



# IMPERIAL IRRIGATION DISTRICT

OPERATING HEADQUARTERS • P.O. BOX 937 • IMPERIAL, CALIFORNIA 92251

June 30, 2010

Mr. Doug Wylie  
California Regional Water Quality Control Board  
Colorado River Basin Region 7  
73-720 Fred Waring Drive, Suite 100  
Palm Desert, CA 92260

**RECEIVED**

JUL - 1 2010

**REGION 7**

Subject: Cease and Desist Order No. R7-2009-0049 – Preliminary Design Submittal

Dear Mr. Wylie,

Imperial Irrigation District (IID) is submitting this preliminary design information (attached) for deep injection well(s) as required in the provisions of Cease and Desist Order No. R7-2009-0049.

As stated in the last quarterly report, IID evaluated the long term cost of the deep injection well and wastewater treatment options. The evaluation identified the deep well option as the most cost effective solution. The injection well option would install US EPA Class I well(s) to inject plant wastewater into deep, isolated rock formations that are thousands of feet below the lower most underground source of drinking water (USDW). Station wastewater will be pumped into wells which are 2,740 to 3,660 feet deep. The design of the well is similar to those used by geothermal power plants in the Imperial Valley for re-injection of brine or disposal of wastewater similar to that at the El Centro Generating Station (ECGS). The deep injection well alternative will require minimal water treatment prior to injection and will produce virtually no significant solid waste as compared to the Wastewater Treatment Option.

The Environmental Protection Agency issued the ECGS injection well draft permit for public comment last month. The public comment period closed on June 29, 2010.

At this time IID does not believe the selection of Injection Wells as the disposal solution will result in any change in schedule as outlined in the Cease and Desist order.

If you have any questions, feel free to contact me at (760) 339-0506.

Sincerely,

Michael Taylor  
General Supt., Generation Plant

*File: 7A 13 0128 003, IID ECGS*

**Energy Production**

**Attachments**

**Cc: E. Aghjayan  
H. Olstowski  
M. Bogart  
W. Lane**

**IMPERIAL IRRIGATION DISTRICT  
EL CENTRO GENERATING STATION  
PROJECT DESCRIPTION**

- 1 The ECGS is owned and operated by IID. The ECGS provides intermediate and base load electrical power serving the expanding electrical demands of the region. The ECGS is located at 485 East Villa Avenue in El Centro, California. The ECGS includes Unit 2, Unit 3 and Unit 4, high voltage switching station, raw water pump houses, water treatment facilities, fuel oil storage tanks and raw water storage ponds.
- 2 The Project will redirect process wastewater generated by the ECGS from the discharge leaving the Station to two deep injection wells located on Station property. The deep injection wells will be located within the 150-acre ECGS Site, reference Figure B5. Injection well number 1 will be located South of Demineralized Water Storage Tank and well number 2 will be located at the North-West side of ECGS property. Well number 3 will be a future injection well not part of this specification.
- 3 The ECGS generates process wastewater as a byproduct of power generation associated with the steam boiler units, combined cycle units, cooling towers and water treatment systems. Sanitary sewer streams from lavatories and laboratory are discharged to an existing on-site septic system, and do not contribute to the ECGS wastewater flows.
- 4 The ECGS currently discharges process wastewater, in compliance with a National Pollutant Discharge Elimination System (NPDES) permit (CA0104248), to IID Central Drain No. 5, which leads to the Alamo River and ultimately the Salton Sea. As required by the current NPDES permit, the ECGS is required to come into compliance with the California Toxics Rule (CTR). IID has determined that the most feasible method of addressing the CTR requirements is to eliminate the process wastewater discharge to Central Drain No. 5 and dispose of it through EPA Class I deep injection wells located on the ECGS property.
- 5 IID will be requesting a permit to install and operate three non-hazardous EPA Class I deep injection wells for disposal of process wastewater meeting the requirements of the Code of Federal Regulations (CFR, Title 40, Parts 124, 144 to 147) for the protection of underground water resources, set by the United States Environmental Protection Agency (USEPA), and administered by USEPA's California Underground Injection Control Program (UIC).
- 6 ECGS drain sources are to be routed to the wastewater injection storage tank under this specification as indicated in the attached drawings.
- 7 Storm water is contained within several designated collection areas at the ECGS. Collected storm water is inspected and sent off-site to Central Drain No. 5 through manually adjusted discharge slide gates associated with each collection area.
- 8 A detailed Project schedule sequencing activities as necessary will be developed to ensure the System is available per the requirements of the specification. The Project shall not interfere with the availability of the existing facilities. Interfaces with existing ECGS systems and equipment shall be coordinated with the IID.
- 9 Table 1 summarizes the average and peak flows of each discharge in gpm for a hot August day, along with the expected yearly discharge in acre-feet per year. The daily average flows are based upon unit design flows factored by expected unit operating hours and output (capacity factor), along with expected general drainage and storm water contribution. The

daily peak flows are based upon unit design flows for 24-hours (100% capacity factor) and worst case general drainage and storm water contribution. The yearly expected discharge is based upon capacity factored flows over 12 calendar months. The table represents conservative quantities for the purposes of sizing the System.

## T A B L E 1

### SUMMER DAILY AND YEARLY DISCHARGE SUMMARY

WASTEWATER STREAM	DAILY AVERAGE	DAILY PEAK	YEARLY EXPECTED
<b>COOLING TOWER BLOWDOWN</b>			
Unit 2	94	171	
Unit 3	120	223	
Unit 4	236	303	
<b>Total Cooling Tower Blowdown</b>	<b>450</b>	<b>697</b>	<b>545.3</b>
<b>WATER TREATMENT REJECTS</b>			
Reverse Osmosis Reject	34.5	55.5	
Mixed Bed Demineralizer Reject	0.5	1.0	
<b>Total Water Treatment Rejects</b>	<b>35.0</b>	<b>56.5</b>	<b>1.70</b>
<b>GENERAL DRAINAGE &amp; STORMWATER</b>			
General Process Drainage	5.0	50	
Storm Water Drainage Area D	0.5	50	
<b>Total General Drainage &amp; Storm Water</b>	<b>5.5</b>	<b>100</b>	<b>1.50</b>
<b>TOTAL DISCHARGE</b>	<b>~490 gpm</b>	<b>~850 gpm</b>	<b>~548.5</b>

- 10 Table 2 summarizes the peak wastewater peak flows of each discharge in gpm for the three different seasons. The table represents conservative quantities for the purposes of sizing the System.

