GW - ___028____

ABOVE GROUND TANK SCHEDULE

DATE:

01/14/09

Chavez, Carl J, EMNRD

From: Chavez, Carl J, EMNRD
Sent: Thursday, December 01, 2011 7:15 AM
To: 'Moore, Darrell'; Krueger, Pamela; Tsinnajinnie, Leona, NMENV; Cobrain, Dave, NMENV
Cc: Dade, Randy, EMNRD; Lackey, Johnny; Spence, Richard (Trampas); VonGonten, Glenn, EMNRD
Subject: RE: TK-401 Leak
Attachments: API 653.pdf; listing_of_standards_and_practices.pdf; AST Repair.doc

Darrell:

The propose method of tank repair does not appear to be consistent with API-653 and/or other applicable professional AST guidelines for tank repairs based on the type and volume of refinery tank. In addition, the repairs shall comply with the requirements stipulated in the OCD discharge permit (GW-028) for retrofitting or upgrading the tank to acceptable standards.

Please find attached some references to acceptable practices for tank repairs and provide the agencies with reference to the proper guidelines that the tank will be repair to. Once the repairs are completed, provide the schematic with references of the reconstructed tank for the OCD's tank records.

Thank you.

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"Why not Prevent Pollution; Minimize Waste; Reduce the Cost of Operations; & Move Forward with the Rest of the Nation?" To see how, go to "Pollution Prevention & Waste Minimization" at:
http://www.emnrd.state.nm.us/ocd/environmental.htm#environmental)

From: Moore, Darrell [mailto:Darrell.Moore@hollyfrontier.com]
Sent: Tuesday, November 29, 2011 10:41 AM
To: Chavez, Carl J, EMNRD; Krueger, Pamela; Tsinnajinnie, Leona, NMENV; Cobrain, Dave, NMENV
Cc: Dade, Randy, EMNRD; Lackey, Johnny; Spence, Richard (Trampas)
Subject: RE: TK-401 Leak

Carl et al,

Typically, there are no engineering drawings done for tank repairs. Obviously, when a new tank is built, there will be engineered drawings to build the tank .....but not for repairs. The lower floor will be repaired using cork and silicon to seal the holes. Four (4) inches of gravel will then be added on top of the lower floor. A brand new steel floor will then be welded into place on top of the gravel. Weep holes (tattle tales) will be added between the two floors for leak detection.

After the new floor has been welded into place, the tank will be hydrotested with fresh groundwater to ensure mechanical integrity. The tank will then be placed back into service.

Materials and crews have been ordered to start this work Monday, December 5, 2011. If there are any questions about this approach, please call me at 575-746-5281 or at my email address.

From: Chavez, Carl J, EMNRD [mailto:CarlJ.Chavez@state.nm.us]
Sent: Tuesday, November 22, 2011 4:30 PM
To: Krueger, Pamela; Moore, Darrell; Tsinnajinnie, Leona, NMENV; Cobrain, Dave, NMENV
Cc: Dade, Randy, EMNRD
Subject: RE: TK-401 Leak

Pam and Darrell:

I think NMED can respond to the AOC; active remediation based on the chemicals of concern; and/or monitoring downgradient from the tank in question.

OCD requests and engineering drawing to determine how the tank will actually be repaired, since it seems like patch work is the plan bases on the LEL and safety concerns. OCD thinks there needs to be competent lower plate, LDS, with another well designed plate above the LDS with an MIT that verifies no leakage to the LDS in order to restore the tank to working order.
Based on the above, the operator can propose an alternative to the above to the agencies.

I'll be back in next Tuesday, November 29, 2011 at 6:30 a.m. NMED should respond tomorrow before the holiday, and if not, maybe by November 28, 2011.

Thank you.

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http://www.emnrd.state.nm.us/ocd/environmental.htm#environmental)

From: Krueger, Pamela [mailto:pam.krueger@arcadis-us.com]
Sent: Tuesday, November 22, 2011 2:52 PM
To: Moore, Darrell; Chavez, Carl J, EMNRD; Tsinnajinnie, Leona, NMENV
Cc: Dade, Randy, EMNRD
Subject: RE: TK-401 Leak

Tank 401 is already included in the Permit under AOC3 – Southeast Tank Farm. That AOC is included in AOC Group 1. MW-28 is on the downgradient side of the Southeast Tank Farm, almost due east of Tank 401. This well is sampled semiannually and the analyte list includes GRO, DRO, Volatiles, metals and cyanide.

Pamela R. Krueger | Senior Project Manager | pam.krueger@arcadis-us.com
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ARCADIS, Imagine the result

From: Moore, Darrell [mailto:Darrell.Moore@hollyfrontier.com]
Sent: Tuesday, November 22, 2011 3:32 PM
To: Chavez, Carl J, EMNRD; Tsinnajinnie, Leona, NMENV
Cc: Dade, Randy, EMNRD; Krueger, Pamela
Subject: RE: TK-401 Leak

Et al

We have gotten into this tank and are having problems with LEL levels. The LEL levels are making it unsafe to do any cutting of the floor so that we could perform the path forward delineated below. Obviously, there is some amount of contamination below the tank. Since we cant cut the floor safely, even using water, we would like to propose a modified path forward.

1) We will plug all holes in the current floor of the tank. This should isolate whatever contamination is under the tank and allow us to get the LEL's down to a safe level.
2) We will then cover the floor with 4" of pea gravel and install a new steel floor in the tank.
3) The below path forward mentions MW-99 as being a monitor well to watch. That monitor well is actually WEST of TK 401 and will probably not be relevant to this issue. That was my mistake. However, MW-28 is about 300 ft due east of TK-401 and we can monitor that well for any trends in VOC's. MW-66 is also east of TK-401, but just south of due east.

Since we cant safely approach this any other way, this may be a candidate to be included in our post-closure permit as an Area of Concern (AOC).

From: Chavez, Carl J, EMNRD [mailto:CarlJ.Chavez@state.nm.us]
Sent: Thursday, November 10, 2011 7:48 AM
To: Tsinnajinnie, Leona, NMENV
Cc: Moore, Darrell; Dade, Randy, EMNRD
Subject: FW: TK-401 Leak

Leona:

I spoke with Darrell Moore this morning about the leak and a path forward as requested in his e-mail on 11/8.

The path forward is:

1) Remove the section where the double pinhole leak is located (NW Quadrant of Tank within 3 ft. of cement ring wall (note: no liner exists beneath the tank) and hand auger down to 10 ft. and assess cuttings and PID readings for gross contamination assessment. A bottom hole sample collected using EPA QA/QC and DQO protocols will be analyzed for TPH and VOCs.

2) The closest MW (MW-99) is located about 300 yds E-NE of Tank will be evaluated for increasing trends of VOCs.

3) The Prax-Aire monitoring was implemented about a year ago and there were no indications of a leak at that time according to Darrell. Prax-Aire was called out recently again and detected a leak, but it was the stained soils from the tattle-tale leak leak detection system in the concrete ringwall beneath the tank that indicated that there was a leak.

4) The operator will notify the NMED and OCD before the augering is to be performed. Based on this work, the agencies will need to determine whether active remediation and another MW positioned down gradient is warranted. Darrell indicated that this area was not in a SWMU.

Please chime in if you have comments and/or recommendations at this time. Thank you.

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http://www.emnrd.state.nm.us/ocd/environmental.htm#environmental)

From: Chavez, Carl J, EMNRD
Sent: Tuesday, November 08, 2011 7:24 AM
To: Tsinnajinnie, Leona, NMENV
Subject: FW: TK-401 Leak

Leona:

I'm wondering if this is the tank with the liner connected to the inner ring-wall of the tank concrete base? Also, I though Navajo had a liquid level alarm to detect product loss or some method to gauge the tanks for possible loss?

I'm reading up on napthas now to see about contaminant hydrogeology and monitoring..... I'll get back with you soon to discuss.

Thanks.

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http://www.emnrd.state.nm.us/ocd/environmental.htm#environmental)

From: Moore, Darrell [mailto:Darrell.Moore@hollyfrontier.com]
Sent: Tuesday, November 08, 2011 7:00 AM
To: Chavez, Carl J, EMNRD; Tsinnajinnie, Leona, NMENV
Subject: TK-401 Leak

Carl and Leona

Ive attached the C-141 and a few photos of a leak we had in a gasoline tank (Tk-401). This C-141 and the pictures were sent to OCD and NMED on October 7, 2011. We have emptied the tank and found a small hole in the floor in the northwest quadrant and that will be repaired. We have cleaned up the part of the spill that can be reached. Obviously we cant clean up the spill that is under the tank. So Im looking for guidance from OCD and NMED about a path going forward. Do we put this area on the AOC list in our post-closure permit and deal with it that way?

Darrell Moore
Environmental Manager for Water and Wastec
The Holly Frontier Companies
Navajo Refining Company, LLC
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Artesia NM 88211-0159
Phone: 575-746-5281
Cell: 575-703-5058

List of Frequently Utilized Storage Tank Standards and Practices

Below is a list of frequently used storage tank standards and practices from organizations that are referenced in 25 PA Code, Chapter 245. There may be other applicable standards. The current (or most recent) edition/revision of a publication should be used.

American Petroleum Institute	
Number (ID)	Title &/or Description
Construction Standards:	
API Spec 12D	Specifications for Field Welded Tanks for Storage of Production Liquids
API Spec 12F	Shop Welded Tanks for Storage of Production Liquids
API Spec 12P	Specifications for Fiberglass Reinforced Plastic Tanks
API Std 620	Design and Construction of Large, Welded, Low Pressure Storage Tanks
API Std 650	Welded Steel Tanks for Oil Storage (Replaced several API 12 series Spec's)
API Std 2000	Venting Atmospheric and Low-pressure Storage Tanks
API Std 2610	Design, Construction, Operation, Maintenance, and Inspection of Terminal & Tank Facilities
Inspection Standards: (Includes Construction Alteration, and Reconstruction Standards)	
API Std 510	Pressure Vessel Inspection Code (Maintenance Inspection, Rating, Repair and Alteration)
API Std 570	Inspection, Repair, Alteration, and Rerating of In-Service Piping Systems
API Std 653	Tank Inspection, Repair, Alteration, and Reconstruction
API Std 2015	Requirements for Safe Entry & Cleaning of Petroleum Storage Tanks
Recommended Practices:	
API RP 12H	Installation of New Bottoms in Old Storage Tanks
API RP 12R	Setting, Maintenance, Inspection, Operation, and Repair of Tanks in Production Service
API RP 574	Inspection Practices for Piping System Components
API RP 575	Inspection of Atmospheric and Low Pressure Storage Tanks
API RP 580	Risk Based Inspection
API RP 651	Cathodic Protection of Aboveground Petroleum Storage Tanks
API RP 652	Lining of Aboveground Petroleum Storage Tank Bottoms
API RP 1107	Pipeline Maintenance Welding Practices
API RP 1110	Pressure Testing of Liquid Petroleum Pipelines
API RP 1604	Closure of Underground Petroleum Storage Tanks
API RP 1615	Installation of Underground Petroleum Storage Systems
API RP 1626	Storing and Handling Ethanol and Gasoline-Ethanol Blends at Distribution Terminals and Service Stations
API RP 1627	Storing and Handling of Gasoline-Methanol/Cosolvent Blends at Distribution Terminals and Service Stations
API RP 1631	Interior Lining and Periodic Inspection of Underground Storage Tanks
API RP 1632	Cathodic Protection of Underground Petroleum Storage Tanks and Piping Systems
API RP 1637	Using the API Color-Symbol System to Mark Equipment and Vehicles for Product Identification at Gasoline Dispensing Facilities and Distribution Terminals
API RP 2003	Protection Against Ignitions Arising Out of Static, Lightning and Stray Currents
API RP 2016	Guidelines for Entering and Cleaning Petroleum Storage Tanks

American Petroleum Institute	
Number (ID)	Title &/or Description
API RP 2027	Ignition Hazards Involved in Abrasive Blasting of Atmospheric Storage Tanks in Hydrocarbon Service
API RP 2350	Overfill Protection for Storage Tanks in Petroleum Facilities
Other Publications:	
API – 334	A Guide to Leak Detection for Aboveground Storage Tanks
API Pub 2009	Safe Welding, Cutting and Hot Work Practices in the Petroleum and Petrochemical Industries
API Pub 2200	Repairing Crude Oil, Liquefied Petroleum Gas, and Product Pipelines
API – 2207	Preparing Tank Bottoms for Hot Work
API Pub 2217A	Guidelines for Work in Inert Confined Spaces in the Petroleum Industry

Petroleum Equipment Institute	
Number (ID)	Title &/or Description
Recommended Practices:	
PEI RP 100	Recommended Practices for Installation of Underground Liquid Storage Systems
PEI RP 200	Recommended Practices for Installation of Aboveground Storage Systems for Motor Vehicle Fueling

National Leak Prevention Association	
Number (ID)	Title &/or Description
Recommended Practices:	
NLPA Std 631	Entry, Cleaning, Interior Inspection, Repair and Lining of Underground Storage Tanks

NACE International – The Corrosion Society	
Number (ID)	Title &/or Description
Inspection Standards:	
NACE TM 01-01	Measurement Techniques Related to Criteria for Cathodic Protection on Underground or Submerged Metallic Tank Systems
NACE TM 04-97	Measurement Techniques Related to Criteria for Cathodic Protection on Underground or Submerged Metallic Piping Systems
Recommended Practices:	
NACE 1/SSPC-SP5	Steel Structures Painting Council: "White Metal Blast Cleaning"
NACE 2/SSPC-SP10	Steel Structures Painting Council: "Near White Metal Blast Cleaning"
NACE 3/SSPC-SP6	Steel Structures Painting Council: "Commercial Blast Cleaning"
NACE 4/SSPC-SP7	Steel Structures Painting Council: "Brush Off Cleaning"
NACE 10/SSPC-PA6	Steel Structures Painting Council: "Fiberglass-Reinforced Plastic (FRP) Linings Applied to Bottoms of Carbon Steel Aboveground Storage Tanks"
NACE RP 0169	Control of External Corrosion on Underground or Submerged Metallic Piping Systems

NACE International – The Corrosion Society	
Number (ID)	Title &/or Description
NACE RP 0172	Surface Preparation of Steel and Other Hard Materials by Water Blasting Prior to Coating or Recoating
NACE SP 0177	Mitigation of Alternating Current and Lightning Effects on Metallic Structures and Corrosion Control Systems
NACE RP 0178	Design, Fabrication, and Surface Finish of Metal Tanks and Vessels to be Lined for Chemical Immersion Service
NACE RP 0184	Repair of Lining Systems
NACE RP 0187	Design Considerations for Corrosion Control of Reinforcing Steel in Concrete
NACE SP 0188	Discontinuity (Holiday) Testing of New Protective Coatings on Conductive Substrates
NACE RP 0193	External Cathodic Protection of On-Grade Carbon Steel Storage Tank Bottoms
NACE RP 0275	Application of Organic Coatings to the External Surface of Steel Pipe for Underground Service
NACE RP 0285	Corrosion Control of Underground Storage Tank Systems by Cathodic Protection

National Fire Protection Association see also 37 PA Code Chapters 11 and 13, Flammable & Combustible Liquids Handbook	
Number (ID)	Title &/or Description
Construction Standards:	
NFPA 70 (NEC)	National Electric Code®
NFPA 30	Flammable and Combustible Liquids Code
NFPA 30A	Motor Fuel Dispensing Facilities and Repair Garages
NFPA 303	Marinas and Boatyards
Recommended Practices:	
NFPA 77	Static Electricity
NFPA 326	Safeguarding Tanks and Containers for Entry, Cleaning or Repair

Underwriters Laboratories	
Number (ID)	Title &/or Description
Construction Standards:	
UL Std 58	Standards for Steel Underground Tanks for Flammable and Combustible Liquids
UL Std 142	Standard for Steel Aboveground Tanks for Flammable and Combustible Liquids
UL Std 567	Standard for Emergency Breakaway Fittings, Swivel Connectors and Pipe-Connection Fittings for Petroleum Products and LP-Gas
UL Std 842	Standard for Valves for Flammable Fluids
UL Std 860	Standard for Pipe Unions for Flammable and Combustible Fluids and Fire Protection Service
UL Std 971	Standard for Nonmetallic Underground Piping for Flammable Liquids
UL Std 1316	Glass-Fiber-Reinforced Plastic Underground Storage Tanks for Petroleum Products, Alcohol and Alcohol-Gasoline Mixtures
UL Std 1746	Standard for External Corrosion Protection Systems for Steel Underground Storage Tanks
UL Std 2085	Standard for Protected Aboveground Tanks for Flammable and Combustible Liquids
UL Std 2245	Standard for Below-grade Vaults for Flammable Liquid Storage Tanks

American National Standards Institute	
Number (ID)	Title &/or Description
Construction Standards:	
ASME B31.3	American Society of Mechanical Engineers: "Process Piping"
ASME B31.4	American Society of Mechanical Engineers: "Liquid Transportation Systems for Hydrocarbons, Liquid Petroleum Gas, Anhydrous Ammonia and Alcohols"
Recommended Practices:	
ASSE Z117.1	American Society of Safety Engineers: "Safety Requirements for Confined Spaces"

American Society for Testing and Materials	
Number (ID)	Title &/or Description
Construction Standards:	
ASTM A182/A182M	Standard Specification for Forged or Rolled Alloy Stainless Steel Pipe Flanges, Forged Fittings and Valves and Parts for High-Temperature Service
ASTM D2996	Standard Specification for Filament-Wound Fiberglass (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe
ASTM D4097	Standard Specification for Contact-Molded Glass-Fiber-Reinforced Thermoset Resin Corrosion Resistant Tanks
ASTM D5685	Standard Specification for Fiberglass (Glass-Fiber-Reinforced Thermosetting-Resin) Pressure Pipe Fittings
Recommended Practices:	
ASTM E797	Standard Practice for Measuring Thickness by Manual Ultrasonic Pulse-Echo Contact Method
ASTM D2794	Standard Test Method for Resistance of Organic Coatings on the Effects of Rapid Deformation (Impact)

Steel Tank Institute	
Number (ID)	Title &/or Description
Construction Standards:	
STI P3	Specification and Manual for External Corrosion Protection of Underground Steel Storage Tanks
STI F841	Standard for Dual Wall Underground Steel Storage Tanks
STI F894	Act-100® Specification For External Corrosion Protection of FRP Composite Steel USTs (See also Association of Composite Tanks)
STI F921®	F921® Standard for Aboveground Tanks with Integral Secondary Containment
STI F922	Specification for Permatank®
STI F941	Standards for Fireguard® Thermally Insulated Aboveground Storage Tanks
STI R951	Specification for Tanks Using Low Levels of Pressure in the Tanks Interstice
STI F961	ACT-100U Specification for External Corrosion Protection of Composite Steel Underground Storage Tanks
Inspection Standards:	
STI SP001	Standard for Inspection of In-Service Shop Fabricated Aboveground Tanks for Storage of Combustible and Flammable Liquids
Recommended Practices:	
STI SP031	Standard for Repair of In-Service Shop Fabricated Aboveground Tanks for Storage of Combustible & Flammable Liquids

Steel Tank Institute	
Number (ID)	Title &/or Description
STI R821	sti-P3 Installation Instructions
STI R891	RP for Hold Down Strap Isolation
STI R892	RP for Corrosion Protection of Underground Piping Networks Associated with Liquid Storage and Dispensing Systems
STI R912	Installation Instructions for Shop Fabricated Aboveground Storage Tanks for Flammable, Combustible Liquids
STI R913	Act-100® Installation Instructions
STI R923	Permatank® Installation Instructions
STI R931	F921® Installation Instructions
STI R942	Fireguard® Installation & Testing Instructions for Thermally Insulated, Lightweight, Double Wall Fireguard Aboveground Storage Tanks
STI R971	ACT-100-U® Installation Instructions
STI R972	RP for the Addition of Supplemental Anodes to sti-P3® USTs

Steel Structures Painting Council see also NACE International	
Number (ID)	Title &/or Description
Recommended Practices:	
	SSPC Painting Manual volume I
	SSPC Painting Manual volume II

Association of Composite Tanks	
Number (ID)	Title &/or Description
Construction Standards:	
ACT 100	Specification for the Fabrication of FRP Clad Underground Storage Tanks

Fiberglass Petroleum Tank and Pipe Institute	
Number (ID)	Title &/or Description
Recommended Practices:	
FPTP 1	Fiberglass Piping Systems Installation Check List for Underground Petroleum Pipe
FTPI RP T-95-02	Remanufacturing of Fiberglass Reinforced Plastic (FRP) Underground Storage Tanks

American Concrete Institute	
Number (ID)	Title &/or Description
Recommended Practices:	
ACI 350	Environmental Engineering Concrete Structures

BODY OF KNOWLEDGE
API-653 ABOVEGROUND STORAGE TANK INSPECTOR CERTIFICATION EXAMINATION

November 2007 (Replaces November 2006)

API Authorized Aboveground Storage Tank Inspectors must have a broad knowledge base relating to tank inspection and repair of aboveground storage tanks. The API Aboveground Storage Tank Inspector Certification examination is designed to identify individuals who have satisfied the minimum qualifications specified in API Standard 653, *Tank Inspection, Repair, Alteration, and Reconstruction.*

The examination consists of two parts. The closed book part tests the candidate on knowledge and tasks requiring everyday working knowledge of API Standard 653 and the applicable reference documents. The open book portion of the examination requires the use of more detailed information that the inspector is expected to be able to find in the documents, but would not normally be committed to memory.

REFERENCE PUBLICATIONS:

A. API Publications

API Recommended Practice 571, Damage Mechanisms Affecting Equipment in Refining Industry
API Recommended Practice 577, Welding Inspection and Metallurgy
API Recommended Practice 575, *Inspection of Atmospheric and Low-Pressure Storage Tanks*
API Standard 650, *Welded Steel Tanks for Oil Storage*
API Recommended Practice 651, *Cathodic Protection of Aboveground Petroleum Storage Tanks*
API Recommended Practice 652, *Lining of Aboveground Petroleum Storage Tank Bottoms*
API Standard 653, *Tank Inspection, Repair, Alteration, and Reconstruction*

B. ASME Publications

American Society of Mechanical Engineers (ASME) *Boiler & Pressure Vessel Code*:
Section V, Nondestructive Examination
Section IX, Welding and Brazing Qualifications

Note: Refer to the Publications Effectivity Sheet in the application package for a list of which editions, addenda, and supplements of the reference publications are effective for your exam.

I. CALCULATIONS & TABULAR EVALUATIONS FOR EVALUATING THICKNESS MEASUREMENTS, WELD SIZES, AND TANK INTEGRITY

(NOTE: Paragraph references for all formulas and calculations listed here should be checked for accuracy to the edition, addenda, or supplement for the examination you plan to take per the Publication Effectivity Sheet in the API Examination Application.)

NOTE: Candidates are expected to be able to understand SI units (metric system) and the US customary units (inches, feet, PSI, etc.) and to use both system formulas.

A. Calculation questions will be oriented toward existing tanks, not new tanks. API Authorized AST Inspectors should be able to check and perform calculations included in the following categories:

1. CORROSION RATES AND INSPECTION INTERVALS (API-575, Paragraph 7.6)

The Inspector should be able to take inspection data and determine the internal and external inspection intervals. These calculations could be in either the "open book" or "closed book" portion of the exam. The Inspector must be able to calculate:

a. Metal Loss (including corrosion averaging - API-653, Section 4)
b. Corrosion Rates
c. Remaining Life
d. Remaining Corrosion Allowance (API-653, Section 6)
e. Inspection Interval (API-653, Section 6)

$$\text{Remaining life (years)} = \frac{t_{actual} - t_{minimum}}{\text{corrosion rate}}$$

[inches (millimeters per year]

Where:

t_{actual} = the thickness, in inches (millimeters), recorded at the time of inspection for a given location or component.

$t_{minimum}$ = minimum allowable thickness, in inches (millimeters), for a given location or component.

$$\text{Corrosion rate} = \frac{t_{previous} - t_{actual}}{\text{years between } t_{actual} \text{ and } t_{previous}}$$

$t_{previous}$ = the thickness, in inches (millimeters), recorded at the same location as t_{actual} measured during a previous inspection.

The formulas for performing the above calculations and rules for setting the inspection intervals may be "closed-book" during the exam. The inspector should also be able to compensate for the corrosion allowance. (Add or subtract based on requirements from the exam problem.)

