

7-18-91

JUNE, 10, 1991  
S - MAY, 13, 1991



INTERIM PRODUCT RECOVERY SYSTEM

AMOCO TERMINAL 2904 WINTER STREET

SUPERIOR, WISCONSIN

DELTA NO. 10-88-457

**INTERIM PRODUCT RECOVERY SYSTEM**

**AMOCO TERMINAL 2904 WINTER STREET  
SUPERIOR, WISCONSIN  
DELTA NO. 10-88-457**

**Prepared By:**

**Delta Environmental Consultants, Inc.  
1801 Highway 8, Suite 114  
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(612) 636-2427**

**June 10, 1991**

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## INTERIM PRODUCT RECOVERY SYSTEM

AMOCO TERMINAL 2904 WINTER STREET

SUPERIOR, WISCONSIN

DELTA NO. 10-88-457

### 1.0 INTRODUCTION

#### 1.1 Purpose

The purpose of this report is to provide information regarding the Interim Product Recovery System (IPRS) installed and operating at the referenced site. This report contains information regarding system installation, specifications, and operational data collected through May 13, 1991.

#### 1.2 Authorization

Delta Environmental Consultants, Inc. (Delta), has been authorized to perform this work by Mr. David A. Piotrowski of Amoco Oil Company (Amoco).

### 2.0 BACKGROUND INFORMATION

#### 2.1 Area of Investigation

The Amoco Terminal is located at 2904 Winter Street, Superior, Wisconsin. The site is in the north 1/2 of the southeast 1/4 of Section 16, Township 49 North Range 14 West. The site's latitude and longitude are approximately 46° 44, N, 92° 7' W, respectively. A topographic map of the site area is presented as Figure 1.

The site is located approximately one-half mile southeast of St. Louis Bay on the western tip of Lake Superior. The elevation at the site is approximately 630 feet relative to National Geodetic Vertical Datum (NGVD), and is approximately 30 feet above the elevation of Lake Superior (602 feet NGVD). The topography in the area of the site is relatively flat with several small swamps and wetlands. Surface water drainage is to the northwest toward St. Louis Bay through intermittently flowing drainage ditches.

#### 2.2 Previous Work

Amoco's investigation at this site began with the installation of 13 monitoring wells in February 1988 as part of a routine subsurface assessment. Ground water samples collected from these wells revealed the presence of free phase hydrocarbons in three of the wells and identified low concentrations of dissolved phase hydrocarbons in four other wells. The data generated during this initial investigation was presented as Appendix A in Delta's May 18, 1989, Remedial Investigation Report (RI).

Following the discovery of liquid hydrocarbons and dissolved petroleum hydrocarbons in the ground water at the site, Delta was contracted by Amoco to continue the investigation. In September 1988, Delta installed five monitoring wells and collected ground water samples for chemical analysis. The results of this work were presented to the Wisconsin Department of Natural Resources (WDNR) in a Remedial Investigation Report dated May 18, 1989. Delta's investigation continued with the installation of additional monitoring wells and soil borings, continued ground water sampling, the installation of seven recovery wells, and the performance of an aquifer pump test. The results of this work were presented to the WDNR in a report titled "Supplemental Site Investigation Report", dated March 14, 1991. Other response actions which have not been discussed in previous reports have included the performance of a field test to evaluate the effectiveness of vacuum enhanced fluid extraction, and the installation of an IPRS. The IPRS is the subject of this report.

### **3.0 INTERIM PRODUCT RECOVERY SYSTEM**

#### **3.1 Installation and Description**

The IPRS was installed as an interim means of recovering liquid product until a more long-term recovery system is designed and installed. The IPRS was installed during January 1991 under direct supervision of Delta representatives and began operating on February 5, 1991.

The IPRS consists of three individual pumping systems which are installed at recovery wells RW-1, RW-2, and RW-6. Each system consists of a system controller (control panel), electrical submersible recovery pump, and a product storage tank. Installation details and equipment specifications are presented on the attached drawings (Appendix A).

The system is designed to recover liquid product only. Therefore, wastewater discharge is not required. In general, the recovery pumps are turned on and off by electrical relays in the system controller. The electrical relays are operated by specific gravity (SG) floats located in the recovery wells. Accumulating liquid product changes the positions of the SG floats and allows the recovery pump to turn on and pump the accumulated product to the product storage tank.

**3.2 Operation**

Operating data is currently being collected by the terminal staff and by routine site visits conducted by Delta. Collected data is recorded on operating logs for each system. Information collected to date regarding the IPRS is attached (Appendix B). Review of the data indicates that approximately 997 gallons of liquid product have been recovered through May 13, 1991.

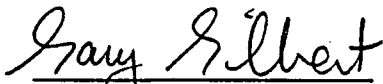
**4.0 DISCUSSION**

Delta is currently evaluating several alternatives for the recovery of liquid product from the project site. The IPRS will remain operational during the alternatives evaluation and final selection process.

**5.0 REMARKS**

The information contained in this report is based on currently available information and is arrived at in accordance with currently accepted hydrogeologic and engineering practices at this time and location. Other than this, no warranty is implied or intended.

This report was prepared by DELTA ENVIRONMENTAL CONSULTANTS, INC.



Gary Gilbert  
Environmental Engineer

Date: 6/10/91



John Grams  
Project Manager

Date: 6/10/91

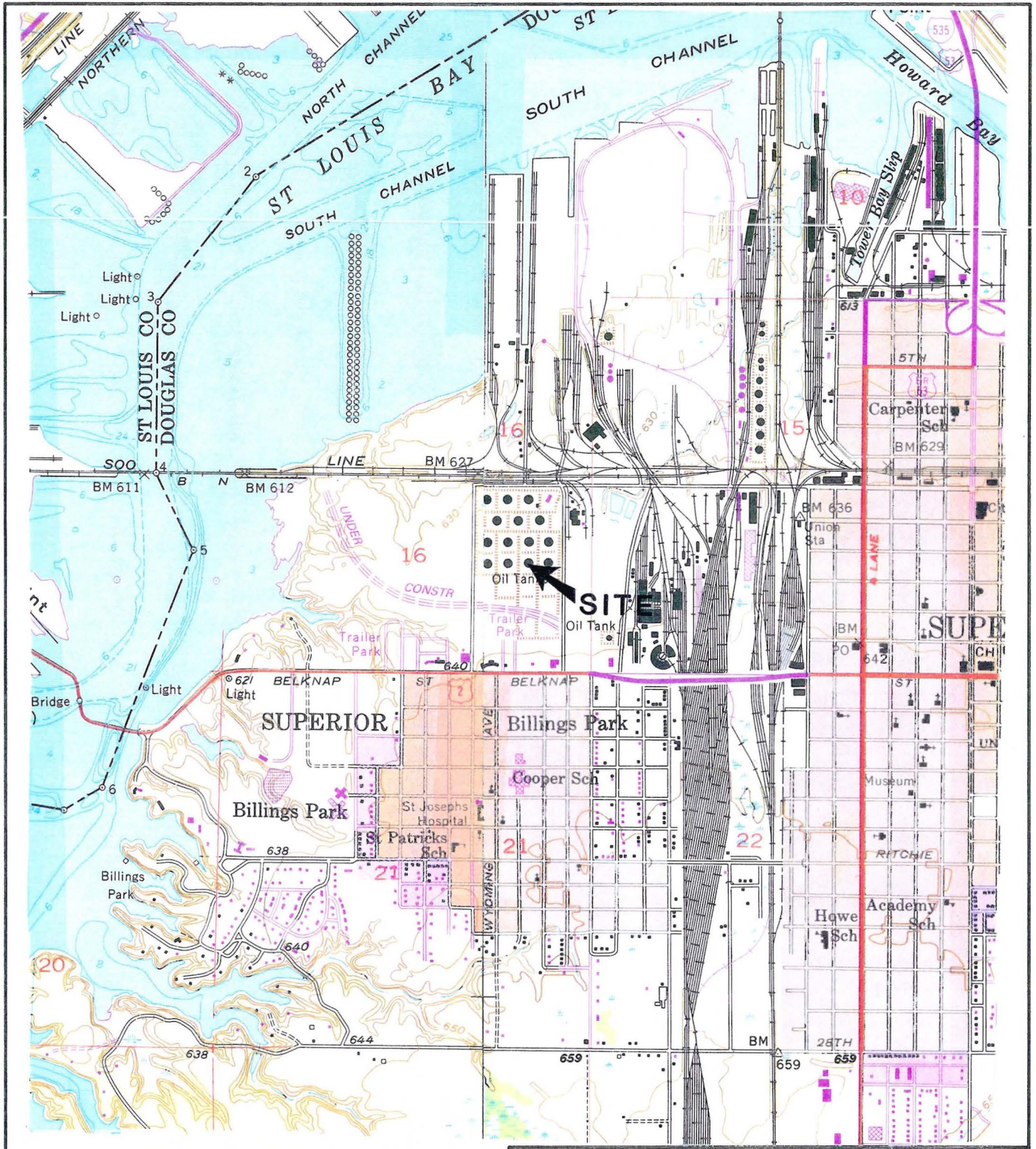
Reviewed by:



Craig Anderson, P.E.  
Engineering Department Manager

Date: 6/10/91





WEST DULUTH QUADRANGLE  
MINNESOTA  
7.5 MINUTE SERIES (TOPOGRAPHIC)

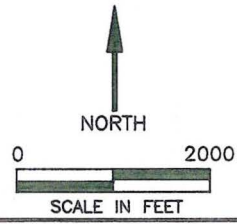
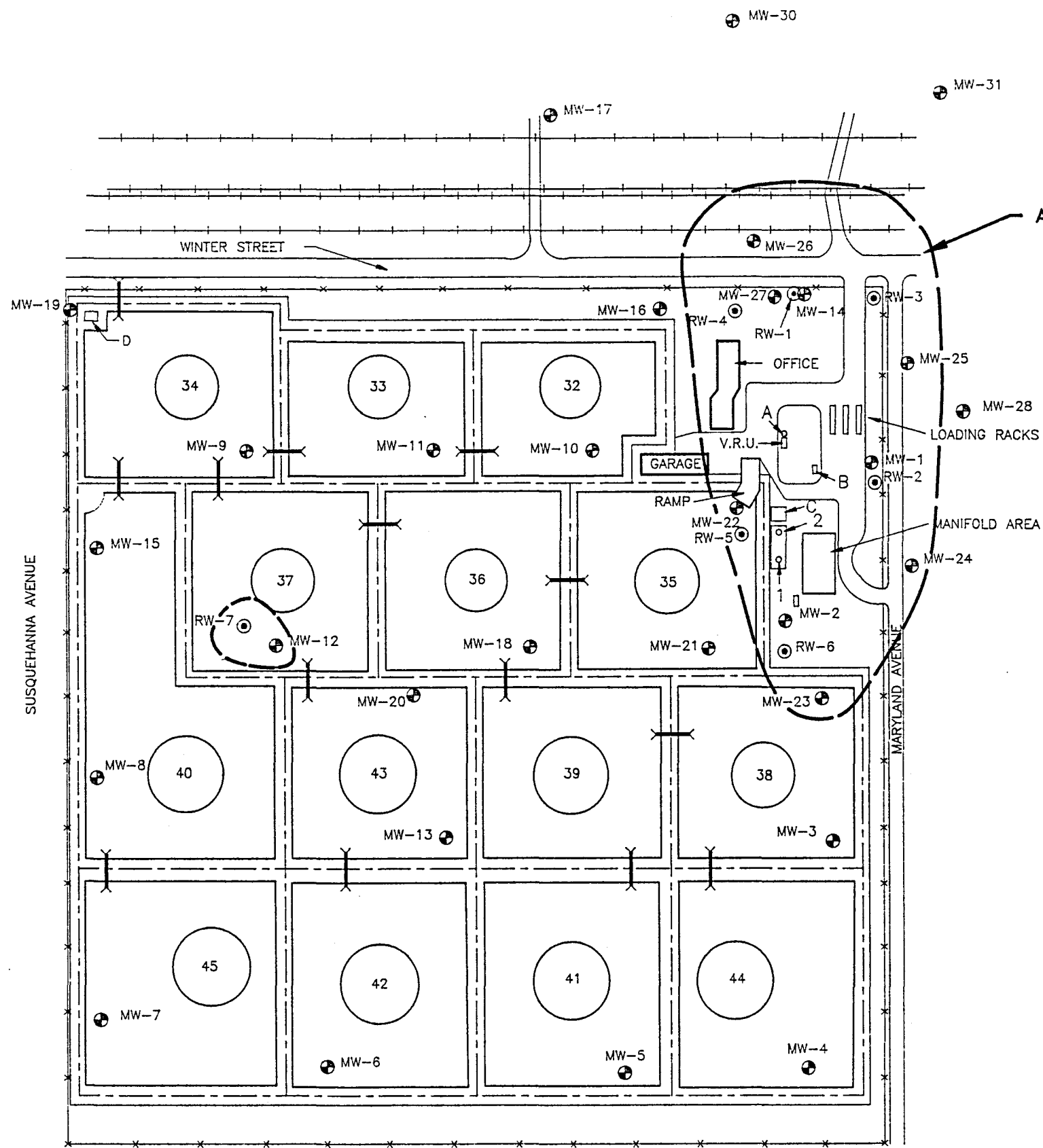