## T A B L E 2

### SEASONAL DAILY PEAK DISCHARGE SUMMARY

WASTEWATER STREAM	PEAK FLOWS (gpm)		
	WINTER	SPRING/FALL	SUMMER
Unit 2 Cooling Tower Blowdown	136.7	159.3	171.4
Unit 3 Cooling Tower Blowdown	170.5	202.9	219.8
Unit 4 Cooling Tower Blowdown	268.1	290.7	302.7
Water Treatment Rejects	39.51	51.23	56.50

#### 11 Injection Wells

The deep wells require a Class I injection well permit to operate a total of 3 wells. Well 1 will be the primary well and Well 2 will be the backup well. The wells will not typically be operated simultaneously. At this time, IID also does not anticipate drilling Well 3. Well 3 will only be drilled if a problem develops with Wells 1 or 2, or future expansion of ECGS requires additional quantities of wastewater discharge as part of the expansion.

##### 11.1 Well Design and Construction

Two injection wells (IW-1 and IW-2) will be drilled and completed as Class I by others.

##### 11.2 Well Operation

The maximum injection rate is expected to be 1.23 million gallons per day. The average injection rate is expected to be 0.706 million gallons per day. The injection rate will be measured continuously at the discharge of each injection pump.

The expected surface well injection pressure (at the well head) is 50 psig at the minimum injection flow rate of 100 gpm to 600 psig at the maximum injection flow rate of 850 gpm. These expected values are based upon experience from existing nearby wells and geological considerations. **The actual injection pressures will be determined during testing of the installed wells.**

Based on preliminary wastewater analysis results, pre-injection treatment will not be required as the total suspended solids (TSS) concentration appears to be less than 5 ppm. However a provision will be made for injecting chemicals, if required.

**INSTRUMENT TERMINOLOGY**

FUNCTION	FIRST LETTER		SECOND LETTER	
	ALARM	STATUS	ALARM	STATUS
A	ALARM	STATUS	ALARM	STATUS
B	ALARM	STATUS	ALARM	STATUS
C	ALARM	STATUS	ALARM	STATUS
D	ALARM	STATUS	ALARM	STATUS
E	ALARM	STATUS	ALARM	STATUS
F	ALARM	STATUS	ALARM	STATUS
G	ALARM	STATUS	ALARM	STATUS
H	ALARM	STATUS	ALARM	STATUS
I	ALARM	STATUS	ALARM	STATUS
J	ALARM	STATUS	ALARM	STATUS
K	ALARM	STATUS	ALARM	STATUS
L	ALARM	STATUS	ALARM	STATUS
M	ALARM	STATUS	ALARM	STATUS
N	ALARM	STATUS	ALARM	STATUS
O	ALARM	STATUS	ALARM	STATUS
P	ALARM	STATUS	ALARM	STATUS
Q	ALARM	STATUS	ALARM	STATUS
R	ALARM	STATUS	ALARM	STATUS
S	ALARM	STATUS	ALARM	STATUS
T	ALARM	STATUS	ALARM	STATUS
U	ALARM	STATUS	ALARM	STATUS
V	ALARM	STATUS	ALARM	STATUS
W	ALARM	STATUS	ALARM	STATUS
X	ALARM	STATUS	ALARM	STATUS
Y	ALARM	STATUS	ALARM	STATUS
Z	ALARM	STATUS	ALARM	STATUS

**SIGNAL LINES**



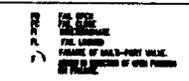
**TAG BALLOONS**



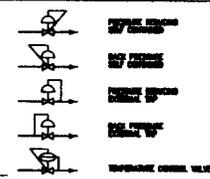
**VALVE ACTUATORS**



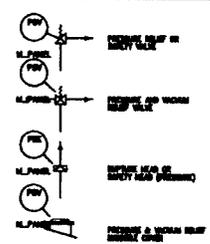
**CONTROL VALVE LETTER NOTATION**



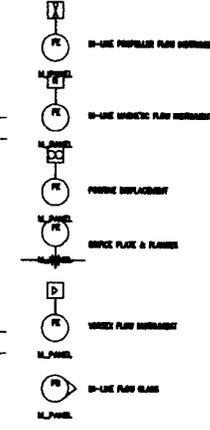
**SELF-ACTUATED REGULATORS**



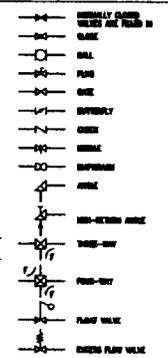
**RELIEF DEVICES**



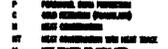
**IN-LINE INSTRUMENTS**



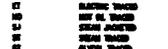
**VALVES**



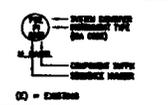
**INSULATION CODES**



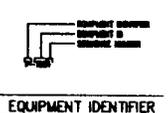
**TRACING CODES**



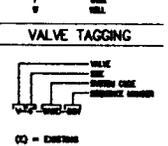
**EQUIPMENT TAGGING**



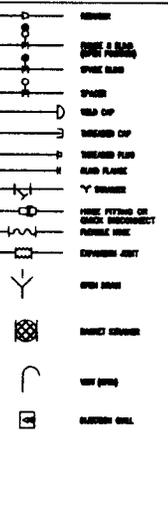
**EQUIPMENT IDENTIFIER**



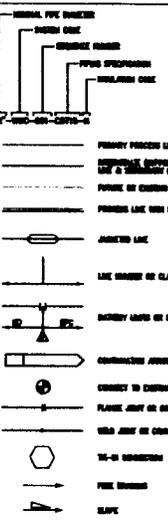
**VALVE TAGGING**



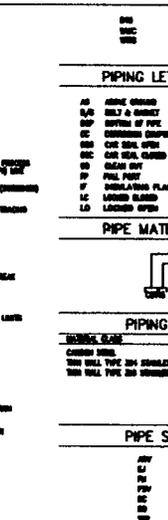
**PIPING SYMBOLS**



**LINES**



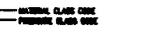
**SYSTEM CODE DESIGNATION**



**PIPING LETTER ABBREVIATIONS**

AS	ARMED	NO	INITIALLY OPEN
AS	ARMED	NO	INITIALLY CLOSED
AS	ARMED	NO	INITIALLY OPEN
AS	ARMED	NO	INITIALLY CLOSED
AS	ARMED	NO	INITIALLY OPEN
AS	ARMED	NO	INITIALLY CLOSED
AS	ARMED	NO	INITIALLY OPEN
AS	ARMED	NO	INITIALLY CLOSED
AS	ARMED	NO	INITIALLY OPEN
AS	ARMED	NO	INITIALLY CLOSED