2. JOINT EFFICIENCIES

The inspector must be able to determine the joint efficiency, "E", of a tank weld. Inspector should be able to determine:

a. Joint Types (API-653 Section 4, Table 4-2)

b. Type and extent of radiography performed (API 653, Table 4-2, Section 12; API 650, Section 6.1, Figure 6-1)

c. Joint efficiency by reading API-653, Table 4-2

Determining joint efficiency may be part of a minimum thickness or maximum fill height problem since joint efficiency, "E", is used in the formulas for determining required thickness. (API-653, 4.3.3.1)

3. MAXIMUM FILL HEIGHT (HYDROSTATIC TESTING)

The inspector should be able to determine the maximum liquid height for a tank. To determine the height, the "t_{min}" formula in API-653 is rearranged as follows. This formula will be provided in the exam. The inspector is NOT expected to derive this formula by using transposition.

a. Calculate the minimum allowable thickness per Section 4 of API 653 or the maximum fill height in the localized corroded area per:

$$H = \left(\frac{S \times E \times t_{min}}{2.6 \times D \times G} \right)$$

b. Calculate the minimum allowable thickness per Section 4 of API 653 or the maximum fill height for an entire shell course per:

$$H = \left(\frac{S \times E \times t_{min}}{2.6 \times D \times G} \right) + 1$$

4. WELD SIZES FOR SHELL & ROOF OPENINGS

The inspector should be familiar with determining the sizes and spacing of welds for shell openings to the extent of being able to use the information in the following Figures and Tables:

a) API-650, Figures 3-4A, 3-4B, 3-5, 3-6, 3-9, 3-11, 3-13, 3-14, 3-16, 3-17, 3-18
b) API-650, Tables 3-6, 3-7, 3-9
c) API-653, Figures 9-1, 9-2, 9-3A, 9-3B

5. HOT TAPPING

a) The Inspector should be familiar with the Hot Tapping requirements. (API-653, Paragraph 9.14)
b) The inspector should be able to calculate the minimum spacing between an existing nozzle and a new hot tap nozzle. (API-653 Paragraph 9.14.3)

6. SETTLEMENT EVALUATION

The Inspector should be able to calculate the maximum allowed settlement for the following:

a) Edge Settlement (API-653 Appendix B.2.3, fig. B-5)
b) Bottom Settlement Near the Tank Shell (API-653, Appendix B.2.4, Figures B-6, B-7, B-9 B-10, B-11, B-12)
c) Localized Bottom Settlement Remote from the Tank Shell (API-653, B.2.5, Fig. B-8)

7. NUMBER OF SETTLEMENT POINTS

a) The inspector should be able to calculate the number of survey points for determining tank settlement. (API-653 12.5.1.2, Appendix B, Figure B-1, Figure B-2)

8. IMPACT TESTING

The inspector should understand the importance of tank materials having adequate toughness. The inspector should be able to determine:

a) Tank design metal temperature (API-650, 2.2.9.3 & Figure 2-2)
b) Material Group Number for a plate (API-650, Tables 2-3a and 2-3b)
c) If impact testing is required (API-650, Figure 2-1)
d) If impact test values are acceptable (API-650, Table 2-4)

9. EXISTING TANK SHELL - MINIMUM THICKNESS

a) Calculate "S", allowable stress (API-653, 4.3.3.1 & 4.3.4.1)
b) Determine "E", Joint efficiency (API-653, 4.3.3.1, 4.3.4.1 & Tables 4-2 & 4-3)
c) Determine "H", liquid height (API-653, 4.3.3.1 & 4.3.4.1)
d) Calculate- minimum acceptable thickness (API-653, 4.3.3.1 & 4.3.4.1)
e) Calculate the thickness required for continued service (API-653, 4.3.3.1 & 4.3.4.1)

10. RECONSTRUCTED TANK SHELL - MINIMUM THICKNESS

The inspector should be able to determine the minimum thickness of the shell of a reconstructed tank. The inspector should be able to:

a) Determine "S_d", allowable stress for design condition (API-650, table 3-2, API-653, 8.4.2)
b) Determine "S_t", allowable stress for hydrostatic test condition (API-650, Table 3-2, API-653, 8.4.3)
c) Calculate "t_d", design shell thickness (API-650, 3.6.3.2, for tanks of 200 foot diameter and smaller)
d) Calculate "t_t", hydrostatic test shell thickness (API-650, 3.6.3.2)

11. TANK SHELL - CORRODED AREA

The inspector should be able to determine if a tank shell corroded area is acceptable for continued service. The inspector should be able to:

a) Select "t_2", minimum thickness exclusive of pits for a corroded area (API-653, 4.3.2.1.a & Figure 4-1)
b) Calculate "L", critical length for a corroded area (API-653, 4.3.2.1.b & Figure 4-1)
c) Determine "t_1", average thickness for a corroded area (API-653, 4.3.2.1.c, 4.3.2.1.d, Figure 4-1)
d) Determine "t_{min}" for the corroded area "H", height and "E", joint efficiency will be based on corroded area (API-653, 4.3.3.1)
e) Determine if "t_1" and "t_2" are acceptable (API-653, 4.3.3.1.a & .b)

12. TANK SHELL - PITTING

The inspector should be able to evaluate a pitted area. The inspector should be able to:

a) Calculate maximum acceptable pit depth (API-653, 4.3.2.2.a)
b) Determine the maximum length of pits in any 8" vertical length (API-653, 4.3.2.2.b & Figure 4-2)

13. BOTTOM PLATE MINIMUM THICKNESS

The inspector should be able to determine if the bottom thickness is acceptable for continued service. The inspector should be able to:
Calculate "MRT_1" & "MRT_2", minimum remaining thickness at the next inspection. (API-653, 4.4.7.1)
Calculate "O", maximum period of operation. These formulas will be provided in the exam.

14. REPLACEMENT PLATES

a) The inspector should be able to determine the minimum dimensions for a replacement plate. (API-653, Figure 9-1)

15. LAP WELDED PATCH PLATES

Per API-653, Paragraph 9.3 the inspector should be able to determine:

a) The minimum thickness
b) The minimum weld size
c) The allowable size of the patch plate

B. Typical code calculations and requirements that candidates will **NOT** be expected to know for purposes of the certification examination.

1. Required thickness calculations for wind, earthquake, and small internal pressures;
2. Nozzle calculations for external loads;
3. Flange calculations;
4. Brazing requirements;
5. Calculating venting requirements;
6. Ladder, stairway, and other structural type calculations;
7. Calculations for bottoms supported by grillage;
8. Variable point method calculations

II. WELDING ON ATMOSPHERIC ABOVEGROUND STORAGE TANKS

ASME Section IX, Welding and Brazing Qualifications

(NOTE: Candidiates should be familiar with the basic requirements for welding qualifications for procedures and welding personnel contained in ASME Section IX. Brazing is NOT covered on the examination.)

A. The inspector should have the knowledge and skills required to review a Procedure Qualification Record and a Welding Procedure Specification or to answer questions requiring the same level of knowledge and skill. Questions covering the specific rules of Section IX will be limited in complexity and scope to the SMAW and SAW welding processes.

1) Questions will be based on:
   a) No more than one process
   b) Filler metals limited to one
   c) Essential, non-essential, variables only will be covered
   d) Number, type, and results of mechanical tests
   e) Base metals limited to P1
   f) Additional essential variables required by API-650 or API-653

2) The following are specifically excluded:
   a) Dissimilar base metal joints
   b) Supplemental powdered filler metals and consumable inserts
   c) Special weld processes such as corrosion-resistant weld metal overlay, hard-facing overlay, and dissimilar metal welds with buttering
   d) Charpy impact requirements and supplementary essential variables
   e) Any PQR and WPS included on the examination will not include heat treatment requirements.

B. The inspector should know that the WPS must reference the applicable PQR and that the PQR must be signed and dated.

C. **API-650 and API-653:** General welding requirements:

1) **API Standard 650**, *Welded Steel Tanks for Oil Storage:* The inspector should be familiar with and understand the general rules for welding in API-650, Section 7 and other rules for welding in API-650 such as those for:
   a) typical joints and definitions
   b) weld sizes
   c) restrictions on joints
   d) maximum allowable reinforcement
   e) inspection requirements

2) **API Standard 653**, *Tank Inspection, Repair, Alteration, and Reconstruction:* The inspector should be familiar with and understand the general rules for welding in API-653, Section 11.

III. NONDESTRUCTIVE EXAMINATION

ASME Section V, Nondestructive Examination

NOTE: The examination will cover only the main body of each referenced Article, except as noted:

A. Article 1, General Requirements:
The inspector should be familiar with and understand:

1) The Scope of Section V,
2) Rules for use of Section V as a referenced Code,
3) Responsibilities of the Owner / User, and of subcontractors,
4) Calibration,
5) Definitions of "inspection" and examination",
6) Record keeping requirements.

B. Article 2, Radiographic Examination:
The inspector should be familiar with and understand:

1) The Scope of Article 2 and general requirements,
2) The rules for radiography as typically applied on butt welded AST horizontal and vertical seams such as, but not limited to:
   required marking
   type, selection, number, and placement of IQIs,
   allowable density
   control of backscatter radiation
   location markers
3) Records

C. Article 6, Liquid Penetrant Examination, Including Mandatory Appendix II:
The inspector should be familiar with and understand:

1) The Scope of Article 6,
2) The general rules for applying and using the liquid penetrant method such as but not limited to:
   a) procedures
   b) contaminants
   c) techniques
   d) examination
   e) interpretation
   f) documentation
   g) record keeping

D. Article 7, Magnetic Particle Examination (Yoke and Prod techniques only, excluding paragraphs T-765 and T-766):
The inspector should be familiar with and understand the general rules for applying and using the magnetic particle method such as but not limited to:

1) The Scope of Article 7,
2) General requirements such as but not limited to requirements for:
   a) procedures
   b) techniques (Yoke and Prod only)
   c) calibration
   d) examination

. e) interpretation
3) Documentation and record keeping

E. Article 23, Ultrasonic Standards, **Section SE–797 only** – Standard practice for measuring thickness by manual ultrasonic pulse-echo contact method:
The inspector should be familiar with and understand;

1) The Scope of Article 23, Section SE-797,
2) The general rules for applying and using the Ultrasonic method
3) The specific procedures for Ultrasonic thickness measurement as contained in paragraph 7.

F. **API-650 and API-653:** General nondestructive examination requirements:

1) **API Standard 650**, *Welded Steel Tanks for Oil Storage:* The inspector should be familiar with and understand the general rules for NDE in API-650, Section 6.
2) **API Standard 653**, *Tank Inspection, Repair, Alteration, and Reconstruction:* The inspector should be familiar with and understand the general rules for NDE in API-653, Section 12

IV. PRACTICAL KNOWLEDGE - GENERAL

A. The following topics may be covered:

1) Organization and Certification Requirements.
2) Types and Definitions of Inspections.
3) Types Corrosion and Deterioration.
4) Materials and Fabrication Problems.
5) Welding.
6) Nondestructive Examination (NDE) Methods
7) Corrosion and Minimum Thickness Evaluation.
8) Estimated Remaining Life.
9) Inspection Interval Determination and Issues Affecting Intervals.
10) Inspecting Relief Devices.
11) Inspection Safety Practices.
12) Inspection Records and Reports.
13) Repairs / Alterations.
14) Disassembly and Reconstruction.
15) Hydro Testing,
16) Pneumatic Testing

More information relevant to each of these categories is contained in section "V. PRACTICAL KNOWLEDGE - SPECIFIC" where each reference publication applicable for study for the examination has been listed with the relevant topics that may be covered on the examination.

B. Typical code requirements that candidates will **NOT** be expected to know for purposes of this certification examination.

1) Required thickness calculations for wind, earthquake, and small internal pressures
2) Nozzle calculations for external loads;
3) Flange calculations;
4) Brazing requirements;
5) Calculating venting requirements;
6) Ladder, stairway, and other structural type calculations;
7) NDE requirements for acoustic emission, eddy current, and motion radiography per ASME Section V, Article 9
8) Technical interpretations of API & ASME Codes and Standards
9) Welding process requirements other than shielded metal arc welding (SMAW) and submerged arc welding (SAW)
10) API-650, Appendix S
11) API-650 Appendix E
12) API-650, Appendix R
13) API-650, Appendix V
14) API-650, Appendix D
15) API-650, Appendix P
16) API-650, Appendix C
17) API-650, Appendix K

V. PRACTICAL KNOWLEDGE - SPECIFIC

A. Each reference publication relative to study for the examination is listed below. A list of topics, which may be covered, is listed for each publication. Some topics may be listed under more than one publication. For example; ASME Section IX is the basic document for welding requirements as referenced by API-650 and API-653. The referencing API documents contain additional welding requirements and exceptions or additions to those contained in ASME Section IX. Therefore, welding requirements may be listed under all three documents and all three documents may be listed under the general heading of "Welding on Tanks".

API RP 571, Damage Mechanisms Affecting Fixed equipment in the Refining Industry

ATTN: Inspectors are not required to memorize the definitions of terms included in Section 3 (Definitions of Terms and Abbreviations), but are expected to be familiar with the common terms and abbreviations and be able to find definitions, if needed in the solution of a test question.

Test questions will be based on the following mechanisms only:

4.2.7 - Brittle Fracture
4.2.16 - Mechanical Fatigue
4.3.2 - Atmospheric Corrosion
4.3.3 - Corrosion under insulation (CUI)
4.3.8 - Microbiologically Induced Corrosion (MIC)
4.3.9 - Soil Corrosion
4.3.10 - Caustic Corrosion
4.5.1 - Chloride Stress Corrosion Cracking (Cl-SCC)
4.5.3 - Caustic Stress Corrosion Cracking (Caustic Embrittlement)
5.1.11 - Sulfuric Acid Corrosion

API Recommended Practice 575, *Inspection of Atmospheric and Low-Pressure Storage Tanks*

NOTE: API RP-575 is a Recommended Practice and contains many general statements that are not strict requirements. Some questions on the examination related to RP-575 may contain phrases such as "it is best to" or "an inspector would normally" when information or statements from RP-575 are covered. In these cases it is important to be familiar with the content of RP-575 and to be able to pick the *best* answer of those given. All of RP-575 is applicable to the examination unless specifically excluded.

A. The inspector should have a practical understanding and be familiar with the information contained in RP-575 (excluding Appendix C) as related to:

1) types of tanks covered
2) procedures to perform internal and external inspection
3) the types of external and internal inspections
4) procedures to determine suitability for continued service
5) evaluation change-of-service effects on suitability for continued service
6) evaluation and general condition of:
   a) distortions, flaws, windgirders, stiffeners, welds, and nozzles
   b) tank bottoms
   c) tank foundations
   d) causes of corrosion, leaks, cracks, and mechanical deterioration
   e) auxiliary equipment.
   f) anchor bolts, pipe connections, ground connections
   g) insulation.

h) shells and roofs

API RP 577, Welding Inspection and Metallurgy

1. Definitions
2. Welding Inspection
3. Welding Processes
4. Welding procedure
5. Welding Materials
6. Welder qualifications
7. Non-destructive examination
8. Metallurgy
9. Refinery and Petrochemical Plant Welding Issues
10. Terminology and symbols
11. Actions to Address improperly made production welds
12. Welding procedure review
13. Guide to common filler metal selection
14. Example report of RT results

API Standard 653, *Tank Inspection, Repair, Alteration, and Reconstruction and the related portions of* API Standard 650, *Welded Steel Tanks for Oil Storage*

(NOTE: all of API-653 is applicable to the examination unless specifically excluded.)

A. Tank Inspection, NDE, and Testing

1) The inspector should have a practical understanding and be familiar with the information contained in API-653 related to general inspection practices such as:

   a) types of tanks covered
   b) applicable inspection tasks for internal and external inspection (e.g., API Standard 653, Appendix C, Checklist for Tank Inspection).
   c) safe working practices
   d) thickness and dimensional measurements and tolerances
   e) requirements of external and internal inspections
   f) frequencies and intervals for external and internal inspection
   g) alternatives to the required internal inspection intervals
   h) NDE procedures and NDE personnel qualification requirements
   i) types of roofs and seals and types of deterioration
   j) reasons for inspection and causes of deterioration of storage tanks
   k) procedures to check or test storage tanks for leaks
   l) tools and equipment for tank inspection
   m) failure assessment and deterioration of auxiliary equipment
   n) suitability for continued service.
   o) change-of-service effects on suitability for continued service
   p) evaluation of tank bottom conditions
   q) evaluate tank foundation conditions
   r) risk of failure due to brittle fracture
   s) evaluate the causes of corrosion, leaks, cracks, and mechanical deterioration.
   t) evaluate the condition of anchor bolts, pipe connections, ground connections, and insulation

2) The inspector should have an understanding and be able to perform calculations related to: (See also previous section on "CALCULATIONS FOR EVALUATING THICKNESS MEASUREMENTS AND TANK INTEGRITY")

   a) actual and minimum required thickness for shell plates
   b) maximum allowable fill height
   c) required thickness for hydrotesting and for elevated temperatures
   d) evaluation of corroded areas and pits on shell plates
   e) t min, corrosion rate, inspection interval and remaining corrosion allowance
   f) distortions, flaws, welds, and nozzles.
   g) minimum thickness for tank bottoms and annular plate rings and shell rings
   h) evaluate the effects of tank bottom settlement and acceptable limits
   i) evaluate the condition of tank shells and roofs.
   j) weld size at roof-to-shell and bottom-to-shell junctions per design requirements

3) The inspector should have an understanding of the requirements for performing repairs and alterations such as:

   a) definitions of repairs and alterations
   b) repairs to foundations, shell plates, welds, tank bottoms, nozzles & penetrations, roofs, seals,
   c) knowledge of the repair/alteration material and toughness requirements
   d) use of unidentified materials for repairs/alterations
   e) hot tap requirements and procedures
   f) inspection and NDE requirements for repairs and alterations
   g) hydrostatic and leak testing requirements
   h) lap welded patch plates (API-653, 9-3)
   i) new bottoms supported by grillage API-650, Appendix I, Excluding calculations)

4) The inspector should have an understanding of the requirements for recording the inspection data and records related to inspection, repairs, and alterations such as:

   a) nameplate requirements
   b) record-keeping requirements
   c) reports for inspection, repair and alterations

API Recommended Practice 651, *Cathodic Protection of Aboveground Petroleum Storage Tanks*

NOTE: Only Sections 1, 2, 3, 4, 5, 6, 8, and 11 will be covered on the examination.

A. The inspector should have a practical understanding and be familiar with the information contained in RP-651 related to:

1) Corrosion of Aboveground Steel Storage Tanks
2) Determination of Need for Cathodic Protection
3) Methods of Cathodic Protection for Corrosion Control
4) Operation and Maintenance of Cathodic Protection Systems

B. Information contained in RP-651 which the inspector will not be examined on:

1) design of cathodic protection systems
2) sources, detection, and control of interference currents

API Recommended Practice 652, *Lining of Aboveground Petroleum Storage Tank Bottoms*

A. The inspector should have a practical understanding and be familiar with the information contained in RP-652 related to:

1) types of tank bottom linings and advantage and disadvantages of each
2) considerations for recommending tank bottom linings
3) causes of tank bottom lining failures
4) types of tank bottom lining materials
5) surface preparation requirements for the installation of tank bottom linings
6) issues affecting the application of a tank bottom lining

Storage Tank Basic Facts

Storage tanks are an essential element in the production, refining, transportation, and marketing of petroleum products. API maintains several documents that address the design, fabrication, operation, inspection, and maintenance of aboveground (AST's) and underground (UST's) storage tanks.

API storage tank standards are developed by committees of experienced tank designers, fabricators, owners, and operators that bring a wealth of accumulated knowledge from their respective companies. Although API standards cover many aspects of AST and UST design and operation, they are not all-inclusive. There are several organizations that publish standards on tank design, fabrication, installation, inspection, and repair that may be more appropriate in some instances than API standards Please refer to the following organizations for additional requirements and specifications:

- American Society of Mechanical Engineers (ASME) - www.asme.org
- American Society for Testing and Materials (ASTM) - www.astm.org
- American Water Works Association (AWWA) - www.awwa.org
- Building Officials and Code Administrators International (BOCA) - www.bocai.org
- NACE International (Corrosion Engineers) - www.nace.org
- National Fire Protection Association (NFPA) - www.nfpa.org
- Petroleum Equipment Institute (PEI) - www.pei.org
- Steel Tank Institute (STI) - www.steeltank.com
- Underwriters Laboratories (UL) - ulstandardsinfonet.ul.com
- International Fire Code Institute (Uniform Fire Code) - www.ifci.com

OTHER RESOURCES

Basis of Seismic Design Provisions for Welded Steel Oil Storage Tanks (1.3 MB)
By R. S. Wozniak and W. W. Mitchell, Presented at 43rd API Midyear Refining, May 7, 1978
(To download: Right-click on link and select "Save Target As . . .")

USGS Earthquake Hazards Program

The Independent Liquid Terminals Association - Provides a listing of equipment and services available to the Bulk Liquid Terminals Industry. It's express purpose is to provide terminal and tank farm owners with a quick and easy reference for locating valuable and needed services parts & equipment.

U.S. Environmental Protection Agency TANKS emission estimation software and information.

STORAGE TANK FAQ'S

Q: Where are storage tanks used in the petroleum industry?

A: Storage tanks are found in most sectors of the petroleum industry. These include Exploration & Production, Refining, Marketing, and Pipelines.

Q: What are the different types of storage tanks?

A: Storage tanks can be divided into two basic types: aboveground (AST) and underground (UST). AST's are used in production, refining, marketing, and pipeline operations. UST's are typically used in the marketing of gasoline at retail service stations.

Q: What are the most recent editions of API 620, 650, and 653?

A: API 620: 10th Edition, February 2002; API 650: 10th Edition, March 1998, including Addenda #1 (2000) and #2 (2001); API 653: 3rd Edition December 2001. More information on past editions can be found at Past Editions of API Tank Design Standards 12C and 650.

Q: What are the API standards for construction of new UST's?

A: API does not publish standards for construction ofUST's. See Underwriters Laboratories UL58, 1316, or 1746, and the Steel Tank Institute's F841-91.

Q: What are the API standards for construction of new AST's?

A: Spec. 12B, Bolted Tanks for Storage of Production Liquids; Spec. 12D, Field Welded Tanks for Storage of Production Liquids; Spec. 12F, Shop Welded Tanks for Storage of Production Liquids; Spec. 12P, Fiberglass Reinforced Plastic Tanks; API 620, Design and Construction of Large, Welded, Low-Pressure Storage Tanks; API 650, Welded Steel Tanks for Oil Storage.

Q: What is the difference between tanks constructed to the API 12 series specifications for production operations and API 650 tanks?

A: Production tanks are usually much smaller than API 650 tanks and are often subject to different operating conditions.

Q: What size tanks are covered by API refining, marketing, and pipeline standards?

A: Generally, the minimum size is 1100 gallons (4164 liters). API design standards for AST's in refining, marketing, and pipeline facilities do not specify a maximum size.

Q: What are the API standards for the inspection and repair of AST's currently in-service?

A: Spec. 12R1, Setting, Maintenance, Inspection, Operation, and Repair of Tanks in Production Service; API 653, Tanks Inspection, Repair, Alteration, and Reconstruction. You also should consider the Steel Tank Institute's SP001-00 standard for shop fabricated tanks.

Q: Does API certify tank manufacturers?

A: No.

Q: Does API issue a certificate to verify that a tank has been built to API 620 or 650?

A: No. The manufacturer is responsible for certifying that the tank has been constructed in accordance with API 650 (see API 650, Section 8.3)

Q: How do I get my tank certified by API to Standard 620 or 650?

A: API does not certify tanks built to API 620 and 650. You may see older 650 tanks with an API stamp or monogram, however, the Monogram Program was removed from API 650 with the release of the sixth edition in 1977. The Monogram Program does include tanks built to API Specifications 12B, 12D, and 12F for exploration and production operations..

Q: Can API provide assistance or consultation on tank design or inspection?

A: No. API does not act as a consultant on specific engineering problems or on the general application of its standards. API will provide an

interpretation of the requirements in the standard and will address suggested changes based on new data or technology. Please refer to API 620, Appendix J; API 650, Appendix D; or API 653, Appendix E for further information in interpretations.

Q: Does API provide nameplates for API 650 tanks?

A: No. The tank manufacturer typically provides the nameplate for a new tank (see API 650, Section 8.1).

Q: Does API certify companies to do tank repair?

A: No. API only certifies inspectors to API 653.

Q: Where can a find an API 653 certified inspector?

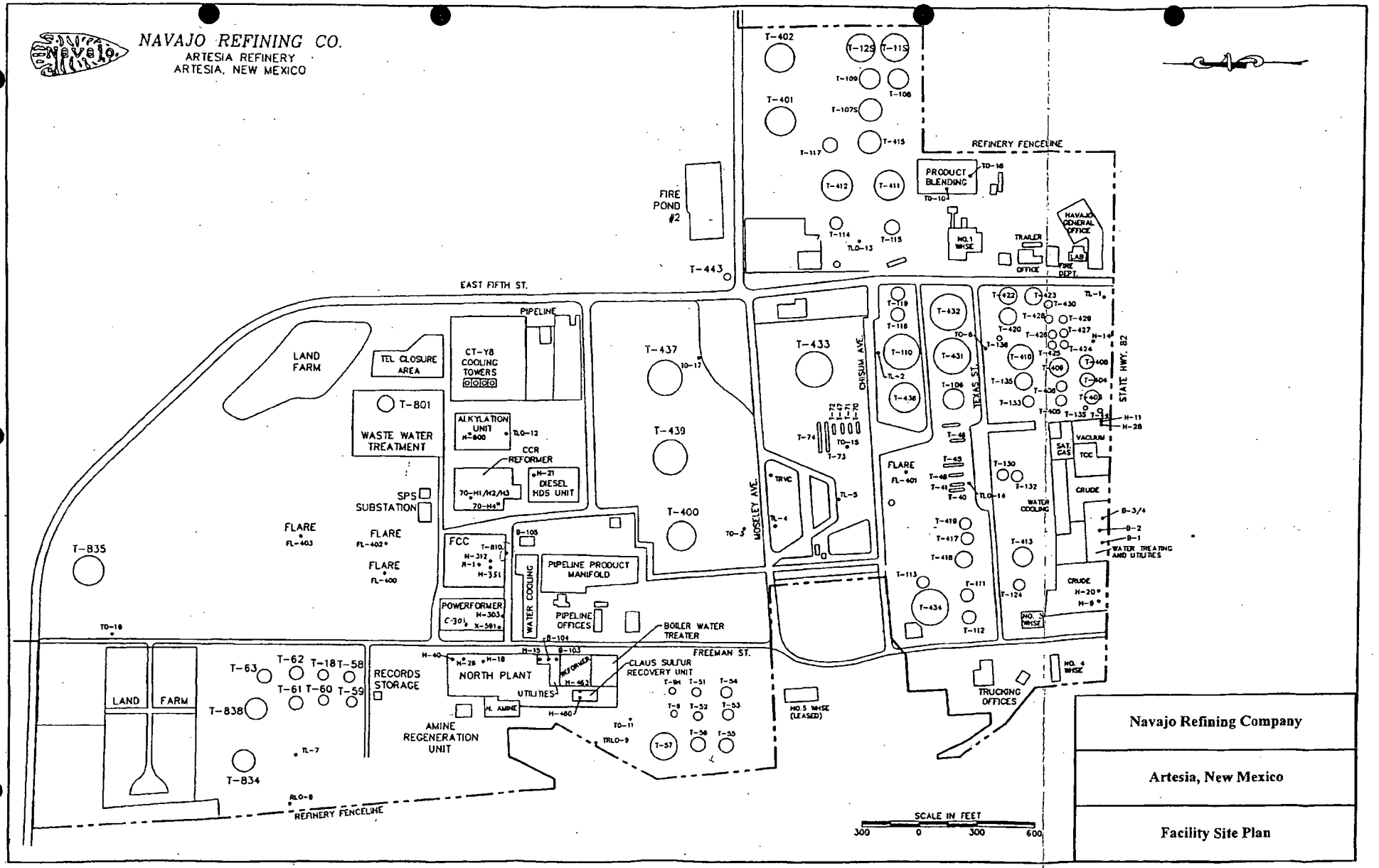
A: A list of companies that employ certified inspectors can be found on the API Inspector Certification website.

