODDRIIDGE COUNTY, WV

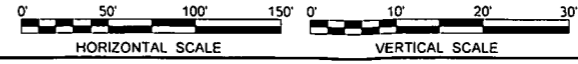
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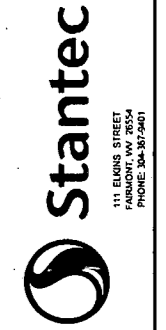


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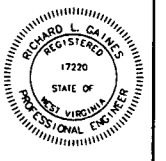
WELL PAD CROSS SECTIONS ALONG SECTION LINE A-A



**LEGEND**  
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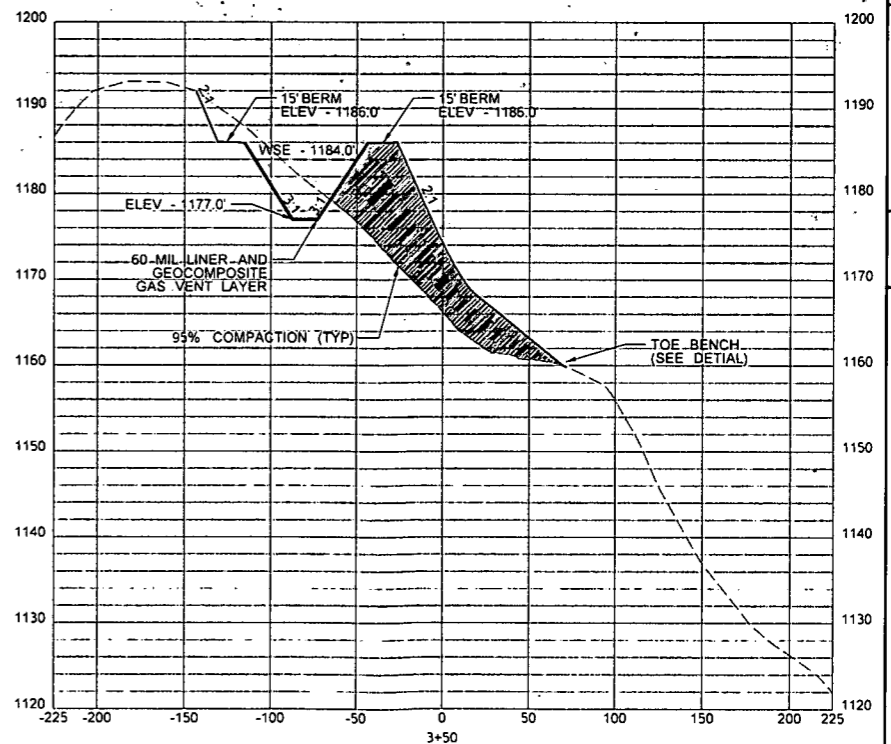
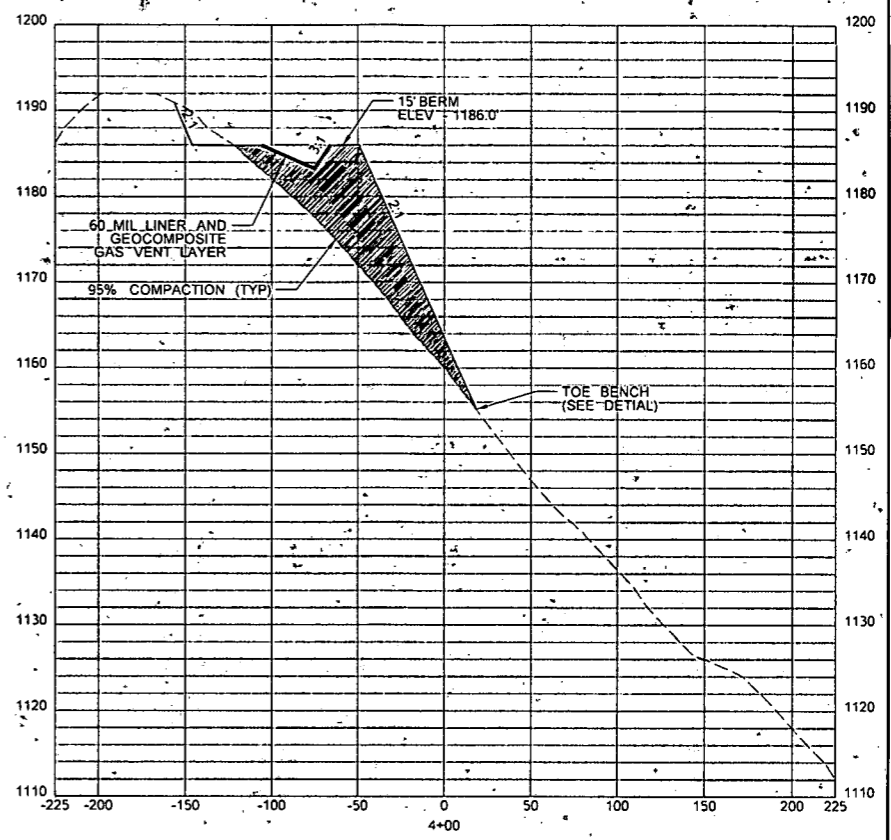
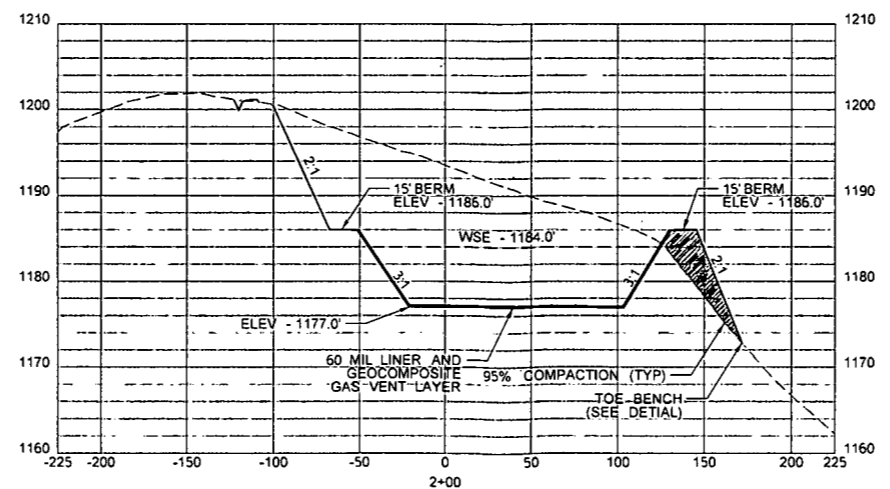
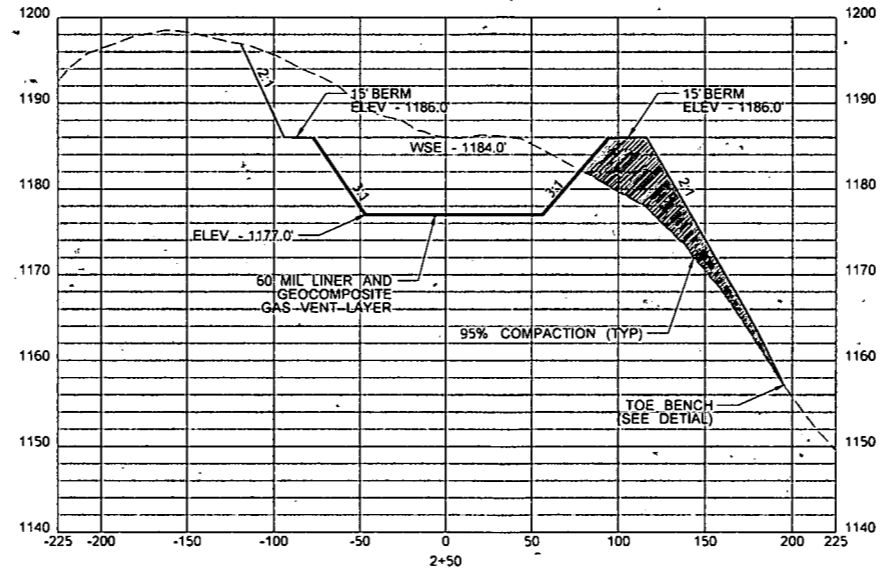
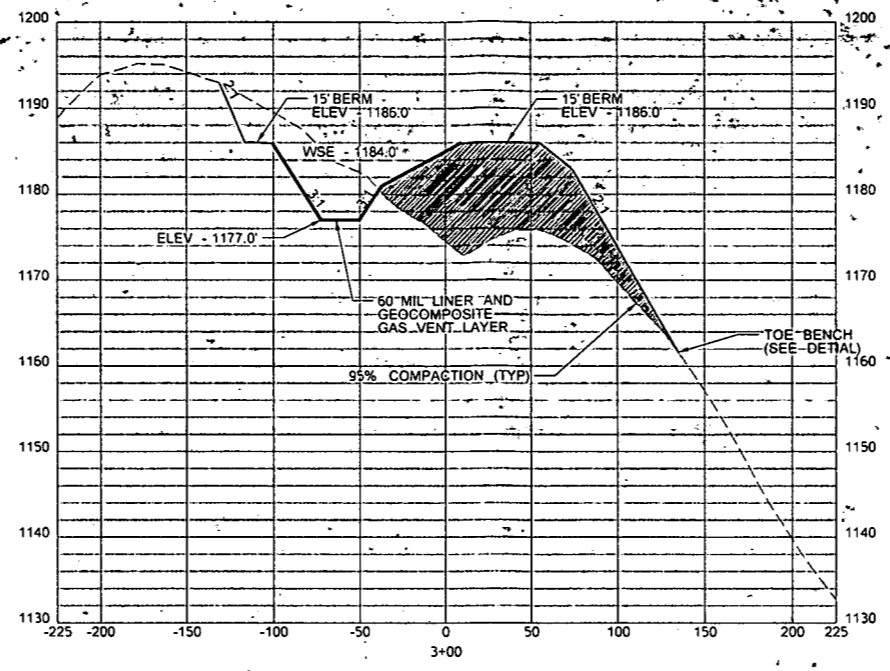
