



# 2021 Leak Detection Testing Report of Bulk Field-Constructed Underground Storage Tank 5 at Red Hill Fuel Storage Complex

**Joint Base Pearl Harbor-Hickam,  
Hawaii**



*Prepared for:*  
**Defense Logistics Agency Energy  
Fort Belvoir, Virginia**

*Prepared under:*  
**Naval Facilities Engineering Systems Command  
Atlantic Contract N62470-16-D-9007  
Delivery Order N6247021F4014**

*Submitted by:*  
**Michael Baker International  
Virginia Beach, Virginia**

*Date:*  
**10 November 2021**

**Michael Baker  
INTERNATIONAL**

*Project: 182337  
Task: 3.0*

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## TABLE OF CONTENTS

	<b>Page No.</b>
LIST OF ABBREVIATIONS AND ACRONYMS.....	ii
PROFESSIONAL ENGINEER CERTIFICATION .....	iii
EXECUTIVE SUMMARY .....	iv
1.0 INTRODUCTION .....	1
1.1 Purpose of Project.....	1
1.2 Site Background and History.....	1
1.3 Historical Testing Results.....	2
1.4 Project Scope .....	2
1.5 Project Team.....	6
1.6 Qualifications and Technical Approach .....	6
2.0 TESTING RESULTS.....	8
3.0 CONCLUSIONS .....	9

### List of Tables

Table 1-1: Project Summary .....	3
Table 2-1: Results Summary.....	8

### List of Figures

Figure 1-1: JB Pearl Harbor-Hickam Overview .....	4
Figure 1-2: Red Hill Fuel Storage Complex Overview .....	5

### List of Appendices

Appendix A    Proprietary Information - Test Report	
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**LIST OF ABBREVIATIONS AND ACRONYMS**

BFCUST	Bulk Field-Constructed Underground Storage Tank
DLA	Defense Logistics Agency
F-24	Commercial Aviation Jet Fuel with Military Additives
FLC	Fleet Logistics Center
gph	gallons per hour
HAR	Hawaii Administrative Rules
JB	Joint Base
MDLR	Minimum Detectable Leak Rate
Michael Baker <small>Proprietary Information</small>	Michael Baker International
NAVFAC	Naval Facilities Engineering Systems Command
NWGLDE	National Work Group on Leak Detection Evaluations
POC	Point(s) of contact
UST	Underground Storage Tank

**PROFESSIONAL ENGINEER CERTIFICATION**

**2021 Leak Detection Testing Report of  
Bulk Field-Constructed Underground Storage Tank 5 at  
Red Hill Fuel Storage Complex**

**Joint Base Pearl Harbor-Hickam,  
Hawaii**

This report has been reviewed by a professional engineer and has been prepared in accordance with good engineering practices. Laboratory results, field notes, and supporting data have been reviewed and referenced correctly.

I hereby certify that I have examined this report and attest that it has been prepared in accordance with good engineering practices.

Engineer: Christopher D. Caputi, P.E.

Registration Number: 032382

State: Virginia

Date: 10 November 2021



## EXECUTIVE SUMMARY

The scope of this project is to perform leak detection testing of bulk field-constructed underground storage tank (BFCUST) 5, at the Red Hill Fuel Storage Complex at Joint Base (JB) Pearl Harbor-Hickam, Hawaii. The 2021 leak detection testing of BFCUST 5 is being performed at the direction of the Naval Facilities Engineering Systems Command (NAVFAC) Atlantic and the Defense Logistics Agency (DLA) Energy Leak Detection Centrally Managed Program to conduct testing capable of detecting a 0.1 gallon per hour (gph) leak rate.

The leak detection testing of BFCUST 5 was performed, by **Proprietary Information**, between 5 and 30 October 2021, with no detectable leak above the test method's minimum detectable leak rate of 0.1 gph, resulting in a passing test.

The environmental regulatory compliance of this site is the responsibility of the base and the service.

## **1.0 INTRODUCTION**

### **1.1 Purpose of Project**

In support of the Defense Logistics Agency (DLA) Energy, Naval Facilities Engineering Systems Command (NAVFAC) Atlantic contracted Michael Baker International (Michael Baker) through NAVFAC Atlantic Contract N62470-16-D-9007, Delivery Order N6247021F4014, to perform leak detection testing of bulk field-constructed underground storage tank (BFCUST) 5 at the Red Hill Fuel Storage Complex at Joint Base (JB) Pearl Harbor-Hickam, Hawaii. The leak detection testing of BFCUST 5 is being performed at the direction of the Naval Facilities Engineering Systems Command (NAVFAC) Atlantic and the Defense Logistics Agency (DLA) Energy Leak Detection Centrally Managed Program to conduct testing capable of detecting a 0.1 gallon per hour (gph) leak rate.

### **1.2 Site Background and History**

JB Pearl Harbor-Hickam is located on the island of Oahu, approximately eight miles northwest of Honolulu, Hawaii. The Red Hill Fuel Storage Complex is located approximately three miles northeast of the base. The fueling operations at JB Pearl Harbor-Hickam are under the Navy's Fleet Logistics Center Pearl Harbor.