Q: Does API publish procedures on hydrostatic testing?

A: Although API 650 and 653 have requirements on when a hydrostatic test must be performed, they do not have detailed procedures on how a hydrostatic test is performed. There is information available in API 650, Appendix S, Section S.4.10 specific to stainless steel tanks. API 620, Section 7.18.4 (Section 5.18.4 in the ninth edition) does have a procedure for low-pressure storage tanks.

Q: Where can I find a list of technical interpretations?

A: API Publication 850 is a compilation of interpretations for API standards 620, 650, and 653 from 1987 through 1997. More recent inquiries can be found on the API website.


NAVAJO REFINING CO.
ARTESIA REFINERY
ARTESIA, NEW MEXICO
REFINERY FENCELINE
PRODUCT BLENDING
NAVAJO GENERAL OFFICE
TRAILER
OFFICE
LAB
FIRE DEPT.
NO.1 WHSE
FIRE POND #2
EAST FIFTH ST.
PIPELINE
LAND FARM
TEL CLOSURE AREA
CT-Y8 COOLING TOWERS
T-801
WASTE WATER TREATMENT
ALKYLATION UNIT
CCR REFORMER
DIESEL HDS UNIT
SPS SUBSTATION
FLARE
FCC
POWERFORMER
PIPELINE PRODUCT MANIFOLD
PIPELINE OFFICES
WATER COOLING
BOILER WATER TREATER
T-835
T-437
T-439
T-400
T-433
MOSLEY AVE.
CHISUM AVE.
TEXAS ST.
STATE HWY. 82
VACUUM
SAT. GAS
TCC
CRUDE
WATER TREATING AND UTILITIES
WATER COOLING
NO. 3 WHSE
NO. 4 WHSE
FREEMAN ST.
RECORDS STORAGE
NORTH PLANT
UTILITIES
CLAUS SULFUR RECOVERY UNIT
AMINE REGENERATION UNIT
NO.3 WHSE (LEASED)
TRUCKING OFFICES
LAND FARM
T-838
T-834
REFINERY FENCELINE
SCALE IN FEET
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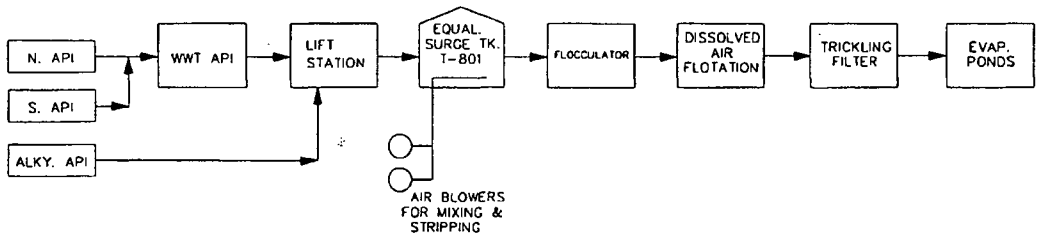
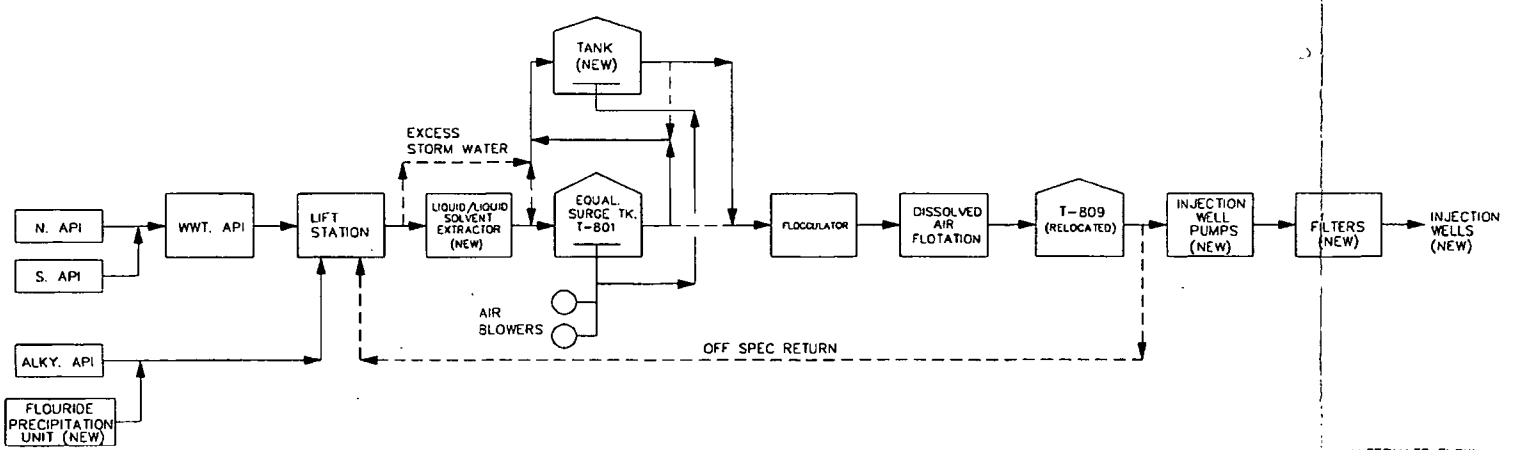
Navajo Refining Company
Artesia, New Mexico
Facility Site Plan

WASTE WATER TREATMENT BLOCK FLOW DIAGRAMS



1. EXISTING SYSTEM



2. MODIFIED SYSTEM

DGJ
06-17-96 REV.0

TEXAS AVENUE
MOSELEY AVENUE
ADAMS DRIVE

Chavez, Carl J, EMNRD

From: Moore, Darrell [Darrell.Moore@hollycorp.com]
Sent: Wednesday, June 29, 2011 2:11 PM
To: Chavez, Carl J, EMNRD; Cobrain, Dave, NMENV
Cc: Monzeglio, Hope, NMENV
Subject: RE: NRS Detailed Area Piping Plan Drawings

Carl

The area we are talking about is the wastewater area. The tanks in that area are waste water tanks so they are not on the tank schedule.

The designation "D" for drum is not really a tank. Its also not a 55 gal drum. Its refinery slang for a steel, welded, process pressure vessel. All the vessels with the "D" designation are on concrete.

From: Chavez, Carl J, EMNRD [mailto:CarlJ.Chavez@state.nm.us]
Sent: Thursday, June 23, 2011 1:58 PM
To: Moore, Darrell; Cobrain, Dave, NMENV
Cc: Monzeglio, Hope, NMENV
Subject: RE: NRS Detailed Area Piping Plan Drawings

Darrell:

I was also using the tank schedule that Navajo submitted to look for the tank numbers I listed and did not see them on the spreadsheet.

Could you please double check the above grade tank tank inspection schedule spreadsheet to make sure it includes all tanks. Also, and drums that you are using as above ground storage containers, i.e., designation "D" from your past correspondences. The drums could be added into a separate column area on the spreadsheet. Please provide the update by the date the OCD requested that the new tanks be added to the spreadsheet and submitted to the OCD. Thank you.

Carl J. Chavez, CHMM
New Mexico Energy, Minerals & Natural Resources Dept.
Oil Conservation Division, Environmental Bureau
1220 South St. Francis Dr., Santa Fe, New Mexico 87505
Office: (505) 476-3490
Fax: (505) 476-3462
E-mail: CarlJ.Chavez@state.nm.us
Website: http://www.emnrd.state.nm.us/ocd/index.htm
"Why not Prevent Pollution; Minimize Waste; Reduce the Cost of Operations; & Move Forward with the Rest of the Nation?" To see how, go to "Pollution Prevention & Waste Minimization" at:
http://www.emnrd.state.nm.us/ocd/environmental.htm#environmental)

File: OCD Online "Tank Schedule"

From: Moore, Darrell [mailto:Darrell.Moore@hollycorp.com]
Sent: Thursday, June 23, 2011 1:25 PM
To: Chavez, Carl J, EMNRD; Cobrain, Dave, NMENV
Cc: Monzeglio, Hope, NMENV
Subject: RE: NRS Detailed Area Piping Plan Drawings

Carl

The only new tanks are TK 829 and TK 830 (plot plan attached) which you approved on May 3, 2011. All the other tanks are already constructed and have been constructed for years. The "Frac Tank" is just a temporary tank that was there when the consultant drew up the plot plan.

The 300 gallon polymer mix tank is part of Veolia's (Formerly ScalTech) process and is on a concrete pad. It too has been there for years.

From: Chavez, Carl J, EMNRD [mailto:CarlJ.Chavez@state.nm.us]
Sent: Thursday, June 16, 2011 11:19 AM
To: Moore, Darrell; Cobrain, Dave, NMENV
Cc: Monzeglio, Hope, NMENV
Subject: RE: NRS Detailed Area Piping Plan Drawings

Darrell:

The OCD is in receipt of the engineering pipeline drawings for the waste water system. The OCD approved the tank upgrades with conditions on May 3, 2011.

Based on the attached drawings, the new tanks appear to be: Tk-0829, Tk-836, Tk-49 (solvent extraction tank), Frac Tank (Dwg: 80-1-201-D-04), Tk-803, Tk-804, Tk-1, Tk-2, Tk-3, Tk-4, Tk-807,.....

Dwg: 80-1-201-D-02 depicts a 300 GALLON POLYMER MIX TANK, which must also meet the design and construction requirements of the permit.

OCD requests that Navajo provide the listing of all new tanks (which include Frac Tanks?) installed at the facility so the OCD can inspect the locations for compliance with the permit.

Thank you.

File: GW-028: "Inspections" and "Permit Modification" Thumbnails

Carl J. Chavez, CHMM
New Mexico Energy, Minerals & Natural Resources Dept.
Oil Conservation Division, Environmental Bureau
1220 South St. Francis Dr., Santa Fe, New Mexico 87505
Office: (505) 476-3490
Fax: (505) 476-3462
E-mail: CarlJ.Chavez@state.nm.us
Website: http://www.emnrd.state.nm.us/ocd/index.htm
"Why not Prevent Pollution; Minimize Waste; Reduce the Cost of Operations; & Move Forward with the Rest of the Nation?" To see how, go to "Pollution Prevention & Waste Minimization" at:
http://www.emnrd.state.nm.us/ocd/environmental.htm#environmental)

From: Moore, Darrell [mailto:Darrell.Moore@hollycorp.com]
Sent: Wednesday, June 15, 2011 9:39 AM
To: Chavez, Carl J, EMNRD; Cobrain, Dave, NMENV
Cc: Monzeglio, Hope, NMENV
Subject: FW: NRS Detailed Area Piping Plan Drawings

Carl, Dave and Hope

Attached, please find detailed piping and other drawings for our upgrade of our Waste Water System. We had sent you the drawings for the tanks for this system a few weeks ago.

From: Siwek, Janusz
Sent: Thursday, June 09, 2011 9:49 PM

To: Moore, Darrell
Cc: McKee, Michael; Meeks, Jimmy; Evans, Jason
Subject: FW: NRS Detailed Area Piping Plan Drawings

From: Holmes, Don P. [holmesdp@cdm.com]
Sent: Thursday, June 09, 2011 5:18 PM
To: Siwek, Janusz; Cline, Jim; Davis, Gary
Cc: Christiansen, John A.
Subject: NRS Detailed Area Piping Plan Drawings

Please find attached the 16 drawings noted above. These drawings are not complete, but do define where all the equipment is located and how about 85% of the piping is located.
These should be useful on your OCD permit request.

Lagenia, Please send an office transmittal to document this and post these drawing on the e-Room. Do not attach these drawings again to the official Transmittal.

Don P. Holmes, P.E.
Sr. Project Manager
CDM, Inc.
3050 Post Oak Blvd., Site 300
Houston, Texas 77056
direct (713) 423-7318
Cell (713) 208-6847

Chavez, Carl J, EMNRD

From: Chavez, Carl J, EMNRD
Sent: Thursday, June 23, 2011 1:58 PM
To: 'Moore, Darrell'; Cobrain, Dave, NMENV
Cc: Monzeglio, Hope, NMENV
Subject: RE: NRS Detailed Area Piping Plan Drawings

Darrell:

I was also using the tank schedule that Navajo submitted to look for the tank numbers I listed and did not see them on the spreadsheet.

Could you please double check the above grade tank tank inspection schedule spreadsheet to make sure it includes all tanks. Also, and drums that you are using as above ground storage containers, i.e., designation "D" from your past correspondences. The drums could be added into a separate column area on the spreadsheet. Please provide the update by the date the OCD requested that the new tanks be added to the spreadsheet and submitted to the OCD. Thank you.

Carl J. Chavez, CHMM
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http://www.emnrd.state.nm.us/ocd/environmental.htm#environmental)

File: OCD Online "Tank Schedule"

From: Moore, Darrell [mailto:Darrell.Moore@hollycorp.com]
Sent: Thursday, June 23, 2011 1:25 PM
To: Chavez, Carl J, EMNRD; Cobrain, Dave, NMENV
Cc: Monzeglio, Hope, NMENV
Subject: RE: NRS Detailed Area Piping Plan Drawings

Carl

The only new tanks are TK 829 and TK 830 (plot plan attached) which you approved on May 3, 2011. All the other tanks are already constructed and have been constructed for years. The "Frac Tank" is just a temporary tank that was there when the consultant drew up the plot plan.

The 300 gallon polymer mix tank is part of Veolia's (Formerly ScalTech) process and is on a concrete pad. It too has been there for years.

From: Chavez, Carl J, EMNRD [mailto:CarlJ.Chavez@state.nm.us]
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To: Moore, Darrell; Cobrain, Dave, NMENV
Cc: Monzeglio, Hope, NMENV
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Darrell:

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Dwg: 80-1-201-D-02 depicts a 300 GALLON POLYMER MIX TANK, which must also meet the design and construction requirements of the permit.

OCD requests that Navajo provide the listing of all new tanks (which include Frac Tanks?) installed at the facility so the OCD can inspect the locations for compliance with the permit.

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Don P. Holmes, P.E.
Sr. Project Manager
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ATTACHMENT 2, January 2009

Navajo Refining Company

Page 1 of 1

DISCHARGE PERMIT (DP-626)
NAVAJO REFINING COMPANY
PROPOSED TRACER LEAK TEST PROJECT

ARTESIA

Priority 1

2009					
Tank ID	Typical Liquid Stored	Type	Volume (bbl)	Year Built	Last Integrity Test Date
T-104	Gasoline	IFR	24,800	1973	2002
T-107	Gasoline	IFR	22,000	1979	1999
T-108	Gasoline	IFR	22,800	1951	2002
T-109	Gasoline	IFR	22,800	1951	2002
T-111	Gasoline	IFR	32,800	1973	2002
T-124	Gasoline	IFR	4,200	1961	2002
T-125	Gasoline	IFR	34,100	1953	2008
T-415	Gasoline	VFR	19,800	1973	2002
T-417	Gasoline	IFR	9,300	1973	2002
T-117	Gasoline	EFR	14,000	1990	2009
T-451	Gasoline	EFR	55,000	1992	2004
T-452	Gasoline	EFR	55,000	1993	2005
T-411	Gasoline	EFR	52,000	1951	2003
T-412	Gasoline	EFR	52,000	1951	2003
T-454	Gasoline	EFR	80,000	1997	2002

19 Tanks

Priority 2

2010					
Tank ID	Typical Liquid Stored	Type	Volume (bbl)	Year Built	Last Integrity Test Date
T-111	Naphtha	IFR	9,000	1973	2001
T-112	Naphtha	IFR	10,000	1973	2000
T-561	Naphtha	IFR	12,800	1973	1990
T-459	Crude Oil	IFR	108,000	1975	2000
T-437	Crude Oil	EFR	83,500	1975	2005
T-57	Naphtha	EFR	5,000	1961	1991
T-414	Distillate	VFR	19,000	1973	2001
T-418	Distillate	VFR	10,100	1973	2001
T-421	Distillate	VFR	10,400	1973	2002
T-421	Distillate	VFR	10,500	1973	2001
T-653	Naphtha	EFR	15,000	2002	2002 New
T-453	Water Drums	EFR	5,000	1994	2007

12 Tanks

Priority 3

2011					
Tank ID	Typical Liquid Stored	Type	Volume (bbl)	Year Built	Last Integrity Test Date
T-834	Distillate	EFR	40,000	1967	2006
T-835	Distillate	EFR	61,000	1973	2006
T-425	Distillate	VFR	55,000	1972	2002
T-424	Distillate	VFR	78,400	1978	2006
T-55	Distillate	VFR	11,000	1978	2007
T-56	Distillate	VFR	5,000	1973	2007
T-675	Distillate	VFR	85,250	2005	2005 New
T-832	Distillate	VFR	39,400	1977	2006
T-413	Distillate	VFR	21,900	1969	2004
T-61	Light Cycle Oil	VFR	13,500	1973	2009

18 Tanks

Priority 4

2012					
Tank ID	Typical Liquid Stored	Type	Volume (bbl)	Year Built	Last Integrity Test Date
T-400	Gas Oils	VFR	36,300	1953	2003
T-433	Gas Oils	VFR	79,900	1973	2001
T-438	Gas Oils	IFR	54,200	1978	2005
T-59	Carbon Black Oil	VFR	5,100	1973	2006
T-63	Carbon Black Oil	VFR	13,700	1973	2002
T-65	Carbon Black Oil	VFR	36,300	1999	2005
T-75	Carbon Black Oil	VFR	18,900	2003	2003 New
T-936	Waste Water	VFR	30,000	1998	1998 New
T-901	Waste Water	VFR	54,200	1997	1997
T-459	Gas Oils	VFR	25,100	1973	Out of Service

18 Tanks

LOVINGTON

Priority 1

2013					
Tank ID	Typical Liquid Stored	Type	Volume (bbl)	Year Built	Last Integrity Test Date
T-1018	Raw Naphtha	EFR	70,000	1973	1995
T-1028	Straight Run Gasoline	EFR	35,000	1973	2007
T-1001A	Crude Oil	EFR	154,500	1973	2005
T-1001B	Crude Oil	EFR	154,500	1973	2009
T-1035A	Raw Diesel	VFR	30,000	1973	1991
T-1035B	Raw Diesel	VFR	30,000	1973	1991
T-1204	Raw Diesel	VFR	41,950	1973	1991
T-1001	Crude Oil	EFR	154,130	1973	2002
T-1214A	Heavy Slop	VFR	29,200	1980	2002
T-1215	Heavy Slop	VFR	29,200	1980	2002
T-1207	Light Slop Oil	VFR	19,858	1973	1999

Priority 2

T-1002A	Raw Kerosene	EFR	15,000	1973	1991
T-1002	Arrmax Gas Oil	EFR	32,800	1973	2008
T-1044	Raw Kerosene	VFR	15,000	1973	1991
T-1046	Arrmax Gas Oil	VFR	15,000	1973	1991
T-1203	Heavy Vacuum Gas Oil	VFR	10,727	1973	1991
T-1236	Arrmax Gas Oil	VFR	8,158	1973	2002
T-1205	Light Slop Oil	EFR	19,900	1973	Out of Service
T-1217C	Waste Water	VFR	97,300	1973	June 2005
T-1217E	Waste Water	VFR	97,300	1973	2007
T-1206	Wastewater	IFR	5,380	1973	2004

21 Tanks

Chavez, Carl J, EMNRD

From: Chavez, Carl J, EMNRD
Sent: Friday, June 10, 2011 10:42 AM
To: Monzeglio, Hope, NMENV; Moore, Darrell
Cc: Cobrain, Dave, NMENV; Tsinnajinnie, Leona, NMENV; Lackey, Johnny
Subject: RE: NCL Tank 815

Yeah, the OCD DP requires fluids not to be allowed to pool for 72 hours before evacuation I believe....

NMED confirmed that it is precipitation and city water that is pooling and would not be tainted with any contaminants from that area and/or addressed by evaporation and phyto remediation anyway.....

So, if the refinery addresses this permit issue, OCD is ok.

Carl J. Chavez, CHMM
New Mexico Energy, Minerals & Natural Resources Dept.
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From: Monzeglio, Hope, NMENV
Sent: Friday, June 10, 2011 10:35 AM
To: Moore, Darrell
Cc: Cobrain, Dave, NMENV; Tsinnajinnie, Leona, NMENV; Lackey, Johnny; Chavez, Carl J, EMNRD
Subject: RE: NCL

Darrell

NMED does not object with managing the water as described below. NMED also spoke with OCD who also does not foresee any issue with this.

Hope

From: Moore, Darrell [mailto:Darrell.Moore@hollycorp.com]
Sent: Monday, June 06, 2011 4:02 PM
To: Monzeglio, Hope, NMENV
Cc: Cobrain, Dave, NMENV; Tsinnajinnie, Leona, NMENV; Lackey, Johnny
Subject: RE: NCL

Hope

Attached, please find an aerial photo of the NCL. I have added a general drawing of what we would like to add to the East berm of the landfarm. As you know, water pools up on the east side of the landfarm. We would add two pipes (with valves) thru the dike that would allow us to drain the water into the dike area of Tk 815 where it could evaporate. If the water got to be too much we would send our vacuum truck and suck it up and put it thru our Waste Water treatment system.

It's a pretty simple fix and we think it would work very well.

From: Monzeglio, Hope, NMENV [mailto:hope.monzeglio@state.nm.us]
Sent: Monday, June 06, 2011 9:09 AM
To: Moore, Darrell
Cc: Cobrain, Dave, NMENV; Tsinnajinnie, Leona, NMENV; Lackey, Johnny
Subject: NCL

Darrell

See attached emails. Please update me on the status of the NCL survey plat and details to address the vegetation by **Friday June 10, 2011**. Navajo must seek NMED approval before changes can be made to the vegetative cover on the NCL.

Let me know if you have any questions.

Hope

Hope Monzeglio Petrie
Environmental Specialist
New Mexico Environment Department
Hazardous Waste Bureau
2905 Rodeo Park Drive East, BLDG 1
Santa Fe NM 87505
Phone: (505) 476-6045; Main No.: (505)-476-6000
Fax: (505)-476-6060
hope.monzeglio@state.nm.us

Websites:
New Mexico Environment Department
Hazardous Waste Bureau

Chavez, Carl J, EMNRD

From: Chavez, Carl J, EMNRD
Sent: Tuesday, May 03, 2011 1:57 PM
To: 'Moore, Darrell'; Monzeglio, Hope, NMENV
Cc: Lackey, Johnny; Siwek, Janusz; Davis, Gary; Dade, Randy, EMNRD
Subject: RE: Navajo Refining Company, Artesia Refinery (GW-028) Tank Drawings for Waste Water Tank Upgrades

Darrell et al.:

Good afternoon.

Approved with the conditions specified in the OCD Discharge Permit provided below. Navajo Refining Company shall provide an updated spreadsheet with tank specifications, info., etc., and tank diagram of tanks with identification numbers for the tank integrity program within 3 months of tank construction.

Please provide at least 72 hours advance notice of tank construction schedule so the agencies may witness the construction of the liner system, concrete ring, leak detection system, etc. You may recall the tank ring that developed cracks because the tank was not centered in the middle of the concrete ring; consequently, I'm sure the construction will ensure that the tank circumference is centered on the tank ring for the construction. Also, the OCD observes that liner specifications were not provided in the engineering diagrams. The discharge permit requires LLDPE; however, if HDPE is used, in order to overcome its stress crack nature, the mil thickness must be increased to a minimum of 60-mil. The OCD expects the liner to be properly tied into the tank ring structure beneath the tank and the liner seams to be properly tested to ensure a good seal exists during and after construction.

Per Section 9 of the Discharge Permit:

9. Above Ground Tanks:

All new and existing above ground tanks containing chemicals must be placed or retrofitted over an impermeable pad (40-mil LLDPE reinforced liner with leak detection system) or liner system within a bermed secondary containment area approved by the OCD. The bermed areas shall be constructed to contain a volume of at least one and one-third (1+1/3) greater than the total volume of the largest tank and/or all interconnected tanks within a bermed containment area. Alternative secondary containment designs must be approved by the OCD.

The owner/operator shall submit a spreadsheet or table identifying all tanks with a work schedule to address this provision (Tank ID #, type of tank, new/used, volume, chemical stored, tank age, last Integrity test date, planned retrofit date and/or construction date, etc.) to the OCD for approval. The owner operator shall prioritize existing tanks for retrofit based on the toxicity and solubility (contaminant transport potential) of chemicals (BTEX, JP4, etc.) and site-specific threats to public health, safety, fresh water, and the environment. A work schedule with a phased approach extending beyond the standard 5-Year permit period may be approved by the OCD if the table is submitted within 3 months of permit issuance. The table(s) shall be considered approved if the OCD does not respond within 30 days of receipt of the table and work schedule.