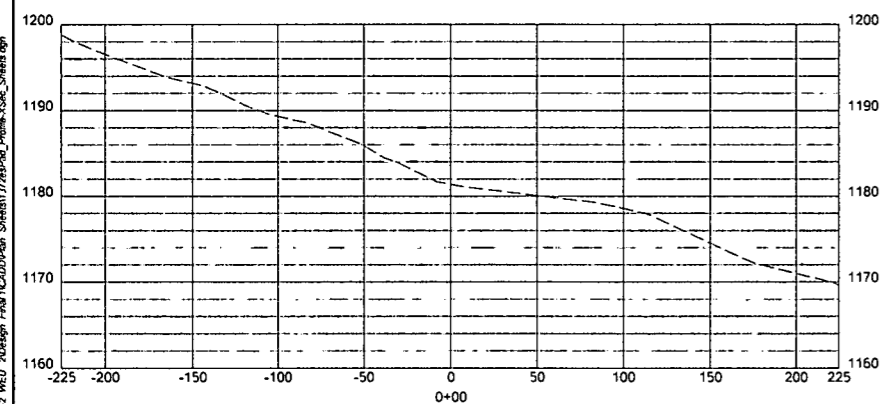
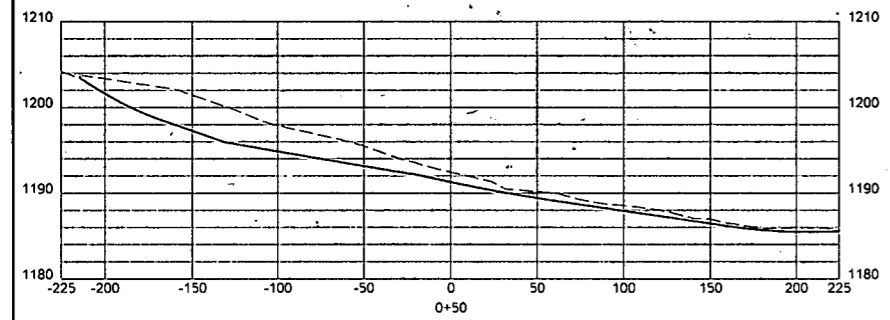
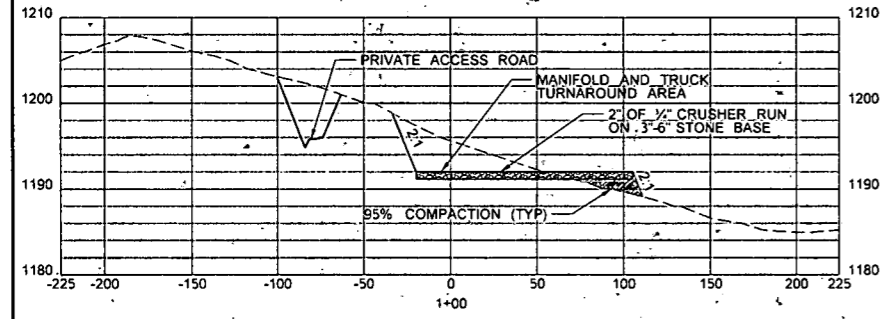
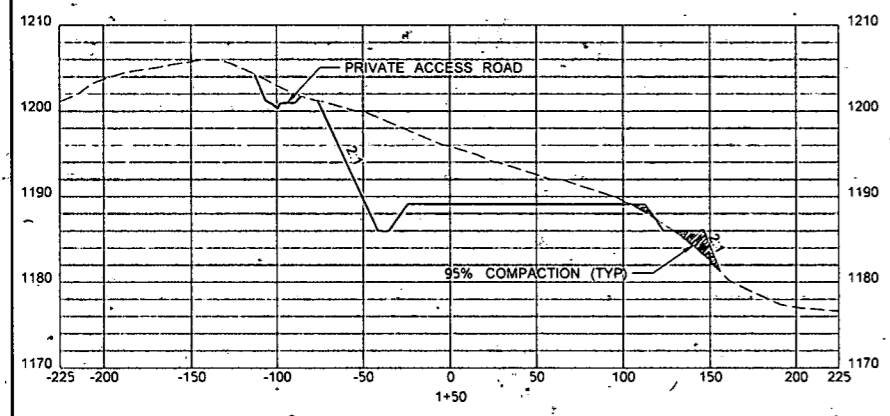
WELL PAD CROSS SECTIONS ALONG SECTION LINE A-A  
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 WEST UNION DISTRICT  
 DODDRIDGE COUNTY, WV