Fuels stored at Red Hill Fuel Storage Complex include commercial aviation jet fuel with military additives (F-24), Jet Propellant 5, and diesel fuel marine. Fuels are issued and received at the Red Hill Fuel Storage Complex from JB Pearl Harbor-Hickam via a transfer pipeline. The Red Hill Fuel Storage Complex consists of 24 BFCUSTs (BFCUSTs 1 through 20 and BFCUSTs S1224 through S1227) that are constructed of single-walled steel. Two of the 24 BFCUSTs (BFCUSTs 1 and 19) were permanently removed from service prior to 2009. BFCUSTs S1224 through S1227 are utilized as surge tanks during receipt and issue operations. The top and bottom portions of BFCUSTs 1 through 20 are accessible via a tunnel system. BFCUSTs S1224 through S1227 are located underground on the south side of the underground pump house facility and are accessible through a tunnel on the north side of the tanks. The BFCUSTs receipt, issue, and water drain piping are connected to JB Pearl Harbor-Hickam Navy Facility via carbon steel piping of various diameters located in the tunnel system associated with the bottom portion of the BFCUSTs. All piping isolation valves are double block and bleed valves. This report includes the leak detection testing of BFCUST 5 only.

The State of Hawaii has implemented underground storage tank (UST) regulations that meet the federal 1988 UST regulations contained in Title 40 Code of Federal Regulations Part 280 (40 CFR 280). Hawaii has received state UST program approval from United States Environmental Protection Agency (USEPA) and has revised state UST regulations to incorporate and meet the 2015 federal revisions to 40 CFR 280. The Hawaii Administrative Rules (HAR) 11-280.1 contains the compliance requirements for owners and operators of USTs. Subchapter 4, Release Detection, presents the requirements for release detection (or leak detection) for USTs. Section 11-280.1-43(10) lists the accepted methods of release detection for field-constructed tanks and allows for annual tank tightness testing that can detect a 0.5 gallons per hour (gph) leak rate. In addition, HAR 11-280.1-43(3) contains the compliance requirements for owners and operators of USTs placing USTs back into service after repairs to conduct tank tightness testing capable of detecting a 0.1 gph leak rate.

### **1.3 Historical Testing Results**

The leak detection testing of BFCUST 5 was last performed under the DLA Leak Detection CMP, by <sup>Proprietary In</sup>, between 4 March and 20 April 2020, at four different product levels, with no detectable leak above the test method's minimum detectable leak rate (MDLR), resulting in passing tests.

### **1.4 Project Scope**

The scope of this project is to perform leak detection testing of BFCUST 5 at an MDLR of 0.1 gph, at the Red Hill Fuel Storage Complex, JB Pearl Harbor-Hickam, Hawaii.

Table 1-1 provides a project summary. Figures 1-1 and 1-2 provide overviews of JB Pearl Harbor-Hickam and the Red Hill Fuel Storage Complex, respectively.



**Table 1-1: Project Summary**

Fuel System	Designation	Tank Diameter (Feet)	Tank Height <sup>1</sup> (Feet)	Tank Volume <sup>2</sup> (Gallons)	Product	Associated Tank Piping				Comments
						Diameter (Inches)		Total Length (Feet)	Volume (Gallons)	
						Length (Feet)				
				6	20					
Red Hill Fuel Storage Complex	BFCUST 5	Critical In	Critical In	12,700,000	F-24	Critical	Critical	Critical I	38	Testing performed at MDLR of 0.1 gph.
Table Notes: 1. Tank height is rounded to the nearest foot. 2. Tank volume is rounded to the nearest hundred thousand gallons.										