Please contact me if you have questions. Thank you.

Carl J. Chavez, CHMM
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Sent: Tuesday, May 03, 2011 11:02 AM
To: Chavez, Carl J, EMNRD; Monzeglio, Hope, NMENV
Cc: Lackey, Johnny; Siwek, Janusz; Davis, Gary
Subject: Tank Drawings for Waste Water Upgrade

Carl and Hope

Attached are drawings for two tanks that we will be building as part of our Waste Water System Upgrade. This project was discussed at the meeting we held in Santa Fe at OCD's offices in March, 2011. We are asking for approval to build these tanks. They are located just north of current waste water tank 836 and will have a liner under each tank with PVC Tattle Tales thru the ring wall to detect any leaks.

If you have any questions, please contact me at 575-746-5281. We would like to start construction by the end of this week if possible. Your attention to this matter is greatly appreciated.

Darrell Moore
Environmental Manager for Water and Waste
Navajo Refining Company, LLC
Phone Number 575-746-5281
Cell Number 575-703-5058
Fax Number 575-746-5451

Chavez, Carl J, EMNRD

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Sent: Tuesday, May 03, 2011 11:02 AM
To: Chavez, Carl J, EMNRD; Monzeglio, Hope, NMENV
Cc: Lackey, Johnny; Siwek, Janusz; Davis, Gary
Subject: Tank Drawings for Waste Water Upgrade
Attachments: T829 Ringwall FDN.PDF; T-0830 RING WALL FDN.PDF; Plots Tanks Location.pdf

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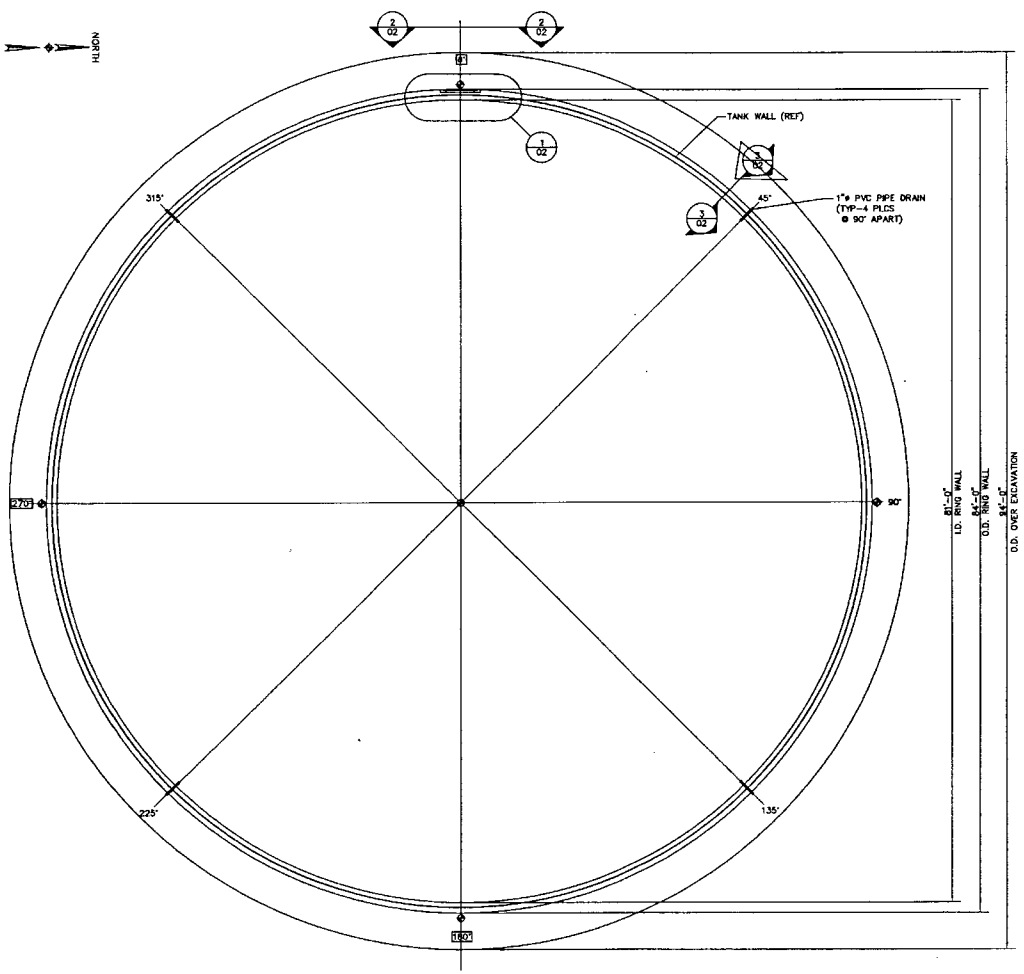
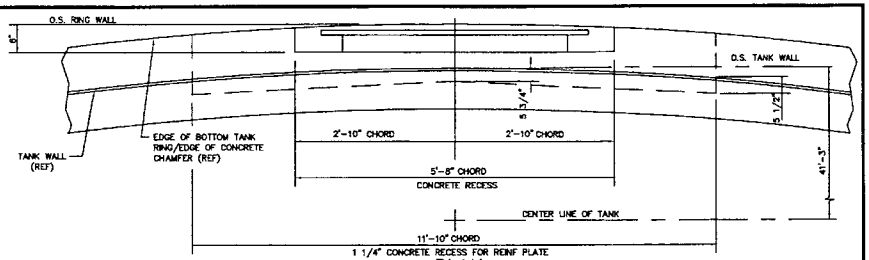
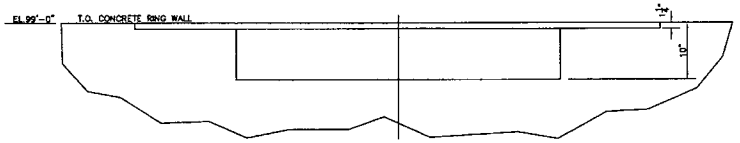


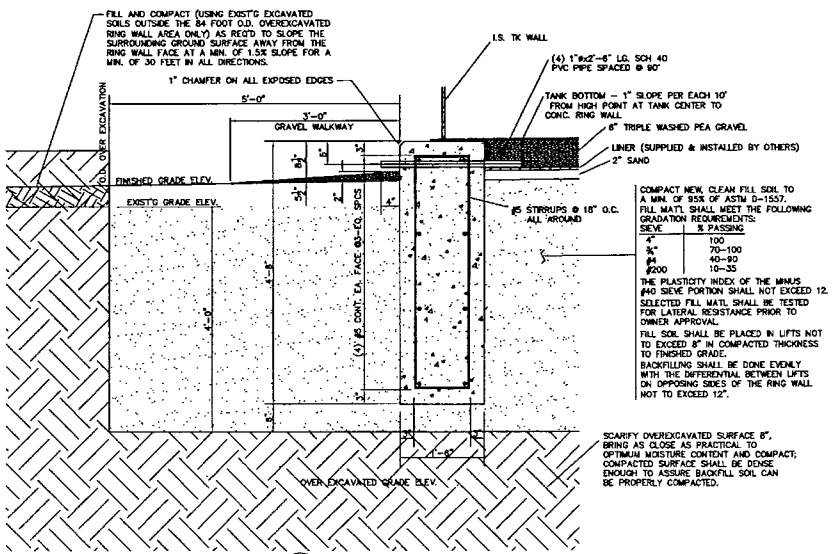
PLAN
T-829 CONCRETE RING WALL



PLAN
1/02 RING WALL CUTOUT FOR CLEANOUT DETAIL



2/02 ELEVATION – LOOKING EAST
RING WALL CUTOUT FOR CLEANOUT



3/02 SECTION

NOTE:

1. ALL MATERIALS AND INSTALLATION SHALL BE PER NAVAJO SPECIFICATIONS, STANDARDS AND DETAILS FOR "CONCRETE STRUCTURES SECTION-D"
2. CONCRETE SHALL BE 3000 PSI.
3. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS PRIOR TO CONSTRUCTION.

REFERENCE DRAWINGS	
NO.	TITLE

REVISIONS					
NO.	DATE	DESCRIPTION	BY	CHK.	APP.
A	4/26/11	ISSUED FOR BID	RDP		

ENGINEERING RECORD		
	BY	DATE
DRN:	RDP	4/26/11
DES:		
CHK:		
APP:		
AFE No.		
S E & C JOB NO.	8010	
PROJ. ENGR:		
SCALE:	NONE	

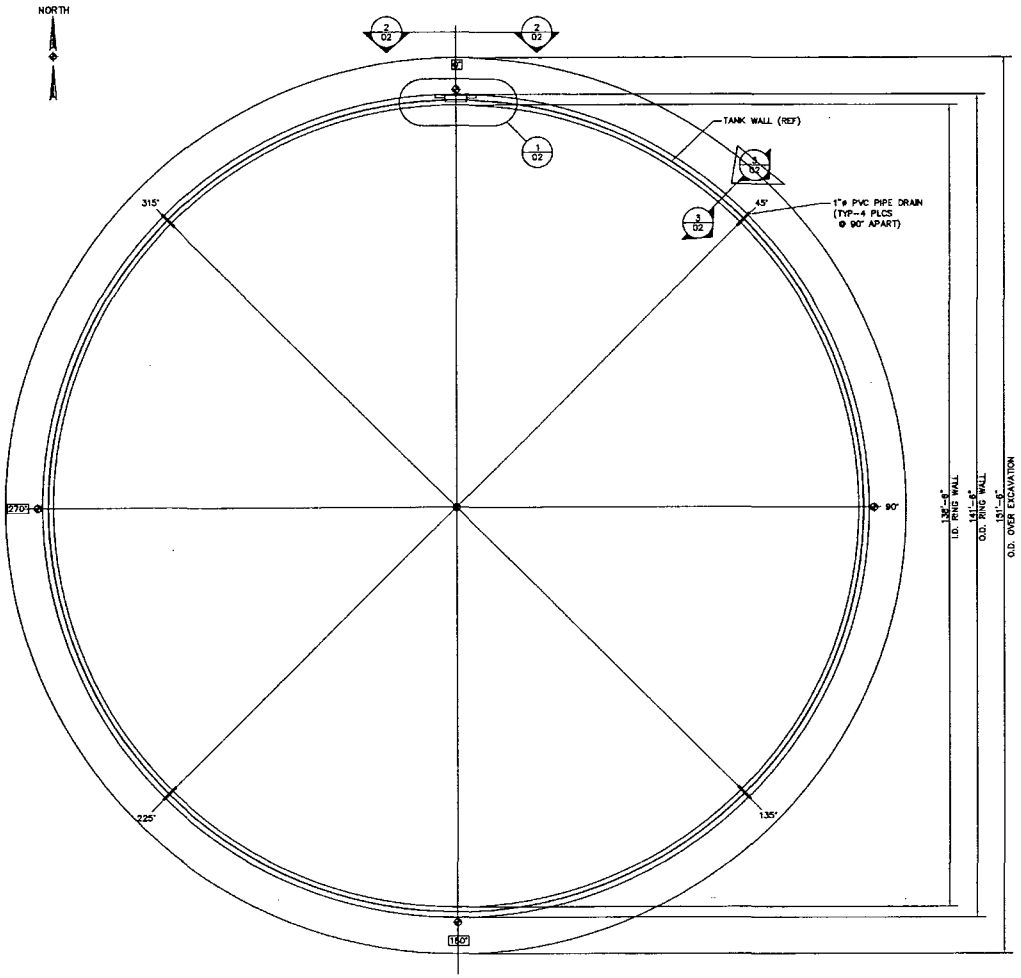
NAVAJO REFINING CO.
GIANT/ENDE INDUSTRIAL
P.O. DRAWER 159
ARTESIA, NEW MEXICO

PLAN & DETAILS
T-829 RING WALL FOUNDATION
82'-6" FT. OD EQUALIZATION TANK
PROJECT
UNIT 80

PLOT SCALE
CAD NO.T-0829 RW FDN

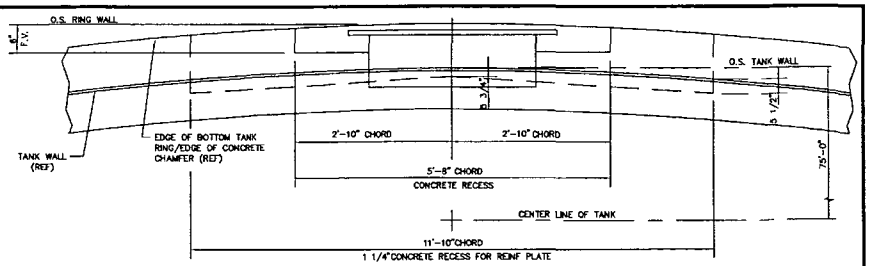
DWG. NO. 00-354-D-100

REV A



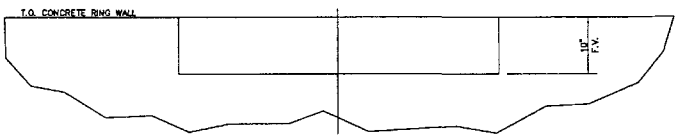
PLAN

T-0830 CONCRETE RING WALL



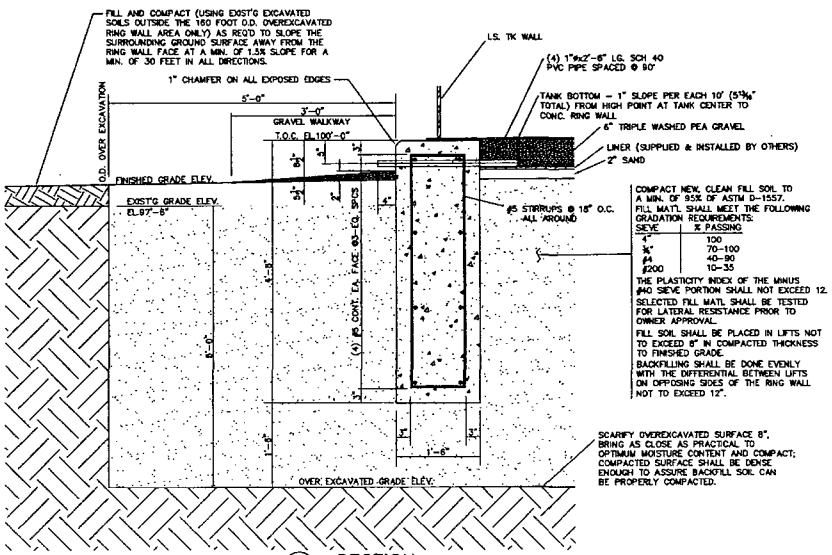
PLAN

1/02 RING WALL CUTOUT FOR CLEANOUT DETAIL



REF EL T.O.CURB @ OLD API SEPARATOR T.O.C. EL.100'-0"

2/02 ELEVATION – LOOKING SOUTH RING WALL CUTOUT FOR CLEANOUT



3/02 SECTION

NOTE:

1. ALL MATERIALS AND INSTALLATION SHALL BE PER NAVAJO SPECIFICATIONS, STANDARDS AND DETAILS FOR "CONCRETE STRUCTURES SECTION-D"
2. CONCRETE SHALL BE 3000 PSI.
3. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS PRIOR TO CONSTRUCTION.

REFERENCE DRAWINGS	
NO.	TITLE

REVISIONS					
NO.	DATE	DESCRIPTION	BY	CHK.	APP.
A	10/26/10	ISSUED FOR BID	RDP		

ENGINEERING RECORD	
BY	DATE
DRN: RDP	10/26/10
DES:	
CHK:	
APP:	
AFE No.	
S E & C JOB NO.	6010
PROJ. ENGR:	
SCALE: NONE	

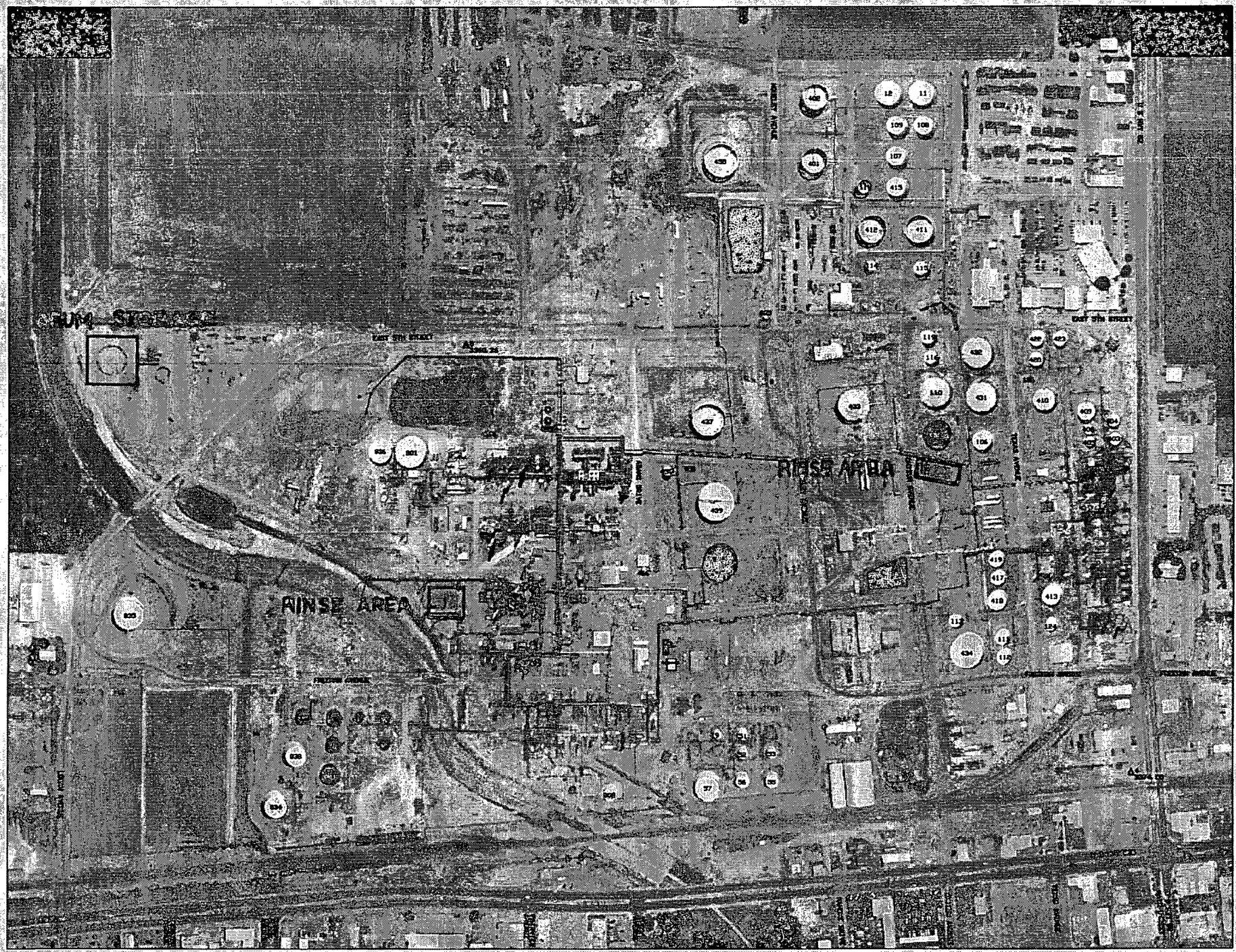
NAVAJO REFINING CO.
ENGINEERING DEPARTMENT
P.O. DRAWER 159
ARTESIA, NEW MEXICO

PLAN & DETAILS
T-0830 RING WALL FOUNDATION
140 FT. DIA. WASTE WATER TANK
WASTE WATER PROJECT
UNIT 08

PLOT SCALE
CAD NO.T-0830 RW FDN

DWG. NO. 08-354-D-100

REV A



DRUM STORAGE & RINSE DIAGRAM

ATTACHMENT 2, January 2009

Navajo Refining Company

DISCHARGE PERMIT (DP-826)
NAVAJO REFINING COMPANY
PROPOSED TRACER LEAK TEST PROJECT

ARTESIA

Priority 1 — 2009

TANK ID	TYPICAL LIQUID STORED	TYPE	VOLUME (bbl)	YEAR BUILT	Last Integrity Test Date
T-106	Gasolines	IFR	24,800	<1971	2002
T-107	Gasolines	IFR	25,000	<1971	1999
T-108	Gasolines	IFR	22,900	<1951	2002
T-109	Gasolines	IFR	22,300	<1971	2002
T-11	Gasolines	IFR	32,800	<1973	2002
T-12M	Gasolines	IFR	6,200	1981	2002
T-12	Gasolines	IFR	32,100	<1973	2008
T-415	Gasolines	VFR	10,800	<1973	2002
T-417	Gasolines	IFR	9,300	<1973	2002
T-117	Gasolines	EFR	14,000	1990	2005
T-401	Gasolines	EFR	53,000	1992	2006
T-402	Gasolines	EFR	53,000	1983	2005
T-411	Gasolines	EFR	52,000	<1951	2003
T-412	Gasolines	EFR	52,000	<1951	2003
T-450	Gasolines	EFR	80,000	1997	2005
	15 Tanks				

Priority 2 — 2010

TANK ID	TYPICAL LIQUID STORED	TYPE	VOLUME (bbl)	YEAR BUILT	Last Integrity Test Date
T-111	Naphthas	IFR	9,100	<1973	2001
T-113	Naphthas	IFR	10,400	<1973	2000
T-56	Naphthas	IFR	10,800	<1973	1990
T-459	Crude Oil	IFR	108,000	1978	2001
T-437	Crude Oil	EFR	85,000	1978	2006
T-57	Naphthas	EFR	5,900	1981	1991
T-416	Distillates	VFR	19,800	<1973	2001
T-419	Distillates	VFR	10,800	<1973	2001
T-422	Distillates	VFR	10,400	<1973	2002
T-423	Distillates	VFR	10,500	<1978	2001
T-852	Slop-water	EFR	10,000	2007	2300 New
T-435	Water Drivers	EFR	5,000	1997	2002
	12 Tanks				

Priority 3 — 2011

TANK ID	TYPICAL LIQUID STORED	TYPE	VOLUME (bbl)	YEAR BUILT	Last Integrity Test Date
T-834	Distillates	EFR	40,000	1967	2006
T-835	Distillates	EFR	51,000	<1973	2006
T-432	Distillates	VFR	55,000	<1972	2002
T-434	Distillates	VFR	78,400	1979	2006
T-55	Distillates	VFR	11,200	1979	2007
T-58	Distillates	VFR	5,000	<1973	2007
T-415	Distillates	VFR	85,250	2005	2006 New
T-838	Distillates	VFR	25,400	1977	2006
T-413	Distillates	IFR	21,900	1968	2004
T-61	Light Cycle Oil	VFR	10,500	<1973	2009
	10 Tanks				

Priority 4 — 2012

TANK ID	TYPICAL LIQUID STORED	TYPE	VOLUME (bbl)	YEAR BUILT	Last Integrity Test Date
T-400	Gas Oils	VFR	96,300	1983	2003
T-433	Gas Oils	VFR	79,900	<1973	2003
T-438	Gas Oils	VFR	94,200	1979	2005
T-59	Carbon Black Oil	VFR	5,100	<1973	2006
T-63	Carbon Black Oil	VFR	10,700	<1971	2005
T-65	Carbon Black Oil	VFR	96,300	1999	2005
T-75	Carbon Black Oil	VFR	18,900	2003	2002 Now
T-836	Water Waters	VFR	30,500	1998	1998 New
T-901	Waste Water	VFR	54,200	1987	1999
T-409	Gas Oils	VFR	25,100	<1973	Out of Service
	10 Tanks				

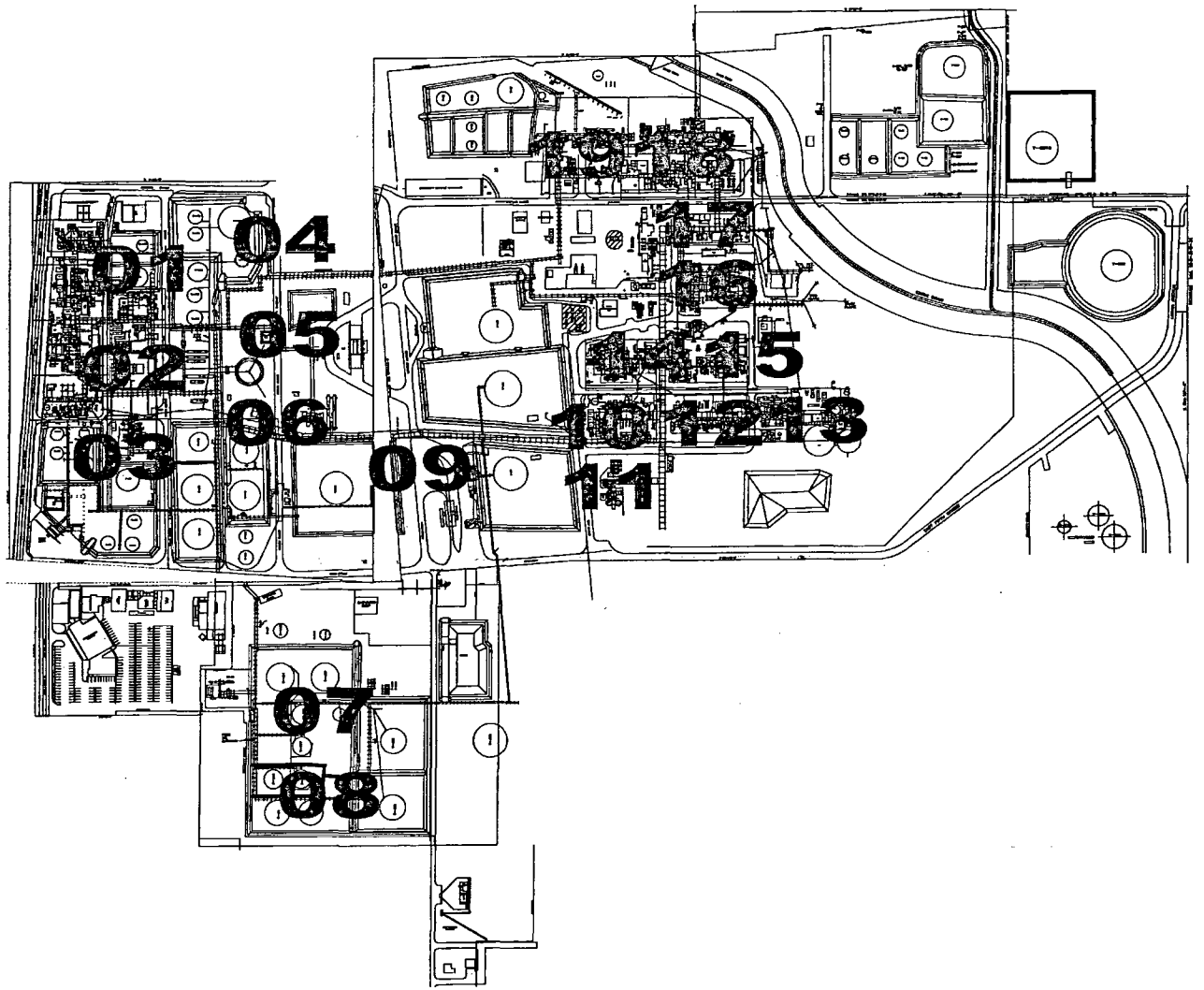
LOVINGTON

Priority 1 — 2013

TANK ID	TYPICAL LIQUID STORED	TYPE	VOLUME (bbl)	YEAR BUILT	Last Integrity Test Date
T-101B	Raw Naphtha	EFR	70,000	1973	1995
T-102B	Straight Run Gasoline	EFR	35,000	1973	2002
T-101A	Crude Oil	EFR	154,500	1973	2005
T-101B	Crude Oil	EFR	154,500	1973	2008
T-103A	Raw Diesel	VFR	30,000	1973	1991
T-103B	Raw Diesel	VFR	30,000	1973	1991
T-1204	Raw Diesel	VFR	43,960	1973	1981
T-1202	Crude Oil	EFR	106,130	1973	2002
T-1214	Heavy Slop	VFR	20,000	1980	2006
T-1215	Heavy Slop	VFR	20,000	1980	2002
T-1207	Light Slop Oil	VFR	10,800	1973	2005

Priority 2

TANK ID	TYPICAL LIQUID STORED	TYPE	VOLUME (bbl)	YEAR BUILT	Last Integrity Test Date
T-102A	Raw Kerosene	EFR	15,000	1973	1991
T-1203	Atmos Gas Oil	EFR	53,800	1973	2006
T-104A	Raw Kerosene	VFR	15,000	1973	1991
T-104B	Atmos Gas Oil	VFR	15,000	1973	1991
T-1205	Heavy Vacuum Gas Oil	VFR	30,700	1973	2005
T-1206	Atmos Gas Oil	VFR	87,180	1973	2002
T-1209	Light Slop Oil	EFR	18,000	1973	Out of Service
T-2012	Waste Water	VFR	97,500	1973	New 2005
T-2013	Waste Water	VFR	97,000	1973	2003
T-1208	Wastewater	IFR	5,380	1973	2004
	21 Tanks				



NOTES

REFERENCE DRAWINGS

NO.	REVISIONS	BY	CHK.	DATE	APPR.	APPR.	NO.	REVISIONS	BY	CHK.	DATE	APPR.	APPR.
							0	ISSUED FOR REFERENCE	SLW	SLW	1/11/08	DGJ	

DRAWING TITLE
KEY PLOT PLAN
UNDERGROUND SEWER PIPING

NAVAJO REFINING CO.
ENGINEERING DEPARTMENT
P.O. DRAWER 159
ARTESIA, NEW MEXICO

DRAWN BY	DATE OF	SCALE	
SLW	SLW	NONE	
DATE	APPR. BY	DRAWING NUMBER	REV.
1/11/08	DGJ	55-Z-32-D-00	0

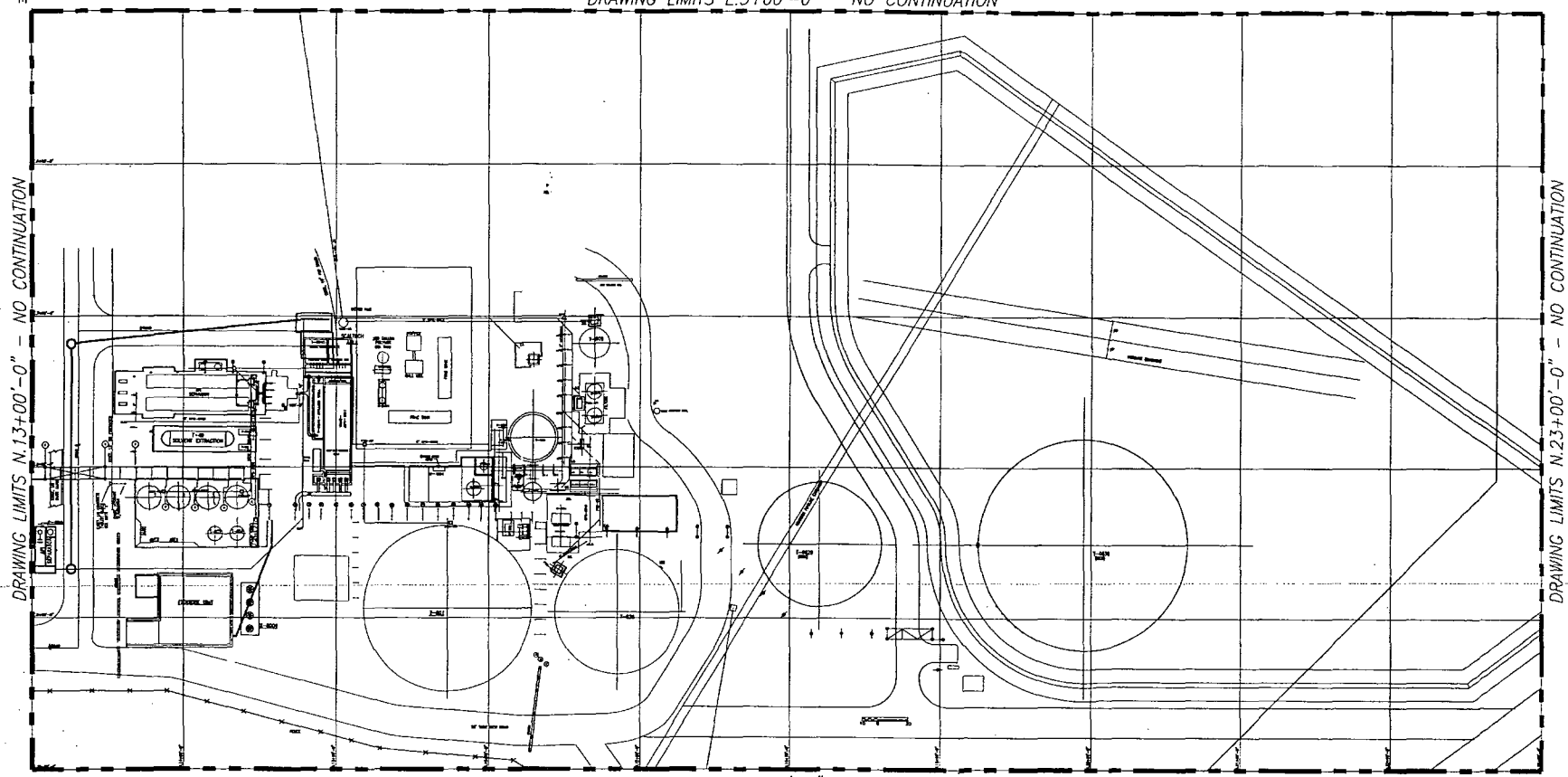
T-0829 = N. 18+20'-0", E. 8+51'-0", Bottom of tank EL. 99'-0"
T-0830 = N. 19+95'-0", E. 8+51'-0", Bottom of tank EL. 99'-0"

DRAWING LIMITS E.5+00'-0" – NO CONTINUATION

DRAWING LIMITS N.13+00'-0" – NO CONTINUATION

DRAWING LIMITS N.23+00'-0" – NO CONTINUATION

DRAWING LIMITS E.10+00'-0" – NO CONTINUATION



JOB NO. CDM-757

PREFERRED ENGINEERING

NOTES

REFERENCE DRAWINGS

NO.	REVISIONS	BY	CHK.	DATE	APPR.	APPR.
A	ISSUED FOR INFORMATION	DAM		4-13-11		

DRAWING TITLE

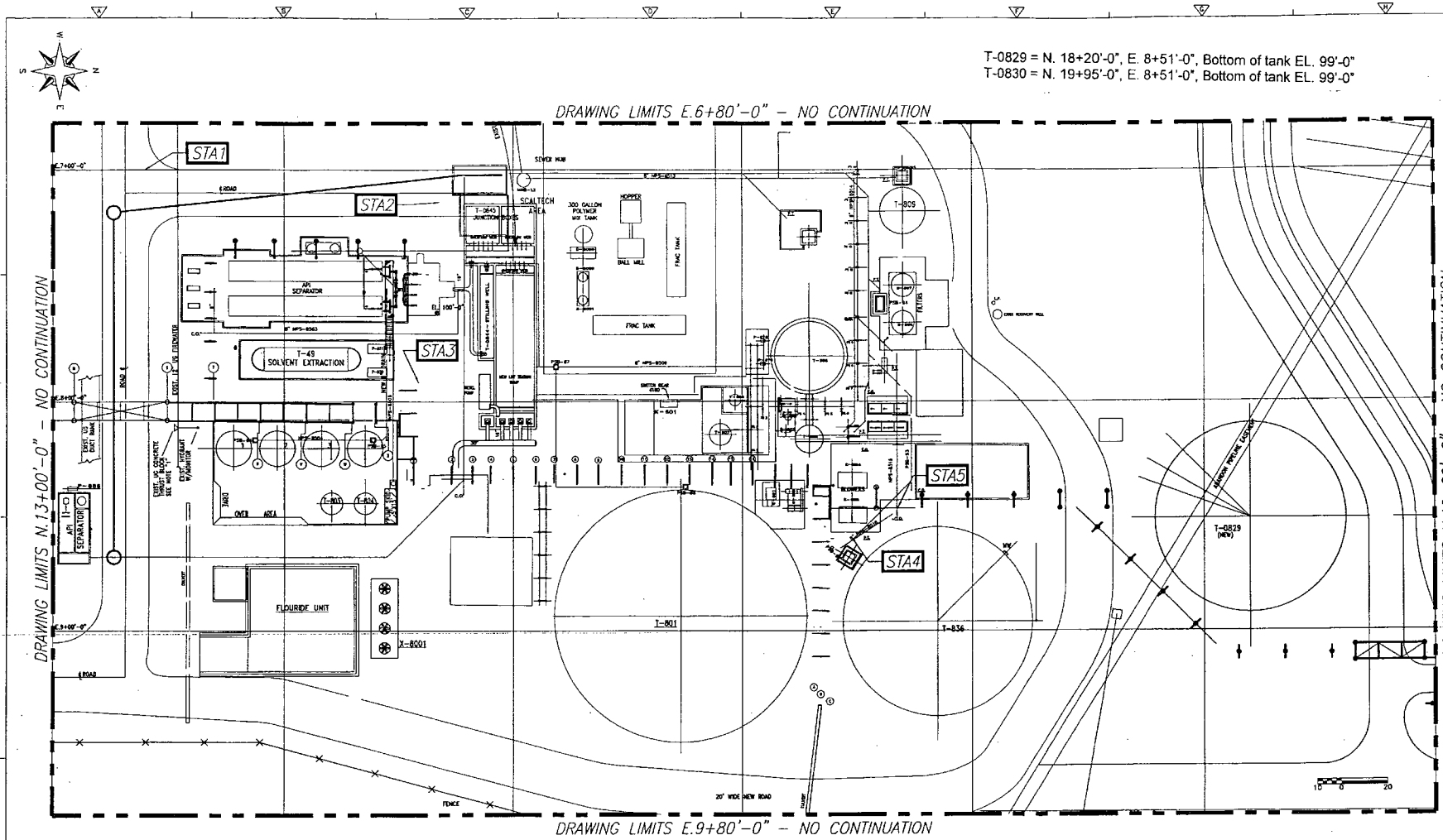
PLOT PLOT

NAVAJO REFINING CO.
ENGINEERING DEPARTMENT
P.O. DRAWER 159
ARTESIA, NEW MEXICO

DRAWN BY	DATE BY	SCALE
DAM		1"=30'-0"
DATE	APPR BY	DRAWING NUMBER / REV.
04-13-11		A

N:\CDM\CDM-757 Navajo Refinery - WWTP Upgrades\Piping\Plans Sections\Working\WWTP UPGRADE SITE PLAN Rev 2.dwg, 4/13/2011 10:13:53 AM, DAMattes

T-0829 = N. 18+20'-0", E. 8+51'-0", Bottom of tank EL. 99'-0"
T-0830 = N. 19+95'-0", E. 8+51'-0", Bottom of tank EL. 99'-0"



NOTE:
1. THE STATION POINT IS THE HEAD OF A GUTTER NAIL WITH AN ORANGE STRING ATTACHED.
2. THE STATION POINT IS THE HEAD OF A STAINLESS STEEL BOLT.
3. THE BENCH MARK IS LOCATED 2'-2 1/2" EAST OF A MARK ON THE ATLAS COPCO SLAB AND UNDER GRAVEL.
4. THE BENCH MARK IS LOCATED 3'-2 1/2" EAST OF A MARK ON AREA PAVING 7'-6 1/2" SOUTH OF CONTAINMENT WALL.

TEMPORARY BENCH MARK COORDINATES

BM	NORTHING	EASTING	ELEVATION	NOTE
STA1	N.13+31.87'	E.7+00.20'	EL.101.25'	1
STA2	N.14+61.52'	E.7+13.96'	EL.98.76'	1
STA3	N.14+58.14'	E.7+41.63'	EL.98.98'	1
STA4	N.16+47.38'	E.8+58.08'	EL.100.47'	2,3
STA5	N.16+67.62'	E.8+46.12'	EL.100.72'	1,4

JOB NO. CDM-757
PREFERRED ENGINEERING
1333 SPACE PARK DRIVE, SUITE 8248
NAVARRE, FLORIDA 32566
REGISTRATION NO. T-9987

REV. NO.	DATE	DRAWN	CHKD	REMARKS
A	3/11	DAM	RDC	ISSUED FOR INFORMATION

DESIGNED BY: DAM
DRAWN BY: DAM
SHEET CHK'D BY: RDC
CROSS CHK'D BY: DAM
APPROVED BY: DAM
DATE: 03-30-11 DECEMBER 2010

CDM
Camp Dresser & McKee
3050 Post Oak Boulevard, Suite 300
Houston, Texas 77056
Tel: (713) 623-7300 Fax: (713) 840-0173
TBPE Firm Registration No. F-2043
consulting • engineering • construction • operations

NAVAJO REFINERY
ARTESIA, NEW MEXICO
PHASE I WWTP

PROJECT NO. 90538-79019
FILE NAME:
SHEET NO.

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DATE: Mar 30, 2011 3:03pm XREFS:757-5101 CDMSYM1

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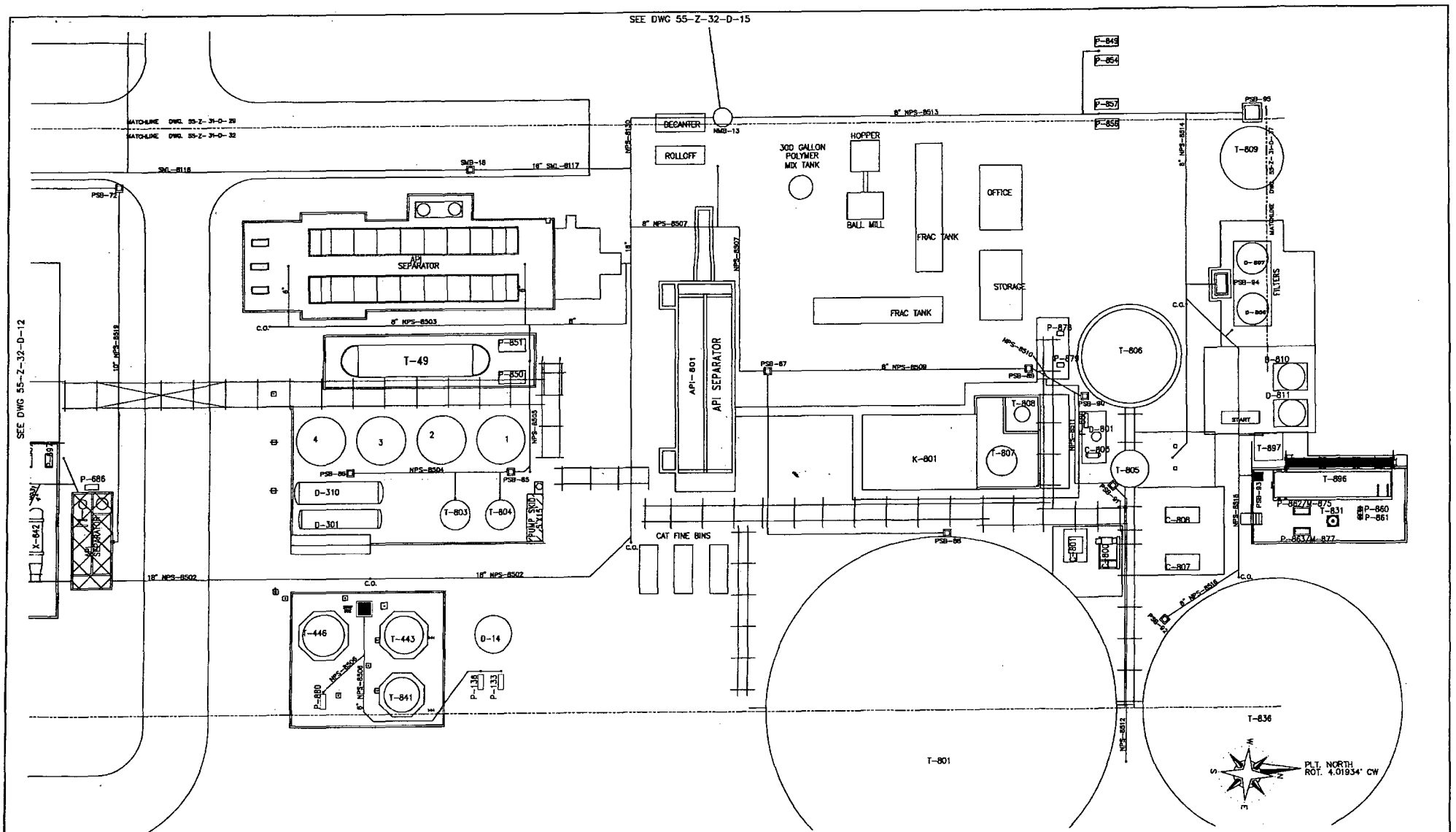
DRUM STORAGE & RINSE DIAGRAM



NOTES

REFERENCE DRAWINGS

NO.	REVISIONS	BY	CHK.	DATE	APPR.	APPR.
0	ISSUED FOR REFERENCE	SLW	SLW	1/11/08	DGJ	

DRAWING TITLE

PLOT PLAN
UNDERGROUND SEWER PIPING
ALKY UNIT AREA,
WWT/API SEPARATOR AREA.

NAVAJO REFINING CO.
ENGINEERING DEPARTMENT
P.O. DRAWER 159
ARTESIA, NEW MEXICO

DRAWN BY	CHK'D BY	SCALE
SLW	SLW	NONE
DATE	APPR BY	DRAWING NUMBER / REV.
1/11/08	DGJ	55-Z-32-D-13 / 0

PRAXAIR

Praxair Services, Inc.

3755 N. Business Center Drive
Tucson, Arizona 85705
Toll Free (800) 989-9929
Tel: (520) 888-9400
Fax: (520) 293-1306

Tracer Tight® Leak Test

10 Above Ground Storage Tanks

Navajo Artesia Refinery
501 E. Main St.
Artesia, NM 88210

Praxair Job No. 10152753

Prepared for:
Navajo Artesia Refinery

Jeff Schmidlen

501 E. Main St.
Artesia NM 88210
Tel: (575) 746-5310

Submitted by:

Praxair Services, Inc.
Alan Harris – Commercial Operations Manager

Alan Harris

E-Mail: alan_harris@ praxair.com
Website: http://www.praxair.com/services

Site Location: **Navajo Artesia Refinery** Praxair Job No.: **10152753**

Inoculation Information:

	Inoculation:	Sampling:
Start Date:	August 18, 2009	August 14, 2009
Completion Date:	Sept 21, 2009	Sept 24, 2009
	Job Completion Date:	**Sept 25, 2009**

Notes:

Annual Testing Results:

Facility:	System:	Type:	Diameter:	Product:	Tracer:	Result:	
Navajo Artesia Refinery	Tank 108	AST	67'	Alky (H)	A	Pass	
Navajo Artesia Refinery	Tank 411	AST	90'	Casinghead	A	Pass	
Navajo Artesia Refinery	Tank 415	AST	67'	Alky (L)	A	Pass	
Navajo Artesia Refinery	Tank 450	AST	120'	Naphtha (S)	A	Pass	
Navajo Artesia Refinery	Tank 11	AST	90'	Reformate	A	Pass	
Navajo Artesia Refinery	Tank 12	AST	90'	Reformate	A	Pass	
Navajo Artesia Refinery	Tank 106	AST	67'	Slop Diesel	A	Pass	
Navajo Artesia Refinery	Tank 107	AST	67'	Casinghead	A	Pass	
Navajo Artesia Refinery	Tank 109	AST	67'	Alky (H)	A	Pass	
Navajo Artesia Refinery	Tank 117	AST	50'	Naphtha (H)	A	Pass	

Alan Harris- Commercial Operational Manager
Date: 09/25/09

Praxair Services, Inc. hereby certifies that the above listed systems(s) have been tested by means of Tracer Tight®, which has been evaluated by a third party according to protocols issued and approved by the United States Environmental Protection Agency (EPA) as being able to detect a leak at a rate of 0.05 gallons per hour with a Probability of Detection (PD) of 0.97 and a Probability of False Alarm (PFA) of 0.029. If you have any questions or concerns, please call Praxair Services, Inc. at 800-989-9929 ext.232.

3755 N. Business Center Drive
Tucson, Arizona 85705
Toll Free (800) 989-9929
Tel: (520) 888-9400
Fax: (520) 293-1306

Tracer Tight® Leak Test

March 2008 Testing

Three Aboveground Storage Tanks
Terminal
City, ST

Praxair Job No. 10000000

Prepared for:

Client
1111 Business Street
City, ST 11111

Tel: 512-555-1111

Attention: First Last Name

Submitted by:

Praxair Services, Inc.
Project Manager

E-Mail: Todd_Waltz @ Praxair.com
Website: http://www.praxair.com/services

Site Location: **Terminal** Praxair Job No.: **111xxx111**

Inoculation and Sampling Information:

	Inoculation:	Sampling:
Start Date:	Month 6, 2008	Month 6, 2008
Completion Date:	Month 13, 2008	Month 13, 2008
	Job Completion Date:	**Month 13, 2008**

Testing Results:

Facility:	System:	Type:	Diameter:	Product:	Tracer:	Result:	
BP	Tank 1	AST	50 ft	Diesel	A	Passed	
BP	Tank 3	AST	50 ft	Diesel	A	Passed	
BP	Tank 7	AST	65 ft	Unleaded Gasoline	A	Passed	

- Project Manager
Date: MO/26/2008

Praxair Services, Inc. hereby certifies that the above listed systems(s) have been tested by means of Tracer Tight®, which has been evaluated by a third party according to protocols issued and approved by the United States Environmental Protection Agency (EPA) as being able to detect a leak at a rate of 0.05 gallons per hour with a Probability of Detection (PD) of 0.97 and a Probability of False Alarm (PFA) of 0.029. Tracer concentrations are report in micrograms per liter (ug/L). The Tracer Tight® non-volume metric test and does not report in gallons per hour. If you have any questions or concerns, please call Praxair Services, Inc. at 800-989-9929 ext.234.

Chavez, Carl J, EMNRD

From: Chavez, Carl J, EMNRD
Sent: Friday, September 03, 2010 7:51 AM
To: 'Moore, Darrell'; 'Lackey, Johnny'
Cc: Dade, Randy, EMNRD; Hill, Larry, EMNRD; VonGonten, Glenn, EMNRD
Subject: Artesia (GW-028) and Lovington (GW-014) Refineries and Praxair Services, Inc. (Praxair) Report(s) Request

Darrell and Johnny:

Good morning. OCD is writing to request all Praxair reports associated with services rendered at the above refineries after the current discharge permits were issued at each facility. Please submit the reports by Tuesday, COB October. 5, 2010.

Also, please make OCD aware of any major discoveries from the Praxair investigations. OCD notices that the February 2010 discovery of a small leak at T-413 from the Praxair method and this may help provide proof that the method is effective.

Please contact me if you have questions. Thank you.