**PIPE MATERIAL DESIGNATION**



**PIPING SPECIFICATION**

PIPE SIZE	PIPE WALL THICKNESS	PIPE
1/2"	1/16"	304
3/4"	1/16"	304
1"	1/16"	304
1 1/2"	1/8"	304
2"	1/8"	304
3"	1/8"	304
4"	1/8"	304

**PIPE SPECIALTY ITEMS**

AV	VALVE	VALVE

THESE DRAWINGS ARE CONCEPTUAL ONLY AND ARE FOR THE CONVENIENCE OF REFERENCE.

REVISIONS

NO.	DESCRIPTION	DATE

PROJECT: [ ]

DATE: [ ]

SCALE: [ ]

BY: [ ]

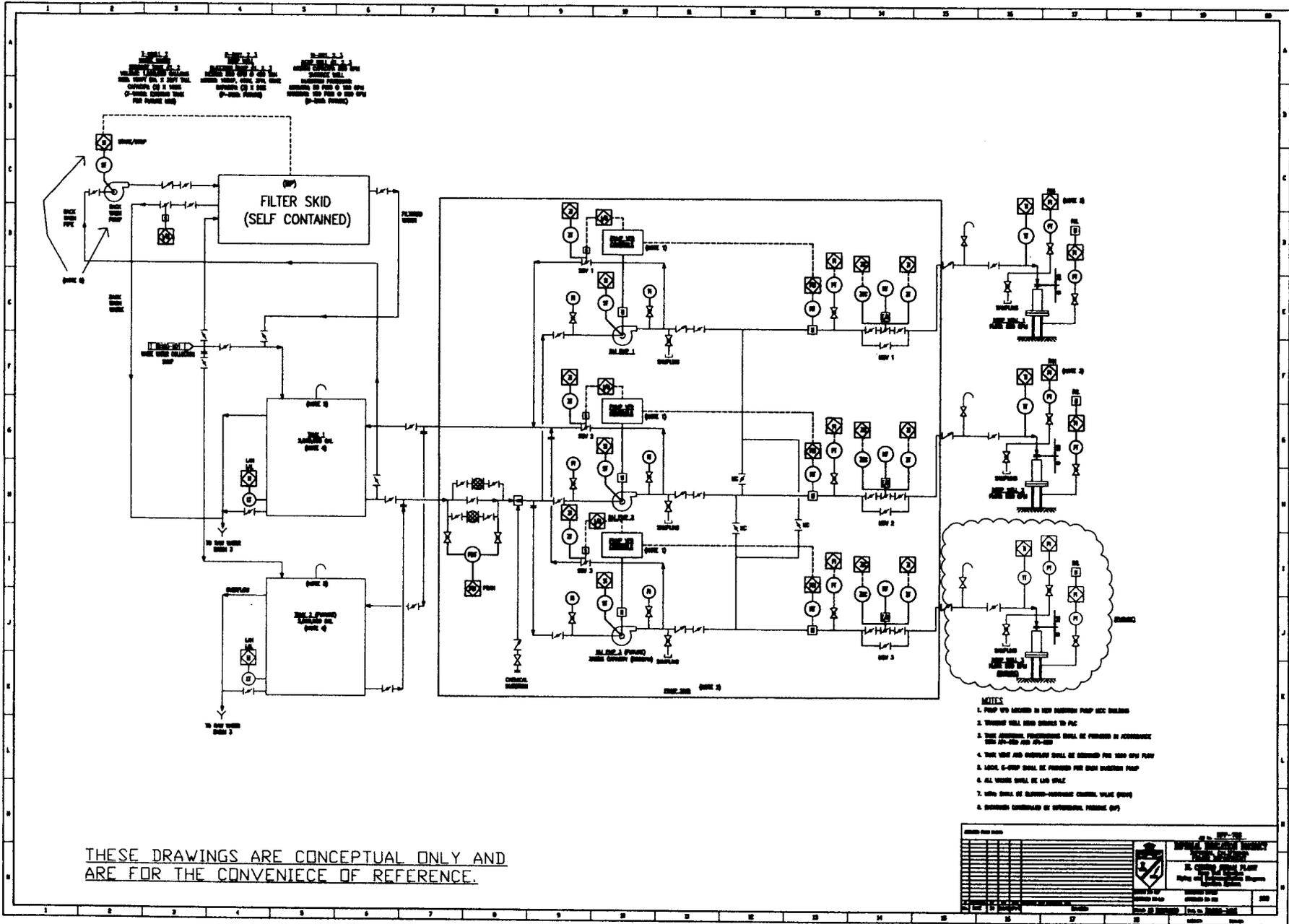
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APPROVED: [ ]









THESE DRAWINGS ARE CONCEPTUAL ONLY AND  
 ARE FOR THE CONVENIENCE OF REFERENCE.