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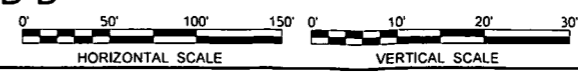


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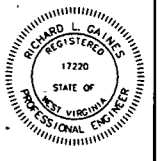
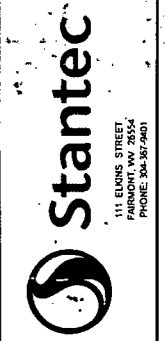
FLOWBACK PIT CROSS SECTIONS ALONG SECTION LINE B-B



LEGEND

--- EXISTING GRADE

— PROPOSED GRADE



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FLOWBACK PIT CROSS SECTIONS ALONG SECTION LINE B-B  
 EQT WEU 2  
 WEST UNION DISTRICT  
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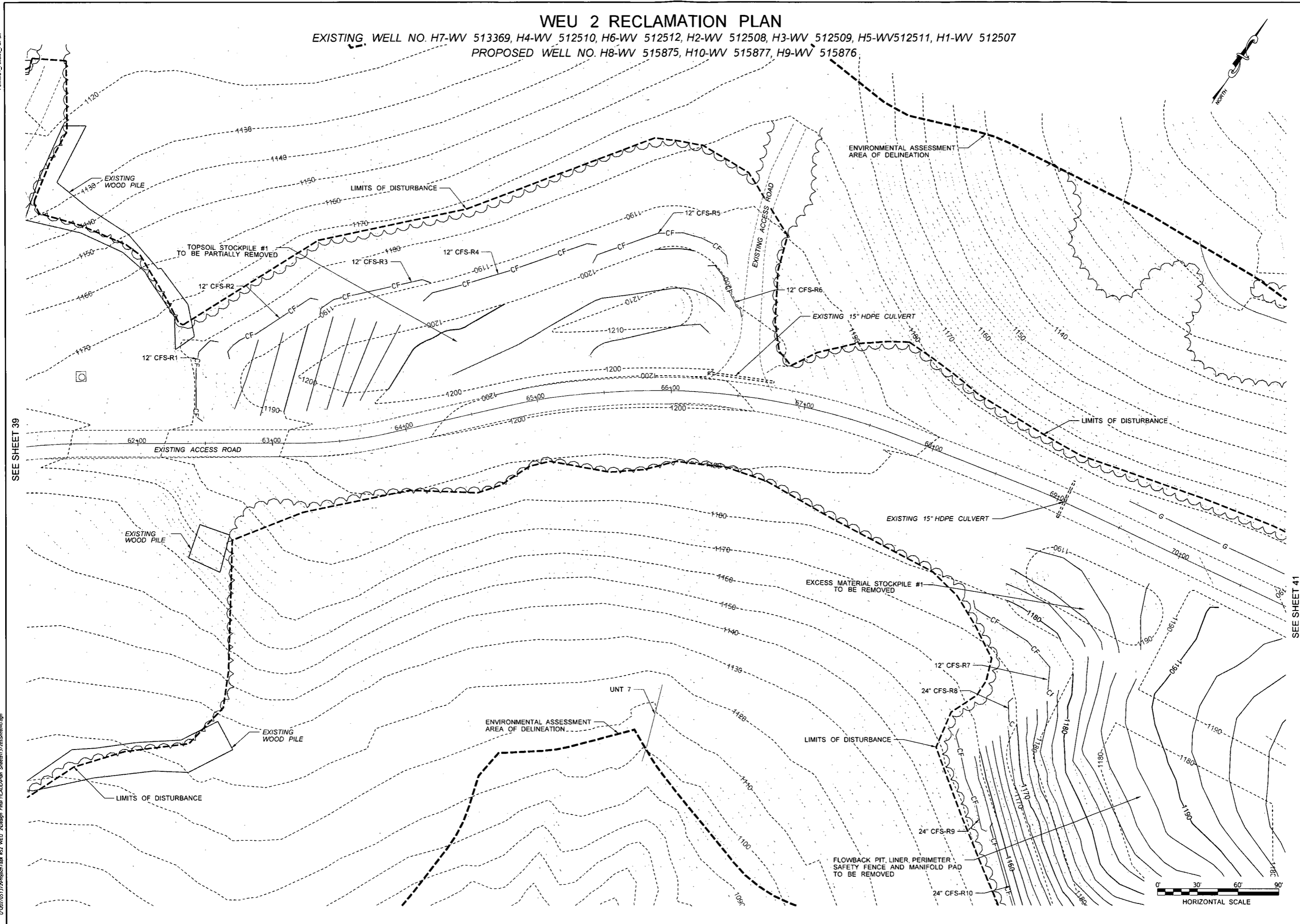




# WEU 2 RECLAMATION PLAN

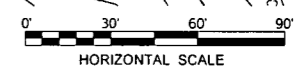
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 DODDRIEGE COUNTY, VA 22026  
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RICHARD L. GAINES  
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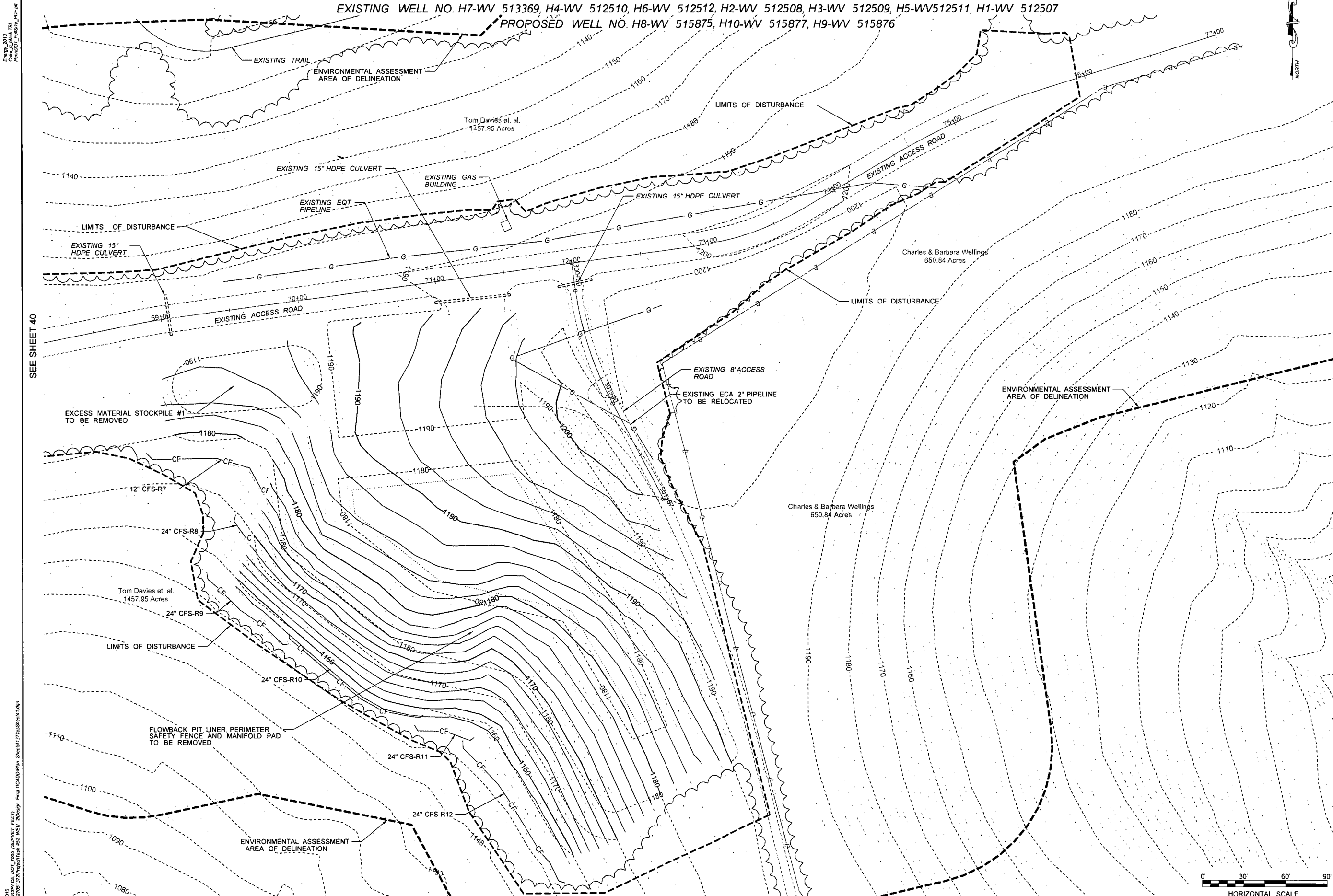
FLOWBACK PIT AND ACCESS  
 ROAD  
 RECLAMATION PLAN  
**EQT WEU 2**  
 WEST UNION DISTRICT  
 DODDRIEGE COUNTY, WV

