



# 1.0 Introduction

## Purpose of Plan

This plan covers Petroleum Storage Tanks (PSTs) and Petroleum, Oil, & Lubricants (POL) storage, under the responsibility of Fort Gordon located in the City of Augusta, Georgia. The primary objective of this Petroleum Storage Tank Management Plan (STMP) is to delineate a path the Activity can follow in order to achieve compliance with the Environmental Protection Agency (EPA) regulations entitled “Oil Pollution Prevention” (40 CFR 112); Rules of Georgia Department of Natural Resources Environmental Protection Division Chapter 391-3-15 entitled “Underground Storage Tank Management”; and finally 40CFR 280 regulations entitled “Technical Standards and Corrective Action Requirements for Owners and Operators of Underground Storage Tanks (USTs)”. The National Fire Protection Association (NFPA) standard entitled “Flammable and Combustible Liquids Code” (NFPA 30) is also discussed.

## Coordination with the Spill Prevention, Control, and Countermeasures Plan

Relative to petroleum storage, the Spill Prevention, Control, and Countermeasures (SPCC) Plan is the definitive document for PST management. This STMP is to be incorporated by reference into the SPCC. The two documents (SPCC and STMP) are designed to be used together in order to achieve compliance. Information is presented in different formats in each document and therefore both reports need to be referenced.

## Organization of Plan

This plan is divided into several sections. When tank data changes (due to updates, change in service testing, etc.) the user of this plan should update the relevant data in the database (using the forms), reprint any tables that have been affected by these changes and replace them in the table sections of the plan. Most data is in excel database format on CD and electronically stored. These will be updated as changes occur.

**Section 1.0, “Introduction,”** contains general facility information including plan purpose, definitions, plan organization, reference publications, site geology and surface water drainage.

**Section 2.0, “Regulations and Codes,”** provides an outline of regulations and standards upon which this management plan is based. This section includes the



purpose of the regulations, the facilities or storage tanks to which they apply and a listing of the topics covered by each regulation or code.

**Section 3.0, “Inspections, Testing and Maintenance”** contains a general discussion of the routine spill prevention, control and countermeasures inspections and inspections required by operation and maintenance (O& M) manuals for Bulk and Non-bulk fuel tanks. A discussion of regulatory required testing of tanks, piping, electronic and manual tank gauges is also provided. Several tables exist in this portion of the plan that is meant to be continuously updated as projects progress. The tables are located at the end of the section to aid in plan updates.

**Section 4.0, “Required Upgrades, Best Management Practice Recommendations”** contains a general discussion of the current compliance status of each Petroleum Storage Tank or other POL Storage containment at Fort Gordon based on the requirements of each applicable regulation and code. The compliance evaluation of each tank is based on field observations, facility UST/AST records, and interviews with facility personnel.

## References

The publications listed below are referenced within this report.

### AMEC Earth & Environmental, Inc.:

Stormwater Pollution Prevention Plan Summary Report and Appendices, August, 2013

### American Petroleum Institute (API) Standards:

ANSI/API 570 “Piping Inspection Code: Inspection, Repair, Alteration, and Rerating of In-Service Piping Systems Edition: 2<sup>nd</sup>, 01-Oct-1998”

API 650 “Welded Steel Tanks for Oil Storage,” Ninth Edition, 1993.

API 651 “Cathodic Protection of Aboveground Petroleum Storage Tanks,” 1<sup>st</sup> Edition, 1991.

API 653 “Tank Inspection, Repair, Alteration and Reconstruction,” 2<sup>nd</sup> Edition, 1995.

API 2000 “Venting Atmospheric and Low-Pressure Storage Tanks: Non-refrigerated and Refrigerated”, 4<sup>th</sup> Edition, 1992.

### Department of Defense:



Mil-Hdbk-1022a "Petroleum Fuel Facilities"

Environmental Protection Agency (EPA) regulations:

40 CFR 112 "Oil Pollution Prevention," 2002.

40 CFR 280 "Technical Standards and Corrective Action Requirements for Owners and Operators of Underground Storage Tanks (UST)," December 22, 1988.

