Naval Facilities Engineering Command Southwest
San Diego, CA

FINAL
UNDERGROUND STORAGE TANK/ ABOVEGROUND STORAGE TANK MANAGEMENT PLAN

MARINE CORPS AIR STATION
MIRAMAR, CALIFORNIA

September 2018

DCN: MMEC-2405-4107-0006

Naval Facilities Engineering Command Southwest
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September 2018

Prepared for:

Department of the Navy
Naval Facilities Engineering Command Southwest
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Prepared for
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REVIEW AND APPROVAL

Project Manager: _____ 09/07/2018

Steve Kummerfeldt
MMEC Group

Date

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ACRONYMS AND ABBREVIATIONS

AB	Assembly Bill
API	American Petroleum Institute
APSA	Aboveground Petroleum Storage Act
ASNT	American Society for Nondestructive Testing
AST	Aboveground Storage Tank
ATG	Automatic Tank Gauging
ATS	Automatic Transfer Switch
BEI	Bechtel Environmental, Inc.
bgs	below ground surface
CARB	California Air Resources Board
CCR	California Code of Regulations
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFC	California Fire Code
CFR	Code of Federal Regulations
CRDM	Continuous Release Detection Method
CERS	California Environmental Reporting System
CUPA	Certified Unified Program Agency
CY	calendar year
DEH	County of San Diego Department of Environmental Health
DOT	U.S. Department of Transportation
DUSTO	Designated Underground Storage Tank Operator
EGT	Emergency Generator Tank
ELD	Enhanced Leak Detection
ELLD	Electronic Line Leak Detection
EMD	Environmental Management Department
EPA	U.S. Environmental Protection Agency
EVR	Enhanced Vapor Recovery
ºF	degrees Fahrenheit
FRP	fiberglass-reinforced plastic
gph	gallons per hour
gpm	gallons per minute
HMBP	Hazardous Materials Business Plan
HMD	Hazardous Materials Division
HSC	Health and Safety Code
ICC	International Code Council
JEG	Jacobs Engineering Group, Inc.
LG	Local Guidance

LIDS	Leak Interception and Detection System
LLD	Line Leak Detection
MCAS	Marine Corps Air Station
MCO	U.S. Marine Corps Order
MCX	U.S. Marine Corps Exchange
MIR	Manual Inventory Reconciliation
MLLD	Mechanical Line Leak Detection
MMEC Group	Multi-Media Environmental Compliance Group
MTBE	methyl tertiary butyl ether
NACE	National Association of Corrosion Engineers
NFPA	National Fire Protection Association
OHS	Oil and Hazardous Substance
O&M	Operation and Maintenance
OSHA	Occupational Safety and Health Administration
OUST	Office of Underground Storage Tanks
OWS	Oil/Water Separator
psi	pounds per square inch
RCRA	Resource Conservation and Recovery Act
RWQCB	Regional Water Quality Control Board
SB	Senate Bill
SDAPCD	San Diego Air Pollution Control District
SDCC	San Diego County Code
SIR	Statistical Inventory Reconciliation
SPCC	Spill Prevention, Control, and Countermeasures
STI	Steel Tank Institute
SWRCB	State Water Resources Control Board
TSDF	Treatment, Storage, and Disposal Facility
UDC	Under Dispenser Containment
UFC	Uniform Fire Code
UL	Underwriters Laboratories, Inc.
UST	Underground Storage Tank
VOC	Volatile Organic Compound

Document Revision Table
Underground Storage Tank/Aboveground Storage Tank Management Plan
Marine Corps Air Station
Miramar, California

Revision Number	Revision Date	Revisions	Changes by
Original Issue	1/15/2011	None	Steve Kummerfeldt URS Corporation
No. 1	10/12/2013	Updated storage tank inventory and included new USTs at Building 2662	Steve Kummerfeldt URS Corporation
No. 2	11/10/2014	Updated storage tank inventory, included DEH permit numbers, and added UST and AST closure information in Appendixes	Steve Kummerfeldt URS Corporation
No.3	4/4/2018	Updated storage tank inventory and UST regulations summary, included references to CERS	Steve Kummerfeldt MMEC Group
No. 4	9/7/2018	Updated Table 2, deleted Table 3, deleted USTs at Building 7684 (Naval Consolidated Brig) and added new USTs at Building 8676 (MCX Gas Station).	Steve Kummerfeldt MMEC Group

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1.0 INTRODUCTION

This underground storage tank (UST) / aboveground storage tank (AST) Management Plan documents the procedures for the installation, management, operation, monitoring, and closure of USTs and ASTs containing oil and hazardous substances at the United States Marine Corps Air Station (MCAS Miramar or Facility) in Miramar, California. Various types and quantities of oil products are stored in USTs and ASTs throughout the Facility to support building, vehicle, and aircraft maintenance and operation. The storage of large quantities of hazardous liquids poses safety risks to personnel as well as environmental risks from unauthorized releases or spills. UST/AST laws and regulations are designed to minimize the threat of an unauthorized or accidental release.

The UST/AST Management Plan is a supplemental document to the MCAS Miramar Oil and Hazardous Substance Spill Prevention, Control, and Countermeasures (OHS SPCC) Plan. The OHS SPCC Plan documents the procedures for the prevention, response, control, and reporting of spills from ASTs at the Facility. The OHS SPCC Plan describes the applicable state and federal regulations for spill prevention and control, and provides the methods used to prevent a discharge from ASTs at MCAS Miramar to the navigable waters of the United States or to the adjoining shorelines. Detailed site descriptions of the ASTs at the Facility are provided in the OHS SPCC Plan.

For the purposes of this UST/AST Management Plan, a hazardous substance is any liquids or mixture of liquids that are toxic, corrosive, an irritant, a strong sensitizer, flammable, or generates pressure and heat through decomposition, heat, or other means (40 Code of Federal Regulations [CFR] 261.3). These materials require controls to ensure sufficient protection of human life and health, property, and the environment.

This UST/AST Management Plan contains the following information:

- A general description of the Facility;
- An inventory of the current USTs and ASTs at the Facility that contain 55 gallons or greater of an OHS;
- Detailed site descriptions of each UST location;
- A summary of federal, state, and local UST regulations;
- UST permitting requirements;
- UST/AST installation, operation, monitoring, maintenance, and closure requirements;
- Training requirements for UST inspection personnel;
- Reporting procedures and record keeping requirements for UST releases; and
- A UST consolidation and reduction plan.

The goal of the UST/AST Management Plan is to provide a guidance document for MCAS Miramar personnel to effectively manage USTs and ASTs at the Facility to comply with all applicable federal, state, and local regulations. Effective UST/AST management reduces the threat of an unauthorized release and maintains regulatory compliance to meet the Certified

Unified Program Agency (CUPA) inspections. The local CUPA for MCAS Miramar is the County of San Diego Department of Environmental Health (DEH).

A copy of the UST/AST Management Plan is maintained at the Facility and is available to the local DEH representative for on-site review during normal working hours. In addition, electronic copies of this Plan will be posted on the MCAS Miramar's environmental website: www.miramar-ems.marines.mil.

1.1 PLAN ORGANIZATION

This UST/AST Management Plan has been organized to establish a Facility-wide strategy for management of the USTs and ASTs. The UST/AST Management Plan is organized as follows:

- Section 1.0 provides an overview of the UST/AST Management Plan, including definitions;
- Section 2.0 presents a general description of the Facility, geology, and hydrology, and a summary of the current USTs and ASTs, including emergency generators, operating within the Facility;
- Section 3.0 contains detailed descriptions of each UST currently in operation at MCAS Miramar;
- Section 4.0 provides a summary of UST regulatory requirements;
- Section 5.0 provides guidance for proper UST operation and maintenance procedures;
- Section 6.0 presents permitting and record keeping requirements for USTs;
- Section 7.0 provides guidance on UST closure procedures,
- Section 8.0 provides a summary of AST regulatory requirements;
- Section 9.0 presents information regarding the management of ASTs; and
- Section 10.0 lists references used in the preparation of this UST/AST Management Plan.

In addition, the OHS SPCC Plan provides site-specific information of each AST within the Facility that is referenced in this Plan.

1.2 DEFINITIONS

The definitions used in this UST/AST Management Plan are as follows:

Aboveground Storage Tank (AST). A tank that has the capacity to store 55 gallons or more of OHS that is substantially or totally above the surface of the ground (California APSA). An AST is a vessel that is designed to contain an accumulation of oil constructed of non-earthen materials that provides structural support, having a liquid capacity of more than 60 gallons, and is in a fixed location (National Fire Protection Association [NFPA] Code 30).

Bulk Storage Container. Any container, equal or greater than 55 gallons, used to store oil for the purposes including, but not limited to, the storage of oil prior to use, while being used, or prior to further distribution in commerce. Oil-filled electrical, operating, or manufacturing equipment are not bulk storage containers (40 CFR 112.2).

Completely Buried Tank. Any container completely below grade and covered with earth, sand, gravel, asphalt, or other material. Containers in vaults, bunkered tanks, or partially buried tanks are considered aboveground storage containers for the purposes of 40 CFR 112.2.

Connecting Piping. All underground piping including valves, elbows, joints, flanges, and flexible connectors attached to a UST system through which hazardous substances flow (California Code of Regulations [CCR] Title 23, Division 3, Chapter 16).

Continuous Monitoring. A system using equipment which routinely performs the required monitoring on a periodic or cyclic basis throughout each day (CCR Title 23, Division 3, Chapter 16).

Continuous Release Detection Method (CRDM). A means of detecting a release of liquid through inherent design, without a reliance on sensors or power to operate. Liquid releases are visually detected by facility operators. CRDM methods include release prevention barriers; secondary containment ASTs, including double-wall ASTs or double-bottom ASTs; and elevated ASTs with release prevention barriers (Steel Tank Institute [STI] SP-001).

***De minimis* Concentration**. The amount of a regulated substance that does not exceed one percent (1 percent) of the capacity of a tank, excluding piping and vent lines.

Designated Underground Storage Tank Operator (DUSTO). One or more individuals designated by the owner to have the responsibility for training facility employees and conducting monthly visual inspections at a UST facility (CCR Title 23, Division 3, Chapter 16).

Discharge. Includes, but is not limited to, any spilling, leaking, pumping, pouring, emitting, emptying or dumping of oil, but excludes discharges in compliance with a permit under Section 402 of the Clean Water Act or Section 13 of the River and Harbor Act of 1899 (40 CFR 112.2).

Dispenser. An aboveground or underground device that is used for the delivery of a hazardous substance from a UST. A dispenser includes metering and delivery devices, and fabricated assemblies located herein (CCR Title 23, Division 3, Chapter 16).

Facility. Any mobile or fixed onshore or offshore building, structure, installation, equipment, pipe or pipeline used in oil storage, oil processing, oil transfer, oil distribution, and waste treatment, or in which oil is used. The boundaries of a facility depend on several site-specific factors, including, but not limited to, the ownership or operation of buildings, structures, and equipment on the same site and the types of activity at the site (40 CFR 112.2).

Field-Erected AST. A welded carbon or stainless steel AST erected on-site where it will be used. ASTs should generally be inspected as field-erected ASTs when a nameplate indicates that they are field-erected ASTs, or when the capacity of the AST is greater than 50,000 U.S. gallons.

Formal External Inspection. A documented external inspection conducted by a certified inspector to assess the condition of the AST and determine its suitability for continued service without entry into the AST interior.

Formal Internal Inspection. A documented internal inspection conducted by a certified inspector to assess the internal and external condition of the AST and determine its suitability for continued service. This includes the inspection requirements of a formal external inspection.

Hazardous Material. Any material which, because of its quantity, concentration, or physical, chemical or infectious characteristics, may pose a substantial hazard to human health or to the environment. Includes substances listed in 49 CFR 172.101 or 40 CFR 302.4, including untreated sewage, petroleum products, and by-products.

Hazardous Substance. A hazardous material or waste designated as hazardous under Section 10 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as identified in 40 CFR 117 or a substance that meets the criteria of either subsection (1) or subsection (2) of section 25281(f) of the California Health and Safety Code.

Hazardous Material Release. The spilling, releasing, discharging, placing, percolating, draining, pumping, leaking, seeping, emitting, disposing, bypassing, or other escaping of a hazardous material into the air, water, subsurface water, or onto the ground.

Hazardous Waste. Any solid, liquid, semisolid, or contained gaseous material designated as waste for disposal and identified in 40 CFR 261.

Interstitial Space. The opening formed between the inner and outer wall of an AST or UST system with double-walled construction, or the opening formed between the inner wall of a containment sump and the UST system component that it contains. It is the space between the primary and secondary containment systems (CCR Title 23, Division 3, Chapter 16).

Leak Threshold. The value against which UST test measurements are compared and which serves as a basis for declaring the presence of a leak. The leak threshold is set by the manufacturer in order to meet state and federal requirements. Leak threshold is not an allowable leak rate (CCR Title 23, Division 3, Chapter 16).

Major or Emergency Spill. Any unplanned release or condition resulting from an accidental or intentional spill, or accumulation of an OHS or hazardous waste in concentrations or quantities sufficient to pose a substantial, actual or potential hazard to human health, property, or the environment. An emergency spill would also include any quantity of an OHS or hazardous waste entering a storm drain. Cleanup and recovery are beyond the capability of the site personnel.

Manual Inventory Reconciliation. A procedure for determining whether a UST system is leaking based on bookkeeping calculations, using measured throughput and a series of daily inventory records taken manually by the tank owner or operator or recorded electronically. The term does not include procedures which are based on statistical inventory reconciliation (CCR Title 23, Division 3, Chapter 16).

Membrane Liner. Any membrane sheet material used in a secondary containment system. A membrane liner shall be compatible with the substance stored (CCR Title 23, Division 3, Chapter 16).

Navigable Waters. The waters of the U.S., including the territorial seas and waters currently or historically used in interstate or foreign commerce, including all waters subject to the ebb and flow of the tide; all interstate waters, including interstate wetlands; all other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sand flats, wetlands, sloughs, prairie potholes, wet meadows, play lakes, or natural ponds; all impoundments of waters

otherwise identified as waters of the U.S.; tributaries of waters identified above; the territorial sea; and wetlands adjacent to waters identified above.

Oil. Oil of any kind or in any form including, but not limited to, fats, oils, or greases of animal, fish, or marine mammal origin; vegetable oils, including oils from seeds, nuts, fruits, or kernels; and other oils and greases, including petroleum (gasoline, jet fuel, and diesel), fuel oil, hydraulic oil, lube oil, synthetic oils, mineral oils, oil refuse, or oil mixed with wastes other than dredged spoil.

Operator. Any person in control of, or having responsibility for, the daily operation of an AST or UST system (CCR Title 23, Division 3, Chapter 16).

Permanently Closed. Any container or facility for which (1) all liquid and sludge has been removed from each container and connecting line; and (2) all connecting lines and piping have been disconnected from the container and blanked off, all valves (except for ventilation valves) have been closed and locked, and conspicuous signs have been posted on each container stating that it is a permanently closed container and noting the date of closure.

Pipeline. All parts of an onshore pipeline facility through which oil moves including, but not limited to, line pipe, valves, and other appurtenances connected to line pipes, pumping units, fabricated assemblies associated with pumping units, metering and delivery stations and fabricated assemblies therein, and breakout tanks.

Pipeline Leak Detector. A continuous monitoring system for underground piping capable of detecting at any pressure, a leak rate equivalent to a specified leak rate and pressure, with a probability of detection of 95 percent or greater and a probability of false alarm of 5 percent or less (CCR Title 23, Division 3, Chapter 16).

Protected Tank. A double-wall AST that has been built to Underwriter's Laboratory (UL) 2085 standard with a 2-hour fire protection rating and protection from physical damage (i.e., automobile impact).

Qualitative Release Detection Method. A method which detects the presence of a hazardous substance or suitable tracer outside the UST being tested (CCR Title 23, Division 3, Chapter 16).

Release or Spill. Synonymous terms as defined by Section 101 (22) of CERCLA, relating to the intentional or accidental spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing of a hazardous substance into the environment.

Release Prevention Barrier. A liquid containment barrier, such as a concrete pad, that is sufficiently impervious to the liquid being stored and is installed under an AST for the purpose of diverting leaks toward the perimeter of the AST where they can be easily detected and to prevent liquid from contaminating the environment.

Safety Data Sheets. A compilation of information required under the Occupational Safety and Health Administration Hazard Communication Standard on the identity of hazardous chemicals, health and physical hazards, exposure limits, and precautions. The Federal Hazard

Communication Standard is cited in 29 CFR 1910.1200. Previously described as material safety data sheets.

Secondary Containment (AST). A system that provides a secondary means of containment for the entire volumetric capacity of the largest single AST within a common dike or berm and sufficient freeboard to contain precipitation. The secondary containment system is to be designed to contain a spill until it can be discovered and cleaned up.

Secondary Containment (UST). For USTs, secondary containment refers to a method or combination of methods of release detection for UST systems.

Shop-built AST. A welded carbon or stainless steel AST fabricated in a manufacturing facility, or an AST not otherwise identified as field-erected with a volume less than or equal to 50,000 gallons.

SPCC Plan. Document required by 40 CFR Part 112.3 that details the equipment, manpower, procedures, and steps to prevent, control, and provide adequate countermeasure to an oil spill; a written description of the facility's compliance with 40 CFR Part 112.

Storage Capacity. The shell capacity of a tank or container, whether the tank or container is partially or fully filled with oil or a mixture of oil and other substances.

Under-Dispenser Containment. A means of secondary containment that is located under a UST dispenser (CCR Title 23, Division 3, Chapter 16).

Underwriters Laboratories, Inc. An independent safety science corporation that has developed standards and specifications for the construction, validation, testing and inspection of ASTs, USTs and underground piping. Underwriters Laboratories will review and approve specific manufacturers to provide UL labeled tanks.

UST. As defined by the UST Programs of 40 CFR 280, an underground storage tank refers to any one or combination of tanks (including underground pipes connected thereto) that is used to contain an accumulation of regulated substances, and the volume of which (including the volume of underground pipes connected thereto) is 10 percent or more beneath the surface of the ground. This term does not include farm or residential tanks of 1,100 gallons or less capacity used for storing motor fuel for noncommercial purposes, tanks used for storing heating oil for consumptive use on the premises where stored, septic tanks, and a few other exceptions.

Upgrade. As defined in 40 CFR 280, an upgrade refers to the addition or retrofit of certain systems, such as cathodic protection, lining, or spill and overfill controls, to improve the ability of an underground storage tank system to prevent the release of product. As defined by CCR Title 23, Division 3, Chapter 16, an upgrade means the addition or retrofit of some systems such as cathodic protection, lining, secondary containment, or spill and overfill controls to improve the ability of a UST system to prevent the release of hazardous substances.

2.0 SITE DESCRIPTION

This section presents a description of the Facility, its local geology and hydrology, and a summary of the USTs and ASTs currently in operation.

2.1 FACILITY DESCRIPTION

MCAS Miramar is located in the city of San Diego, California approximately 13 miles north of the downtown area, as shown on Figure 1. It is bordered by the communities of Mira Mesa and Scripps Ranch to the north, University City and Claremont to the west, Kearny Mesa and Tierrasanta to the south, and unincorporated rural areas to the east. The primary mission of MCAS Miramar is to maintain and operate U.S. Marine Corps facilities, and provide services and materials to support operations of U.S. Marine Corps aircraft units designated by the Commandant of the Marine Corps in coordination with the Chief of Naval Operations.

2.2 GEOLOGY

The upper 200 feet of soil consists predominantly of sand and conglomerate with some interbedded fine-grained layers. The Lindavista Formation, the main surficial unit over much of MCAS Miramar, consists mostly of interbedded sandstone and conglomerate (Bechtel Environmental, Inc. [BEI], 2003). The formation is strongly to weakly cemented by iron oxide, resulting in its characteristic reddish brown color. Cobbles up to 6 inches in diameter are common. The Lindavista Formation also contains moderate amounts of clay and fines. Its resistance to weathering is responsible for the formation of most of the mesas around the main portion of the Facility; therefore, the formation is the surface unit exposed on the tops of these mesas and marine terraces. The formation is estimated to be 100 feet thick (Kennedy and Peterson, 1975). A relatively thin, well-cemented layer is also present in many areas of the Facility at depths of about 10 feet below ground surface (bgs).

2.3 HYDROGEOLOGY

MCAS Miramar is located within the Miramar subunit of the Peñasquitos Hydrographic Unit of the San Diego groundwater basin. The Peñasquitos Hydrographic Unit is a triangular area of about 170 square miles, extending from Poway on the east to La Jolla on the west (California Regional Water Quality Control Board [RWQCB], 1995).

Groundwater has been encountered at depths of approximately 200 feet bgs at MCAS Miramar (Jacobs Engineering Group, Inc. [JEG], 1991). The groundwater aquifer occurs in the sandy units and in weathered plutonic rock at the interface of the Friars Formation and the southern California batholith. Monitoring well data indicate that the groundwater gradient in the southern and western portions of MCAS Miramar is to the west and southwest, parallel to Rose and San Clemente Canyons, while in the northeastern portion, the groundwater gradient is to the northwest. The hydraulic velocity is between 0.006 and 0.016 foot per day (JEG, 1991).

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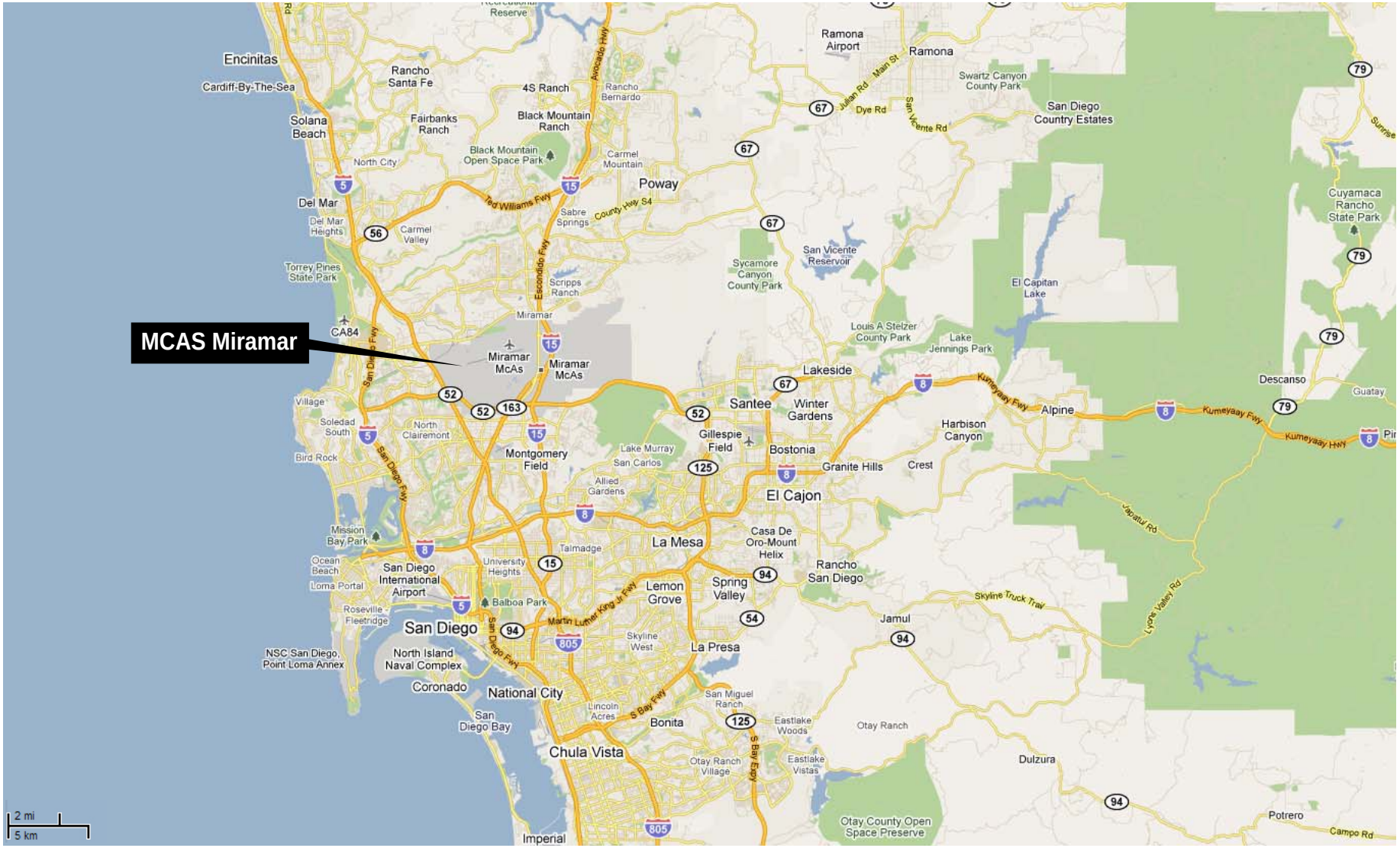

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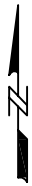

Department of the U.S. Navy
Marine Corps Air Station Miramar
San Diego, CA 92145

FIGURE 1
Facility Location Map
UST/AST Management Plan

K:\2010\Alliance\MCAS Miramar\Figure 1 Facility Location Map.ai

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Perched-water conditions have also been observed within the upper portions of the Linda vista Formation at various sites across the Facility. Perched water collects at the interface of the unconsolidated reddish brown silty sand and the well-cemented cobble conglomerate layer. The generally impermeable cemented conglomerate retards groundwater infiltration and forms a thin perched saturated zone. These perched zones tend to occur between 10 and 30 feet bgs; however, discontinuous perched zones have been observed at depths greater than 100 feet (BEI, 2003).

2.4 UNDERGROUND STORAGE TANKS

The Facility currently operates 19 USTs, which are described in Table 1. The USTs include the following:

- Ten (10) USTs contain gasoline for fueling government and public vehicles;
- Six (6) USTs contain diesel fuel for fueling government or public vehicles and emergency generators;
- Two (2) USTs contain JP-5 jet fuel for fueling military/tactical vehicles and engine test stand equipment; and
- One UST contains biodiesel (B-20) for fueling government vehicles.

The USTs at MCAS Miramar provide JP-5 jet fuel, diesel fuel, gasoline or B-20 biodiesel to support U.S. Marine Corps aircraft and vehicle fueling, test cell operation, and emergency generators. The USTs are primarily fiberglass tanks of double-walled construction that are monitored by electronic sensors to detect any leaks or ruptures. The locations of the USTs at MCAS Miramar are shown on Figure 2. Additional detailed descriptions of the UST sites are provided in Section 3.

2.5 ABOVEGROUND STORAGE TANKS

The Facility currently operates a total of 158 ASTs including the following:

- Fifty Three (53) ASTs contain diesel fuel for fueling emergency generators, government vehicles, lawn maintenance equipment, boilers, and emergency fire water pumps;
- Sixty five (65) ASTs contain JP-5 jet fuel for military aircraft operations, refueling equipment and engine testing;
- Sixteen (16) ASTs contain used oil or waste cooking oil for disposal;
- Eight (8) ASTs contain hydraulic fluid for aircraft equipment testing and building elevator operation;
- Seven (7) ASTs contain salvaged JP-5 jet fuel for reuse;
- Five (5) ASTs contain virgin lube oil for vehicle maintenance (grease guns) or support of engine test cell equipment;
- Two (2) ASTs contain gasoline for fueling government vehicles and lawn maintenance equipment;

- One AST contains E-85 (ethanol mixture with gasoline) for vehicle fueling; and
- One AST is currently empty but may be used for secondary containment of stored hazardous materials and hazardous wastes.

The ASTs at MCAS Miramar range in capacities from 66 gallons to 1.64 million gallons and are described in Table 2. A majority of the ASTs are of double-walled construction and others are of single-wall construction located within concrete bermed secondary containment structures. In addition, the Facility operates emergency generators with diesel tanks that provide backup power for essential U.S. Marine Corps equipment. Four of the emergency generators have separate stand-alone ASTs that supply diesel fuel to a day tank or directly to the generator. The remaining emergency generators have integral base tanks that contain diesel fuel and are mounted directly under the generator. With the exception of two ASTs mounted on mobile trailers, the emergency generators and associated base tanks are at fixed locations within fenced or cement block wall enclosures adjacent to Facility buildings. A majority of the emergency generator base tanks are of double-walled construction with capacities ranging from 60 to 1,959 gallons.

The location of each AST at the Facility is shown in Figure 2. A description of each AST at the Facility is provided in the OHS SPCC Plan.

NOTE:

1. REFER TO TABLE 3 FOR AST AND EMERGENCY GENERATOR TANK CONTENTS AND CAPACITIES
2. REFER TO TABLE 4 FOR UST CONTENTS AND CAPACITIES
3. REFER TO FACILITY'S SWPPP FOR SURFACE FLOW DIRECTION AT THE FACILITY

Legend

- Aboveground Storage Tank
- Underground Storage Tank (Exempt)
- Emergency Generator
- Hazardous Material Storage Lockers and Hazardous Waste Accumulation Area
- Transfer Station

1,000 500 0 1,000 Feet

INSET MAP LOCATION

AECOM

Department of the U.S. Navy

Marine Corps Air Station Miramar
San Diego, CA 92145

Site Map

Aboveground Storage Tanks, Emergency Generators, Underground Storage Tanks, Hazardous Materials Storage Lockers and Hazardous Waste Accumulation Areas
OHS SPCC PLAN

Revision Date: 7/11/2018	Figure 2

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3.0 DESCRIPTION OF UST SITES

The following section provides a description of each of the active UST sites at MCAS Miramar. A detailed inventory of the USTs at the Facility is provided in Table 1.

3.1 BUILDING 6021 (TACTICAL FUELING STATION)

Building 6021 is located at the southeast intersection of Gonsalves Avenue and Bauer Road. The building provides fuel to U.S. Marine Corps military vehicles.

3.1.1 Storage Areas and Equipment

Building 6021 contains the following USTs that are included in this UST/AST Management Plan:

- Tank No. 6021-1: One 40,000-gallon JP-5 Jet Fuel UST (DEH UST Operating Permit Tank No. 31063) located within a fenced enclosure on the east side of the kiosk building; and
- Tank No. 6021-2: One 40,000-gallon Bio Diesel (B20) UST (DEH UST Operating Permit Tank No. 31064) also located within the fenced enclosure on the east side of the kiosk building.

Photographs of Building 6021 and the USTs are provided on Figure 3. A drawing showing the general arrangement of the two USTs at Building 6021 is provided as Figure 4.

The Tactical Fueling Station provides fuel to military vehicles. The two USTs supply fuel to three pump islands within the fenced site. Each pump island contains two single-hose dispensers, providing a total of six dispensers for the station. Each UST is connected to three dedicated dispensers for either JP-5 fuel or bio diesel (B20). Each dispenser is capable of fueling one vehicle at a time, thus giving the station a total simultaneous fueling capacity of six military vehicles at once.

The fuel systems at Building 6021 feature a pressurized double-contained underground piping system that is activated whenever demand is made by the dispensers. Each UST contains a turbine pump to supply the fuel into the pipelines. The UST turbines are activated whenever one or more of the dispensers are in use. Each dispenser provides fuel delivery from the appropriate UST, while metering the amount of product delivered to the vehicle. The fuel management system records and reports the amount of product dispensed to a central computerized accounting system at the site.

3.1.2 Containment Measures

Each UST is a double-walled storage tank constructed of fiberglass-reinforced plastic (FRP). The internal tank shell is completely enclosed by a secondary tank shell that provides 100 percent secondary containment. FRP is compatible with JP-5 and biodiesel storage. This material also prevents failure from both external and internal corrosion. Since FRP-constructed tanks do not rust, they are not susceptible to internal corrosion problems due to the potential retention of water within each tank.

Figure 3: Building 6021 (Tactical Fueling Station)

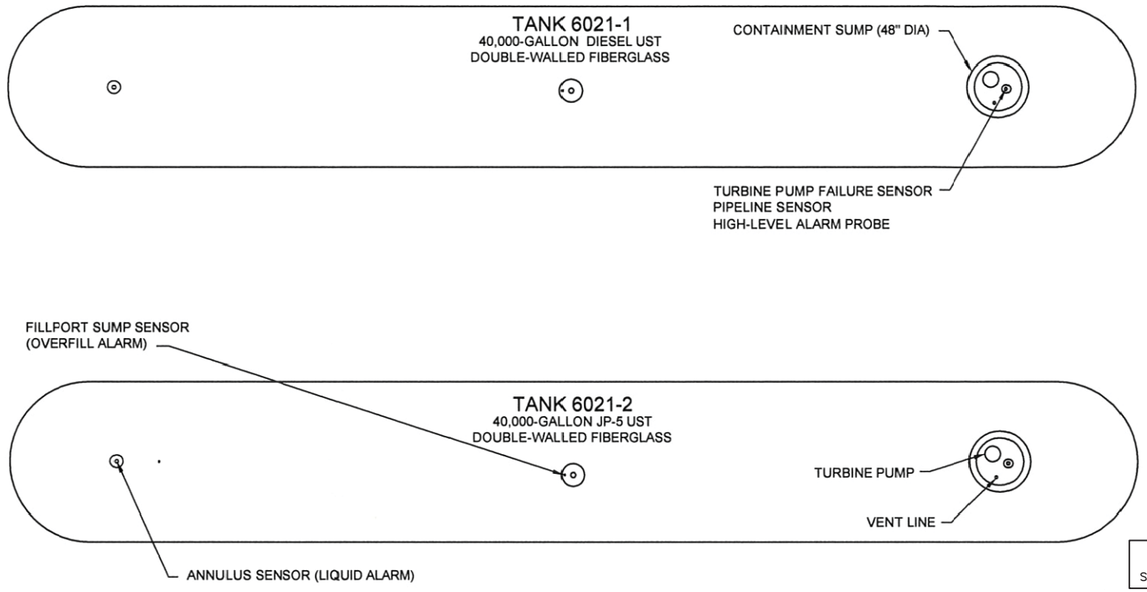
Tank No. 6021-1:40,000-gallon JP-5 Jet Fuel UST
(DEH UST Operating Permit Tank No. 31063)
Tank No. 6021-2: 40,000-gallon Bio Diesel (B20) UST
(DEH UST Operating Permit Tank No. 31064)

Location of USTs inside Fenced Area

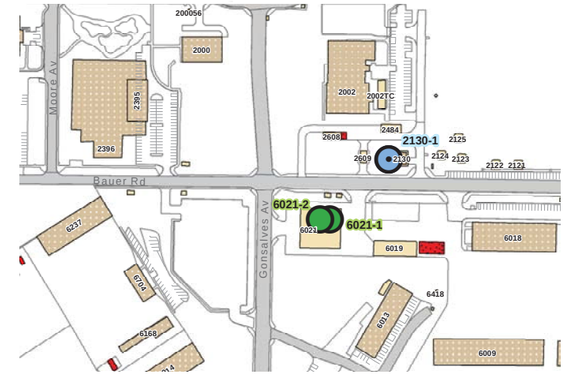
Paved Area

Kiosk and Dispenser Islands

Veeder Root TLS-350 Alarm Panel inside Kiosk



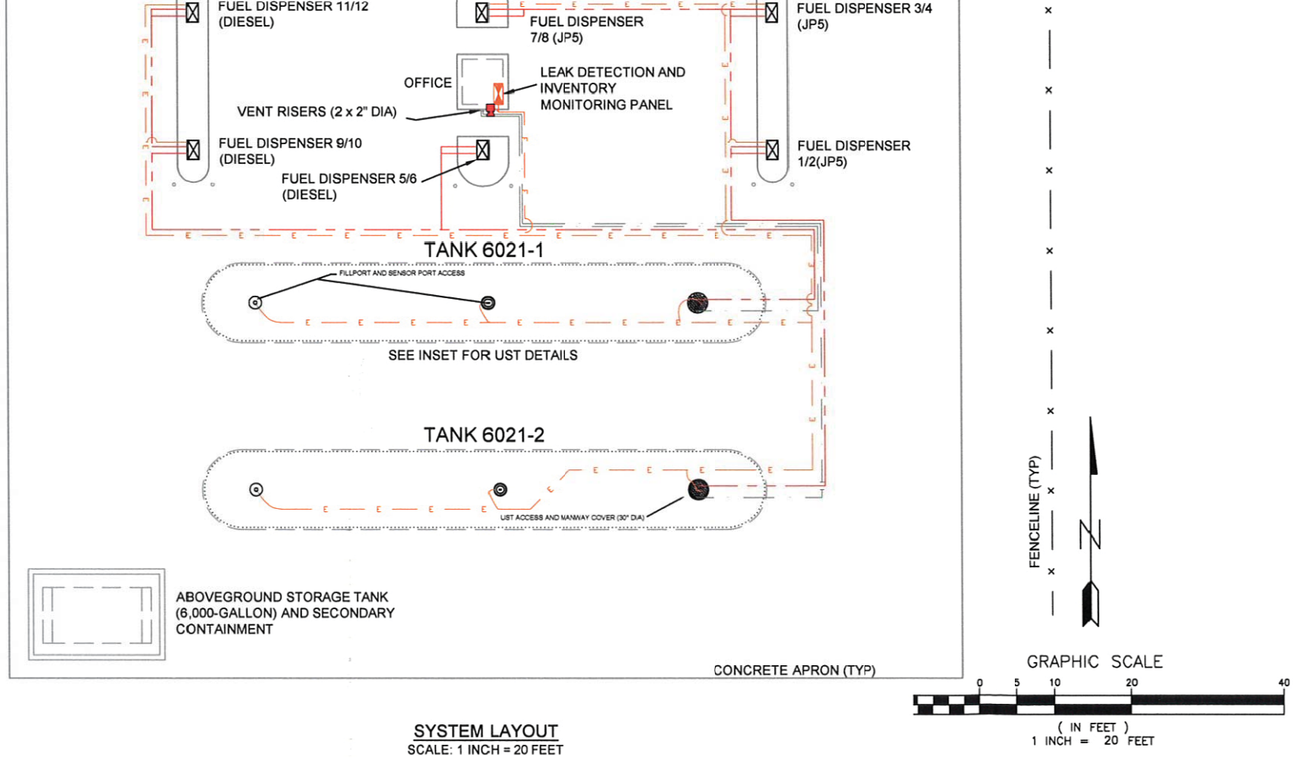
INSET DETAIL
SCALE: 1 INCH = 10 FEET



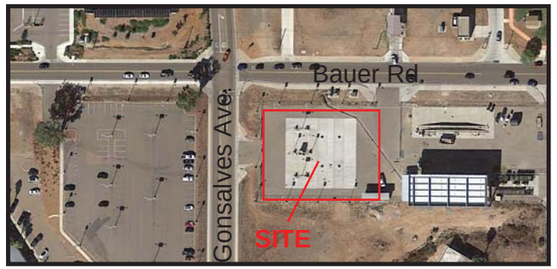
SITE LOCATION MAP
Not To Scale

SCHEDULE OF UNDERGROUND STORAGE TANK SYSTEM

BUILDING No.	DEH PERMIT No.	TANK ID No.	INSTALLATION DATE	CONTENTS	CAPACITY (GALLONS)	TANK MATERIAL	TANK CONTAINMENT	TANK LEAK DETECTION SYSTEM
6021–1	181142	31063	10/5/1998	JP–5 JET FUEL	40,000	FRP	DOUBLE–WALLED	VEEDER ROOT TLS–300C WITH ATG
6021–2		31064	10/5/1998	BIO DIESEL (B20)	40,000	FRP	DOUBLE–WALLED	



SYSTEM LAYOUT
SCALE: 1 INCH = 20 FEET



SYMBOL LEGEND:

UNDERGROUND:		UNDERGROUND:	
E	UNDERGROUND ELECTRICAL LINE		FUEL DISPENSER
	UNDERGROUND VENT LINE ("VR" INDICATES VAPOR RETURN (GASOLINE SYSTEMS ONLY)		AUDIBLE ALARM HORN; LEAK DETECTION SYSTEM (ORIENTATION MAY VARY)
DW	UNDERGROUND PRODUCT PIPING (DW)		
	LEAK DETECTION SENSOR PORT		FILLPORT/SENSOR COVER
	TURBINE PUMP/SUMP AND SUMP SENSOR/PORT (ADDITIONAL SENSORS/PORTS MAY BE PRESENT - ORIENTATION MAY VARY)		UST ACCESS AND MANWAY COVER
	FILLPORT AND VENT OR SENSOR PORT		LEAK DETECTION SYSTEM CONTROLLER PANEL
	VENT RISERS (2-INCH DIA TYPICAL)		

ABBREVIATIONS:

ATG	AUTOMATIC TANK GAUGING
CONST	CONSTRUCTION
DIA	DIAMETER
DW	DOUBLE-WALLED
FRP	FIBERGLASS REINFORCED PLASTIC
PRES	PRESSURE
TYP	TYPICAL
UST	UNDERGROUND STORAGE TANK

UST/AST
MANAGEMENT PLAN
FACILITY DIAGRAM

FIGURE 4
LOCATION OF USTS
BUILDING 6021

DEPARTMENT OF THE U.S. NAVY
MARINE CORPS AIR STATION MIRAMAR
SAN DIEGO, CA 92145

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The turbine, electrical connections, and fuel delivery piping in each UST are accessible within a liquid-tight containment sump located on top of the tank that is constructed of FRP. The fueling system containment sump is equipped with an electronic liquid detection device. This leak detection probe will automatically shut down the electrical power to the turbine in the event liquid is detected within the sump. Each UST fill port on the top of each tank is also protected by a liquid-tight secondary containment sump constructed of FRP.

Underground piping between the USTs and the dispensers is constructed of FRP pipe that is double-contained with an outer secondary pipe that is also constructed of FRP for containment and corrosion resistance. The annular space of each underground transfer pipeline from the USTs to the dispensers contains an electronic sensor which will detect a liquid fuel leak, sound the alarm, and shut down operation of the UST turbine pumps.

Each fuel dispenser has an under dispenser containment (UDC) system. The UDC functions as a containment system and an emergency shutoff to control product flow in case of a leak within the dispenser. Each UDC system consists of a secondary containment basin with a mechanical float and chain assembly and the product line shear valves. The system is located beneath each fuel dispenser housing. The underground fuel product lines from the USTs are connected to the dispensers from the side of the UDC. If a leak occurs, fuel accumulates in the UDC containment basin and the ball float would begin to rise, placing tension on the attached chain, which is connected to the shear valve. When the ball float reaches a specific height pre-determined by the manufacturer, the shear valve is triggered by the tensioned chain that stops the flow of product to the dispenser.

3.1.3 Monitoring System

The UST system at Building 6021 is equipped with a Veeder Root TLS-350 monitoring system. The Veeder Root TLS-350 is part of an Automatic Tank Gauging (ATG) system that provides continuous monitoring of each UST. The product level and temperature in each UST are continuously measured, analyzed, and recorded by the Veeder Root TLS-350 computer. In the "inventory mode," the ATG replaces the use of the gauge stick to measure product level and provides product inventory control. This mode records the changes in volume during operation of the UST, including fuel deliveries. In the "test mode," the product level and inventory probe performance are tested when no product is being added or dispensed from the UST. The ATG must be able to detect a leak no greater than 0.2 gallons per hour without the probability of a false alarm.

The USTs are constructed with an interstitial space that is filled with a saline water solution. Electronic sensors within the interstitial space measure any changes in the fluid level that would indicate either internal or external leaks within the primary shells of the USTs. The Veeder Root TLS-350 provides secondary containment leak detection for each of the UST's turbine pump and product fill sumps utilizing electronic sensors. In addition, the Veeder-Root TLS-350 is connected to electronic line leak detectors (ELLDs) installed in the turbine sump that will indicate a leak into the underground double-walled product piping.

If a fuel release is detected within the secondary containment piping, UDCs, or sumps in the UST system, the Veeder Root TLS-350 disables power to the turbine that stops the dispensing of fuel, sounds an alarm and illuminates a red flashing light. The warning light is mounted on the kiosk building and is in direct view from the UST fill ports.

The fuel dispensers provide data on the amount of fuel dispensed to the vehicles to the Veeder Root TLS-350 system. The UST operator can use the Veeder Root TLS-350 system to reconcile the actual UST fuel volumes to the dispensed volumes by printing out the inventories and comparing the numerical values.

3.1.4 Overfill Protection Devices

The Veeder Root TLS-350 monitoring system at Building 6021 will be triggered if the UST volume reaches 95 percent capacity, indicating a potential overflow situation. The electronic probes mounted in each tank will also activate an alarm when the tank reaches 90 percent capacity. This alarm provides enough time for the tanker truck driver to close the truck's shutoff feed valve before an overfill situation occurs.

Additional safety features in the fuel dispensing system include automatic shutoff nozzles to prevent overfilling of vehicles, anti-spark generating components, and grounding features in the delivery hoses and nozzles for fire prevention. The dispensers also have break-away couplings between the dispenser unit and the delivery nozzle to prevent spills from vehicles leaving the area with the dispenser nozzles still inserted in the vehicle's fuel tank. A manual emergency shutoff switch is also located on the kiosk in the event of a failure of the safety systems or an emergency situation.