Carl J. Chavez, CHMM
New Mexico Energy, Minerals & Natural Resources Dept.
Oil Conservation Division, Environmental Bureau
1220 South St. Francis Dr., Santa Fe, New Mexico 87505
Office: (505) 476-3490
Fax: (505) 476-3462
E-mail: CarlJ.Chavez@state.nm.us
Website: http://www.emnrd.state.nm.us/ocd/index.htm
(Pollution Prevention Guidance is under "Publications")

REFINING COMPANY, LLC

FAX
(575) 746-5283 DIV. ORDERS
(575) 746-5481 TRUCKING
(575) 746-5458 PERSONNEL

501 EAST MAIN STREET • P. O. BOX 159
ARTESIA, NEW MEXICO 88211-0159
TELEPHONE (575) 748-3311

FAX
(575) 746-5419 ACCOUNTING
(575) 746-5451 ENV/PURCH/MKTG
(575) 746-5421 ENGINEERING

January 14, 2009

FedEx Overnight Delivery

Wayne Price
Environmental Bureau Chief
Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, NM 87505

Re: Navajo Refining Company, L.L.C., Discharge Permit (GW-028) Proposals

Dear Mr. Price:

Enclosed pursuant to your August 20, 2008 letter to Darrell Moore regarding the Navajo Refining Company-Artesia Refinery (GW-028) Discharge Permit Approval are the required schedules, drawings and plot plans as follows:

Attachment 1: Drum Storage Site Diagram. (GW-028, Section 7).

Attachment 2: Above Ground Tanks, Leak Detection Retrofit Schedule for OCD approval. (GW-028, Section 9).

Attachment 3: Sanitary Waste Water Proposal for OCD approval. (GW-028, Section 17 iv).

Attachment 4: Underground Process/Wastewater Lines listing. (GW-028, Section 13A).

Attachment 5: Underground tanks sumps, pits. (GW-028, Section 21C).

Please contact me at 575-746-5490 or Darrell Moore at 575-746-5281 if you have any questions.

Sincerely,

Johnny Lackey
Environmental Manager

Attachments

Cc (w/attachments): Navajo Refining: JER
OCD: Carl Chavez, 1220 South St. Francis Dr., Santa Fe, NM 87505

Electronic cc (w/attachments): DGM
Environmental Files: REF.ART.08-4.E.03
(Artesia Discharge Permit)

Attachment 1

DRUM STORAGE

RINSE AREA

EAST 5TH STREET

FREEMAN AVENUE

U S HWY 285

U S HWY 82

MOSELEY AVENUE

ADAMS DRIVE

CHISUM AVENUE

TEXAS AVENUE

MAIN STREET

LOGAN AVENUE

CANNON AVENUE

CLARK AVENUE

FAIRVIEW AVENUE

YUCCA AVENUE

MARONE DRIVE

△5 3360.36

△4 3374.20

DRUM STORAGE & RINSE DIAGRAM

Attachment 2

ATTACHMENT 2, January 2009

Navajo Refining Company

DISCHARGE PERMIT (GW-028)
NAVAJO REFINING COMPANY
PROPOSED TRACER LEAK TEST PROJECT

ARTESIA

Priority 1 — 2009

TANK ID	TYPICAL LIQUID STORED	TYPE	VOLUME (bbl)	YEAR BUILT	Last Integrity Test Date
T-106	Gasolines	IFR	24,800	<1971	2002
T-107	Gasolines	IFR	25,000	<1971	1999
T-108	Gasolines	IFR	22,900	<1951	2002
T-109	Gasolines	IFR	22,300	<1971	2002
T-11	Gasolines	IFR	32,600	<1973	2002
T-124	Gasolines	IFR	6,200	1981	2002
T-12	Gasolines	IFR	32,300	<1973	2008
T-415	Gasolines	VFR	10,800	<1973	2002
T-417	Gasolines	IFR	9,300	<1973	2002
T-117	Gasolines	EFR	14,000	1960	2005
T-401	Gasolines	EFR	53,000	1982	2005
T-402	Gasolines	EFR	53,000	1983	2005
T-411	Gasolines	EFR	52,000	<1951	2003
T-412	Gasolines	EFR	52,000	<1951	2003
T-450	Gasolines	EFR	80,000	1997	2002
	15 Tanks				

Priority 2 — 2010

TANK ID	TYPICAL LIQUID STORED	TYPE	VOLUME (bbl)	YEAR BUILT	Last Integrity Test Date
T-111	Naphthas	IFR	9,100	<1973	2001
T-112	Naphthas	IFR	10,400	<1973	2000
T-56	Napthas	IFR	10,800	<1973	1990
T-439	Crude Oil	IFR	108,000	1978	2007
T-437	Crude Oil	EFR	85,000	1975	2006
T-57	Naphthas	EFR	5,000	1981	1991
T-418	Distillates	VFR	19,600	<1973	2001
T-419	Distillates	VFR	10,800	<1973	2001
T-422	Distillates	VFR	10,400	<1973	2002
T-423	Distillates	VFR	10,500	<1970	2001
T-802	Sour water	EFR	10,000	2002	2002 New
T-435	Water Draws	EFR	5,000	1997	2000
	12 Tanks				

Priority 3 — 2011

TANK ID	TYPICAL LIQUID STORED	TYPE	VOLUME (bbl)	YEAR BUILT	Last Integrity Test Date
T-834	Distillates	EFR	40,000	1967	2006
T-835	Distillates	EFR	61,000	<1973	2006
T-432	Distillates	VFR	55,000	<1972	2002
T-434	Distillates	VFR	78,400	1979	2006
T-55	Distillates	VFR	11,300	1979	2007
T-58	Distillates	VFR	5,000	<1973	2007
T-815	Distillates	VFR	85,250	2005	2005 New
T-838	Distillates	VFR	29,400	1977	2006
T-413	Distillates	IFR	21,900	1960	2004
T-61	Light Cycle Oil	VFR	10,500	<1973	2009
	10 Tanks				

Priority 4 — 2012

TANK ID	TYPICAL LIQUID STORED	TYPE	VOLUME (bbl)	YEAR BUILT	Last Integrity Test Date
T-400	Gas Oils	VFR	96,300	1983	2003
T-433	Gas Oils	VFR	79,900	<1973	2003
T-438	Gas Oils	VFR	54,200	1978	2005
T-59	Carbon Black Oil	VFR	5,100	<1973	2006
T-63	Carbon Black Oil	VFR	10,700	<1973	2005
T-65	Carbon Black Oil	VFR	96,300	1999	2005
T-75	Carbon Black Oil	VFR	18,900	2003	2003 New
T-836	Waste Water	VFR	30,500	1998	1998 New
T-801	Waste Water	VFR	54,200	1987	1999
T-409	Gas Oils	VFR	25,100	<1973	**Out of Service**
	10 Tanks				

LOVINGTON

Priority 1 — 2013

TANK ID	TYPICAL LIQUID STORED	TYPE	VOLUME (bbl)	YEAR BUILT	Last Integrity Test Date
T-101B	Raw Naphtha	EFR	70,000	1973	1995
T-102B	Straight Run Gasoline	EFR	35,000	1973	2002
T-1201A	Crude Oil	EFR	154,500	1973	2005
T-1201B	Crude Oil	EFR	154,500	1973	2008
T-103A	Raw Diesel	VFR	30,000	1973	1991
T-103B	Raw Diesel	VFR	30,000	1973	1991
T-1204	Raw Diesel	VFR	43,860	1973	1991
T-1202	Crude Oil	EFR	108,130	1973	2002
T-1214	Heavy Slop	VFR	20,000	1980	2006
T-1215	Heavy Slop	VFR	20,000	1980	2002
T-1207	Light Slop Oil	IFR	10,800	1973	2006
	Priority 2				**Last Integrity Test Date**
T-102A	Raw Kerosene	EFR	35,000	1973	1991
T-1203	Atmos Gas Oil	EFR	53,800	1973	2008
T-104A	Raw Kerosene	VFR	15,000	1973	1991
T-104B	Atmos Gas Oil	VFR	15,000	1973	1991
T-1205	Heavy Vacuum Gas Oil	VFR	30,700	1973	2005
T-1206	Atmos Gas Oil	VFR	97,180	1973	2002
T-1209	Light Slop Oil	EFR	18,000	1973	**Out of Service**
1201C	Waste Water	VFR	97,000	1973	New 2005
1201D	Waste Water	VFR	97,000	1973	2007
T-1208	Wastewater	IFR	5,380	1973	2004
	21 Tanks				

Attachment 3

ATTACHMENT 3, January 2009

Navajo Refining Company

Navajo Refinery in Artesia New Mexico currently has five operating areas separated by geographic area. With the current refinery expansion, a sixth operating area will be added in 2009 to accommodate new process units. Each of the operating areas includes both DCS (i.e. Control Board) and Field Operators. Current and future operating areas are listed below:

1. CCR Area:
2. FCC Area
3. North Plant (NP) Area
4. South Plant (SP) Area
5. Oil Movements Area
6. MHC Area (Pending completion of refinery expansion)

Within the existing operating areas there are eight (8) septic holding tanks in various stages of service. For the holding tanks that are in service, the practice is to empty the tanks via vacuum truck and haul the waste material to a septic waste handling facility. The tanks have been used primarily to service field operating crews while performing duties in and around several buildings provided for environmental shelter. The following are the locations / descriptions of the existing holding tanks and their current status. Please refer to attached aerial photograph drawing:

EXISTING ENVIRONMENTAL SHELTERS WITH HOLDING TANKS			
No.	**Location**	**Current Operator Service**	**Holding Tank Status**
1	Central Control Room	• FCC, NP and CCR DCS Operators • CCR Field Operators	In Service
2	FCC Operator Shelter	• FCC Field Operators	In Service
3	Pipeline Office Building	• NP Field Operators • Supervisor Offices	In Service
4	North Plant Operator Shelter	• North Plant Tool and Supply Storage	In Service
5	Blender Control Room	• Oil Movement DCS Operators • Oil Movement Field Operators	In Service
6	TCC Operator Shelter	• South Plant Tool and Supply Storage	Out of Service
7	South Plant Control Room	• South Plant DCS Operators • South Plant Field Operators	In Service
8	Old South Plant Control Room	• South Plant Tool and Supply Storage	Out of Service

Navajo is currently in the engineering phase to add new environmental shelters and reconfigure utilization of existing buildings to accommodate refinery expansion and addition of the new MHC operating area. The

overall plan will include installation of 2 new buildings thereby providing environmental shelters for all field operating personnel. Upon completion of the project, use of the septic holding tanks will be discontinued. The following table describes the future services for the new and existing shelters and the future status of the septic holding tanks:

FUTURE ENVIRONMENTAL SHELTER CONFIGURATION			
No.	**Location**	**Future Operator Service**	**Holding Tank Status**
1	Central Control Room	• FCC, NP, CCR, and MHC DCS Operators • FCC, CCR Field Operators	Out of Service
2	FCC Operator Shelter	• FCC Tool and Supply Storage	Out of Service
3	Pipeline Office Building	• General Storage	Out of Service
4	North Plant Operator Shelter	• NP Tool and Supply Storage	Out of Service
5	Blender Control Room	• Oil Movement DCS Operators • Oil Movement Field Operators	Out of Service
6	TCC Operator Shelter	• South Plant Tool and Supply Storage	Out of Service
7	South Plant Control Room	• South Plant DCS Operators • South Plant Field Operators	Out of Service
8	Old South Plant Control Room	• South Plant Tool and Supply Storage	Out of Service
9	New Operator Shelter #1 (OS#1)	• MHC Field Operators	Not Applicable
10	New Operator Shelter #2 (OS#2)	• NP Field Operators	Not Applicable

Relative to the elimination of the septic holding tanks, the project includes provisions to utilize existing septic sewer lines currently routed through the refinery that were recently upgraded and re-commissioned on 11/26/08 in conjunction with the re-routing of the City of Artesia's sewer line. Refer to the attached aerial photograph drawing for general locations of new and existing facilities:

1. Purchase and install two (2) new modern operator shelters to accommodate MHC and NP Field Operators.

2. Install sewer lines from lavatory facilities in the New Operator Shelter #1 running East along Adams Drive and tie into the main line running North/South along East 5th Street.

3. Install sewer lines from lavatory facilities in the New Operator Shelter #2 running south along Freeman Avenue and tie into the lateral line running East/West along Moseley Avenue.

4. Renovate the Central Control Room to accommodate MHC DCS operators and FCC field operators in addition to the operators currently using the building for environmental shelter.

5. Install a sewer line from the lavatory facilities in the Central Control Room running South adjacent to TK 400 and tie into the lateral line running East/West along Moseley Avenue.

6. Install sewer line from the lavatory facilities in the Blender Control Room running West past the Maintenance Office Building and tie into the main line running North/South along East 5th Street.

7. Install sewer line from the lavatory facilities in the South Plant Control Room running East along Texas Avenue and tie into the main line running North/South along East 5th Street.

8. Decommission all abandoned lavatory facilities.

9. Decommission the holding tanks to eliminate future use following NMED Guidelines for removal or in place decommissioning of the below ground sanitary waste water closed tank systems.

Navajo anticipates that the project to install and/or renovate operator shelters and install new sewer lines to eliminate the holding tanks will be complete on or before 09/11/2010 which is 24 months after Artesia's completion of the new sewer line as required in Discharge Permit GW-028 Sec17.iv.

Extensive excavation inside the refinery boundary will be required to install the necessary piping to connect to the city of Artesia's sewer system. If during construction, underground piping or unforeseen obstructions prevent Navajo from completing the above described tie-ins to the city of Artesia's sanitary sewer system; Navajo will tie-in to the refinery oil/water sewer system to treat and/or dispose of all sanitary waste water effluent through the refinery waste water treatment system and permitted UIC Class 1 Injection Wells east of the refinery.

Attachment 4

ATTACHMENT 4, January 2009
Navajo Refining Company

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NAVAJO REFINING COMPANY
ARTESIA REFINERY
LISTING OF UNDERGROUND PROCESS/WASTEWATER LINES

Description	Equipment	Unit Code	Priority
UNDERGROUND LINE INTEGRITY TESTING	08-TANKAGE	08	3
UNDERGROUND LINE INTEGRITY TESTING	08-TANKAGE	08	1
UNDERGROUND LINE INTEGRITY TESTING	08-TANKAGE	08	3
UNDERGROUND LINE INTEGRITY TESTING	08-TANKAGE	08	1
UNDERGROUND LINE INTEGRITY TESTING	08-TANKAGE	08	1
UNDERGROUND LINE INTEGRITY TESTING	29-BLENDING	29	1
UNDERGROUND LINE INTEGRITY TESTING	29-BLENDING	29	1
UNDERGROUND LINE INTEGRITY TESTING	29-BLENDING	29	1
UNDERGROUND LINE INTEGRITY TESTING	29-BLENDING	29	1
UNDERGROUND LINE INTEGRITY TESTING	08-TANKAGE	08	1
UNDERGROUND LINE INTEGRITY TESTING	08-TANKAGE	08	1
UNDERGROUND LINE INTEGRITY TESTING	08-TANKAGE	08	3
UNDERGROUND LINE INTEGRITY TESTING	29-BLENDING	29	1

Attachment 5

ATTACHMENT 5, January 2009

Navajo Refining Company

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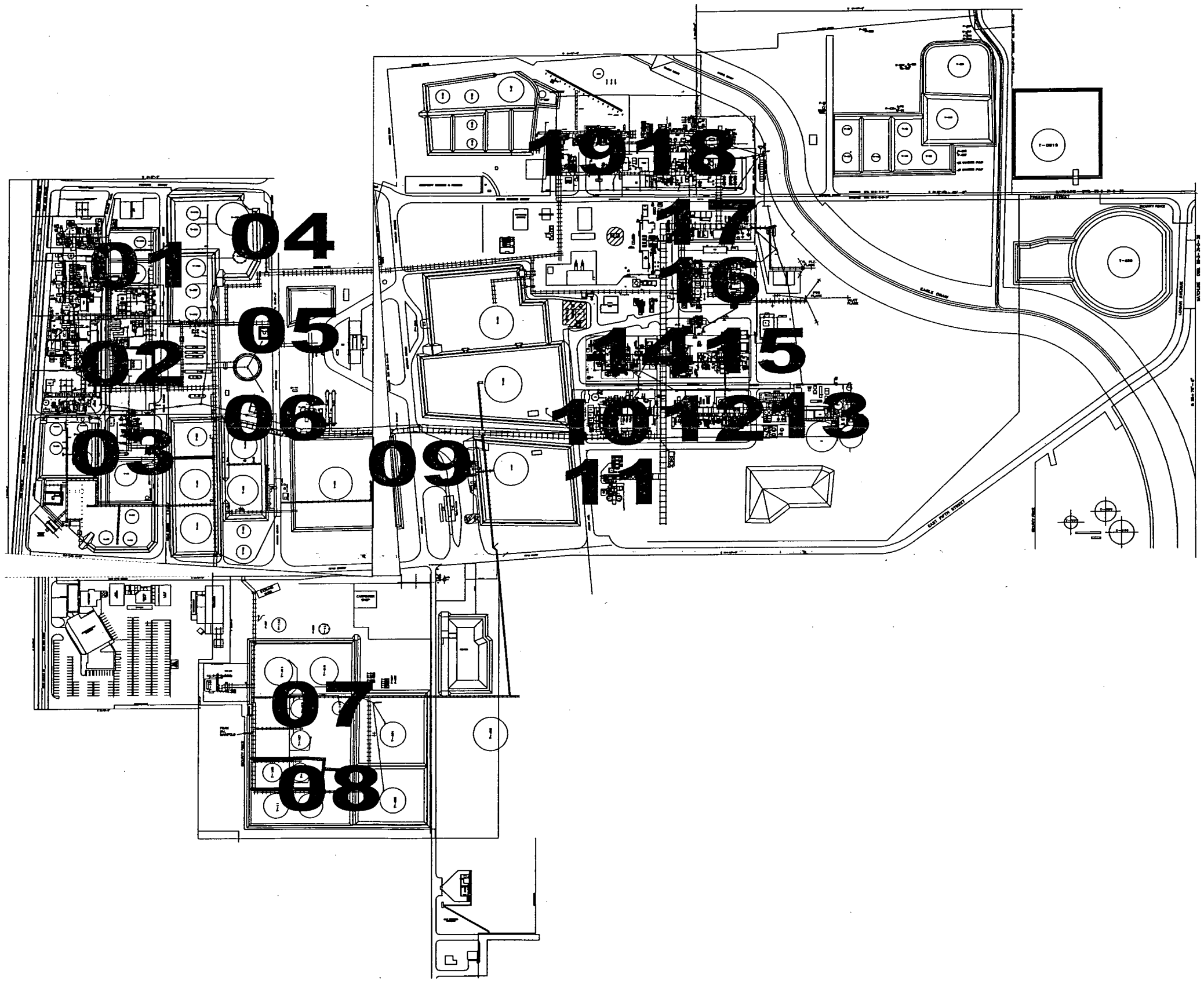
REVISION #6

ALL SUMPS SHOWN ON DRAWING 55-Z-32-D-01

NAVAJO REFINING COMPANY
ARTESIA REFINERY
LISTING OF ALL SUMPS

JAN. 13, 2008

NO. OF SUMPS	SUMP ID #	LOCATION	DESCRIPTION	APPROX DIMENSIONS	LAST TEST DATE	NEXT TEST DUE	TEST PASS / FAIL	TESTED BY	TEST METHOD	REPAIR METHOD	COMMENT
1	02SUMP01	UNDER H-20	CONCRETE BOX	2'-0" x 2'-0" x 3'-0" D		2009					
2	02SUMP02	UNDER H-19	CONCRETE BOX	2'-6" x 2'-6" x 15" D	6/1/2005	6/1/2010					
3	08SUMP01	UNLOADING RACK SOUTH OF 400 TANK	CONCRETE BOX	7'-6" L x 4'-6" W x 3'-0" D	8/25/2008	8/25/2013	PASS	GILES, INC.	HYDRO/LEVEL CHECK		
4	08SUMP02	SPILL COLLECTION BOX AT CBO RR RACK (NORTH)	STEEL BOX	2' x 2' x 2'	9/7/2004	9/7/2009	PASS	GILES, INC.	HYDRO/LEVEL CHECK		
5	08SUMP03	SPILL COLLECTION BOX AT CBO RR RACK (SOUTH)	STEEL BOX	2' x 2' x 2'	9/7/2004	9/7/2009	PASS	GILES, INC.	HYDRO/LEVEL CHECK		
6	08SUMP04	CBO BETWEEN TRUCK RACK & RAILROAD (NORTH)	CONCRETE BOX	8' x 6' x 8'	8/12/2004	8/12/2009	PASS	GILES, INC.	HYDRO/LEVEL CHECK		
7	08SUMP05	CBO BETWEEN TRUCK RACK & RAILROAD (SOUTH)	CONCRETE BOX	8' x 6' x 8'	8/12/2004	8/12/2009	PASS	GILES, INC.	HYDRO/LEVEL CHECK		
8	08SUMP06	P-139 EAST OF CBO RACK	CONCRETE BOX	3' x 3' x 3'	9/8/2004	9/8/2009	PASS	GILES, INC.	HYDRO/LEVEL CHECK		
9	08SUMP07	WATER DRAW NORTH SIDE OF 834 TANK	55 GALLON STEEL DRUM	N/A	9/28/2004	9/28/2009	PASS	GILES, INC.	HYDRO/LEVEL CHECK		
10	08SUMP08	SOUTHWEST CORNER OF 834 TANK	U/G STEEL TANK	N/A	2/14/2005	2/14/2010	PASS	GILES, INC.	HYDRO/LEVEL CHECK		
11	08SUMP09	838 TANK WATER DRAW PIT	CONCRETE BOX	18' x 9' x 2'	N/A	N/A					LOCATED IN NE CORNER OF DIKE - OUT OF SERVICE
12	08SUMP10	WATER DRAW PIT EAST SIDE OF 835 TANK	CONCRETE BOX	9'-8" x 5'-8" x 2'-6"	8/2/2004	8/2/2009	PASS	GILES, INC.	HYDRO/LEVEL CHECK		
13	08SUMP11	SLURRY SLINGER SLUDGE PIT	STEEL BOX	9' x 7' x 5'	N/A	N/A					OUT OF SERVICE
14	08SUMP12	SLURRY SLINGER SLUDGE PIT	STEEL BOX	9' x 7' x 5'	N/A	N/A					OUT OF SERVICE
15	08SUMP13	SLURRY SLINGER SLUDGE PIT	STEEL BOX	9' x 7' x 5'	N/A	N/A					OUT OF SERVICE
16	08SUMP14	WATER DRAW PIT AT EAST SIDE OF 815 TANK	CONCRETE BOX	8'-0" x 4'-0" x 3'-9" D	1/2/2006	1/2/2011	PASS	GILES, INC.	HYDRO/LEVEL CHECK		
17	08SUMP15	BLENDER PUMP PIT	CONCRETE BOX	4' x 4' x 4'	8/27/2008	8/27/2013	PASS	GILES, INC.	HYDRO/LEVEL CHECK		NORTH OF BLENDER BUILDING
18	08SUMP16	SEWER BOX LIFTING STATION SW CORNER OF DIKE @ 401 TK	CONCRETE BOX	8' x 8' x 8'	10/11/2004	10/11/2009	PASS	GILES, INC.	HYDRO/LEVEL CHECK		
19	08SUMP17	WEST SIDE OF 450 TANK	CONCRETE BOX	3' x 3' x 4'	9/29/2004	9/29/2009	PASS	GILES, INC.	HYDRO/LEVEL CHECK		
20	08SUMP18	WEST SIDE OF 415 TANK	CONCRETE BOX	8' x 6' x 6' DEEP	12/13/2004	12/13/2009	PASS	GILES, INC.	HYDRO/LEVEL CHECK		
21	08SUMP19	SE CORNER #2 YARD AT NAPHTHA TRANSFER PUMPS	CONCRETE BOX	3' x 3' x 3'	9/21/2004	9/21/2009	PASS	GILES, INC.	HYDRO/LEVEL CHECK		
22	08SUMP20	WEST OF #3 BLENDER	CONCRETE BOX	3' x 3' x 3'	8/27/2008	8/27/2013	PASS	GILES, INC.	HYDRO/LEVEL CHECK		
23	08SUMP21	ASPHALT RACK SOUTH OF 433 TANK	CONCRETE BOX	4' x 4' x 4'	9/20/2004	9/20/2009	PASS	GILES, INC.	HYDRO/LEVEL CHECK		
24	08SUMP22	WATER DRAW PIT AT 437 TANK	CONCRETE BOX	20' x 40' x 3'	N/A	N/A					OUT OF SERVICE, REMOVED BY ENG. PROJECTS JAN. 2008
25	08SUMP23	WATER DRAW PIT AT 439 TANK	CONCRETE BOX	20' x 40' x 3'	N/A	N/A					OUT OF SERVICE
26	08SUMP24	SOUTH OF 438 TANK	U/G STEEL TANK	N/A	10/12/2004	10/12/2009	PASS	GILES, INC.	HYDRO/LEVEL CHECK		
27	08SUMP25	WEST OF 400 TANK	U/G STEEL TANK	N/A	8/26/2008	8/26/2013	PASS	GILES, INC.	HYDRO/LEVEL CHECK		
28	08SUMP26	SPILL RETENTION SUMPS @ GASOLINE LOADING RACK	CONCRETE BOX	2' x 2'-6" x 2'	9/21/2008	9/21/2013	PASS	GILES, INC.	HYDRO/LEVEL CHECK		HOLLY ENERGY PARTNERS
29	08SUMP27	SPILL RETENTION SUMPS @ GASOLINE LOADING RACK	CONCRETE BOX	2' x 2'-6" x 2'	9/2/2008	9/2/2013	PASS	GILES, INC.	HYDRO/LEVEL CHECK		HOLLY ENERGY PARTNERS
30	08SUMP28	NORTH SIDE OF 110 TANK	U/G STEEL TANK	N/A	10/13/2004	10/13/2009	PASS	GILES, INC.	HYDRO/LEVEL CHECK		
31	08SUMP29	LIFT STATION @ FILTER MANIFOLD S. OF LPG LOADING RACK	U/G STEEL TANK	6' DIAMETER x 4' DEEP	11/15/2004	11/15/2009	PASS	GILES, INC.	HYDRO/LEVEL CHECK		HOLLY ENERGY PARTNERS
32	08SUMP30	SUMP BETWEEN 431 TANK AND 432 TANK	CONCRETE BOX	6' x 8' x 7'-6"	6/10/2004	6/10/2009	PASS	GILES, INC.	HYDRO/LEVEL CHECK		
33	08SUMP31	SOUTH ASPHALT LOADING RACK	CONCRETE BOX	5' x 8'-6" x 6'	7/16/2004	7/16/2009	PASS	GILES, INC.	HYDRO/LEVEL CHECK		LOCATED UNDERNEATH DOGHOUSE AT RACK
34	08SUMP32	SOUTHWEST OF 834 TANK	U/G STEEL TANK	N/A	N/A	N/A					OUT OF SERVICE
35	08SUMP33	EASTOF 115 TANK BY HEP PUMPS	METAL BOX	5' x 3' x 3'	12/8/2008	12/8/2013	FAIL	GILES, INC.	HYDRO/LEVEL CHECK		REPLACE METAL BOX OR INSTALL CONCRETE SUMP
36	08SUMP34	EL PASO PUMP STATION	METAL BOX	6' x 4' x 8'	12/5/2008	12/5/2013	PASS	GILES, INC.	HYDRO/LEVEL CHECK		
37	08SUMP35	EL PASO PUMP STATION	METAL BOX	5' x 3' x 3'	12/5/2008	12/5/2013	PASS	GILES, INC.	HYDRO/LEVEL CHECK		
38	08SUMP36	EL PASO PUMP STATION	METAL BOX	6' x 4'	12/5/2008	12/5/2013	PASS	GILES, INC.	HYDRO/LEVEL CHECK		
39	08SUMP37	FOUR CORNERS STATION "HEP"	METAL BOX	6' x 4'	12/5/2008	12/5/2013	PASS	GILES, INC.	HYDRO/LEVEL CHECK		
40	08SUMP38	FOUR CORNERS STATION "HEP"	METAL BOX	6' x 4'	12/5/2008	12/5/2013	PASS	GILES, INC.	HYDRO/LEVEL CHECK		
41	09SUMP01	FLUORIDE PRECIPITATOR	CONCRETE BOX	4'-0" x 4'-0" x 3' D	10/25/2007		FAIL	GILES, INC.	HYDRO/LEVEL CHECK		
42	09SUMP01	FLUORIDE PRECIPITATOR	CONCRETE BOX	4'-0" x 4'-0" x 3' D	10/27/2007	10/26/2012	PASS	GILES, INC.	HYDRO/LEVEL CHECK		REPAIRED WITH CONCRETE PATCH
43	10SUMP01	SLURRY BARREL @ NORTH PLANT SOUTH OF X-245	1/2 - 55 GALLON STEEL DRUM	N/A	N/A	Replace as req'd					LOCATED IN NORTH PLANT NW OF OLD COMFORT STATION
44	10SUMP02	SLURRY BARREL @ NORTH PLANT SOUTH OF X-245	1/2 - 55 GALLON STEEL DRUM	N/A	N/A	Replace as req'd					LOCATED IN NORTH PLANT NW OF OLD COMFORT STATION
45	10SUMP03	FLUE GAS SCRUBBER - FCCU	CONCRETE BOX	4'-0" x 4'-0" x 4' D	10/25/2007	10/24/2012	PASS	GILES, INC.	HYDRO/LEVEL CHECK		
46	10SUMP04	FLUE GAS SCRUBBER - FCCU	CONCRETE BOX	4'-0" x 4'-0" x 3' D	10/25/2007		FAIL	GILES, INC.	HYDRO/LEVEL CHECK		
47	10SUMP04	FLUE GAS SCRUBBER - FCCU	CONCRETE BOX	4'-0" x 4'-0" x 3' D	11/3/2007	11/2/2012	PASS	GILES, INC.	HYDRO/LEVEL CHECK		REPAIRED WITH CONCRETE PATCH
48	21SUMP01	UNDER D-202 (VACUUM UNIT)	CONCRETE BOX	2'-6" x 2'-6" x 2'-6" D	10/29/2007	10/28/2012	PASS	GILES, INC.	HYDRO/LEVEL CHECK		
49	21SUMP02	EAST OF X-407 ON BRADLEY BLVD	CONCRETE BOX	1'-6" x 1'-6" x 15" D	10/29/2007	10/28/2012	PASS	GILES, INC.	HYDRO/LEVEL CHECK		
50	43SUMP01	WEST END OF S.P. ALKY C.T. Y-2 (NORTH)	CONCRETE BOX	6'-0" x 8'-0" x 6'-6" D	N/A	N/A					OUT OF SERVICE
51	43SUMP02	WEST END OF S.P. ALKY C.T. Y-2 (SOUTH)	CONCRETE BOX	10'-0" x 8'-0" x 6'-6" D	N/A	N/A					OUT OF SERVICE
52	44SUMP16	H-21 PUMP OUT SUMP (NW CORNER OF CURBED AREA AT H-21)	CONCRETE BOX	2'-8" x 2'-8" x 2'-0" D	10/29/2007	10/28/2012	PASS	GILES, INC.	HYDRO/LEVEL CHECK		
53	46SUMP01	NORTH TOOL ROOM	CONCRETE BOX	2' x 2' x 2'	5/20/2004	5/20/2009	PASS	GILES, INC.	HYDRO/LEVEL CHECK		
54	46SUMP02	SE CORNER OF TRUCKING YARD	CONCRETE BOX	3' x 3' x 2'-6"	9/10/2004	9/10/2009	PASS	GILES, INC.	HYDRO/LEVEL CHECK		
55	46SUMP03	DIESEL STORAGE TANK AT MULCOCK WELL GENERATOR	FIBERGLASS	10' x 8' x 1'-9"	9/3/2009	9/3/2014	PASS	GILES, INC.	HYDRO/LEVEL CHECK		
56	46SUMP04	NP BUNDLE SLAB CATCH BASIN	CONCRETE BOX W/ BAFFLE	50' x 3' x 3'-6"	7/14/2004	7/14/2009	PASS	GILES, INC.			NOT A SUMP - TIED TO SEWER LINE (SEE SEWER DWGS)
57	46SUMP05	DIESEL STORAGE TANK SOUTH OF #2 WAREHOUSE	FIBERGLASS	16' x 8' x 1'-9"	8/28/2008	8/28/2013	PASS	GILES, INC.	HYDRO/LEVEL CHECK		
58	46SUMP06	HYDRAULIC FLUID CONTAINMENT SOUTH OF #2 WAREHOUSE	FIBERGLASS	7'-6" x 6'-6" x 1'-6"	8/28/2008	8/28/2013	PASS	GILES, INC.	HYDRO/LEVEL CHECK		
59	46SUMP07	UNLEADED GASOLINE STORAGE TK SOUTH OF WELDING SHOP	FIBERGLASS	12' x 8' x 2'	8/28/2008	8/28/2013	PASS	GILES, INC.	HYDRO/LEVEL CHECK		
60	46SUMP08	SP BUNDLE SLAB CATCH BASIN	CONCRETE BOX W/ BAFFLE	50' x 3' x 3'-6"	7/13/2004	7/13/2009	PASS	GILES, INC.			NOT A SUMP - TIED TO SEWER LINE (SEE SEWER DWGS)
61	46SUMP09	CHEMICAL PAD WEST END OF #2 YARD	CONCRETE BOX	3' x 3' x 3'	6/9/2004	6/9/2009	PASS	GILES, INC.	HYDRO/LEVEL CHECK		
62	46SUMP10	EAST OF MECHANIC SHOP	CONCRETE BOX	4' x 2'-9" x 3'	9/4/2008	9/4/2013	PASS	GILES, INC.	HYDRO/LEVEL CHECK		
63	46SUMP11	EAST OF MECHANIC SHOP	CONCRETE BOX	3' x 3' x 3'	5/11/2004	5/11/2009	PASS	GILES, INC.	HYDRO/LEVEL CHECK		
64	46SUMP12	NW CORNER OF ELECTRICAL SHOP	U/G STEEL TANK	N/A	9/5/2008	9/5/2013	PASS	GILES, INC.	HYDRO/LEVEL CHECK		
65	46SUMP13	NORTH OF INSTRUMENT SHOP	CONCRETE BOX	5' x 5' x 5'	9/4/2008	9/4/2013	PASS	GILES, INC.	HYDRO/LEVEL CHECK		
66	46SUMP15	SAMPLE SUMP NORTH OF LAB	CONCRETE BOX	4' x 4' x 4' (approx)		2010					
67	46SUMP16	CHEMICAL STORAGE AREA, NORTH OF WAREHOUSE "EAST"	CONCRETE BOX		NEW 10/07	2012					"NEW ADDITION" REQUIRES ADDED TO DRAWING
68	46SUMP17	CHEMICAL STORAGE AREA, NORTH OF WAREHOUSE "WEST"	CONCRETE BOX		NEW 10/07	2012					"NEW ADDITION" REQUIRES ADDED TO DRAWING
69	63SUMP01	NORTHSIDE OF HYDROGEN UNIT	CONCRETE BOX	3'-0" x 3'-0" x 4'-3" D	6/1/2005	6/1/2010					THIS SUMP WILL BECOME PSB WHEN NEW H2 UNIT IS BUILT
70											



NOTES

REFERENCE DRAWINGS

NO.	REVISIONS	BY	CHK.	DATE	APPR.	APPR.

NO.	REVISIONS	BY	CHK.	DATE	APPR.	APPR.
0	ISSUED FOR REFERENCE	SLW	SLW	1/11/08	DGJ	

DRAWING TITLE
KEY PLOT PLAN
UNDERGROUND SEWER PIPING

NAVAJO REFINING CO.
ENGINEERING DEPARTMENT
P.O. DRAWER 159
ARTESIA, NEW MEXICO

DRAWN BY	CHK'D BY	SCALE	
SLW	SLW	NONE	
DATE	APPR BY	DRAWING NUMBER	REV.
1/11/08	DGJ	55-Z-32-D-00	0

NOTES

REFERENCE DRAWINGS

NO.	REVISIONS	BY	CHK.	DATE	APPR.

NO.	REVISIONS	BY	CHK.	DATE	APPR.
0					

DRAWING TITLE

PLOT PLAN
UNDERGROUND SEWER PIPING
UNIT 02, UNIT 43, PBC SKID
TREATER AREA, SOUTH TRUNK
LINE, SOUTH MAIN LINE

NAVAJO REFINING CO.
ENGINEERING DEPARTMENT
P.O. DRAWER 159
ARTESIA, NEW MEXICO

DRAWN BY	CHK'D BY	SCALE	DRAWING NUMBER	REV.
SLW	SLW	NONE	55-Z-32-D-01	0
DATE	APPR BY			
1/11/08	DGJ			

SEE DWG 55-Z-32-D-02

SEE DWG 55-Z-32-D-04

TEXAS STREET

T-419
T-417
T-418
T-111
T-413
T-124

PLT. NORTH
ROT. 4.01934° CW

STLB-06
STLB-01
STLB-02
STLB-08
STLB-09
STLB-10
STLB-11
STLB-12
STLB-13
STLB-14
STLB-15
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STLB-28
STLB-29
STLB-30
STLB-31
STLB-32
STLB-33
STLB-34
STLB-35
STLB-36

SML-8101
SML-8100
SML-02

BRADLEY BLVD.

CONTROL BUILDING
SOUTH PLANT CONTROL ROOM
CONTROL ROOM
SWITCH GEAR ROOM
FIRE PUMP HOUSE
SOUTH API 7 TOWER
NORTH API 7 TOWER
T-34
T-35
T-36
T-37
T-38
T-39
T-40
T-41
T-42
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T-72
T-73

SEE DWG 55-Z-32-D-01

SEE DWG 55-Z-32-D-03

SEE DWG 55-Z-32-D-05

MATCHLINE DWG. 55-Z-31-D-06

T-419

T-40

T-41

T-42

T-45

T-48

T-46

CONTROL ROOM

TCC TOWER

TCC COOLING TOWER Y-1

SKID-A

SKID-B

SKID-C

SKID-D

SKID-E

SKID-F

TEXAS STREET

STREET

PLT. NORTH
ROT. 4.01934° CW

NOTES

REFERENCE DRAWINGS

NO.	REVISIONS	BY	CHK.	DATE	APPR.	APPR.
0	ISSUED FOR REFERENCE	SLW	SLW	1/11/08	DGJ	

DRAWING TITLE

PLOT PLAN
UNDERGROUND SEWER PIPING
VACUUM UNIT AREA, PCB SKID
TREATER AREA, SOUTH MAIN
LINE, SOUTH TRUNK LINE, AREA
EAST OF 419 TANK-S.P.

NAVAJO REFINING CO.
ENGINEERING DEPARTMENT
P.O. DRAWER 159
ARTESIA, NEW MEXICO

DRAWN BY	CHK'D BY	SCALE	
SLW	SLW	NONE	
DATE	APPR BY	DRAWING NUMBER	REV.
1/11/08	DGJ	55-Z-32-D-02	0

SEE DWG 55-Z-32-D-02

TEXAS ST

BRADLEY BLVD.

ACCESS ROAD

T-403

T-404

T-405

T-406

T-409

T-410

T-106

T-431

PSB-132 OLD SLURRY TK

PSB-127

PSB-133

PSB-129

PSB-128

PSB-131

PSB-136

PSB-139

PSB-140

PSB-J30 21SUMP01

PSB-122

PSB-123

PSB-124

PSB-125

TCC ALLEY

E 8+16'-0"

MAIN SEWER (LIVE LINE)

NEW FIRE HYDRANT

FIRE HYDRANT

8" FIRE WATER LINE (LIVE LINE)

NEW 10" FIRE WATER LINE

10" FIRE WATER LINE (LIVE LINE)

SECTIONAL FIRE WATER VALVE

16" D.I. MAIN SEWER (LIVE LINE)

2" SLOP RETURN TO T-130 & T-132 (LIVE LINE)

EQUIP. PAD (EXIST'G)

H.D. DRUM

DEAD VALVE PIT (EXIST'G)

12" SEWER (DEAD LINE)

PDC

PLT. NORTH
ROT. 4.01934° CW

SEE DWG 55-Z-32-D-04

SEE DWG 55-Z-32-D-06

NOTES

REFERENCE DRAWINGS

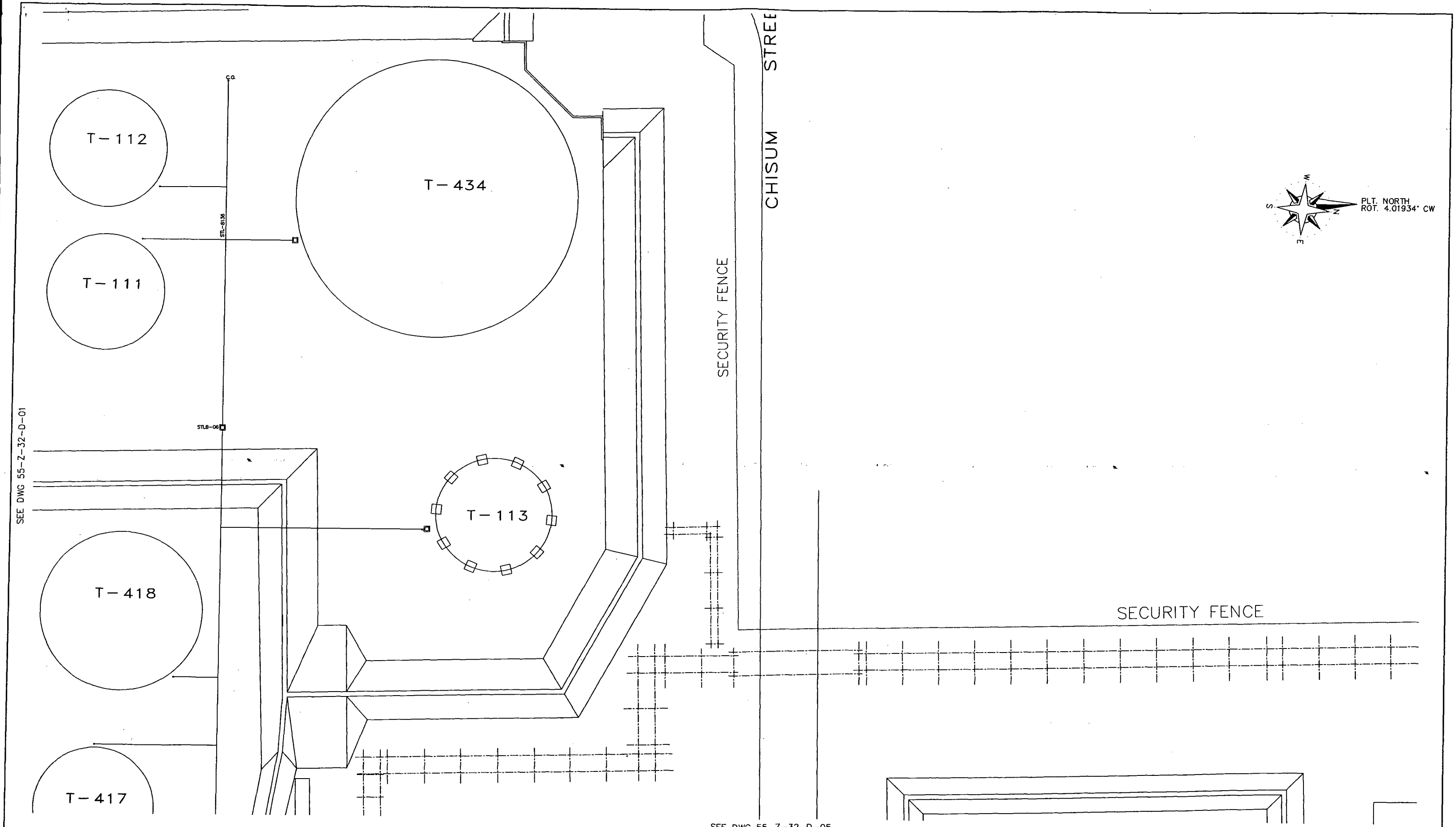
NO.	REVISIONS	BY	CHK.	DATE	APPR.	APPR.
0	ISSUED FOR REFERENCE	SLW	SLW	1/11/08	DGJ	

DRAWING TITLE

PLOT PLAN
UNDERGROUND SEWER PIPING
VACUUM UNIT AREA, SOUTH
MAIN LINE, ROSE UNIT AREA

NAVAJO REFINING CO.
ENGINEERING DEPARTMENT
P.O. DRAWER 159
ARTESIA, NEW MEXICO

DRAWN BY	CHK'D BY	SCALE	
SLW	SLW	NONE	
DATE	APPR BY	DRAWING NUMBER	REV.
1/11/08	DGJ	55-Z-32-D-03	0



NOTES

REFERENCE DRAWINGS

NO.	REVISIONS	BY	CHK.	DATE	APPR.	APPR.
0	REVISIONS	0	.	DATE	.	.

DRAWING TITLE
PLOT PLAN
UNDERGROUND SEWER PIPING
SOUTH TRUNK LINE

NAVAJO REFINING CO.
ENGINEERING DEPARTMENT
P.O. DRAWER 159
ARTESIA, NEW MEXICO

DRAWN BY	CHK'D BY	SCALE	
SLW	SLW	NONE	
DATE	APPR BY	DRAWING NUMBER	REV.
1/11/08	DGJ	55-Z-32-D-04	0

SEE DWG 55-Z-32-D-04

SEE DWG 55-Z-32-D-02

T-417

T-419

T-445

T-40

T-41

T-42

T-45

T-48

STL-8137

STLB-07

SPS-8585

SPS-8584

SPS-8582

SPS-8583

TPB-121

M STREET

SEE DWG 55-Z-32-D-06

PLT. NORTH
ROT. 4.01934° CW

NOTES

REFERENCE DRAWINGS

NO.	REVISIONS	BY	CHK.	DATE	APPR.	APPR.
0	ISSUED FOR REFERENCE	SLW	SLW	1/11/08	DGJ	

DRAWING TITLE
PLOT PLAN
UNDERGROUND SEWER PIPING
SOUTH TRUNK LINE, AREA EAST
OF 419 TANK-S.P.

NAVAJO REFINING CO.
ENGINEERING DEPARTMENT
P.O. DRAWER 159
ARTESIA, NEW MEXICO

DRAWN BY	CHK'D BY	SCALE	
SLW	SLW	NONE	
DATE	APPR BY	DRAWING NUMBER	REV.
1/11/08	DGJ	55-Z-32-D-05	0

SEE DWG 55-Z-32-D-05

SEE DWG 55-Z-32-D-02

SEE DWG 55-Z-32-D-03

SEE DWG 55-Z-32-D-09

CHISUM STRE

SR-39

T-48

T-46

T-106

T-438

T-71

T-47

T-72

T-73

T-74

P-191

SMB-07

SMB-08

SMB-09

SMB-10

SML-8106

SML-8107

SMS-8108

SMS-8109

PLT. NORTH
ROT. 4.01934° CW

NOTES

REFERENCE DRAWINGS

NO.	REVISIONS	BY	CHK.	DATE	APPR.	APPR.
0	ISSUED FOR REFERENCE	SLW	SLW	1/11/08	DGJ	

DRAWING TITLE

PLOT PLAN
UNDERGROUND SEWER PIPING
SOUTH TRUNK LINE, SOUTH
MAIN LINE

NAVAJO REFINING CO.
ENGINEERING DEPARTMENT
P.O. DRAWER 159
ARTESIA, NEW MEXICO

DRAWN BY	CHK'D BY	SCALE	
SLW	SLW	NONE	
DATE	APPR BY	DRAWING NUMBER	REV.
1/11/08	DGJ	55-Z-32-D-06	0

NOTES

REFERENCE DRAWINGS

NO.	REVISIONS	BY	CHK.	DATE	APPR.
0	ISSUED FOR REFERENCE	SLW	SLW	1/11/08	DGJ

DRAWING TITLE
PLOT PLAN
UNDERGROUND SEWER PIPING
BLENDER TANK FARM, NORTH
PLANT-SOUTH TANK FARM

NAVAJO REFINING CO.
ENGINEERING DEPARTMENT
P.O. DRAWER 159
ARTESIA, NEW MEXICO

DRAWN BY	CHK'D BY	SCALE
SLW	SLW	NONE

DATE	APPR BY	DRAWING NUMBER	REV.
1/11/08	DGJ	55-Z-32-D-07	0

SEE DWG 55-Z-32-D-08

T-401
T-107
T-117
T-415
T-412
T-411
TFPS-8139
TFPS-8140
TFPS-8141
TFPS-8142
TFPS-8144
TFPS-8145
TFPS-8146
PUMP ABOVE GROUND
TO SWB-07

PLL NORTH
ROT. 4.01934° CW

P-0277
P-0273
P-0274
P-0275
P-0276
P-0277
P-XXXX
P-0341
P-0761
P-0762
P-0105

NAVAJO REFINING CO.
ENGINEERING DEPARTMENT
P.O. DRAWER 159
ARTESIA, NEW MEXICO

DRAWING TITLE
PLOT PLAN
UNDERGROUND SEWER PIPING
BLENDER TANK FARM

NO.	REVISIONS	BY	CHK.	DATE	APPR.	APPR.
0	ISSUED FOR REFERENCE	SLW	SLW	1/11/08	DGJ	

NOTES

REFERENCE DRAWINGS

DRAWN BY	CHK'D BY	SCALE	DRAWING NUMBER	NO.
SLW	SLW	NONE	55-Z-32-D-08	0
DATE	APPR BY			
1/11/08	DGJ			

T-402
T-12
T-11
T-109
T-108
T-107
T-401
PLT. NORTH
ROT. 4.01934° CW
SEE DWG 55-Z-32-D-07

SEE DWG 55-Z-32-D-06

T-433

F 8+90'-2"

N 0+62'-5"

E 8+88'-0"

EY AVENUE

TRUCK SCALES

P-XXXX

P-XXXX

SA-20A

P-?
P-?
P-248
P-259

T-437

PLT. NORTH
ROT. 4.01934° CW

SEE DWG 55-Z-32-D-10

REFERENCE DRAWINGS

NO.	REVISIONS	BY	CHK.	DATE	APPR.
0	ISSUED FOR REFERENCE				

NO.	REVISIONS	BY	CHK.	DATE	APPR.

DRAWING TITLE
PLOT PLAN
UNDERGROUND SEWER PIPING
SOUTH MAIN LINE

DRAWN BY
CHKD BY
SCALE

NAVAJO REFINING CO.
ENGINEERING DEPARTMENT
P.O. DRAWER 159
ARTESIA, NEW MEXICO

NOTES

REFERENCE DRAWINGS

NO.	REVISIONS	BY	CHK.	DATE	APPR.

NO.	REVISIONS	BY	CHK.	DATE	APPR.
0	ISSUED FOR REFERENCE	SLW	SLW	1/11/08	DGJ

DRAWING TITLE

PLOT PLAN
UNDERGROUND SEWER PIPING
SOUTH MAIN LINE, 435 TANK
AREA, UNIT 33 AREA, R.O.
WATER BLDG.