40 CFR 281 "Approval of State Underground Storage Tank Programs," December 22, 1988.

Georgia Department of Natural Resources:

Chapter 391-3-15 "Underground Storage Tank Management"

Chapter 391-3-16-.02 Criteria For Protection of Groundwater Recharge Areas

National Association of Corrosion Engineers (NACE) standards:

NACE 0169 "Control of External Corrosion on Underground or Submerged Metallic Piping Systems," 1983.

NACE 0285 "Control of External Corrosion on Metallic Buried, Partially Buried or Submerged Liquid Storage Systems," 1985.

National Fire Protection Association (NFPA) Codes:

NFPA 30 "Flammable and Combustible Liquids Code," Latest Edition.

NFPA 30A "Automotive and Marine Service Station Code," Latest Edition.

NFPA 77 "Recommended Practices on Static Electricity," Latest Edition.

NFPA 780 "Lightning Protection Code," Latest Edition.

Occupational Safety and Health Administration (OSHA) Standards:

29 CFR 1910.106 "Flammable and Combustible Liquids."

Steel Tank Institute:

"Standards for the Inspection of Aboveground Storage Tanks, 5<sup>th</sup> Edition, September 2011" (STI-SP001-05)

Fort Gordon Environmental and Natural Resources Management Office:



Facility Response Plan (FRP) Fort Gordon, Georgia

U.S. Army Public health Command:

Installation Spill Contingency Plan (ISCP)

## **General Facility Information**

Reference section 7.0 of the SPCC Plan

## **2.0 Regulations and Codes**

This Section provides a general outline of the regulations and standards upon which this STMP is based. It is assumed that the user of this document has knowledge of storage tank system rules and regulations. The information presented in this section only summarizes the regulatory requirements for storage tanks.

### **Federal Oil Pollution Prevention Regulations 40 CFR 112**

The main regulations regarding petroleum storage at Fort Gordon are the Federal Oil Pollution Prevention regulations found in 40 CFR 112. The main requirement of 40 CFR 112 is a formal written Spill Prevention, Control, and Countermeasures (SPCC) Plan which address the following items:

- Containment and/or diversionary structures or equipment to control spills
- Facility drainage equipment and procedures
- Facility transfer, pumping and in-plant process equipment and operations
- Facility tanker truck loading/unloading rack provisions
- Facility inspections and records
- Adequate security
- Personnel, training and spill prevention procedures
- Underground Storage Tanks not addressed by 40 CFR 280



## **Federal UST Regulations 40 CFR 280**

The Federal UST regulation, 40 CFR 280, applies to Fort Gordon as an owner/operator of underground petroleum storage tank systems. Requirements for individual regulated USTs include the following:

- Tank Leak Detection (Deferrals of this requirement for some types of systems)
- Piping Leak Detection
- Pressurized Piping Leak Detection
- Suction Piping Leak Detection
- Tank Corrosion Protection
- Piping Corrosion Protection
- Spill and Overfill Prevention & Catchment

## **Georgia State UST Regulation 391-3-15 (also referred to as GA 40 CFR 281)**

Georgia State UST Regulation 391-3-15 applies to any UST system, including attached underground piping, in the State of Georgia that is used to contain an accumulation of regulated substances, whose capacity is greater than 110 gallons and whose volume of which (including the volume of underground pipes connected thereto) is ten percent (10%) or more beneath the surface of the ground. Requirements for USTs include:

- Site Diagrams
- Records of USTs
- Tank Leak Detection
- Piping Leak Detection
- Pressurized Piping Leak Detection
- Suction Piping Leak Detection
- Tank Corrosion Protection
- Piping Corrosion Protection
- Spill and Overfill Prevention & Catchment



### **391-3-16.02 Criteria for Protection of Groundwater Recharge Areas**

(1) Background. Variable levels of recharge area protection can be based upon the State's hydrogeology (e.g., areas such as the Dougherty Plain where a major aquifer crops out would receive a relatively high degree of protection whereas other areas, such as the shale hills of northwest Georgia, would receive a lower degree of Protection). Recharge area protection within the significant recharge areas would be further refined, based upon the local susceptibility or vulnerability to human induced pollution (e.g., high, medium, or low). The significant recharge areas have already been identified and mapped (about 22-23% of the State). Pollution susceptibility mapping is ongoing. Existing statutes are adequate for protection of the remaining recharge areas (about 77-78% of the State).