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# WEU 2 RECLAMATION PLAN

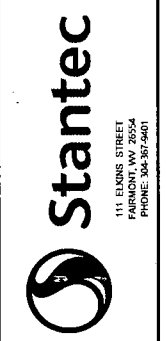
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 PROPOSED WELL NO. H8-WV 515875, H10-WV 515877, H9-WV 515876



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FLOWBACK PIT AND ACCESS  
 RECLAMATION PLAN  
**EQT WEU 2**  
 WEST UNION DISTRICT  
 DODDRIDGE COUNTY, WV

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**Table 2**  
Acceptable Fertilization Recommendation

Species	N (lbs/acre)	P2O5 (lbs/acre)	Example Rec. (per acre)
Cool Season Grass	40	80	400 lbs. 10-20-20
CS Grass & Legume	30	60	300 lbs. 10-20-20
Temporary Cover	40	40	200 lbs. 10-19-19

**Table 3**  
Temporary Cover

Species	Seeding Rate (lbs/acre)	Optimum Seeding Dates	Drainage	pH Range
Annual Ryegrass	40	3/1 - 6/15 or 8/15 - 9/15	Well - Poorly	5.5 - 7.5
Field Bromegrass	40	3/1 - 6/15 or 8/15 - 9/15	Well - Mod. Well	6.0 - 7.0
Spring Oats	80	3/1 - 6/15	Well - Poorly	5.5 - 7.0
Sudangrass	40	6/15 - 8/15	Well - Poorly	5.5 - 7.5
Winter Rye	168	8/15 - 10/15	Well - Poorly	5.5 - 7.5
Winter Wheat	180	8/15 - 11/15	Well - Mod. Well	5.5 - 7.0
Japanese Millet	30	6/15 - 8/15	Well	4.5 - 7.5
Redtop	5	3/1 - 6/15	Well	4.0 - 7.5
Annual Ryegrass	20	3/1 - 6/15	Well - Poorly	5.5 - 7.5
Spring Oats	64	3/1 - 6/15	Well - Poorly	5.5 - 7.5

NOTE: These rates should be increased 50% if planted April 16 - August 1 and October 1 - March 1.

**Table IV-5**  
Lime and Fertilizer Table

pH of Soil	Lime in Tons per Acre	Fertilizer, Lbs. per Acre (10-20-20 or Equivalent)
Above 6.0	2	500
5.0 to 6.0	3	600
Below 5.0	4	600

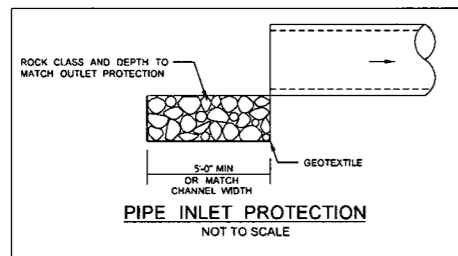
**Table IV-6**  
Mulch Materials Rates and Used

Material	Minimum Rates per acre	Coverage	Remarks
Hay or straw	2 to 3 Tons	Cover 70% to 80% of Surface	Subject to wind blowing or washing unless tied down
Wood Fiber	1000 to 1500 lbs	Cover all	For hydroseeding
Pulp Fiber		Disturbed Areas	
Wood - Cellulose Recirculated Paper			

Tables IV 1-4 taken from Natural Resources Conservation Service Manual 'Critical Area Planting'

**Table IV-1**  
Recommended Seeding Dates

Planting Dates	Suitability
March 1 - April 15 and August 1 - October 1	Best Seeding Periods
April 15 - August 1	HIGH RISK - moisture stress likely
October 1 - December 1	HIGH RISK - freeze damage to young seedlings
December 1 - March 1	Good seeding period. Dormant seeding



**CORRUGATED PLASTIC PIPE DESIGN TABLE**

PIPE LOCATION (STA)	PIPE DIAMETER (IN)	PIPE LENGTH (FT)	OUTLET PROTECTION			
			MIN D50 (IN)	ROCK DEPTH (IN)	LENGTH (FT)	WIDTH (FT)
ACCESS ROAD 66+25	15	50	6	14	10	9.5
ACCESS ROAD 69+05	15	30	6	14	10	9.5
ACCESS ROAD 71+53	15	55	6	14	10	9.5
ACCESS ROAD 72+13	15	25	6	14	10	9.5