3.1.5 Spill Scenarios

Possible spill scenarios from the USTs at Building 6021 are as follows:

- Catastrophic failure of the primary UST shell; estimated volume is 40,000 gallons, but the leak is expected to remain within the secondary containment shell of the UST.
- Spills during loading of fuel into the USTs from tanker trucks; estimated volume is less than 50 gallons.
- Spills during fuel dispensing during vehicle fueling operations; estimated volume is less than 2 gallons.
- Leaks within the fuel dispensers; estimated volume is less than 2 gallons based on actuation of the shear valve located within the UDC sump.

3.1.6 Predicted Spill Direction and Site Drainage

Small spills occurring during loading of the USTs would pool on the concrete pavement until cleaned up with absorbent materials. General surface flow direction across the site is from south to north. There are no existing storm drains visible nearby; however, storm water runoff flows over land into nearby side streets and curbs.

3.2 BUILDING 6214 (RETAIL AUTOMOBILE SERVICE STATION AND AUTO REPAIR)

Building 6214 is located south of Miramar Court and east of Miramar Way. This site consists of a commercial Firestone dealership with several self-serve fuel pump islands for non-military vehicles, a cashier kiosk, a vehicle repair garage, retail store, and offices. Primary services include fuel sales, auto repair, retail, and maintenance. The multiple fueling islands are under a roof structure on a large concrete pad north of the building.

3.2.1 Storage Areas and Equipment

Building 6214 contains the following USTs that are included in this UST/AST Management Plan:

- Tank No. 6214-1: One 15,000-gallon premium 91 unleaded gasoline UST (DEH UST Operating Permit Tank No. 30606) located southeast of the building;
- Tank No. 6214-2: One 15,000-gallon mid-grade 89 unleaded gasoline UST (DEH UST Operating Permit Tank No. 30607) located southeast of the building; and
- Tank No. 6214-3: One 20,000-gallon regular 87 unleaded gasoline UST (DEH UST Operating Permit Tank No. 30608) located southeast of the building.

Photographs of Building 6214 and the USTs are provided on Figure 5. A drawing showing the general arrangement of the three USTs at Building 6214 is provided as Figure 6.

The Retail Automobile Service Station provides fuel to non-military vehicles. The three USTs supply fuel to three pump islands within the site. Each pump island contains two dual-hose dispensers, providing a total of four dispensing locations for each island. Each dispenser can individually dispense any of the three fuel products (i.e., regular, mid-grade, or premium grade gasoline). Each dispenser is capable of fueling two vehicles at a time, thus giving the station a total simultaneous fueling capacity of 12 vehicles at once.

The fuel systems at Building 6214 feature a pressurized double-contained underground piping system that is activated whenever demand is made by the dispensers. Each UST contains a turbine pump to supply the fuel into the pipelines. The UST turbines are activated whenever one or more of the dispensers are in use. Each dispenser provides fuel delivery from the appropriate UST, while metering the amount of product delivered to the vehicle. The fuel management system records and reports the amount of product dispensed to a central computerized accounting system at the site.

3.2.2 Containment Measures

Each UST is a double-walled storage tank constructed of FRP. The internal tank shell is completely enclosed by a secondary tank shell that provides 100 percent secondary containment. FRP is compatible with gasoline storage. This material also prevents failure from both external and internal corrosion. Since FRP-constructed tanks do not rust, they are not susceptible to internal corrosion problems due to the potential retention of water within each tank.

Figure 5: Building 6214 (Retail Automobile Service Station and Auto Repair)

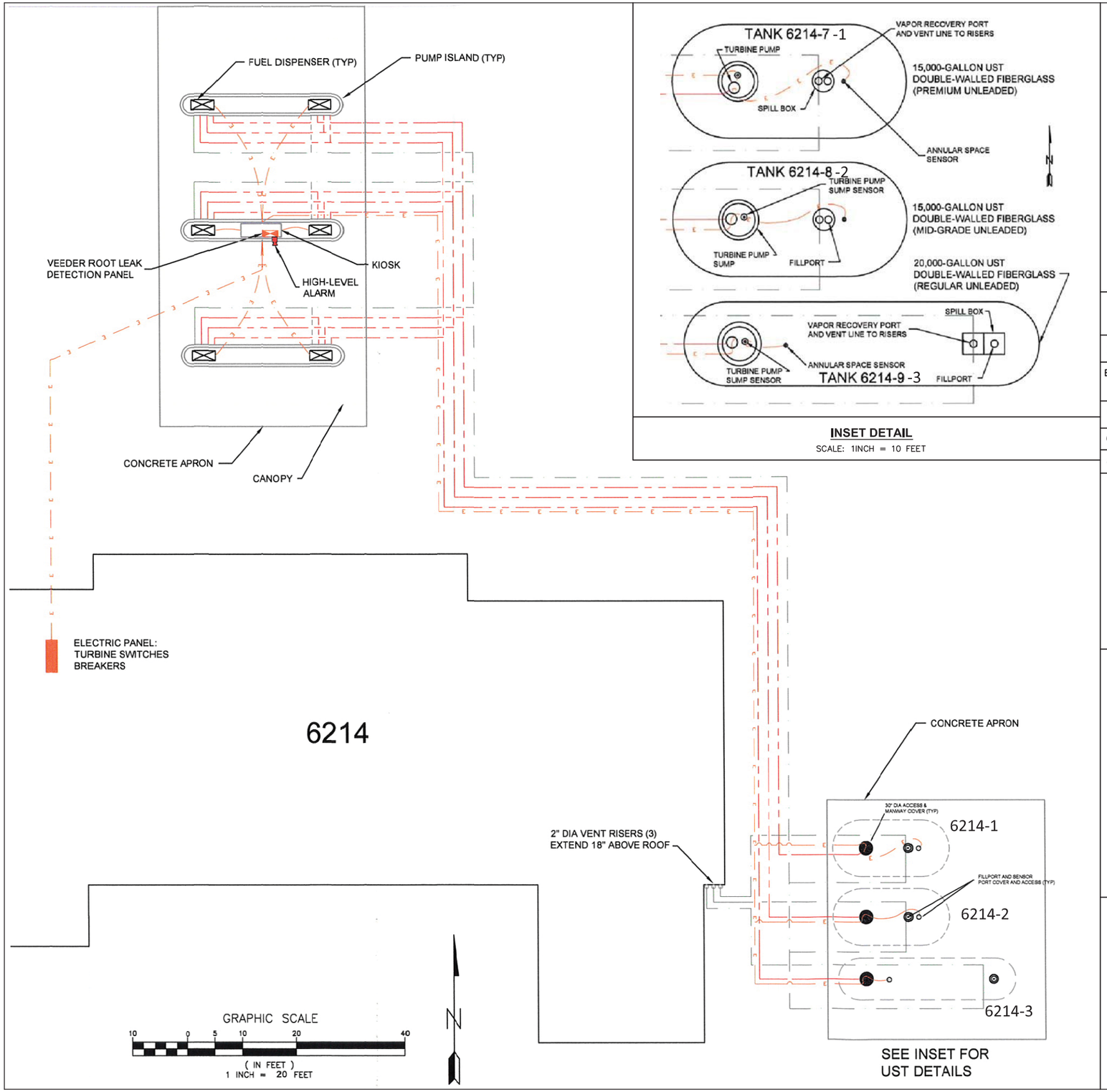
Tank No. 6214-1: One 15,000-gallon Premium 91 Unleaded Gasoline UST
(DEH UST Operating Permit Tank No. 30606)
Tank No. 6214-2: One 15,000-gallon Mid-grade 89 Unleaded Gasoline UST
(DEH UST Operating Permit Tank No. 30607)
Tank No. 6214-3: One 20,000-gallon Regular 87 Unleaded Gasoline UST
(DEH UST Operating Permit Tank No. 30608)

Location of USTs southeast of Building 6214

Tanker Truck Delivery of Fuel to USTs

Covered Dispenser Islands and Kiosk

Veeder Root TLS-350 Alarm Panel inside Kiosk

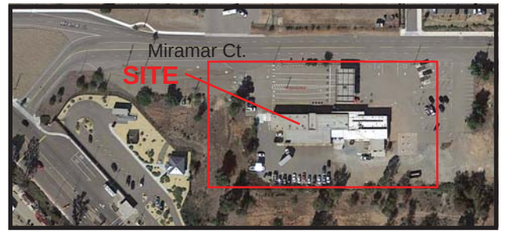


INSET DETAIL
SCALE: 1INCH = 10 FEET

SITE LOCATION MAP
Not to Scale

SCHEDULE OF UNDERGROUND STORAGE TANK SYSTEM

BUILDING No.	DEH PERMIT No.	TANK ID No.	INSTALLATION DATE	CONTENTS	CAPACITY (GALLONS)	TANK MATERIAL	TANK CONTAINMENT	TANK LEAK DETECTION SYSTEM
6214–1	180620	30606	01/03/1996	GASOLINE–PREMIUM GRADE	15,000	FRP	DOUBLE–WALLED	VEEDER ROOT TLS–350C WITH ATG
6214–2		30607	01/03/1996	GASOLINE–MID GRADE	15,000	FRP	DOUBLE–WALLED	
6214–3		30608	01/03/1996	GASOLINE–REGULAR GRADE	20,000	FRP	DOUBLE–WALLED	



SYMBOL LEGEND:

BELOW GROUND:

- UNDERGROUND ELECTRICAL LINE
- UNDERGROUND VENT LINE ("VR" INDICATES VAPOR RETURN - GASOLINE SYSTEMS ONLY)
- UNDERGROUND PRODUCT PIPING (DW)
- LEAK DETECTION SENSOR PORT
- TURBINE PUMP/SUMP AND SUMP SENSOR/PORT (ADDITIONAL SENSORS/PORTS MAY BE PRESENT - ORIENTATION MAY VARY)
- FILLPORT AND VENT OR SENSOR PORT
- VENT RISERS (2-INCH DIA TYPICAL)

ABOVE GROUND:

- FUEL DISPENSER
- AUDIBLE ALARM HORN; LEAK DETECTION SYSTEM (ORIENTATION MAY VARY)
- FILLPORT/SENSOR COVER
- UST ACCESS AND MANWAY COVER
- LEAK DETECTION SYSTEM CONTROLLER PANEL
- ELECTRICAL PANEL - PUMP SWITCHES, CIRCUIT BREAKERS, JUNCTION BOX, ETC.

ABBREVIATIONS:

ATG	AUTOMATIC TANK GAUGE
CONST	CONSTRUCTION
DIA	DIAMETER
DW	DOUBLE-WALLED
FRP	FIBERGLASS REINFORCED PLASTIC
TYP	TYPICAL
UST	UNDERGROUND STORAGE TANK

UST/AST
MANAGEMENT PLAN
FACILITY DIAGRAM

FIGURE 6
LOCATION OF USTS
BUILDING 6214

DEPARTMENT OF THE U.S. NAVY
MARINE CORPS AIR STATION MIRAMAR
SAN DIEGO, CA 92145

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The turbine, electrical connections, and fuel delivery piping in each UST are accessible within a liquid-tight containment sump located on top of the tank that is constructed of FRP. The fueling system containment sump is equipped with an electronic liquid detection device. This leak detection probe will automatically shut down the electrical power to the turbine in the event liquid is detected within the sump. Each UST fill port on the top of each tank is also protected by a liquid-tight secondary containment sump constructed of FRP.

Underground piping between the USTs and the dispensers is constructed of FRP pipe that is double-contained with an outer secondary pipe that is also constructed of FRP for containment and corrosion resistance. The annular space of each underground transfer pipeline from the USTs to the dispensers contains an electronic sensor which will detect a liquid fuel leak, sound the alarm, and shut down operation of the UST turbine pumps.

Each fuel dispenser has an UDC system. The UDC functions as a containment system and an emergency shutoff to control product flow in case of a leak within the dispenser. Each UDC system consists of a secondary containment basin with a mechanical float and chain assembly and the product line shear valves. The system is located beneath each fuel dispenser housing. The underground fuel product pipelines from the USTs are connected to the dispensers from the side of the UDC. If a leak occurs, fuel accumulates in the UDC containment basin and the ball float would begin to rise, placing tension on the attached chain, which is connected to the shear valve. When the ball float reaches a specific height pre-determined by the manufacturer, the shear valve is triggered by the tensioned chain that stops the flow of product to the dispenser.

Gasoline vapors generated during fuel delivery are scavenged by means of a vacuum system that returns the vapors to the USTs through a separate underground pipeline network.

3.2.3 Monitoring System

The UST system at Building 6214 is equipped with a Veeder Root TLS-350 monitoring system. The Veeder Root TLS-350 is part of an ATG system that provides continuous monitoring of each UST. The product level and temperature in each UST are continuously measured, analyzed, and recorded by the Veeder Root TLS-350 computer. In the "inventory mode," the ATG replaces the use of the gauge stick to measure product level and provides product inventory control. This mode records the changes in volume during operation of the UST, including fuel deliveries. In the "test mode," the product level and inventory probe performance are tested when no product is being added or dispensed from the UST. The ATG must be able to detect a leak no greater than 0.2 gallons per hour without the probability of a false alarm.

The USTs are constructed with an interstitial space that is filled with a saline water solution. Electronic sensors within the interstitial space measure changes in the fluid level that would indicate either internal or external leaks within the primary shells of the USTs. The Veeder Root TLS-350 provides secondary containment leak detection for each of the UST’s turbine pump and product fill sumps utilizing electronic sensors. In addition, the Veeder-Root TLS-350 is connected to ELLDs installed in the turbine sump that will indicate a leak into the double-walled product piping.

If a fuel release is detected within the secondary containment piping, UDCs, or sumps in the UST system, the Veeder Root TLS-350 disables power to the turbine that stops the dispensing of fuel, sounds an alarm and illuminates a red flashing light. The warning light is mounted on the side of the building and is in direct view from each of the UST fill ports.

The fuel dispensers provide data on the amount of fuel dispensed to the vehicles to the Veeder Root TLS-350 system. The UST operator can use the Veeder Root TLS-350 system to reconcile the actual UST fuel volumes to the dispensed volumes by printing out the inventories and comparing the numerical values.

3.2.4 Overfill Protection Devices

The Veeder Root TLS-350 monitoring system at Building 6214 will be triggered if the UST volume reaches 95 percent capacity, indicating a potential overflow situation. The electronic probes mounted in each tank will also activate an alarm when the tank reaches 90 percent capacity. This alarm provides enough time for the tanker truck driver to close the truck's shutoff feed valve before an overfill situation occurs.

Additional safety features in the fuel dispensing system include automatic shutoff nozzles to prevent overfilling of vehicles, anti-spark generating components, and grounding features in the delivery hoses and nozzles for fire prevention. The dispensers also have break-away couplings between the dispenser unit and the delivery nozzle to prevent spills from vehicles leaving the area with the nozzles still inserted in the vehicle tank. A manual emergency shutoff switch is also located on the exterior wall of Building 6214 in the event of a failure of the safety systems or an emergency situation.

3.2.5 Spill Scenarios

Possible spill scenarios from the USTs at Building 6214 are as follows:

- Catastrophic failure of the primary UST shell; estimated volume is 15000 gallons, but the leak is expected to remain within the secondary containment shell of the UST.
- Spills during loading of fuel into the USTs from tanker trucks; estimated volume is less than 50 gallons.
- Spills during fuel dispensing during vehicle fueling operations; estimated volume is less than 2 gallons.
- Leaks within the fuel dispensers; estimated volume is less than 2 gallons based on actuation of the shear valve located within the UDC sump.

3.2.6 Predicted Spill Direction and Site Drainage

Small spills occurring during loading of the USTs would pool on the concrete pavement, until cleaned up with absorbent materials. General surface flow direction across the site is primarily from north to south into Rose Canyon. Storm water runoff from the covered fueling islands flows west to an asphalt drainage swale and discharges through Outfall 73 into Rose Canyon. Storm water runoff from the southeastern portion of the site where the USTs are located flows to an unlined drainage swale and discharges through Outfall 114 into Rose Canyon.

3.3 BUILDING 7498 (U.S. MARINE CORPS EXCHANGE GASOLINE STATION)

Building 7498 is located east of Mitscher Way, north of Miramar Way, and south of Bauer Road. This building is part of the U.S. Marine Corps Exchange (MCX) and provides fuel to non-military vehicles.

3.3.1 Storage Areas and Equipment

Building 7498 contains the following USTs that are included in this UST/AST Management Plan:

- Tank No. 7498-1: One 15,000-gallon premium unleaded gasoline UST (DEH UST Operating Permit Tank No. 30597) located west of the building;
- Tank No. 7498-2: One 15,000-gallon mid-grade unleaded gasoline UST (DEH UST Operating Permit Tank No. 30596) located west of the building; and
- Tank No. 7498-3: One 15,000-gallon regular unleaded gasoline UST (DEH UST Operating Permit Tank No. 30595) located west of the building.

Photographs of Building 7498 and the USTs are provided on Figure 7. A drawing showing the general arrangement of the three USTs at Building 6214 is provided on Figure 8.

The MCX Gasoline Station provides fuel to non-military vehicles. The three USTs supply fuel to three pump islands within the site. Each pump island contains two dispensers, providing a total of six dispensers for the station. Each dispenser can individually dispense any of the three fuel products (i.e., regular, mid-grade, or premium grade gasoline). Each dispenser is capable of fueling two vehicles at a time, thus giving the station a total simultaneous fueling capacity of 12 vehicles at once.

The fuel systems at Building 7498 feature a pressurized double-contained underground piping system that is activated whenever demand is made by the dispensers. Each UST contains a turbine pump to supply the fuel into the pipelines. The UST turbines are activated whenever one or more of the dispensers are in use. Each dispenser provides fuel delivery from the appropriate UST, while metering the amount of product delivered to the vehicle. The fuel management system records and reports the amount of product dispensed to a central computerized accounting system at the site.

3.3.2 Containment Measures

Each UST is a double-walled storage tank constructed of FRP. The internal tank shell is completely enclosed by a secondary tank shell that provides 100 percent secondary containment. FRP is compatible with gasoline storage. This material also prevents failure from both external and internal corrosion. Since FRP-constructed tanks do not rust, they are not susceptible to internal corrosion problems due to the potential retention of water within each tank.

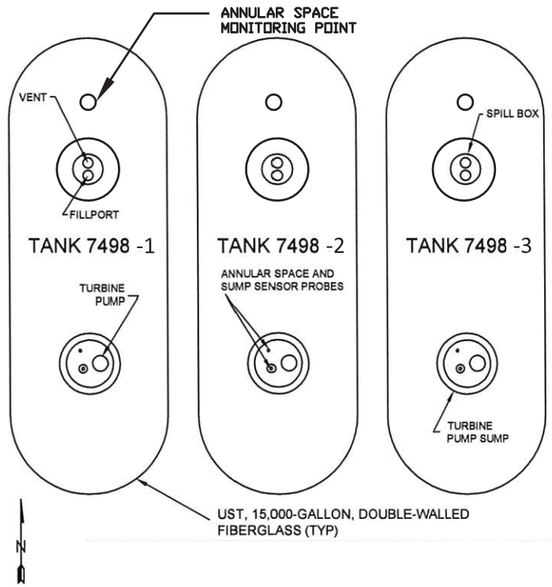
Figure 7: Building 7498 (MCX Gasoline Station)
Tank No. 7498-1: One 15,000-gallon Premium Unleaded Gasoline UST
(DEH UST Operating Permit Tank No. 30597)
Tank No. 7498-2: One 15,000-gallon Mid-grade Unleaded Gasoline UST
(DEH UST Operating Permit Tank No. 30596)
Tank No. 7498-3: One 15,000-gallon Regular Unleaded Gasoline UST
(DEH UST Operating Permit Tank No. 30595)

Bldg 7498 MCX Gas Station

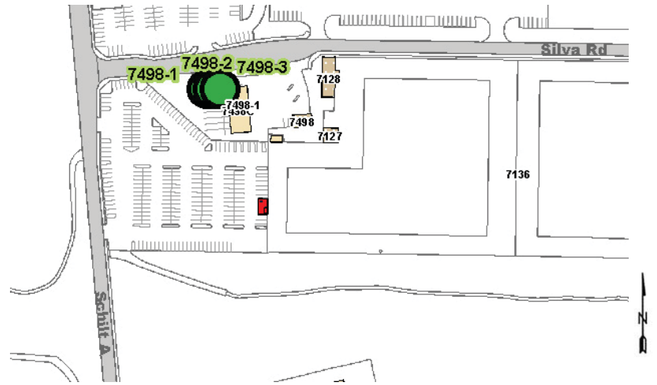
Location of USTs west of Building 7498

Covered Dispenser Islands and Kiosk

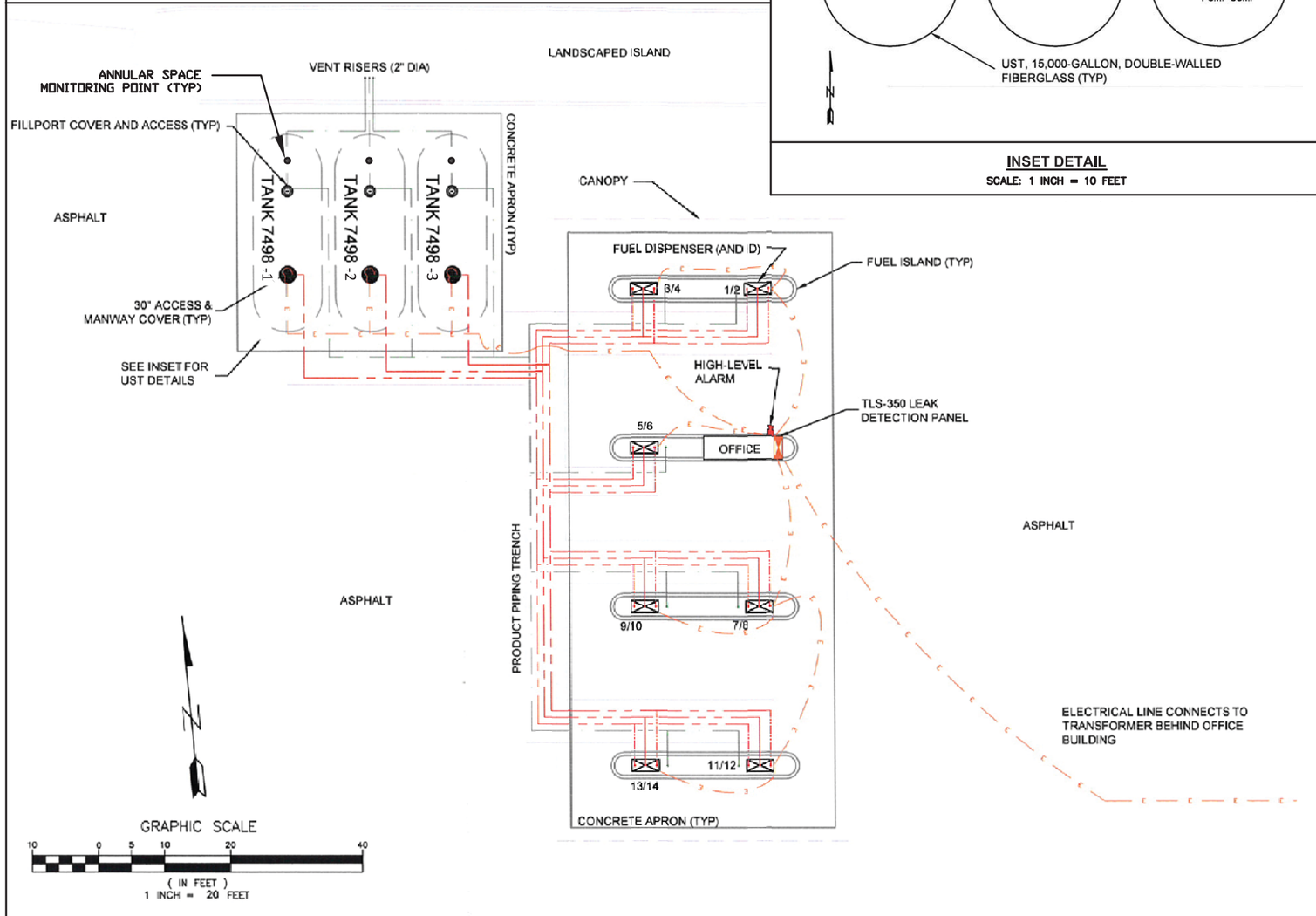
Veeder Root TLS-350 Alarm Panel inside Kiosk



INSET DETAIL
SCALE: 1 INCH = 10 FEET



SITE LOCATION MAP
Not to Scale



SCHEDULE OF UNDERGROUND STORAGE TANK SYSTEM

BUILDING No.	DEH PERMIT No.	TANK ID No.	INSTALLATION DATE	CONTENTS	CAPACITY (GALLONS)	TANK MATERIAL	TANK CONTAINMENT	TANK LEAK DETECTION SYSTEM
7498–1	180004	30595	10/28/1998	GASOLINE–REGULAR GRADE	15,000	FRP	DOUBLE–WALLED	VEEDER ROOT TLS–350C WITH ATG
7498–2		30596	10/28/1998	GASOLINE–MID GRADE	15,000	FRP	DOUBLE–WALLED	
7498–3		30597	10/28/1998	GASOLINE–PREMIUM GRADE	15,000	FRP	DOUBLE–WALLED	

NOTES:

LEAK DETECTION SENSORS/ALARMS ON ALL USTs:
1. ANNULUS SENSOR (INTERSTITIAL LIQUID ALARM)
2. FILLPORT SUMP SENSOR (OVERFILL ALARM)
3. TURBINE PUMP FAILURE SENSOR

PRODUCT PIPING IS ILLUSTRATED BASED ON PLAN DESIGNS. ACTUAL LOCATIONS AND CONFIGURATIONS MAY VARY.

SYMBOL LEGEND:

BELOW GROUND:
- UNDERGROUND ELECTRICAL LINE
- UNDERGROUND VENT LINE ("VR" INDICATES VAPOR RETURN - GASOLINE SYSTEMS ONLY)
- UNDERGROUND PRODUCT PIPING (DW)
- LEAK DETECTION SENSOR PORT
- TURBINE PUMP/SUMP AND SUMP SENSOR/PORT (ADDITIONAL SENSORS/PORTS MAY BE PRESENT - ORIENTATION MAY VARY)
- FILLPORT AND VENT OR SENSOR PORT
- VENT RISERS (2" DIA TYPICAL)

ABOVE GROUND:
- FUEL DISPENSER ISLAND
- AUDIBLE ALARM HORN; LEAK DETECTION SYSTEM (ORIENTATION MAY VARY)
- FILLPORT/SENSOR COVER
- UST ACCESS AND MANWAY COVER
- LEAK DETECTION SYSTEM CONTROLLER PANEL

ABBREVIATIONS:

ATG	AUTOMATIC TANK GAUGING
CONST	CONSTRUCTION
DIA	DIAMETER
DW	DOUBLE-WALLED
FRP	FIBERGLASS REINFORCED PLASTIC
TYP	TYPICAL
UST	UNDERGROUND STORAGE TANK

UST/AST
MANAGEMENT PLAN
FACILITY DIAGRAM

FIGURE 8
LOCATION OF USTS
BUILDING 7498

DEPARTMENT OF THE U.S. NAVY
MARINE CORPS AIR STATION MIRAMAR
SAN DIEGO, CA 92145

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The turbine, electrical connections, and fuel delivery piping in each UST are accessible within a liquid-tight containment sump located on top of the tank that is constructed of FRP. The fueling system containment sump is equipped with an electronic liquid detection device. This leak detection probe will automatically shut down the electrical power to the turbine in the event liquid is detected within the sump. Each UST fill port on the top of each tank is also protected by a liquid-tight secondary containment sump constructed of FRP.

Underground piping between the USTs and the dispensers is constructed of FRP pipe that is double-contained with an outer secondary pipe that is also constructed of FRP for containment and corrosion resistance. The annular space of each underground transfer pipeline from the USTs to the dispensers contains an electronic sensor which will detect a liquid fuel leak, sound the alarm, and shut down operation of the UST turbine pumps.

Each fuel dispenser has an UDC system. The UDC functions as a containment system and an emergency shutoff to control product flow in case of a leak within the dispenser. Each UDC system consists of a secondary containment basin with a mechanical float and chain assembly and the product line shear valves. The system is located beneath each fuel dispenser housing. The underground fuel product lines from the USTs are connected to the dispensers from the side of the UDC. If a leak occurs, fuel accumulates in the UDC containment basin and the ball float would begin to rise, placing tension on the attached chain, which is connected to the shear valve. When the ball float reaches a specific height pre-determined by the manufacturer, the shear valve is triggered by the tensioned chain that stops the flow of product to the dispenser.

Gasoline vapors generated during fuel delivery are scavenged by means of a vacuum system that returns the vapors to the USTs through a separate underground pipeline network.

3.3.3 Monitoring System

The UST system at Building 7498 is equipped with a Veeder Root TLS-350 monitoring system. The Veeder Root TLS-350 is part of an ATG system that provides continuous monitoring of each UST. The product level and temperature in each UST are continuously measured, analyzed, and recorded by the Veeder Root TLS-350 computer. In the "inventory mode," the ATG replaces the use of the gauge stick to measure product level and provides product inventory control. This mode records the changes in volume during operation of the UST, including fuel deliveries. In the "test mode," the product level and inventory probe performance are tested when no product is being added or dispensed from the UST. The ATG must be able to detect a leak no greater than 0.2 gallons per hour without the probability of a false alarm.

The USTs are constructed with an interstitial space that is filled with a saline water solution. Electronic sensors within the interstitial space measure changes in the fluid level that would indicate either internal or external leaks within the primary shells of the USTs. The Veeder Root TLS-350 provides secondary containment leak detection for each of the UST’s turbine pump and product fill sumps utilizing electronic sensors. In addition, the Veeder-Root TLS-350 is connected to ELLDs installed in the turbine sump that will indicate a leak into the double-walled product piping.

If a fuel release is detected within the secondary containment piping, UDCs, or sumps in the UST system, the Veeder Root TLS-350 disables power to the turbine that stops the dispensing of fuel, sounds an alarm and illuminates a red flashing light. The warning light is mounted on the side of the building and is in direct view from each of the UST fill ports.

The fuel dispensers provide data on the amount of fuel dispensed to the vehicles to the Veeder Root TLS-350 system. The UST operator can use the Veeder Root TLS-350 system to reconcile the actual UST fuel volumes to the dispensed volumes by printing out the inventories and comparing the numerical values.

3.3.4 Overfill Protection Devices

The Veeder Root TLS-350 monitoring system at Building 7498 will be triggered if the UST volume reaches 95 percent capacity, indicating a potential overflow situation. The electronic probes mounted in each tank will also activate an alarm when the tank reaches 90 percent capacity. This alarm provides enough time for the tanker truck driver to close the truck's shutoff feed valve before an overfill situation occurs.

Additional safety features in the fuel dispensing system include automatic shutoff nozzles to prevent overfilling of vehicles, anti-spark generating components, and grounding features in the delivery hoses and nozzles for fire prevention. The dispensers also have break-away couplings between the dispenser unit and the delivery nozzle to prevent spills from vehicles leaving the area with the nozzles still inserted in the vehicle tank. A manual emergency shutoff switch is also located on the exterior wall of the kiosk in the event of a failure of the safety systems or an emergency situation.

3.3.5 Spill Scenarios

Possible spill scenarios from the USTs at Building 7498 are as follows:

- Catastrophic failure of the primary UST shell; estimated volume is 15,000 gallons, but the leak is expected to remain within the secondary containment shell of the UST.
- Spills during loading of fuel into the USTs from tanker trucks; estimated volume is less than 50 gallons.
- Spills during fuel dispensing during vehicle fueling operations; estimated volume is less than 2 gallons.
- Leaks within the fuel dispensers; estimated volume is less than 2 gallons based on actuation of the shear valve located within the UDC sump.

3.3.6 Predicted Spill Direction and Site Drainage

Small spills occurring during loading of the USTs would pool on the concrete pavement until cleaned up with absorbent materials. General surface flow direction across the site is primarily from north to south into Rose Canyon.

3.4 BUILDING 8676 (U.S. MARINE CORPS EXCHANGE GASOLINE STATION)

Building 8676 is located at the northeastern corner of Pless Avenue and Obregon Avenue. This building is part of the U.S. Marine Corps Exchange (MCX) and provides fuel to non-military vehicles.

3.4.1 Storage Areas and Equipment

Building 8676 contains the following USTs that are included in this UST/AST Management Plan:

- Tank No. 8676-1: One 30,000-gallon regular-grade unleaded gasoline UST (DEH UST Operating Permit Tank No. 11831) located west of the building; and

- Tank No. 8676-2/8676-3: One dual-tank UST containing 10,000 gallons of diesel fuel and 20,000 gallons of premium-grade unleaded gasoline (DEH UST Operating Permit Tank No. 11832 and 11833) located west of the building.

Photographs of Building 8676 and the USTs are provided on Figure 9. A drawing showing the general arrangement of the two USTs at Building 8676 is provided on Figure 10.

The MCX Gasoline Station provides fuel to non-military vehicles. The two USTs supply fuel to eight pump islands within the site. Each pump island contains one dispenser, providing a total of eight dispensers for the station. Each dispenser can individually dispense any of the three fuel products (i.e., diesel, regular-grade gasoline, or premium-grade gasoline). Each dispenser is also capable of fueling two vehicles at a time, thus giving the station a total simultaneous fueling capacity of 16 vehicles at once.

The fuel systems at Building 8676 feature a pressurized double-contained underground piping system that is activated whenever demand is made by the dispensers. Each UST contains a turbine pump to supply the fuel into the pipelines. The UST turbines are activated whenever one or more of the dispensers are in use. Each dispenser provides fuel delivery from the appropriate UST, while metering the amount of product delivered to the vehicle. The fuel management system records and reports the amount of product dispensed to a central computerized accounting system at the site.

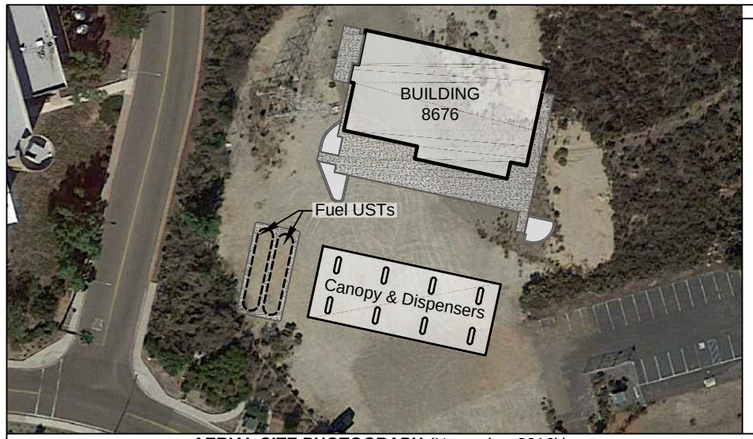
Figure 9: Building 8676 (MCX Gasoline Station)
Tank No. 8676-1: One 30,000-gallon Regular Grade Unleaded Gasoline UST
(DEH UST Operating Permit Tank No. 11831)
Tank No. 8676-2/8676-3: One 10,000-gallon Diesel Fuel and
20,000-gallon Premium Grade Unleaded Gasoline UST
(DEH UST Operating Permit Tank No. 11832 and 11833)

Building 8676 MCX Gas Station

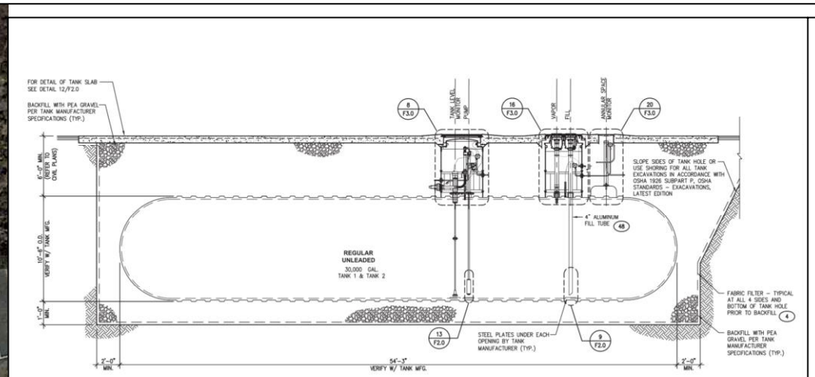
Building 8676 MCX Gas Station

Location of USTs west of Building 8676

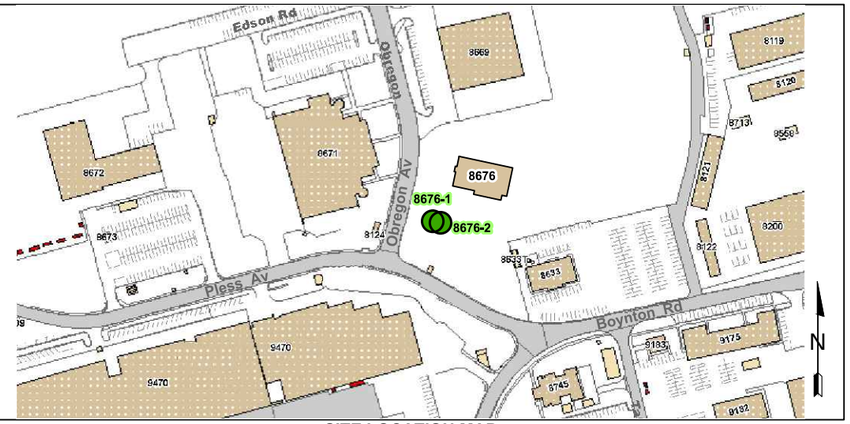
ICON TS-5000 alarm panel and emergency shut-off switch inside Building 8676



AERIAL SITE PHOTOGRAPH (November 2016)*
Approx. Scale: 1:1200 (1 inch = 100 feet)



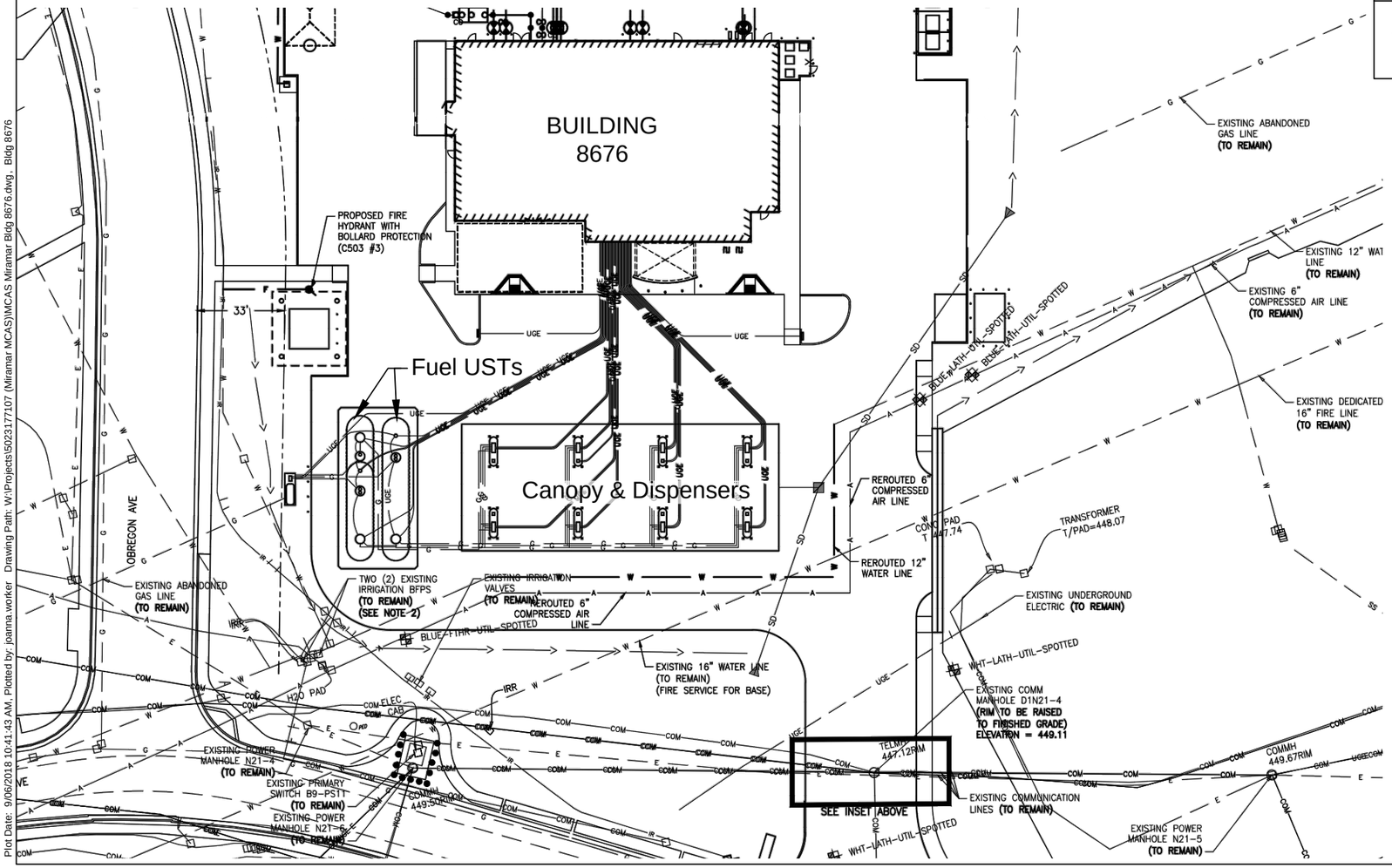
UST DETAIL
Not to Scale



SITE LOCATION MAP
Not to Scale

SCHEDULE OF UNDERGROUND STORAGE TANK SYSTEM

BUILDING No.	DEH PERMIT No.	TANK ID No.	INSTALLATION DATE	CONTENTS	CAPACITY (GALLONS)	TANK MATERIAL	TANK CONTAINMENT	TANK LEAK DETECTION SYSTEM
8676	003944	11831	2/2/2018	GASOLINE – Regular Grade	30,000	FRP	DOUBLE–WALLED	INCON TS–5000 WITH ATG
		11832		DIESEL	10,000	FRP	DOUBLE–WALLED	
		11833		GASOLINE – Premium Grade	20,000			



ABBREVIATIONS:

ATG AUTOMATIC TANK GAUGING

FRP FIBERGLASS REINFORCED PLASTIC

UST UNDERGROUND STORAGE TANK

SYMBOL LEGEND:

BELOW GROUND:

- UGE — UNDERGROUND ELECTRICAL LINE
- G — UNDERGROUND PRODUCT PIPING
- W — UNDERGROUND WATER LINE
- IR — UNDERGROUND IRRIGATION LINE
- A — UNDERGROUND COMPRESSED AIR LINE
- COM — UNDERGROUND COMMUNICATION LINE
- SD — STORM DRAIN
- ⊛ — FILPORT AND VENT OR SENSOR PORT

*Aerial photo from Google™ earth Pro, dated 11-8-2016.

Basemap modified from a drawing titled "Site Utility Plan", by The Stellar Group, dated 04-11-2018.

0' 15' 30' 60'
SCALE 1" = 60'

UST/AST
MANAGEMENT PLAN
FACILITY DIAGRAM

FIGURE 10
LOCATION OF UST
BUILDING 8676

DEPARTMENT OF THE U.S. NAVY
MARINE CORPS AIR STATION MIRAMAR
SAN DIEGO, CA 92145

Plot Date: 9/06/2018 10:41:43 AM, Plotted by: joanna.worker Drawing Path: W:\Projects\50231771\07 (Miramar MCAS)\MCAS Miramar Bldg 8676.dwg, Bldg 8676

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3.4.2 Containment Measures

Each UST is a double-walled storage tank constructed of FRP. The internal tank shell is completely enclosed by a secondary tank shell that provides 100 percent secondary containment. FRP is compatible with diesel and gasoline storage. This material also prevents failure from both external and internal corrosion. Because FRP-constructed tanks do not rust, they are not susceptible to internal corrosion problems because of the potential retention of water within each tank.

The turbine, electrical connections, fuel delivery piping, and fill port in each UST are accessible within two liquid-tight containment sumps located on top of the tank that are constructed of FRP. Each sump is filled with a brine solution. Each sump is also equipped with an electronic float sensor that measures any changes in the fluid level that would indicate either an internal or external leak within the sump of each UST. This probe will automatically shut down the electrical power to the turbine in the event that a leak is detected within the sump.

Underground piping between the USTs and the dispensers is constructed of FRP pipe that is double-walled construction with an outer secondary pipe that is also constructed of FRP for containment and corrosion resistance. The annular space of each underground transfer pipeline from the USTs to the dispensers contains an electronic sensor that will detect a liquid fuel leak, sound the alarm, and shut down operation of the UST turbine pumps.

A UDC system is also located beneath each fuel dispenser housing. The underground fuel product lines from each UST are connected to the dispensers from the side of the UDCs. Each UDC pan is of double-walled construction, where the interstitial space contains a brine solution. In the event that the brine solution leaks outside the pan and dispenser, an electronic float sensor detects the change in fluid level and sounds an alarm. The interior of the UDC pan contains the product shear valves and piping. If a leak occurs, fuel accumulates in the UDC containment basin and an additional electronic level sensor sounds an alarm and automatically shuts down the pump to stop the flow of product at the dispenser.

Gasoline vapors generated during fuel delivery are scavenged by means of a vacuum system that returns the vapors to the USTs through a separate underground pipeline network.

3.4.3 Monitoring System

The UST system at Building 8675 is equipped with an Incon TS-5000 monitoring system. The Incon TS-5000 is part of an ATG system that provides continuous monitoring of each UST. The product level and temperature in each UST are measured continuously, and are automatically analyzed and recorded by the Incon TS-5000 computer. The ATG records the volume change activities of each in-service UST, including fuel deliveries. The ATG must be able to detect a leak no larger than 0.2 gallon per hour without the probability of a false alarm.

The USTs are constructed with an enhanced leak detection system. The interstitial spaces of each UST and the UDC are filled with a brine solution. In addition, the product fill and turbine pump sumps of each UST are also filled with a brine solution. Electronic sensors within the interstitial space and sumps of each UST measure any changes in the fluid level that indicate either an internal or external leak within the primary shell or sumps of each UST.

If a fuel release is detected within the secondary containment piping, UDCs, or sumps in the UST system, the Incon TS-5000 disables power to the turbine that stops the dispensing of fuel, sounds an alarm, and illuminates a red flashing light mounted on the exterior of the building.

The fuel dispensers provide data on the amount of fuel dispensed to the vehicles to the Incon TS-5000 system. The UST operator can use the Incon TS-5000 system to reconcile the actual UST fuel volumes to the dispensed volumes by printing out the inventories and comparing the numerical values.

3.4.4 Overfill Protection Devices

The Incon TS-5000 monitoring system at Building 8675 will be triggered if the UST volume reaches 95 percent capacity, indicating a potential overflow situation. The electronic probes mounted in each tank will also activate an alarm when the tank reaches 90 percent capacity. This alarm provides enough time for the tanker truck driver to close the truck's shutoff feed valve before an overfill situation occurs. A warning light marked "Overfill Alarm" is mounted adjacent to the UST vent tubes and is in direct view of the UST fill ports.

Additional safety features in the fuel-dispensing system include automatic shutoff nozzles to prevent overfilling of vehicles, anti-spark generating components, and grounding features in the delivery hoses and nozzles for fire prevention. The dispensers also have break-away couplings between the dispenser unit and the delivery nozzle to prevent spills from vehicles leaving the area with the nozzles still inserted in the vehicle tank. Manual emergency shutoff switches are also located next to the Incon TS-5000 alarm panel inside Building 8675 and on an exterior cement block post in the event of a failure of the safety systems or an emergency situation.

3.4.5 Spill Scenarios

Possible spill scenarios from the USTs at Building 8675 are as follows:

- Catastrophic failure of the primary UST shell; estimated maximum volume is 30,000 gallons, but the leak is expected to remain within the secondary containment shell of the UST.
- Spills during loading of fuel into the USTs from tanker trucks; estimated volume is less than 50 gallons.
- Spills during fuel dispensing during vehicle fueling operations; estimated volume is less than 2 gallons.
- Leaks within the fuel dispensers; estimated volume is less than 2 gallons based on actuation of the shear valve located within the UDC sump.

3.4.6 Predicted Spill Direction and Site Drainage

Small spills occurring during loading of the USTs would pool on the concrete pavement until cleaned up with absorbent materials. General surface flow direction is primarily to the west and south into Pless Avenue.

3.5 BUILDING 8483 (MILITARY FUEL STATION)

Building 8483 is located north of Boyington Road and west of the intersection of Schilt Avenue. The building provides fuel to U.S. Marine Corps military vehicles.

3.5.1 Storage Areas and Equipment

Building 8483 contains the following USTs that are included in this UST/AST Management Plan:

- Tank No. 8483-1: One 10,000-gallon diesel UST (DEH UST Operating Permit Tank No. 31047) located on the west side of the building; and
- Tank No. 8483-2: One 15,000-gallon regular grade unleaded gasoline UST (DEH UST Operating Permit Tank No. 31046) also located on the west side of the building.

Photographs of Building 8483 and the USTs are provided on Figure 11. A drawing showing the general arrangement of the two USTs at Building 8483 is provided on Figure 12.

The Military Fuel Station provides fuel to government and military vehicles. The two USTs supply fuel to one pump island located southeast of the USTs. The pump island contains two dispensers. The pump island can dispense either regular grade gasoline or diesel fuel. One dispenser is dedicated to dispensing diesel and the other dispenser is dedicated to dispensing gasoline. Only one vehicle may be fueled at any given time.

The fuel systems at Building 8483 feature a pressurized double-contained underground piping system that is activated whenever demand is made by the dispensers. Each UST contains a turbine pump to supply the fuel into the pipelines. The UST turbines are activated whenever one or more of the dispensers are in use. Each dispenser provides fuel delivery from the appropriate UST, while metering the amount of product delivered to the vehicle. The fuel management system records and reports the amount of product dispensed to a central computerized accounting system at the site.

3.5.2 Containment Measures

Each UST is a double-walled storage tank constructed of FRP. The internal tank shell is completely enclosed by a secondary tank shell that provides 100 percent secondary containment. FRP is compatible with gasoline and diesel fuel storage. This material also prevents failure from both external and internal corrosion. Since FRP-constructed tanks do not rust, they are not susceptible to internal corrosion problems due to the potential retention of water within each tank.

Figure 11: Building 8483 (Military Fuel Station)

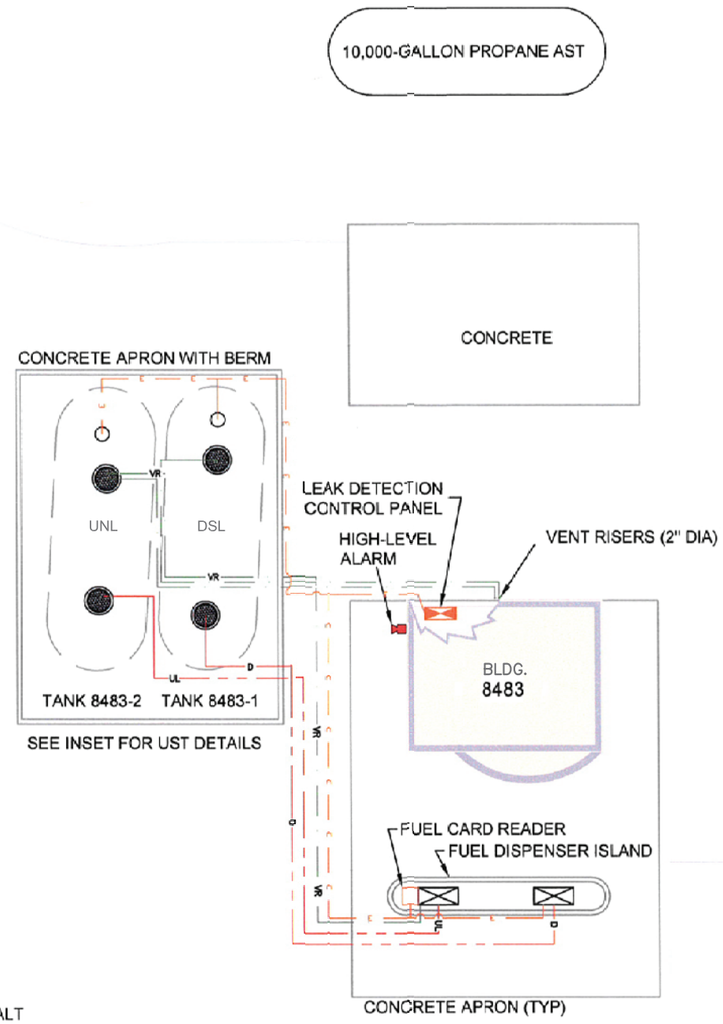
Tank No. 8483-1: 10,000-gallon Diesel UST
(DEH UST Operating Permit Tank No. 31047)
Tank No. 8483-2: 15,000-gallon Regular Unleaded Gasoline UST
(DEH UST Operating Permit Tank No. 31046)

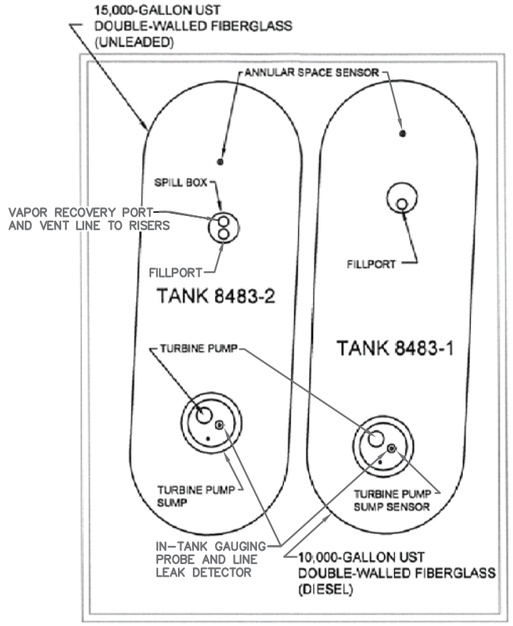
Building 8483

Location of USTs within Concrete Bermed Area

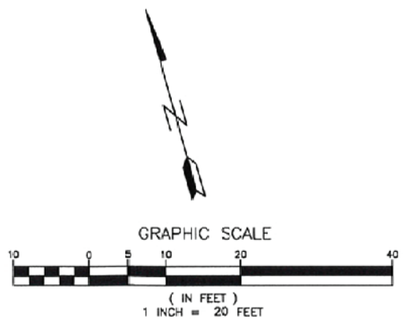
Veeder Root TLS-350 Alarm Panel inside Building 8483

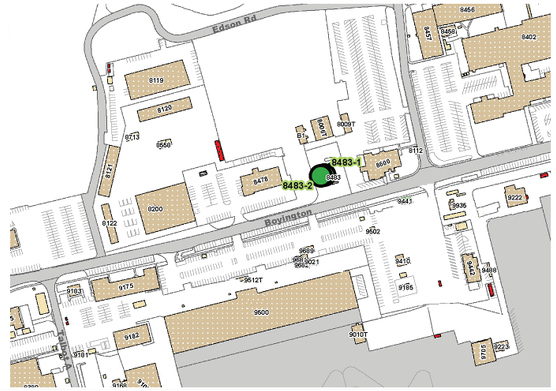
Access Hatches to Tank No. 8483-1





INSET DETAIL
SCALE: 1 INCH = 10 FEET

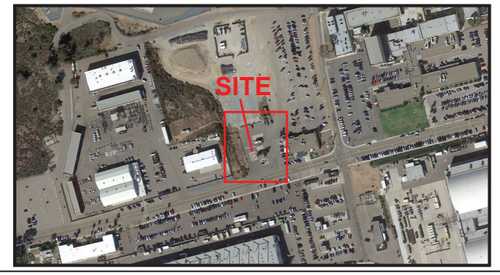




SITE LOCATION MAP
Not to Scale

SCHEDULE OF UNDERGROUND STORAGE TANK SYSTEM

BUILDING No.	DEH PERMIT No.	TANK ID No.	INSTALLATION DATE	CONTENTS	CAPACITY (GALLONS)	TANK MATERIAL	TANK CONTAINMENT	TANK LEAK DETECTION SYSTEM
8483–1	181127	31047	07/21/1998	DIESEL	10,000	FRP	DOUBLE–WALLED	VEEDER ROOT TLS–350C WITH ATG
8483–2		31046	07/21/1998	GASOLINE–REGULAR GRADE	15,000	FRP	DOUBLE–WALLED	



SYMBOL LEGEND:

BELOW GROUND:
- UNDERGROUND ELECTRICAL LINE
- UNDERGROUND VENT LINE ("VR" INDICATES VAPOR RETURN - GASOLINE SYSTEMS ONLY)
- UNDERGROUND PRODUCT PIPING (DW)
- LEAK DETECTION SENSOR PORT
- TURBINE PUMP/SUMP AND SUMP SENSOR/PORT (ADDITIONAL SENSORS/PORTS MAY BE PRESENT - ORIENTATION MAY VARY)
- FILLPORT AND VENT OR SENSOR PORT
- VENT RISERS (2-INCH DIA TYPICAL)

ABOVE GROUND:
- FUEL DISPENSER
- AUDIBLE ALARM HORN; LEAK DETECTION SYSTEM (ORIENTATION MAY VARY)
- FILLPORT/SENSOR COVER
- UST ACCESS AND MANWAY COVER
- LEAK DETECTION SYSTEM CONTROLLER PANEL

ABBREVIATIONS:

ATG	AUTOMATIC TANK GAUGING
CONST	CONSTRUCTION
DIA	DIAMETER
DSL	DIESEL
DW	DOUBLE-WALLED
FRP	FIBERGLASS REINFORCED PLASTIC
PRES	PRESSURE
TYP	TYPICAL
UNL	UNLEADED GASOLINE
UST	UNDERGROUND STORAGE TANK
VR	VAPOR RECOVERY (LINE)

UST/AST
MANAGEMENT PLAN
FACILITY DIAGRAM

FIGURE 12
LOCATION OF USTS
BUILDING 8483

DEPARTMENT OF THE U.S. NAVY
MARINE CORPS AIR STATION MIRAMAR
SAN DIEGO, CA 92145

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The turbine, electrical connections, and fuel delivery piping in each UST are accessible within a liquid-tight containment sump located on top of the tank that is constructed of FRP. The fueling system containment sump is equipped with an electronic liquid detection device. This leak detection probe will automatically shut down the electrical power to the turbine in the event liquid is detected within the sump. Each UST fill port on the top of each tank is also protected by a liquid-tight secondary containment sump constructed of FRP. In addition, the concrete paved area above the USTs is enclosed on three sides by a concrete berm for minor spill containment.

Underground piping between the USTs and the dispensers is constructed of FRP pipe that is double-contained with an outer secondary pipe that is also constructed of FRP for containment and corrosion resistance. The annular space of each underground transfer pipeline from the USTs to the dispensers contains an electronic sensor which will detect a liquid fuel leak, sound the alarm, and shut down operation of the UST turbine pumps.

Each fuel dispenser has a UDC system. The UDC functions as a containment system and an emergency shutoff to control product flow in case of a leak within the dispenser. The UDC system in the gasoline dispenser consists of a secondary containment basin with a mechanical float and chain assembly and the product line shear valves. The underground gasoline product line from the UST is connected to the dispenser from the side of the UDC. If a leak occurs at the gasoline dispenser, fuel accumulates in the UDC containment basin and the ball float would begin to rise, placing tension on the attached chain, which is connected to the shear valve. When the ball float reaches a specific height pre-determined by the manufacturer, the shear valve is triggered by the tensioned chain which stops the flow of gasoline product to the dispenser. In the diesel dispenser, an electronic signal from a UDC sump sensor will trigger the shear valve instead of a mechanical float and chain assembly.

Gasoline vapors generated during fuel delivery are scavenged by means of a vacuum system that returns the vapors to the USTs through a separate underground pipeline network.

3.5.3 Monitoring System

The UST system at Building 8483 is equipped with a Veeder Root TLS-350 monitoring system. The Veeder Root TLS-350 is part of an ATG system that provides continuous monitoring of each UST. The product level and temperature in each UST are continuously measured, analyzed, and recorded by the Veeder Root TLS-350 computer. In the "inventory mode," the ATG replaces the use of the gauge stick to measure product level and provides product inventory control. This mode records the changes in volume during operation of the UST, including fuel deliveries. In the "test mode," the product level and inventory probe performance are tested when no product is being added or dispensed from the UST. The ATG must be able to detect a leak no greater than 0.2 gallons per hour without the probability of a false alarm.

The USTs are constructed with a dry interstitial space. Electronic sensors within the interstitial space detect the presence of liquid that would indicate either internal or external leaks within the primary shells of the USTs. The Veeder Root TLS-350 provides secondary containment leak detection for each of the UST's turbine pump and product fill sumps utilizing electronic sensors. In addition, the Veeder-Root TLS-350 is connected to ELLDs installed in the turbine sump that will indicate a leak into the double-walled product piping.

If a fuel release is detected within the secondary containment piping, UDCs, or sumps in the UST system, the Veeder Root TLS-350 disables power to the turbine that stops the dispensing of fuel, sounds an alarm and illuminates a red flashing light. The warning light is mounted on the building and is in direct view from the UST fill ports.

The fuel dispensers provide data on the amount of fuel dispensed to the vehicles to the Veeder Root TLS-350 system. The UST operator can use the Veeder Root TLS-350 system to reconcile the actual UST fuel volumes to the dispensed volumes by printing out the inventories and comparing the numerical values.

3.5.4 Overfill Protection Devices

The Veeder Root TLS-350 monitoring system at Building 8483 will be triggered if the UST volume reaches 95 percent capacity, indicating a potential overflow situation. The electronic probes mounted in each tank will also activate an alarm when the tank reaches 90 percent capacity. This alarm provides enough time for the tanker truck driver to close the truck's shutoff feed valve before an overfill situation occurs.

Additional safety features in the fuel dispensing system include automatic shutoff nozzles to prevent overfilling of vehicles, anti-spark generating components, and grounding features in the delivery hoses and nozzles for fire prevention. The dispensers also have break-away couplings between the dispenser unit and the delivery nozzle to prevent spills from vehicles leaving the area with the nozzles still inserted in the vehicle tank. A manual emergency shutoff switch is also located on Building 8483 in the event of a failure of the safety systems or an emergency situation.

3.5.5 Spill Scenarios

Possible spill scenarios from the USTs at Building 8483 are as follows:

- Catastrophic failure of the primary UST shell; estimated volume is 15,000 gallons, but the leak is expected to remain within the secondary containment shell of the UST.
- Spills during loading of fuel into the USTs from tanker trucks; estimated volume is less than 50 gallons.
- Spills during fuel dispensing during vehicle fueling operations; estimated volume is less than 2 gallons.
- Leaks within the fuel dispensers; estimated volume is less than 2 gallons based on actuation of the shear valve located within the UDC sump.

3.5.6 Predicted Spill Direction and Site Drainage

Small spills occurring during loading of the USTs would pool on the concrete pavement within the bermed area until cleaned up with absorbent materials. General surface flow direction across the site is from south to north. There are no existing storm drains visible nearby; however, storm water runoff flows over land into nearby asphalt paved areas and a concrete swale behind the building.

3.6 BUILDING 8545 (AIRCRAFT ENGINE TEST CELL)

Building 8545 is used to test aircraft jet engines. The building is located north of Boyington Road and east of Mitscher Way.

3.6.1 Storage Areas and Equipment

Building 8545 contains the following UST that is included in this UST/AST Management Plan:

- Tank No. 8545-2: One 20,000-gallon JP-5 Jet Fuel (DEH UST Operating Permit Tank No. 29612) located northwest of the building.

Photographs of Building 8545 and the UST are provided on Figure 13. A drawing showing the general arrangement of the UST at Building 8545 is provided on Figure 14.

Building 8545 is an aircraft engine test cell facility used to test repaired U.S. Marine Corps jet fighter engines. The engines are placed inside the test cell chamber and connected to diagnostic equipment and a JP-5 fuel supply line. The JP-5 fuel is transferred to the test cell through a series of underground pipelines from the UST. The jet fuel is pre-processed by fuel filters and moisture knockout equipment inside the test cell prior to entering the jet engine.

3.6.2 Containment Measures

Tank No. 8545-2 is a double-walled storage tank constructed of FRP. The internal tank shell is completely enclosed by a secondary tank shell that provides 100 percent secondary containment. FRP is compatible with JP-5 jet fuel storage. This material also prevents failure from both external and internal corrosion. Since an FRP-constructed tank does not rust, the tank is not susceptible to internal corrosion problems due to the potential retention of water within each tank.

The UST is equipped with two electrical impeller feed pumps. The pumps transfer fuel from the UST through the underground pipelines under constant pressure. The JP-5 is then consumed by the jet engine inside the test cell. Once the demand for fuel is not needed, the pumps are turned off and the line is de-pressurized. Jet fuel then remains in the supply line for the next jet engine test.

Underground piping between the UST and the test cell is constructed of FRP pipe that is double-walled construction with an outer secondary pipe that is also constructed of FRP for containment and corrosion resistance until entering Building 8545. The piping and associated interstitial space is sloped to gravity drain any leak into the UST turbine sump which is electronically monitored to detect a liquid, sound an alarm, and shut down the turbine pump.

The pumps are located within an aboveground concrete shed and will be shut down if a leak is detected within the entire UST system. The UST fill ports are also protected by a secondary containment sump constructed of FRP on the tank.

Figure 13: Building 8545 (Aircraft Engine Test Cell)

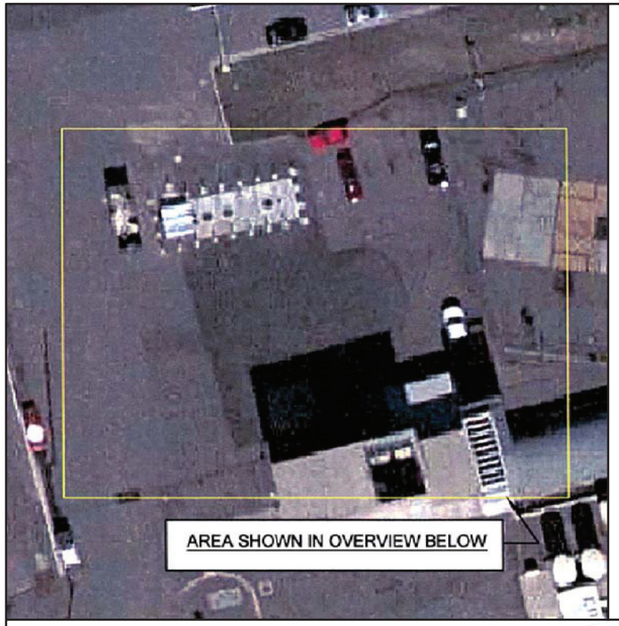
Tank No. 8545-2: One 20,000-gallon JP-5 Jet Fuel UST
(DEH UST Operating Permit Tank No. 29612)

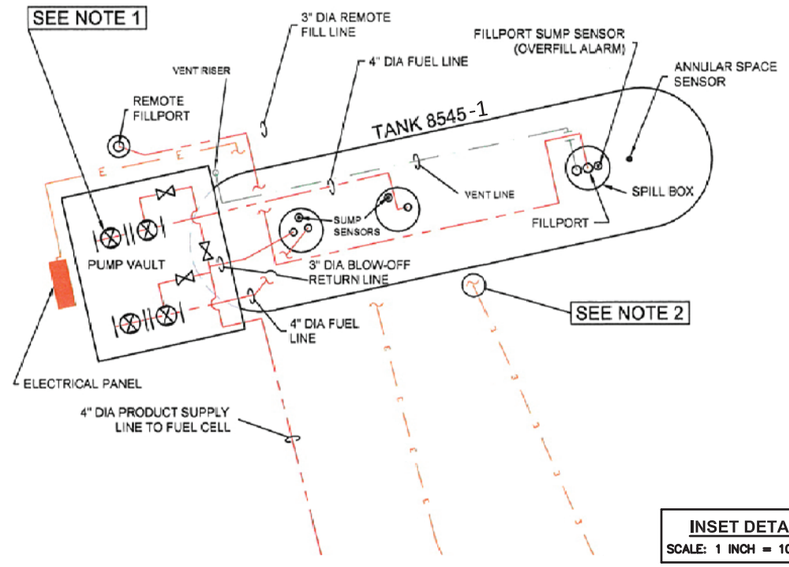
Location of UST northwest of Building 8545

Access Ports to UST

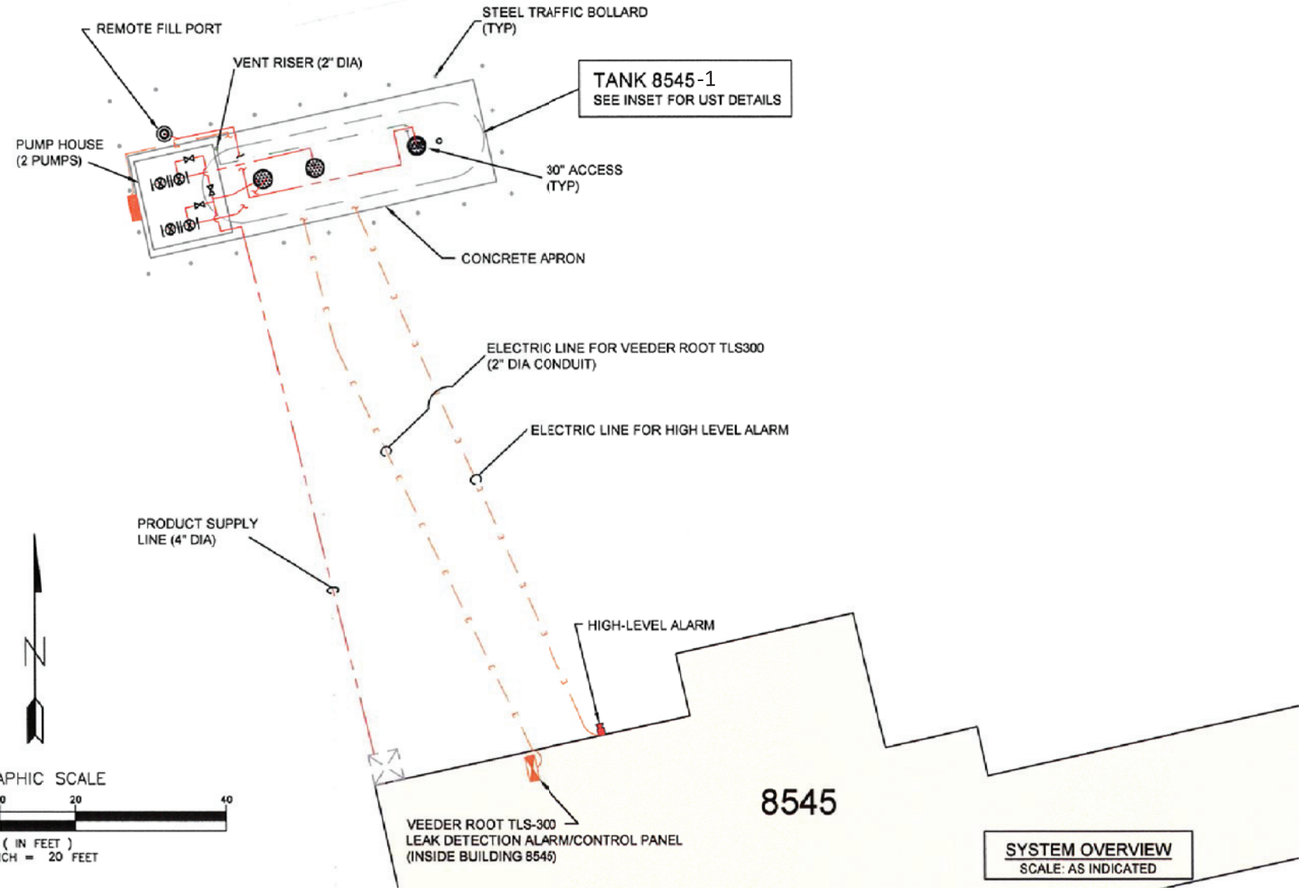
Traffic Bollards surrounding UST

Veeder Root TLS-300C Alarm Panel inside Building 8545

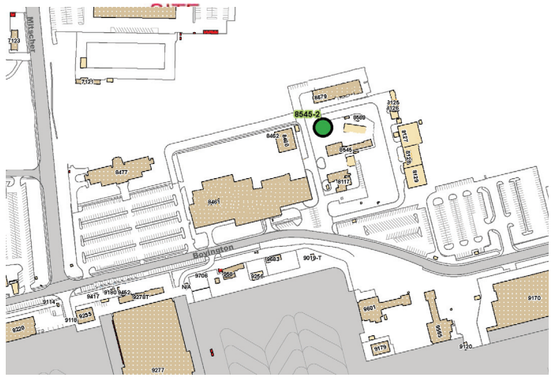




INSET DETAIL
SCALE: 1 INCH = 10 FEET



SYSTEM OVERVIEW
SCALE: AS INDICATED



SITE LOCATION MAP
Not to Scale

SCHEDULE OF UNDERGROUND STORAGE TANK SYSTEM

BUILDING No.	DEH PERMIT No.	TANK ID No.	INSTALLATION DATE	CONTENTS	CAPACITY (GALLONS)	TANK MATERIAL	TANK CONTAINMENT	TANK LEAK DETECTION SYSTEM
8545-2	180004	29612	9/8/1998	JP-5 JET FUEL	20,000	FRP	DOUBLE-WALLED	VEEDER ROOT TLS-300C WITH ATG

NOTES:

1. PRODUCT PUMPS: VERTICAL SPLIT-CASE OVERHUNG IMPELLER END SUCTION – SINGLE-STAGE CENTRIFUGAL.
2. UNABLE TO VERIFY ELECTRICAL WIRING MANIFOLD LAYOUT IN UST AREA. DETERMINE DURING FUTURE SUBSURFACE EXCAVATION OF TANK SYSTEM.

SYMBOL LEGEND:

- UNDERGROUND ELECTRICAL LINE
- UNDERGROUND VENT LINE ("VR" INDICATES VAPOR RETURN (GASOLINE SYSTEMS ONLY)
- UNDERGROUND PRODUCT PIPING (DW)
- LEAK DETECTION SENSOR PORT
- PUMP, SUMP, AND SUMP SENSOR/PORT (ADDITIONAL SENSORS/PORTS MAY BE PRESENT - ORIENTATION MAY VARY)
- FILLPORT AND VENT OR SENSOR PORT
- VENT RISERS (2-INCH DIA TYPICAL)
- VALVE
- AUDIBLE ALARM HORN; LEAK DETECTION SYSTEM (ORIENTATION MAY VARY)
- FILLPORT/SENSOR COVER
- UST ACCESS AND MANWAY COVER
- LEAK DETECTION SYSTEM CONTROLLER PANEL
- ELECTRICAL PANEL - PUMP SWITCHES, CIRCUIT BREAKERS, JUNCTION BOX, ETC.

ABBREVIATIONS:

ATC	AUTOMATIC TANK GAUGING
CONST	CONSTRUCTION
DIA	DIAMETER
DW	DOUBLE-WALLED
FRP	FIBERGLASS REINFORCED PLASTIC
PRES	PRESSURE
TYP	TYPICAL
UST	UNDERGROUND STORAGE TANK

UST/AST
MANAGEMENT PLAN
FACILITY DIAGRAM

FIGURE 14
LOCATION OF UST
BUILDING 8545

DEPARTMENT OF THE U.S. NAVY
MARINE CORPS AIR STATION MIRAMAR
SAN DIEGO, CA 92145

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3.6.3 Monitoring System

The UST monitoring system at Building 8545 is equipped with a Veeder Root TLS-300C monitoring system. The Veeder Root TLS-300C is part of an ATG system that provides continuous monitoring of Tank No. 8545-2. The product level and temperature in the UST are continuously measured, analyzed, and recorded by the Veeder Root TLS-300C computer. In the "inventory mode," the ATG replaces the use of the gauge stick to measure product level and provides product inventory control. This mode records the changes in volume during operation of the UST, including fuel deliveries. In the "test mode," the product level and inventory probe performance are tested when no product is being added or dispensed from the UST. The ATG must be able to detect a leak no greater than 0.2 gallons per hour without the probability of a false alarm.

Tank No. 8545-2 is constructed with a dry interstitial space. An electronic sensor within the interstitial space detects the presence of liquid that would indicate either internal or external leaks within the primary shell of the UST. The Veeder Root TLS-300C also provides secondary containment leak detection for the UST's sumps and the associated double-contained underground piping. The interior of the shed containing the fuel pumps is also visually monitored on a daily basis for the presence of fuel that may have leaked from the equipment.

If a fuel release is detected within the secondary containment piping or sumps in the UST system, the Veeder Root TLS-300C disables power to the turbine, sounds an alarm and illuminates a red flashing light. The warning light is mounted on the building exterior and is in direct view from the UST fill port, as well as inside the building so the test cell operators can be alerted.

3.6.4 Overfill Protection Devices

The Veeder Root TLS-300C monitoring system at Building 8545 will be triggered if the UST volume reaches 95 percent capacity, indicating a potential overflow situation. The electronic probes mounted in the tank will also activate an alarm when the tank reaches 90 percent capacity. This alarm provides enough time for the tanker truck driver to close the truck's shutoff feed valve before an overfill situation occurs.

3.6.5 Spill Scenarios

Possible spill scenarios from the UST at Building 8545 are as follows:

- Catastrophic failure of the primary UST shell; estimated volume is 20,000 gallons, but the leak is expected to remain within the secondary containment shell of the UST.
- Spills during loading of fuel into the UST from tanker trucks; estimated volume is less than 50 gallons.

3.6.6 Predicted Spill Direction and Site Drainage

Small spills occurring during loading of the USTs would pool on the concrete pavement until cleaned up with absorbent materials. Surface drainage around Building 8545 generally flows toward storm drains located on the west side of the building. The storm drains discharge through Outfall 12 into Rose Canyon. The storm drains on the east side of Building 8545 discharge through Outfalls 125 and 11.

3.7 BUILDING 9211 (AIRFIELD OPERATIONS)

Building 9211 is located at the end of Fleming Court and adjacent to the Flightline. The site provides logistical support to all U.S. Marine Corps airfield operations.

3.7.1 Storage Areas and Equipment

Building 9211 contains the following UST that is included in this UST/AST Management Plan:

- Tank No. 9211-2: One 5,000-gallon diesel UST (DEH UST Operating Permit Tank No. 29613) located south of the building near the Flightline.

Photographs of Building 9211 and the UST are provided on Figure 15. A drawing showing the general arrangement of the UST at Building 9211 is provided on Figure 16.

Tank No. 9211-2 supplies fuel to an emergency generator day tank located inside a mechanical room within Building 9211. Diesel fuel is transferred from the UST to the 100-gallon day tank under suction through underground double-walled supply and return pipelines. The diesel fuel is consumed by the emergency generator to provide power to the building in the event of an emergency. The connections between the day tank and emergency generator also consist of aboveground supply and return pipelines. Under this arrangement, a continuous recirculating system delivers diesel fuel to the generator with excess returned back to the day tank. This system allows for rapid response to generator loads that can cause changes in fuel flow rates from the day tank. Once the fuel level in the day tank drops to a specific level, an automatic valve is opened and additional fuel is transferred from the UST to fill the day tank.

The emergency generator system consists of an engine-driven generator, the fuel supply system, and switchgear that allows the generator to automatically operate and send electrical power to support building equipment in the event of an emergency. The generator is also connected to the on-site power distribution system.

The emergency generator at Building 9211 utilizes an ATS to start, operate, and shut down the generator. The automatic starting sequence begins with the detection of a power loss from the electric utility for a pre-determined time period. The time delay prevents premature operation of the generator during a brief outage. After the time period has passed, the ATS will begin a start sequence. The system will ensure proper flow of fuel to the engine from the UST. Once started, the engine will come up to full speed, and the ATS will begin the sequence of opening the grid power feed breaker to the generator feed. The building will then be operating on standby power from the generator. Once grid power has been restored, the ATS will disconnect the generator feed from the connected loads and initiate a cool down and shut down sequence. Finally, the ATS will issue an engine stop command and the engine fuel supply will automatically be shut off.

Figure 15: Building 9211 (Airfield Operations)

Tank No. 9211-2: One 5,000-gallon Diesel UST (DEH UST Operating Permit Tank No. 29613)

Location of UST south of Building 9211

Location of UST in Access Driveway

Veeder Root TLS-300C Alarm Panel

Interior Mechanical Room containing Day Tank and Emergency Generator

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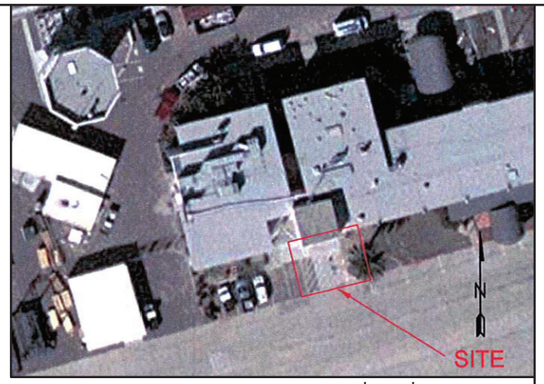
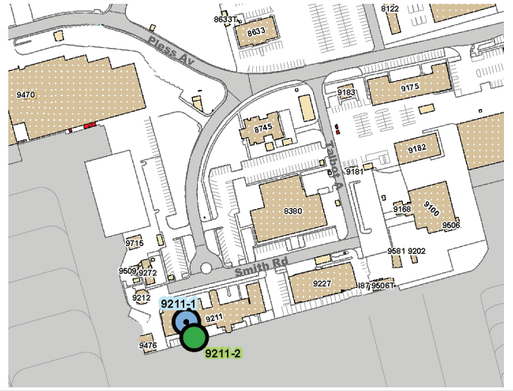
BUILDING 9211 INTERIOR





SITE LOCATION MAP
Not to Scale

VENT RISER (2" DIA)

EMERGENCY GENERATOR

VEEDER ROOT TLS 300C

AUDIBLE ALARM (LEAK-DETECTION SYSTEM)

VENT LINE

TANK 9211 -1

3" DIA PRODUCT SUPPLY LINE

PIPING SENSOR

PRODUCT RETURN LINE (3" DIA)

VENT

FILLPORT SUMP

SUMP SENSOR (OVERFILL ALARM)

FILLPORT

CONCRETE (EXTERIOR)

GRASS LAWN

ANNULAR LEAK DETECTION SENSOR

GRAPHIC SCALE
2 0 1 2 4 8
(IN FEET)
1/4 INCH = 1 FOOT

SCHEDULE OF UNDERGROUND STORAGE TANK SYSTEM

BUILDING No.	DEH PERMIT No.	TANK ID No.	INSTALLATION DATE	CONTENTS	CAPACITY (GALLONS)	TANK MATERIAL	TANK CONTAINMENT	TANK LEAK DETECTION SYSTEM
9211-2	180004	29613	9/24/1998	DIESEL	5,000	FRP	DOUBLE-WALLED	VEEDER ROOT TLS-300C WITH ATG

SYMBOL LEGEND:

- UNDERGROUND ELECTRICAL LINE
- UNDERGROUND VENT LINE ("VR" INDICATES VAPOR RETURN - GASOLINE SYSTEMS ONLY)
- UNDERGROUND PRODUCT SUPPLY PIPING (DW)
- UNDERGROUND PRODUCT RETURN LINE (DW)
- SUCTION SYSTEM PRODUCT SUPPLY/RETURN PORTS/SUMP, VENT RISER, AND SUMP SENSOR/PORT
- FILLPORT, SUMP AND SUMP SENSOR PORT
- VENT RISERS (2-INCH DIA TYPICAL)
- LEAK DETECTION SENSOR PORT
- AUDIBLE ALARM HORN; LEAK DETECTION SYSTEM (ORIENTATION MAY VARY)
- LEAK DETECTION SYSTEM CONTROLLER PANEL

ABBREVIATIONS:

ATC	AUTOMATIC TANK GAUGING
CONST	CONSTRUCTION
DIA	DIAMETER
DW	DOUBLE-WALLED
FRP	FIBERGLASS REINFORCED PLASTIC
TYP	TYPICAL
UST	UNDERGROUND STORAGE TANK

UST/AST
MANAGEMENT PLAN
FACILITY DIAGRAM

FIGURE 16
LOCATION OF UST
BUILDING 9211

DEPARTMENT OF THE U.S. NAVY
MARINE CORPS AIR STATION MIRAMAR
SAN DIEGO, CA 92145

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3.7.2 Containment Measures

Tank No. 9211-2 is a double-walled UST constructed of FRP. The internal tank shell is completely enclosed by a secondary tank shell that provides 100 percent secondary containment. FRP is compatible with diesel fuel storage. This material also prevents failure from both external and internal corrosion. Since an FRP-constructed tank does not rust, it is not susceptible to internal corrosion problems due to the potential retention of water within the tank.

The fueling system will automatically shut down in the event there is a leak that fills the sump. The UST fill port is also protected by a secondary containment sump constructed of FRP on the top of the tank.

Underground piping between the UST and the emergency generator is constructed of FRP pipe that is double-walled construction with an outer secondary pipe that is also constructed of FRP for containment and corrosion resistance. Once inside Building 9211, the supply and return pipelines are single-walled construction to the emergency generator. The fuel is transferred under suction to the day tank.

3.7.3 Monitoring System

The UST system at Building 9211 is equipped with a Veeder Root TLS-300C monitoring system. The Veeder Root TLS-300C is part of an ATG system that provides continuous monitoring of Tank No. 9221-2. The product level and temperature in the UST are continuously measured, analyzed, and recorded by the Veeder Root TLS-300C computer. In the "inventory mode," the ATG replaces the use of the gauge stick to measure product level and provides product inventory control. This mode records the changes in volume during operation of the UST, including fuel deliveries. In the "test mode," the product level and inventory probe performance are tested when no product is being added or dispensed from the UST. The ATG must be able to detect a leak no greater than 0.2 gallons per hour without the probability of a false alarm.

Tank No. 9211-2 is constructed with a dry interstitial space. An electronic sensor within the interstitial space detects the presence of liquid that would indicate either internal or external leaks within the primary shells of the UST. The Veeder Root TLS-300C also provides secondary containment leak detection for the UST's ATG and product fill sumps and the associated double-contained underground piping.

If a fuel release is detected within the secondary containment piping or sumps in the UST system, the Veeder Root TLS-300C sounds an alarm and illuminates a red flashing light. The warning light is mounted on the building exterior and is in direct view from the UST fill port.

3.7.4 Overfill Protection Devices

The Veeder Root TLS-300C monitoring system will be triggered if the UST volume reaches 95 percent capacity, indicating a potential overflow situation. The electronic probes mounted in the tank will also activate an alarm when the tank reaches 90 percent capacity. This alarm provides enough time for the tanker truck driver to close the truck's shutoff feed valve before an overfill situation occurs.

3.7.5 Spill Scenarios

Possible spill scenarios from the UST at Building 9211 are as follows:

- Catastrophic failure of the primary UST shell; estimated volume is 5,000 gallons, but the leak is expected to remain within the secondary containment shell of the UST.
- Spills during loading of fuel into the UST from tanker trucks; estimated volume is less than 50 gallons.

3.7.6 Predicted Spill Direction and Site Drainage

Small spills occurring during loading of the UST would pool on the concrete pavement until cleaned up with absorbent materials. General surface flow direction across the site is primarily to the south into the asphalt area of the Flightline.

3.8 BUILDING 9441 (STANDBY GENERATOR PLANT NO. 2)

Building 9441 is located near the southwest corner of Boyington Road and Schilt Avenue. A block wall building contains an emergency generator.

3.8.1 Storage Areas and Equipment

Building 9441 contains the following UST that is included in this UST/AST Management Plan:

- Tank No. 9441-2: One 600-gallon diesel UST (DEH UST Operating Permit Tank No. 29611) located south of the building adjacent to Boyington Avenue.

Photographs of Building 9441 and the UST are provided on Figure 17. A drawing showing the general arrangement of the UST at Building 9441 is provided on Figure 18.

Tank No. 9441-2 supplies fuel to an aboveground metered dispenser that is used to manually fill the emergency generator base tank inside Building 9441. Diesel fuel is transferred from the UST to the dispenser through an underground double-walled supply pipeline when the dispenser nozzle is activated. The diesel fuel is then dispensed manually into the emergency generator's 150-gallon base tank where it is then consumed by the emergency generator to provide power to the building in the event of an emergency.

3.8.2 Containment Measures

Tank No. 9441-2 is a double-walled UST constructed of FRP. The internal tank shell is completely enclosed by a secondary tank shell that provides 100 percent secondary containment. FRP is compatible with diesel fuel storage. This material also prevents failure from both external and internal corrosion. Since an FRP-constructed tank does not rust, it is not susceptible to internal corrosion problems due to the potential retention of water within the tank.