"Significant Recharge Areas" means those areas mapped by the Department of Natural Resources in Hydrologic Atlas 18 (1989 edition). Mapping of recharge areas is based on outcrop area, lithology, soil type thickness, slope, density of lithologic contacts, geologic structure, the presence of karst, and potentiometric surface. Significant recharge areas are as follows in the various geologic provinces of Georgia:

(2) In the Piedmont and in the Blue Ridge, rocks have little primary porosity, with most groundwater being stored in the overlying soils. The significant recharge areas are those with thicker soils. Field mapping indicates that thick soils in the Piedmont and Blue Ridge are characterized by a density of two or more geologic contacts per four squares miles (source: 1976 1:500,000 Geologic Map of Georgia) and slopes lower than 8%.

(3) The following criteria pursuant to O.C.G.A. § 12-2-8 shall apply in significant recharge areas: New above-ground chemical or petroleum storage tanks, having a minimum volume of 660 gallons, shall have secondary containment for 110% of the volume of such tanks or 110% of the volume of the largest tank in a cluster of tanks. (Note: These figures are consistent with US EPA rules for oil pollution prevention, 40 CFR 112.1).

Fort Gordon is located within the recharge area for unconfined aquifers.

### **National Fire Protection Association Code NFPA 30 and 30A**

The standards of Flammable and Combustible Liquids Code NFPA 30 and Automotive and Marine Service Station Code NFPA 30A are intended to reduce fire hazard to a degree consistent with reasonable public safety without undue interference with public convenience and necessity, of operations that require the use of flammable and combustible liquids. As opposed to being a "regulation," NFPA is a "code;" thus, its standards must only be met where required by authorities having jurisdiction.



NFPA 30 and 30A applies to the storage, handling and use of all flammable and combustible liquids, including waste liquids. This code applies to all aboveground storage tanks (ASTs) and underground storage tanks (USTs) of any size and any portable tank whose capacity is greater than 660 gallons (2,500 liters).

**NFPA 30 & 30A standards, pertaining to aboveground storage tanks and facilities, include:**

- Location of ASTs
- Control of spillage from ASTs
- Tank monitoring
- Tank supports, foundation and anchorage
- Tank venting requirements
- Fire protection and control
- Overfill prevention
- Inventory records
- Piping systems
- Portable tank storage
- Facility operations
- Tank vehicles and tank cars

**NFPA 30 & 30 A standards, pertaining to underground storage tanks and facilities, include:**

- Location of USTs
- Corrosion Protection
- Closure (Temporary and Permanent), Reuse and Change of Service
- Venting
- Fill, Discharge and Gauging Openings
- Facility Operations
- Testing and Maintenance
  
- Leak Detection and Inventory records
- Overfill Prevention
- Piping Systems
- Tank Vehicles and Tank Cars



## AR200-1

AR200-1 is the Army's environmental guidance document. Chapter 11 includes a discussion of storage tank systems and spill planning. All of these requirements directly reference both 40 CFR 112 & 280 and therefore no additional requirements above these federal regulations. Therefore, AR200-1 requirements have already been addressed.

## Local Regulations

Fort Gordon is primarily located in Richmond County but also has portions of area that occupy Columbia County, Jefferson County and McDuffie County. None of these counties regulate above ground or underground storage tanks.

# 3.0 Inspections, Testing, and Maintenance

## General

Since the majority of the regulations regarding Inspections, Testing, and Maintenance relative to oil storage are related to PSTs, this chapter is mainly dedicated to tanks storing oils. Since 40 CFR 112 also covers oil-containing equipment like generators with integral tanks, management of those systems is also necessary. In order to keep these items separate from PSTs, generators with integral tanks are discussed separately at the end of this section (3.0). Performance of both routine inspections and scheduled testing is essential to satisfactory PST management. Both are required by multiple regulations as well as the existing SPCC plan. Although similar, testing and inspections are performed in different manners at different time intervals. Generally, the differences can be summarized as follows:

**Inspections:** Performed on a frequent schedule and in some cases can be performed by minimally trained base personnel. These mainly involve visual assessments of the tanks or ancillary equipment and the completion of a log or checklist. However, STI does state that certified inspectors are required in certain types of inspections





**Testing:** Performed on a longer timeframe and usually involves the use of specialized personnel. Usually testing involves in-depth assessment including data collection using tools or equipment. Testing is often presented in a formal report.