**Table 4a**  
Permanent Seeding Mixture

Species/Mixtures	Seeding Rate (lbs/acre)	Drainage	pH Range
Crownvetch/ Tall Fescue	10 - 15	Well - Mod. Well	5.0 - 7.5
Crownvetch/ Perennial Ryegrass	20	Well - Mod. Well	5.0 - 7.5
Ladino Clover/ Sericea Lespedeza/ Tall Fescue	30	Well - Mod. Well	4.5 - 7.5
Ladino Clover/ Redtop	2	Well - Mod. Well	5.0 - 7.5
Crownvetch/ Tall Fescue/ Redtop	10	Well - Mod. Well	5.0 - 7.5
Tall Fescue/ Redtop	3	Well - Mod. Well	5.0 - 7.5
Tall Fescue/ Birdfoot Trefol/ Redtop	40	Well - Mod. Well	5.0 - 7.5
Sericea Lespedeza/ Tall Fescue/ Redtop	25	Well - Mod. Well	4.5 - 7.5
Redtop/ Tall Fescue/ Creeping Red	30	Well - Mod. Well	6.0 - 7.6
Tall Fescue/ Creeping Red	50	Well - Poorly	4.5 - 7.5

\* 'Lathco' Flatpea is potentially poisonous to some livestock. All legumes should be planted with proper inoculants prior to seeding. For unprepared seedbeds or seeding outside the optimum timeframe, add 50% more seed to the specified rate.

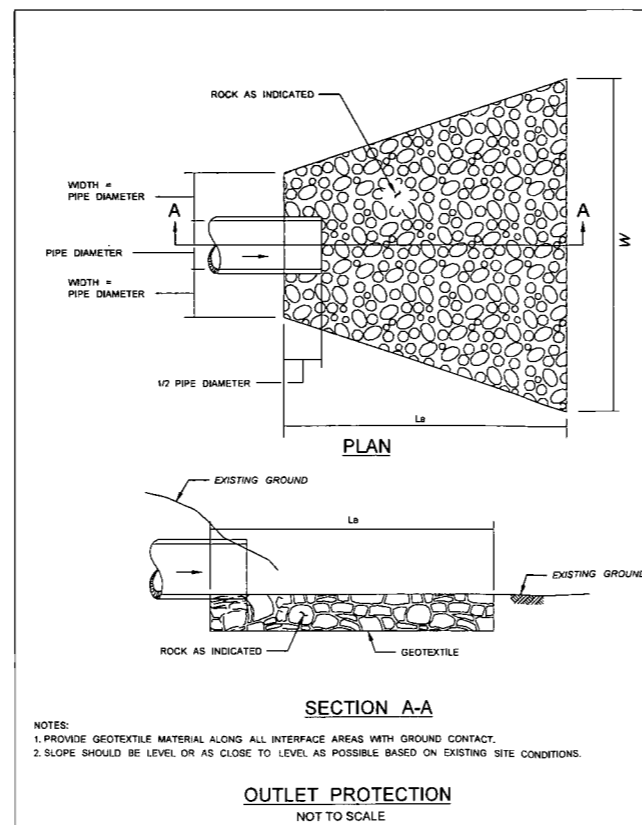
Mixtures listed in bold are suitable for use in shaded woodland settings; those in italics are suitable for use in filter strips.

**Table 4b**  
Wildlife and Farm Friendly Seed Mixtures

Species/Mixtures	Seeding Rate (lbs/acre)	Drainage	pH Range
KY Bluegrass/ Redtop	20	Well - Mod. Well	5.5 - 7.5
Ladino or Birdfoot Trefol/ Timothy	2/10	Well - Mod. Well	5.5 - 8.0
Alfalfa	12	Well - Mod. Well	6.5 - 8.0
Timothy/ Birdfoot Trefol	5	Well - Poorly	5.5 - 7.5
Orchardgrass/ Ladino Clover/ Redtop	10	Well - Mod. Well	5.5 - 7.5
Orchardgrass/ Ladino Clover	2	Well - Mod. Well	5.5 - 7.5
Orchardgrass/ Perennial Ryegrass	10	Well - Mod. Well	6.5 - 7.6
Creeping Red Fescue/ Perennial Ryegrass	30	Well - Mod. Well	5.5 - 7.5
Orchardgrass or KY Bluegrass	10	Well - Mod. Well	6.0 - 7.5
Birdfoot Trefol/ Redtop/ Orchardgrass	10	Well - Mod. Well	5.5 - 7.5
Lathco Flatpea/ Perennial Ryegrass	30	Well - Mod. Well	6.5 - 7.6
Lathco Flatpea/ Orchardgrass	30	Well - Mod. Well	6.5 - 7.6

\* 'Lathco' Flatpea is potentially poisonous to some livestock. All legumes should be planted with proper inoculants prior to seeding. For unprepared seedbeds or seeding outside the optimum timeframe, add 50% more seed to the specified rate.

Mixtures listed in bold are suitable for use in shaded woodland settings; those in italics are suitable for use in filter strips.



**REVEGETATION**

Taken from the  
West Virginia Erosion and Sediment Control Field Manual  
West Virginia Division of Environmental Protection Office of Oil and Gas  
Charleston, W.Va.  
Section IV

**Temporary Seeding**

**A. General Conditions Where Practice Applies**

Where exposed soil surfaces are not to be fine-graded or worked for periods longer than 21 days. Temporary vegetative cover with sediment controls must be established where runoff will go directly into a stream. Immediately upon construction of the site (site includes road and location), vegetation must be established on road bank and location slopes. A permanent vegetative cover shall be applied to areas that will be left un-worked for a period of more than six months.

**B. Seed Mixtures and Planting Dates**

Refer to Tables 2 through 4 for recommended dates to establish vegetative cover and the approved lists of temporary and permanent plant species, and planting rates. Table 3 gives recommended types of temporary vegetation, rates of application, and optimum seeding dates. In situations where another cover is desired, contact the local soil conservation district for seeding recommendations.