NAVAJO REFINING CO.
ENGINEERING DEPARTMENT
P.O. DRAWER 159
ARTESIA, NEW MEXICO

DRAWN BY	CHK'D BY	SCALE
SLW	SLW	NONE

DATE	APPR BY	DRAWING NUMBER	REV.
1/11/08	DGJ	55-Z-32-D-10	0

SEE DWG 55-Z-32-D-11

SEE DWG 55-Z-32-D-12

SEE DWG 55-Z-32-D-09

SEE DWG 55-Z-32-D-14

PLT. NORTH
ROT. 4.01934° CW

H-2421

H-2421

MATCHLINE DWG. 55-Z-31-D-15

MATCHLINE DWG. 55-Z-31-D-30

MATCHLINE DWG. 55-Z-31-D-34

MATCHLINE DWG. 55-Z-31-D-27

SWL-8112

SWL-8113

SWL-8114

SWB-16

MANHOLE SWB-14

MANHOLE

NEUTRALIZING VAT

CHANGE ROOM

COOLING WATER CONSOLE

W-630

W-631

H-601

F-602

F-601

D-246

D-661

D-662

D-663

D-664

D-665

D-666

D-667

D-668

D-669

D-671

D-672

D-673

D-674

D-675

D-676

D-677

D-681

X-687(A)

X-687(B)

X-688(A)

X-688(B)

X-689(A)

X-689(B)

X-671(A)

X-671(B)

X-672(A)

X-672(B)

X-673(A)

X-673(B)

X-674

X-675

X-681

X-682

X-747

X-748

X-766

X-701

X-702

P-3501

P-3502

P-3503

P-3504

P-3505

P-3506

P-3507

P-3516

P-3517

P-3518

P-3519

PSB-106

PSB-107

PSB-108

PSB-109

PSB-110

PSB-111

PSB-112

PSB-113

PSB-115

PSB-262

PSB-267

PSB-76

TRFS-8573

TRFS-8572

TB-115

C.O.

C.O.

4" NPS-8557

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4" NPS-8993

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4" NPS-8998

4" NPS-8999

NOTES

REFERENCE DRAWINGS

NO.	REVISIONS	BY	CHK.	DATE	APPR.

NO.	REVISIONS	BY	CHK.	DATE	APPR.
0	ISSUED FOR REFERENCE	SLW	SLW	1/11/08	DGJ

DRAWING TITLE

PLOT PLAN
UNDERGROUND SEWER PIPING
HYDROGEN UNIT AREA

NAVAJO REFINING CO.
ENGINEERING DEPARTMENT
P.O. DRAWER 159
ARTESIA, NEW MEXICO

DRAWN BY	CHK'D BY	SCALE	REV.
SLW	SLW	NONE	0
DATE	APPR BY	DRAWING NUMBER	
1/11/08	DGJ	55-Z-32-D-11	

PLT. NORTH
ROT. 4.01934° CW

OPEN DITCH

NPS-8574

NPS-8575

NPS-8577

NPS-8579

6" NPS-8578

PSB-120

NPS-8576

PSB-119

PSB-118

PSB-117

PSB-116

6"SUMP01

H-6801

H-6802

STACK

F-8810

X-8810

X-8811

D-8811

X-8812

X-8813

D-8813

X-8803

X-8804

X-8808

D-8808

D-8803

D-8802

D-8801

D-8816

P-8802

P-8801

D-8815

D-8814

D-8811

D-8810

D-8813

D-8809

D-8812

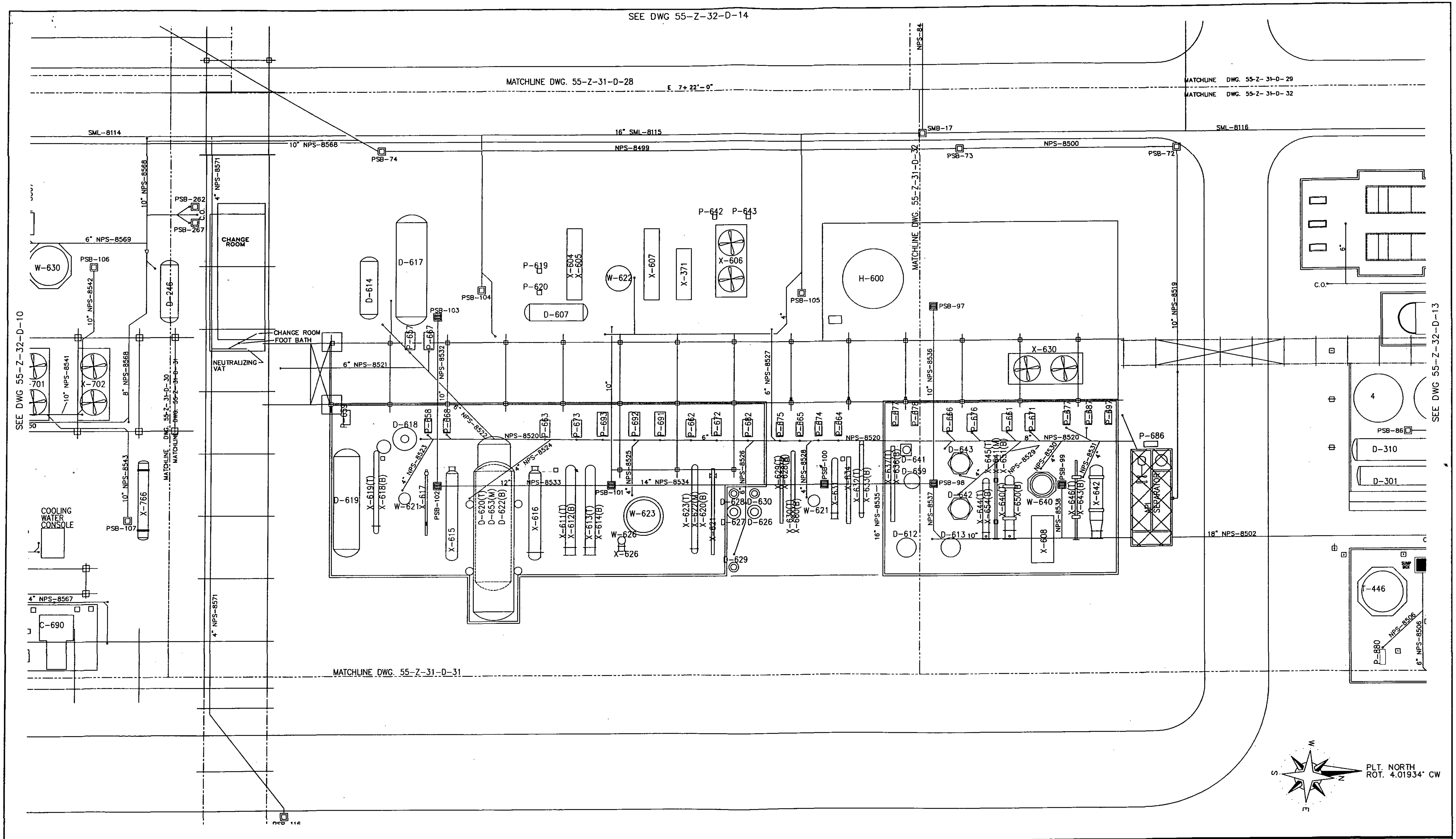
X-8805

FLUME
UNIT 64
HYDROGEN PLANT

Y-08

H-2421

SEE DWG 55-Z-32-D-10



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REFERENCE DRAWINGS

NO.	REVISIONS	BY	CHK.	DATE	APPR.	APPR.
0	ISSUED FOR REFERENCE	SLW	SLW	1/11/08	DGJ	

DRAWING TITLE

PLOT PLAN
UNDERGROUND SEWER PIPING
UNIT 33 AREA, ALKY UNIT AREA,
WWT/API SEPARATOR AREA,
SOUTH MAIN LINE

NAVAJO REFINING CO.
ENGINEERING DEPARTMENT
P.O. DRAWER 159
ARTESIA, NEW MEXICO

DRAWN BY	CHK'D BY	SCALE	
SLW	SLW	NONE	
DATE	APPR BY	DRAWING NUMBER	REV.
1/11/08	DGJ	55-Z-32-D-12	0

NAVAJO REFINING CO.
ENGINEERING DEPARTMENT
P.O. DRAWER 159
ARTESIA, NEW MEXICO

DRAWING TITLE
PLOT PLAN
UNDERGROUND SEWER PIPING
ALKY UNIT AREA,
WWT/API SEPARATOR AREA.

DRAWN BY	CHK'D BY	SCALE
SLW	SLW	NONE

DATE	APPR BY	DRAWING NUMBER	REV.
1/11/08	DGJ	55-Z-32-D-13	0

NO.	REVISIONS	BY	CHK.	DATE	APPR.	APPR.
0	ISSUED FOR REFERENCE	SLW	SLW	1/11/08	DGJ	

NO.	REVISIONS	BY	CHK.	DATE	APPR.	APPR.

REFERENCE DRAWINGS

NOTES

PLT. NORTH
ROT. 4.01934° CW

T-836
T-801
NPS-8512
P-880
8" NPS-8506
T-841
T-443
T-446
P-133
P-136
D-14
C.O.
18" NPS-8502
PSB-92
8" NPS-8516
PSB-88
CAT FINE BINS
C-802
C-807
C-808
P-800
C-801
T-805
T-807
K-801
T-808
C-805
D-801
NPS-8511
PSB-90
PSB-89
8" NPS-8509
PSB-87
API SEPARATOR
API-801
PUMP SKID 5'X15'
T-804
T-803
D-301
D-310
PSB-85
PSB-86
NPS-8504
NPS-8505
P-850
P-851
T-49
8" NPS-8503
SEPARATOR
P-686
SEDIMENTOR
X-642
P-597
SEE DWG 55-Z-32-D-12
10" NPS-8519
PSB-72
SML-8116
16" SML-8117
SMB-18
P-863/M-877
P-862/M-875
P-860
P-861
T-831
T-896
PSB-93
NPS-8515
T-897
D-811
START
D-810
T-806
P-879
P-878
PSB-94
D-806
D-807
FILTERS
WATCHLINE DWG. 55-Z-31-D-27
T-809
8" NPS-8514
PSB-95
C.O.
STORAGE
FRAC TANK
FRAC TANK
OFFICE
BALL MILL
HOPPER
300 GALLON
POLYMER
MIX TANK
ROLLOFF
DECANTER
NMB-13
8" NPS-8513
P-856
P-857
P-854
P-849
NPS-8507
8" NPS-8507
16"
NPS-8510
NPS-8520
WATCHLINE DWG. 55-Z-31-D-32
WATCHLINE DWG. 55-Z-31-D-29
SEE DWG 55-Z-32-D-15

NAVAJO REFINING CO.
ENGINEERING DEPARTMENT
P.O. DRAWER 159
ARTESIA, NEW MEXICO

DRAWING TITLE
PLOT PLAN
UNDERGROUND SEWER PIPING
UNIT 44/45/ALKY WEST SIDE,
CCRU AREA

NO.	REVISIONS	BY	CHK.	DATE	APPR.	APPR.
0	ISSUED FOR REFERENCE	SLW	SLW	1/11/08	DGJ	

NO.	REVISIONS	BY	CHK.	DATE	APPR.	APPR.

REFERENCE DRAWINGS

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DRAWN BY	CHK'D BY	SCALE	DATE	APPR BY	DRAWING NUMBER	REV.
SLW	SLW	NONE	1/11/08	DGJ	55-Z-32-D-14	0

SEE DWG 55-Z-32-D-10

SEE DWG 55-Z-32-D-12

SEE DWG 55-Z-32-D-15

SEE DWG 55-Z-32-D-16

MATCHLINE DWG. 55-Z-31-D-28

MATCHLINE DWG. 55-Z-31-D-27

PLT. NORTH
ROT. 4.01934° CW

N
S
E
W

COMPRESSOR PLATFORM

COMPRESSOR COOLING SKID

SCRUBBER

X-FORMER

4160 V STARTER

CENTRAL R.I.E.

FIRE MONITOR

FEED SYSTEM SKID

BMS Module

R.O. BUILDING

SWITCH RACK

DUCT BANK

Crane Access Road

SUMP

MANHOLE

E of ROAD E 7+16-6 1/4

E 7+22'-0"

N 8+89'-7"

E 6+09'-7"

10-1/4

10-1/2

10" NPS-8568

16" SWL-8115

SWL-8114

SWG-15

NPS-8499

NPS-8498

NPS-8472

NPS-8462

NPS-8470

NPS-8463

NPS-8471

NPS-8464

NPS-8473

NPS-8474

NPS-8484

NPS-8485

NPS-8462

NPS-8477

NPS-8479

NPS-8487

NPS-8476

NPS-8475

NPS-8494

NPS-8495

NPS-8496

NPS-8492

NPS-8497

NPS-8478

NPS-8469

NPS-8488

NPS-8490

NPS-8491

NPS-8489

NPS-8493

NPS-8498

NPS-8499

NPS-8472

PSB-74
PSB-75
PSB-76
PSB-77
PSB-78
PSB-79
PSB-80
PSB-81
PSB-82
PSB-83
PSB-84
PSB-66
PSB-67
PSB-68
PSB-69
PSB-64
PSB-11

D-379
D-384
D-342
D-395
D-374
D-770
D-771
D-245
D-2476
D-2472
D-477
D-475
D-478
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D-473
D-2478
D-2479
D-2473
D-2492
D-250
D-405
H-355
H-21
H-2421
W-2421
W-2441
C-2421
D-2484
C-156
C-157
C-339
C-420
C-421
C-430
C-972
C-973
P-2478/79
P-2480/81
P-2476/77
P-994
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X-387
X-390
X-391
X-2480/81
X-2487
X-2488
X-2489
X-177
X-176

SEE DWG 55-Z-32-D-16

SEE DWG 55-Z-32-D-14

FIRE MONITOR

FIRE HYDRANT

MATCHLINE DWG. 55-Z-31-D-37

E 5+72'-0"

MATCHLINE DWG. 55-Z-31-D-26

E 5+42'-0"

P/B

SC-5

POLE

SUB 2

FIRE MONITOR

PDC

FIRE MONITOR

H-362 H-363 H-364 D-235 P-54 P-55 PSB-70

H-352 H-353 H-354 D-362 D-361 OD-360 PSB-62 PSB-63

10" NPS-8458

10" NPS-8457

6" NPS-8471

6" NPS-8465

8" NPS-8465

C.O.

X-365(T) X-375(B)

6" NPS-8466

X-362 X-361 X-360 X-315 X-316 P-313 D-403 D-358 P-382 P-381 X-350 X-366 D-343 D-344 D-365 C-375 D-398 D-345 D-349 W-351 D-401 D-400 F-383 D-412 D-275 D-274 D-355 D-363 D-417 D-416 D-390 C-350 LUBE OIL CONSOLE X-386 PSB-71 PSB-61 95+9.54N 3'11

C-352 D-368 D-347 D-369 D-348 D-447 D-349 H-356 D-366 P-389 D-367

6" NPS-8467 PSB-63

6" NPS-8468

6" NPS-8469

10" NPS-8454

NPS-8455

MATCHLINE DWG. 55-Z-31-D-29

MATCHLINE DWG. 55-Z-31-D-32

SMB-17 SML-8116 SMB-18 16" SML-8117

NPS-8500

PSB-73 PSB-72

SEE DWG 55-Z-32-D-13

12" NML-8129

NPS-8130

DECANTER NMB-13

ROLLOFF

300 GALLON POLYMER MIX TANK

HOPPER

OFFICE

8" NPS-8513

8" NPS-8514

P-849 P-854 P-857 P-856

PSB-95

T-809

DWG. 55-Z-31-D-27

PLT. NORTH
ROT. 4.01934° CW

NOTES

REFERENCE DRAWINGS

NO.	REVISIONS	BY	CHK.	DATE	APPR.	APPR.

NO.	REVISIONS	BY	CHK.	DATE	APPR.	APPR.
0	ISSUED FOR REFERENCE	SLW	SLW	1/11/08	DGJ	

DRAWING TITLE

PLOT PLAN
UNDERGROUND SEWER PIPING
ALKY UNIT AREA,
WWT/API SEPARATOR AREA,

NAVAJO REFINING CO.
ENGINEERING DEPARTMENT
P.O. DRAWER 159
ARTESIA, NEW MEXICO

DRAWN BY	CHK'D BY	SCALE	
SLW	SLW	NONE	
DATE	APPR BY	DRAWING NUMBER	REV.
1/11/08	DGJ	55-Z-32-D-15	0

SEE DWG 55-Z-32-D-17

30" HDPE P

P-830
P-831
P-829
P-826

D-148
D-147
PSB-43
NPS-8213
NPS-8214
NPS-8215
PIPE RACK
CAUSTIC MIX
SAFETY SHOWER
PSB-44
SEWER
FIBER OPTIC CABLE
P-825
P-132
P-143
P-144
P-146
Y-4 COOLING TOWER
E. 76'-6 1/2"
EXIST. W6 COL.
PIPE RACK
D-525
D-523
PSB-53
COOLING Y-6 COOLING TOWER
B-8
B-7
DRYERS/ FILTERS
P-996
D-250
PSB-46
CONTROL ROOM
PSB-48
C-36
NPS-8229
D-251
P-907
P-927
P-928
P-929
P-930
P-931
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X-564

SEE DWG 55-Z-32-D-18

FREEMAN STREET

FREEMAN STREET

SMOKE SHACK

ELECTRICAL SUB-STATION

Y-8 COOLING TOWER

ELECTRICAL BUILDING

ELECTRICAL BUILDING

ELECTRICAL BUILDING

D-62

W-308

NPS-8217

NPS-8223

NPS-8226

NPS-8218

PSB-50

C.O.

NPS-8216

NPS-8219

NPS-8220

NPS-8221

NPS-8222

NPS-8224

NPS-8225

NPS-8225

NPS-8225

X-175

D-339

D-281

W-304

D-280

PSB-46

P-830

P-831

P-829

P-826

D-148

D-147

PSB-43

NPS-8213

NPS-8214

NPS-8215

PIPE RACK

CAUSTIC MIX VAT

PSB-44

SAFETY SHOWER/EW

SEWER

FIBER OPTIC CABLE

P-825

P-143

P-144

P-146

Y-4 COOLING TOWER

PIPE RACK

EXIST. W6 COL.

D-525

D-523

PSB-53

PSB-52

CONTROL ROOM

PSB-48

C-36

D-251

P-907

P-927

P-928

P-929

P-930

P-931

P-932

P-870

X-505

X-548

X-526

X-527

X-525

W-305

W-311

W-306

P-399

P-400

10" NPS-8238

NPS-8236

NPS-8237

6" NPS-8232

4" NPS-8235

4" NPS-8233

NPS-8234

PSB-55

12" NPS-8249

D-0340

6" NPS-8241

4" NPS-8240

C-930

C-932

D-340

PSB-56

PSB-60

C-956

PSB-59

4" NPS-8247

NPS-8246

X-538

X-537

X-541

D-541

W-405

12" NPS-8453

4" NPS-8457

MATCHLINE DWG. 55-Z-31-D-37

N 13+ 38'-0"

C.O.

NMB-09

NMB-8126

NPS-8517

PSB-96

FUEL GAS DRUM

FLARE DRUM

8"-NPS-8228

NML-8126

NMB-10

NML-8127

NMB-11

NML-8128

PLT. NORTH
ROT. 4.01934° CW

SEE DWG 55-Z-32-D-16

NOTES

REFERENCE DRAWINGS

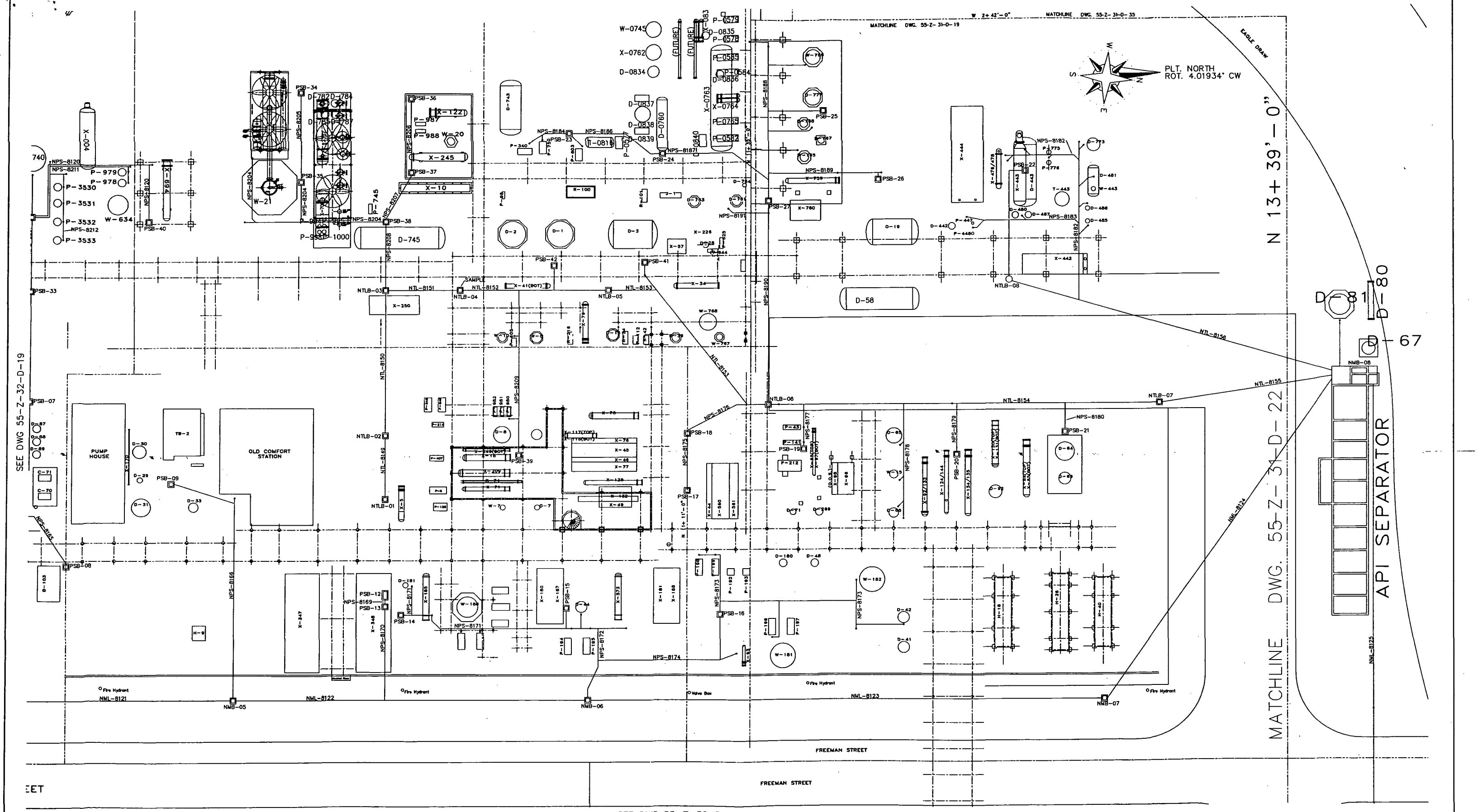
NO.	REVISIONS	BY	CHK.	DATE	APPR.	APPR.
0	ISSUED FOR REFERENCE	SLW	SLW	1/11/08	DGJ	

DRAWING TITLE

PLOT PLAN
UNDERGROUND SEWER PIPING
NORTH PLANT DEAERATOR AREA,
FCCU AREA, ISOM/JP-8 AREA,
NORTH MAIN LINE

NAVAJO REFINING CO.
ENGINEERING DEPARTMENT
P.O. DRAWER 159
ARTESIA, NEW MEXICO

DRAWN BY	CHK'D BY	SCALE	
SLW	SLW	NONE	
DATE	APPR BY	DRAWING NUMBER	REV.
1/11/08	DGJ	55-Z-32-D-17	0


PLT. NORTH
ROT. 4.01934° CW
MATCHLINE DWG. 55-Z-31-D-19
MATCHLINE DWG. 55-Z-31-D-35
N 13+39'-0"
MATCHLINE DWG. 55-Z-31-D-22
SEE DWG 55-Z-32-D-19
SEE DWG 55-Z-32-D-17
EAGLE DRAW
API SEPARATOR
PUMP HOUSE
OLD COMFORT STATION
TB-2
FREEMAN STREET
Fire Hydrant
Valve Box
NML-8121
NML-8122
NML-8123
NML-8124
NML-8125
NTL-8150
NTL-8151
NTL-8152
NTL-8153
NTL-8154
NTL-8155
NTL-8156
NPS-8165
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NMB-05
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NTLB-01
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NTLB-07
NTLB-08
PSB-07
PSB-08
PSB-09
PSB-12
PSB-13
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PSB-15
PSB-16
PSB-17
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PSB-27
PSB-33
PSB-34
PSB-35
PSB-36
PSB-37
PSB-38
PSB-39
PSB-40
PSB-41
PSB-42
D-745
X-10
X-245
X-1227
X-250
X-347
X-348
W-20
W-21
W-634
W-707
W-708
W-759
W-760
W-781
W-782
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W-805
W-806
W-807
W-808
W-809
W-810
W-811
W-812
W-813
W-814
W-815
W-816
W-817
W-818
W-819
W-820

PLT. NORTH
ROT. 4.01934° CW

Fire Hydrant

FREEMAN STREET

SEE DWG 55-Z-32-D-17

SEE DWG 55-Z-32-D-18

NOTES

REFERENCE DRAWINGS

NO.	REVISIONS	BY	CHK.	DATE	APPR.	APPR.
0	ISSUED FOR REFERENCE	SLW	SLW	1/11/08	DGJ	

DRAWING TITLE

PLOT PLAN
UNDERGROUND SEWER PIPING
NORTH MAIN LINE, NORTH PLANT
OLD UTILITY AREA, SRU, NORTH
PLANT UTILITY AIR, AMINE SKIDS,
NORTH TRUNK LINE, NAPTHA
UNIT

NAVAJO REFINING CO.
ENGINEERING DEPARTMENT
P.O. DRAWER 159
ARTESIA, NEW MEXICO

DRAWN BY	CHK'D BY	SCALE
SLW	SLW	NONE
DATE	APPR BY	DRAWING NUMBER / REV.
1/11/08	DGJ	55-Z-32-D-19 / 0