## Inspections

40 CFR 112 and the Facility's SPCC Plan require routine inspections of PST equipment. Inspections will include: monthly visual tank inspections; Accumulated rain water in dike areas (Before draining); and regular monitoring of electronic systems (LDS, line tests, liquid levels, etc). Deficiencies detected during routine inspections should be documented and reported to the location manager. The respective manager should inform the Environmental Division.

Deficiencies identified during field inspections should be corrected through a maintenance program in a timely manner to reduce the risk of a significant spill occurrence. Inspection records and logs are required to be kept at the respective facility as well as at the Environmental Division. Checklists for these PST inspections are provided in Appendix E of the SPCC Plan. Alternative checklists may be acceptable provided the checklists are compliant with minimum industry standards and have been approved by a manager competent in all the regulations identified in this report.

### Inspections for Leaks

Certainly the most important of all inspections is that of system leak determination ("is this tank or piping leaking?"). While this can be accomplished in variety of ways the main issue is that personnel must check on a routine basis, either through visual inspection of this system or the associated leak detection system, to see if a system is leaking. The Database CD identifies/tracks the frequency at which systems must be checked and documented for leaks. Although tank systems that have electronic leak detection systems are listed as having continuous leak detection, the leak detection systems must be monitored monthly for leak detection. Systems with leak detection panels must be monitored once per month and log entries made indicating a negative alarm status. If a positive leak alarm is noted at any time, the system must be taken out of service and the cause for the alarm identified. If the piping cannot be routinely inspected for leaks due to its construction, then it is considered as inadequate.

As detailed in the testing section, leak detection systems and liquid level gauges must also be annually inspected for working order and if applicable, calibrated by a qualified technician to ensure proper operation. It is critical that all identified inoperable leak detection systems and liquid level gauges be repaired to ensure compliance with leak detection requirements.



## **Inspection of Double Walled ASTs**

It should be noted that for compliance with 40 CFR 112 inspection requirements, the EPA has determined that inspection of a double-walled AST must also include inspection of the inner product tank. This is discussed in detail in EPA memorandum OSWER 9360.8-38. This type of inspection can be a manual inspection of the interstitial space, but that is difficult and time consuming. A more effective method of this inspection is the installation of a mechanical or electronic interstitial leak detector. Best Management Practice (BMP) recommends to upgrade all DW tanks that do not have interstitial leak detectors. This is discussed on the Database CD (Appendix F).

## **Inspection of Underground Piping Associated with ASTs for Leaks**

Leak determination of underground piping associated with ASTs is an issue at Fort Gordon. ASTs that have underground piping without any form of leak detection pose a risk to the environment. Best Management Practices Recommends (detailed in Section 4.0) to upgrade these systems as soon as possible. Upgrading can come in the form of the addition of some type of leak detection system for the existing piping or replacing the piping with above ground piping and utilizing routine visual inspection for leak detection. Unless this piping is upgraded as recommended, integrity testing of these systems or should be performed as referenced in the Database CD.

## **Testing**

Formal Testing of PST equipment is required by 40 CFR 112. The Database CD lists all recommended testing for Non-Bulk systems. Deficiencies detected during testing must be corrected in accordance with respective industry standards in a timely manner to reduce the risk of a significant spill occurrence.

## **Specific Testing Requirements**

The following sections identify specific periodic testing to be performed for PSTs.

### **Formal Evaluation of Bulk Cut/Cover Tanks**



There is currently one 200,000 gallon BFCUSTs, requiring a formal internal modified API 653 inspection and integrity testing should be performed immediately. The modified API 653 internal inspection should be conducted every 10 years and periodic inspections as recommended by the tank inspector. This also is referenced in the Database CD.

## **Formal Assessments of Shop-Fabricated ASTs (STI SP001-05)**

SPCC regulation (40 CFR 112.7) requires formal evaluation of shop fabricated ASTs. The Steel Tank Institute (STI) has developed a standard test method, the STI SP001-05, Fifth Edition, based on tank configuration. All shop-fabricated tanks less than 5,000 gallons at Fort Gordon are classified as category 1 tanks and require periodic visual inspections. Tanks greater than 5,000 gallons also require periodic inspections as well as formal external inspections 20 years from date of installation. The Database CD presents a schedule for formal evaluations of the shop built ASTs at Fort Gordon utilizing the STI SP001-05 method. The piping associated with these ASTs should also be inspected periodically.