FIGURE 1  
SITE LOCATION MAP  
SUPERIOR TERMINAL  
SUPERIOR, WISCONSIN

PROJECT NO. 10-88-457	PREPARED BY JCG/PAJ
DATE 4/1/91	REVIEWED BY JCG

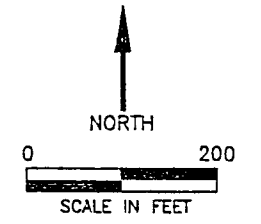




**LEGEND:**

- MONITORING WELL LOCATION
- RECOVERY WELL LOCATION
- RAILROAD TRACKS
- DRAINAGE CULVERT
- FENCE LINE
- UNDERGROUND STORAGE TANK LOCATION
- ABOVE GROUND STORAGE TANK LOCATION
- APPROXIMATE LIMIT OF LIQUID PRODUCT

- NOTES:**
1. MAP DRAWN FROM DATA COLLECTED JULY 13, 1990
  2. TABLE 11 PRESENTS PRODUCT THICKNESS DATA



**FIGURE 2**  
**EXTENT OF LIQUID PRODUCT**  
**JULY 13, 1990**  
**SUPERIOR TERMINAL**  
**SUPERIOR, WISCONSIN**

PROJECT NO. 10-88-457	PREPARED BY GDG/PAJ	REVIEWED BY 	
DATE 5/24/91	REVISION NO.	FILE NAME 88457-2	



**APPENDIX A**

**Construction Drawings**

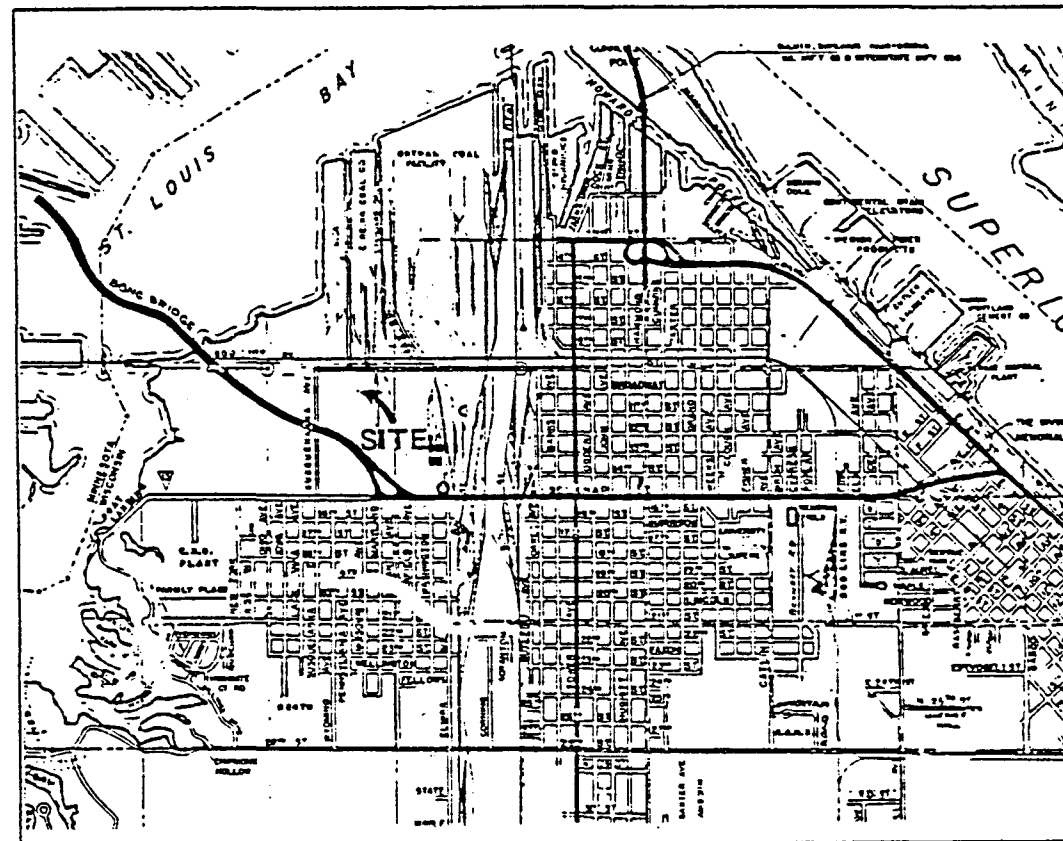
# INTERIM PRODUCT RECOVERY SYSTEM

PREPARED FOR:

AMOCO OIL COMPANY  
AMOCO SUPERIOR TERMINAL  
SUPERIOR, WISCONSIN

PREPARED BY:

DELTA ENVIRONMENTAL CONSULTANTS, INC.  
ST. PAUL DISTRICT



1 SITE VICINITY MAP  
G-1 SCALE: 1" = 2000'

SECTION	DRAWING NUMBER	DRAWING TITLE
GENERAL	G-1	COVER SHEET
	G-2	SITE MAP & INTERIM PRODUCT RECOVERY SYSTEM LOCATION
	G-3	PROCESS & INSTRUMENTATION DIAGRAM
	G-4	SYMBOLS & LEGEND PAGE
MECHANICAL	P-1	PIPING ISOMETRIC
	P-2	RECOVERY WELL AND PUMP CONFIGURATION
	P-3	PRODUCT TANK DETAILS
	P-4	RECOVERY WELL SEALS AND COVER DETAILS
ELECTRICAL	E-1	ELECTRICAL DETAILS
	E-2	SYSTEM CONTROL PANEL WIRING DETAILS

PROJECT CONTACT INFORMATION

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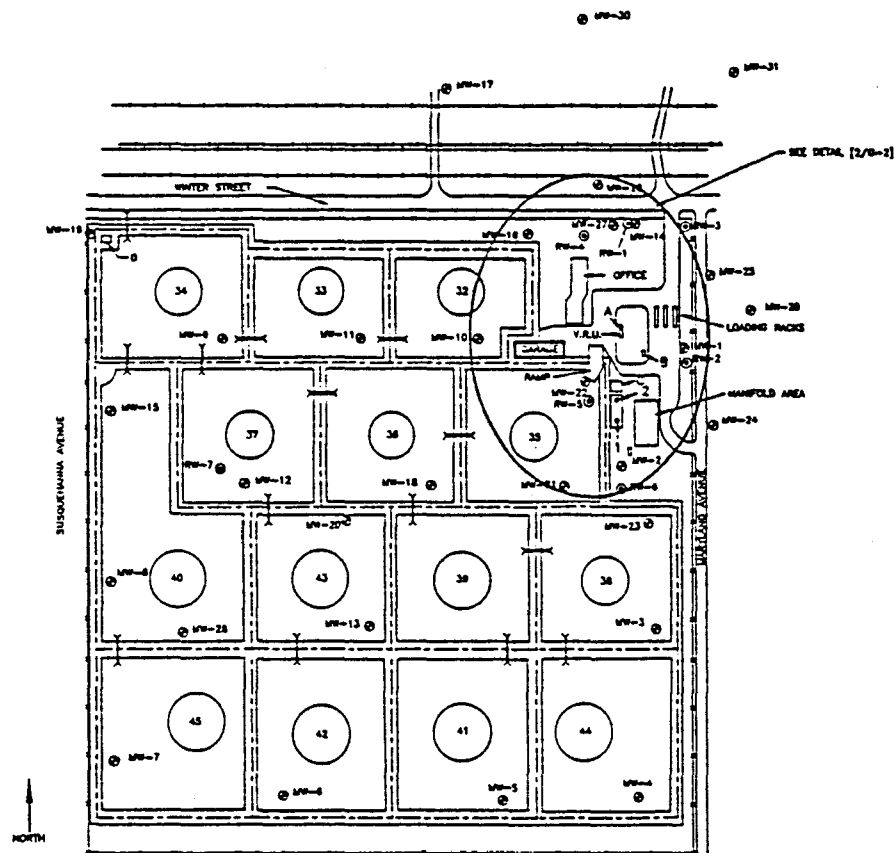
REV	DATE	DESCRIPTION	DRAWN	REVIEW
REVIEWED BY		PREPARED BY	GDG/PAJ	
DATE		DATE	12/17/90	