- NOTES:**
1. PUMP VFD LOCATED IN NEW BARRIERS PUMP BSC BUILDING
  2. TANKS WILL BE NEW BARRIERS TO PUC
  3. TANK ELECTRICAL REQUIREMENTS SHALL BE PROVIDED BY APPROXIMATE 200-250 AND 40-50
  4. TANK TEST AND OVERFLOW SHALL BE PROVIDED FOR NEW BARRIERS PUMP
  5. LOCAL O-RING SHALL BE PROVIDED FOR NEW BARRIERS PUMP
  6. ALL TANKS SHALL BE LAD W/SAFE
  7. W/SAFE SHALL BE BARRIERS-ROCKWELL CONTROL W/SAFE (CWP)
  8. BARRIERS CONTROL W/SAFE (CWP)

		<b>U.S. ARMY CORPS OF ENGINEERS</b> <b>WATER RESOURCES DIVISION</b> <b>NEW BARRIERS PUMP</b> <b>NEW BARRIERS PUMP</b> <b>NEW BARRIERS PUMP</b>
PROJECT NO. _____ DRAWING NO. _____ SHEET NO. _____ OF _____ DATE _____	DESIGNED BY _____ CHECKED BY _____ APPROVED BY _____ TITLE _____	DRAWN BY _____ CHECKED BY _____ APPROVED BY _____ TITLE _____