Figure 17: Building 9441 (Standby Generator Plant No. 2)

Tank No. 9441-2: One 600-gallon Diesel UST (DEH UST Operating Permit Tank No. 29611)

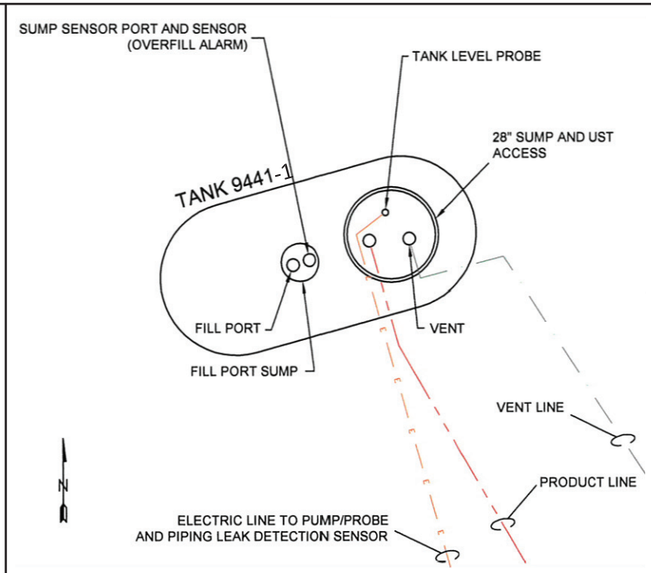
Building 9441 containing Emergency Generator

Location of UST south of Building 9441

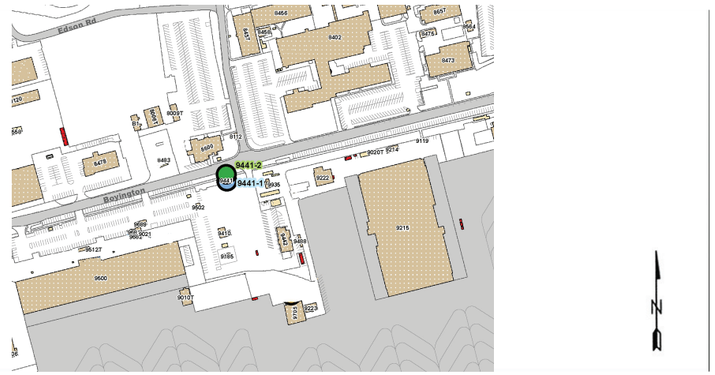
Veeder Root TLS-300C Alarm Panel inside Building

Exterior Building Alarm Light

AERIAL SITE PHOTOGRAPH
SCALE: 1:1200 (1 INCH = 100 FEET)



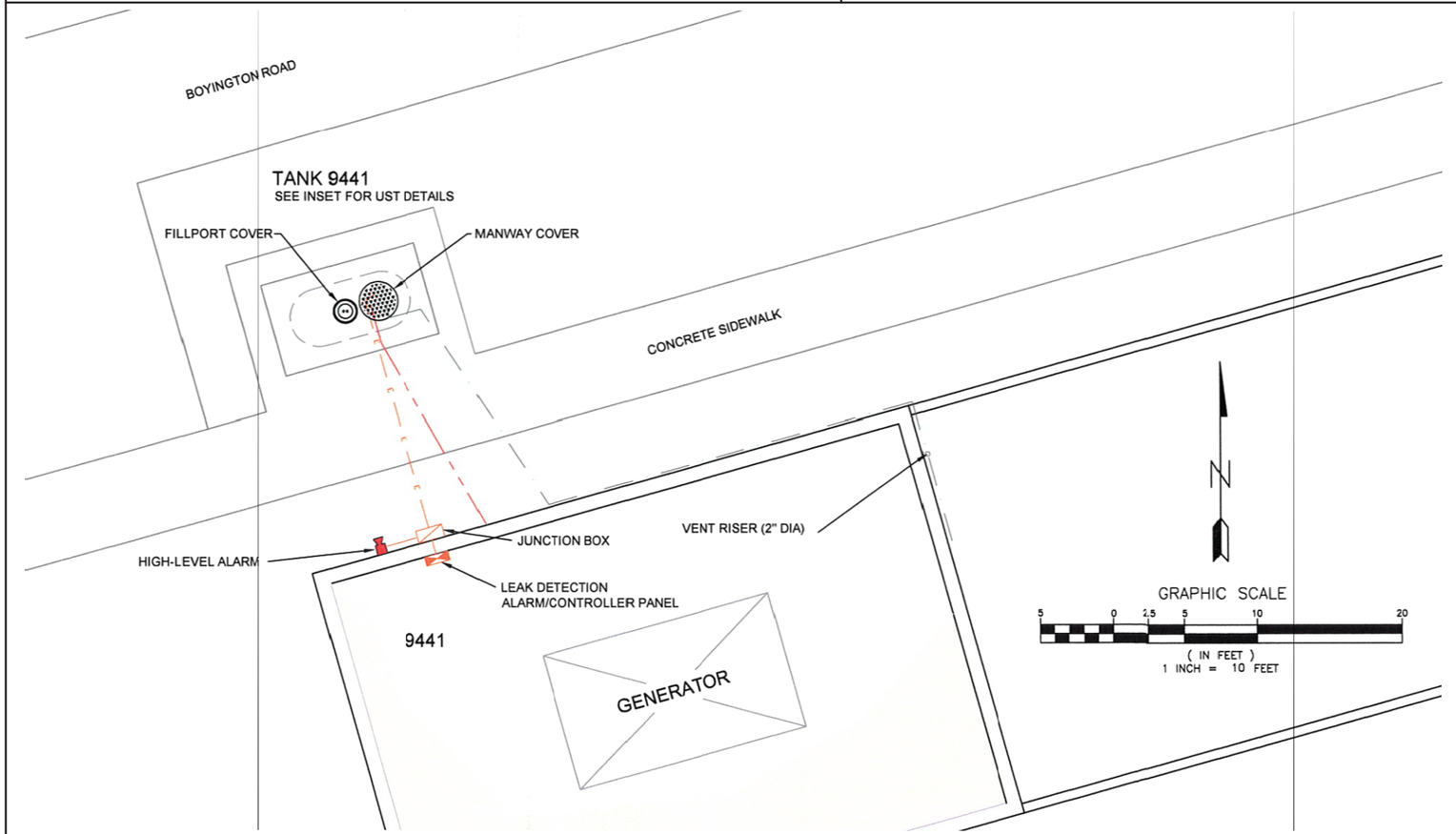
INSET DETAIL
SCALE: 1/4" = 1'-0"



SITE LOCATION MAP
Not to Scale

SCHEDULE OF UNDERGROUND STORAGE TANK SYSTEM

BUILDING No.	DEH PERMIT No.	TANK ID No.	INSTALLATION DATE	CONTENTS	CAPACITY (GALLONS)	TANK MATERIAL	TANK CONTAINMENT	TANK LEAK DETECTION SYSTEM
9441-2	180004	29611	8/3/1998	DIESEL	600	FRP	DOUBLE-WALLED	VEEDER ROOT TLS-300C WITH ATG



SYMBOL LEGEND:

BELOW GROUND:

- UNDERGROUND ELECTRICAL LINE
- UNDERGROUND VENT LINE
- UNDERGROUND PRODUCT PIPING (DW)
- VENT RISERS (2-INCH DIA TYPICAL)
- TURBINE PUMP/SUMP AND SUMP SENSOR/PORT
- FILLPORT AND VENT OR SENSOR PORT

ABOVE GROUND:

- AUDIBLE ALARM HORN; LEAK DETECTION SYSTEM (ORIENTATION MAY VARY)
- LEAK DETECTION SYSTEM CONTROLLER PANEL
- ELECTRICAL JUNCTION BOX
- UST ACCESS AND MANWAY COVER
- FILLPORT AND VENT COVER

ABBREVIATIONS:

ATC	AUTOMATIC TANK GAUGING
CONST	CONSTRUCTION
DIA	DIAMETER
DW	DOUBLE-WALLED
FRP	FIBERGLASS REINFORCED PLASTIC
TYP	TYPICAL
UST	UNDERGROUND STORAGE TANK

UST/AST
MANAGEMENT PLAN
FACILITY DIAGRAM

FIGURE 18
LOCATION OF UST
BUILDING 9441

DEPARTMENT OF THE U.S. NAVY
MARINE CORPS AIR STATION MIRAMAR
SAN DIEGO, CA 92145

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The turbine pump in the UST is located within a top secondary containment sump that is constructed of FRP. The fueling system will automatically shut down in the event there is a leak from the pump that fills the sump. The UST fill port is also protected by a secondary containment sump constructed of FRP on the top of the tank.

The underground piping between the UST and the dispenser is constructed of FRP pipe is double-walled construction with an outer secondary pipe that is also constructed of FRP for containment and corrosion resistance. Once the pipeline enters Building 9441, it is of single-walled construction routed to the manual dispenser mounted on the interior wall.

3.8.3 Monitoring System

The UST system at Building 9441 is equipped with a Veeder Root TLS-300C monitoring system. The Veeder Root TLS-300C is part of an ATG system that provides continuous monitoring of Tank No. 9441-2. The product level and temperature in the UST are continuously measured, analyzed, and recorded by the Veeder Root TLS-300C computer. In the "inventory mode," the ATG replaces the use of the gauge stick to measure product level and provides product inventory control. This mode records the changes in volume during operation of the UST, including fuel deliveries. In the "test mode," the product level and inventory probe performance are tested when no product is being added or dispensed from the UST. The ATG must be able to detect a leak no greater than 0.2 gallons per hour without the probability of a false alarm.

Tank No. 9441-2 is constructed with a dry interstitial space. An electronic sensor within the interstitial space detects the presence of a liquid that would indicate either internal or external leaks within the primary shell of the UST. The Veeder Root TLS-300C provides secondary containment leak detection for the UST's turbine pump and product fill sump utilizing electronic sensors. In addition, the Veeder-Root TLS-300C is connected to ELLDs installed in the turbine sump that will indicate a leak into the double-walled product piping.

If a fuel release is detected within the secondary containment piping or sumps in the UST system, the Veeder Root TLS-300C disables power to the turbine, sounds an alarm and illuminates a red flashing light. The warning light is mounted on the building exterior and is in direct view from the UST fill port.

3.8.4 Overfill Protection Devices

The Veeder Root TLS-300C monitoring system will be triggered if the UST volume reaches 95 percent capacity indicating a potential overflow situation. The electronic probes mounted in the tank will also activate an alarm when the tank reaches 90 percent capacity. This alarm provides enough time for the tanker truck driver to close the truck's shutoff feed valve before an overfill situation occurs.

3.8.5 Spill Scenarios

Possible spill scenarios from the UST at Building 9441 are as follows:

- Catastrophic failure of the primary UST shell; estimated volume is 600 gallons, but the leak is expected to remain within the secondary containment shell of the UST.

- Spills during loading of fuel into the UST from tanker trucks; estimated volume is less than 50 gallons.

3.8.6 Predicted Spill Direction and Site Drainage

Small spills occurring during loading of the UST would pool on the concrete pavement until cleaned up with absorbent materials. General surface flow direction is primarily from the north to south into the paved area of Boyington Road. There were no surface drains visible within the site.

3.9 BUILDING 2662 (MCX GAS STATION)

Building 2662 is located at 2662 Gonsalves Avenue, which is north of Hercules Road and south of the Commissary complex. This facility is also part of the MCX and provides fuel to non-military vehicles.

3.9.1 Storage Areas and Equipment

Building 2662 contains the following USTs that are included in this UST/AST Management Plan:

- Tank No. 2662-1: One 30,000-gallon regular gasoline UST (DEH UST Operating Permit Tank No. 388076) located southwest of the building.
- Tank No. 2662-2: One 30,000-gallon regular gasoline UST (DEH UST Operating Permit Tank No. 388073) located southwest of the building; and
- Tank No. 2662-3: One 30,000-gallon premium gasoline UST (DEH UST Operating Permit Tank No. 388077) located southwest of the building; and
- Tank No. 2662-4: One 15,000-gallon diesel fuel UST (DEH UST Operating Permit Tank No. 388070) located southwest of the building.

Photographs of Building 2662 and the USTs are provided on Figure 19. A drawing showing the general arrangement of the four USTs at Building 2662 is provided on Figure 20.

The MCX Gas Station provides fuel to non-military vehicles. The four USTs supply fuel to 12 pump islands within the site. Each pump island contains two dispensers. Each dispenser can individually dispense any of the three fuel products (i.e., diesel, regular, or premium grade gasoline). Each dispenser is capable of fueling one vehicle at a time, thus giving the station a total simultaneous fueling capacity of 24 vehicles at once.

The fuel systems at Building 2662 feature a pressurized double-contained underground piping system that is activated whenever demand is made by the dispensers. Each UST contains a turbine pump to supply the fuel into the pipelines. The UST turbines are activated whenever one or more of the dispensers are in use. Each dispenser provides fuel delivery from the appropriate UST, while metering the amount of product delivered to the vehicle. The fuel management system records and reports the amount of product dispensed to a central computerized accounting system at the site.

Figure 19: Building 2662 (MCX Gas Station)

Tank No. 2662-1: One 30,000-gallon Regular Gasoline UST
(DEH UST Operating Permit Tank No. 388076)
Tank No. 2662-2: One 30,000-gallon Regular Gasoline UST
(DEH UST Operating Permit Tank No. 388073)
Tank No. 2662-3: One 30,000-gallon Premium Gasoline UST
(DEH UST Operating Permit Tank No. 388077)
Tank No. 2662-4: One 15,000-gallon Diesel Fuel UST
(DEH UST Operating Permit Tank No. 388070)

Bldg 2662 MCX Gas Station

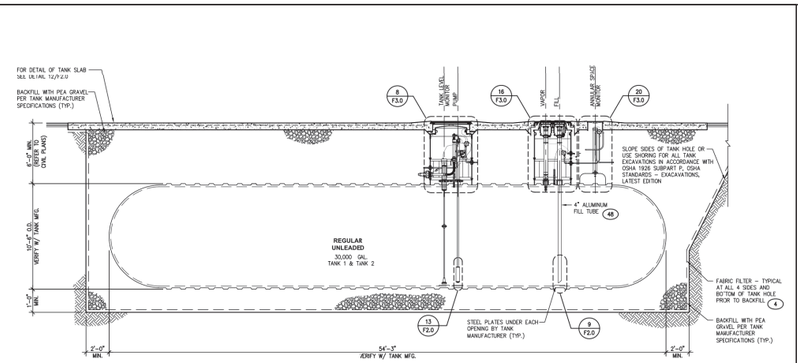
Location of USTs southeast of Building 2662

Incon TS-5000 Alarm Panels inside Building

Tank Overfill Alarm next to UST Vents

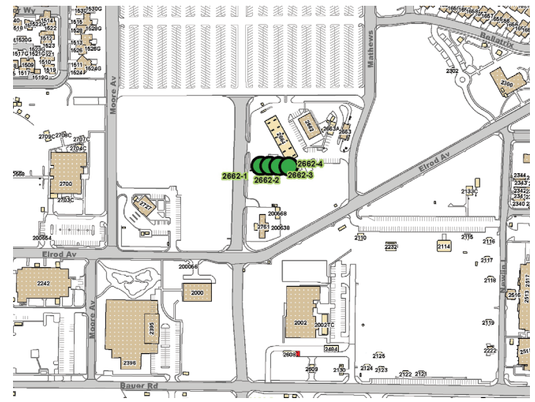
AERIAL SITE PHOTOGRAPH

APPROX. SCALE: 1:1200 (1 INCH = 100 FEET)



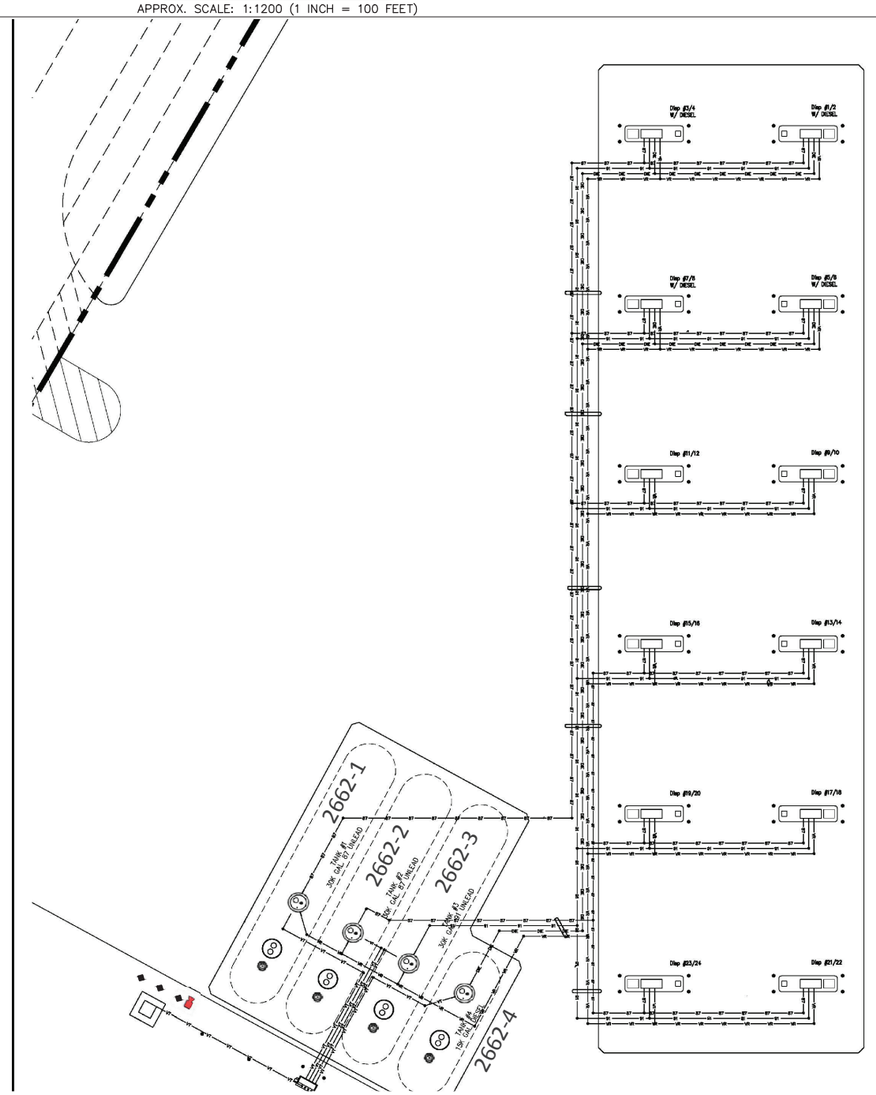
UST DETAIL

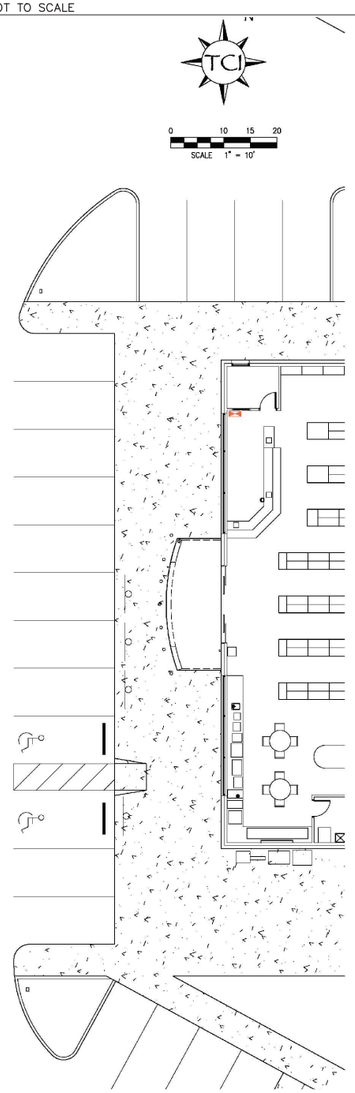
NOT TO SCALE



SITE LOCATION MAP

Not to Scale





SCHEDULE OF UNDERGROUND STORAGE TANK SYSTEM

BUILDING No.	DEH PERMIT No.	TANK ID No.	INSTALLATION DATE	CONTENTS	CAPACITY (GALLONS)	TANK MATERIAL	TANK CONTAINMENT	TANK LEAK DETECTION SYSTEM
2662–4	215491	388070	5/17/2012	DIESEL	15,000	FRP	DOUBLE–WALLED	INCON TS–500 WITH ATG
2662–1		388073	5/17/2012	GASOLINE	30,000	FRP	DOUBLE–WALLED	
2662–2		388076	5/17/2012	GASOLINE	30,000	FRP	DOUBLE–WALLED	
2662–3		388077	5/17/2012	GASOLINE	30,000	FRP	DOUBLE–WALLED	

SYMBOL LEGEND:

BELOW GROUND:

- UNDERGROUND ELECTRICAL LINE
- UNDERGROUND VENT LINE
- UNDERGROUND PRODUCT PIPING
- VENT RISERS (2-INCH DIA TYPICAL)
- TURBINE PUMP/SUMP AND SUMP SENSOR/PORT
- FILLPORT AND VENT OR SENSOR PORT

ABOVE GROUND:

- AUDIBLE ALARM HORN; LEAK DETECTION SYSTEM (ORIENTATION MAY VARY)
- LEAK DETECTION SYSTEM CONTROLLER PANEL
- FILLPORT AND VENT COVER

ABBREVIATIONS:

ATG	AUTOMATIC TANK GAUGING
CONST	CONSTRUCTION
DIA	DIAMETER
DW	DOUBLE-WALLED
FRP	FIBERGLASS REINFORCED PLASTIC
TYP	TYPICAL
UST	UNDERGROUND STORAGE TANK

UST/AST
MANAGEMENT PLAN
FACILITY DIAGRAM

FIGURE 20
LOCATION OF UST
BUILDING 2662

DEPARTMENT OF THE U.S. NAVY
MARINE CORPS AIR STATION MIRAMAR
SAN DIEGO, CA 92145

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3.9.2 Containment Measures

Each UST is a double-walled storage tank constructed of FRP by Containment Solutions. The internal tank shell is completely enclosed by a secondary tank shell that provides 100 percent secondary containment. FRP is compatible with gasoline storage. This material also prevents failure from both external and internal corrosion. Since FRP-constructed tanks do not rust, they are not susceptible to internal corrosion problems due to the potential retention of water within each tank.

The turbine, electrical connections, fuel delivery piping, and fill port in each UST are accessible within two liquid-tight containment sumps located on top of the tank that are constructed of FRP. Each sump is filled with a propylene glycol solution. Each sump is also equipped with an electronic float sensor that measures any changes in the fluid level that would indicate either an internal or external leak within the sump of each UST. This probe will automatically shut down the electrical power to the turbine in the event a leak is detected within the sump.

Underground piping between the USTs and the dispensers is constructed of FRP pipe that is double-walled construction with an outer secondary pipe that is also constructed of FRP for containment and corrosion resistance. The annular space of each underground transfer pipeline from the USTs to the dispensers contains an electronic sensor which will detect a liquid fuel leak, sound the alarm, and shut down operation of the UST turbine pumps.

A UDC system is also located beneath each fuel dispenser housing. The underground fuel product lines from each UST are connected to the dispensers from the side of the UDCs. Each UDC pan is of double-wall construction where the interstitial space contains a brine solution. In the event the brine solution leaks outside the pan and dispenser, an electronic float sensor would detect the change in fluid level and sound an alarm. The interior of the UDC pan contains the product shear valves and piping. If a leak occurs, fuel would accumulate in the UDC containment basin and an additional electronic level sensor would sound an alarm, and automatically shut down the pump to stop the flow of product at the dispenser.

Gasoline vapors generated during fuel delivery are scavenged by means of a vacuum system that returns the vapors to the USTs through a separate underground pipeline network.

3.9.3 Monitoring System

The UST system at Building 2662 is equipped with an Incon TS-500 monitoring system. The Incon TS-5000 is part of an ATG system that provides continuous monitoring of each UST. The product level and temperature in each UST are measured continuously, and automatically analyzed and recorded by the Incon TS-5000 computer. The ATG records the volume change activities of each in-service UST, including fuel deliveries. The ATG must be able to detect a leak no larger than 0.2 gallons per hour without the probability of a false alarm.

The USTs are constructed with an enhanced leak detection system. The interstitial space of each UST and the UDC are filled with a saline water solution. In addition, the product fill and turbine pump sumps of each UST are also filled with a propylene glycol solution. Electronic sensors within the interstitial space and sumps of each UST measure any changes in the fluid level that would indicate either an internal or external leak within the primary shell or sumps of each UST.

If a fuel release is detected within the secondary containment piping, UDCs, or sumps in the UST system, the Incon TS-5000 disables power to the turbine that stops the dispensing of fuel, sounds an alarm and illuminates a red flashing light. The warning light is mounted on the side of the building and is in direct view from each of the UST fill ports.

The fuel dispensers provide data on the amount of fuel dispensed to the vehicles to the Incon TS-5000 system. The UST operator can use the Incon TS-5000 system to reconcile the actual UST fuel volumes to the dispensed volumes by printing out the inventories and comparing the numerical values.

3.9.4 Overfill Protection Devices

The Incon TS-5000 monitoring system at Building 2662 will be triggered if the UST volume reaches 95 percent capacity, indicating a potential overflow situation. The electronic probes mounted in each tank will also activate an alarm when the tank reaches 90 percent capacity. This alarm provides enough time for the tanker truck driver to close the truck's shutoff feed valve before an overfill situation occurs.

Additional safety features in the fuel dispensing system include automatic shutoff nozzles to prevent overfilling of vehicles, anti-spark generating components, and grounding features in the delivery hoses and nozzles for fire prevention. The dispensers also have break-away couplings between the dispenser unit and the delivery nozzle to prevent spills from vehicles leaving the area with the nozzles still inserted in the vehicle tank. A manual emergency shutoff switch is also located on the exterior wall of the building in the event of a failure of the safety systems or an emergency situation.

3.9.5 Spill Scenarios

Possible spill scenarios from the USTs at Building 2662 are as follows:

- Catastrophic failure of the primary UST shell; estimated maximum volume is 30,000 gallons, but the leak is expected to remain within the secondary containment shell of the UST.
- Spills during loading of fuel into the USTs from tanker trucks; estimated volume is less than 50 gallons.
- Spills during fuel dispensing during vehicle fueling operations; estimated volume is less than 2 gallons.
- Leaks within the fuel dispensers; estimated volume is less than 2 gallons based on actuation of the shear valve located within the UDC sump.

3.9.6 Predicted Spill Direction and Site Drainage

Small spills occurring during loading of the USTs would pool on the concrete pavement until cleaned up with absorbent materials. General surface flow direction is primarily from north to southwest into Gonsolves Avenue.

4.0 UNDERGROUND STORAGE TANK REGULATORY OVERVIEW

This section presents a summary of the federal, state, and local regulations for the installation, operation, monitoring, and closure of USTs at MCAS Miramar.

4.1 INTRODUCTION

The U.S. Environmental Protection Agency (EPA) administers the UST Program through its Office of Underground Storage Tanks (OUST), which was created in 1985 to mandate and regulate UST activities nationally. OUST has the responsibility of overseeing the Resource Conservation and Recovery Act (RCRA), Subtitle I Program regarding USTs. OUST provides technical and administrative support to the EPA's regional, state, and territorial regulatory programs.

RCRA was developed to give the EPA the authority to control hazardous waste from cradle-to-grave. RCRA also set forth the framework for the management of non-hazardous wastes (i.e., petroleum products). Subtitle I was added to RCRA through the 1984 Hazardous and Solid Waste Amendments to provide federal funds for assessments and cleanups to address petroleum releases from UST systems. On 23 September 1988, the EPA published final regulations setting the minimum technical standards for new and existing USTs and outlining the corrective action needed to be taken in the event of a UST release (40 CFR Part 280). Additionally, the EPA published final regulations that allow the EPA to delegate enforcement authority to state agencies by setting standards for the EPA approval of individual state UST programs (40 CFR Part 281). These regulations became effective on 22 December 1988.

California currently does not have an approved federal UST program. However, California has developed UST legislation under the California Code of Regulations (CCR) and the California Health and Safety Code (HSC) that parallels and, in some cases, is more stringent than the federal UST standards. Budgetary constraints have led the EPA to allow states to assume primary responsibility for administration and enforcement of their UST programs before receiving formal delegation of authority.

4.2 APPLICABLE UST REGULATIONS AND POLICY

The USTs at MCAS Miramar are regulated by several policies including the following:

- U. S. Marine Corps Environmental Compliance and Protection Manual (MCO P5090.2A Sections 18200-18204);
- Federal UST regulations (40 CFR Parts 280 and 281);
- State UST regulations (HSC Division 20, Chapter 6.7, Sections 25280 – 25299.80 and CCR Title 23, Division 3, Chapter 16); and
- Local UST regulations (San Diego County Code [SDCC], Title 6, Division 8, Chapter 10, Sections 68.1001-68.1011; and San Diego Air Pollution Control District [SDAPCD], Rule 61.0-61.8).

4.2.1 U.S. Marine Corps Order

The U.S. Marine Corps Environmental Compliance and Protection Manual (i.e., MCO P5090.2A) provides information and guidance applicable to regulations on USTs containing petroleum products and hazardous substances at Marine Corps installations within the United States and its territories and possessions. The document outlines the requirements of UST compliance, inventory, management, and closure documentation. Marine Corps policy requires compliance with all federal, state, and local UST requirements.

Section 18201 of MCO P5090.2A requires the development of adequate baseline data regarding an installation's UST population. A description of the current USTs in operation at MCAS Miramar is provided in Table 1. Section 18202 requires compliance with UST regulations necessary to reduce environmental liability and to utilize UST systems as efficiently as possible. A consolidation and reduction plan of the existing UST systems at MCAS Miramar to meet storage needs while minimizing environmental risk is provided in Section 7.3 of this Plan. Section 18204 of MCO P5090.2A requires compliance with UST closure documentation which is further described in Section 7.2.3 of this Plan.

4.2.2 Federal UST Regulations

40 CFR Part 280 sets forth the technical requirements enforced under the UST program established by the EPA and adopted by the state of California. These technical requirements govern the UST design; operation and installation; release detection; release reporting investigation and confirmation; corrective action; closure; and financial responsibility. Part 280 also states that UST systems must meet requirements for automatic leak detection, corrosion protection, overfill protection, and spill control. UST systems not in compliance with these requirements by 22 December 1998 were to be properly closed. 40 CFR Part 281 concerns the delegation of UST enforcement authority to the state agencies.

The EPA issued new UST regulations on 15 July 2015, which is the first major revision to the federal UST regulations since 1988. The revisions strengthen the 1988 federal UST regulations by increasing emphasis on properly operating and maintaining UST equipment. The new federal UST regulations were effective 13 October 2015. Compliance deadlines depend on the specific requirement and ranged from 13 October 2015 to 13 October 2018.

The new federal UST regulations changed certain portions of the 1988 UST technical regulation in 40 CFR Part 280. EPA added new operation and maintenance requirements and addressed UST systems deferred in the 1988 UST regulation. The changes can be summarized as follows:

- *Added secondary containment requirements for new and replaced tanks and piping.* Beginning on April 11, 2016, owners and operators must install secondarily contained tanks and piping when installing or replacing tanks and piping, and must install UDC systems for all new dispenser systems.

- *Added operator training requirements.* EPA established minimum training requirements for designated Class A, Class B, and Class C operators. In California, Class A and B are referred to as the designated UST operator or DUSTO, and Class C is referred to as the facility employee. Operators must be trained by 13 October 2018.

- *Added periodic operation and maintenance requirements for UST systems.* Beginning on 13 October 2018, owners and operators must:

    - Conduct walkthrough inspections at their UST facility,

    - Have their overfill prevention equipment inspected for proper operation at least once every three years,

    - Meet requirements for spill containment equipment and for containment sumps used for piping interstitial monitoring, and

    - Test electronic and mechanical components of their release detection equipment for proper operation at least annually.

- *Added requirements to ensure UST system compatibility before storing certain biofuel blends.* The regulation requires additional notification, demonstration, and record keeping actions for owners that store biofuels.

- *Removed past deferrals for emergency generator tanks, field constructed tanks, and airport hydrant systems.*

    - Owners and operators of emergency power generator UST systems must meet the release detection requirements in subpart D by 13 October 2018.

    - UST systems with field-constructed tanks and airport hydrant fuel distribution systems that meet the UST definition are now regulated under subpart K of the UST regulation.

- *Updated codes of practice; and*

- *Made editorial and technical corrections.*

4.2.3 State UST Regulations

HSC Division 20, Chapter 6.7, Sections 25280 – 25299.80 pertains to all aspects of USTs operated within the state of California. California CCRs are developed based on the HSC, and the UST regulations were codified under CCR Title 23, Division 3, Chapter 16. Section 25281 defines an underground storage tank as "… any one or combination of tanks, including pipes connected thereto, that is used for the storage of hazardous substances and that is substantially or totally beneath the surface of the ground." Note that there is no specific volume exemption in California for a UST.

The regulations apply to underground storage of hazardous substances and petroleum products in tanks, including tanks and piping systems that are substantially or totally beneath the ground. The California UST regulations and requirements closely parallel the federal requirements and, in some cases, are more stringent. The UST upgrade compliance date under state regulations was also identical to federal regulations as of 22 December 1998.

In California, the state UST laws are overseen by the State Water Resources Control Board (SWRCB), which promulgates statewide UST regulations, and by the individual RWQCBs.

However, actual implementation is delegated to the local CUPA. In practice, state-mandated revisions to UST requirements, both statutory and regulatory, are incorporated into local programs through amendments to county and city ordinances.

UST owners and operators are responsible for cleanup of contamination from leaking USTs, following "corrective action" procedures and standards adopted by SWRCB and the applicable RWQCB or local UST agency. Additionally, UST owners are required to file an Unauthorized Release form with the local CUPA, and provide a description and schedule of corrective and remedial actions.

After the publication of EPA's 2015 UST regulations, the revised federal requirements became more stringent than the California's UST requirements. On 20 August 2015, SWRCB notified California UST owners and operators they must comply with the new federal UST regulations, in addition to California UST statues and regulations. SWRCB has prepared a detailed compilation of new federal UST requirements that must be met in addition to state UST regulations. A copy of this table is presented as Appendix B. SWRCB is in the process of updating the state UST regulations in CCR Title 23, Division 3, Chapter 16 to bring them in compliance with the revised federal UST regulations.

4.2.4 Local UST Regulations

UST regulations issued by San Diego County include a majority of the state UST requirements under CCR Title 23, Division 3, Chapter 16. San Diego County requirements that differ from, or are in addition to, the state regulations concerning UST permitting include SDCC 68.1003, Operating Permit Element Required; and SDCC 68.1004, Installation, Repair or Closure Permit/Extension.

Regulations controlling gasoline vapor emissions from gasoline marketing operations, such as automobile service station facilities, are regulated by the California Air Resources Board (CARB). Controls for gasoline dispensing facilities are divided into two phases. Phase I regulates the emissions from gasoline transfer from cargo tanks to dispensing facility storage tanks, and Phase II regulates the emissions from gasoline transfer from the dispensing facility storage tank to the motor vehicle.

Under Rules and Regulations of SDAPCD, Rule 61.3.1 and 61.4.1, the SDAPCD regulates the transfer of gasoline from mobile transfer tanks (i.e., tanker trucks) to stationary USTs or from a stationary UST to vehicle fuel tanks. Requirements for stationary USTs receiving gasoline include a Phase I or II vapor recovery system to capture fuel vapors during transferring of fuel. The storage tanks subject to Phase I recovery system requirements include all USTs with a capacity greater than 250 gallons for any stations, and USTs with a capacity greater than 550 gallons for non-retail facilities. The rule does not apply to the dispensing of E-85 (ethanol) from any stationary storage tank into a Flexible Fuel Vehicle fuel tank at any retail or non-retail service station.

Phase II Enhanced Vapor Recovery (EVR) regulations provide additional emission reductions for gasoline dispensing facilities with USTs. Phase II EVR systems are certified to several new standards, including Onboard Refueling Vapor Recovery compatibility, more stringent spillage and "dripless nozzle" requirements, in-station diagnostics and storage tank pressure limits. All

gasoline dispensing facilities with USTs should have been upgraded to Phase II EVR by 1 April 2009.

4.3 UST SYSTEM COMPLIANCE TABLES

The state UST regulations in CCR Title 23, Division 3, Chapter 16 have been summarized in a series of compliance tables prepared by the SWRCB. The compliance tables were developed to eliminate confusion and aid in understanding the requirements of each UST regulation. For the USTs in operation at MCAS Miramar, the following SWRCB tables are applicable and have been included in Appendix A:

- Table A-1: Tank owner's options to install new piping that is storing a hazardous substance including motor vehicle fuels and installed after 1 July 1987;
- Table A-2: Underground Storage Tank Spill Container Requirements;
- Table A-3: Underground Storage Tank Overfill Prevention Design Criteria and Exemptions;
- Table A-4: Monitoring Methods for Underground Storage Tanks With Secondary Containment; and
- Table A-5: Monitoring Methods for Piping with Secondary Containment Associated With Underground Storage Tanks.

4.4 ADDITIONAL STATE UST LEGISLATION

Additional bills that have been passed in the California state government that pertain to UST management include Senate Bill (SB) 989, Assembly Bills (ABs) 2481 and 1702, SB 445, and AB 2286.

4.4.1 Senate Bill 989

SB 989 became effective on 1 January 2000 and was enacted because of the growing concern about releases of oxygenate methyl tertiary butyl ether (MTBE) in dispensed gasoline. New regulations were subsequently adopted by the SWRCB to comply with SB 989. SB 989 required that all secondary containment systems installed before 1 January 2001 must be tested before 1 January 2003 and every 36 months thereafter. Systems installed after 1 January 2001 must have been tested upon installation, 6 months after installation, and every 36 months thereafter. Secondary containment systems that, by virtue of their design, cannot be tested must have been replaced by 31 December 2002.

The UST testing requirements include:

- All interstitial spaces on USTs must be pressure tested;
- Containment sumps on USTs must be tested;
- Secondary containment piping must be pressure tested;
- UDC systems must be tested;
- Monitoring systems must be tested and annually certified; and

- Monitoring systems must have a positive shut down mode if a leak is detected.

Table A-6 in Appendix A presents the SB 989 requirements as they pertain to the management of UST systems containing gasoline.

4.4.2 Assembly Bills 1702 and 2481

ABs 1702 and 2481 established more stringent requirements for UST systems installed on or after 1 July 2003. The law requires that all new USTs be double-contained and that both primary and secondary containment must be "product tight" (i.e., impervious to the liquid and vapor phases of the substance reported). In addition, AB 1702 and 2481 included the following requirements:

- Water intrusion must be prevented.
- Secondary containment must meet specified volumetric requirements.
- The UST must have a continuous leak monitoring system.
- Pressurized piping must be equipped with leak detection.
- The UST must be tested using enhanced leak detection (inert gas pressure test) or an equivalent test method before it is placed into use.
- UST spill containment structures are to be tested annually.
- Licensed tank testers are required to prepare a report on each UST or piping integrity test they perform and to sign the report under penalty of perjury.
- Owners of USTs within 1,000 feet of drinking water wells take action to fix the problem when enhanced testing shows tank leakage.
- Exempts unburied fuel piping connected to an emergency generator tank from regulation as part of an UST system if the piping is inspected each time the tank is operated, but not less than monthly, and a log of inspection results is maintained. In addition, secondary containment for emergency tank systems may be tested using enhanced leak detection. If the tank is located within a structure that provides secondary containment, periodic secondary containment testing is not required if the tank is visually inspected at least monthly.
- Provides local agencies with the authority to affix, "red tags," to the fill pipes of a UST system discovered to have significant violations. Once a red tag is affixed to a tank, fuel delivery to that UST is prohibited and violation of the red tag requirement subjects the owner to a penalty of $5,000 per day.

Table A-7 in Appendix A presents the UST Leak Prevention and Enforcement Provisions established under AB 1702 and 2481.

4.4.3 Senate Bill 445

SB 445 requires the permanent closure of all single-walled USTs in California by December 31, 2025. This also includes single-walled product piping. The SB 445 was signed on 25 September 2014, and is included in HSC, chapter 6.7, section 25292.05. All the USTs and associated piping at MCAS Miramar are of double-walled construction.

4.4.4 Assembly Bill 2286

A recent amendment to the State regulations requires the submittal of specific UST information and documentation through the California Environmental Reporting System (CERS). The CERS is the statewide web-based system that supports the electronic exchange of required environmental information among businesses, local governments and the U.S. EPA. Effective January 1, 2009, Assembly Bill 2286 requires all regulated businesses and all CUPAs to electronically report and submit mandatory information through CERS or a local CUPA reporting portal. CERS is accessible through the following webpage: https://cers.calepa.ca.gov/

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5.0 UST OPERATION AND MAINTENANCE

Operation and maintenance (O&M) of a UST is essential to protecting the environment from an unauthorized release of a petroleum product or hazardous substance. Federal and state regulations require that certain procedures be established to provide early detection and correction of a UST system failure. The following sections present the requirements for O&M of a UST system with regard to monitoring, leak detection, fuel filling, record keeping, and preventative maintenance.

The UST data formerly collected on DEH Forms HM-9715, HM-9716, HM-9717, and HM-9222-A are now required to be entered as data elements on CERS. The following is a list of DEH UST forms and their submittal format:

Complete in CERS in the Underground Storage Tanks section:

- Operating Permit Application - Facility Information (formerly Form HM-9715)
- Operating Permit Application -Tank Page (formerly Form HM-9717)
- UST Monitoring System Plan (formerly Form HM-9222-A)
- UST Certification of Installation/Modification (formerly Form HM-9716)

Complete form and upload in CERS in the Underground Storage Tanks section:

- UST Monitoring System Emergency Response Plan HM-9222B
- UST Monitoring System Plot (Site) Plan HM-9222C
- Certification of Financial Responsibility
- Sample Letter from the Chief Financial Officer
- Designation of UST Operator & Owner Statement

Complete form and send to DEH (mail, email or fax):

- Spill Bucket Testing Report Form HM-9010
- Tank Integrity Test Report HM-965
- UST Claim of Exemption Form HM-978
- Temporary Closure of UST - Procedures & Application HM-9119
- Unauthorized Release Forms and Instructions (UST Leak Reporting Form)
- UST Monitoring System Certification HM-9301
- UST Secondary Containment Testing Certification HM-9169
- Affirmative Statement of UST Compatibility HM-9325
- UST Leak Detection Functionality HM-9326

Complete form and keep onsite for inspection review:

- Designated Operator Training Description and Documentation HM-9177
- Designated UST Operator Monthly Visual Inspection Checklist HM-9175

5.1 UST CORROSION PROTECTION

If unprotected, USTs, piping, and other associated appurtenances constructed of steel can corrode in the ground and cause leakage of product into the environment. New USTs are often made of a non-corrodible material such as FRP to minimize corrosion. Steel USTs were required to be upgraded no later than 22 December 1998. The USTs were either to be replaced with a non-corrodible constructed tank, or include an internal and external lining as shown on Figure 21, or installed with a corrosion protection system, such as the impressed current cathodic protection system or sacrificial anodes as shown on Figure 22.

Impressed current cathodic protection systems use electrical rectifiers and anodes to send current to the UST that is more powerful than the corrosive current that would normally flow away from the tank, thus preventing corrosion when operating properly. The other common type of cathodic protection system consists of sacrificial anodes, which are metal bars that are more corrosive and electrically active than steel, thus drawing the corrosive current away from the steel tank. The design standards for corrosion protection systems are per the National Association of Corrosion Engineers (NACE) SP 0169 and RP 0285.

5.2 UST RELEASE DETECTION METHODS

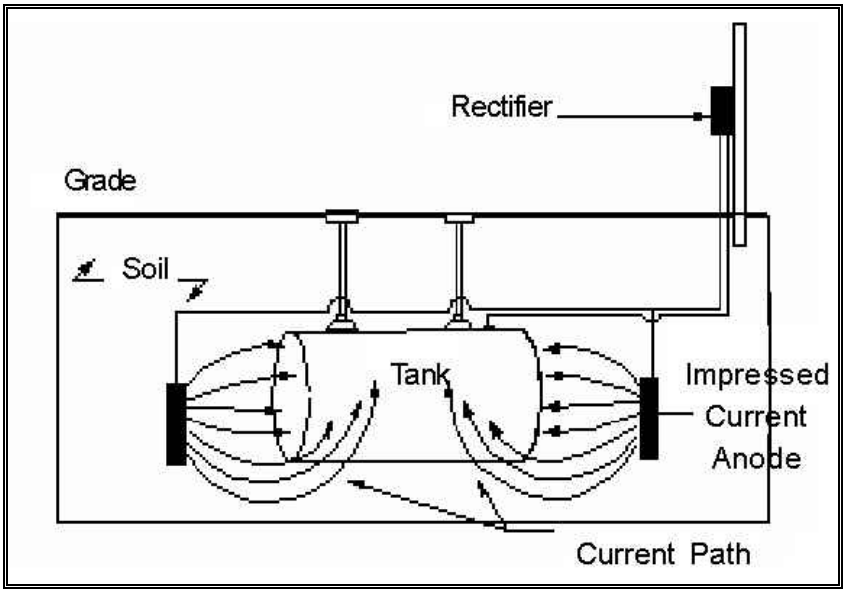
Several methods of release detection are referenced in 40 CFR 280.43 for USTs, including inventory control, manual tank gauging, automatic tank gauging, tank tightness testing, groundwater monitoring, and vapor monitoring. Additional detail on each of these methods is provided in the following subsections.

5.2.1 Inventory Control

Product inventory control involves performing a volumetric mass balance of existing tank product levels, which also accounts for deliveries and withdrawals, to determine if there are any product losses attributable to leaks. An inventory control method is required to be able to detect a leak of at least 1 percent of the flow-through volume plus 130 gallons on a monthly basis. The equipment used is required to be capable of measuring the level of product over the full range of the tank to the nearest one-eighth of an inch. Any water level in the tank is required to be measured to the nearest one-eighth of an inch every month.

Source: USEPA, Operating and Maintaining Underground Storage Tanks, November 2007

Figure 21: Application of an Internal Lining Within a UST



Source: USEPA, Operating and Maintaining Underground Storage Tanks, November 2007

Figure 22: Schematic of Impressed Current Cathodic Protection System for a UST

5.2.2 Manual Tank Gauging

In manual tank gauging, liquid measurements are taken at the start and end of a 36-hour period during which time no product is added to or taken out of the tank. Product levels are based on two consecutive dipstick measurements at both the beginning and the end of the period. If the variation between the initial and final measurements exceeds certain limits based on sampling frequency and tank size, then a release is suspected and reporting is required.

Only tanks less than or equal to 550 gallons in capacity are allowed to use manual tank gauging as the sole method of release detection. Tanks with a capacity from 551 to 2,000 gallons may use this method in place of manual inventory control. Tanks of nominal capacity greater than 2,000 gallons may not use this method for release detection.

5.2.3 Automatic Tank Gauging

ATG uses an automatic process to monitor product volume and usage. ATG systems can be used for release detection as long as the gauging equipment meets the minimum performance standards of detecting a 0.2 gph leak rate from any portion of the tank that routinely contains product and inventory control is conducted. The Veeder Root and Incon monitoring systems are part of an ATG system that provides continuous monitoring of the USTs at MCAS Miramar.

5.2.4 Tank Tightness Testing

A variety of approved tank tightness testing methods can be used to determine if a tank has a defect that is causing a leak. Most utilize extremely accurate volumetric measurements over a period of several hours, tracer chemicals, or acoustics to test the tank. Tank tightness testing methods are required to be capable of detecting a 0.1 gph leak rate from any portion of the tank that routinely contains product.

5.2.5 Interstitial Monitoring

Interstitial monitoring systems are designed to detect leaks in the interstice (i.e., space) between a primary product storage tank and the barrier providing secondary containment. Such secondary barrier configurations include double-walled or jackets tanks, internally fitted liners (i.e., bladders), or leak-proof excavation liners. Monitoring of the interstitial space between a UST and a secondary barrier may be used if the equipment is capable of detecting a leak from any portion of the tank that routinely contains product. For double-walled constructed UST systems, the sampling or testing method must be able to detect a release in any portion of the inner wall. For UST systems with a secondary barrier, the sampling method must be capable of detecting a release between the UST and the secondary barrier. Tanks with an internally fitted liner must contain an automated device that can detect a release between the inner wall of the tank and the liner. All USTs at MCAS Miramar have interstitial monitoring.

5.2.6 Groundwater Monitoring

A groundwater monitoring system consists of groundwater wells installed around the UST in strategic locations and the use of either continuous or periodic monitoring/sampling to detect floating product in the wells. Groundwater monitoring is generally acceptable if all of the following conditions are met:

- The regulated substance stored is immiscible in water and has a specific gravity of less than one;
- Groundwater is not more than 20 feet below the ground surface;
- The hydraulic conductivity of the soil between the UST system and the monitoring wells or devices is not less than 0.01 centimeters per second; and
- The monitoring devices are capable of detecting at least one-eighth of an inch of free product in the monitoring wells.

The EPA's 2015 federal UST regulations require a site assessment on record to ensure the above conditions are met (40 CFR 280.45[a]). Any site assessment conducted after October 2015 must be signed by a licensed professional.

5.2.7 Vapor Monitoring

Vapor monitoring methods are designed to detect leaks around USTs by monitoring vapors in the nearby soils. Leakage of petroleum products produces vapors in the soil that can be detected under specific conditions. Vapor monitoring is generally acceptable if all of the following conditions are met:

- The backfill materials are sufficiently porous;
- The stored regulated substance is sufficiently volatile to result in vapor levels detectable by the equipment in use;
- The presence of groundwater, soil moisture, or other environmental conditions does not interfere with the measurement of vapors; and
- The system is designed to easily detect vapor concentrations above background levels of the regulated substance.

The EPA's 2015 federal UST regulations require a site assessment on record to ensure the above conditions are met (40 CFR 280.45[a]). Any site assessment conducted after October 2015 must also be signed by a licensed professional.

5.2.8 Additional UST Leak Indicators

Additional indicators of a leak in a UST that may lead to a loss in product include the following:

- Presence of water in the fuel tank may indicate groundwater entering the tank;
- An unaccounted large single day variance or monthly fuel reconciliation variance greater than 1 percent of throughput greater than 130 gallons;

- Gasoline or fuel odor or visual signs of fuel in the soil near a UST;
- Motor fuel or fuel odor in adjoining underground structures such as basements or sewers;
- Clumps of dying or sickly plants on the property near the UST; or
- Actuation of UST leak detection system alarms.

5.3 UST PIPING CONTAINMENT AND LEAK DETECTION

Pressurized underground piping that conveys a regulated substance to and from a UST, such as underground pipelines that convey fuel from a UST to an aboveground dispenser at MCAS Miramar, must include an automatic line leak detector that alerts the operator of the system to the presence of a leak by restricting or shutting off flow through the piping or triggering an audible alarm. The leak detector is required to be capable of detecting a 3 gph leak at 10 pounds per square inch (psi) line pressure within 1 hour.

All UST underground pressurized piping installed after 1 November 2007 is required to be of double-walled construction or have other secondary containment provisions. All UST piping currently in operation at MCAS Miramar is of double-walled construction and is continuously monitored for a release into the pipeline's annular space.

All suction systems are to be monitored for signs of leakage when the UST is in operation. Suction pipelines are to be monitored for the presence of air in the pipeline by observing the suction pumping system for the following indicators:

- Hesitation in delivery of motor fuel by the suction pump at the day tank may be a sign of a piping leak.
- Rattling sound and irregular fuel flow in a suction pumping system is a sign that air is entering the pipeline and mixing with the fuel. Air could be entering through a loose fitting or hole in the piping.
- Day tank transfer pump is running but not pumping liquid.
- The pump appears to over speed when first turned on and then slows down as it begins to pump liquid.

If any of the above indicators are observed, the pipeline must be tested to determine if it is adequately sealed. If there is any doubt following the inspection, it should be repaired or replaced.

5.4 UST MONITORING PLANS

California UST regulations under CCR Title 23, Sections 2632, 2634(d), 2638, 2641(h), and 2711(a)(9) require that facilities operating USTs have a written monitoring plan describing equipment and procedures used to monitor the UST systems for leaks. The plan must be approved by the DEH. These monitoring plans must be revised in CERS within 30 days of any personnel change or other situation which affects the information they contain. Changes in UST

monitoring equipment or procedures require submittal of revised information in CERS for the DEH review and approval prior to implementation. A current copy of the plan must be kept at the UST site.

The written monitoring procedures for each UST site were used to be completed using DEH standardized form HM-9222-A. These information is now entered in CERS. Copies of the current UST Monitoring Plans for each UST in operation at MCAS Miramar are maintained at the Facility and are available to the DEH representative for on-site review during normal working hours. The components of the form include the following:

1. **General Information**: Site name and address, UST(s) and UST system(s) covered by the plan, and leak detection equipment.
2. **UST Monitoring**: Type of monitoring (e.g., continuous, ATG, manual inventory reconciliation (MIR), manual tank gauging, UST testing).
3. **Pipeline Monitoring**: Type of monitoring for line leak detection (LLD) (e.g., continuous, mechanical LLD [MLLD], ELLD, line testing).
4. **Dispenser Leak Detection** (*if applicable*): Type of monitoring (e.g., float and chain, continuous, inspection frequency).
5. **Monitoring Locations**: Develop a site plan showing general UST and piping layouts and location of monitoring (e.g., sensors, line leak detectors, control panels).
6. **Indirect Hazard Determination** (*if applicable*): Develop method to determine the presence of a hazardous substance if it cannot be determined by the monitoring methods used at the site.
7. **Equipment Testing and Preventative Maintenance**: List the company and contact information for all testing, preventative maintenance, and calibration of monitoring equipment. Testing is to be conducted on an annual basis.
8. **Personnel Responsibilities**: List the personnel responsible for the following monitoring activities: conducting routine monitoring activities; performing periodic inspections of equipment; reporting of alarms, leaks, and equipment problems; arranging equipment testing, servicing, and calibration; and maintaining UST monitoring records.
9. **Reporting Format**: Indicate the type of format (records) that will be used to document monitoring and inspections.
10. **Training**: Educate and train the personnel responsible for UST monitoring and maintain the following documents on site: UST monitoring plans and operating manuals for electronic monitoring equipment.
11. **Certifications**: Responsible UST operator must certify the UST monitoring plan by signing and dating the plan.

All monitoring equipment used to satisfy the regulatory UST requirements of CCR Title 23, Chapter 16 should be installed, calibrated, operated, and maintained in accordance with manufacturer's instructions, and certified every 12 months for operability, proper operating condition, and proper calibration. UST inspection and maintenance frequency requirements, with the respective roles and responsibilities, are summarized in Table 5.

Annual monitoring equipment certification should be made on the DEH Monitoring System Certification Form HM-9301. The Monitoring System Certification Form should be submitted to DEH through CERS within 30 days after completion of the inspection. DEH should be notified at least 48 hours prior to conducting the installation, repair, replacement, calibration, or certification of monitoring equipment unless the notification requirement is waived by DEH.

5.5 UST EMERGENCY RESPONSE PLAN

California UST regulations under CCR Title 23 Sections 2632(d)(2), 2634(e), and 2641(h) require that facilities that operate USTs prepare a written emergency response plan that describes how an unauthorized release from a UST will be handled. Each facility must submit a completed UST emergency response plan through CERS using the DEH standardized form HM-9222-B. Copies of the current UST Emergency Response Plan for the USTs in operation at MCAS Miramar are maintained at the Facility and are available to the DEH representative for on-site review during normal working hours. The DEH emergency response form contains the following information:

1. **Facility Information** – Facility name and address.
2. **Spill Control and Cleanup Methods** – Steps to be taken once a leak has been detected (if safe to do so).
3. **Spill Control and Cleanup Equipment** – List of spill control and cleanup equipment to be kept permanently at the facility and perform routine inspection. Spill response equipment should include, but not be limited to: personal protective equipment, 55-gallon United Nations approved drums, explosion-proof submersible electrical pump, flexible hoses, spark-proof shovels, brooms, granular absorbent and pads, and plastic bags and sheeting.
4. **Responsible Persons** – Names of the personnel responsible for authorizing any work necessary under the UST emergency response plan.
5. **Indirect Hazard Determination** – Steps to be taken to determine the presence or absence of a hazardous substance in the secondary containment when monitoring methods are not possible to detect a substance.
6. **Leak Interception and Detection System** – Leak interception and detection system (LIDS) information for motor vehicle fuel UST systems constructed per the Alternate Construction Requirements of CCR Title 23, Section 2633, and if the LIDS does not meet the volumetric requirements of CCR Title 23, Sections 2633(d)(1) through (5).
7. **Reporting and Record Keeping** – Reporting for any overfill, spill, or unauthorized release from a UST system.
8. **Owner/Operator Signature** – Written certification of the emergency response plan during the time of submittal to the DEH.

5.6 UST SYSTEM INSPECTION REQUIREMENTS

The accessible parts of UST systems at MCAS Miramar should be visually inspected daily for indications of a release of product. It is important to inspect and maintain the UST equipment to ensure that it is functioning adequately. As an example, improper maintenance of sumps and catch basins, illustrated by the sump and catch basin full of debris and water as shown on Figure 23, causes a reduction of the overflow capacity, degrades the structural integrity and operation of the sump, and increases the risk for potential spills of regulated substances from the UST.

For the parts of UST system that are not accessible, non-visual monitoring with the quantitative release detection method (CCR Title 23, Section 2643) or qualitative release detection method (CCR Title 23, Section 2644) can be used. All of the UST systems in operation at MCAS Miramar use a continuous monitoring system (CCR Title 23, Sections 2632 and 2634).

5.7 UST BULK FILLING PROCEDURES

The U.S. Department of Transportation (DOT) regulates loading and unloading procedures for hazardous substances regardless of the types of trucks used. This includes fueling activities by U.S. Marine Corps personnel and civilian customers at service stations, and the receipt of product from mobile tanker trucks or smaller carriers.

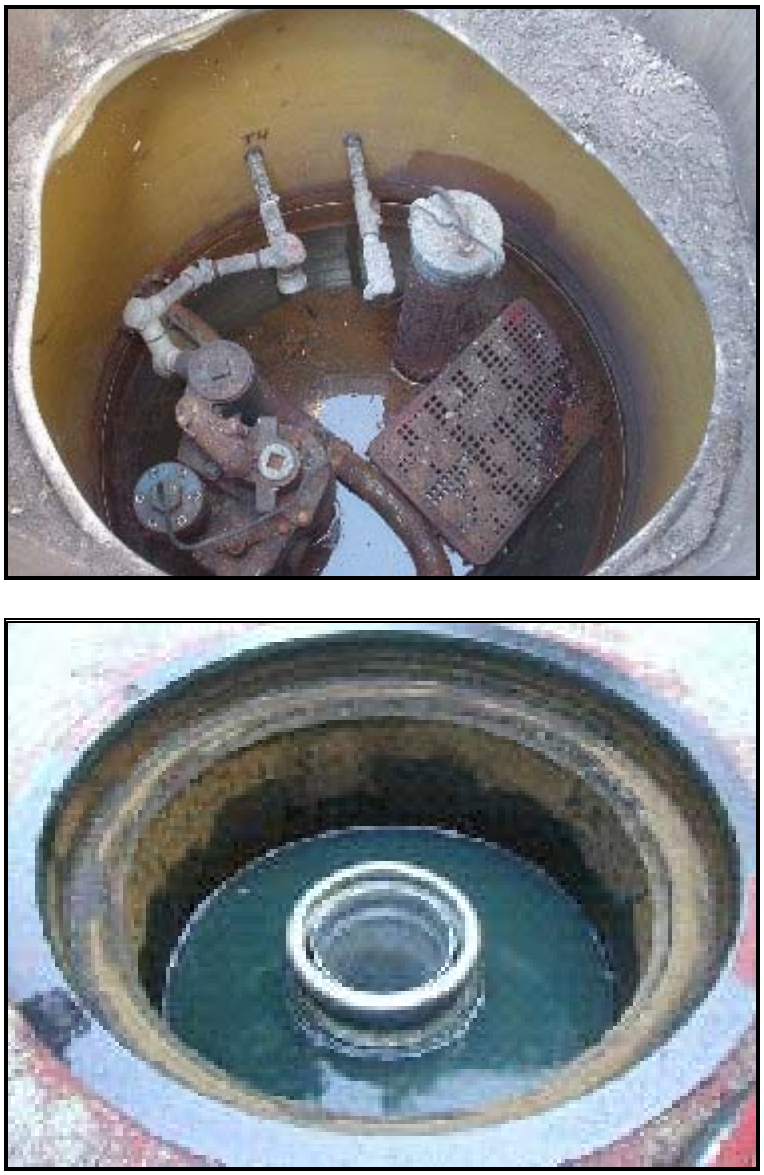
Transfer operations of oil products from mobile tanker trucks to USTs have a significant potential to spill large amounts of hazardous substances. Proper operating techniques will minimize this potential. All tanker truck drivers at MCAS Miramar are required to comply with DOT regulations in 49 CFR Part 177 and Standard Operating Procedures developed by the MCAS Miramar Fuels Division. Contractors providing tanker truck services to the Facility are also required to follow the written procedures. Loading and unloading procedures for mobile tanker trucks at MCAS Miramar are provided in the OHS SPCC Plan.

Vehicles used to deliver fuel to the USTs at the Facility are visually examined prior to off-loading. The UST operator should be present during bulk fuel transfers into the UST system. The UST operator must compare the product quantity in the tank before and after a fuel drop with the fuel truck driver's delivery ticket to ensure that product quantity received matches the invoiced amount. Significant discrepancies can lead to overbilling, ATG miscalibration, or UST system malfunction. The UST operator must coordinate with the tanker operator to ensure that the general fuel unloading procedures are promptly applied.

The UST operator must ensure that the volume available in the UST is greater than the volume of product to be transferred to the UST before the transfer is made. The transfer operation should be monitored constantly to prevent overfilling and spilling. The UST operator must also ensure that the UST is filled to no more than 95 percent of its total capacity.

5.8 UST RECORD KEEPING REQUIREMENTS

A permit to operate a UST is issued by the DEH and is effective for 5 years (CCR Title 23, Section 2712[c]). The permit indicates a State UST identification number assigned to the specific tank(s). Before the DEH issues a new permit or renewal to operate a UST, the DEH will inspect the UST and determine that the UST complies with the provisions of all applicable regulations. Table 1 contains the DEH identification number for each of the USTs at MCAS Miramar.



Source: USEPA, UST Systems: Inspecting and Maintaining Sumps and Spill Buckets, May 2005

Figure 23: UST Sump and Spill Bucket Full of Debris and Liquid

Written records of all UST monitoring and maintenance will be maintained at the MCAS Miramar Public Works and Logistics Division for a period of at least 3 years (CCR Title 23, Sections 2712 and 2713). The UST records must be made available, upon request, during inspections conducted by regulatory agencies, including the DEH, RWQCB, or EPA. UST records are also required to be entered into the CERS. Records to be maintained on file include:

- Written monitoring procedures and response plan (CCR Title 23, Sections 2632 and 2641).
- Daily inspection records for single wall suction piping (CCR Title 23, Section 2636(a)(3)(D).
- Release recording and reporting (spill) log (CCR Title 23, Section 2712).
- Written monitoring and maintenance records, including monthly and/or annual integrity test results (CCR Title 23, Section 2712).
- Written performance claims for release detection system components. Excerpts from the SWRCB LG113-14 may be used as a substitute for performance claims (CCR Title 23, Section 2712).
- Annual calibration and maintenance records for the UST leak detection system (CCR Title 23, Section 2712).
- Records of repairs, lining, and upgrades for the underground detection system (CCR Title 23, Section 2712).
- Additional monitoring records (if applicable) made available during the inspection (CCR Title 23, §2712) such as:
    - Date and time of all monitoring and sampling.
    - Monitoring equipment calibration and maintenance.
    - The results of any visual observations.
    - The results of all sample analysis performed in the laboratory or in the field, including laboratory data sheets and analysis used.
    - The logs of all readings or gauges or other monitoring equipment, groundwater elevations, or other test results.
    - The results of inventory readings and reconciliation.

5.9 UST PREVENTATIVE MAINTENANCE

All UST equipment should be periodically maintained in accordance with the manufacturer's instructions. The records of such maintenance should be retained for the life of the tank. All maintenance should be performed by trained technicians.

Facility personnel should periodically clean the sumps and spill buckets to remove any collected water, fuel, and debris. Improper or inadequate maintenance of sumps and spill buckets may cause releases to the environment. Even small releases may seep into the soil and reach

groundwater. If fuel or other liquids are found to be present in the sumps, it is important to remove it in a timely manner.

Preventative maintenance for UST monitoring equipment is performed yearly or in accordance with the manufacturer's instructions. Any service work required of the UST system should be performed only by technicians who possess a current certificate issued by the International Code Council (ICC) indicating the passage of the California UST Service Technician exam.

5.10 DESIGNATED UST OPERATORS AND TRAINING

Owners of UST systems are required to submit under CCR Title 23 Chapter 16, Section 2715 a signed statement to DEH indicating that the owner understands and is in compliance with all applicable UST requirements, and identifies the designated UST operator (DUSTO) for each facility. Information for any change of the DUSTO should be sent to DEH within 30 days after the change. All DUSTOs shall possess a current certificate issued by the ICC indicating that he or she has passed the California DUSTO exam. The ICC certification is required to be renewed every 24 months.

The DUSTO shall perform monthly visual inspections of all UST systems for which they are designated. The results of each inspection shall be recorded in the monthly inspection report. The inspection records and all attachments for the previous twelve months should be kept on site.

The DUSTO is required to train Facility personnel responsible in the proper operation and maintenance of the UST system at least once every 12 months. For new site personnel, the initial training shall be conducted within 30 days. For individuals assuming the duties of a facility employee on or after 13 October 2018, the initial training should be conducted before he or she assumes the operation responsibilities per EPA's 2015 federal regulations.

A list of all Facility personnel that received training shall be maintained at a readily available location and shall be provided to the DEH upon request. The list shall include the dates of training for all applicable Facility personnel and must identify the name of trainee, date trained, and operator training class completed. Per the EPA's federal regulations, any training program should include an evaluation through testing, a practical demonstration or another approach acceptable to the local regulatory agency. In addition, the training records should be signed by the trainer. Current training revisions being considered by the SWRCB include "through a practical demonstration" as the form of evaluation.

5.11 UST RELEASE REPORTING REQUIREMENTS

MCAS Miramar must record and report any unauthorized release from a UST, and any spill or overfill, in accordance with 23 CCR Chapter 16, Article 5, Sections 2650 through 2655. The spill response procedures for MCAS Miramar are outlined in the OHS SPCC Plan. In addition, the DEH should be notified if one or more of the following occur:

- A leak from a UST that escapes into the environment, a leak that increases the hazard of fires or explosion, or a leak that causes deterioration of the secondary containment of the UST must be reported to the DEH within 24 hours of detection. A written report must also be sent to the DEH within five (5) working days of the leak.

- A failed integrity test of the UST system must be reported to the DEH within 24 hours. Submit a copy of all UST integrity test results to the DEH within five (5) days of conducting the test.
- Overfills of USTs or spills of 5 gallons or more must be reported to the DEH within 24 hours of detection.

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6.0 UST PERMITTING REQUIREMENTS

Any person who constructs, installs, modifies, operates, maintains, or removes or destroys a UST must first obtain a permit. Prior to operating a UST, a permit to operate must be obtained through the DEH (SDCC 68.1105). Operating permit application forms used to be prepared using the UST Operating Permit Application – Facility Information (DEH Form HM-9715) and the UST Operating Permit Application – Tank Information (DEH Form HM-9717). Previously this information was submitted on paper forms but is now required to be entered directly in CERS.

6.1 DESIGN

Although most new USTs are designed in accordance with applicable regulations, it is important to ensure that the UST meets all design, construction, monitoring, and containment requirements set forth in CCR Title 23, Section 2633. A summary of the requirements is provided below; however, for a detailed description of these requirements refer to the applicable regulations.

6.1.1 Construction

USTs used for storage of motor vehicle fuel and constructed under CCR Title 23, Section 2633 shall be composed of:

- FRP;
- Cathodically protected steel; or
- Steel clad with FRP.

Leak interception and detection systems for new tanks must be installed in accordance with the requirements outlined in CCR Title 23, Sections 2633(d) through (f).

6.1.2 Primary and Secondary Containment Systems

All new USTs are required to have secondary containment. For specific requirements on the design, construction, testing, and certification for both primary and secondary containment systems, refer to CCR Title 23, Sections 2635 and 2631 (b) and (d).

All new pressurized piping must be installed inside a secondary containment system such as a secondary pipe or a lined trench, and must be tested for tightness in accordance with the manufacturer's guidelines upon installation (CCR Title 23, Section 2635).

6.2 CERTIFICATION

All new primary and secondary containment systems and primary piping and secondary containment systems must be tested and certified at the factory before being transported to the specific customer.

The monitoring system, equipment, and devices used in implementing the monitoring program must be installed, calibrated, operated, and maintained in accordance with manufacturer's instructions, including routine annual maintenance and service checks for operability or running

condition (CCR Title 23, Section 2641[j]). Written records must be maintained as required in CCR Title 23, Section 2712.

Each quantitative release detection method, with the exception of inventory reconciliation and manual tank gauging, must have a certification stating that it complies with the performance standards. This certification must be provided and performed by an independent third-party testing laboratory. Refer to CCR Title 23, Section 2643(g) for a description of the evaluation procedures.

After the installation of the system, owners of the UST system and their DUSTO should certify that the installation of the tanks and piping meets the requirements. The certification should be made by completing the DEH UST Certification of Installation /Modification Form HM-9716 in the CERS.

6.3 CONTINUOUS MONITORING

Secondary containment systems where the continuous monitoring automatically monitors both the primary and secondary containment (e.g., systems that have hydrostatically monitored or under constant vacuum) are exempt from periodic secondary containment testing (CCR Title 23, Section 2637[g]). Otherwise, integrity testing should be performed on USTs every three years (CCR Title 23, Section 2637[a]).

6.4 INSTALLATION

Installation of a UST system must be performed in accordance with DEH requirements by an experienced, certified, and licensed contractor. Most leaks start or are accelerated by improper installation of the UST system. Therefore, multiple on-site inspections by an independent qualified engineer and DEH are necessary during different phases of the installation process.

The initial inspection includes pressure testing of the primary tank, secondary tank, and primary piping. The type of tank and piping, manufacturer's specifications, and system operating pressure will determine testing specifications.

The second inspection includes inspecting the UST leak detection system and obtaining copies of the contractor's certification of installation, certification of the monitoring equipment, integrity test report, and the monitoring and emergency response plans.

Before installation, the UST must be tested for tightness at the installation site in accordance with the manufacturer's guidelines. The owner should notify the DEH at least two working days prior to conducting any tank integrity test. The written report shall be provided to DEH within 30 calendar days of completion of the UST integrity test.

7.0 CLOSURE OF USTS

There are significant differences in the closure of USTs that contain non-hazardous materials, hazardous materials or hazardous waste. If a UST contains an unknown material, it must first be characterized to determine if it is hazardous. Unless operator information is available on the original material the tank contained, the materials within the UST would be collected and analyzed using the following methods to determine if the contents are hazardous:

- Volatile Organic Compounds (VOCs) EPA Method 8260;
- Semi-Volatile Compounds EPA Method 8270
- California 22 metals (i.e. TTLC, STLC and federal TCLP analyses);
- pH;
- Flash Point; and
- 96-hour fish toxicity (bioassay).

The data obtained from testing by a state-certified analytical laboratory would be evaluated to determine if the contents would be classified as hazardous. If the material is hazardous but is not a waste, such as virgin motor oil, the tank contents could be removed for reuse.

7.1 TEMPORARY UST CLOSURE

The temporary closure requirements of CCR Title 23, Section 2671 apply to those USTs in which the storage of hazardous substances has ceased, but the UST will again be used for the storage of hazardous substances within the next 12 consecutive months. Owners and operators who have discontinued use of a UST for storage of a regulated substance, and who do not again intend to use the UST, must comply with the permanent closure requirements of the UST system.

Temporary closure is typically initiated by an owner who no longer wants the liability associated with USTs, cannot meet upgrade requirements, or is preparing to fund UST removal. Temporary closure allows the owner to take the UST out of operation for a maximum of 12 months. The following steps outline the procedures necessary to be granted a temporary closure at MCAS Miramar:

Step 1: Permitting – The MCAS Miramar Environmental Management Department (EMD) shall submit the permit application for tank closure to the DEH.

Step 2: Remove residual product from UST – The contractor shall pump the tank so that less than one inch of product remains, or remove the maximum amount that can be pumped with conventional methods.

Step 3: Vent UST – Vent lines must remain open and functioning.

Step 4: Secure other lines – The contractor shall cap and secure all other lines, pumps, manways, and ancillary equipment.

Step 5: Extensions – An additional 12-month extension can be requested by the MCAS Miramar EMD. The MCAS Miramar EMD must first complete a site assessment to determine if soil or

groundwater has been impacted. If an unauthorized release has occurred from a UST, MCAS Miramar will be required to permanently close the UST.

An additional description of the procedures to be used to temporarily close a UST is provided in Appendix C.

7.2 PERMANENT UST CLOSURE

A UST is not permanently closed until the lead agency issues a "No Further Action Required" letter or equivalent. This letter is typically not issued by the DEH until the UST is removed and any soil or groundwater that may be impacted has been remediated to acceptable levels. A description of the procedures to permanently close a UST is also provided in Appendix C.

7.2.1 UST Closure in Place

Regulators do not typically allow an owner to close a UST in place. Tank closure in place is primarily for situations where removing the UST would jeopardize the integrity of a building or other aboveground structure. A California registered engineer would be required to certify the application.

7.2.2 UST Removal

A UST that contained a non-hazardous material, a hazardous material, or a hazardous waste may be removed. A UST is normally cleaned on site, certified as appropriately clean, and then transported to a metal recycler for disposal. UST removal should be performed by an experienced, certified, and licensed contractor. The following steps summarize the requirements for UST removal at MCAS Miramar:

Step 1: Permitting – MCAS Miramar shall obtain permits from the City of San Diego Fire Department and the DEH.

Step 2: Removal of residual product from the UST and associated piping – The contractor shall pump, clean and properly dispose of residual product and sludge from the UST and piping.

Step 3: Disconnection of electrical service – MCAS Miramar facility personnel shall lock out and tag electrical service to the UST.

Step 4: Purge and monitor UST of all flammable vapors –The contractor shall place dry ice into the UST to purge flammable vapors.

Step 5: Excavate top of UST – A section of the top of the UST may be removed by the contractor to facilitate internal cleaning.

Step 6: Certification of cleaning – Once fully cleaned and purged, tank is inspected by a qualified individual to certify as appropriately clean.

Step 7: Removal of UST – Tank is further excavated for removal by the contractor and loaded onto a truck for off-site transportation for disposal.

Step 8: Soil Sampling – Under direction of the DEH, soil samples may be collected by the contractor below the footprint of the UST as it is removed to determine if an unauthorized release has occurred.

Step 9: Certificates of cleaning and disposal – The contractor will issue MCAS Miramar certificates of proper cleaning and disposal of the tank.

Step 10: Closure documentation – MCAS Miramar shall send all documents pertaining to the UST removal to the DEH within 30 days of the UST removal.

Step 11: Maintain permanent records – MCAS Miramar shall maintain copies of records for all activities associated with the removal of the UST.

7.2.3 UST Closure Documentation

Proper documentation of UST removals and in-place closures is required by MCO P5090.2A to ensure compliance, reduce environmental liability, avoid duplicative effort, and show progress and due diligence. The MCAS Miramar EMD or authorized representative/contractor must record and maintain specific detailed information for every UST taken out of service. Such information should be organized into a written UST Closure Report prepared by the MCAS Miramar EMD.

7.3 UST CONSOLIDATION AND REDUCTION PLAN

Section 18202 of MCO P5090.2A requires the development of a Consolidation and Reduction Plan of the existing UST systems at MCAS Miramar to meet storage needs while minimizing environmental risk. The Consolidation and Reduction Plan is to evaluate alternative storage vessels such as ASTs with proper spill prevention and containment or vaulted underground tanks to replace out-of-date USTs. The Consolidation and Reduction Plan should also consider economic considerations in the discussion of storage alternatives.

USTs, by their inherent underground location and their potential for corrosion and leakage, represent a risk to the environment. An evaluation was conducted of the existing USTs to determine the potential for upgrade or replacement with alternate storage vessels. This evaluation is provided in Table 3.

MCAS Miramar has also removed all of the USTs located in Fuel Farm Areas B, G, and H including the 114,000 gallon JP-5 Jet Fuel Octagon UST 9940 at the Flightline. The Consolidation and Reduction Plan for the remaining USTs at MCAS Miramar is provided in Table 4, including milestones for the UST replacement or removal, if applicable.

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8.0 ABOVEGROUND STORAGE TANK REGULATORY OVERVIEW

This section presents a summary of the federal, state, and local regulations for the installation, operation, monitoring, and closure of ASTs at MCAS Miramar. The ASTs at MCAS Miramar are regulated by several policies including the following:

- U.S. Marine Corps Environmental Compliance and Protection Manual (MCO P5090.2A);
- Industry standards (National Fire Protection Agency [NFPA], American Petroleum Institute [API], and the Steel Tank Institute [STI]);
- Federal AST regulations (40 CFR 112 and 29 CFR 1910);
- State AST regulations (CCR Title 22, Division 4.5 and HSC Sections 25270-25270.13); and
- Local AST regulations.

Note that U.S. military facilities, such as MCAS Miramar, are not regulated under the California Fire Code by local city or county fire departments, such as the City of San Diego Fire Department, but are reviewed by federal fire agencies.

8.1 U.S. MARINE CORPS ORDER

The Commandant of the Marine Corps, designated by MCO P5090.2A under the Environmental Compliance and Protection Manual, Chapter 7, directs applicable active and reserve Marine Corps installations to conform to 40 CFR 112. This guidance includes providing technical and administrative support in the management of OHSs stored in ASTs.

8.2 INDUSTRY STANDARDS

Industry standards have been developed for the construction, repair, inspection, and operation of ASTs. The industry standard for defining the requirements of shop-built aboveground steel tanks is NFPA Code 30, the Flammable and Combustible Liquids Code. The mission of the NFPA, an international nonprofit established in 1896, is to reduce the burden of fire and other hazards on the quality of life by providing and advocating consensus codes and standards, research, training, and education. NFPA develops, publishes, and disseminates more than 300 consensus codes and standards intended to minimize the possibility and effects of fire and other risks.

The API is a national trade association that represents the United States oil and natural gas industry. API has led the development of petroleum and petrochemical equipment and operating standards. API maintains more than 500 standards and recommended practices, including API-653 for the repair, alteration, and inspection of field-erected ASTs. Many API standards have been incorporated into state and federal regulations.

The STI is also a national trade association representing fabricators of steel construction products and their suppliers. Member companies produce steel storage tanks, field erected water tanks, pressure vessels, heat exchangers, and pipe and pipelines. STI provides certification training and procedures for the inspection of shop-built ASTs, portable containers, and small field-erected ASTs.

8.3 FEDERAL AST REGULATIONS

8.3.1 Oil Pollution Prevention

Federal oil pollution prevention regulations under 40 CFR 112 require the preparation and implementation of an SPCC Plan for all facilities that store oil in excess of an aggregate aboveground container capacity greater than 1,320 gallons, and that have discharged or could reasonably be expected to discharge oil into navigable waters of the U.S. or its adjoining shorelines. Because MCAS Miramar stores more than 1,320 gallons of petroleum products in containers or ASTs greater than or equal to 55 gallons, the Facility is considered subject to the federal SPCC regulations and a separate OHS SPCC Plan was prepared.

8.3.2 Hazardous Waste Regulations

RCRA also established a comprehensive program for federal and state regulations of solid waste management and disposal. Subtitle C of the Act requires the EPA to define hazardous waste and publish standards that must be followed, including standards for storage and handling of hazardous waste. These specific regulations are set forth in 40 CFR 260 and 265. MCAS Miramar currently does not store RCRA hazardous wastes in ASTs.

8.3.3 Health and Safety Regulations

The Occupational Safety and Health Administration (OSHA) requires that employers provide a safe and healthy workplace. There are provisions of OSHA related to the safety features of ASTs, especially tanks that store flammable liquids, under 29 CFR 1910.

8.4 STATE AST REGULATIONS

8.4.1 California Aboveground Petroleum Storage Act

HSC Division 20, Chapter 6.67, Sections 25270-25270.13, the California Aboveground Petroleum Storage Act (APSA) requires the preparation of an SPCC Plan, specific action to prevent spills, filing of a storage statement, and implementation of a monitoring program for facilities that store greater than 1,320 gallons or more of petroleum liquids. Note that ASPA requires preparation of an SPCC Plan even if the facility is not located near navigable water.

The ASTs at MCAS Miramar are subject to APSA regulations, except ASTs that store a hazardous waste and oil-filled electrical equipment that contains less than 10,000 gallons of dielectric fluid, such as transformers. The used oil ASTs at MCAS Miramar are exempt from the APSA regulations, but are required to comply with California hazardous waste regulations of CCR Title 22, Division 4.5. The DEH is responsible for enforcing APSA and hazardous waste management regulations. APSA includes requirements that the DEH conduct site inspections of MCAS Miramar to determine compliance with the SPCC Plan requirements of APSA.

APSA also requires each owner or operator of a tank facility subject to APSA to file an annual tank facility statement that provides specific information on all ASTs exceeding 10,000 gallons in capacity and holding a substance containing at least 5 percent of petroleum. MCAS Miramar prepares a tank facility statement on an annual basis as required by APSA.

8.4.2 California Hazardous Waste Regulations

CCR Title 22, Division 4.5 and HSC Division 20, Chapter 6.67, Sections 25270-25270.13, regulate all aspects of hazardous waste management in California. Hazardous waste management regulations are included in the AST compliance requirements since MCAS Miramar stores used oil in ASTs. The Department of Toxic Substances Control is the state agency overseeing the hazardous waste regulations. The DEH is the local agency enforcing these regulations at MCAS Miramar.

8.4.3 California Air Resources Board

CARB has developed Phase II EVR standards for volatile emissions originating from gasoline ASTs. On May 2, 2008 the CARB issued Certification Procedure CP-206, which describes the procedures for evaluating and certifying ASTs, Standing Loss Control, Phase I and Phase II vapor recovery systems, and components used at gasoline dispensing facilities. CARB is also responsible for evaluating and testing new or modified vapor recovery systems.

8.5 LOCAL AST REGULATIONS

The SDAPCD regulates the transfer of any VOCs from mobile transfer tanks (i.e., tanker trucks) to stationary ASTs under SDCC Rule 61.3. Requirements for stationary ASTs receiving VOCs (i.e., gasoline) include a Phase I vapor recovery system to capture fuel vapors displaced during bulk transfer of fuel to an AST. The storage tanks subject to Phase 1 recovery system requirements include all ASTs with a capacity greater than 260 gallons for retail service stations, and ASTs with a capacity greater than 550 gallons for other facilities.

Any business which handles hazardous materials, at any time during the year, in quantities of 55 gallons or more or a total weight of 500 pounds or more, is required to submit a Hazardous Materials Business Plan on an annual basis to the local CUPA. This information includes oil and fuels that may be stored in ASTs. Effective January 1, 2013, Assembly Bill 2286 required this information to be submitted electronically through the CERS. MCAS Miramar is not required to prepare a Hazardous Materials Business Plan, but does submit an annual tank statement under APSA into the CERS.

The City of San Diego Fire Department usually requires the facility owner to obtain a Hazardous Material Permit for the installation or removal of ASTs containing fuels, oils and other flammable or combustible liquids. However, the City of San Diego Fire Department does not have jurisdiction over federal land and the Hazardous Material Permits do not apply to the ASTs at MCAS Miramar.

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9.0 MANAGEMENT OF ABOVEGROUND STORAGE TANKS

This section discusses the management of ASTs at MCAS Miramar. Additional descriptions of the ASTs at MCAS Miramar are provided in the OHS SPCC Plan.

9.1 REQUIRED AST FEATURES AND AUXILIARY EQUIPMENT

A majority of the ASTs at MCAS Miramar that contain a combustible or flammable liquid are shop-built tanks. Shop-built tanks are welded steel ASTs fabricated by an outside vendor's manufacturing facility, as shown on Figure 24. In order to operate safely and effectively, shop-built ASTs mounted at fixed locations require specific features and auxiliary equipment.

The industry standard for defining the requirements of shop-built aboveground steel tanks is NFPA Code 30, the Flammable and Combustible Liquids Code. Additional requirements are also specified in 40 CFR 112. The requirements for ASTs containing a combustible or flammable liquid are summarized in Table 6.

9.1.1 AST Construction and Containment

Construction materials for tanks and their appurtenances should be compatible with the liquid to be stored. For storage of flammable and combustible liquids, plastic tanks are generally not acceptable and should be avoided. The ASTs should be constructed of carbon steel or stainless steel per Underwriters Laboratories, Inc. (UL) Code 142 "Steel Aboveground Tanks for Flammable and Combustible Liquids." UL 142 provides specifications for single-walled and double-walled constructed shop-built atmospheric tanks that are for stationary locations up to 75,000 gallon capacity. UL 142 provides minimum steel thickness, requires performance testing by the manufacturer, limits tank support heights, specifies weld joint design, provides one exterior paint coating, and requires both standard and emergency venting. UL 142 certified tanks are also labeled with a specific UL serial number reference.

"Protected" tanks also offer greater safety and regulatory compliance features for storage of flammable and combustible liquids. A protected tank is a double-walled AST constructed to UL Code 2085 "Protected Aboveground Tanks for Flammable and Combustible Liquids." A UL 2085 certified AST is required to be tested and pass a 2-hour fire rating. The tanks are constructed of insulated materials, such as concrete, that offer protection from physical damage, allow them to be placed closer to buildings and structures, and have fuel dispensers that may be mounted directly next to the tank. All UL 2085 certified ASTs have provisions for monitoring the interstitial space of the tank and, based on their construction, may not be required to have an emergency vent in the annular space. Examples include Fireguard®, Convault®, and Enviroguard® brand tanks.

9.1.2 AST Secondary Containment

Aboveground bulk storage tanks that contain oil are required to be provided with "a secondary means of containment for the entire capacity of the largest single container and sufficient freeboard to contain precipitation." This is considered a specific secondary containment provision, whereby the secondary containment volume must be designed to hold the entire contents of the bulk storage tank, and have sufficient additional volume to contain precipitation without a release.

In most cases, passive fixed structures are used to provide specific secondary containment. In addition to external concrete or metal containment walls, curbs, dikes, pallets or pits that may surround a container or drum, storage tanks may be constructed of a primary tank completely enclosed by a secondary shell (i.e., double-walled construction) to meet specific secondary containment requirements. An example of a double-walled constructed AST is provided on Figure 25.

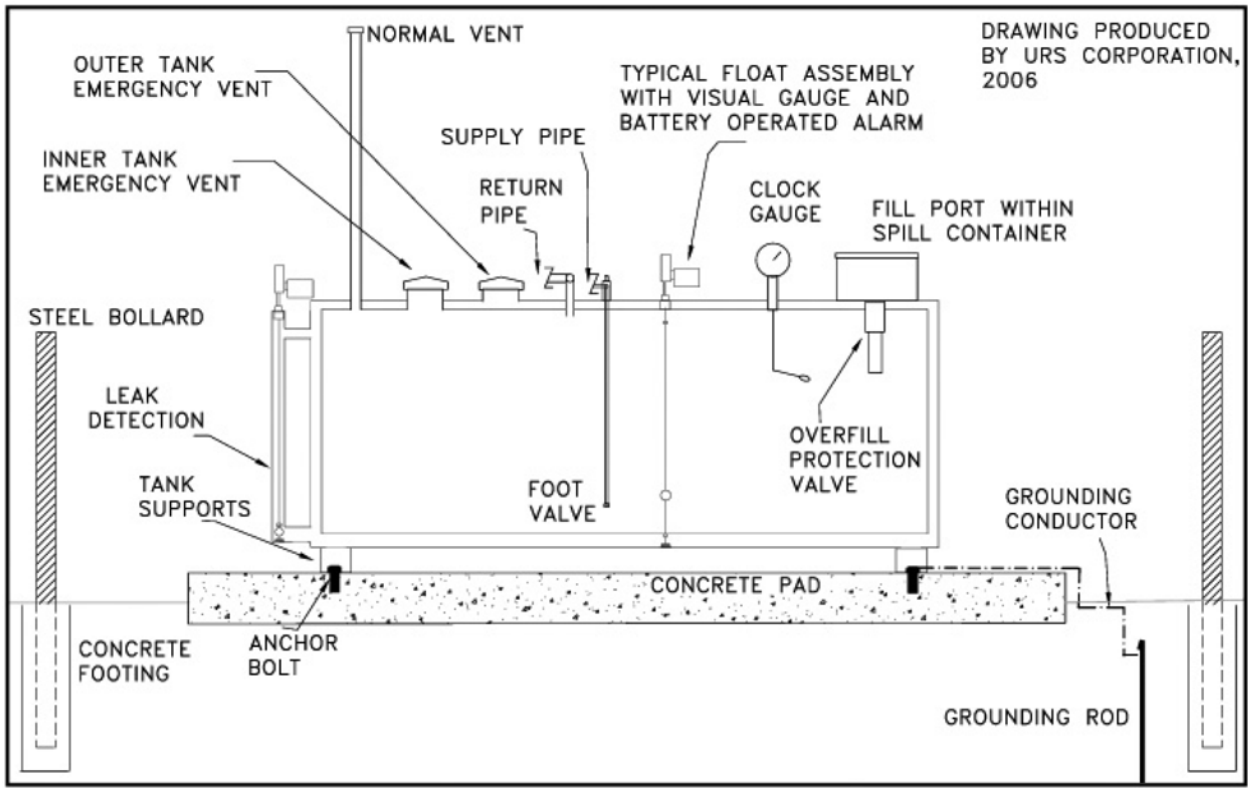
When bulk storage tanks are located indoors, specific secondary containment only considers the volume (i.e., maximum shell capacity not working volume) of the AST. If several different size ASTs are located within the same room, the secondary containment volume would be based only on the relatively largest tank present, not the total volume stored. Note that when determining the available secondary containment volume present, the displaced volume by other tanks and/or equipment within the containment structure must be subtracted. In addition, depending on the size of the AST and its location within a large room, a concrete floor area without drains may provide sufficient containment before a spill reaches an exterior doorway; however, this situation would need to be determined by a Professional Engineer who certifies the SPCC Plan.

For aboveground bulk storage tanks located in exterior non-enclosed areas without a roof cover, the specific secondary containment provisions must also have sufficient freeboard to capture and contain rainfall from a major storm event. As a general engineering practice, the determination of precipitation freeboard in the calculation is based on the 24-hour, 25-year rainfall event for the local area. A 25-year, 24-hour rainfall event means a rainfall event with a probable recurrence interval of once in 25 years.

The National Oceanic and Atmospheric Administration (NOAA) Hydrometeorological Design Center has developed precipitation frequency maps for the United States. The Precipitation Frequency Data Server (http://hdsc.nws.noaa.gov/hdsc/pfds/index.html) provides individual maps of each state to locate precipitation data for specific points. As an example, MCAS Miramar is located at 32.8873 latitude and -117.1198 longitude and a 25-year, 24-hour rainfall event generates approximately 3.26 inches of storm water freeboard. Thus, when designing passive exterior secondary containment structures, the structure should be at least 3.26 inches higher than the calculated height for the largest tank shell volume.

A “110% rule” has also been used for design of exterior passive secondary containment structures whereby the precipitation freeboard is based on 10 percent of the largest tank volume. This rule originates from the Uniform Fire Code regulations. In most instances where the tank volume is relatively large and the local rainfall is limited, this rule may be applicable. However, this rule does not relate directly to the intensity of local rainfall and may underestimate the required secondary containment storage volume during a significant rain event.

Figure 24: Example of Shop-Built AST



Figures 25: Example of Double-Walled Constructed AST

9.1.3 AST Fill Port Spill Container

A majority of the spills associated with ASTs involves fuel loading operations. A spill container or bucket is used to limit a potential release outside a tank due to operator error. The device consists of a plastic or metal bowl or rectangular box with a hinged cover connected to the top fill port of the tank. The spill bucket should have a means of draining any collected liquids within the bucket back into the primary tank, either through a separate drain line or a small hand pump. The Myers Collection System Used Oil ASTs at MCAS Miramar have integral spill containers built into the tank. Examples of fill port spill containers for ASTs are provided on Figure 26.

9.1.4 AST Level Indication and Overfill Protection

In addition to product releases at the AST fill port, a majority of spills are caused by overfilling of the tank. One of the following devices must be provided for each bulk oil storage container in accordance with good engineering practice to prevent overfilling of the AST and a potential discharge:

1. High level liquid alarm with an audible or visual signal;
2. High level liquid pump cutoff device to stop flow at a predetermined level;
3. Direct audible or code signal communication between the tank operator and the pumping station; or
4. A fast response system for determining the liquid level of the container such as direct vision gauges.

ASTs must have adequate overfill protection devices. For large free-standing ASTs, an electronic high liquid level sensor with a remote alarm panel is recommended that includes a visual warning lamp at 90 percent capacity with an audible alarm that can be noted directly by the operator. For relatively small tanks or base tanks associated with emergency generators, a post-type or dial-type mechanical level gauge should be installed into the top of the tank that would be directly visible to an operator when filling the tank. Examples of these gauges are provided on Figure 27.

9.1.5 AST Leak Detection

All bulk oil storage containers should be inspected on a periodic basis to determine if the secondary containment provisions for each container are intact and a leak has not occurred. The regulations require that a user must frequently inspect the outside of the container for leaks and any accumulation of oil inside diked or secondary containment areas. Any accumulated oil or fuel present must be promptly removed. As with level indication, separate mechanical gauges or electronic sensors should be installed into the inspection port of a double-walled constructed AST to detect a potential leak in the interstitial space.

	
Round Covered Spill Bucket	Secondary Round Spill Bucket
	
Rectangular Spill Bucket	Round Spill Bucket with Lid

Figure 26: AST Fill Port Spill Containers

<table>
<tr><td>  </td><td>  </td></tr>
<tr><td>Mechanical Post Gauge</td><td>Mechanical Dial Gauge</td></tr>
<tr><td> 
</td><td> 
</td></tr>
<tr><td>Mechanical Float Gauge</td><td>Electronic Level Sensor Alarm Panel</td></tr>
</table>

Figure 27: AST Liquid Level Controls

9.1.6 AST Normal Vents

Atmospheric storage tanks should be adequately vented to prevent the development of vacuum or pressure sufficient to distort the roof of a tank or exceed the design pressure, as a result of filling or emptying, and atmospheric temperature changes. Normal vents should be at least as large as the AST fill port or drainage connection, whichever is larger, but in no case less than 1-1/4 inch nominal inside diameter.

All normal vents should not terminate within a building or room, but should be routed to the exterior of the building. Vent pipe outlets for ASTs storing flammable liquids that are adjacent to buildings or public ways should be located so that the vapors are released at a safe point outside of buildings and not less than 12 feet above the adjacent ground level. In order to aid their dispersion, vapors should be discharged upward or horizontally away from closely adjacent walls. Vent outlets should be located so that flammable vapors will not be trapped by building eaves or other obstructions, and be at least 5 feet away from building openings such as doors or windows. ASTs storing Class IA liquids, such as gasoline, must also have a vent pipe terminating with a flame arrestor that is normally closed except when venting to pressure or vacuum conditions.

9.1.7 AST Emergency Vents

In addition to a normal vent, every fixed AST must have emergency relief venting in the form of construction or a device or devices that will relieve excess internal pressure caused by exposure to a fire. The emergency vent requirement also applies to the interstitial space (annulus) of a double-walled constructed AST. Note that some ASTs constructed to UL 2085 standard may, by means of their construction, not require an emergency vent mounted into the annular space of the double-walled constructed tank. Emergency generator base tanks may also be designed with an open annular space that does not require an emergency vent. Mobile and portable tanks are also exempt from emergency vent requirements.

A properly rated emergency relief vent of the appropriate diameter and pressure rating should be installed into each AST to adequately ventilate the tank in the event of an emergency. The emergency vent may consist of a weighted or spring-loaded cap connected to a threaded port on top of the tank. The opening for an emergency vent is normally larger than a standard vent opening and may range from 3 to 8 inches in diameter. For tank installations that do not have adequate connections for installation of an emergency vent, the tank may need to be replaced with a new double-walled constructed tank, or modified, if cost-effective, by welding on an additional threaded vent connection. All emergency vents should also not terminate within a building or room, but should be routed to the exterior of the building. Examples of emergency vents are provided on Figure 28.

Standard Weighted Emergency Vent

Side view of Installed Emergency Vent

Top View of Spring Cap Emergency Vent

Emergency Vent built into Manway Lid

Figure 28: AST Emergency Vents

For storage tanks that have bolted manway covers, the cover can be modified in some cases, to act as an emergency vent by replacing the existing tightened bolts with longer shaft bolts that have at least 1-1/2 inches without any thread. The number of modified bolts on the manway can be reduced to three or four, as needed. The attaching nuts would then be positioned in such a way to allow the cover to lift up slightly, but not be entirely removed during a tank overpressure situation. There should be no obstructions to prevent the manway lid from rising including any overhead piping placement. Long bolt manways are not approved for use as an emergency vent on UL 2085 certified ASTs.

9.1.8 AST Grounding

All ASTs locations where the potential exists for an ignitable mixture to be present should be properly bonded or grounded. Ignitable mixtures are generally defined as flammable and combustible liquids that have a flash point below 140 degrees Fahrenheit (ºF). Gasoline has a flash point of -45 ºF and diesel fuel has a range of flash point from 125 to 180 ºF, depending upon the grade of fuel. Under the Fire Code, such liquids would be considered as Class 1 or Class II rated liquids.

All ASTs containing flammable and combustible liquids should have adequate electrical bonding and grounding. An appropriate braided copper grounding wire (No. 4 or larger) should be connected to the metal tank, support or a tank shell connection on top of the metal portion of the tank from a qualified electrical ground under National Electrical Code guidelines. Note that connection to an existing metal conduit to an AST is not considered adequate. All AST ground connections should be to a copper grounding rod driven into the open subsurface outside a containment berm, if applicable, next to the tank. The cable connection to the grounding rod must be above grade and not buried. Two grounding rods are recommended per tank site. Several ASTs can share the same grounding rod; however, separate cables from the grounding rod to each tank are recommended.

9.1.9 AST Hazard Warning Signage

Each AST should be marked to identify the tank's liquid contents and the associated hazards for the general public, MCAS military personnel and emergency services staff. ASTs containing combustible or flammable liquids should have a sign or label that meets the requirements of NFPA 704, Standard System for the Identification of the Hazards of Materials for Emergency Response (i.e. NFPA diamond). In addition, it is recommended that each AST be marked with "No Smoking and No Open Flames."

The signage should be located where it can be easily seen, such as on at least two sides of the AST, the shoulder of an accessway or walkway to the tank, or on the fencing surrounding the tank. The signs should also be placed facing in the direction where emergency vehicles or personnel would normally approach the site. If more than one tank is involved, separate markings are to be provided for each individual tank. Examples of AST signage are shown on Figure 29.

9.1.10 Requirements for Portable or Mobile Tanks

Portable tanks are defined under NFPA Code 30 as a "vessel having the capacity over 60 gallons (230 liters) intended for storing liquids and not intended for fixed installation." Within the context of this code, these tanks are used for transport of liquid commodities and are constructed under Department of Transportation (DOT) specifications. Common terms for these portable tanks are Intermediate Bulk Containers (IBCs) or "totes".

Figure 29: AST Hazard Warning Signage

Portable tanks at MCAS Miramar; such as mobile defuelers and mobile emergency generators with base tanks mounted on trailers, are exempt from NFPA Code 30 requirements including emergency vents. However, the ASTs must be constructed of materials compatible with the liquids they store, have an overfill protection device, and have secondary containment provisions as required under 40 CFR 112.

In December 2006, the EPA amended the SPCC rule to streamline requirements for sized secondary containment for mobile and portable tanks. Owners and operators of mobile tanks at a non-transportation-related facility are no longer required to provide sized secondary containment systems, which are systems large enough to contain the capacity of the largest single compartment or container on a mobile tank along with enough room to contain precipitation. Providing sized secondary containment for vehicles that move frequently within a facility to perform fueling or defueling operations can raise safety and security concerns. However, the SPCC rule's general secondary containment requirements still apply to mobile and portable tanks.

The general secondary containment requirements are intended to address the most likely oil discharge from portable and mobile tanks based on a typical failure mode and in accordance with good engineering practice. In many instances, general secondary containment provisions for portable tanks can be addressed by providing a spill kit combined with frequent visual inspections.

9.2 ABOVEGROUND STORAGE TANK INSPECTIONS

All ASTs and associated aboveground piping, drainage areas, secondary containment structures, and truck loading/unloading areas are to be inspected to ensure that the equipment is properly maintained and the potential for a significant spill or leak due to a failure is minimized. Records of AST and containment structure inspections shall be maintained for three years and readily accessible for review. An additional description of the AST inspection requirements is provided in the OHS SPCC Plan.

9.2.1 Daily AST Inspections

MCAS Miramar has submitted an AST Certification and Engineering Assessment Exemption Notification to the DEH for the ASTs at the Facility that currently store used oil. This notification exempts each tank from the requirements of a Professional Engineer Assessment under CCR Title 22 Section 66265.192 for hazardous waste tank systems. One of the terms and conditions of the DEH exemption is to conduct **daily** inspections of each used oil tank and maintain a log on site. A copy of the MCAS Miramar Daily Used Oil Inspection Log is provided in the OHS SPCC Plan. The assessment exemption for each used oil AST is valid for the service life of the AST or until the AST is replaced or modified.

9.2.2 Monthly AST Inspections

All ASTs that contain 55-gallons or greater of oil at MCAS Miramar will be inspected on a **monthly** basis. The inspections will be conducted by personnel who are responsible for operating each AST or container. Inspections of the ASTs associated with emergency generators will be conducted by the MCAS Miramar Public Works Division. All other tanks will be inspected by the Unit Environmental Coordinator, their designate, or the operator of the AST (such as a contractor).

Inspections of the ASTs are conducted in general accordance with the inspection requirements specified in the latest edition of the Steel Tank Institute (STI) SP001, *Standard for the Inspection of Aboveground Storage Tanks*, for shop-built tanks. A copy of the 5th edition of STI SP001 guidance is provided in the OHS SPCC Plan. The monthly AST inspections shall be documented on the MCAS Miramar Monthly Oil Storage Tank and Secondary Containment Inspection Checklist, which is also provided in the OHS SPCC Plan.

During the monthly visual inspections, all 55-gallon drums used to store oil are also evaluated for corrosion. In order to ensure their integrity, any 55-gallon drums showing any signs of visual degradation (i.e., rusting, corrosion, etc.) and drums that are 12 or more years in age are to be replaced.

In accordance with STI SP001, the monthly AST inspections at the Facility will include the following procedures:

- Primary and secondary tank(s) or containment(s) are visually inspected for presence of water, corrosion, and leaks.
- The interstitial space of a double-walled constructed tank (such as an emergency generator base tank) is inspected for the presence of oil. If the interstitial space of the tank is equipped with a leak detection system, the system is checked to ensure proper functionality. If no leak detection system is present, the valve for the outer tank is carefully opened. All fluid that drains from the interstitial space is collected and visually inspected for the presence of oil. All collected fluids will be removed for proper disposal.
- All containment structures are inspected for the presence of fluids. If the containment structure contains oil, the oil is removed for proper disposal or recycling. If no oil is present, the collected water is drained per the procedures described in the OHS SPCC Plan. Any debris present in the containment structures is removed and properly disposed of.
- All pipe connections are inspected for evidence of leaks. Thread connections are tightened, if necessary.
- Walk-around inspections of the exterior of the tank are conducted. New coating or paint is applied, if necessary.
- Operating vents and emergency vents on primary and secondary tanks are inspected and cleaned, if necessary.

9.2.3 Annual AST Inspections

In addition to the monthly inspections, a detailed **annual** inspection of all ASTs will be performed. The annual inspections will be performed by the MCAS Miramar EMD or their designated representative and documented on the MCAS Miramar Annual Oil Storage Tank and Secondary Containment Inspection Checklist, which is provided in the OHS SPCC Plan.

The OHS SPCC Plan provides site-specific information that should be used when conducting the annual survey; however, the MCAS Miramar EMD or their designated representative must ensure that the site-specific information is kept current by reviewing the Facility for operational changes.

In accordance with SP001, the annual inspections for ASTs shall include the following procedures:

- A walk-around inspection is performed to check for proper drainage around each tank or container, noting any ground settling or puddling of water near the tank;
- O-ring gasket(s) of emergency vents are checked for damage or deterioration;
- The tank foundation is checked for signs of settlement, cracking, pitting, and spalling;
- Anchor bolts are checked for signs of distortion of the bolts or significant cracking around the bolts; and
- Overfill protection devices (high-level alarms) and leak detection devices are functionally checked on an annual basis with manual removal and physical actuation.

9.2.4 Product Recovery Tank Inspections

Fuel Farm Area G at Building 7939 operates a 4,000-gallon JP-5 jet fuel product recovery tank that is mounted within a below-grade concrete containment vault. Based on discussions with the DEH, site-specific inspection requirements have been established for this AST to exempt its classification as a vaulted UST. MCAS Miramar Fuels Division personnel shall conduct daily inspections of the tank and its associated interconnecting pipelines per the Product Recovery Tank Audit Form, which is included in the OHS SPCC Plan.

9.3 CERTIFIED INTEGRITY TESTING OF ASTS

In addition to monthly and annual inspections, non-destructive integrity testing of ASTs may be required. The integrity testing is based on a prescribed inspection schedule in accordance with SP001 and whenever material repairs are made for ASTs of 50,000 gallons or less in capacity. The integrity testing for ASTs is based on shop-fabricated construction, the type of spill protection present, the tank's capacity, and the age of the tank. SP001 classifies ASTs according to the following categories:

- Category 1 – ASTs with spill control and Continuous Release Detection Method (CRDM);
- Category 2 - ASTs with spill control and without CRDM; and
- Category 3 - ASTs without spill control and without CRDM.

Spill control is defined as a means to control a release such as remote impounding, secondary containment dike or berm, and double-walled tank construction. CRDM is a passive means of detecting a release through the inherent tank design such as elevating the tank on saddles, mounting the tank on an impermeable barrier, or providing secondary containment with double-walled or double-bottom construction. Examples of each SP001 AST categories are shown on Figure 30.

Category 1 AST – Double-Walled Tank with Overfill Protection

Category 2 AST – Single-Wall Tank with Overfill Protection

Category 3 AST – Single-Wall Tank with no Overfill Protection

Figure 30: Example of SP001 Category Tanks

A majority of the ASTs in operation at MCAS Miramar are classified under Category 1. Although some ASTs may not have a physical means, such as a spill bucket, to capture potential spills that may be generated at tank fill ports, MCAS Miramar has written procedures for monitoring all AST filling operations in the OHS SPCC Plan to prevent spills. The recommended schedule for certified integrity testing for Category 1 shop-fabricated ASTs of 50,000 gallons or less in capacity is described in Table 7. In addition, a majority of the ASTs at MCAS Miramar are less than 50,000 gallons capacity. These ASTs satisfy integrity testing requirements through the environmental equivalence of the monthly and annual visual inspections.

Several ASTs at MCAS Miramar have a storage capacity from 5,001 to 50,000 gallons. In addition to monthly and annual inspections, these tanks will require external integrity testing every 20 years of operating service for Category 1 designated ASTs. The integrity testing shall include a formal external inspection of the tank configuration and its components by an STI-certified tank inspector or equivalent with non-destructive testing.

9.4 EVALUATION OF FIELD-ERECTED ASTS

Field-erected ASTs are welded steel ASTs erected on-site where they will be used. MCAS Miramar operates three 1.3-million gallon JP-5 jet fuel ASTs that were field constructed at Fuel Farm Area G shown on Figure 31. In addition to monthly and annual visual inspections, these tanks will be integrity tested every 10 years under the American Petroleum Institute (API) Standard 653, *Tank Inspection, Repair, Alteration, and Reconstruction.* The scope of this standard covers all carbon and low alloy steel tanks built to API Standard 650, *Welded Steel Tanks for Oil Storage.* Table 8 also provides a summary of the inspection requirements for field-erected ASTs under API 653.

9.5 AST MAINTENANCE AND REPAIR

All AST equipment should be maintained in accordance with the manufacturer's instructions. Tank exterior coatings should be maintained free of any corrosion, oil stains, or defects. Heavily weathered or inoperable equipment, such as broken gauges and alarm panels, should be removed and replaced. All tank appurtenances should be maintained in working order and should be promptly repaired or replaced if found to be defective during scheduled inspections.

For shop-built ASTs, STI SP001 dictates specific triggers for when a tank must be repaired, based on wall thickness, and the type of CRDM and spill control. If an AST shell must be repaired due to insufficient wall thickness, the tank must have its next formal external or formal internal inspection within five years after the repair, and every five years thereafter. If a repair to an AST is required for any other reason, an engineer is required to inspect the tank and make a determination if a formal external or formal internal inspection is required. All records of such maintenance and repair should be retained for the life of the tank. Any repairs to the tank shell should be performed by trained technicians to insure the integrity of the tank is not compromised.

Figure 31: Example of Field Erected ASTs

9.6 AST CLOSURE

When AST's are abandoned, temporarily taken out-of-service, or removed, the applicable federal, state, and local regulations must be followed. All out-of-service ASTs should be marked with signage that states "Empty", the date of service termination, and what hazardous substance the tank last contained. Additional signage describing the tank's previous contents should be removed or covered with white paint.

An AST that is not used for a period of 90 days should be temporarily placed out of service. All liquids should be removed from the tank, all piping capped or plugged and secured against tampering, and the vent lines left open and properly maintained. These closure procedures also apply to ASTs attached to emergency generators. ASTs that are out-of-service for one year or more must be permanently closed and removed from the property. A description of the procedures to temporarily or permanently close an AST is provided in Appendix D.

10.0 REFERENCES

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40 CFR 261 - Identification and Listing of Hazardous Waste
40 CFR 262 - Standards Applicable to Generators of Hazardous Waste
40 CFR 263 - Standards Applicable to Transporters of Hazardous Waste
40 CFR 264 - Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities

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40 CFR 270 - EPA Administered Permit Programs: The Hazardous Waste Permit Program
40 CFR 271 - Requirements for Authorization of State Hazardous Waste Programs
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UL 1746, External Corrosion Protection Systems for Steel Underground Storage Tanks

UL 142, Steel Aboveground Tanks for Flammable and Combustible Liquids

UL 2085, Protected Aboveground Tanks for Flammable and Combustible Liquids

TABLES

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TABLE 1: UNDERGROUND STORAGE TANKS INVENTORY

UST/AST Management Plan
Marine Corps Air Station, Miramar, California

Tank No.	DEH Permit No.	Tank ID No.	Installation Date	Contents	Capacity (gallons)	Tank Material	Tank Containment	Piping Leak Detection	UDC	Striker Plate	Drop Tubes	Tank Leak Detection System
2662-1	215491	388073	5/17/2012	87 Unleaded Gasoline	30,000	FRP	Double-walled	Yes	Yes	Yes	Yes	Incon TS-5000 with ATG
2662-2		388076	5/17/2012	87 Unleaded Gasoline	30,000	FRP	Double-walled	Yes	Yes	Yes	Yes	
2662-3		388077	5/17/2012	91 Premium Gasoline	30,000	FRP	Double-walled	Yes	Yes	Yes	Yes	
2662-4		388070	5/17/2012	Diesel	15,000	FRP	Double-walled	Yes	Yes	Yes	Yes	
6021-1	181142	31063	10/5/1998	JP-5 Jet Fuel	40,000	FRP	Double-walled	Yes	Yes	Yes	Yes	Veeder Root TLS-350 with ATG
6021-2		31064	10/5/1998	Bio-Diesel (B20)	40,000	FRP	Double-walled	Yes	Yes	Yes	Yes	
6214-1	180620	30606	01/03/1996	91 Premium Gasoline	15,000	FRP	Double-walled	Yes	Yes	Yes	Yes	Veeder Root TLS-350 with ATG
6214-2		30607	01/03/1996	89 Unleaded Gasoline	15,000	FRP	Double-walled	Yes	Yes	Yes	Yes	
6214-3		30608	01/03/1996	87 Unleaded Gasoline	20,000	FRP	Double-walled	Yes	Yes	Yes	Yes	
7498-1	180618	30595	10/28/1998	87 Unleaded Gasoline	15,000	FRP	Double-walled	Yes	Yes	Yes	Yes	Veeder Root TLS-350 with ATG
7498-2		30596	10/28/1998	87 Unleaded Gasoline	15,000	FRP	Double-walled	Yes	Yes	Yes	Yes	
7498-3		30597	10/28/1998	91 Premium Gasoline	15,000	FRP	Double-walled	Yes	Yes	Yes	Yes	
8483-1	181127	31047	7/21/1998	Diesel	10,000	FRP	Double-walled	Yes	Yes	Yes	Yes	Veeder Root TLS-350 with ATG
8483-2		31046	7/21/1998	87 Unleaded Gasoline	15,000	FRP	Double-walled	Yes	Yes	Yes	Yes	
8545-2	180004	29612	9/8/1998	JP-5 Jet Fuel	20,000	FRP	Double-walled	Yes	NA	Yes	Yes	Veeder Root TLS-300C with ATG

TABLE 1: UNDERGROUND STORAGE TANKS INVENTORY (CONTINUED)

UST/AST Management Plan
Marine Corps Air Station, Miramar, California

Tank No.	DEH Permit No.	Tank ID No.	Installation Date	Contents	Capacity (gallons)	Tank Material	Tank Containment	Piping Leak Detection	UDC	Striker Plate	Drop Tubes	Tank Leak Detection System
8676-1	003944	11831	2/2/2018	87 Unleaded Gasoline	30,000	FRP	Double-walled	Yes	Yes	Yes	Yes	Incon TS-5000 with ATG
8676-1		11832		Diesel	10,000							
8676-3		11833		91 Premium Gasoline	20,000							
9211-2	180004	29613	9/24/1998	Diesel	5,000	FRP	Double-walled	Yes	NA	Yes	Yes	Veeder Root TLS-300C with ATG
9441-2	180004	29611	8/3/1998	Diesel	600	FRP	Double-walled	Yes	NA	Yes	Yes	Veeder Root TLS-300C with ATG

Notes: ATG = Automatic Tank Gauging
DEH = County of San Diego Department of Environmental Health (CUPA)
FRP = Fiberglass Reinforced Plastic
NA = Not Applicable

TABLE 2: ABOVEGROUND STORAGE TANKS

UST/AST Management Plan
Marine Corps Air Station, Miramar, California

Bldg/AST Number	Shell Capacity (Gallons)	Contents	Tank Type	Function	Secondary Containment
1686-1	147	Diesel	Fixed Horizontal Rectangular Base	Emergency Generator	Double Wall
2130-1	89	Diesel	Fixed Horizontal Rectangular Base	Emergency Generator	Double Wall
2273-1	628	Diesel	Fixed Horizontal Rectangular Base	Emergency Generator	Double Wall
2496-1	150	Diesel	Fixed Horizontal Rectangular Base	Emergency Generator	Double Wall
2661-1	235	Diesel	Fixed Horizontal Rectangular Base	Emergency Generator	Double Wall
2682-1	89	Diesel	Fixed Horizontal Rectangular Base	Emergency Generator	Double Wall
3426-1	480	Diesel	Fixed Horizontal Rectangular	Greens Equipment	Double Wall
3426-2	500	Gasoline	Fixed Horizontal Rectangular	Greens Equipment	Double Wall
5500-1	200	Waste Cooking Oil	Portable Horizontal Rectangular	Waste Disposal	Pop-Up Rubber Berm
6001-1	65	Diesel	Fixed Horizontal Cylinder	Fire Pumps	Concrete Berm
6009-1	5,000	JP-5 Jet Fuel	Mobile Refueler (M970 Tanker Trailer)	Fuel Delivery	Pop-Up Rubber Berm
6009-2	5,000	JP-5 Jet Fuel	Mobile Refueler (M970 Tanker Trailer)	Fuel Delivery	Pop-Up Rubber Berm
6009-3	5,000	JP-5 Jet Fuel	Mobile Refueler (M970 Tanker Trailer)	Fuel Delivery	Pop-Up Rubber Berm
6009-4	5,000	JP-5 Jet Fuel	Mobile Refueler (M970 Tanker Trailer)	Fuel Delivery	Pop-Up Rubber Berm
6009-5	5,000	JP-5 Jet Fuel	Mobile Refueler (M970 Tanker Trailer)	Fuel Delivery	Pop-Up Rubber Berm
6009-6	5,000	JP-5 Jet Fuel	Mobile Refueler (M970 Tanker Trailer)	Fuel Delivery	Pop-Up Rubber Berm
6009-7	5,000	JP-5 Jet Fuel	Mobile Refueler (M970 Tanker Trailer)	Fuel Delivery	Pop-Up Rubber Berm
6009-8	5,000	JP-5 Jet Fuel	Mobile Refueler (M970 Tanker Trailer)	Fuel Delivery	Pop-Up Rubber Berm

TABLE 2: ABOVEGROUND STORAGE TANKS (CONTINUED)
UST/AST Management Plan
Marine Corps Air Station, Miramar, California

Bldg/AST Number	Shell Capacity (Gallons)	Contents	Tank Type	Function	Secondary Containment
6009-9	5,000	JP-5 Jet Fuel	Mobile Refueler (M970 Tanker Trailer)	Fuel Delivery	Pop-Up Rubber Berm
6009-10	5,000	JP-5 Jet Fuel	Mobile Refueler (M970 Tanker Trailer)	Fuel Delivery	Pop-Up Rubber Berm
6009-11	5,000	JP-5 Jet Fuel	Mobile Refueler (M970 Tanker Trailer)	Fuel Delivery	Pop-Up Rubber Berm
6009-12	5,000	JP-5 Jet Fuel	Mobile Refueler (M970 Tanker Trailer)	Fuel Delivery	Pop-Up Rubber Berm
6009-13	900	JP-5 Jet Fuel	Mobile Horizontal Square (SIXCON)	Fuel Delivery	Pop-Up Rubber Berm
6009-14	900	JP-5 Jet Fuel	Mobile Horizontal Square (SIXCON)	Fuel Delivery	Pop-Up Rubber Berm
6009-15	900	JP-5 Jet Fuel	Mobile Horizontal Square (SIXCON)	Fuel Delivery	Pop-Up Rubber Berm
6009-16	900	JP-5 Jet Fuel	Mobile Horizontal Square (SIXCON)	Fuel Delivery	Pop-Up Rubber Berm
6010-1	528	Used Oil	Fixed Vertical Cylinder (Blue Betty)	Hazardous Waste Disposal	Double Wall
6017-1	115	Diesel	Fixed Horizontal Cylinder	Fire Pumps	Concrete Berm
6017-2	115	Diesel	Fixed Horizontal Cylinder	Fire Pumps	Concrete Berm
6018-1	900	JP-5 Jet Fuel	Mobile Horizontal Square (SIXCON)	Fuel Delivery	Concrete Berm
6018-2	900	JP-5 Jet Fuel	Mobile Horizontal Square (SIXCON)	Fuel Delivery	Concrete Berm
6018-3	900	JP-5 Jet Fuel	Mobile Horizontal Square (SIXCON)	Fuel Delivery	Concrete Berm
6018-4	900	JP-5 Jet Fuel	Mobile Horizontal Square (SIXCON)	Fuel Delivery	Concrete Berm
6018-5	900	JP-5 Jet Fuel	Mobile Horizontal Square (SIXCON)	Fuel Delivery	Concrete Berm
6018-6	900	JP-5 Jet Fuel	Mobile Horizontal Square (SIXCON)	Fuel Delivery	Concrete Berm
6018-7	900	JP-5 Jet Fuel	Mobile Horizontal Square (SIXCON)	Fuel Delivery	Concrete Berm
6018-8	900	JP-5 Jet Fuel	Mobile Horizontal Square (SIXCON)	Fuel Delivery	Concrete Berm
6018-9	900	JP-5 Jet Fuel	Mobile Horizontal Square (SIXCON)	Fuel Delivery	Concrete Berm
6018-10	900	JP-5 Jet Fuel	Mobile Horizontal Square (SIXCON)	Fuel Delivery	Concrete Berm

TABLE 2: ABOVEGROUND STORAGE TANKS (CONTINUED)
UST/AST Management Plan
Marine Corps Air Station, Miramar, California

Bldg/AST Number	Shell Capacity (Gallons)	Contents	Tank Type	Function	Secondary Containment
6018-11	900	JP-5 Jet Fuel	Mobile Horizontal Square (SIXCON)	Fuel Delivery	Concrete Berm
6018-12	900	JP-5 Jet Fuel	Mobile Horizontal Square (SIXCON)	Fuel Delivery	Concrete Berm
6018-13	900	JP-5 Jet Fuel	Mobile Horizontal Square (SIXCON)	Fuel Delivery	Concrete Berm
6018-14	900	JP-5 Jet Fuel	Mobile Horizontal Square (SIXCON)	Fuel Delivery	Concrete Berm
6018-15	900	JP-5 Jet Fuel	Mobile Horizontal Square (SIXCON)	Fuel Delivery	Concrete Berm
6214-4	285	Used Oil	Fixed Horizontal Rectangular	Hazardous Waste Disposal	Double Wall
6026-1	5,000	JP-5 Jet Fuel	Mobile Refueler (M970 Tanker Trailer)	Fuel Delivery	Pop-Up Rubber Berm
6026-2	5,000	JP-5 Jet Fuel	Mobile Refueler (M970 Tanker Trailer)	Fuel Delivery	Pop-Up Rubber Berm
6214-5	250	Virgin Lube Oil	Fixed Vertical Cylinder	Vehicle Service	Double Wall
6214-6	250	Virgin Lube Oil	Fixed Vertical Cylinder	Vehicle Service	Double Wall
6218-1	150	Diesel	Fixed Horizontal Cylinder	Fire Pumps	Concrete Berm
6218-2	150	Diesel	Fixed Horizontal Cylinder	Fire Pumps	Concrete Berm
6239-1	79	Diesel	Mobile Horizontal Rectangular Base	Emergency Generator	Double Wall
6239-2	103	Diesel	Mobile Horizontal Rectangular Base	Emergency Generator	Double Wall
6317-1	528	Used Oil	Fixed Vertical Cylinder (Blue Betty)	Hazardous Waste Disposal	Double Wall
6319-1	10,000	E-85 Ethanol	Fixed Horizontal Cylinder	Vehicle Fueling	Double Wall
6655-1	60	Diesel	Fixed Horizontal Rectangular Base	Emergency Generator	Double Wall
6673-1	396	Used Oil	Fixed Vertical Cylinder (Blue Betty)	Hazardous Waste Disposal	Double Wall
6754-1	1,000	Spilled Hazardous Waste	Fixed Horizontal Cylinder	Secondary Containment	Below-Grade Vault
6754-2	528	Used Oil	Fixed Vertical Cylinder (Blue Betty)	Hazardous Waste	Double Wall

TABLE 2: ABOVEGROUND STORAGE TANKS (CONTINUED)
UST/AST Management Plan
Marine Corps Air Station, Miramar, California

Bldg/AST Number	Shell Capacity (Gallons)	Contents	Tank Type	Function	Secondary Containment
				Disposal	
7117-1	214	Diesel	Fixed Horizontal Rectangular Base	Emergency Generator	Double Wall
7122-1	115	Diesel	Fixed Horizontal Cylinder	Fire Pumps	Concrete Berm
7207-1	82	Diesel	Fixed Horizontal Rectangular Base	Emergency Generator	Double Wall
7210-1	214	Diesel	Fixed Horizontal Rectangular Base	Emergency Generator	Double Wall
7224-1	78	Diesel	Fixed Horizontal Rectangular Base	Emergency Generator	Double Wall
7494-1	500	Diesel	Fixed Horizontal Rectangular Base	Emergency Generator	Double Wall
7683-1	1,464	Diesel	Fixed Horizontal Rectangular Base	Emergency Generator	Double Wall
7684-1	200	Waste Cooking Oil	Portable Horizontal Rectangular	Waste Disposal	Rubber Berm and Tent
7684-2	2,644	Diesel	Fixed Horizontal Rectangular Base	Emergency Generator	Double Wall
7906-1	25,000	Diesel	Fixed Vertical Cylinder	Bulk Fuel Storage	Double Wall
7907-1	25,000	Gasoline	Fixed Vertical Cylinder	Bulk Fuel Storage	Double Wall
7908-1	25,000	JP-5 Jet Fuel	Fixed Vertical Cylinder	Bulk Fuel Storage	Double Wall
7909-1	25,000	JP-5 Jet Fuel	Fixed Vertical Cylinder	Bulk Fuel Storage	Double Wall
7931-1	400	Diesel	Fixed Horizontal Rectangular Base	Emergency Generator	Double Wall
7932-1	1,639,659	JP-5 Jet Fuel	Fixed Vertical Cylinder	Bulk Fuel Storage	Concrete Wall
7933-2	1,637,526	JP-5 Jet Fuel	Fixed Vertical Cylinder	Bulk Fuel Storage	Concrete Wall
7934-3	1,641,539	JP-5 Jet Fuel	Fixed Vertical Cylinder	Bulk Fuel Storage	Concrete Wall
7937-1	4,000	Salvaged JP-5 Jet Fuel	Fixed Horizontal Cylinder	Product Recovery	Below-Grade Vault
7956-1	5,000	Salvaged JP-5 Jet Fuel	Fixed Vertical Cylinder	Bulk Fuel Storage	Double Wall
7957-1	5,000	Salvaged JP-5 Jet Fuel	Fixed Vertical Cylinder	Bulk Fuel Storage	Double Wall
7958-1	5,000	Salvaged JP-5 Jet Fuel	Fixed Vertical Cylinder	Bulk Fuel Storage	Double Wall

TABLE 2: ABOVEGROUND STORAGE TANKS (CONTINUED)
UST/AST Management Plan
Marine Corps Air Station, Miramar, California

Bldg/AST Number	Shell Capacity (Gallons)	Contents	Tank Type	Function	Secondary Containment
7959-1	5,000	Salvaged JP-5 Jet Fuel	Fixed Vertical Cylinder	Bulk Fuel Storage	Double Wall
7960-1	5,000	Salvaged JP-5 Jet Fuel	Fixed Horizontal Cylinder	Engine Test Cell	Double Wall
8117-1	1,000	JP-5 Jet Fuel	Fixed Horizontal Cylinder	Engine Test Cell	Concrete Berm
8119-1	396	Used Oil	Fixed Vertical Cylinder (Blue Betty)	Hazardous Waste Disposal	Double Wall
8125-1	100	JP-5 Jet Fuel	Fixed Horizontal Rectangular	Engine Test Cell	Concrete Berm
8128-1	1,000	JP-5 Jet Fuel	Fixed Horizontal Cylinder	Engine Test Cell	Concrete Berm
8200-1	528	Used Oil	Fixed Vertical Cylinder (Blue Betty)	Hazardous Waste Disposal	Double Wall
8402-1	800	Hydraulic Fluid	Fixed Oil-Filled Operational Equipment	Flight Simulator	Active Measures
8461-1	602	Virgin Lube Oil	Fixed Horizontal Cylinder	Aircraft Equipment Testing	Concrete Berm
8461-3	150	Hydraulic Fluid	Fixed Oil-Filled Operational Equipment	Engine Test Stand	Active Measures
8461-4	150	Hydraulic Fluid	Fixed Oil-Filled Operational Equipment	Engine Test Stand	Active Measures
8461-5	150	Hydraulic Fluid	Fixed Oil-Filled Operational Equipment	Engine Test Stand	Active Measures
8461-6	150	Hydraulic Fluid	Fixed Oil-Filled Operational Equipment	Engine Test Stand	Active Measures
8545-1	850	Virgin Lube Oil	Fixed Horizontal Cylinder	Engine Test Cell	Concrete Berm Roof Cover
8656-1	150	Hydraulic Fluid	Fixed Oil-Filled Operational Equipment	Flight Simulator	Active Measures
8671-1	150	Diesel	Fixed Horizontal Rectangular Base	Emergency Generator	Double Wall
8679-1	850	Virgin Lube Oil	Fixed Horizontal Cylinder	Engine Test Cell	Concrete Berm
8679-2	20,000	JP-5 Jet Fuel	Fixed Horizontal Cylinder	Engine Test Cell	Double Wall

TABLE 2: ABOVEGROUND STORAGE TANKS (CONTINUED)
UST/AST Management Plan
Marine Corps Air Station, Miramar, California

Bldg/AST Number	Shell Capacity (Gallons)	Contents	Tank Type	Function	Secondary Containment
9123-1	65	Diesel	Fixed Horizontal Rectangular Base	Emergency Generator	Double Wall
9170-1	528	Used Oil	Fixed Vertical Cylinder (Blue Betty)	Hazardous Waste Disposal	Double Wall
9211-1	100	Diesel	Fixed Vertical Rectangular Day	Emergency Generator	Double Wall
9213-1	200	Diesel	Fixed Horizontal Rectangular Base	Emergency Generator	Double Wall
9213-2	200	Diesel	Fixed Horizontal Rectangular Base	Emergency Generator	Double Wall
9226-1	500	Diesel	Fixed Horizontal Rectangular	Emergency Generator	Double Wall
9227-1	112	Diesel	Fixed Horizontal Rectangular Base	Emergency Generator	Double Wall
9255-1	396	Used Oil	Fixed Vertical Cylinder (Blue Betty)	Hazardous Waste Disposal	Double Wall
9255-2	260	Used Oil	Fixed Horizontal Rectangular	Hazardous Waste Disposal	Double Wall
9266-1	1,000	Diesel	Fixed Horizontal Rectangular	Emergency Generator	Double Wall
9268-1	1,000	Diesel	Fixed Horizontal Rectangular	Emergency Generator	Double Wall
9276-1	350	Diesel	Fixed Horizontal Rectangular Base	Emergency Generator	Double Wall
9277-1	260	Used Oil	Fixed Horizontal Rectangular	Hazardous Waste Disposal	Double Wall
9369-1	113	Diesel	Fixed Horizontal Rectangular Base	Emergency Generator	Double Wall
9441-1	150	Diesel	Fixed Horizontal Rectangular Base	Emergency Generator	Double Wall
9452-1	440	Diesel	Fixed Horizontal Cylinder	Emergency Generator	Double Wall
9452-2	150	Diesel	Fixed Horizontal Rectangular Base	Emergency Generator	Double Wall
9470-1	124	Hydraulic Fluid	Fixed Oil-Filled Operational Equipment	Building Elevator	Active Measures
9470-2	260	Used Oil	Fixed Horizontal Rectangular	Hazardous Waste Disposal	Double Wall
9470-3	119	Diesel	Fixed Horizontal	Emergency	Double Wall

TABLE 2: ABOVEGROUND STORAGE TANKS (CONTINUED)
UST/AST Management Plan
Marine Corps Air Station, Miramar, California

Bldg/AST Number	Shell Capacity (Gallons)	Contents	Tank Type	Function	Secondary Containment
			Rectangular Base	Generator	
9470-4	209	Diesel	Fixed Horizontal Rectangular Base	Emergency Generator	Double Wall
9470-5	1,272	Diesel	Fixed Horizontal Rectangular Base	Emergency Generator	Double Wall
9470-6	260	Used Oil	Fixed Horizontal Rectangular	Hazardous Waste Disposal	Double Wall
9500-1	100	Diesel	Fixed Horizontal Rectangular Base	Emergency Generator	Double Wall
9500-2	528	Used Oil	Fixed Vertical Cylinder (Blue Betty)	Hazardous Waste Disposal	Double Wall
9570-1	451	Diesel	Fixed Horizontal Rectangular Base	Emergency Generator	Double Wall
9611-1	395	Diesel	Fixed Horizontal Rectangular Base	Emergency Generator	Double Wall
9651-1	162	Diesel	Fixed Horizontal Rectangular Base	Emergency Generator	Double Wall
9653-1	79	Diesel	Fixed Horizontal Rectangular Base	Emergency Generator	Double Wall
9680-1	89	Diesel	Fixed Horizontal Rectangular Base	Emergency Generator	Double Wall
9681-1	89	Diesel	Fixed Horizontal Rectangular Base	Emergency Generator	Double Wall
9705-1	1,000	JP-5 Jet Fuel	Fixed Horizontal Cylinder	Vehicle Refueling	Double Wall
9743-1	5,000	Salvaged JP-5 Jet Fuel	Fixed Horizontal Rectangular	Open Burn Pit	Double Wall
9743-2	365	Salvaged JP-5 Jet Fuel	Fixed Vertical Cylinder	Open Burn Pit	Concrete Berm
9744-1	1,000	Salvaged JP-5 Jet Fuel	Mobile Refueler (Tanker Truck)	Fuel Delivery	Active Measures
9744-2	1,000	JP-5 Jet Fuel	Mobile Refueler (Tanker Truck)	Fuel Delivery	Active Measures
9744-3	4,000 (2,000 + 2,000)	JP-5 Jet Fuel	Mobile Refueler (Tanker Truck)	Fuel Delivery	Active Measures
9744-4	5,000	JP-5 Jet Fuel	Mobile Refueler (Tanker Truck)	Fuel Delivery	Active Measures
9744-5	5,000	JP-5 Jet Fuel	Mobile Refueler (Tanker Truck)	Fuel Delivery	Active Measures
9744-6	5,000	JP-5 Jet Fuel	Mobile Refueler (Tanker Truck)	Fuel Delivery	Active Measures

TABLE 2: ABOVEGROUND STORAGE TANKS (CONTINUED)
UST/AST Management Plan
Marine Corps Air Station, Miramar, California

Bldg/AST Number	Shell Capacity (Gallons)	Contents	Tank Type	Function	Secondary Containment
9744-7	5,000	JP-5 Jet Fuel	Mobile Refueler (Tanker Truck)	Fuel Delivery	Active Measures
9744-8	6,000	JP-5 Jet Fuel	Mobile Refueler (Tanker Truck)	Fuel Delivery	Active Measures
9744-9	6,000	JP-5 Jet Fuel	Mobile Refueler (Tanker Truck)	Fuel Delivery	Active Measures
9744-10	6,000	JP-5 Jet Fuel	Mobile Refueler (Tanker Truck)	Fuel Delivery	Active Measures
9744-11	6,000	JP-5 Jet Fuel	Mobile Refueler (Tanker Truck)	Fuel Delivery	Active Measures
9744-12	10,000	JP-5 Jet Fuel	Mobile Refueler (Tanker Truck)	Fuel Delivery	Active Measures
9744-13	10,000	JP-5 Jet Fuel	Mobile Refueler (Tanker Truck)	Fuel Delivery	Active Measures
9770-1	118	Hydraulic Fluid	Fixed Oil-Filled Operational Equipment	Building Elevator	Active Measures
9770-2	1,959	Diesel	Fixed Horizontal Rectangular Base	Emergency Generator	Double Wall
20301-1	2,000	JP-5 Jet Fuel	Fixed Horizontal Rectangular	Bulk Fuel Storage	Double Wall
21134A-1	209	Diesel	Fixed Horizontal Rectangular Base	Emergency Generator	Double Wall
22103-1	78	Diesel	Fixed Horizontal Rectangular Base	Emergency Generator	Double Wall
22111-1	89	Diesel	Fixed Horizontal Rectangular Base	Emergency Generator	Double Wall
Bowser-1	600	JP-5 Jet Fuel	Mobile Defuelers (Bowser)	Salvaged Fuel Collection	Active Measures
Bowser-2	600	JP-5 Jet Fuel	Mobile Defuelers (Bowser)	Salvaged Fuel Collection	Active Measures
Bowser-3	600	JP-5 Jet Fuel	Mobile Defuelers (Bowser)	Salvaged Fuel Collection	Active Measures
Bowser-4	600	JP-5 Jet Fuel	Mobile Defuelers (Bowser)	Salvaged Fuel Collection	Active Measures
Bowser-5	600	JP-5 Jet Fuel	Mobile Defuelers (Bowser)	Salvaged Fuel Collection	Active Measures
Bowser-6	600	JP-5 Jet Fuel	Mobile Defuelers (Bowser)	Salvaged Fuel Collection	Active Measures
owser-7	600	JP-5 Jet Fuel	Mobile Defuelers (Bowser)	Salvaged Fuel Collection	Active Measures

TABLE 3: EVALUATION OF ALTERNATIVES FOR MCAS MIRAMAR UNDERGROUND STORAGE TANKS

UST/AST Management Plan
Marine Corps Air Station, Miramar, California

Building No.	DEH Permit No.	Tank ID No.	Contents	Capacity (gallons)	Purpose	Alternative
2662	215491	388070	Diesel	15,000	Vehicle fueling	For vehicle fueling stations, USTs have been used to provide fuel in a location that generally has limited space to install a similar capacity AST and is not threatened by collision with vehicle traffic. Alternative is to replace USTs with tanks mounted within below-grade vault that provides greater level of inspection and corrosion protection.
		388073	87 Unleaded Gasoline	30,000	Vehicle fueling	
		388076	87 Unleaded Gasoline	30,000	Vehicle fueling	
		388077	91 Premium Gasoline	30,000	Vehicle fueling	
6021	181142	31063	JP-5 Jet Fuel	40,000	Equipment fueling	
		31064	Bio Diesel (B20)	40,000	Vehicle fueling	
6214	180620	30606	91 Premium Gasoline	15,000	Vehicle fueling	
		30607	89 Unleaded Gasoline	15,000	Vehicle fueling	
		30608	87 Unleaded Gasoline	20,000	Vehicle fueling	
6214	180618	30595	87 Unleaded Gasoline	15,000	Vehicle fueling	
		30596	87 Unleaded Gasoline	15,000	Vehicle fueling	
		30597	91 Premium Gasoline	15,000	Vehicle fueling	
7498	180618	30595	87 Unleaded Gasoline	15,000	Vehicle fueling	

TABLE 3: EVALUATION OF ALTERNATIVES FOR MCAS MIRAMAR UNDERGROUND STORAGE TANKS (CONTINUED)
UST/AST Management Plan
Marine Corps Air Station, Miramar, California

Building No.	DEH Permit No.	Tank ID No.	Contents	Capacity (gallons)	Purpose	Alternative
		30596	87 Unleaded Gasoline	15,000	Vehicle fueling	
		30597	91 Premium Gasoline	15,000	Vehicle fueling	
		30599	Diesel	2,000	Fuel supply to Emergency Generator	
8483	181127	31047	Diesel	10,000	Vehicle fueling	For vehicle fueling stations, USTs have been used to provide fuel in a location that generally has limited space to install a similar capacity AST and is not threatened by collision with vehicle traffic. Alternative is to replace USTs with tanks mounted within below-grade vault that provides greater level of inspection and corrosion protection.
		31046	87 Unleaded Gasoline	15,000	Vehicle fueling	
8545	180004	29612	JP-5 Jet Fuel	20,000	Fuel supply to Engine Test Cell	Existing location has limited area to install AST of similar capacity. Evaluate if smaller capacity AST can satisfy engine test stand requirements.
8676	003944	11831	87 Unleaded Gasoline	30,000	Vehicle fueling	For vehicle fueling stations, USTs have been used to provide fuel in a location that generally has limited space to install a similar capacity AST and is not threatened by collision with vehicle traffic. Alternative is to replace USTs with tanks mounted within below-grade vault that provides greater level of inspection and corrosion protection.
		11832	Diesel	10,000	Vehicle fueling	
		11833	91 Premium Gasoline	20,000	Vehicle fueling	
9211	180004	29613	Diesel	5,000	Fuel supply to Emergency Generator	Existing USTs can be replaced with ASTs that are either stand-alone units, such as at Building 9226, or install with an integral base tank.
9441	180004	29611	Diesel	600	Fuel supply to Emergency Generator	

TABLE 4: MCAS MIRAMAR PLAN OF ACTION AND MILESTONES AND CONSOLIDATION/REDUCTION PLAN FOR UNDERGROUND STORAGE TANKS

UST/AST Management Plan
Marine Corps Air Station, Miramar, California

Building No.	Tank ID No.	Contents	Capacity (gallons)	Milestone	Consolidation/Reduction
2662	388070	Diesel	15,000	Recent new UST installation.	Recent new installation of gasoline station.
	388073	87 Unleaded Gasoline	30,000		
	388076	87 Unleaded Gasoline	30,000		
	388077	91 Premium Gasoline	30,000		
6021	31063	JP-5 Jet Fuel	40,000	Replacement not urgent. No scheduled replacement. Continue with scheduled inspections.	No, only JP-5 UST at Building 6021.
	31064	Bio Diesel (B20)	40,000	Replacement not urgent. No scheduled replacement. Continue with scheduled inspections.	Primary station for fueling diesel Government Owned Vehicles (GOVs). Further actions dependent upon regulator's decision to approve the UST for storage of biodiesel (currently under review).
6214	30606	91 Premium Gasoline	15,000	Removal plans are to be determined.	This retail gasoline dispensing station is scheduled to be removed due to the construction of a new facility in a different location on the Base. Date of removal is to be determined.
	30607	89 Unleaded Gasoline	15,000		
	30608	87 Unleaded Gasoline	20,000		
7498	30595	87 Unleaded Gasoline	15,000	Replacement not urgent. No scheduled replacement. Continue with scheduled inspections.	Primary station for fueling non-military vehicles on base.
	30596	87 Unleaded Gasoline	15,000		
	30597	91 Premium Gasoline	15,000		
	30599	Diesel	2,000		

TABLE 4: MCAS MIRAMAR PLAN OF ACTION AND MILESTONES AND CONSOLIDATION/REDUCTION PLAN FOR UNDERGROUND STORAGE TANKS (CONTINUED)

UST/AST Management Plan
Marine Corps Air Station, Miramar, California

Building No.	Tank ID No.	Contents	Capacity (gallons)	Milestone	Consolidation/Reduction
8483	31047	Diesel	10,000	Replacement not urgent. No scheduled replacement. Continue with scheduled inspections.	No, only diesel UST at Building 8483.
	31046	87 Unleaded Gasoline	15,000		No, only gasoline UST at Building 8483.
8545	29612	JP-5 Jet Fuel	20,000	Replacement not urgent. No scheduled replacement. Continue with scheduled inspections.	No, alternate fuel supply at test cell facility is not available.
8676	11831	87 Unleaded Gasoline	30,000	Recent new UST installation.	Recent new installation of gasoline station.
	11832	Diesel	10,000		
	11833	91 Premium Gasoline	20,000		
9211	29613	Diesel	5,000	Replacement not urgent. No scheduled replacement. Continue with scheduled inspections.	No, alternate fuel supply for generator is not available. UST can be removed if the generator is not needed.
9441	29611	Diesel	600	Removal plans are to be determined.	Removal recommended due to emergency generator it fuels is no longer in service. Emergency generator has a 150 gallon integrated fuel tank, is not needed for its original purpose and can be relocated to a different facility without the UST 9441.

CY = calendar year

TABLE 5: UNDERGROUND STORAGE TANK INSPECTION AND MAINTENANCE FREQUENCY

UST/AST Management Plan
Marine Corps Air Station, Miramar, California

Frequency	Status	Description	Responsible Person
Site Personnel Responsibilities			
Daily	Mandatory	Visually inspect for leaks	On-Site Personnel
Daily	Mandatory	Check inventory	On-Site Personnel
Daily	Mandatory	Check monitoring system (*Emergency Generators only* during monthly startup or when system is operated)	On-Site Personnel
Daily	Mandatory	Remove water from sumps dispose of as hazardous waste (as needed)	On-Site Personnel
Daily	Mandatory	Record and report spills, overfills, unauthorized removals	On-Site Personnel
Weekly	Recommended	Review daily logs	Supervisor
Weekly	Mandatory	Emergency response equipment inspection per business plan	Supervisor
Monthly	Mandatory	Inventory reconciliation	Supervisor
Monthly	Mandatory	Prepare monthly inspection report	Supervisor
Monthly	Recommended	Check inventory spill cleanup materials	On-Site Personnel
Monthly	Recommended	Check monitoring system	On Site Personnel
Quarterly	Mandatory	Inspect tank system, calibrate leak detection system	Qualified Contractor
Annually	Recommended	Review and update Business Plan	Supervisor
Annually	Recommended	Review and update Emergency Procedures	Supervisor
Annually	Recommended	Review and update Monitoring Procedures	Supervisor
Annually	Mandatory	Employee training	Supervisor
Four Years	Mandatory	Submit to DEH the Operating Permit Renewal	Supervisor
UST and UST System Testing/Certification Requirements			
Three Years	Mandatory	UST system secondary containment testing	Qualified Contractor
Annually	Mandatory	ATG inspection certification	Qualified Contractor
Annually	Mandatory	Automatic leak detection testing/certification	Qualified Contractor
Annually	Mandatory	Continuous monitoring system testing/certification	Qualified Contractor

TABLE 5: UNDERGROUND STORAGE TANK INSPECTION AND MAINTENANCE FREQUENCY (CONTINUED)

UST/AST Management Plan
Marine Corps Air Station, Miramar, California

Frequency	Status	Description	Responsible Person
Compliance Inspections			
Annually	Mandatory	Compliance inspection	DEH
Annually	Mandatory	Respond to Inspection report	Owner/Operator within 30 days
Four Years	Mandatory	Operating permit renewal	DEH

Notes:
ATG = automatic tank gauging
DEH = County of San Diego Department of Environmental Health
UST = underground storage tank

TABLE 6: ABOVEGROUND STORAGE TANK REQUIREMENTS FOR STORING COMBUSTIBLE OR FLAMMABLE LIQUIDS

UST/AST Management Plan
Marine Corps Air Station, Miramar, California

Tank Item	Description	Recommendation	Regulatory Reference
Construction	Tank is approved by Underwriters Laboratories, Inc. (UL) for storage of flammable and combustible liquids and is compatible with the liquids stored.	Install a tank constructed of carbon steel or stainless steel that complies with a UL 142 or 2085 standard rating.	NFPA 30 Section 21.4.1
Containment	Provide a secondary means of containment for the entire capacity of the largest single container and sufficient freeboard to contain precipitation, if applicable.	Install a tank with double –wall construction that does not have secondary containment open to precipitation.	40 CFR 112.7 and NFPA 30 Section 22.11
Level Indication and Overfill Protection	Primary tank contains a high liquid level alarm with an audible or visual signal at 90 percent tank capacity. Primary tank also has a positive shutoff valve at 95 percent tank capacity	One of the following devices must be provided for each AST: 1. High level liquid alarm with an audible or visual signal; 2. High level liquid pump cutoff device to stop flow at a predetermined level; 3. Direct audible or code signal communication between the tank operator and the pumping station; or 4. A fast response system for determining the liquid level of the container such as direct vision gauges. Liquid level gauges can be a mechanical post or clock gauge, or an electronic gauge with a sensor. As an option to an electronic sensor that closes a valve at 95 percent capacity, tanks can be installed with internal valves that mechanically close with rising internal fluid level.	40 CFR 112.8
Leak Detection	Provide a means of detecting a leak from the primary tank to the secondary tank.	Double-wall constructed tanks have a separate monitoring inspection port to determine if a leak has occurred from the primary tank. Install a mechanical leak gauge or electronic leak detection sensor.	40 CFR 112.8(c)(6) and 40 CFR 112.8(c)(10)
Normal Vent	Atmospheric storage tanks should be adequately vented to prevent the development of a vacuum or pressure that can exceed the design pressure of the tank when filling, emptying, or due to atmospheric temperature changes.	Provide a normal vent at least as large as the tank filling or withdrawal connection, whichever is larger, but in no case less than 1 1/4-inch nominal inside diameter. For combustible liquids (i.e. diesel fuel), provide a short vent with a rain cap. For Class I flammable liquids (i.e. gasoline), vent shall be equipped with piping that extends 12-feet above grade and topped with a flame arrester.	29 CFR 1910.106(b)(2)(iv) NFPA 30 Section 21.4.3
Emergency Vent	Every AST should have emergency relief venting in the form of construction or a device or devices that will relieve excess internal pressure caused by an exposure fire.	Evaluate each AST for the ability to install a properly rated emergency relief vent of the appropriate diameter and pressure rating to adequately ventilate the tank in the event	NFPA 30 Section 22.7.1

TABLE 6: ABOVEGROUND STORAGE TANK REQUIREMENTS FOR STORING COMBUSTIBLE OR FLAMMABLE LIQUIDS (CONTINUED)

UST/AST Management Plan
Marine Corps Air Station, Miramar, California

Tank Item	Description	Recommendation	Regulatory Reference
		of an emergency. Note that the opening for an emergency vent is normally larger than a standard vent opening and may range from 3 to 6 inches in diameter. In some cases, the top manway lid of an AST may be used as an emergency vent with modified attachment bolts (not for UL 2085 rated tanks). An emergency vent is required both on the primary tank and annular space of a double-wall constructed AST, however an emergency vent is not required for mobile or portable ASTs.	
Restraint	Provide adequate restraints for protection from wind and earthquakes.	Provide adequate seismic constraints, if needed, based on local requirements. The tank manufacturer can provide seismic calculations for most commercially available ASTs.	NFPA 30 Section 22.5
Grounding	All metallic equipment such as tanks, machinery, and piping where the potential exists for an ignitable mixture to be present, shall be properly bonded or grounded. The sources of ignition may include sparks (static, electrical, and mechanical).	Confirm that all ASTs containing flammable and combustible liquids have adequate electrical bonding and grounding. Connect an appropriate size copper braided grounding wire (No. 4 or larger) to a metal tank support or a tab connection on top of the metal portion of the tank from a qualified electrical ground under National Electrical Code guidelines. Drive a copper grounding rod into the open subsurface next to each tank to provide a permanent ground connection, if needed.	29 CFR 1910.106 NFPA 30 Section 6.5.4
Vehicle Protection	Protect the tank from vehicle impact protection.	Guard posts shall be located not less than 5 feet from the tank, spaced no more than 4 feet on center, not less than 3 feet in height, constructed of not less than 4-inch diameter steel, and concrete filled. UL 2085 type tanks also offer additional vehicle protection with a concrete exterior surface.	NFPA 30 Section 22.15 and NFPA 30A Section 4.3.7
Spacing	The distance between two storage tanks containing flammable or combustible liquids must be at least three feet. Tanks shall be located at least 15 feet from property lines and at least 5 feet from buildings or public ways.	Install ASTs with adequate minimum spacing. Note spacing requirements increase with the volume capacity of tank.	NFPA 30 Section 22.4

TABLE 6: ABOVEGROUND STORAGE TANK REQUIREMENTS FOR STORING COMBUSTIBLE OR FLAMMABLE LIQUIDS (CONTINUED)

UST/AST Management Plan
Marine Corps Air Station, Miramar, California

Tank Item	Description	Recommendation	Regulatory Reference
Signage	Each AST must be marked to identify the tank's liquid contents and the associated hazards for the general public. ASTs containing combustible or flammable liquids shall have a sign or label that meets the requirements of NFPA 704, Standard System for the Identification of the Hazards of Materials for Emergency Response (i.e. NFPA diamond), or another approved system such as a Department of Transportation (DOT) hazard class placard.	Make sure each AST has the following signs posted: 1) Description of tank contents (Diesel Fuel, Gasoline, No. 2 Fuel Oil, etc.); 2) DOT Flammable/Combustible Placard (red diamond) or NFPA Placard (Four-Colored Diamond with appropriate rating numbers); and 3) "No Smoking" signs if the tank contains a flammable liquid (flash point below 100 degrees F). The label should be located where it can be easily seen, such as on the side of the tank, the shoulder of an accessway or walkway to the tank, or on the fencing surrounding the tank. The signs should also be placed facing in the direction where emergency vehicles or personnel would normally approach the site. If more than one tank is involved, separate markings are to be provided for each individual tank.	NFPA 30 Sections 21.7.2.1 and 21.7.2.2

Notes:
CFR – Code of Federal Regulations
NFPA 30 – National Fire Protection Association Code 30, Flammable and Combustible Liquids (2012 edition)

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TABLE 7: STI SP001 MAXIMUM ALLOWABLE INTERVAL FOR INSPECTIONS AND TESTING OF SHOP-BUILT ABOVEGROUND STORAGE TANKS
UST/AST Management Plan
Marine Corps Air Station, Miramar, California

Description	Frequency Category 1 ASTs	Frequency Category 2 ASTs	Frequency Category 3 ASTs
AST of capacity <1,100 gallons	P	P	P + E and L every 10 years
AST of capacity 1,101 – 5,000 gallons	P	P + E and L every 10 years	P + E and L every 5 years + I every 10 years; or P + E every 5 years and L every 2 years
AST of capacity 5,001 – 30,000 gallons	P + E every 20 years	P + E every 10 years and I every 20 years; or P + E every 5 years and L every 10 years	P + E and L every 5 years + I every 10 years; or P + E every 5 years and L every year
AST of capacity 30,001 – 50,000 gallons	P + E every 20 years	P + E and L every 5 years and I every 15 years	P + E and L every 5 years and I every 10 years
Portable Containers	P	P	P

NOTES:

CATEGORY 1 ASTS HAVE SPILL CONTROL AND CRDM

CATEGORY 2 ASTS HAVE SPILL CONTROL BUT NO CRDM

CATEGORY 3 ASTS DO NOT HAVE SPILL CONTROL AND NO CRDM

CRDM = CONTINUOUS RELEASE DETECTION METHOD

P = MONTHLY AND ANNUAL VISUAL INSPECTION BY OWNER/OPERATOR

E = EXTERNAL INTEGRITY INSPECTIONS CONDUCTED BY SP001 CERTIFIED INSPECTOR

I = INTERNAL INTEGRITY INSPECTIONS CONDUCTED BY SP001 CERTIFIED INSPECTOR

L = LEAK TESTING CONDUCTED BY OWNER/OPERATOR OR DESIGNEE

ASTS WHICH ARE OF DOUBLE-WALLED CONSTRUCTION ARE NOT REQUIRED TO HAVE INTERNAL AND EXTERNAL INTEGRITY INSPECTIONS.

ASTS THAT ARE ELEVATED ARE NOT REQUIRED TO HAVE INTERNAL INTEGRITY INSPECTIONS.

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TABLE 8: GENERAL INSPECTION REQUIREMENTS FOR FIELD ERECTED ABOVEGROUND STORAGE TANKS PER API 653

UST/AST Management Plan
Marine Corps Air Station, Miramar, California

Description	Inspection Method	Frequency
Inspection of tank's exterior surfaces	Visual	Monthly
External inspections	Ultrasonic	Every 5 years or less[1]
Tank wall thickness	Ultrasonic	Every 5 years or less[1]
Internal inspections when tank bottom is not visible	Internal inspection	Every 10 years or less[1]
Internal inspections when tank bottom is visible	External inspection in lieu of internal inspection	Every 10 years or less[1]

[1]. When corrosion rates are unknown, external inspections and tank wall thickness must be determined after no more than 5 years, and internal inspections are no more than 10 years.

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APPENDIX A
REGULATORY SUMMARY TABLES FOR UNDERGROUND STORAGE TANKS

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TABLE A-1: TANK OWNER'S OPTIONS TO INSTALL NEW PIPING THAT IS STORING A HAZARDOUS SUBSTANCE INCLUDING MOTOR VEHICLE FUELS AND INSTALLED AFTER 1 JULY 1987 (1)
UST/AST Management Plan
Marine Corps Air Station, Miramar, California

Options	Action	Citation (CCR)	Monitoring
1	Install primary piping integral with secondary containment (e.g. a double-walled piping) • Choose piping that: – is approved by an independent testing organization in accordance with industry codes, voluntary consensus standards, or engineering standards – is compatible with stored product – has external corrosion protection • Install a spill container • Install an overfill prevention device	§2631(b) §2635(a)(2) §2636(a), (b) and (c)(1) §280.32, 40CFR	Monitoring Methods for Piping with Secondary Containment
2	Install primary piping separate from secondary containment (e.g. vaulted or trench lined) • Choose a tank system in which: – both primary and secondary containment are compatible with stored product – both primary and secondary containment are corrosion protected – the primary containment is approved by an independent testing organization in accordance with industry codes, voluntary consensus standards, or engineering standards – the secondary containment is designed and constructed according to an engineering specification approved by a state registered professional engineer or according to a nationally recognized industry code or engineering standard • Install a spill container • Install an overfill prevention device	§2631(a), (b), and (d) §2635(a)(2) and (b)(1) and (2) §280.32, 40CFR	Method 1 for a vaulted tank and Method 2 for a tank installed in a membrane-lined pit, under Monitoring Methods for Tanks with Secondary Containment

(1) Single-walled piping installed on a double-walled tank is acceptable provided the tank stores motor vehicle fuel and it was installed on or after January 1, 1984 and before July 1, 1987 [Section 25291(a)(7)(E) HSC]. Monitor such piping in accordance with Table 5-11, "Monitoring Methods for Single-walled Piping"

Most recent regulations can be found at following links:
23 CCR Division 3 Chapter 16
40 CFR 280

TABLE A-2: UNDERGROUND STORAGE TANK SPILL CONTAINER REQUIREMENTS

UST/AST Management Plan
Marine Corps Air Station, Miramar, California

Option	Construction	Citation (CCR)	Monitoring
1	• Install a spill container around each fill pipe • Choose a spill container that: • if made of metal, has exterior corrosion protection • has a minimum capacity of 5-gal (19 liters) • has a drain valve which allows drainage of the collected spill into the primary container. If the spill container does not have a drain valve the owner or operator will have to provide another way to keep the spill container empty	§2635(b) §2665	Visual inspection at a designated interval approved by the local agency. Keep a log of inspection results identifying: operator date results of inspection any follow-up action taken

TABLE A-3: UNDERGROUND STORAGE TANK OVERFILL PREVENTION DESIGN CRITERIA AND EXEMPTIONS (1)

UST/AST Management Plan
Marine Corps Air Station, Miramar, California

Options	Device Performance Criteria	Example(s) of Device(s)	Citation (CCR)
1	• Transfer operator is alerted by an audible and visual alarm when product reaches 90% of tank capacity	• Automatic tank gauging (ATG) • Product Level Overfill Alarm	§2635(b)(2)
2	• Transfer operator is alerted by restriction of product flow into the tank when product reaches 90% of tank capacity	• Ball float vent valve in the vent/vapor recovery line	§2635(b)(2) LG 150-2, "Ball Float Vent Valve Vs. Fill Tube Positive Shutoff Valve
3	• Delivery of flow to the tank is restricted at least 30 minutes before the tank overfills, provided the restriction occurs when the tank is filled to no more than 95% of capacity; and activate an audible alarm sounds at least five minutes before the tank overfills	• Not commonly used	§2635(b)(2)
4	• Dispensing of product into the tank is positively shut-off when product reaches 95% of tank capacity	• Fill tube positive shutoff valve set at 95% of tank capacity	§2635(b)(2) LG 150-2, "Ball Float Vent Valve Vs. Fill Tube Positive Shutoff Valve
5	• Dispensing of product into the tank is positively shut-off at a level such that none of the fittings located at the top of the tank are exposed to product due to overfilling	• Fill tube positive shutoff valve set at a level to achieve this criteria	§2635(b)(2) LG 150-2, "Ball Float Vent Valve Vs. Fill Tube Positive Shutoff Valve

(1) The local agency may waive the requirement for overfill prevention equipment if all of the following are satisfied:

- the tank inlet exists in an observable area; the tank system is filled by transfers of no more than 25-gal at one time; and
- the spill container is adequate to collect any overfill [23 CCR, §2635(b)(3)].
- The transfer of product should also be monitored to ensure that no spills occur, or that it is cleaned up in the event of a spill.

TABLE A-4: MONITORING METHODS FOR UNDERGROUND STORAGE TANKS WITH SECONDARY CONTAINMENT

UST/AST Management Plan
Marine Corps Air Station, Miramar, California

Choose the Appropriate Method		
Method	**Monitoring Criteria**	**Citation (CCR)**
1) Visual Monitoring of Primary Containment of Vaulted Tanks	Monitor all exterior surfaces of the underground storage tank and the surface of the floor directly beneath the underground storage tank daily by direct viewing. See the regulations for further details	§2632(c)(1)
2)Interstitial Monitoring of Double-Walled Tanks	Install a continuous monitoring system that is connected to an audible and visual alarm	§2632(c)(2) §25291(a)(6) HSC LG 113, "Liquid-phase Interstitial Detector" or "Pressure/Vacuum Interstitial Monitor"

TABLE A-5: MONITORING METHODS FOR PIPING WITH SECONDARY CONTAINMENT ASSOCIATED WITH UNDERGROUND STORAGE TANKS

UST/AST Management Plan
Marine Corps Air Station, Miramar, California

For Pressurized Piping, Choose One of the Four Options. For Other Piping, Follow Specifications Shown		
Type of Piping	**Monitoring Criteria**	**Citation (CCR)**
Pressurized -Option 1	Continuous monitoring system that: • Monitors the secondary containment system • Activates an audible and visual alarm system when a release condition is detected Automatic Line Leak Detector that: • Detects a release equivalent to 3.0 gph defined at 10 psi Piping Integrity Test conducted annually that: • Detects a release from the primary piping equivalent to 0.1 gph defined at 150% of normal operating pressure	§2636(f)(1), (2), and (4) LG 113, "Liquid-phase Interstitial Detector", "Pressure/vacuum Interstitial Monitor", "Automatic Electronic or Mechanical Line Leak Detectors", "Line Tightness Test Methods"
Pressurized -Option 2	Continuous monitoring system that: • Monitors the secondary containment system • Activates an audible and visual alarm system when a release condition is detected • Shuts down the pump system when a release condition is detected Piping Integrity Test conducted annually that: • Detects a release from the primary piping equivalent to 0.1 gph defined at 150% of normal operating pressure	§2636(f)(1), (3), and (4) LG 113, "Liquid-phase Interstitial Detector," "Pressure/Vacuum Interstitial Monitor," "Line Tightness Test Methods"
Pressurized -Option 3	Continuous monitoring system that: • Monitors the secondary containment system • Activates an audible and visual alarm system when a release condition is detected • Shuts down the pump system when a release condition is detected • Shuts down the pumping system if the continuous monitoring system fails or is disconnected	§2636(f)(1) §2636(g)(1), (3), and (4) LG 113, "Liquid-phase Interstitial Detector", "Pressure/Vacuum Interstitial Monitor"
Pressurized -Option 4 **For Emergency Generators Only** (1)	Continuous monitoring system that: • Monitors the secondary containment system • Activates an audible and visual alarm system when a release condition is detected ***Note**: pump shutdown is not required on emergency generator tanks provided the continuous monitoring system is checked daily* Automatic Line Leak Detector that: • Detects a release equivalent to 3.0 gph defined at 10 psi. ***Note**: choose an automatic line leak detector that does not restrict product flow or shut down the pump.*	§2636(f)(1) and (2) §2636(g)(1), (2), and (5) LG 113, "Liquid-phase Interstitial Detector", "Pressure/Vacuum Interstitial Monitor", "Automatic Electronic or Mechanical Line Leak Detectors"

(1) Exemptions for emergency generators are removed in EPA's 2015 UST regulations. Emergency generators must meet release requirements (similar to other USTs) by 13 October 2018 (40 CFR 280.10(a)(ii)

TABLE A-6: UNDERGROUND STORAGE TANK REQUIREMENTS UNDER SB 989 FOR GASOLINE DISPENSING FACILITIES

UST/AST Management Plan
Marine Corps Air Station, Miramar, California

Requirement	HSC Citation	CCR Citation
Owners or operators of USTs with a single-walled component must implement a program of enhanced leak detection if the UST system is within 1,000 feet of a public drinking water well, as identified by the state Geographical Information system (GIS) mapping database.	HSC 25292.4(a)/	CCR Title 23, §2640(e), §2644.1
Conduct annual testing of release detection sensors and alarms.	HSC 25284.1(a)(4)(C)/	CCR Title 23, §2637
Anyone who installs, maintains, repairs, or calibrates monitoring equipment must be trained according to standards set by the SWRCB in regulations and must have one of the following Contractors State Licensing Board (CSLB) licenses: Class A, C-10, C-34, C-36, C-61.	HSC 25284.1(a)(5)(D)/	CCR Title 23, §2715(g), (h)(1)(2)
All UST systems must have a UDC system.	HSC 25284.1(a)(5)(C)/	CCR Title 23, §2660(h)

TABLE A-7: SUMMARY TABLE OF UNDERGROUND STORAGE TANK LEAK PREVENTION AND ENFORCEMENT PROVISIONS

UST/AST Management Plan
Marine Corps Air Station, Miramar, California

Item	Summary of Requirement	Citation (HSC)
Items 1 through 5 only apply to UST systems installed on or after July 1, 2003		
1	Primary and secondary containment must be "product tight." Product tight means impervious to the liquid and vapor of the stored substance, to prevent seepage from containment	HSC §25290.2(a), (c)(1), (c)(2) HSC §25290.1(a), (c)(1), (c)(2)
2	Secondary containment must be constructed to prevent water intrusion into the UST system by precipitation, infiltration, or surface runoff	HSC §25290.2(c)(3); HSC §25290.1(c)(3)
3	The UST system must be designed and constructed with a continuous monitoring system capable of (1) detecting entry of the liquid substance stored in the primary containment into the secondary containment and (2) detecting water intrusion into the secondary containment	HSC §25290.2(d)
4	The UST must be tested after installation (but before being put into service) using one of the following: • Enhanced leak detection (ELD), • an inert gas pressure test certified by a third-party and approved by the SWRCB, • or a test method deemed equivalent to ELD and approved by the SWRCB in regulation	HSC §25290.2(i); HSC §25290.1(j)
5	Vent lines, vapor recovery lines, and fill pipes that are beneath the surface of the ground are defined as pipe and therefore part of the *UST system*, which means they must have secondary containment	HSC §25290.2(j); HSC §25290.1(k)
ELD Testing of UST Systems *Located Within 1,000 feet of a Public Drinking Water Well*		
6	By June 1, 2003, the SWRCB must notify owners and operators of UST systems with secondary containment that are located within 1,000 feet of a public drinking water well of the requirement to test the UST system once using ELD. ELD testing must be performed by January 1, 2005 (Note: This requirement does not apply to UST systems installed after July 1, 2003)	HSC §25292.5(a), (b)
7	If results of ELD testing indicate that any component of the UST system is leaking liquid or vapor, the owner or operator must take appropriate actions to correct the leakage. Additionally, the owner or operator must retest the UST system using ELD until the UST system is no longer leaking liquid or vapor	HSC §25292.5(c), §25292.4(d)
All UST Systems		
8	Owners/operators must annually test spill containment structure(s) designed to prevent a release in the event of a spill or overfill while a hazardous substance is being placed in the tank to show that it is capable of containing the substance until it is detected and cleaned up	HSC, §25284.2
Tank Test Reporting		
9	A tank tester who conducts or supervises a tank or piping integrity test must prepare a report detailing the results of the tank test and maintain a record of the report for at least three years, in a specified manner. Tank testers must sign these reports with an original signature, under penalty of perjury. Additionally, a tank tester must type or print his or her name and license number on the report	HSC §25284.4(i)

TABLE A-7: SUMMARY TABLE OF UNDERGROUND STORAGE TANK LEAK PREVENTION AND ENFORCEMENT PROVISIONS (CONTINUED)

UST/AST Management Plan
Marine Corps Air Station, Miramar, California

Item	Summary of Requirement	Citation (HSC)
Diesel Emergency Generator Tank (EGT) Systems (Note: EPA's 2015 UST regulations removes the exemptions for EGT systems by 13 October 2018.)		
10	EGT system means a UST system that provides power supply in the event of a commercial power failure, stores diesel fuel, and is used solely in connection with an emergency system, legally required standby system, or optional standby system, as defined in the Articles 700, 701, and 702 of the National Electrical Code of the NFPA	HSC §25281.5(c)
11	Any tank or piping that is part of an EGT system located in a structure as described in the HSC §25283.5 is exempt from secondary containment testing if visual inspections of the tank or piping are conducted each time the tank system is operated, but no less than monthly	HSC §25284.1(a)(4)(B)(iii)
12	Unburied fuel piping connected to an EGT system is excluded from the definition of UST, if the owner or operator conducts visual inspections of the piping each time the system is operated, but no less than monthly This exclusion does not apply if the SWRCB adopts specific regulations relative to EGT systems	HSC §25281.5(b)(3)
13	Secondary containment components that are part of an EGT system may be tested using ELD to satisfy the secondary containment testing requirement. However, the test must be performed at the frequency specified by the SWRCB secondary containment testing regulations	HSC §25284.1(a)(4)(B)(ii)
14	If results of ELD testing indicate that any component of the UST system is leaking liquid or vapor, the owner or operator must take appropriate actions to correct the leakage. Additionally, the owner or operator must retest the UST system using ELD until the UST system is no longer leaking liquid or vapor	HSC §25284.1(a)(4)(B)(ii)
Red Tag & Administrative Enforcement Order (AEO) Authority		
15	Deletes requirement for an upgrade certificate of compliance and substitutes red tag authority	Not Applicable
16	A local agency may, upon the discovery of a significant violation that poses an imminent threat to human health, safety, or the environment, immediately affix a red tag to the fill pipe to provide notice that the delivery of petroleum into the UST system is prohibited	HSC §25292.3(a)
17	If a local agency discovers a significant violation that does not pose an imminent threat, the local agency may issue a notice of significant violation to the owner or operator. The owner or operator must within seven days correct the violation. If the owner or operator fails to correct the violation to the satisfaction of the local agency, the local agency may affix a red tag to the fill pipe to provide notice that the delivery of petroleum into the UST system is prohibited	HSC §25292.3(b)
18	Upon notification by the owner that a violation has been corrected, the local agency must re-inspect the UST system within 5 days to determine whether the system continues to be in significant violation. If the local agency determines that the violation has been corrected, the local agency must immediately remove the red tag or may authorize the owner or operator in writing to remove the red tag	HSC §25292.3(f)
19	Prohibits any person from depositing petroleum into an UST system that has a red tag affixed to its fill pipe	HSC §25292.3(d)
20	Requires the SWRCB to adopt regulations defining "significant violation"	HSC §25292.3(g)
21	Authorizes Unified Program Agencies to issue AEOs requiring that violations be corrected and to impose an administrative penalty. The law specifies procedures for conducting a hearing, upon the request of a person served with an order	HSC §25404.1.1

TABLE A-7: SUMMARY TABLE OF UNDERGROUND STORAGE TANK LEAK PREVENTION AND ENFORCEMENT PROVISIONS (CONTINUED)

UST/AST Management Plan
Marine Corps Air Station, Miramar, California

Item	Summary of Requirement	Citation (HSC)
Items 22 through 23 only apply to UST systems installed on or after July 1, 2004. In addition to the requirements of items 22 – 23, UST systems installed on or after July 1, 2004 are also subject to all of the installation and monitoring requirements in items # 1, 2, 4, and 5		
22	The UST system must be designed and constructed with a continuous monitoring system capable of (1) detecting entry of the liquid or vapor-phase of the substance stored in the primary containment into the secondary containment and (2) detecting water intrusion into the secondary containment	HSC §25290.1(d)
23	The interstitial space of the UST must be maintained under constant vacuum or pressure to detect a breach in the primary or secondary containment before the liquid or vapor of the stored substance is released to the environment. Interstitial liquid level measurement methods satisfy this requirement	HSC §25290.1(e)

Notes: UST means tanks and piping used for the storage of a hazardous substance [HSC, §25281(x)(1)].
UST system means an UST, connected piping, ancillary equipment and containment systems [HSC, §25281(y)].

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APPENDIX B
Federal Underground Storage Tank Regulations That Must be Met in Addition to California Underground Storage Tank Regulations

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CALIFORNIA
Water Boards

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

State Water Resources Control Board

October 21, 2015

To: Underground Storage Tank Owners and Operators

COMPLIANCE WITH CALIFORNIA AND FEDERAL UNDERGROUND STORAGE TANK REGULATIONS

The United States Environmental Protection Agency (U.S. EPA) issued revised underground storage tank (UST) regulations on July 15, 2015. The revisions strengthen the 1988 federal UST regulations by increasing the emphasis on properly operating and maintaining UST systems. The new federal UST regulations have been published in the Federal Register located at: http://www.gpo.gov/fdsys/pkg/FR-2015-07-15/pdf/2015-15914.pdf.

On August 20, 2015 the State Water Resources Control Board (State Water Board) notified California UST owners and operators they must comply with the new federal UST regulations, in addition to California UST statutes and regulations. The new federal UST regulations became effective on October 13, 2015 in Indian Territory and in those states, including California, that do not have State Program Approval. The compliance deadlines for the new requirements in the federal UST regulations range from October 13, 2015 to October 13, 2018 for those USTs installed on or before October 13, 2015. All USTs installed after October 13, 2015 must fully comply with the new applicable federal UST regulations, as well as California UST statutes and/or regulations at the time of installation.

To assist in complying with the new federal UST regulations, the U.S. EPA provides publications and other resources on their 2015 Revised Underground Storage Tank Regulations webpage at http://www2.epa.gov/ust/revising-underground-storage-tank-regulations-revisions-existing-requirements-and-new. Additional resources for field constructed tanks and airport hydrant fuel distribution systems are posted at http://www2.epa.gov/ust/field-constructed-tanks-and-airport-hydrant-systems-2015-requirements. And finally, resources for emergency generator tank systems can be found at http://www2.epa.gov/ust/emergency-power-generator-ust-systems-2015-requirement-release-detection.

In addition to the U.S. EPA resources, State Water Board staff has compiled a detailed table to assist California UST owners and operators in identifying new federal UST regulations that must be met in addition to California UST statute and regulations. The table contains the category of the new federal requirement, the compliance deadline dates, a detailed description of each of the new federal regulations that affect California USTs, and the citation of the federal requirement.

For more information about the new federal UST regulations, please see the U.S. EPA's 2015 Revised Underground Storage Tank Regulations webpage located at http://www2.epa.gov/ust/revising-underground-storage-tank-regulations-revisions-existing-requirements-and-new.

If you have any further questions regarding these new federal UST regulations, please contact me at (916) 341-5870 or laura.fisher@waterboards.ca.gov or Mr. Cory Hootman at (916) 341-5668 or cory.hootman@waterboards.ca.gov.

Sincerely,

Laura S. Fisher, Chief
UST Leak Prevention Unit and
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Enclosure (1)
1. Federal Underground Storage Tank Regulations That Must Be Met In Addition To California Underground Storage Tank Regulations (October 2015)

cc: [Via email only]

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FEDERAL UNDERGROUND STORAGE TANK REGULATIONS THAT MUST BE MET IN ADDITION TO CALIFORNIA UNDERGROUND STORAGE TANK REGULATIONS*

Requirements for Underground Storage Tanks		
Category	**Requirement**	**40 CFR**
Definitions Effective October 13, 2015.	*Release detection* means determining whether a release of a regulated substance has occurred from the underground storage tank (UST) system into the environment or a leak has occurred into the interstitial space between the UST system and its secondary barrier or secondary containment around it.	280.10
	Repair means to restore to proper operating condition a tank, pipe, spill prevention equipment, overfill prevention equipment, corrosion protection equipment, release detection equipment or other UST system component that has caused a release of product from the UST system or has failed to function properly.	280.10
	Replaced means: (1) For a tank—to remove a tank and install another tank. (2) For piping—to remove 50 percent or more of piping and install other piping, excluding connectors, connected to a single tank. For tanks with multiple piping runs, this definition applies independently to each piping run.	280.10
Design & Construction Requirements Effective as Indicated.	Effective April 11, 2016, except for safe suction piping, when piping is installed or replaced; it must be double-walled and interstitially monitored.	280.20
	Effective October 13, 2015, when overfill prevention is installed or replaced, flow restrictors in vent lines may not be used to comply with the overfill requirement.	280.20(c)(3)
Notification Requirement Effective October 13, 2015.	Within 30 days of acquisition, any person who assumes ownership of a regulated underground storage tank system must submit a notice of the ownership change to the implementing agency, using the form in appendix II of part 280 of 40 Code of Federal Regulations.	280.22(b)
Compatibility Requirements Effective October 13, 2015.	Owners and operators must notify the implementing agency at least 30 days prior to switching to a regulated substance containing greater than 10 percent ethanol, greater than 20 percent biodiesel, or any other regulated substance identified by the implementing agency.	280.32(b)
	Owners and operators must be able to demonstrate compatibility of the UST system (including the tank, piping, containment sumps, pumping equipment, release detection equipment, spill equipment, and overfill equipment) with the regulated substance containing greater than 10 percent ethanol, greater than 20 percent biodiesel, or any other regulated substance identified by the implementing agency.	280.32(b)(1)
	Owners and operators may demonstrate compatibility of the UST system with the regulated substance containing greater than 10 percent ethanol, greater than 20 percent biodiesel, or any other regulated substance identified by the implementing agency by using a certification or listing of UST system equipment or components by a nationally recognized, independent testing laboratory for use with the regulated substance stored; or equipment or component manufacturer approval. The manufacturer's approval must be in writing, indicate an affirmative statement of compatibility, specify the range of biofuel blends the equipment or component is compatible with, and be from the equipment or component manufacturer.	280.32(b)(1)(i) & (ii)
	Owners and operators must maintain the compatibility certifications, listings, or equipment or component manufacturer approval of UST system equipment for as long as the UST system is used to store the regulated substance containing greater than 10 percent ethanol, greater than 20 percent biodiesel, or any other regulated substance identified by the implementing agency.	280.32(c)

* For underground storage tanks installed after October 13, 2015, these requirements are effective at the time of installation.

FEDERAL UNDERGROUND STORAGE TANK REGULATIONS THAT MUST BE MET IN ADDITION TO CALIFORNIA UNDERGROUND STORAGE TANK REGULATIONS (continued)

Equipment Inspection and Testing After Repairs Effective October 13, 2015.	Within 30 days following the date of completion of any repairs to secondary containment areas of tanks and piping used for interstitial monitoring and containment sumps used for interstitial monitoring of piping, the secondary containment must be tested for tightness according to the manufacturer's instructions, a code of practice developed by a nationally recognized association or independent testing laboratory, or according to requirements established by the implementing agency.	280.33(d)
	Within 30 days following any repair to overfill prevention equipment, the repaired overfill prevention equipment must be inspected. At a minimum, the inspection must ensure that overfill prevention equipment is set to activate at the correct level to prevent spilling and overfilling associated with product transfer to the UST system, and will activate when regulated substance reaches that level to ensure it is operating properly. The inspection must be conducted according to requirements developed by the manufacturer, a code of practice developed by a nationally recognized association or independent testing laboratory, or requirements determined by the implementing agency to be no less protective of human health and the environment.	280.33(f) & 280.35(a)(2)
	Within 30 days following any repair to spill prevention equipment, the repaired spill prevention equipment must be tested. At a minimum, the test must ensure the equipment is liquid tight by using vacuum, pressure, or liquid testing in accordance with requirements developed by the manufacturer, a code of practice developed by a nationally recognized association or independent testing laboratory, or requirements determined by the implementing agency to be no less protective of human health and the environment.	280.33(f) & 280.35(a)(1)(ii)
	Owners and operators must maintain records of each repair of the tank, pipe, spill prevention equipment, overfill prevention equipment, corrosion protection equipment, release detection equipment or other UST system component that has caused a release of product from the UST system or has failed to function properly until the UST system is permanently closed or undergoes a change-in-service.	280.33(g)
First Periodic Inspection of Overfill Prevention Equipment Required by October 13, 2018.	At least every once every 3 years, overfill prevention equipment must be inspected. At a minimum, the inspection must ensure that overfill prevention equipment is set to activate at the correct level to prevent spilling and overfilling associated with product transfer to the UST system, and will activate when regulated substance reaches that level to ensure it is operating properly. The inspection must be conducted according to requirements developed by the manufacturer, a code of practice developed by a nationally recognized association or independent testing laboratory, or requirements determined by the implementing agency to be no less protective of human health and the environment.	280.20(c)(4) & 280.35(a)(2)
	Owners and operators must maintain all records of overfill inspections for three years.	280.35(c)(1)
Periodic Testing of Containment Sumps Effective October 13, 2018	Containment sumps used for interstitial monitoring of piping that are double-walled and the integrity of both walls is periodically monitored at a frequency not less than the frequency of the walkthrough inspections are not required to be tested every three years. Documentation showing that the prevention equipment is double-walled and the integrity of both walls is periodically monitored must be maintained for as long as the equipment is periodically monitored.	280.35(a)(1)(i) & 280.35(c)(2)

FEDERAL UNDERGROUND STORAGE TANK REGULATIONS THAT MUST BE MET IN ADDITION TO CALIFORNIA UNDERGROUND STORAGE TANK REGULATIONS (continued)

	Owners and operators must begin periodic tightness testing of containment sump used for interstitial monitoring of piping and conduct a test within 30 days of discontinuing periodic monitoring of the integrity of the double-walled containment sumps used for interstitial monitoring of piping.	280.35(a)(1)(i)
First Walkthrough Inspection Required by October 13, 2018.	Walkthrough inspections must be conducted every 30 days. The inspection must include inspecting the spill prevention equipment by visually checking for damage, removing liquid or debris, checking for and removing obstructions in the fill pipe, and checking the fill cap to make sure it is securely on the fill pipe. In addition, check to make sure the release detection equipment is operating with no alarms or other unusual operating conditions present; and ensure records of release detection testing are reviewed and current.	280.36(a)(1)(i)
	Annually, containment sumps must be visually check for damage, leaks to the containment area, or releases to the environment; remove liquid or debris if present; and, for double walled sumps with interstitial monitoring, check for a leak in the interstitial area. Hand held release detection equipment devices such as tank gauge sticks or groundwater bailers must be check for operability and serviceability.	280.36(a)(1)(ii)
	Owners and operators must maintain records of operation and maintenance walkthrough inspections for one year. Records must include a list of each area checked, whether each area checked was acceptable or needed action taken, and a description of actions taken to correct an issue.	280.36(b)
First Annual Operations Test of Release Detection Equipment Required by October 13, 2018.	Annually, a test of the proper operation of release detection equipment must be performed that includes the testing of the automatic tank gauge and other controller's backup battery, checking probes and sensors to ensure floats move freely; the shaft is not damaged, cables are free of kinks and breaks, and hand-held electronic sampling equipment associated with groundwater and vapor monitoring.	280.40(a)(3)
	Owners and operators must maintain records of the results of the annual operation tests for three years. At a minimum, the results must list each component tested, indicate whether each component tested properly functions or needs to have action taken, and describe any action taken to correct an issue.	280.45(b)(1)
Statistical Inventory Reconciliation Requirements Effective October 13, 2015.	USTs using statistical inventory reconciliation as the tank's form of release detection must use a release detection method based on the application of statistical principles to inventory data that reports a quantitative result with a calculated leak rate, be capable of detecting a leak rate of 0.2 gallon per hour or a release of 150 gallons within 30 days; and use a threshold that does not exceed one-half the minimum detectible leak rate.	280.43(h)
Vapor and Groundwater Monitoring Site Assessment Required by October 13, 2018.	Owners and operators of USTs that use vapor or groundwater monitoring as a method of release detection must maintain records of a site assessment of the UST excavation zones to ensure the materials used as backfill are sufficiently porous (e.g., gravel, sand, crushed rock) to readily allow diffusion of vapors from releases into the excavation area; the level of background contamination in the excavation zone will not interfere with the method used; the regulated substance stored is immiscible in water and has a specific gravity of less than one; monitoring wells or devices intercept the excavation zone or are as close to it as is technically feasible. The records of the site assessment must be maintained for as long as the vapor or groundwater monitoring methods are used.	280.45(a)

FEDERAL UNDERGROUND STORAGE TANK REGULATIONS THAT MUST BE MET IN ADDITION TO CALIFORNIA UNDERGROUND STORAGE TANK REGULATIONS (continued)

	Records of site assessments developed after October 13, 2015 must be signed by a professional engineer or professional geologist, or equivalent licensed professional with experience in environmental engineering, hydrogeology, or other relevant technical discipline acceptable to the implementing agency.	280.45(a)
Release Investigation & Response Effective October 13, 2015.	If a release is suspected owners and operators must conduct tightness test of the primary or secondary containment, as appropriate, to determine whether a leak exists in that portion of the tank that routinely contains product, the attached delivery piping, or a breach of either wall of the containment has occurred.	280.52(a)(1)
	If the system test confirms a leak into the interstice or a release, owners and operators must repair, replace, upgrade, or close the UST system. In addition, owners and operators must begin corrective action if the test results for the system, tank, or delivery piping indicate that a release exists.	280.52(a)(2)
Operator Training Required by October 13, 2018.	Class C operators must be trained by the Class A or Class B operator before assuming duties of the Class C operator.[1]	280.243(c)
	The Class A and Class B operator training program for Class C operators must include an evaluation through testing, a practical demonstration, or another approach acceptable to the implementing agency.[1]	280.242(d)
	Class A and Class B operators of UST systems determined by the implementing agency to be out of compliance must complete a training program or comparable examination. The training program or comparable examination must be developed or administered by an independent organization, the implementing agency, or a recognized authority. Class A and Class B operators take annual refresher training. The training program or comparable examination must be completed no later than 30 days from the date the implementing agency determines the facility is out of compliance unless the Class A and Class operators take annual refresher training for Class A and Class B operators that cover all applicable operator training requirements, or the implementing agency, at its discretion, waives this retraining requirement for either the Class A or Class B operator or both.[1]	280.244
	Owners and operators must maintain a list that identifies all Class A, Class B, and Class C operators currently designated for the facility and include names, class of the operator trained, date assumed duties, date each completed initial training, and any retraining.[1]	280.245(a)
	Owners and operators must maintain records of classroom or field training programs (including Class C operator training provided by the Class A or Class B operator) or a comparable examination that, at a minimum, is signed by the trainer or examiner. Records from computer based training must, at a minimum, indicate the name of the training program and web address, if Internet based. Records of Class A or Class B operator recertification must include those areas in which the operator has been recertified.[1]	280.245(b)

[1] In California, Class A and B are referred to as the designated operator, and Class C is referred to as the facility employee.

FEDERAL UNDERGROUND STORAGE TANK REGULATIONS THAT MUST BE MET IN ADDITION TO CALIFORNIA UNDERGROUND STORAGE TANK REGULATIONS (continued)

Emergency Generator Tank Systems		
Category	**Requirement**	**40 CFR**
Release Detection Required by October 13, 2018.	Emergency generators tank systems must meet release detection requirements.	280.10(a)(1)(ii)
	Emergency generator tank systems that cannot apply a method of release detection must permanently close.	280.40(c)
Release Reporting Effective October 13, 2018.	Emergency generator tank systems must meet the Release Reporting, Investigation, and Confirmation requirements.	280.40(b)
First Annual Operations Test of Release Detection Equipment Required by October 13, 2018.	Annually, a test of the proper operation of release detection equipment must be performed that includes the testing of the automatic tank gauge and other controller's backup battery; checking probes and sensors to ensure floats move freely; the shaft is not damaged; and cables are free of kinks and breaks. Hand-held electronic sampling equipment associated with groundwater and vapor monitoring must be checked to ensure proper operation.	280.40(a)(3)
	Owners and operators must maintain records of the results of the annual operation tests for three years. At a minimum, the results must list each component tested, indicate whether each component tested properly functions or needs to have action taken, and describe any action taken to correct an issue.	280.45(b)(1)
Statistical Inventory Reconciliation Requirements Effective October 13, 2015.	Emergency generators tank systems using statistical inventory reconciliation as the UST's form of release detection must use a release detection method based on the application of statistical principles to inventory data that reports a quantitative result with a calculated leak rate, be capable of detecting a leak rate of 0.2 gallon per hour or a release of 150 gallons within 30 days; and use a threshold that does not exceed one-half the minimum detectible leak rate.	280.43(h)
Vapor and Groundwater Monitoring Site Assessment Required by October 13, 2018.	Owners and operators of USTs that use vapor or groundwater monitoring as a method of release detection must maintain records of a site assessment of the UST excavation zones to ensure the materials used as backfill are sufficiently porous (e.g., gravel, sand, crushed rock) to readily allow diffusion of vapors from releases into the excavation area; the level of background contamination in the excavation zone will not interfere with the method used; the regulated substance stored is immiscible in water and has a specific gravity of less than one; monitoring wells or devices intercept the excavation zone or are as close to it as is technically feasible. The records of the site assessment must be maintained for as long as the vapor or groundwater monitoring methods are used.	280.45(a)
	Records of site assessments developed after October 13, 2015 must be signed by a professional engineer or professional geologist, or equivalent licensed professional with experience in environmental engineering, hydrogeology, or other relevant technical discipline acceptable to the implementing agency.	280.45(a)
Release Investigation & Response Effective October 13, 2018.	If a release is suspected owners and operators must conduct tightness test of the primary or secondary containment, as appropriate, to determine whether a leak exists in that portion of the tank that routinely contains product, the attached delivery piping, or a breach of either wall of the containment has occurred.	280.52(a)(1)
	If the system test confirms a leak into the interstice or a release, the owners and operators must repair, replace, upgrade, or close the UST system. In addition, owners and operators must begin corrective action if the test results for the system, tank, or delivery piping indicate that a release exists.	280.52(a)(2)

FEDERAL UNDERGROUND STORAGE TANK REGULATIONS THAT MUST BE MET IN ADDITION TO CALIFORNIA UNDERGROUND STORAGE TANK REGULATIONS (continued)

Requirements for Airport Hydrant Fuel Distribution Systems & Field-Constructed Tanks		
Category	**Requirement**	**40 CFR**
Definitions Effective October 13, 2015.	*Airport hydrant fuel distribution system* (also called *airport hydrant system*) means a UST system which fuels aircraft and operates under high pressure with large diameter piping that typically terminates into one or more hydrants (fill stands). The airport hydrant system begins where fuel enters one or more tanks from an external source such as a pipeline, barge, rail car, or other motor fuel carrier.	280.50
	Field-constructed tank means a tank constructed in the field. For example, a tank constructed of concrete that is poured in the field, or a steel or fiberglass tank primarily fabricated in the field is considered field-constructed.	280.50
General Requirements Effective as Indicated.	Except as expressly specified, by October 13, 2015, owners and operators must comply with the requirements of Program Scope and Installation Requirements for Partially Excluded UST Systems; Release Reporting, Investigation, and Confirmation; Release Response and Corrective Action for UST Systems Containing Petroleum or Hazardous Substances; Out-of-Service UST Systems and Closure; Financial Responsibility; UST Systems: Design, Construction, Installation and Notification.	280.251(c)
	Except as expressly specified, by October 13, 2018, owners and operators must comply with the requirements of General Operating; Release Detection; and Operator Training.	280.251(c)
Notification of System Existence Required by October 13, 2018.	Owners and operators must submit a one-time notice of tank system existence to the implementing agency, using the notification form in appendix I of part 280 of 40 Code of Federal Regulations.	280.251(b)
Demonstrate Financial Responsibility Required by October 13, 2018.	Owners and operators must demonstrate financial responsibility at the time of submission of the tank system existence notification form and maintain these records for the life of the system.	280.251(b)
Change of Ownership Notification Effective October 13, 2015.	Within 30 days of acquisition, any person who assumes ownership of an airport hydrant fuel distribution system or field constructed tank must submit a notice of the ownership change to the implementing agency, using the form in appendix II of part 280 of 40 Code of Federal Regulations.	280.22(b)
Design and Construction Effective April 11, 2016.	Effective April 11, 2016, except for safe suction piping, when piping is installed or replaced; it must be double-walled and interstitially monitored.	280.20
	Owners and operators of field constructed tanks greater than 50,000 gallons and piping associated with airport hydrant systems do not have to meet the requirement to upgrade single-walled piping to double-walled interstitially monitored piping when installing or replacing piping as required after April 11 2016, including under–dispenser containment.	280.252(a)
System Upgrades Required by October 13, 2018.	Steel tanks and piping of airport hydrant fuel distribution systems and field-constructed tanks in direct contact with the ground must have cathodic protection.	280.252(b)(1)
	Airport hydrant fuel distribution systems and field-constructed tanks must comply with spill and overfill prevention equipment requirements to prevent spilling and overfilling associated with product transfer to the UST system.	280.252(b)(2)

FEDERAL UNDERGROUND STORAGE TANK REGULATIONS THAT MUST BE MET IN ADDITION TO CALIFORNIA UNDERGROUND STORAGE TANK REGULATIONS (continued)

Compatibility Requirements by October 13, 2018.	Owners and operators must notify the implementing agency at least 30 days prior to switching to a regulated substance containing greater than 10 percent ethanol, greater than 20 percent biodiesel, or any other regulated substance identified by the implementing agency.	280.32(b)
	Owners and operators must be able to demonstrate compatibility of the UST system (including the tank, piping, containment sumps, pumping equipment, release detection equipment, spill equipment, and overfill equipment) with the regulated substance containing greater than 10 percent ethanol, greater than 20 percent biodiesel, or any other regulated substance identified by the implementing agency.	280.32(b)(1)
	Owners and operators may demonstrate compatibility of the UST system with the regulated substance containing greater than 10 percent ethanol, greater than 20 percent biodiesel, or any other regulated substance identified by the implementing agency by using a certification or listing of UST system equipment or components by a nationally recognized, independent testing laboratory for use with the regulated substance stored; or equipment or component manufacturer approval. The manufacturer's approval must be in writing, indicate an affirmative statement of compatibility, specify the range of biofuel blends the equipment or component is compatible with, and be from the equipment or component manufacturer.	280.32(b)(1)(i) & (ii)
	Owners and operators must maintain the compatibility certifications, listings, or equipment or component manufacturer approval of UST system equipment for as long as the UST system is used to store the regulated substance containing greater than 10 percent ethanol, greater than 20 percent biodiesel, or any other regulated substance identified by the implementing agency.	280.32(c)
Equipment Inspection and Testing After Repairs Effective October 13, 2018.	Within 30 days following the date of completion of any repairs to the primary or secondary containment of tanks and piping, the containment must be tested for tightness according to the manufacturer's instructions, a code of practice developed by a nationally recognized association or independent testing laboratory, or according to requirements established by the implementing agency.	280.33(d)
	Within 30 days following any repair to overfill prevention equipment, the repaired overfill prevention equipment must be inspected. At a minimum, the inspection must ensure that overfill prevention equipment is set to activate at the correct level to prevent spilling and overfilling associated with product transfer to the UST system, and will activate when regulated substance reaches that level to ensure it is operating properly. The inspection must be conducted according to requirements developed by the manufacturer, a code of practice developed by a nationally recognized association or independent testing laboratory, or requirements determined by the implementing agency to be no less protective of human health and the environment.	280.33(f) & 280.35(a)(2)
	Within 30 days following any repair to spill prevention equipment, the repaired spill prevention equipment must be tested. At a minimum, the test must ensure the equipment is liquid tight by using vacuum, pressure, or liquid testing in accordance with requirements developed by the manufacturer, a code of practice developed by a nationally recognized association or independent testing laboratory, or requirements determined by the implementing agency to be no less protective of human health and the environment.	280.33(f) & 280.35(a)(1)(ii)

FEDERAL UNDERGROUND STORAGE TANK REGULATIONS THAT MUST BE MET IN ADDITION TO CALIFORNIA UNDERGROUND STORAGE TANK REGULATIONS (continued)

	Owners and operators must maintain records of each repair of the tank, pipe, spill prevention equipment, overfill prevention equipment, corrosion protection equipment, release detection equipment or other UST system component that has caused a release of product from the UST system or has failed to function properly until the UST system is permanently closed or undergoes a change-in-service.	280.33(g)
	Within 6 months following the repair of any cathodically protected UST system, the cathodic protection system must be tested to ensure that it is operating properly.	280.33€
First Periodic Test of Spill Prevention Equipment and Containment Sump Required by October 13, 2018.	At least every once every 3 years, spill prevention equipment and containment sumps used for interstitial monitoring of piping must be tested. At a minimum, the test must ensure that spill prevention equipment is liquid tight. The test must be conducted according to requirements developed by the manufacturer, a code of practice developed by a nationally recognized association or independent testing laboratory, or requirements determined by the implementing agency to be no less protective of human health and the environment.	280.20(c)(4) & 280.35(a)(1)(ii)
	Owners and operators must maintain all records of spill prevention equipment and containment sump testing for three years.	280.35(c)(2)
	Periodic tightness testing of spill prevention equipment and containment sumps used for interstitial monitoring of piping is not required if the spill prevention equipment and containment sumps used for interstitial monitoring of piping monitor is double-walled the integrity of the double-walled equipment is monitored at a frequency no less than the periodic walkthroughs.	280.35(a)(1)(i)
	Containment sumps used for interstitial monitoring of piping that are double-walled and the integrity of both walls is periodically monitored at a frequency not less than the frequency of the walkthrough inspections are not required to be tested every three years. Documentation showing that the prevention equipment is double-walled and the integrity of both walls is periodically monitored must be maintained for as long as the equipment is periodically monitored.	280.35(a)(1)(i) & 280.35(c)(2)
	Owners and operators must begin periodic tightness testing of spill prevention equipment and containment sumps used for interstitial monitoring of piping and conduct a test within 30 days of discontinuing periodic monitoring of the integrity of the double-walled spill prevention equipment and containment sumps used for interstitial monitoring of piping.	280.35(a)(1)(i)
First Periodic Inspection of Overfill Prevention Equipment Required by October 13, 2018.	At least every once every 3 years, overfill prevention equipment must be inspected. At a minimum, the inspection must ensure that overfill prevention equipment is set to activate at the correct level to prevent spilling and overfilling associated with product transfer to the UST system, and will activate when regulated substance reaches that level to ensure it is operating properly. The inspection must be conducted according to requirements developed by the manufacturer, a code of practice developed by a nationally recognized association or independent testing laboratory, or requirements determined by the implementing agency to be no less protective of human health and the environment.	280.20(c)(4) & 280.35(a)(2)
	Owners and operators must maintain all records of overfill inspections for three years.	280.35(c)(1)

FEDERAL UNDERGROUND STORAGE TANK REGULATIONS THAT MUST BE MET IN ADDITION TO CALIFORNIA UNDERGROUND STORAGE TANK REGULATIONS (continued)

Release Detection Required by October 13, 2018.	Airport hydrant fuel distribution systems and field-constructed tanks that cannot apply a method of release detection must permanently close.	280.40(c)
	Owners and operators of field-constructed tanks with a capacity less than or equal to 50,000 gallons and associated piping must meet the release detection requirements in subpart D of part 280 of 40 Code of Federal Regulations.	280.252(d)(1) & (2)
	Owners and operators of field constructed tanks with a capacity greater than 50,000 gallons and associated piping and airport hydrant fuels distribution systems must meet release detection requirements by monitoring the tank and/or piping, as applicable, with vapor and/or groundwater monitoring combined with inventory control; tightness testing; automatic tank gauging; or interstitial monitoring.	280.252(d)(1)
	Owners and operators of airport hydrant fuel distribution systems and field-constructed tanks must maintain release detection records.	280.252(d)(3)
Vapor and Groundwater Monitoring Site Assessment Required by October 13, 2018.	Owners and operators of USTs that use vapor or groundwater monitoring as a method of release detection must maintain records of a site assessment of the UST excavation zones to ensure the materials used as backfill are sufficiently porous (e.g., gravel, sand, crushed rock) to readily allow diffusion of vapors from releases into the excavation area; the level of background contamination in the excavation zone will not interfere with the method used; the regulated substance stored is immiscible in water and has a specific gravity of less than one; monitoring wells or devices intercept the excavation zone or are as close to it as is technically feasible. The records of the site assessment must be maintained for as long as the vapor or groundwater monitoring methods are used.	280.45(a)
	Records of site assessments developed after October 13, 2015 must be signed by a professional engineer or professional geologist, or equivalent licensed professional with experience in environmental engineering, hydrogeology, or other relevant technical discipline acceptable to the implementing agency.	280.45(a)
First Annual Operations Test of Release Detection Equipment Required by October 13, 2018.	Annually, a test of the proper operation of release detection equipment must be performed that includes the testing of the automatic tank gauge and other controller's backup battery; checking probes and sensors to ensure floats move freely; the shaft is not damaged; and cables are free of kinks and breaks. Hand-held electronic sampling equipment associated with groundwater and vapor monitoring must be checked to ensure proper operation.	280.40(a)(3)
	Owners and operators must maintain records of the results of the annual operation tests for three years. At a minimum, the results must list each component tested, indicate whether each component tested properly functions or needs to have action taken, and describe any action taken to correct an issue.	280.45(b)(1)
Operator Training Required by October 13, 2018.	Class C operators must be trained by the Class A or Class B operator before assuming duties of the Class C operator.[1]	280.243(c)
	The Class A and Class B operator training program for Class C operators must include an evaluation through testing, a practical demonstration, or another approach acceptable to the implementing agency.[1]	280.242(d)

FEDERAL UNDERGROUND STORAGE TANK REGULATIONS THAT MUST BE MET IN ADDITION TO CALIFORNIA UNDERGROUND STORAGE TANK REGULATIONS (continued)

	Class A and Class B operators of UST systems determined by the implementing agency to be out of compliance must complete a training program or comparable examination. The training program or comparable examination must be developed or administered by an independent organization, the implementing agency, or a recognized authority. Class A and Class B operators take annual refresher training. The training program or comparable examination must be completed no later than 30 days from the date the implementing agency determines the facility is out of compliance unless the Class A and Class operators take annual refresher training for Class A and Class B operators that cover all applicable operator training requirements, or the implementing agency, at its discretion, waives this retraining requirement for either the Class A or Class B operator or both.[1]	280.244
	Owners and operators must maintain a list that identifies all Class A, Class B, and Class C operators currently designated for the facility and include names, class of the operator trained, date assumed duties, date each completed initial training, and any retraining.[1]	280.245(a)
	Owners and operators must maintain records of classroom or field training programs (including Class C operator training provided by the Class A or Class B operator) or a comparable examination that, at a minimum, is signed by the trainer or examiner. Records from computer based training must, at a minimum, indicate the name of the training program and web address, if Internet based. Records of Class A or Class B operator recertification must include those areas in which the operator has been recertified.[1]	280.245(b)
First Walkthrough Inspection Required by October 13, 2018.	Walkthrough inspections must be conducted every 30 days. The inspection must include inspecting the spill prevention equipment by visually checking for damage, removing liquid or debris, checking for and removing obstructions in the fill pipe, and checking the fill cap to make sure it is securely on the fill pipe. In addition, check to make sure the release detection equipment is operating with no alarms or other unusual operating conditions present; and ensure records of release detection testing are reviewed and current.	280.36(a)(1)(i)
	Annually, containment sumps must be visually check for damage, leaks to the containment area, or releases to the environment; remove liquid or debris if present; and, for double walled sumps with interstitial monitoring, check for a leak in the interstitial area. Hand held release detection equipment devices such as tank gauge sticks or groundwater bailers must be check for operability and serviceability.	280.36(a)(1)(ii)
	Owners and operators must maintain records of operation and maintenance walkthrough inspections for one year. Records must include a list of each area checked, whether each area checked was acceptable or needed action taken, and a description of actions taken to correct an issue.	280.36(b)
	In addition, owners and operators of airport hydrant fuel distribution systems must inspect hydrant pits and hydrant piping vaults. Hydrant pits inspections must include checking for any visual damage, removing any liquid or debris present, and checking for any leaks. Hydrant piping vaults inspection must include checking for any hydrant piping leaks. Hydrant pits and hydrant piping vaults must be inspected at least once every 30 days if confined space entry according to the Occupational Safety and Health Administration is not required or at least annually if confined space entry is required.	280.252(c)

FEDERAL UNDERGROUND STORAGE TANK REGULATIONS THAT MUST BE MET IN ADDITION TO CALIFORNIA UNDERGROUND STORAGE TANK REGULATIONS (continued)

Release Investigation & Response Effective October 13, 2015.	If a release is suspected owners and operators must conduct tightness test of the primary or secondary containment, as appropriate, to determine whether a leak exists in that portion of the tank that routinely contains product, the attached delivery piping, or a breach of either wall of the containment has occurred.	280.52(a)(1)
	If the system test confirms a leak into the interstice or a release, the owners and operators must repair, replace, upgrade, or close the UST system. In addition, owners and operators must begin corrective action if the test results for the system, tank, or delivery piping indicate that a release exists.	280.52(a)(2)
Closure Requirements Effective October 13, 2015.	At least 30 days before beginning either permanent closure or a change-in service, or within another reasonable time period determined by the implementing agency, owners and operators must notify the implementing agency of their intent to permanently close or make the change-in-service, unless such action is in response to corrective action. The required assessment of the excavation zone must be performed after notifying the implementing agency but before completion of the permanent closure or a change-in-service.	280.71(a)
	When directed by the implementing agency, the owner and operator of an UST system with field constructed tanks or airport hydrant system permanently closed before October 13, 2015 must assess the excavation zone and close the UST system in accordance with closure requirements if releases from the UST may, in the judgment of the implementing agency, pose a current or potential threat to human health and the environment.	280.252(e)

NOTE: This working document was developed for ease of reference. State Water Resources Control Board staff have taken every effort to ensure that the requirements listed in this document match the requirements in part 280 of 40 Code of Federal Regulations. We recommend that this document be used in conjunction with 40 Code of Federal Regulations part 280. In the event of a conflict between this document and 40 Code of Federal Regulations part 280, 40 Code of Federal Regulations part 280 controls.

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APPENDIX C
UNDERGROUND STORAGE TANK (UST) CLOSURE GUIDELINES FOR COMPLIANCE

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UNDERGROUND STORAGE TANK (UST)
CLOSURE GUIDELINES FOR COMPLIANCE

General:

Applicable federal, state, and local regulations must be followed when underground storage tanks (USTs) that contain a hazardous material or hazardous waste are no longer used, closed, abandoned or removed.

The County of San Diego Department of Environmental Health (DEH) regulates the construction, operation, repair and removal of UST systems at the Marine Corps Air Station (MCAS) Miramar. The DEH Hazardous Materials Division (HMD) established a UST Group to conduct routine inspections of all fuel facilities in San Diego County; approve all electronic submissions regarding UST removals submitted through the California Environmental Reporting System (CERS); and conduct closure inspections.

A permit to operate a UST system in San Diego County is required by the San Diego County Code of Regulatory Ordinances Title 6, Division 8, and Chapter 10. State and federal regulations also mandate testing and frequent inspection of all UST facilities by a California Designated Underground Storage Tank Operator (DUSTO).

Placing USTs Temporarily Out-of-Service when containing a Hazardous Material:

1. All residual liquid, solids, or sludges inside the UST shall be pumped out and disposed of properly.
2. If the UST contained a hazardous substance, such as diesel fuel or gasoline, that could produce flammable vapors at standard temperature and pressure, then it shall be inerted, as often as necessary, to levels below the lower explosion limit (LEL) or to lower levels as required by the DEH.
3. Except for required vent lines, seal and secure all fill ports and access locations into the UST using locking caps and/or concrete plugs. Disconnect, cap and secure all other accessible pipelines connected to the UST.
4. Disconnect (Lock out/tag out) power service for all pumps associated with the use of the UST unless the power supports additional equipment which is not being closed, such as the tank monitoring system and an impressed-current cathodic protection system, if applicable.
5. The monitoring required pursuant to the UST permit may be modified by the DEH during the temporary closure period. In making a decision to modify monitoring requirements, the DEH shall consider the need to maintain monitoring in order to detect unauthorized releases that may have occurred during the time the UST was used but that have not yet been detected. In all cases, a corrosion protection system, if applicable, shall continue to be operated.
6. The UST shall be inspected by a licensed International Code Council (ICC) certified DUSTO at least once every three months to verify that the temporary closure measures are still in place. The inspection shall include the following:
    a. Visual inspection of all locked caps and/or concrete plugs.

b. If locking caps are used, at least one shall be removed to determine if any liquids or other substances have been added to the UST.

7. At the end of a temporary closure period, including any extension granted by the DEH, the Base may reuse the UST only if the tank meets all requirements or is upgraded to meet the latest UST requirements.
8. The Base must continue to comply with UST repair and record keeping requirements, release reporting and investigation requirements, and release response and corrective action requirements during the temporary closure period.

If the UST is temporarily closed for more than 12 months, the Base must permanently close the UST if it does not meet current performance standards (unless the DEH provides an extension). The Base must complete a site assessment before such an extension can be applied for.

Permanent Closure and Removal of USTs containing a Hazardous Material:

The following procedures shall be used to permanently close USTs which are no longer in use and will not be in service again.

1. At least 30 days prior to beginning permanent closure of a UST, the Base must notify the DEH of their intent, unless such action is in response to corrective action. The required assessment of the UST excavation zone must be performed after notifying the DEH but before completion of the permanent closure.
2. The UST and all associated piping should be drained of all stored fluids. This can be accomplished through opening existing manways, operating existing transfer pumps, manual removal of fluids and residue, etc. All fluids should be collected in compatible containers for reuse, if possible. Waste materials shall be collected in labeled drums for proper disposal.
3. Disconnect and blank off all accessible piping, pumps, or additional equipment associated with the UST, with the exception of the normal vent line. All valves (except for ventilation valves) should be closed and locked. Seal or blank off all accessible openings other than the normal vent line with threaded plugs, caps, solid flanges, etc.
4. Contact a qualified commercial contractor to provide additional cleaning, excavation zone assessment, removal, and proper disposal of the UST. Information to be provided to the Contractor will include:

    - Number of USTs to be removed;
    - The volume capacity of each UST to be removed;
    - Previous contents;
    - Manufacturer information of each UST; and
    - The current location of each UST on the installation.

5. Contractor will be required to perform the following functions:
    a. Obtain a UST closure permit from the San Diego Fire Department and DEH;

b. The UST shall be excavated to reveal the top half-portion of the tank and all attached underground piping;

c. UST interior and all associated piping will be triple-rinsed with a pressure washer to remove all remaining liquids and residue;

d. Removed liquids will be placed in a tanker truck or drummed and labeled for proper off-site disposal by a licensed hazardous waste hauler;

e. UST will be purged with dry ice and checked with hand-held combustible gas indicator (CGI) which is properly calibrated to measure the concentration of flammable vapor at the top, center and bottom of the tank. The concentration of flammable vapor shall be zero percent of the Lower Explosive Limit (LEL) for the material that was contained in the UST; and the oxygen concentration shall be the same as that of the ambient air, approximately 20.8%;

f. Non-sparking, cold-cutting tools or a non-sparking cold cutting process will be used to cut the shell if the UST held a flammable or combustible material. A section of the tank shall be cut open to fully reveal the interior. Attached piping and additional appurtenances shall be cut and removed;

g. The UST shall be inspected and further cleaned as necessary to be visually free of product, sludge, scale (i.e., thin, flaky residual of tank contents), rinseate and debris, except that residual staining caused by waste consisting of light shadows, slight streaks, or minor discolorations, and waste in cracks, crevices, and pits may be present.

h. At the completion of the UST cleaning process, all piping and appurtenances shall be free of product, sludge, rinseate and debris to the extent that no material can be poured or drained from them when held in any orientation (e.g., tilted, inverted, etc.)

i. Excavation zone assessment is required for both the tank and associated piping. The excavation area must be exposed prior to the scheduled inspection and soil sampling points identified by the DEH. The tank and piping must remain in the excavation area until the DEH Inspector approves the removal. Soil samples shall be collected and analyzed as follows:

   - The tank owner/authorized Base representative on site must submit a uniform hazardous waste manifest demonstrating that the tank has been properly decontaminated. A CGI and soil sampling equipment must be on site. The DEH Inspector will identify the soil sampling points.

   - As the UST or any portion is removed, soil samples shall be taken immediately beneath the removed portions of the tank, a minimum of two feet into native material at each end of the tank in accordance with 23 CCR, Section 2649. Separate soil samples shall be collected for each 20 linear-feet of trench for attached piping.

   - Soils shall be analyzed in accordance with 23 CCR, Section 2649 for all constituents of the previously stored hazardous substances within the UST. The DEH may waive the requirement for analysis in certain circumstances.

j. The UST shell will then be completely removed from the excavation area.

k. Once cleaned and removed, the UST shell will be inspected and certified as cleared for disposal as a non-hazardous solid waste (i.e., scrap metal) by one of the following professionals, certified or registered in California:
   (1) Certified industrial hygienist;
   (2) Certified safety professional;
   (3) Certified marine chemist;
   (4) Registered environmental health specialist;
   (5) Registered professional engineer;
   (6) Registered environmental assessor, Class II; or
   (7) A contractor properly licensed by the Contractor's State License Board (CSLB) to contract for the removal of underground storage tanks and who holds a Hazardous Substance Removal Certification issued by the CSLB.

l. The UST shell will then be transported by a qualified scrap metal hauler for disposal off-site.

m. The Base will ensure that all parts listed in Appendix G-4, "Outline of Permanent Closure Report," (Marine Corps Order 5090.2A) are recorded and retained on site or under the control of the owner/operator of the UST.

n. The Base must maintain records that are capable of demonstrating compliance with closure requirements. The results of the excavation zone assessment must be maintained for at least three (3) years after completion of permanent UST closure.

Permanent Closure and Removal of USTs containing a Hazardous Waste:

Prior to initiating any cleaning, cutting, dismantling, or excavation of a UST that contains or contained a hazardous waste (**including used oil**) the installation shall notify the DEH in writing of the following information:

1. The location of the UST;
2. The scheduled date(s)when the UST will be cleaned;
3. A brief description of the UST operation, equipment and associated components;
4. The identification of the hazardous waste last held in the UST supported by:
   a. A statement signed by the tank operator certifying the identity of the waste last stored or accumulated in the UST; or
   b. If residuals remain in sufficient quantity to be collected and analyzed, a chemical analysis of the residual in the UST;
5. The name and credentials of the individual who will provide certification, when applicable; and
6. The intended disposition and destination of the UST after cleaning and certification.

The notification statement shall be mailed to the following address:

County of San Diego – CUPA
Department of Environmental Health (DEH)
Hazardous Materials Division
P.O. Box 129261
San Diego, CA 92112-9261

Following the written notification to the DEH, complete closure of a hazardous waste UST shall follow the same procedures as for permanent closure of a UST containing hazardous materials. An inspection by the DEH is also required. Prior to removal of the UST and the DEH Inspector's arrival on site, the UST system including piping must be exposed to allow proper inspection and identification of the soil sampling points. The waste hauler must also provide a manifest number to the DEH Inspector.

In addition, the Contractor will fill out the DEH Hazardous Waste Tank Closure Certification form at the completion of the hazardous waste UST closure:

http://www.sdcounty.ca.gov/deh/hazmat/pdf/hm-9704.pdf

A copy of this completed form will accompany the cleaned UST shell to the disposal/recycling facility. The Contractor will also provide a copy to MCAS Miramar for their records and shall submit this completed form to the DEH.

Permanent Closure in Place of USTs containing a Hazardous Waste:

The DEH may approve USTs to be closed in place if removal will compromise the structural integrity of an adjoining building or create a health and safety issue. The UST may be closed in place by filling with an inert material, such as concrete slurry. Closure in place permit applications will require submittal of a sampling protocol which will be reviewed by the DEH.

Two DEH inspections will be required during the initial soil and/or groundwater sampling and at the closure by concrete slurry backfill. After the sampling protocol is approved, DEH will witness the soil sampling (first inspection), and receive and review the soil and/or groundwater analytical results before a closure inspection (second inspection) is scheduled.

A reinspection and fee will be required when the DEH inspector cannot complete the required inspections including, but not limited to, the following conditions:

1. The contractor did not schedule the inspection with other agencies, when required (fire department, for example).
2. The contractor cannot provide and /or maintain a safe working environment.
3. The product piping has not been exposed prior to the inspector's arrival.
4. The UST(s) have not been cleaned or adequately cleaned, or the contractor does not properly inert the tanks.
5. No CGI is on site.

Responsibilities:

The MCAS Miramar Environmental Management Department (EMD) shall coordinate, organize, implement and track the Base-wide effort to maintain compliance with all federal, state, local, and Marine Corps regulations concerning the management of USTs, to include placing USTs out-of-service and/or the closure of tanks no longer in use.

All personnel under the authority of the Installation Commander (active duty, civil servants, and contractors) shall:

1) Provide data, as required, to the UST Program Manager; and
2) Attend environmental awareness training commensurate to the responsibilities of their job (e.g., unit personnel with USTs should attend training for proper tank management).

Relevant Documents:

American Petroleum Institute Recommended Practice 1604, "Removal and Disposal of Used Underground Petroleum Storage Tanks"

American Petroleum Institute Publication 2015, "Cleaning Petroleum Storage Tanks"

American Petroleum Institute Recommended Practice 1631, "Interior Lining of Underground Storage Tanks,"

California Health and Safety Code, Chapter 6.7.

California Code of Regulations (CCR), Title 23, California Underground Storage Tank Regulations.

Code of Federal Regulations (CFR), Title 40, Underground Storage Tanks, Section 280-281.

MCO, P5090.2A w/Ch 1 & 2, U.S. Marine Corps Environmental Compliance and Protection Manual. 2008.

National Fire Protection Agency (NFPA), Code 30, Chapter 22, Storage of Liquids in Tanks

NFPA Code 326, Chapter 5, Preparation for Safeguarding Storage Tanks

San Diego County Code (SDCC) Title 6, Division 8, Chapter 10.

San Diego County Department of Environmental Health (DEH), "Temporary Closure of UST - Application Cover Sheet & Procedures HM-9119"

San Diego County DEH, "Temporary Closure of UST - Application HM-9119a"

San Diego County DEH, "Hazardous Waste Tank Closure Certification HM-9704"

San Diego County DEH, "Part III Close a UST system HM-9313"

APPENDIX D
ABOVEGROUND STORAGE TANK (AST) CLOSURE GUIDELINES FOR COMPLAINCE

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ABOVEGROUND STORAGE TANK (AST)
CLOSURE GUIDELINES FOR COMPLIANCE

General:

When aboveground storage tanks (ASTs) that contain hazardous materials or hazardous wastes are no longer used, closed, abandoned or removed, applicable federal, state, and local regulations must be followed. Marine Corps Air Station (MCAS) Miramar is required to comply with the California Code of Regulations (CCR) Title 22, the California Aboveground Petroleum Storage Act (APSA), and local fire codes. Responsibility for the implementation and enforcement of AST closure falls under the Miramar Fire Department and the County of San Diego Department of Environmental Health (DEH), the local Certified Unified Program Agency (CUPA).

Placing Tanks Temporarily Out-of-Service when containing a Hazardous Material:

California fire code regulations require that all ASTs that contain combustible or flammable liquids that are no longer used for a period of 90 days shall be placed out-of-service. The following procedures shall be used to temporarily place an AST out-of-service that contains a hazardous material, such as virgin motor oil or transmission fluid.

1. Tank and associated piping should be drained of all stored fluids. This can be accomplished through opening existing drain lines, operating existing transfer pumps, manual removal of fluids and residue, etc. All fluids should be collected in compatible containers for reuse, if possible. Waste materials shall be collected in labeled drums for proper disposal.
2. Mark exterior of tank with signage that states “Empty”, the date of when it was placed out of service, and a statement “Last Contained _____”. All additional signage describing the tank’s previous contents, including NFPA diamonds and/or DOT hazard placards, should be covered with tape or paint.

Note that this procedure is only to temporarily place a tank out-of-service with the intention that the AST will again be operated in the same or similar function in the future. Such a tank is still regulated under APSA and federal Spill Prevention, Control, and Countermeasure (SPCC) regulations. Once the tank is placed back into service, the Empty sign is removed and the signage stating the tank contents and hazard placards are restored.

Permanent Closure of Tanks containing a Hazardous Material:

California fire code regulations require that ASTs that are out-of-service for one year or more must be permanently closed and removed from the property. The following procedures shall be used to permanently close ASTs which are no longer in use and will not be in service again.

1. Tank and associated piping should be drained of all stored fluids. This can be accomplished through opening existing drain lines, operating existing transfer pumps, manual removal of fluids and residue, etc. All fluids should be collected in compatible containers for reuse, if possible. Waste materials shall be collected in labeled drums for proper disposal.
2. Disconnect and blank off all piping, pumps, or additional equipment attached to the tank, with the exception of the normal vent line. All valves (except for ventilation valves) should be closed and locked. Seal or blank off all openings other than the normal vent with threaded plugs, caps, solid flanges, etc.
3. Mark exterior of tank with signage that states "Tank Permanently Closed", the date of when it was closed, and a statement "Last Contained _____". All additional signage describing the tank's previous contents, including NFPA diamonds and/or DOT hazard placards, should be removed or covered with paint. Note that the tank will no longer be regulated under APSA or federal SPCC regulations.
4. When ready to remove the AST from the site, contact a qualified commercial contractor to provide additional cleaning and proper disposal of the tank. Information to be provided to the Contractor will include:
    - The size and shape of the tank to be removed;
    - Previous contents;
    - Manufacturer information of the tank;
    - Number of tanks to be removed; and
    - The current location of the tank on the installation.
5. Contractor will be required to perform the following functions:

    a. Obtain a fire permit;

    b. Non-sparking, cold-cutting tools or a non-sparking cold cutting process will be used if the tank held a flammable or combustible material, and the tank, piping or additional appurtenances are to be cut onsite;

    c. Tank interior will be triple-rinsed with a pressure washer to remove all remaining liquids and residue;

    d. Removed liquids will be placed in a tanker truck or drummed and labeled for proper off-site disposal;

    e. Tank will be purged with dry ice and checked with hand-held combustible gas indicator (CGI) which is properly calibrated to measure the concentration of flammable vapor at the top, center and bottom of the tank. The concentration of flammable vapor shall be zero percent of the Lower Explosive Limit (LEL) for the material that was contained in the tank; and the oxygen concentration shall be the same as that of the ambient air, approximately 20.8%;

f. At the completion of the tank cleaning process,
    (1) All piping and appurtenances shall be free of product, sludge, rinseate and debris to the extent that no material can be poured or drained from them when held in any orientation (e.g., tilted, inverted, etc.); and
    (2) The tank, upon inspection, shall be visually free of product, sludge, scale (i.e., thin, flaky residual of tank contents), rinseate and debris, except that residual staining caused by waste consisting of light shadows, slight streaks, or minor discolorations, and waste in cracks, crevices, and pits may be present.

g. Once cleaned, the tank will be inspected and certified as cleared for disposal as a non-hazardous solid waste (i.e., scrap metal) by one of the following professionals, certified or registered in California:
    (1) Certified industrial hygienist;
    (2) Certified safety professional;
    (3) Certified marine chemist;
    (4) Registered environmental health specialist;
    (5) Registered professional engineer;
    (6) Registered environmental assessor, Class II; or
    (7) a contractor properly licensed by the Contractor's State License Board (CSLB) to contract for the removal of underground storage tanks and who holds a Hazardous Substance Removal Certification issued by the CSLB; and

h. If necessary due to size, the tank will be cut into smaller pieces to allow for adequatetransport and disposal off-site.

Complete Closure of Tanks containing a Hazardous Waste:

Prior to initiating any cleaning, cutting, or dismantling of an AST that contains or contained a hazardous waste (**including used oil**) the installation shall notify the DEH in writing of the following information:

1. The location of the tank;
2. The scheduled date(s) when the tank will be cleaned;
3. A brief description of the tank operation, equipment and associated components;
4. The identification of the hazardous waste last held in the tank supported by:
    a. A statement signed by the tank operator certifying the identity of the waste last stored or accumulated in the tank; or
    b. If residuals remain in sufficient quantity to be collected and analyzed, a chemical analysis of the residual in the tank;
5. The name and credentials of the individual who will provide certification, when applicable; and
6. The intended disposition and destination of the tank after cleaning and certification.

The notification statement shall be mailed to the following address:

County of San Diego – CUPA
Department of Environmental Health (DEH)
Hazardous Materials Division
P.O. Box 129261
San Diego, CA 92112-9261

Following the written notification to the DEH, complete closure of a hazardous waste tank shall follow the same procedures as for permanent closure of an AST containing hazardous materials. In addition, the

Contractor will fill out the DEH Hazardous Waste Tank Closure Certification form at the completion of the hazardous waste AST closure:

http://www.sdcounty.ca.gov/deh/hazmat/pdf/hm-9704.pdf

A copy of this completed form will accompany the cleaned tank to the disposal/recycling facility. The Contractor will also provide a copy to MCAS Miramar for their records and shall submit this completed form to the DEH.

Responsibilities:

The AST Program Manager shall coordinate, organize, implement and track the Base-wide effort to maintain compliance with all federal, state, local, and Marine Corps regulations concerning the management of ASTs, to include placing tanks out-of-service and/or the closure of tanks no longer in use.

All personnel under the authority of the Installation Commander (active duty, civil servants, and contractors) shall:

1) Provide data, as required, to the AST Program Manager; and
2) Attend environmental awareness training commensurate to the responsibilities of their job (e.g., unit personnel with ASTs should attend training for proper AST management).

Reference Documents:

American Petroleum Institute, Safe Entry and Cleaning of Petroleum Storage Tanks, API Publication 2015, American Petroleum Institute, 1220 L Street, N.W., Washington, DC 20005, May 1994.

Assembly Bill 1130, Chapter 626 Liard. Aboveground Storage Tanks

http://www.calepa.ca.gov/CUPA/Aboveground/AB1130.pdf

CAL EPA "California Aboveground Petroleum Storage Act (APSA), FAQ Sheet"

California HSC, http://caselaw.lp.findlaw.com/cacodes/hsc.html

Chapter 6.67 - Aboveground Storage of Petroleum (APSA) (Sections 25270-25270.13)

CCR, Title 22, Chapter 32, Management of Tanks

County of San Diego 2012 Department of Environmental Health (DEH)

"Hazardous Waste Tank Closure Certification HM-9704"

MCO, P5090.2A, U.S. Marine Corps Environmental Compliance and Protection Manual. 1998.

National Fire Protection Agency (NFPA) Code 30, Chapter 22, Storage of Liquids in Tanks, 2012 Edition.

NFPA Code 326, Standard for the Safeguarding of Tanks and Containers for Entry, Cleaning, or Repair; 2012 Edition.

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