DRAWING G-1  
COVER SHEET  
INTERIM PRODUCT RECOVERY SYSTEM  
AMOCO SUPERIOR TERMINAL  
SUPERIOR, WISCONSIN

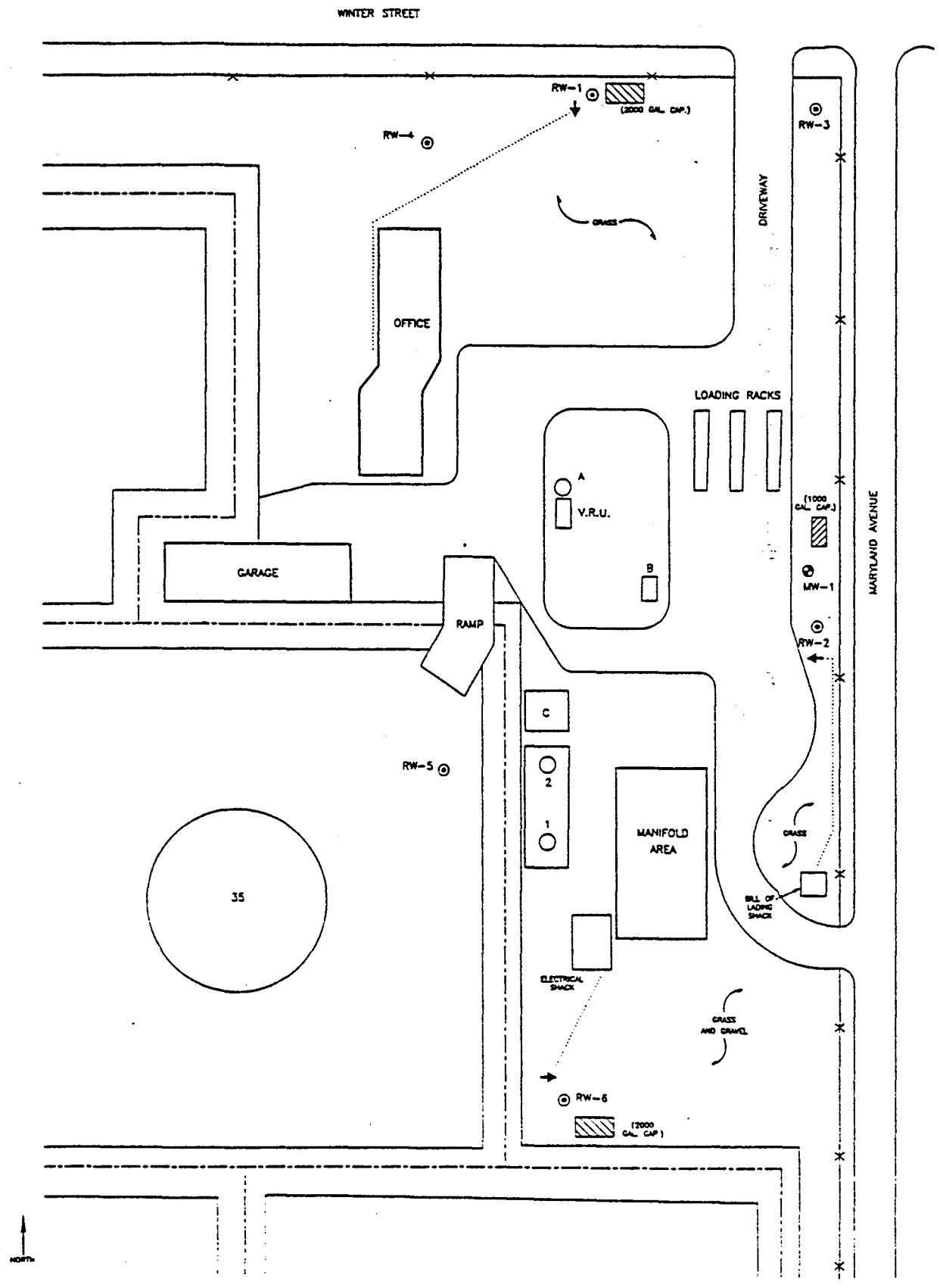


**Delta**  
Environmental  
Consultants, Inc.

DELTA PROJECT NUMBER | FILE NAME | SHEET NO. | REV. NO.  
10-88-487 | BR457-01 | |



1 SITE AREA MAP  
G-2 SCALE: 1" = 200'



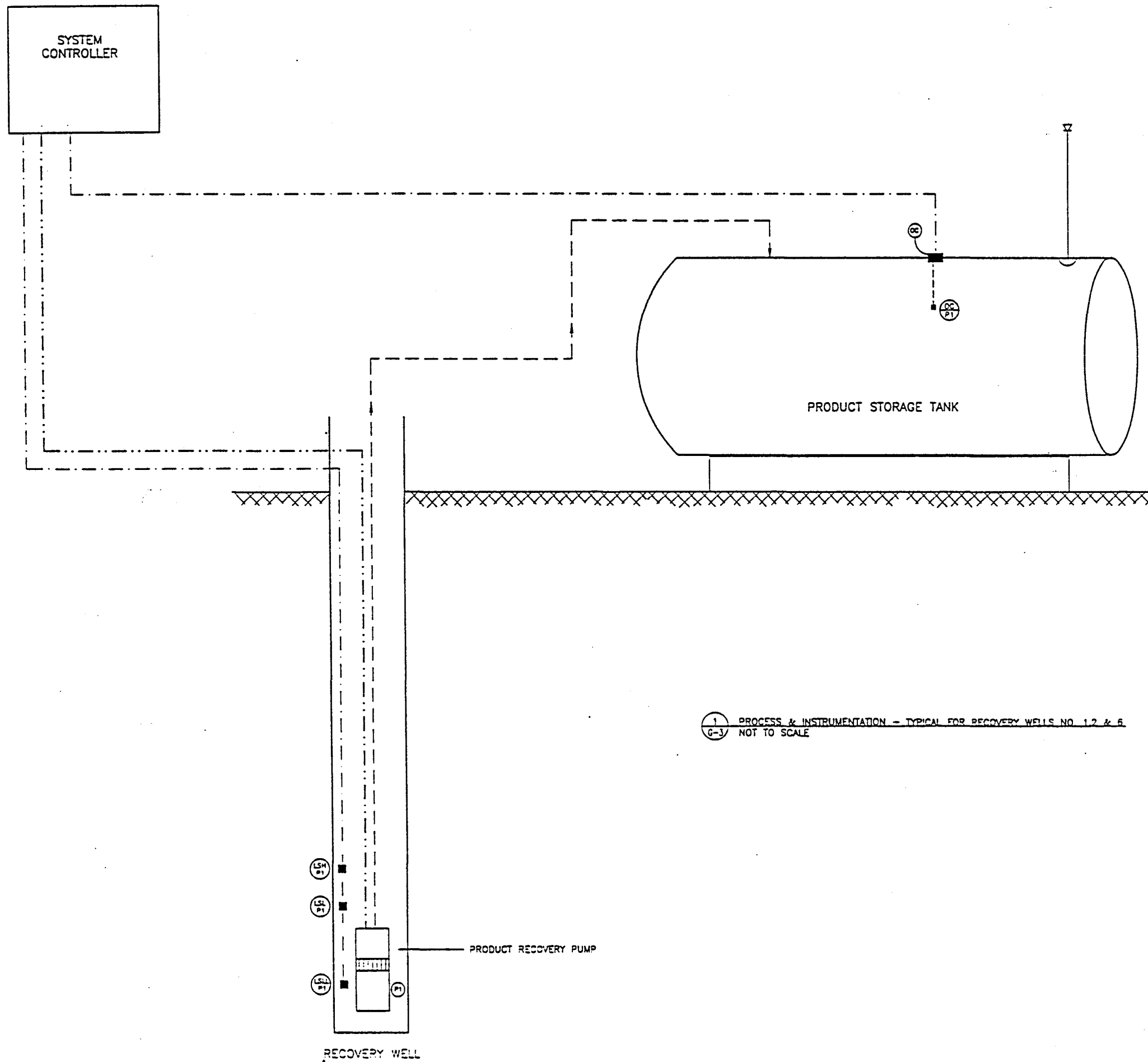
2 PRODUCT RECOVERY SYSTEM LOCATION  
G-2 SCALE: 1" = 40'

- LEGEND
- ⊙ MONITORING WELL LOCATION
  - ⊙ RECOVERY WELL LOCATION
  - - - - - FENCE LINE
  - A UNDERGROUND STORAGE TANK
  - 35 ABOVE GROUND STORAGE TANK
  - ▨ APPROXIMATE LOCATION OF PRODUCT STORAGE TANKS
  - ↓ APPROXIMATE LOCATION OF BREAKER & SYSTEM CONTROL PANELS
  - TEMPORARY ELECTRICAL SUPPLY FOR SYSTEM PANELS

1	2/72	RECORD DRAWINGS	CS
REVI DATE	DESCRIPTION	PREPARED BY	DRAWN/REVIEW
REVIEWED BY		PREPARED BY	CDC/PAJ
DATE		DATE	12/17/90

FIGURE G-2  
SITE MAP &  
PRODUCT RECOVERY SYSTEM LOCATION  
INTERIM PRODUCT RECOVERY SYSTEM  
AMOCO SUPERIOR TERMINAL  
SUPERIOR, WISCONSIN





1 PROCESS & INSTRUMENTATION - TYPICAL FOR RECOVERY WELLS NO. 1, 2 & 6  
 G-3 NOT TO SCALE

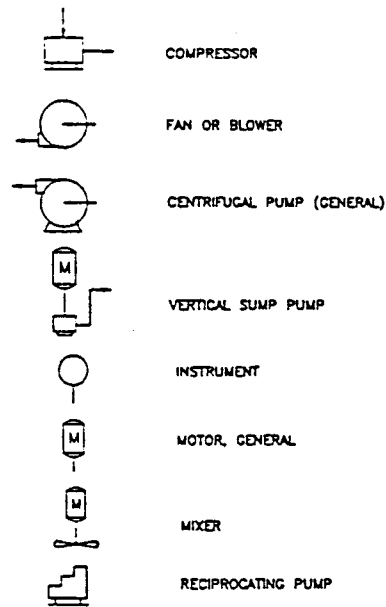
2/12 1991	RECORD DRAWINGS	CS
REVI DATE	DESCRIPTION	DRAWN/REVIEW
REVIEWED BY	PREPARED BY	GDG/PAJ
DATE	DATE	12/19/90

DRAWING G-3  
 PROCESS AND INSTRUMENTATION  
 INTERIM PRODUCT RECOVERY SYSTEM  
 AMOCO SUPERIOR TERMINAL  
 SUPERIOR, WISCONSIN

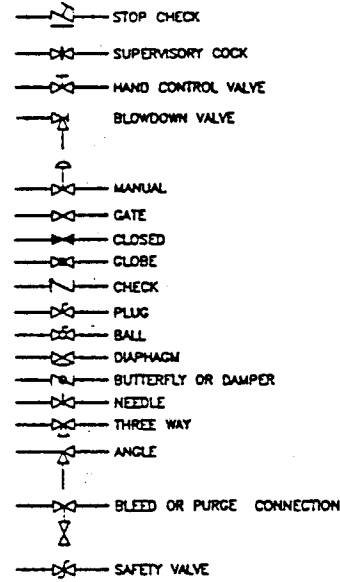
**Delta**  
 Environmental  
 Consultants, Inc.

DELTA PROJECT NUMBER	FILE NAME	SHEET NO.	REV. NO.
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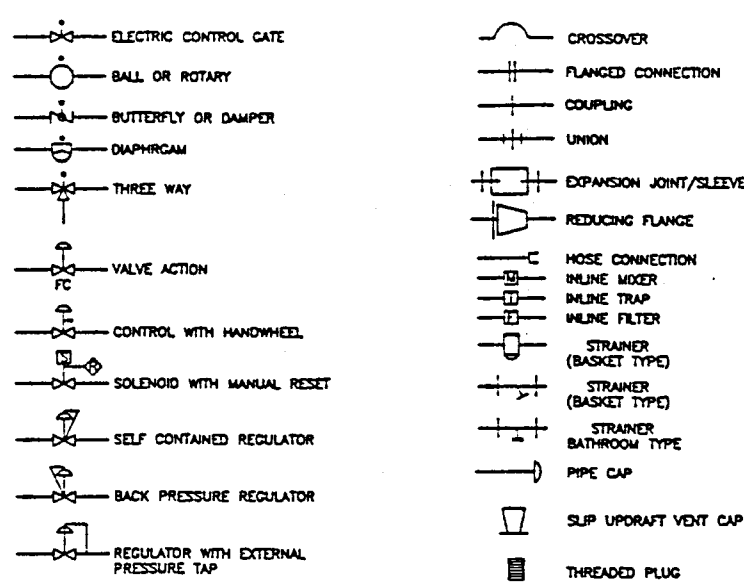
EQUIPMENT ACCESSORIES



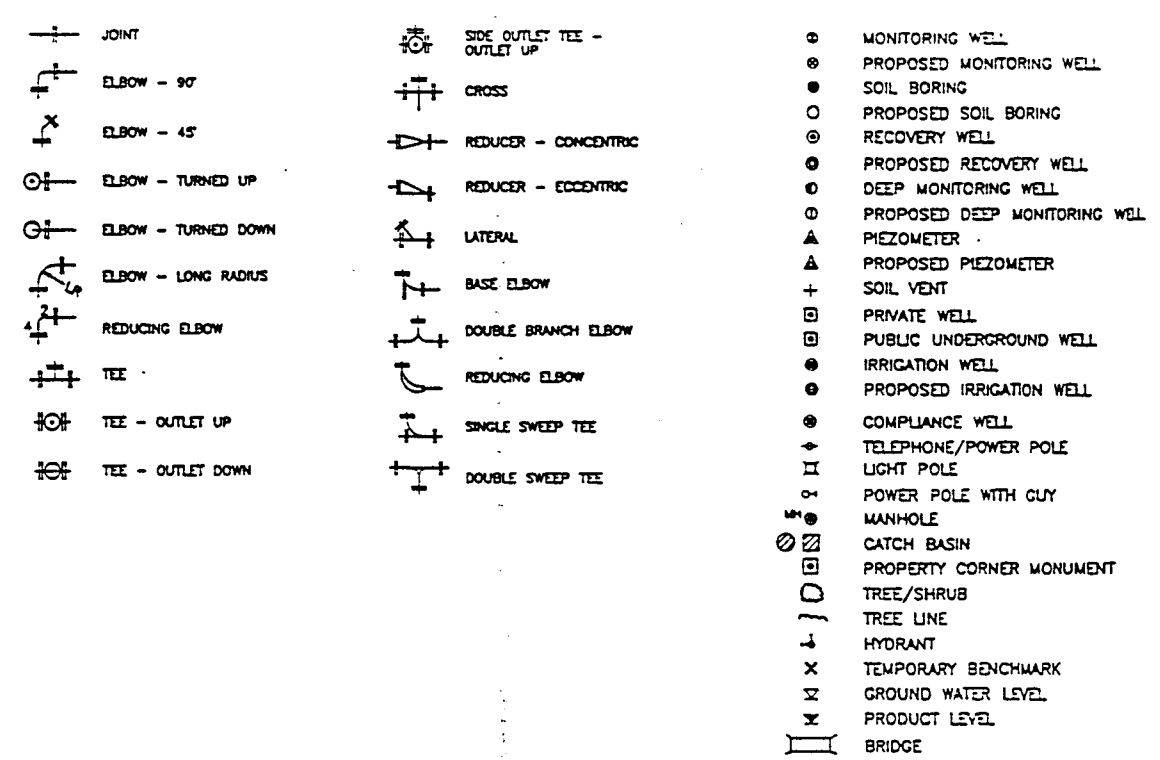
VALVES



PIPE FITTINGS



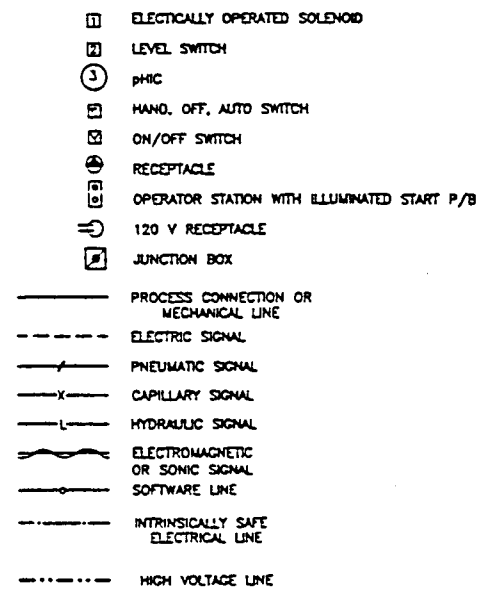
SYMBOL DESIGNATIONS



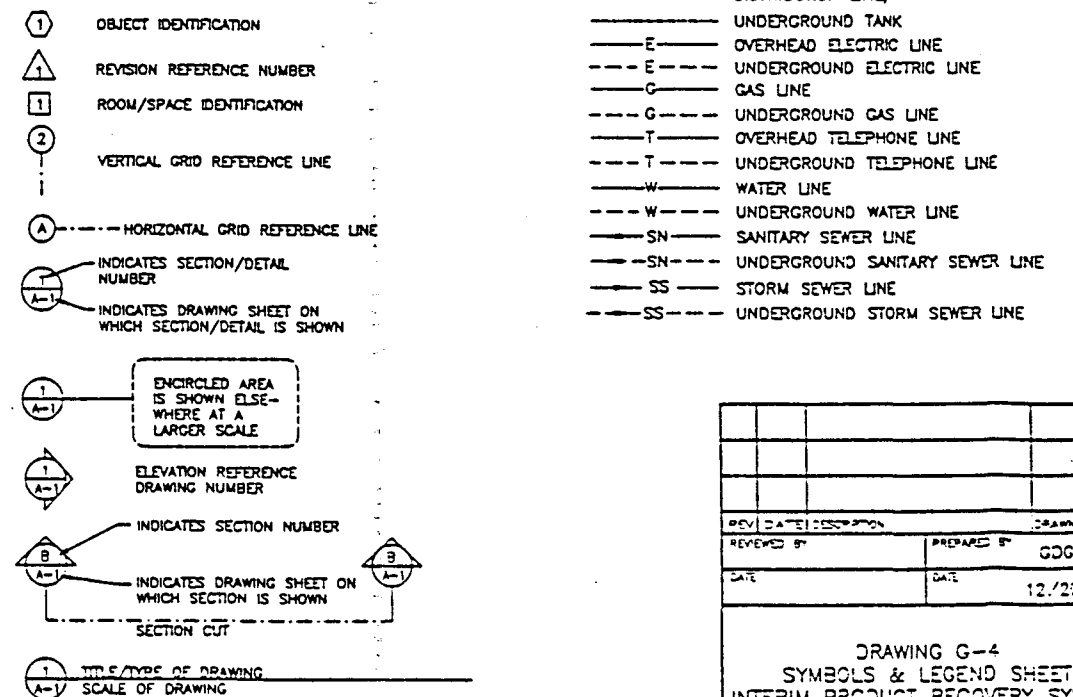
INSTRUMENTATION DESIGNATIONS

FIRST-LETTER		SUCCEEDING-LETTERS		
MEASURED OR INITIATING VARIABLE	MODIFIER	READOUT OR PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER
A   Analysis		Alarm		
B   Burner, Combustion		User's Choice	User's Choice	User's Choice
C   User's Choice			Control	
D   User's Choice	Differential			
E   Voltage		Sensor (Primary Element)		
F   Flow Rate	Ratio (Fraction)			
G   User's Choice		Glass, Viewing Device		
H   Hand				High
I   Current (Electrical)		Indicate		
J   Power	Scan			
K   Time, Time Schedule	Time Rate of Change		Control Station	
L   Level		Light		Low
M   User's Choice	Momentary		Valve, Damper, Louver	Middle, Intermediate
N   User's Choice		User's Choice	User's Choice	User's Choice
O   Overflow		Office Restriction		
P   Pressure, Vacuum		Point (Test) Connection		
Q   Quality	Integrate, Totals			
R   Radiation		Record		
S   Speed, Frequency	Safety		Switch	
T   Temperature			Transmit (I/S)	
U   Multivariable		Multifunction	Multifunction	Multifunction
V   Vibration, Mechanical Analysis			Valve, Damper, Louver	
W   Weight, Force		Wet		
X   Unclassified	X Axis	Unclassified	Unclassified	Unclassified
Y   Event, State or Presence	Y Axis		Relay, Compute, Covert	
Z   Position, Dimension	Z Axis		Driver, Actuator, Unclassified Final Control Element	

ELECTRICAL



ARCHITECTURAL SYMBOL DESIGNATIONS



INSTRUMENTATION

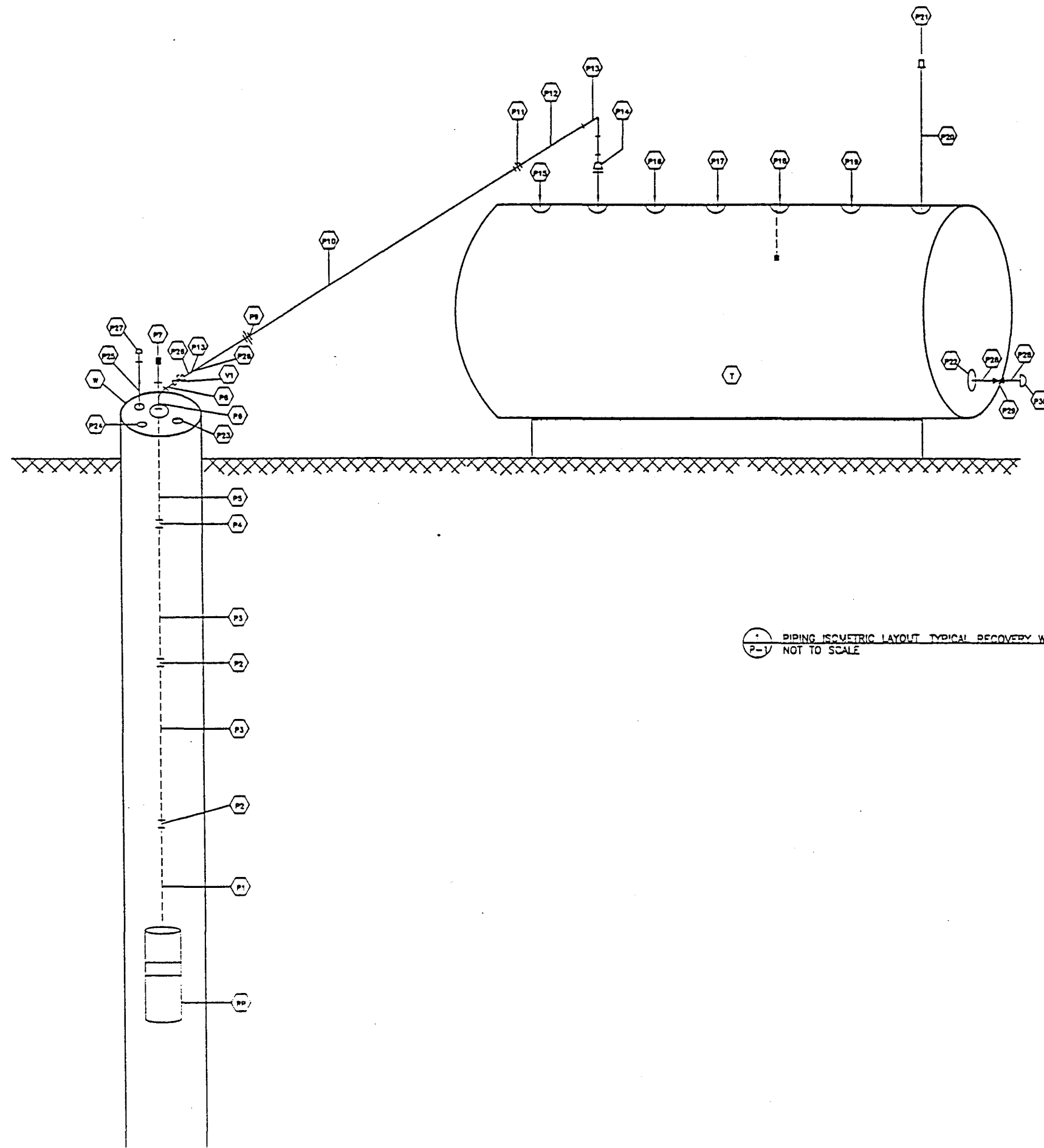



REV	DATE	DESCRIPTION	BY	REVISION

DRAWING G-4  
 SYMBOLS & LEGEND SHEET  
 INTERIM PRODUCT RECOVERY SYSTEM  
 AMOCO SUPERIOR TERMINAL  
 SUPERIOR, WISCONSIN



DELTA PROJECT NUMBER	FILE NAME	SHEET NO.	REV. NO.
10-88-457	88457-04		



PIPING ISOMETRIC LAYOUT TYPICAL RECOVERY WELL NO. 1, 2, & 6  
P-1  
NOT TO SCALE

NOTES AND MATERIALS LIST

PLUMBING MATERIALS LIST - GALV.

- P1 1" PIPE; LENGTH TO BE FIELD DETERMINED (7')
- P2 1" COUPLING; LOCATION AND USE TO BE FIELD DETERMINED
- P3 1" PIPE; LENGTH TO BE FIELD DETERMINED (7')
- P4 1" COUPLING; LOCATION AND USE TO BE FIELD DETERMINED
- P5 1" PIPE; LENGTH TO BE FIELD DETERMINED (10')
- P6 1" 90° TEE
- P7 1" PLUG
- P8 1" x 6" NIPPLE
- P9 UNION
- P10 1" FLEXIBLE GASOLINE RESISTANT HOSE WITH 1" MALE THREADS ON BOTH ENDS
- P11 UNION
- P12 1" NIPPLE; LENGTH TO BE DETERMINED IN FIELD
- P13 1" ELBOW
- P14 2" x 1" BUSHING DOUBLE TAP
- P15 2" PLUG-OBSERVATION PORT
- P16 2" PLUG
- P17 2" PLUG
- P18 HIGH LEVEL/OVERFLOW CONTROL- SUPPLIED WITH SYSTEM CONTROLLER
- P19 4" PLUG
- P20 2" VENT; FINISHED HEIGHT MUST EXCEED 12" ABOVE GRADE
- P21 2" SLIP UPDRAFT VENT CAP
- P22 3" X 2" REDUCING BUSHING
- P23 3/4" PLUG
- P24 3/4" PLUG
- P25 2" x 4" NIPPLE
- P26 1" x 3" NIPPLE
- P27 2" CAP OBSERVATION PORT
- P28 2" x 4" NIPPLE
- P29 2" BALL VALVE
- P30 2" CAP
- V1 1" BRASS BALL VALVE
- T STORAGE TANK (SEE DRAWING P-3 FOR DETAILS)
- W WELL COVER &/OR SEALS (SEE DRAWING P-4 FOR WELL SEAL & COVER DETAILS)
- RP RECOVERY PUMP (SEE DRAWING P-2 FOR DETAILS)

NOTES

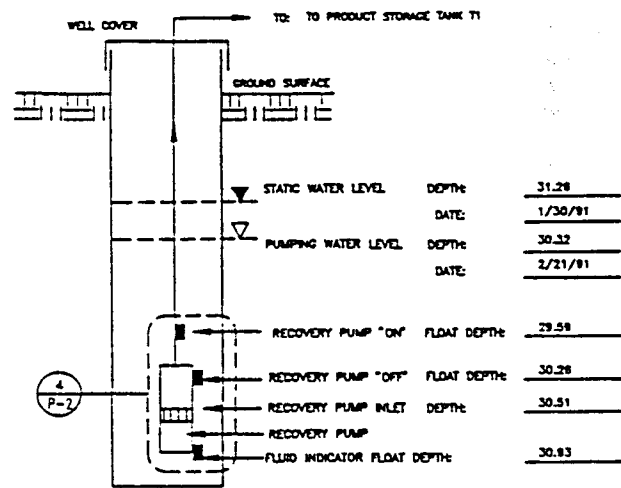
- 1) SEE DRAWING P-2 FOR WELL & PUMP DETAILS
- 2) SEE DRAWING P-3 FOR TANK DETAILS
- 3) SEE DRAWING P-4 FOR WELL SEAL & COVER DETAILS
- 4) ALL STEEL PIPE AND FITTINGS TO BE GALVANIZED

1	2/12	RECORD DRAWINGS		
REV	DATE	DESCRIPTION	DRAWN	REVIEW
			GGG/PA	
DATE	DATE			12/22/80

DRAWING P-1  
PIPING ISOMETRIC LAYOUT  
INTERIM PRODUCT RECOVERY SYSTEM  
AMOCO SUPERIOR TERMINAL  
SUPERIOR, WISCONSIN







RECOVERY WELL SPECIFICATIONS

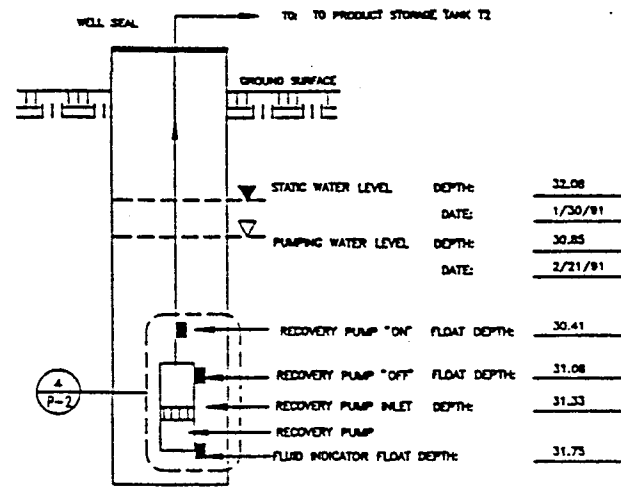
MATERIAL (SCREEN/CASING)	STAINLESS STEEL/LOW CARBON STEEL
DIAMETER (SCREEN/CASING)	12" / 12"
LENGTH (SCREEN/CASING)	22' / 18'
TYPE OF SCREEN	JOHNSON CONTINUOUS WRAP
SLOT SIZE	20
TOTAL DEPTH	41'

STATIC WATER LEVEL	DEPTH:	31.28
	DATE:	1/30/91
PUMPING WATER LEVEL	DEPTH:	30.32
	DATE:	2/21/91
RECOVERY PUMP "ON" FLOAT DEPTH		29.59
RECOVERY PUMP "OFF" FLOAT DEPTH		30.28
RECOVERY PUMP INLET DEPTH		30.51
RECOVERY PUMP		
FLUID INDICATOR FLOAT DEPTH		30.93

NOTE: ALL MEASUREMENTS OBTAINED FROM REFERENCE POINT AND ARE IN FEET.

REFERENCE ELEVATION POINT (0.0 FT.) NORTH SIDE OF WELL CASING

1 RECOVERY WELL NO. 1  
P-2 NOT TO SCALE



RECOVERY WELL SPECIFICATIONS

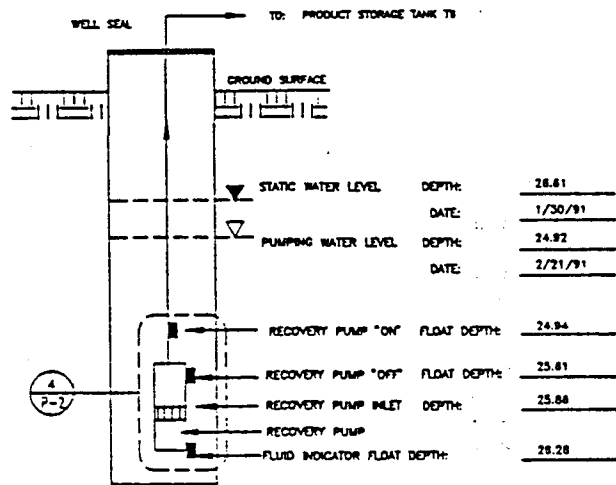
MATERIAL (SCREEN/CASING)	STAINLESS STEEL/LOW CARBON STEEL
DIAMETER (SCREEN/CASING)	6" / 6"
LENGTH (SCREEN/CASING)	22' / 24'
TYPE OF SCREEN	JOHNSON CONTINUOUS WRAP
SLOT SIZE	20
TOTAL DEPTH	48" (INCLUDES 3.0" TRAP AT BOTTOM OF WELL)

STATIC WATER LEVEL	DEPTH:	32.08
	DATE:	1/30/91
PUMPING WATER LEVEL	DEPTH:	30.85
	DATE:	2/21/91
RECOVERY PUMP "ON" FLOAT DEPTH		30.41
RECOVERY PUMP "OFF" FLOAT DEPTH		31.08
RECOVERY PUMP INLET DEPTH		31.33
RECOVERY PUMP		
FLUID INDICATOR FLOAT DEPTH		31.75

ALL MEASUREMENTS OBTAINED FROM REFERENCE POINT AND ARE IN FEET.

REFERENCE ELEVATION POINT (0.0 FT.) NORTH SIDE OF WELL CASING

2 RECOVERY WELL NO. 2  
P-2 NOT TO SCALE



RECOVERY WELL SPECIFICATIONS

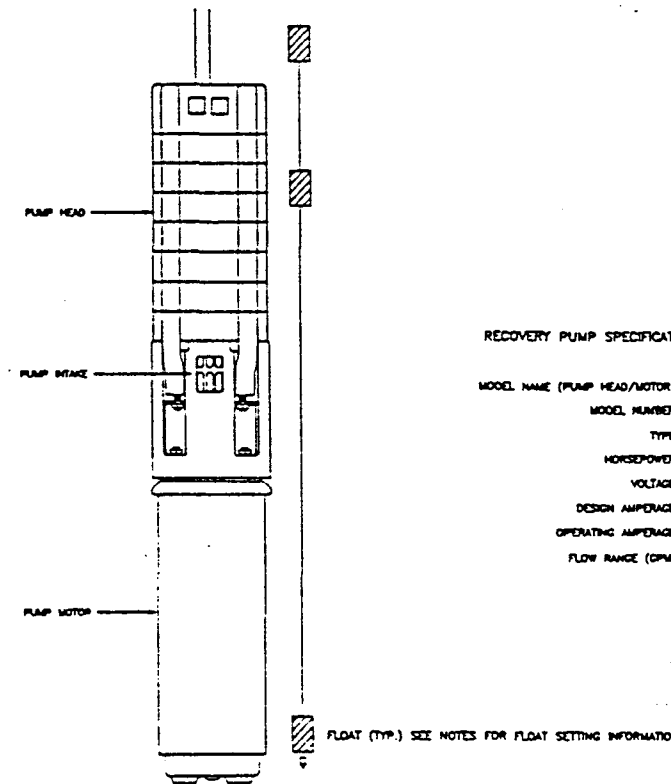
MATERIAL (SCREEN/CASING)	STAINLESS STEEL/LOW CARBON STEEL
DIAMETER (SCREEN/CASING)	6" / 6"
LENGTH (SCREEN/CASING)	22' / 22'
TYPE OF SCREEN	JOHNSON CONTINUOUS WRAP
SLOT SIZE	20
TOTAL DEPTH	48" (INCLUDES 3.0" TRAP AT BOTTOM OF WELL)

STATIC WATER LEVEL	DEPTH:	28.81
	DATE:	1/30/91
PUMPING WATER LEVEL	DEPTH:	24.92
	DATE:	2/21/91
RECOVERY PUMP "ON" FLOAT DEPTH		24.94
RECOVERY PUMP "OFF" FLOAT DEPTH		25.81
RECOVERY PUMP INLET DEPTH		25.88
RECOVERY PUMP		
FLUID INDICATOR FLOAT DEPTH		28.28

NOTE: ALL MEASUREMENTS OBTAINED FROM REFERENCE POINT AND ARE IN FEET.

REFERENCE ELEVATION POINT (0.0 FT.) TOP OF TWO INCH OBSERVATION PORT

3 RECOVERY WELL NO. 3  
P-2 NOT TO SCALE



RECOVERY PUMP SPECIFICATIONS (TYPICAL RP1, RP2, RP3)

MODEL NAME (PUMP HEAD/MOTOR)	GRUNDOS/TRAWLER
MODEL NUMBER	TSP 1-1
TYPE	SUBMERSIBLE-TEFLON FITTED
HORSEPOWER	1/3
VOLTAGE	220 VOLTS
DESIGN AMPERAGE	3.0
OPERATING AMPERAGE	1.0
FLOW RANGE (GPM)	1.2 - 2.2

4 PUMP DETAIL  
P-2 NOT TO SCALE

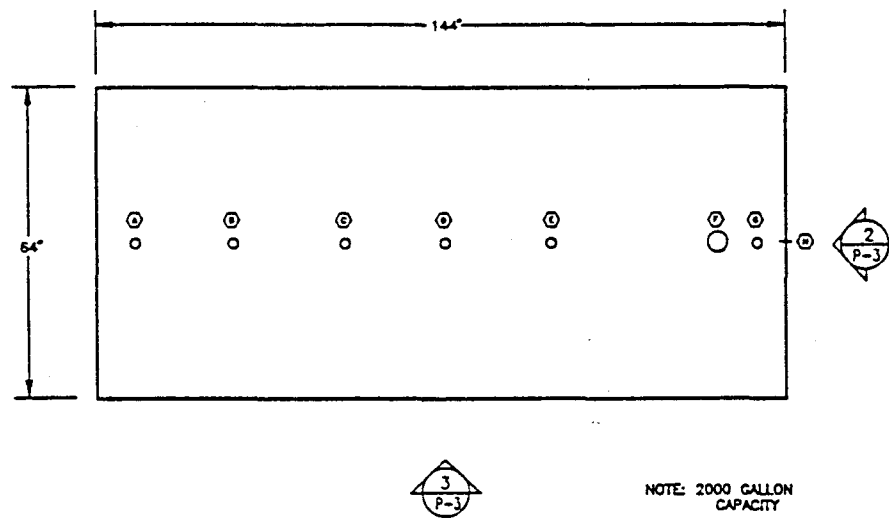
FLOAT SETTING INFORMATION

- 1) ATTACH FLOAT ASSEMBLIES TO PUMPS AS DETERMINED IN FIELD
- 2) SET BOTTOM FLOAT APPROXIMATELY 5 INCHES BELOW PUMP INTAKE AND 2 INCHES ABOVE THE BOTTOM OF THE PRODUCT/WATER INTERFACE IN THE RECOVERY WELLS.

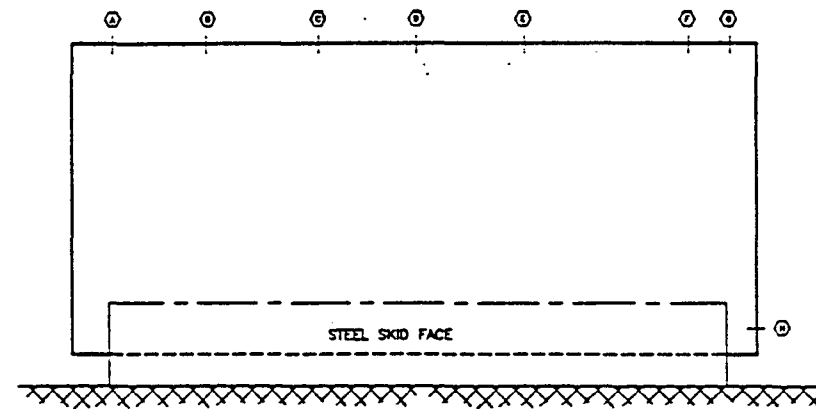
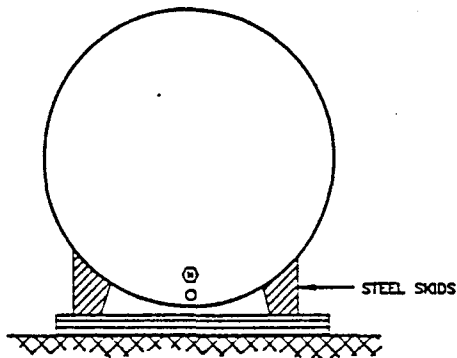
1	2/12	RECORD DRAWINGS		
REV#	DATE	DESCRIPTION	DRAWN	REVIEW
REVIEWED BY		PREPARED BY	GDG/PJ	
DATE		DATE	12-10-90	

DRAWING P-2  
RECOVERY WELL AND PUMP CONFIGURATIONS  
INTERIM PRODUCT RECOVERY SYSTEM  
AMOCO SUPERIOR TERMINAL  
SUPERIOR, WISCONSIN





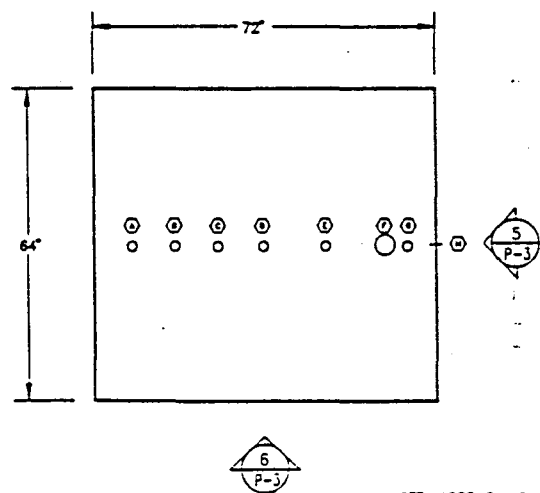
NOTE: 2000 GALLON CAPACITY



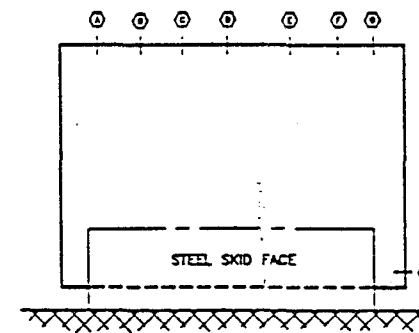
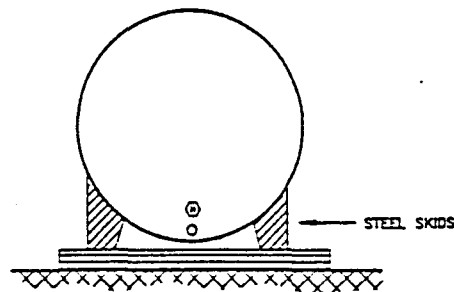
1 PLAN VIEW - PRODUCT STORAGE TANK (TYP.) T1 AND T6  
SCALE: 1" = 4'

2 END VIEW - PRODUCT STORAGE TANK (TYP.) T1 AND T6  
SCALE: 1" = 4'

3 SIDE VIEW - PRODUCT STORAGE TANK (TYP.) T1 AND T6  
SCALE: 1" = 4'



NOTE: 1000 GALLON CAPACITY



4 PLAN VIEW - PRODUCT STORAGE TANK (TYP.) T2  
SCALE: 1" = 4'

5 END VIEW - PRODUCT STORAGE TANK (TYP.) T2  
SCALE: 1" = 4'

6 SIDE VIEW - PRODUCT STORAGE TANK (TYP.) T2  
SCALE: 1" = 4'

IDENTIFICATION AND SPECIFICATIONS:

PIPING INFORMATION

- ⊙ 2" DIAMETER PORT
- ⊙ 2" DIAMETER PORT
- ⊙ 2" DIAMETER PORT
- ⊙ 2" DIAMETER PORT
- ⊙ 2" DIAMETER PORT
- ⊙ 2" DIAMETER PORT
- ⊙ 4" DIAMETER PORT
- ⊙ 2" DIAMETER PORT
- ⊙ 3" DIAMETER PORT

TANK INFORMATION

- MATERIAL: 10 GAUGE STEEL
- CAPACITY: AS NOTED
- FINISH: PAINTED RED
- OTHER: SKID MOUNTED, NEW CONSTRUCTION, SUPPLY HANDLES TO LIFT AND MOVE.

NOTES

- TANKS LEVELLED AND INSTALLED ON TREATED LUMBER

1	12/12	RECORD DRAWINGS	
REVIEW DATE	DESCRIPTION	DRAWN	REVIEW
REVIEWED BY	PREPARED BY	GDG/PAJ	
DATE	DATE	12/12/90	

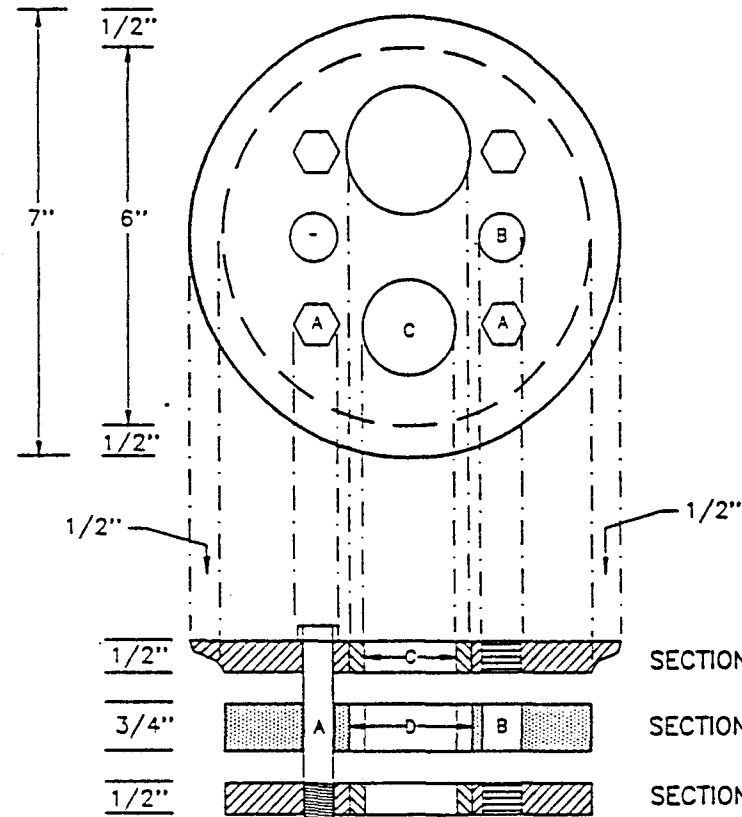
DRAWING P-3  
PRODUCT STORAGE TANKS  
INTERIM PRODUCT RECOVERY SYSTEM  
AMOCO SUPERIOR TERMINAL  
SUPERIOR, WISCONSIN



OBJECT IDENTIFICATION

- A- 1/2" X 2 1/2" HEX HEAD GALVANIZED BOLTS (4), SECTION 1 DRILLED TO 5/8" Ø (SMOOTH BORE), SECTION 2 DRILLED TO 1/2" Ø, SECTION 3 DRILLED AND THREADED FROM TOP DOWN 1/2" Ø.
- B- 3/4" NPT FEMALE OPENING. SECTION 1 DRILLED AND THREADED FROM TOP DOWN 3/4" Ø, SECTION 2 DRILLED TO 3/4" Ø (SMOOTH BORE), SECTION 3 DRILLED AND THREADED FROM BOTTOM UP 3/4" Ø.
- C- COMPRESSION OPENING FOR 1" SCH 40 GALVANIZED PIPE. SECTION 1 DRILLED TO 1 1/2" Ø (SMOOTH BORE), SECTION 2 AND 3 ALSO DRILLED TO 1 1/2" Ø (SMOOTH BORE). NO THREADS IN OPENING C.
- D- 2" NPT FEMALE OPENING. SECTION 1 DRILLED AND THREADED FROM TOP DOWN FOR 2" Ø SCH 40 GALVANIZED PIPE. SECTION 2 DRILLED TO 2" Ø (SMOOTH BORE), SECTION 3 DRILLED TO 2" Ø (SMOOTH BORE).

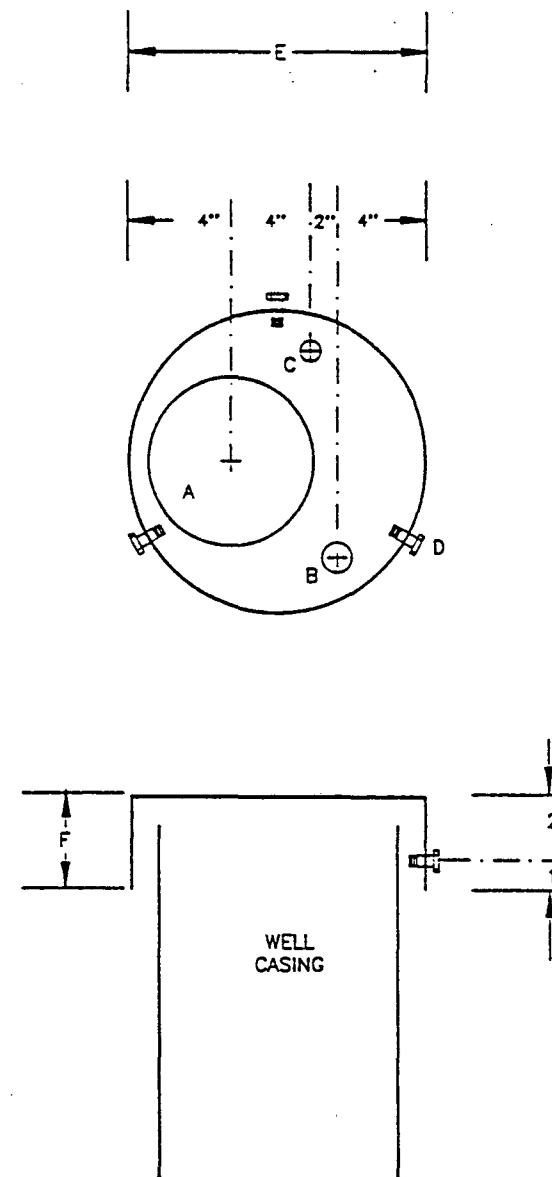
PLAN VIEW



CROSS SECTIONAL VIEW

1 RECOVERY WELL SEALS RW-2 & RW-6  
P-4 NOT TO SCALE

PLAN VIEW



CROSS SECTIONAL VIEW

2 RECOVERY WELL COVER RW-1  
P-4 NOT TO SCALE

OBJECT IDENTIFICATION

ID	OD	LENGTH/HEIGHT	THREADED	MATERIAL
A	6 1/8"	6 5/8"	1 1/2"	NO LCS
B	2"	2 3/8"	3"	YES LCS
C	3/4"	1"	2"	YES LCS
D	-	1/2"	2"	YES GALVANIZED
E	14"	14 1/2"	-	NO SS
F	-	-	3"	NO SS

NOTES:

LCS = LOW CARBON STEEL  
SS = STAINLESS STEEL  
PAINT COVER GLOSS BLACK  
THREADED = MALE NPT  
INSTALL 2" HINGED LOCKING CAP ON ITEM B  
INSTALL 3/4" MUSHROOM VENT CAP ON ITEM C  
RW-1 WELL SEAL IS A 6" x 1" STANDARD SEAL  
WELL COVER NOT REQUIRED FOR RW-2 & RW-6

REVI	DATE	DESCRIPTION	DRAWN	REVIEW
REVIEWED BY		PREPARED BY	GDG/CD	
DATE		DATE	12/17/90	

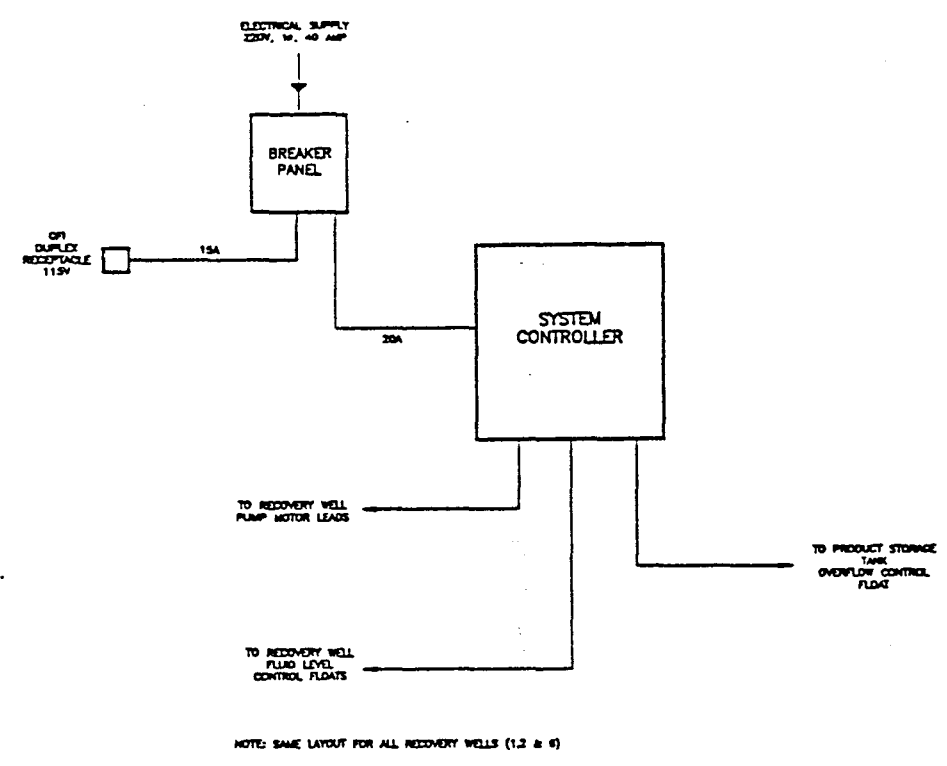
DRAWING P-4  
RECOVERY WELL  
SEALS & COVER DETAIL  
INTERIM PRODUCT RECOVERY SYSTEM  
AMOCO SUPERIOR TERMINAL  
SUPERIOR, WISCONSIN



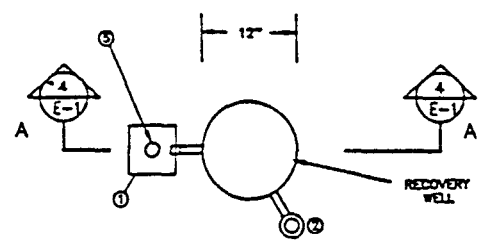
DELTA PROJECT NUMBER	FILE NAME	SHEET NO.	REV. NO.
10-86-457	88457-P4		

**NOTES**

1. SEE DRAWING E-2 FOR CONTROL PANEL WIRING DETAILS
2. SEE DRAWING C-2 FOR LOCATIONS OF ELECTRICAL SUPPLY LINES
3. ELECTRICAL SUPPLY TO RW-1 IS SUPPLIED FROM THE EMERGENCY BREAKER PANEL WITHIN AMOCO'S OFFICE BUILDING
4. ELECTRICAL SUPPLY TO RW-2 IS SUPPLIED FROM THE BREAKER PANEL WITHIN THE BELL OF LADING SHACK
5. ELECTRICAL SUPPLY TO RW-4 IS SUPPLIED FROM WITHIN THE ELECTRICAL BUILDING AS SHOWN ON DRAWING C-2
6. DUE TO WINTER INSTALLATION UNIONS AND EXTRA MATERIAL HAVE BEEN INSTALLED TO MINIMIZE COSTS OF INSTALLING CONDUIT UNDERGROUND WHEN WEATHER PERMITS. ALL WIRING IS ENCLOSED IN 3/4" RIGID CONDUIT AND IS INSTALLED ON THE SURFACE OF THE GROUND



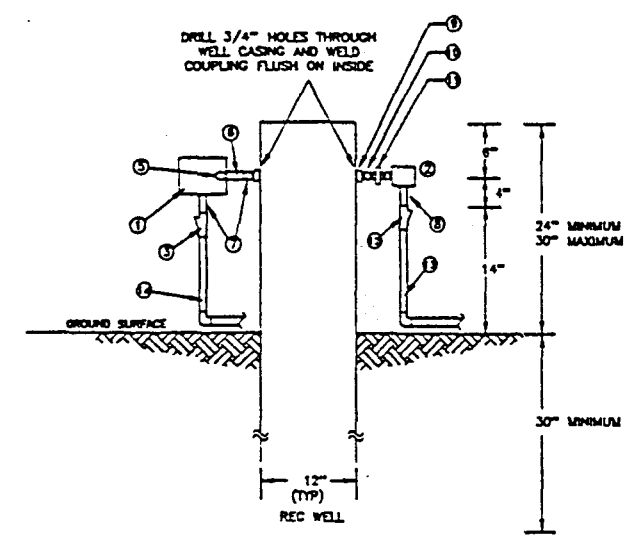
1 ELECTRICAL FLOW DIAGRAM  
E-1  
NOT TO SCALE



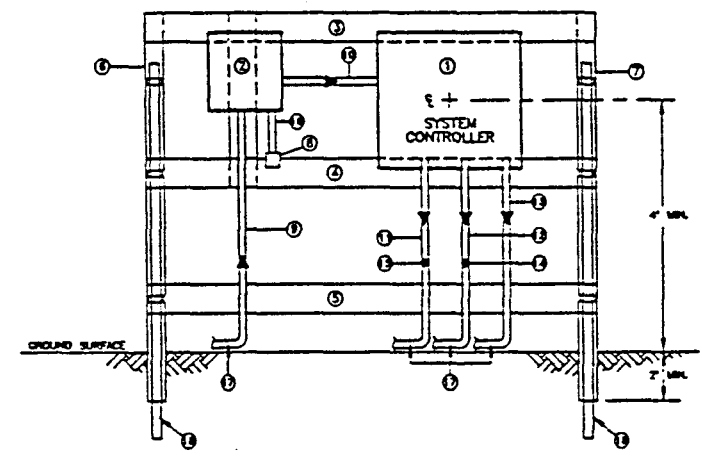
**MATERIAL DESCRIPTION**

- 1 WEATHERPROOF JUNCTION BOX
- 2 CROUSE HINDS JUNCTION BOX #CJ4B228
- 3 CROUSE HINDS 3/4" CONDUIT SEAL #EYSZ
- 4 CROUSE HINDS CORROSION RESISTANT CABLE FITTINGS #CCB22334
- 5 3/4" COUPLING
- 6 3" NIPPLE
- 7 3" NIPPLE
- 8 3/4" COUPLING
- 9 3/4" x 1" NIPPLES
- 10 3/4" UNION
- 11 CROUSE HINDS 3/4" CONDUIT SEAL #EYSZ
- 12 3/4" RIGID CONDUIT, CONDUIT FOR RECOVERY PUMP MOTOR LEAD
- 13 3/4" RIGID CONDUIT, CONDUIT FOR FLUID LEVEL CONTROL FLOATS

3 WELL HEAD ELECTRICAL DETAIL - PLAN VIEW  
E-1  
NOT TO SCALE



4 WELL HEAD ELECTRICAL DETAIL - SECTION VIEW  
E-1  
NOT TO SCALE



2 ELECTRICAL LAYOUT CONTROL PANELS & MOUNTING STRUCTURE  
E-1  
NOT TO SCALE

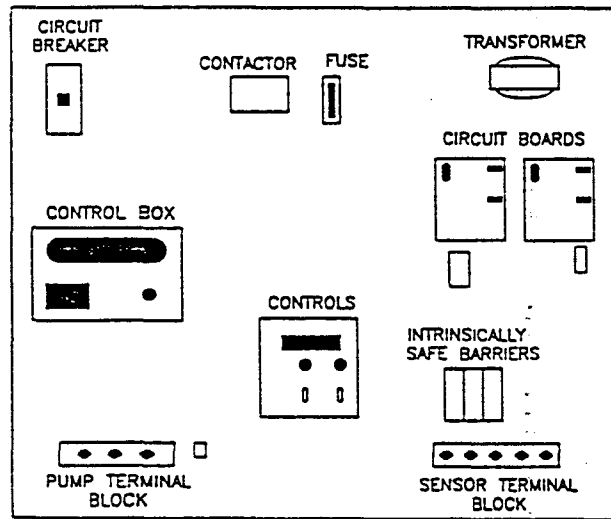
**MATERIAL DESCRIPTION**

- 1 SYSTEM CONTROLLER - SUPPLIED BY VENDOR  
- TO BE MOUNTED AT A MINIMUM 3/4" ABOVE FROM RECOVERY WELL HEAD.  
- MOUNT 4" ABOVE GROUND LEVEL.  
- MOUNT SECURELY TO WOOD FRAME.  
- INSTALL ON SEPARATE 220 V, 15 & 2-PHASE 20A BREAKER.
- 2 BREAKER PANEL  
- TO BE CAPABLE OF HANDLING A MINIMUM OF 40A.  
- MESA OR RAINING OR EQUIVALENT.  
- MOUNT SECURELY TO WOOD FRAME.
- 3 2x6 TREATED LUMBER OR EQUIVALENT  
- LENGTH TO BE DETERMINED IN FIELD
- 4 SAME AS ITEM 3
- 5 SAME AS ITEM 3
- 6 4x4 TREATED TIMBER  
- LENGTH DETERMINED IN FIELD  
- BURIAL DEPTH MIN. 2'0"
- 7 SAME AS ITEM 6
- 8 DUPLEX RECEPTACLE  
- WEATHER TIGHT INSTALLATION  
- SEPARATE 15 AMP BREAKER
- 9 3/4" RIGID CONDUIT OR EQUIVALENT
- 10 SAME AS ITEM 9
- 11 SAME AS ITEM 9
- 12 SAME AS ITEM 9
- 13 3/4" CONDUIT SEAL CROUSE HIND #EYSZ OR EQUIVALENT
- 14 SAME AS ITEM 12
- 15 SAME AS ITEM 12
- 16 INCOMING POWER (SEE NOTES)  
- 220 V 15  
- 50 AMP MINIMUM  
- SOURCE TO FIELD DETERMINED  
- SOURCE SHOULD BE SUCH THAT DISCONNECTION IS UNLIKELY.
- 17 1" CONDUIT POUNDED 30" INTO GROUND FOR SUPPORT OF CONTROL PANEL RACK

1	2/12	RECORD DRAWINGS		
REVIEW DATE	DESCRIPTION	DRAWN	REVIEW	
REVIEWED BY		PREPARED BY	GDC/DD	
DATE		DATE	12/19/90	

DRAWING E-1  
ELECTRICAL DETAILS  
INTERIM PRODUCT RECOVERY SYSTEM  
AMOCO SUPERIOR TERMINAL  
SUPERIOR, WISCONSIN

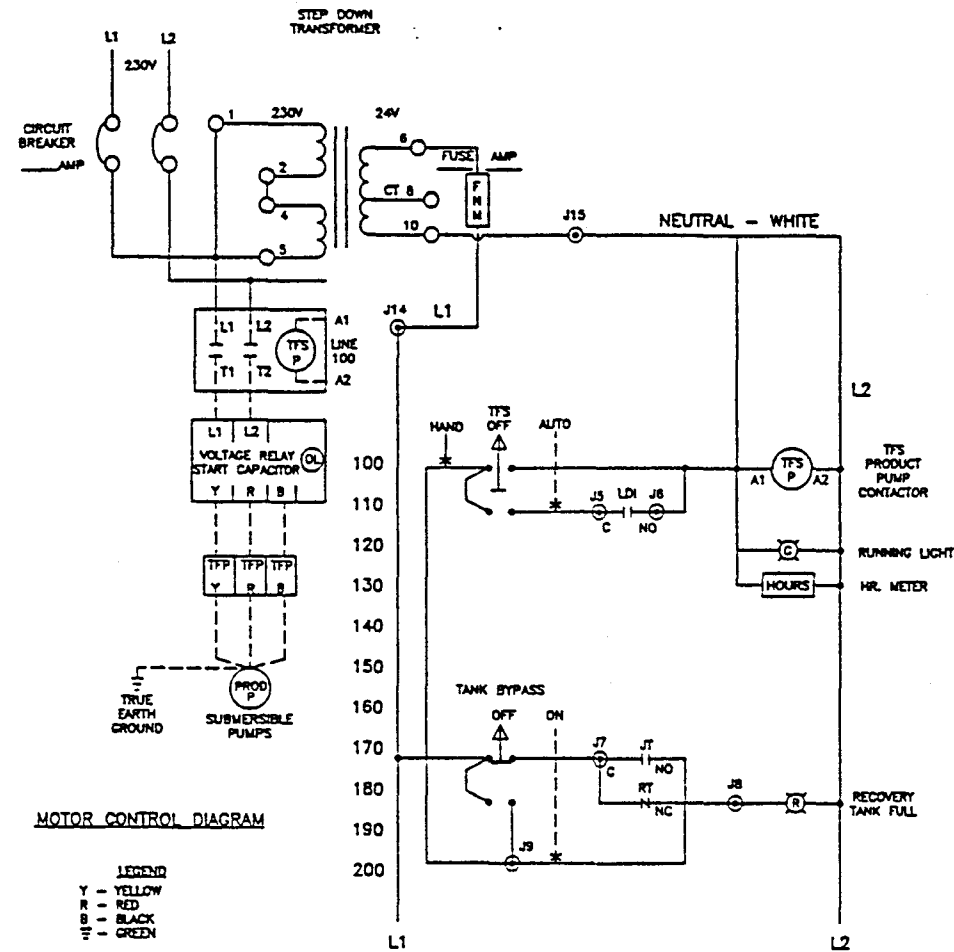




POWER IN PUMP IN

FLOATS IN TSOS

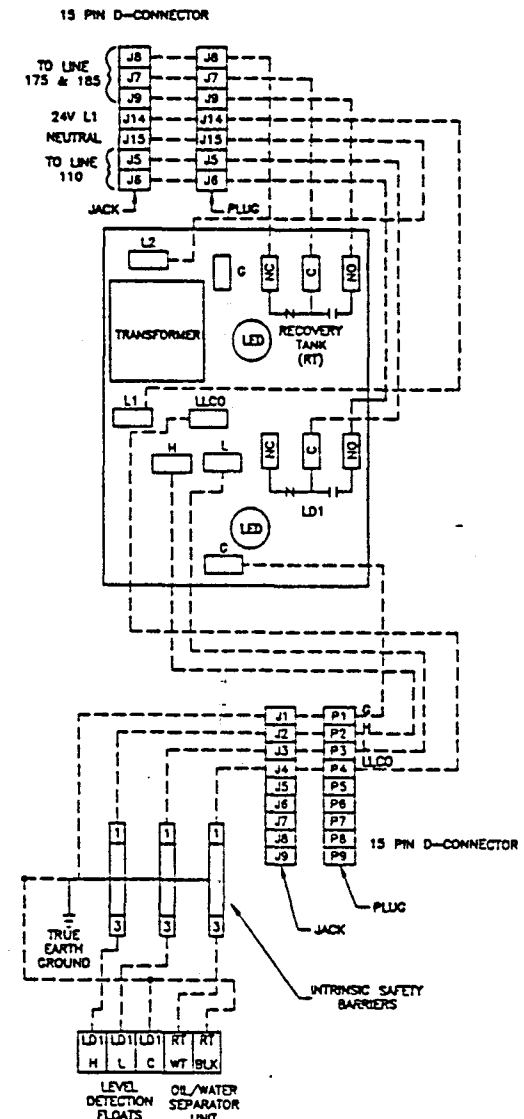
1 SYSTEM CONTROL PANELS (TYP. RW-1, 2, AND 6)  
E-2 NOT TO SCALE



MOTOR CONTROL DIAGRAM

LEGEND  
Y - YELLOW  
R - RED  
B - BLACK  
W - GREEN

2 24v. CONTROL WIRING DIAGRAM  
E-2 NOT TO SCALE



LEVEL DETECTION FLOATS  
H - HIGH LEVEL FLOATS YELLOW  
L - LOW LEVEL FLOATS YELLOW  
C - COMMON BLACK

3 HAZARDOUS CIRCUIT WIRING DIAGRAM  
E-2 NOT TO SCALE

1	2/12	RECORD DRAWINGS		
REV	DATE	DESCRIPTION	DRAWN	REVIEW
			GDC/DD	
DATE	DATE			12/20/90

DRAWING E-2  
SYSTEM CONTROL PANEL  
WIRING DETAILS  
INTERIM PRODUCT RECOVERY SYSTEM  
AMOCO SUPERIOR TERMINAL  
SUPERIOR, WISCONSIN

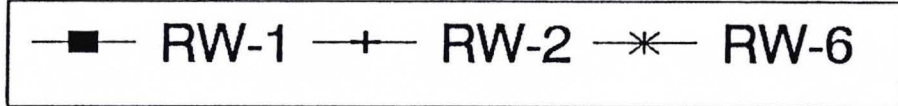
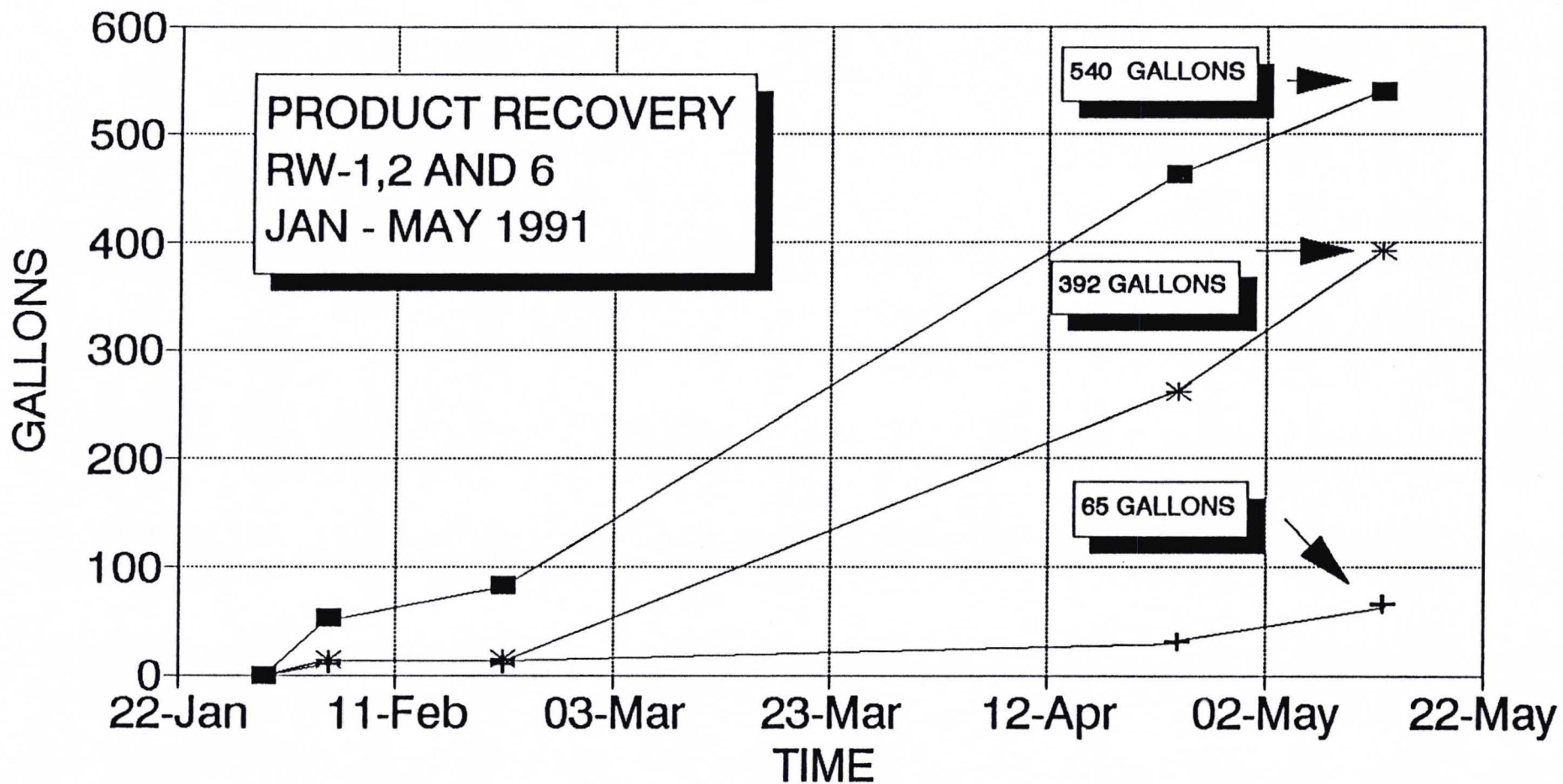


**APPENDIX B**

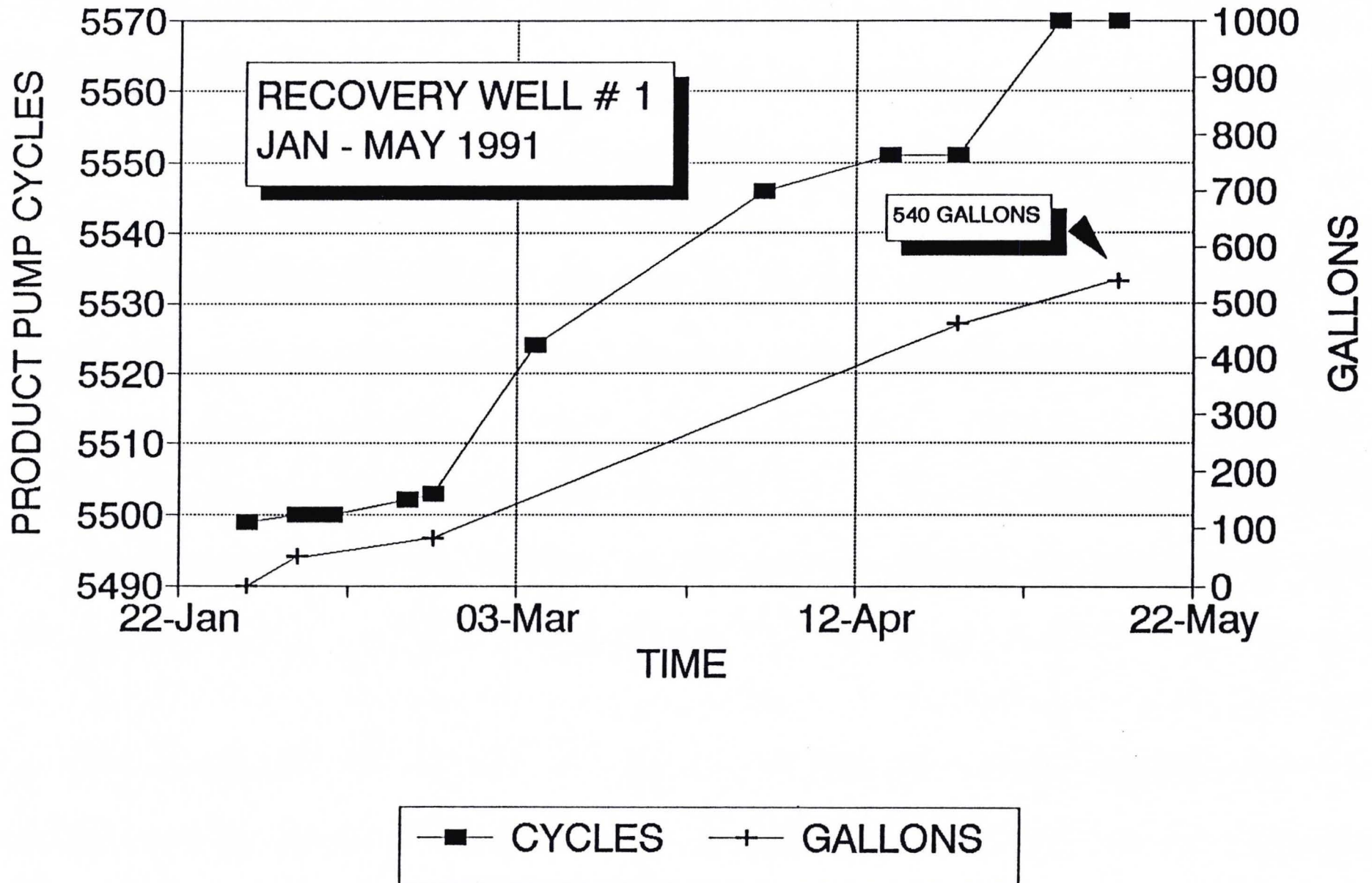
**Operating Data from IPRS**



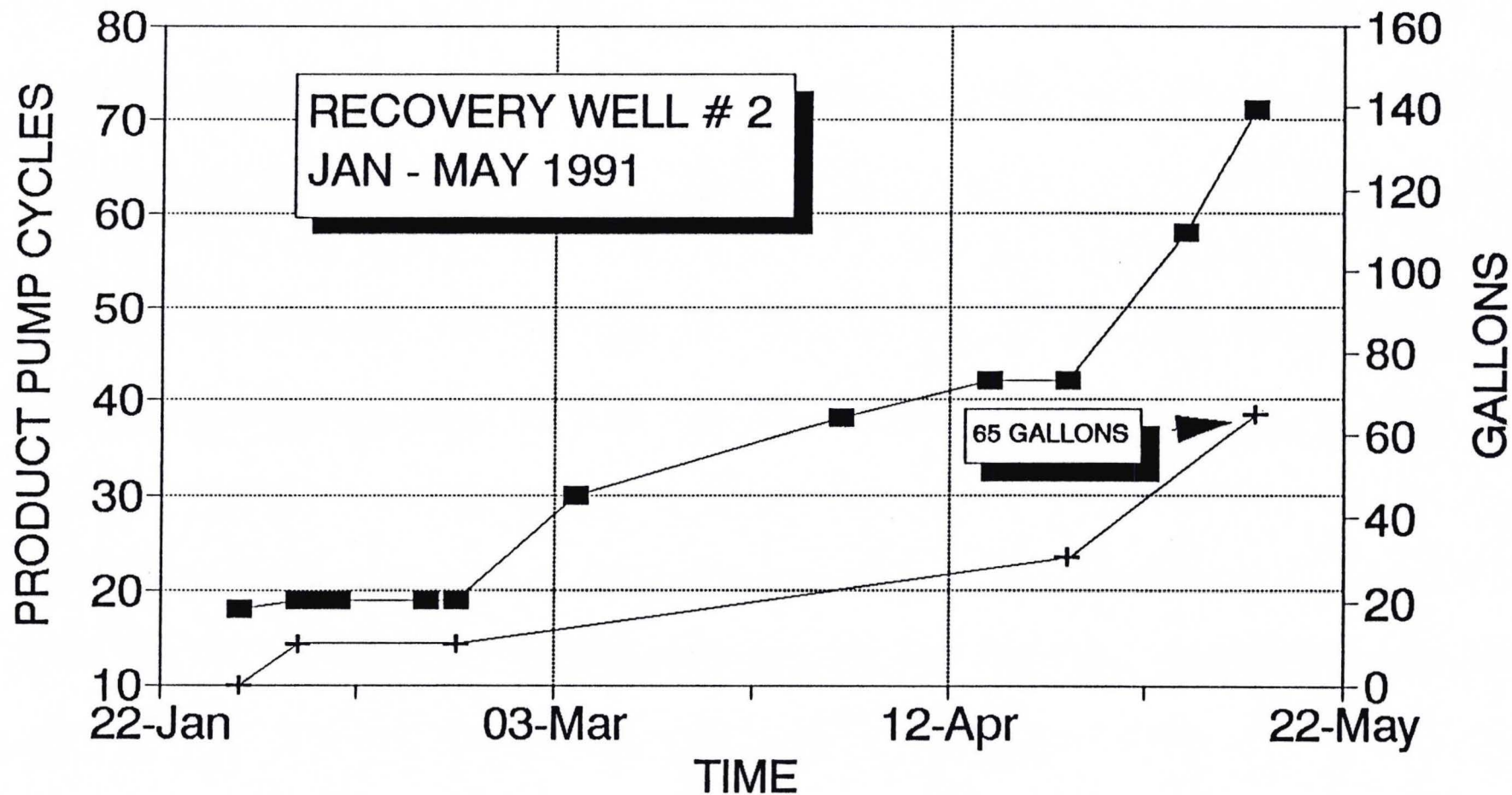
# INTERIM PRODUCT RECOVERY SYSTEM AMOCO SUPERIOR TERMINAL



# INTERIM PRODUCT RECOVERY SYSTEM AMOCO SUPERIOR TERMINAL



# INTERIM PRODUCT RECOVERY SYSTEM AMOCO SUPERIOR TERMINAL

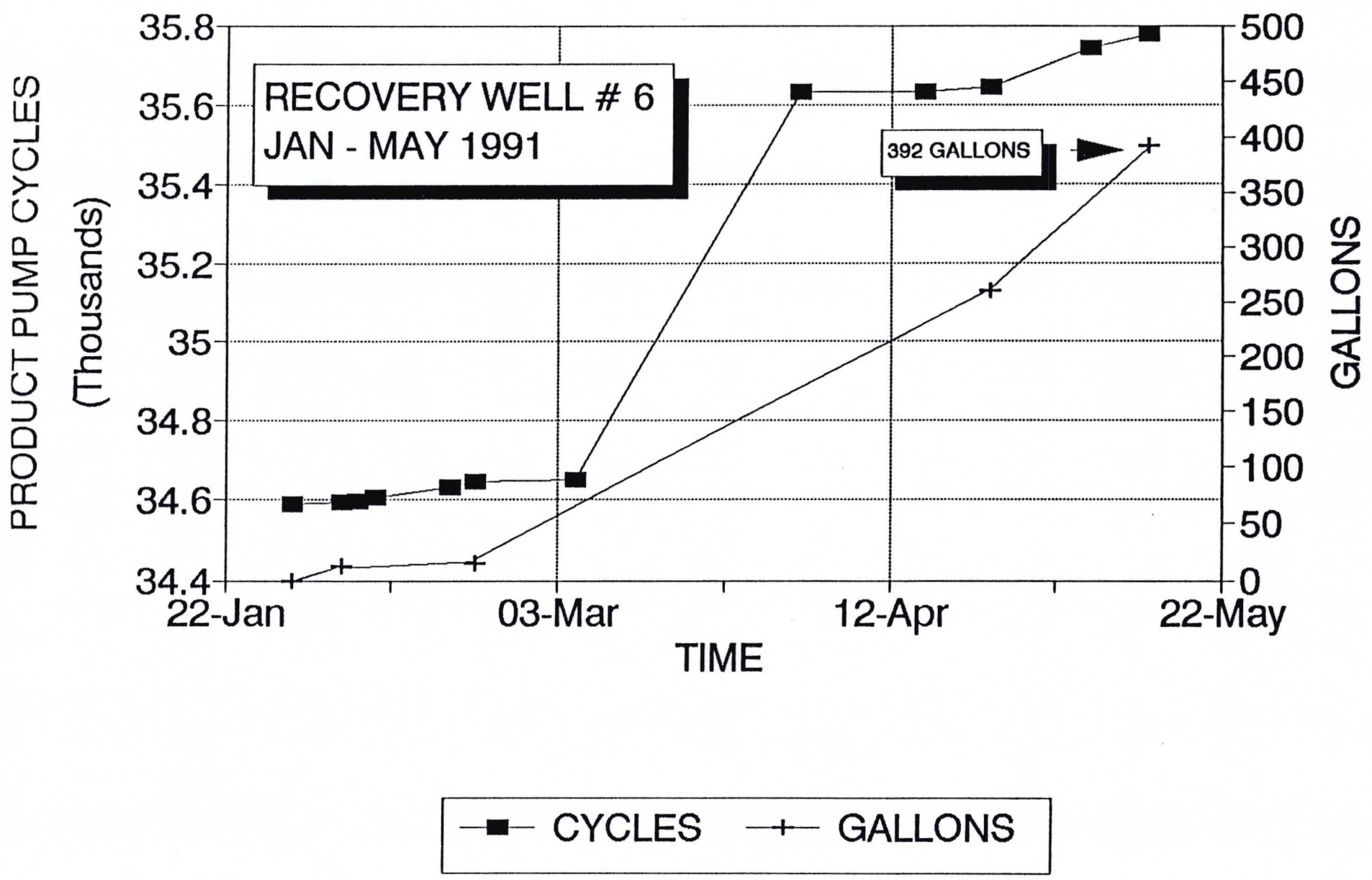


—■— CYCLES    —+— GALLONS



# INTERIM PRODUCT RECOVERY SYSTEM

## AMOCO SUPERIOR TERMINAL



OPERATING DATA  
 INTERIM PRODUCT RECOVERY SYSTEM  
 AMOCO SUPERIOR TERMINAL  
 SUPERIOR, WI  
 DELTA NO 10-88-457

RECOVERY WELL #1

DATE	RECOVERY WELL				PRD TANK			TOTAL	
	PROD LVL	WTR LVL	PRD THK	CYCLES	HOURS	PROD LVL	PRD THK	PROD VOL	PROD REC
01/30/91	21.69	31.26	9.57	5499		0	0	0	0
02/05/91				5500	365.2	4.56	0.38	52	52
02/07/91				5500	365.2				
02/09/91				5500	365.2				
02/18/91				5502	365.3				
02/21/91	22.17	30.32	8.15	5503	365.4	4.48	0.46	83	83
03/05/91				5524	365.8				
04/01/91				5546	366.4				
04/16/91				5551	366.6				
04/24/91	22.2	28.26	6.06	5551	366.6	3.44	1.5	462	462
05/06/91				5570	366.9				
05/13/91	21.5	25.9	4.4	5570	366.9	3.25	1.69	540	540

RECOVERY WELL #2

DATE	RECOVERY WELL				PRD TANK			TOTAL	
	PROD LVL	WTR LVL	PRD THK	CYCLES	HOURS	PROD LVL	PRD THK	PROD VOL	PROD REC
01/30/91	20.58	32.08	11.5	18	0.4	0	0	0	0
02/05/91				19	0.4	5.13	0.12	10	10
02/07/91				19	0.4				
02/09/91				19	0.4				
02/18/91				19	0.4				
02/21/91	21.1	30.85	9.65	19	0.4	5.14	0.11	10	10
03/05/91				30	0.6				
04/01/91				38	49.8				
04/16/91				42	49.9				
04/24/91	20.58	29.69	9.11	42	49.9	4.87	0.38	31	31
05/06/91				58	49.9				
05/13/91	19.42	27.75	8.33	71	49.9	4.62	0.63	65	65

RECOVERY WELL #6

DATE	RECOVERY WELL				PRD TANK			TOTAL	
	PROD LVL	WTR LVL	PRD THK	CYCLES	HOURS	PROD LVL	PRD THK	PROD VOL	PROD REC
01/30/91	20.47	26.61	6.14	34590	293	0	0	0	0
02/05/91				34592	293.05	5	0.12	13	13
02/07/91				34597	293.1				
02/09/91				34604	293.15				

02/18/91				34630	293.4				
02/21/91	21.56	24.92	3.36	34643	293.5	5	0.15	15	15
03/05/91				34649	293.5				
04/01/91				35632	298.4				
04/16/91				35632	298.4				
04/24/91	22.22	25.44	3.22	35645	298.5	4.34	0.96	261	261
05/06/91				35742	299.7				
05/13/91	21	23.45	2.45	35776	300	3.95	1.35	392	392