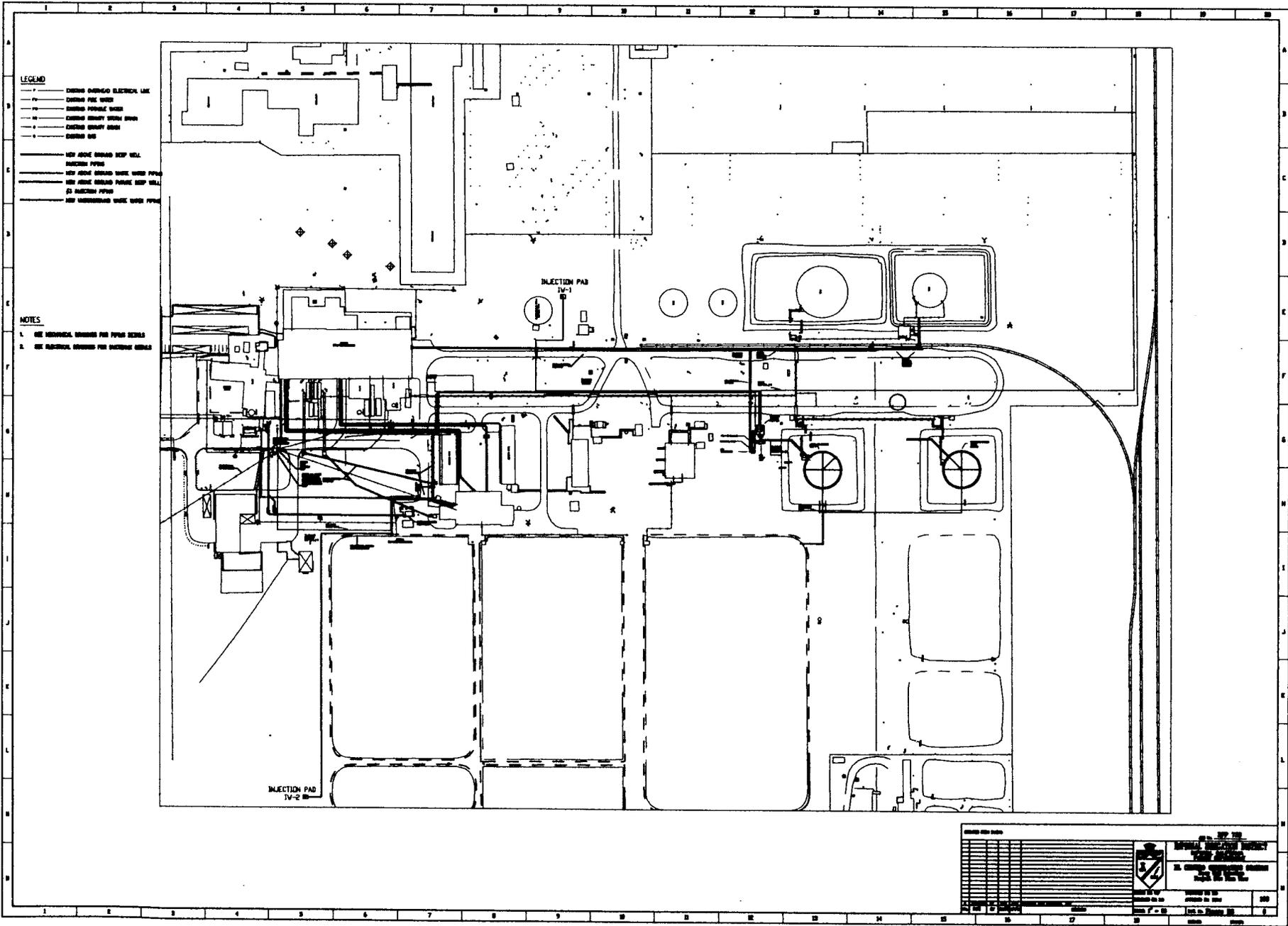








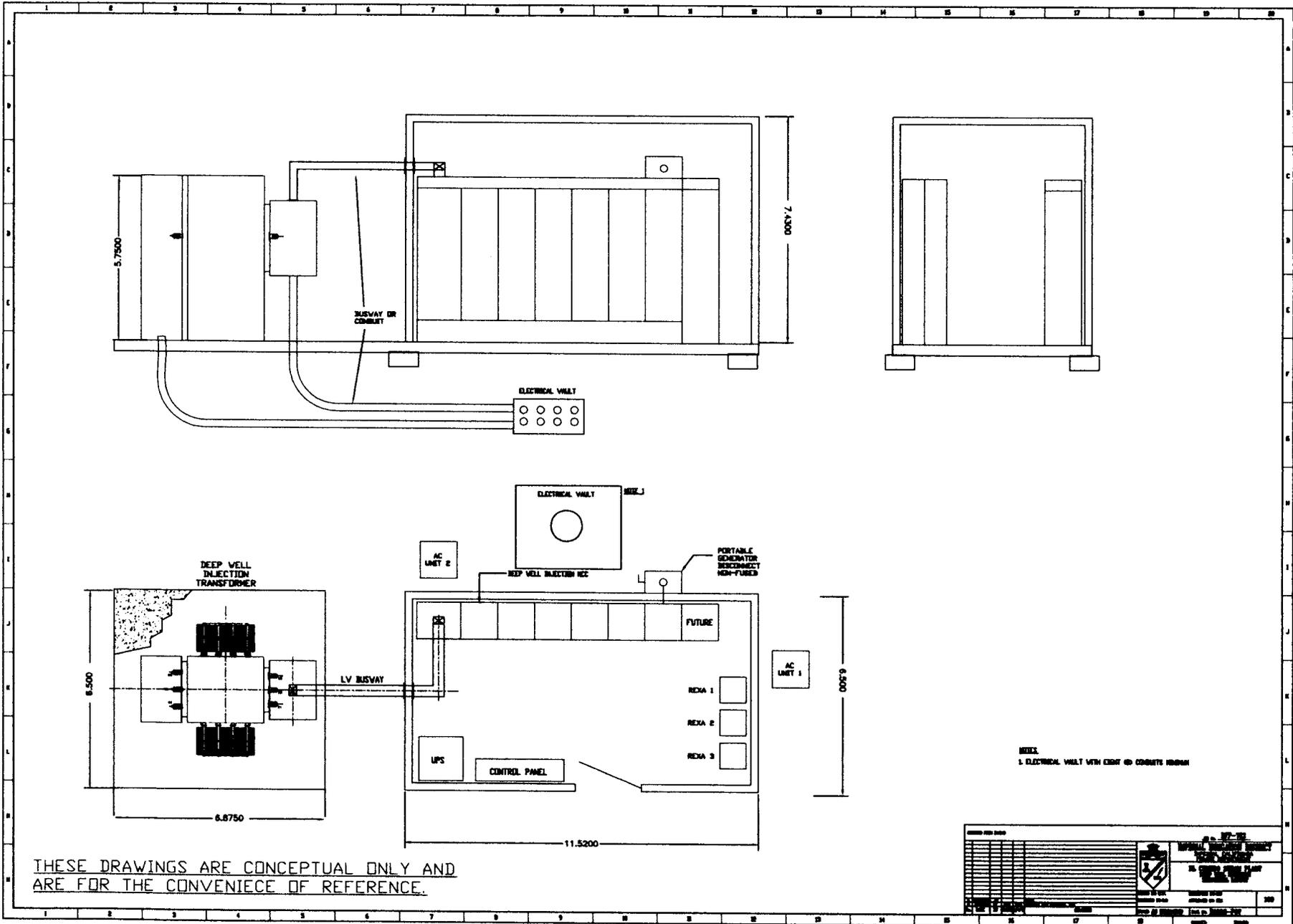




- LEGEND**
- CHASIS OVERHEAD ELECTRICAL LINES
  - CHASIS PIPE WORK
  - CHASIS PIPING WORK
  - CHASIS BRASSY WORK WORK
  - CHASIS BRASSY WORK
  - CHASIS W.C.
  - NEW JUNE BRASSY W.C. W.C. W.C.
  - BRASSY PIPING
  - NEW JUNE BRASSY W.C. W.C. W.C. W.C.
  - NEW JUNE BRASSY PIPING W.C. W.C. W.C. W.C.
  - NEW BRASSY W.C. W.C. W.C. W.C.
  - NEW BRASSY W.C. W.C. W.C. W.C.

- NOTES**
1. SEE MECHANICAL DRAWINGS FOR PIPING DETAILS
  2. SEE ELECTRICAL DRAWINGS FOR ELECTRICAL DETAILS

		U.S. ARMY CORPS OF ENGINEERS DISTRICT OFFICE 3150 GARDNER DRIVE FORT BELLEVILLE, ILLINOIS 62205
PROJECT NO. DRAWING NO. SHEET NO.	DATE SCALE DESIGNED BY CHECKED BY APPROVED BY	TITLE PROJECT NO. DRAWING NO. SHEET NO.



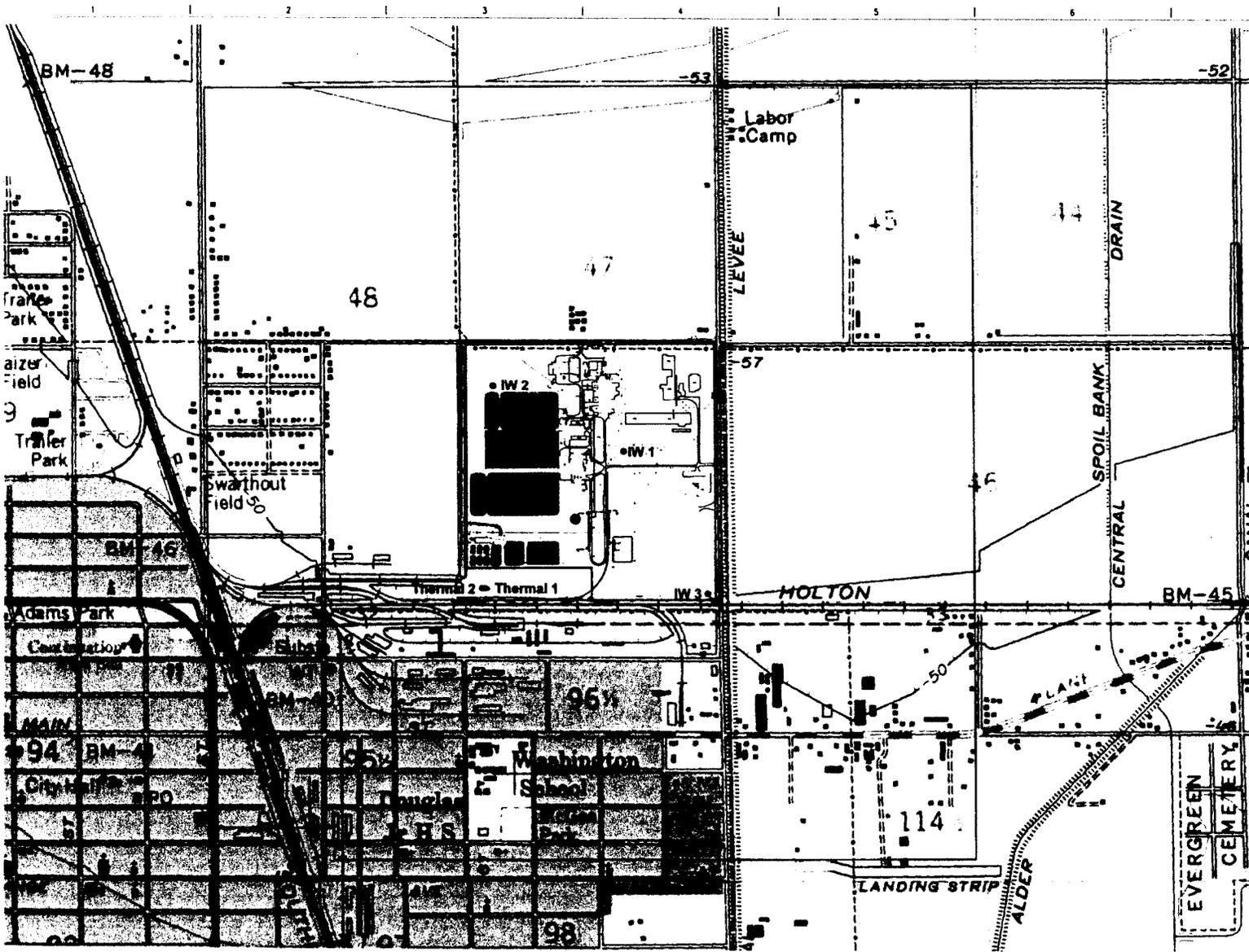
THESE DRAWINGS ARE CONCEPTUAL ONLY AND ARE FOR THE CONVENIENCE OF REFERENCE.

NOTE:  
1. ELECTRICAL VAULT WITH CONDUIT @ CONDUIT HEIGHT

PROJECT NO. 100-100-100-100 DRAWING NO. 100-100-100-100 SHEET NO. 100-100-100-100 DATE 10/10/10	TITLE 100-100-100-100 100







- LEGEND**
- PROPERTY LINE
  - EXISTING FENCE
  - CONTROL POINT
  - △ PROPERTY CORNER
  - ABANDONED GEOTHERMAL WELL
  - PROPOSED INJECTION WELL
  - WASTEWATER HOLDING TANK
  - AREA OF REVIEW

**NOTES**

1. EXISTING PLANT LAYOUT AND CONTROL POINT INFORMATION PROVIDED BY THE STATE SURVEYING, LTD. (778) 289-9491. PROJECT NO. 06382.01. 6-26-06.

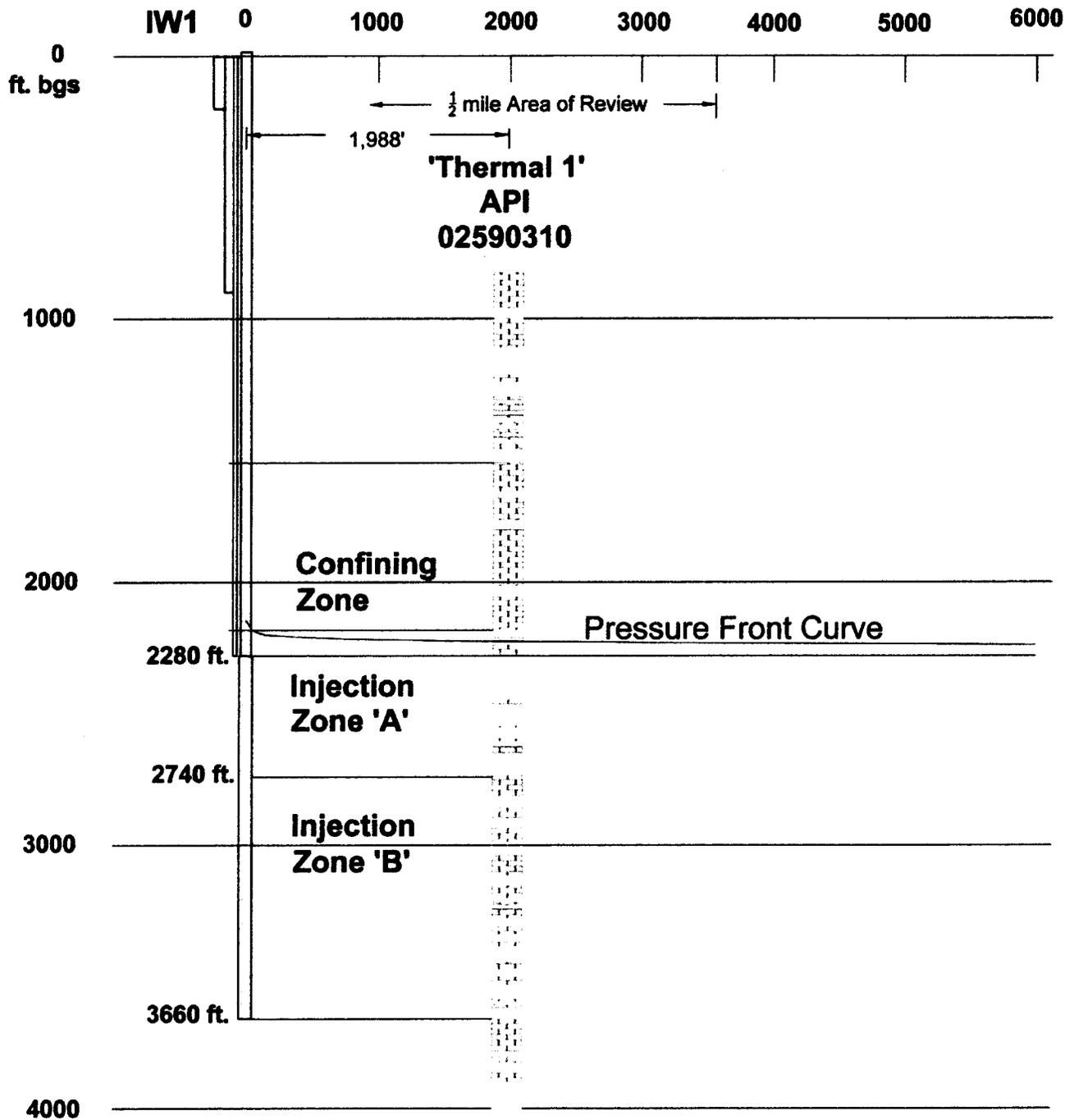


REV	REVISIONS	DATE	DRN	DSCN	CKD	APPD	REFERENCE DRAWINGS
B	REVISED WELL LOCATIONS						
A	REVISED FOR PERMIT APPLICATION						

DSCN	DRN	CKD	SCALE:	AS SHOWN



IMPERIAL IRRIGATION DISTRICT	JOB NUMBER	REV
EL CENTRO GENERATING STATION	P-0563	
BASE MAP WITH AREA OF REVIEW	DRAWING NUMBER	
	<b>Figure B1</b>	



Notes:  
 1. Half mile Area of Review shown from nearest property boundary.

### Legend

- Sand
- Shale

Approximate Horizontal Scale 1" = 1150'  
 Approximate Vertical Scale 1" = 575'

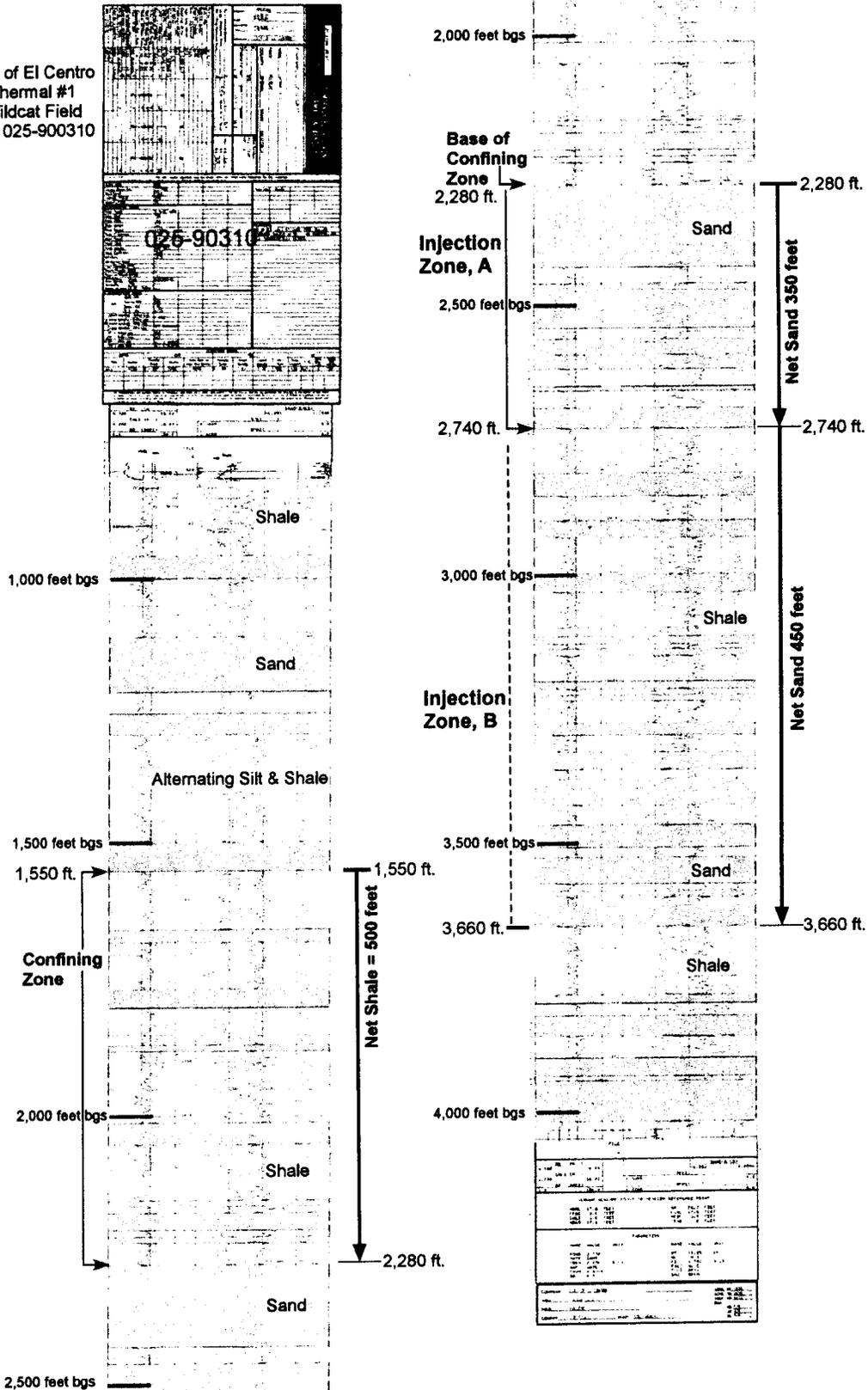
### Cross-Section of Calculated Pressure Front

El Centro Generating Station  
 Imperial Irrigation District

Date: 08/03/2009

Figure B2

City of El Centro  
Thermal #1  
Wildcat Field  
API 025-900310

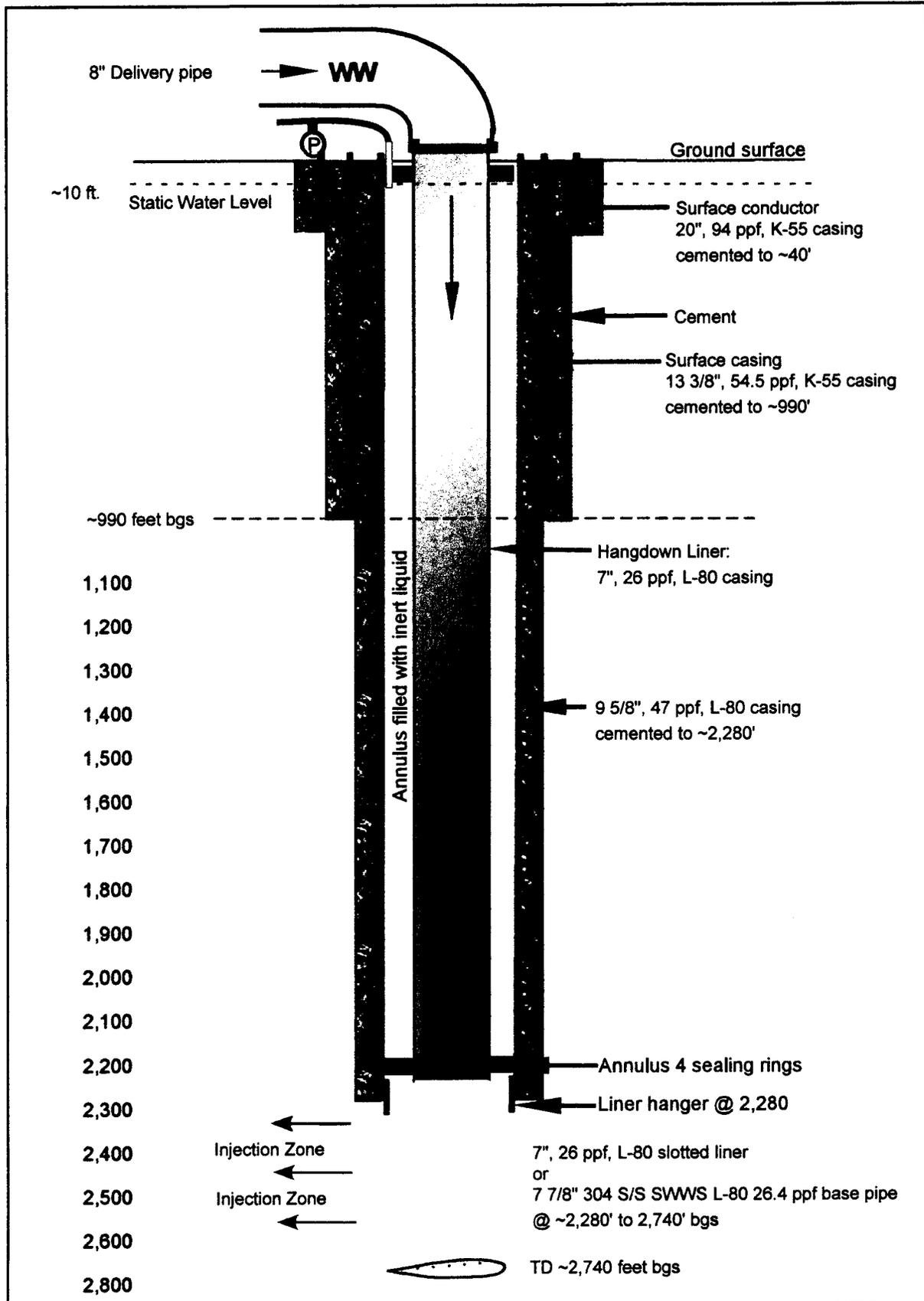


**LEGEND**

- Sand
- Shale

**Lithologic Column, 'Thermal 1'  
Wildcat Field, API 025-90310**

El Centro Generating Station  
Imperial Irrigation District  
Figure G1

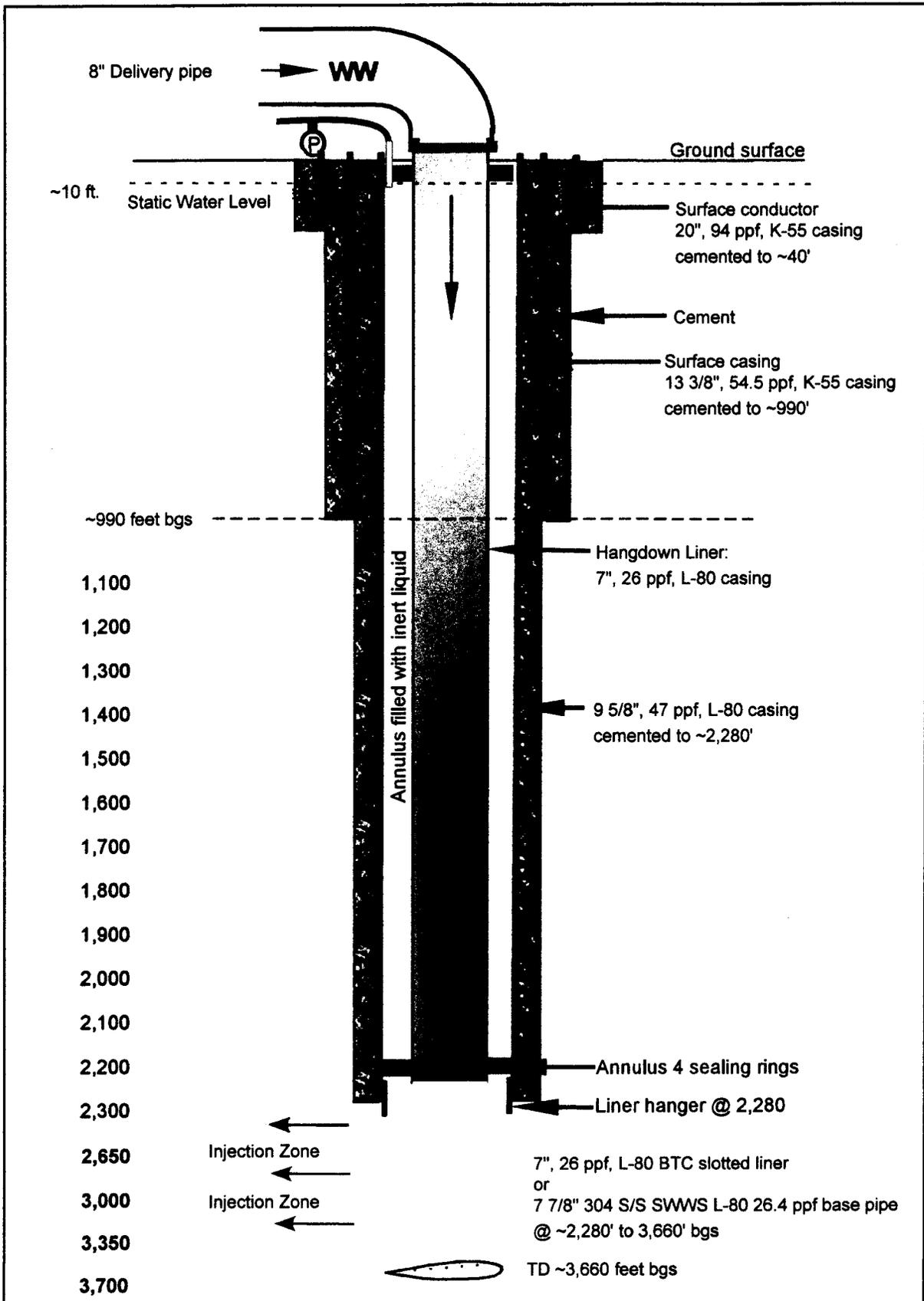


**Proposed Injection Well Schematic**

El Centro Generating Station  
Imperial Irrigation District

Figure M1

Revision: 1  
Date: 08/14/2009



**Proposed Injection Well Schematic**

El Centro Generating Station  
Imperial Irrigation District

Figure M2

Revision: 1  
Date: 08/14/2009