**C. Seed Application**

Apply seed by broadcasting, drilling, or by hydroseed according to the rates indicates in Table IV-3. Perform a11 planting operations at right angles to the slope. Necessary site preparation and roughening of the soil surface should be done just prior to seeding. Seedbed preparation may not be required on newly disturbed areas.

**Permanent Seeding**

**A. General**

Permanent vegetative cover will be established where no further soil disturbance is anticipated or needed. Soil fertility and pH level should be tested and adjusted according to seed species planted. Planting of permanent vegetative covers must be performed on a11 disturbed areas after completion of the drilling process. Any site that contains significant amounts of topsoil shall have the topsoil removed and stockpiled when feasible. Topsoil should not be added to slopes steeper than 2:1 unless a good bonding to the sub-layer can be achieved. After proper grading and seedbed preparation, the vegetation will reestablish ground cover for the control of surface water runoff erosion. All required seedbed preparation and loosening of soil by disking or dozer tracking should be performed just prior to seeding. If seedbed preparation is not feasible, 50% more seed shall be added to the recommended rates shown in Tables IV-3 and IV-4. When hydroseeding, seedbed preparation may not be necessary if adequate site preparation was performed. Incorporate the appropriate amount of lime and/or fertilizer in the slurry mix when hydroseeding.

When hydroseeding, first mix the lime, fertilizer, and hydro-mulch in the recommended amount of water. Mix the seed and inoculants together within one hour prior to planting, and add to the slurry just before seeding. Apply the slurry uniformly over the prepared site. Assume that agitation is continuous throughout the seeding operation and the mix is applied within one hour of initial mixing.

**B. Lime and Fertilizer**

- Lime shall be applied to a11 permanent seedings. The pH of the soil is to be determined and lime applied accordingly. Once the pH is known, select the amount of lime to be applied from Table IV-5.
- Fertilizer shall be applied in all permanent seedings. Apply the equivalent for 500 lbs. minimum 10-20-20 fertilizer per acre or use the amount of fertilizer and lime recommended by a certified soil test.
- Application: For best results and maximum benefits, the lime and fertilizer are to be applied at the time of seedbed preparation.

**C. Permanent Seed Mixtures**

Planners should take into consideration the species makeup of the existing pasture and the landowner's future pasture management plans when recommending seed mixtures. Selection: From Tables IV 4a and b, Permanent Seeding Mixtures Suitable for Establishment in West Virginia.

**Notes:**

- All legumes must be planted with the proper inoculants prior to seeding.
- 'Lathco' Flatpea is potentially poisonous to some livestock.
- Only endophyte free varieties of Tall Fescue should be used. Tall Fescue and Crownvetch are also very invasive species, non-native to WV.
- For unprepared seedbeds or seeding outside the optimum timeframes, add 50% more seed to the specified rate. Mixtures in Table 4b are more wildlife and farm friendly; those listed in bold are suitable for use in shaded woodland settings. Mixtures in italic are suitable for use in filter strips.

**D. Seeding for Wildlife Habitat**

Consider the use of the native plants or locally adapted plants when selecting cover types and species for wildlife habitat. Wildlife friendly species or mixes that have multiple values should be considered. See wildlife friendly species/mixtures in Table IV-4b. Consider selecting no or low maintenance long-lived plants adaptable to sites which may be difficult to maintain with equipment.

**Mulching**

**A. General Organic Mulches**

The application of straw, hay or other suitable materials to the soil surface to prevent erosion. Straw made from wheat or oats is the preferred mulch, the use of hay is permissible, but not encouraged due to the risk of spreading invasive species. Mulch must be applied to all temporary and permanent seeding on all disturbed areas. Depending on site conditions, in critical areas such as waterways or steep slopes, additional or substitute soil protective measures may be used if deemed necessary. Examples include jute mesh and soil stabilization blankets or erosion control matting.

Areas that have been temporarily or permanently seeded should be mulched immediately following seeding. Mulches conserve desirable soil properties, reduce soil moisture loss, prevent crusting and sealing of the soil surface and provide a suitable microclimate for seed germination.

Areas that cannot be seeded because of the season should be mulched to provide some protection to the soil surface. An organic mulch, straw or hay should be used and the area then seeded as soon as weather or seasonal conditions permit. Do not use fiber mulch (cellulose-hydroseed) alone for this practice; at normal application rates it will not give the soil protection of other types of mulch.

Wood cellulose fiber mulch is used in hydroseeding operations and applied as part of the slurry. It creates the best seed-soil contact when applied over the top of (as a separate operation) newly seeded areas. Fiber mulch does not alone provide sufficient protection on highly erodible soils, or during less than favorable growing conditions. Fiber mulch should not be used alone during the dry summer months or when used for late fall mulch cover. Use straw mulch during these periods and fiber mulch may be used to tack (anchor) the straw mulch. Fiber mulch is well suited for steep slopes, critical areas and areas susceptible to wind.

**B. Chemical Mulches, Soil Binders and Tackifiers**

A wide range of synthetic spray on materials are marketed to stabilize and protect the soil surface. These are mixed with water and sprayed over the mulch and to the soil. They may be used alone in some cases as temporary stabilizers, or in conjunction with fiber mulch, straw or hay. When used alone most chemical mulches do not have the capability to insulate the soil or retain soil moisture that organic mulches have.

**C. Specifications**

From Table IV-6 select the type of mulch and rate of application that will best suit the conditions at the site.