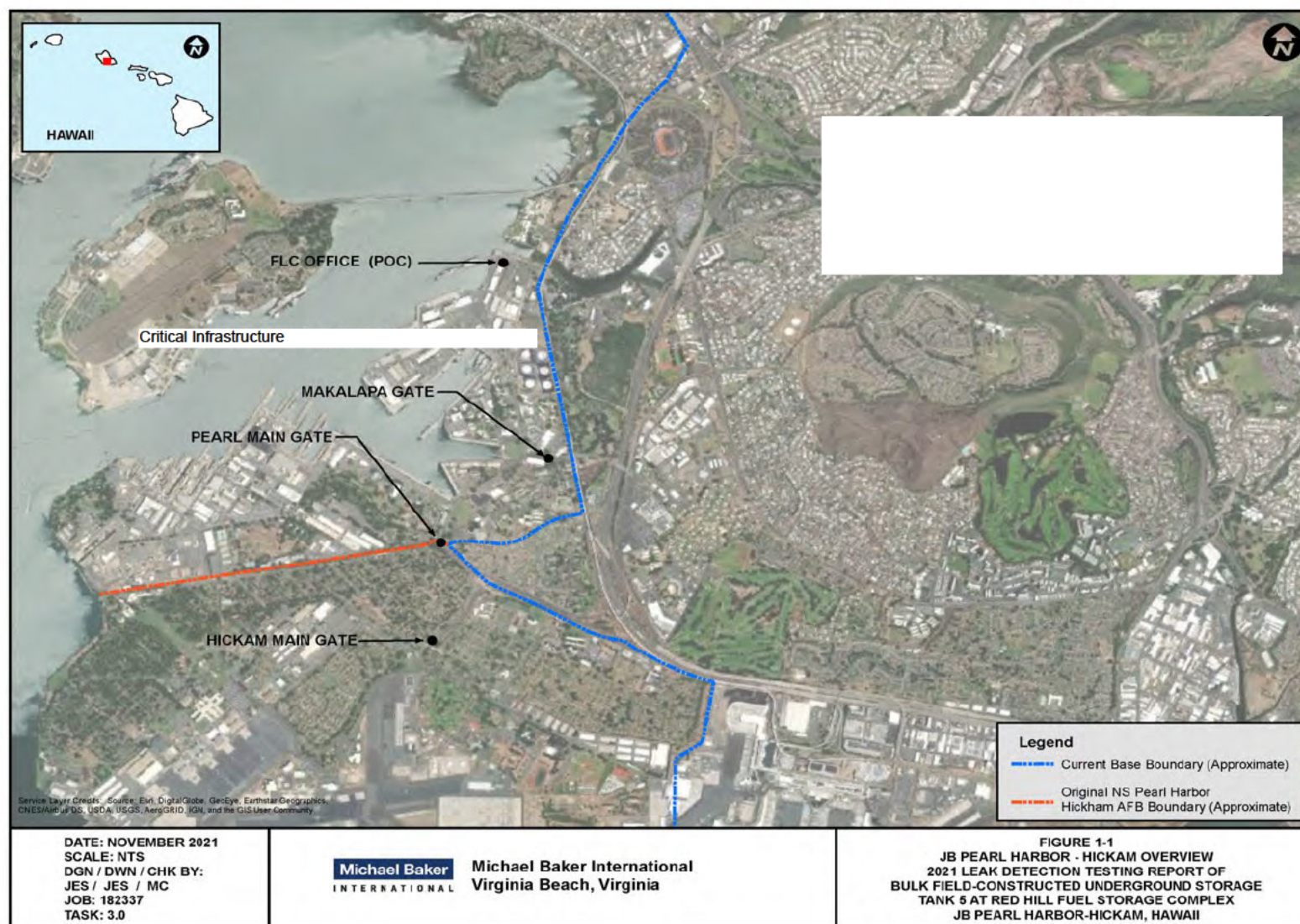
**Figure 1-1: JB Pearl Harbor-Hickam Overview**

Figure 1-2: Red Hill Fuel Storage Complex Overview

# Critical Infrastructure

DATE: NOVEMBER 2021  
SCALE: NTS  
DGN / DWN / CHK BY:  
JES / JES / MC  
JOB: 182337  
TASK: 3.0



Michael Baker International  
Virginia Beach, Virginia

FIGURE 1-2  
RED HILL FUEL STORAGE COMPLEX OVERVIEW  
2021 LEAK DETECTION TESTING REPORT OF  
BULK FIELD-CONSTRUCTED UNDERGROUND STORAGE  
TANK 5 AT RED HILL FUEL STORAGE COMPLEX  
JB PEARL HARBOR-HICKAM, HAWAII

## **1.5 Project Team**

Michael Baker subcontracted MTC to perform the leak detection testing. Field-testing oversight, coordination with facility fuel representatives, quality assurance/quality controls, and final report preparation and submission were provided by Michael Baker personnel.

## **1.6 Qualifications and Technical Approach**

Proprietary information

## Proprietary Information

## 2.0 TESTING RESULTS

The <sup>Proprietary Inf</sup> test report is provided in Appendix A.

The leak detection testing of BFCUST 5 was performed by **Proprietary Information**, between 5 and 30 October 2021, with no detectable leak above the test method's MDLR of 0.1 gph, resulting in a passing test.

The results summary is listed in Table 2-1.

**Table 2-1: Results Summary**

Fuel System	Designation	Height <sup>1</sup> (Feet)	Capacity <sup>2</sup> (Gallons)	Test Product Height (Feet)	Certified MDLR (gph)	Test Date	Result
Red Hill Fuel Storage Complex	BFCUST 5	Critical In	12,700,000	Critical Infrastru	0.1	5 – 30 October 2021	Pass
Table Notes: 1. Tank height is rounded to the nearest foot. 2. Tank volume is rounded to the nearest hundred thousand gallons.							

### **3.0 CONCLUSIONS**

The 2021 leak detection testing of BFCUST 5 at 0.1 gph resulted in a passing test.

The environmental regulatory compliance of this site is the responsibility of the base and the service.

## **APPENDIX A**

### Proprietary Information



# Proprietary Information

# Proprietary Information

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