## **Gauge Calibration and Testing (all PSTs)**

Since in many cases the gauge (either electronic or mechanical) is the main form of overfill prevention and thus discharge prevention for PSTs, it is critical to make certain all gauges are in good working order on a routine schedule. Annually, all gauges and other liquid level sensing devices such as high level alarms should be assessed and tested to confirm proper working order and calibrated for accuracy (reference the Database CD). It should be noted that there are PSTs at Fort Gordon without gauges or any other form of overfill prevention. For best management practices, all PSTs should have some type of liquid level gauge.

## **Corrosion Protection System Testing**

While the majority of the PSTs at Fort Gordon utilize a simple coating system as the main form of corrosion protection there are several systems requiring routine testing to ensure proper working condition. Both active (impressed current) and passive (sacrificial anode) systems must be regularly tested. The Database CD provides the recommended corrosion testing for USTs and provides a list of USTs where corrosion protection needs to be identified and/or upgraded.

## **Integrity Testing of USTs and Underground Piping Associated**



## **With PST's**

For 40 CFR 112 single walled regulated USTs with no other form of leak detection, tightness testing or installation of leak detection systems is required by the SPCC Plan to be performed annually. Also, integrity testing on the piping systems is required on an annual basis for pressurized piping and triennial basis for suction piping. For ASTs with underground piping with no form of leak detection, integrity testing is recommended and should be performed on the same basis as USTs (annual basis for pressurized piping and triennial basis for suction piping). The Database CD shows the recommended schedule for the testing of systems.



## **Maintenance**

The logical outcome of an inspection and testing program is the need for periodic maintenance of PST systems. Fort Gordon can expect to have to perform such maintenance items as repainting tanks and piping, replacing blown circuit boards in electronic leak detection system panels, and replacing light bulbs in security lighting. In general, Fort Gordon sites/facilities appear to keep adequate maintenance/inspection records on site for the ones performed by their operators. All other maintenance, upgrades, repairs, inspections and testing records are kept at DPW-Environmental.

### **Preventive Maintenance Program**

Fort Gordon is making improvements to have an active, fully implemented Preventative Maintenance Program. Routine, monthly inspections are being performed, documented and records maintained addressing any discrepancies to be corrected. If the preventative maintenance required is beyond the capability of the base operators, then the manager of the respective POL storage location should procure the services of a qualified contractor to perform such repairs.

### **Inspections, Testing, and Maintenance of Generator Tanks**

Per the requirements of 40 CFR 112, the large (greater than 55-gallon) integral storage tanks associated with emergency generators are treated the same as PSTs relative to inspections. Therefore, these systems are subject to routine inspections. Ft. Gordon includes such generators in the active monthly visual inspection program.

## **Database CD**

A comprehensive Database CD is referenced in this section (3.0) and is provided for tracking of required upgrades/maintenance and testing (Appendix F).



## 4.0 Required Upgrades/BMP Recommendations

### General

The Database CD included with the STMP identifies the required upgrades, testing and BMP recommendations. The database can be a useful tool in tracking and updating progress towards correcting deficiencies and documentation records.

Specific required upgrades are identified for correction that are necessary to bring a particular tank and/or generator facility into compliance with a Federal, State, and local regulations. Also included are Best Management Practice (BMP) recommendations based on good engineering practices that will enhance the operation, maintenance and management of those tanks and generator facilities listed.

It should be noted that providing overfill catchment has been listed as a Required Upgrade, this catchment is typically provided by fuel delivery personnel utilizing a spill catchment bucket under the fitting with the tank. This can be taken to each site at no cost. If Fort Gordon was to install a overfill catchment basin at each tank needing one, then they should budget approximately \$400 per tank.

Another issue relative to general compliance of all systems deals with 40 CFR 112 compliant loading/offloading areas for storage tanks. It is a requirement of 40 CFR 112.7 (c) that all regulated tanks have some type of discharge control for the loading of tanks or the fueling of vehicles. The Database CD identifies PSTs that do not have either a dedicated loading/offloading containment structure or general containment provided. The sites that need containment structures at loading areas have not been determined to be "out of compliance" based solely on that requirement. However, as noted, containment measures should be implemented immediately to avoid any potential environmental impacts.