**D. Anchoring**

Depending on the field situation, mulch may not stay in place because of wind action or rapid water runoff. In such cases, mulch is to be anchored mechanically or with mulch netting.

**1. Mechanical Anchoring**

Apply mulch and pull mulch anchoring tool over the mulch. When a disk is used set the disk straight and pull across slope. Mulch material should be tuck into the soil about three inches.

**2. Mulch netting**

Follow manufacturer's recommendation when positioning and stapling the mulch netting in the soil.



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**EQT WEU 2 MATERIAL QUANTITIES**

**WELL PAD**

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	ITEM TOTAL
<b>1.0 CLEARING AND GRUBBING</b>				
1.a. TREE CLEARING	0.1	AC	\$	\$
1.b. MOWING	3.2	AC	\$	\$
<b>2.0 COMPOST FILTER SOCK</b>				
2.a. 12" COMPOST FILTER SOCK	274	LF	\$	\$
2.b. 18" COMPOST FILTER SOCK	245	LF	\$	\$
2.c. 24" COMPOST FILTER SOCK	409	LF	\$	\$
<b>3.0 AGGREGATE SURFACING</b>				
3.a. 3"-6" STONE BASE (VARIABLE DEPTH)	6,684	TONS	\$	\$
3.b. 2" of 3/4" CRUSHER RUN	1,386	TONS	\$	\$
3.c. GEOTEXTILE	13,490	SY	\$	\$
<b>4.0 COCONUT SLOPE MATTING</b>				
	5,460	SY	\$	\$
<b>5.0 SEED &amp; MULCH</b>				
5.a. SEEDING (INCLUDES AREA OF SLOPE MATTING)	1.1	AC	\$	\$
5.b. MULCH (EXCLUDES AREA OF SLOPE MATTING)	0.0	AC	\$	\$
<b>6.0 EXCAVATION</b>				
6.a. WELL PAD (CUT W/ NO SWELL)	4,692	CY	\$	\$
6.b. BORROW (FROM WEU 49 STOCKPILE)	11,008	CY		
6.c. TOPSOIL (ESTIMATED 6")	0	CY	\$	\$
<b>7.0 KEYWAY EXCAVATION (TOE LENGTH X 12' WIDTH X 4' DEPTH)</b>				
	3,171	CY	\$	\$
<b>8.0 WELL PAD SUMP DRAIN</b>				
8.a. 4" CORRUGATED OUTLET PIPE	66	LF	\$	\$
8.b. d50 = 6" MIN (RIPRAP APRONS)	19	TONS	\$	\$
8.c. GEOTEXTILE (RIPRAP APRONS)	22	SY	\$	\$

**EQT WEU 2 MATERIAL QUANTITIES**

**ACCESS ROADS AND FLOWBACK PIT**

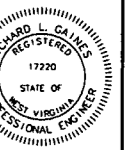
ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	ITEM TOTAL
<b>1.0 CLEARING AND GRUBBING</b>				
1.a. TREE CLEARING	3.9	AC	\$	\$
1.b. MOWING	1.8	AC	\$	\$
<b>2.0 COMPOST FILTER SOCK</b>				
2.a. 12" COMPOST FILTER SOCK	1,455	LF	\$	\$
2.b. 18" COMPOST FILTER SOCK	617	LF	\$	\$
2.c. 24" COMPOST FILTER SOCK	844	LF	\$	\$
<b>3.0 AGGREGATE SURFACING</b>				
3.a. 8" of 3"-6" STONE BASE	1,481	TONS	\$	\$
3.b. 2" of 3/4" CRUSHER RUN	391	TONS	\$	\$
3.c. GEOTEXTILE	3,809	SY	\$	\$
<b>4.0 COCONUT SLOPE MATTING</b>				
	6,768	SY	\$	\$
<b>5.0 SEED &amp; MULCH</b>				
5.a. SEEDING (INCLUDES AREA OF SLOPE MATTING)	2.4	AC	\$	\$
5.b. MULCH (EXCLUDES AREA OF SLOPE MATTING)	1.0	AC	\$	\$
<b>6.0 CULVERT</b>				
6.a. 15" HDPE	160.0	LF		
<b>7.0 EXCAVATION</b>				
7.a. ACCESS ROADS AND FLOWBACK PIT (CUT W/ NO SWELL) - INCLUDES EXC. FOR AGGREGATE	13,465	CY	\$	\$
7.b. TOPSOIL (ESTIMATED 6")	5,432	CY	\$	\$
<b>8.0 RIP RAP APRONS</b>				
8.a. d50 = 6" MIN	13	TON		
8.b. GEOTEXTILE	16	SY		
<b>9.0 KEYWAY EXCAVATION (TOE LENGTH X 12' WIDTH X 4' DEPTH)</b>				
	1,113	CY	\$	\$
<b>10.0 FLOWBACK PIT LINER SYSTEM</b>				
10.a. PRIMARY LINER (60 ML)	3,468	SY	\$	\$
10.b. GEOCOMPOSITE GAS VENT LAYER	3,468	SY	\$	\$
<b>11.0 MISCELLANEOUS</b>				
11.a. PERIMETER SAFETY FENCE	879	LF	\$	\$
11.b. ACCESS GATE W/ EMERGENCY LIFE LINE	1	EACH	\$	\$

**Stantec**



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THIS DOCUMENT WAS PREPARED BY STANTEC FOR EOT PRODUCTION COMPANY

CONSTRUCTION QUANTITIES  
**EQT WEU 2**  
WEST UNION DISTRICT  
DODDRIDGE COUNTY, WV

DATE: 3-6-2015  
SCALE: AS SHOWN  
DESIGNED BY: CSH  
FILE NO.: SLS-8265  
SHEET 46 OF 46  
REV: