FINAL 2018 ANNUAL LEAK DETECTION TESTING REPORT OF 17 BULK FIELD-CONSTRUCTED UNDERGROUND STORAGE TANKS 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 Command
Atlantic Contract N62470-16-D-9007
Delivery Order N6247018F4143

Submitted by:
Michael Baker International
Virginia Beach, Virginia

Date:
23 January 2019

Michael Baker
INTERNATIONAL

Project: 169227
Task: 3.0

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LIST OF ABBREVIATIONS AND ACRONYMS

AOC	Administrative Order on Consent
BFCUST	Bulk field-constructed underground storage tank
CMP	Centrally Managed Program
DLA	Defense Logistics Agency
F-24	Commercial aviation jet fuel with military additives
F-76	Diesel fuel marine
FLC	Fleet Logistics Center
gph	gallons per hour
JB	Joint Base
JP-5	Jet Propellant 5
MDLR	Minimum detectable leak rate
Michael Baker	Michael Baker International
MTC	Mass Technology Corporation
N/A	Not applicable
NAVFAC	Naval Facilities Engineering Command
NWGLDE	National Work Group on Leak Detection Evaluations
POC	Point(s) of contact

PROFESSIONAL ENGINEER CERTIFICATION

Final 2018 Annual Leak Detection Testing Report of
17 Bulk Field-Constructed Underground Storage Tanks 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: 23 January 2019

EXECUTIVE SUMMARY

The scope of this project is to perform annual leak detection testing of 22 bulk field-constructed underground storage tanks (BFCUSTs) at the Red Hill Fuel Storage Complex at Joint Base (JB) Pearl Harbor-Hickam, Hawaii. The annual leak detection testing is being conducted in accordance with the Administrative Order on Consent (AOC), signed September 2015, between the Commander Navy Region Hawaii, Defense Logistics Agency (DLA) Energy, the State of Hawaii Department of Health, and the United States Environmental Protection Agency Region 9.

Upon mobilization and system review, five BFCUSTs (BFCUSTs 5, 13, 14, 17, and S1227) were removed from testing due to being temporarily out-of-service. Consequently, the final 2018 annual leak detection testing event included 17 BFCUSTs at the Red Hill Fuel Storage Complex at JB Pearl Harbor-Hickam.

The annual leak detection testing of 17 BFCUSTs was performed, by Mass Technology Corporation, between 10 October and 27 November 2018, with no detectable leak above the test method's minimum detectable leak rate, resulting in passing tests. BFCUSTs 7, 15, 18, and 20 were tested at less than tank high level, per base request, due to operational issues at the time of testing.

The DLA Energy's Leak Detection Centrally Managed Program (CMP) manager should be notified immediately when BFCUSTs 5, 13, 14, 17, and S1227 are returned to service and when BFCUSTs 7, 15, 18, and 20 product levels are returned to normal operating levels to facilitate immediate testing, to comply with the AOC.

In accordance with the AOC, annual leak detection testing of 22 BFCUSTs at JB Pearl Harbor-Hickam must be initiated on or before the anniversary date of 10 October 2019. The annual testing will be repeated in 2019 under the DLA Energy's Leak Detection CMP, in accordance with the AOC; other regulatory obligations are the responsibility of the base and Naval Supply Systems Command.

1.0 INTRODUCTION

1.1 Purpose of Project

The Defense Logistics Agency (DLA) Energy contracted Michael Baker International (Michael Baker) through Naval Facilities Engineering Command (NAVFAC) Atlantic Contract N62470-16-D-9007, Delivery Order N6247018F4143 to perform annual leak detection testing of 22 bulk field-constructed underground storage tanks (BFCUSTs) at the Red Hill Fuel Storage Complex at Joint Base (JB) Pearl Harbor-Hickam, Hawaii. The annual leak detection testing is being conducted in accordance with the Administrative Order on Consent (AOC), signed September 2015, between the Commander Navy Region Hawaii, DLA Energy, the State of Hawaii Department of Health, and the United States Environmental Protection Agency Region 9. A copy of the AOC is provided in Appendix A.

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 (FLC) Pearl Harbor.

Fuels stored at Red Hill Fuel Storage Complex include: commercial aviation jet fuel with military additives (F-24), Jet Propellant 5 (JP-5), and diesel fuel marine (F-76). 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.

1.3 Historical Leak Detection Testing Results

The annual leak detection testing of 18 BFCUSTs was performed, by Mass Technology Corporation (MTC), between 5 October and 19 November 2017, with no detectable leak above the test method's minimum detectable leak rates (MDLRs), resulting in passed tests. The annual leak detection testing of BFCUST S1225 was performed, by MTC, between 12 October and 16 October 2017, with inconclusive results due to fuel bypassing an isolation valve. After the isolation valve was reseated and verified to be properly closed, BFCUST S1225 was retested, between 21 October and 25 October 2017, with no detectable leak above the test method's MDLR, resulting in a passed test. BFCUSTs 5, 13, 14, and 17 were not tested due to being temporarily out-of-service. BFCUSTs 16 and 18 were tested at less than the tank product high level, per base request, due to operational issues at the time of testing (Reference 4.1).

Leak detection testing of BFCUSTs 16 and 18 was again performed, by MTC, between 30 April 2018 and 6 May 2018, with no detectable leak above the test method's MDLR, resulting in passed tests. BFCUST 16 was tested at the tank product high level. BFCUST 18 was tested at less than the tank product high level, due to vent system issues encountered when filling (Reference 4.2).

1.4 Project Scope

The scope of this project is to perform annual leak detection testing of 22 BFCUSTs at JB Pearl Harbor-Hickam, Hawaii. Upon mobilization and system review, five BFCUSTs (BFCUSTs 5, 13, 14, 17, and S1227) were removed from testing due to being temporarily out-of-service. Consequently, the final 2018 annual leak detection testing event included 17 BFCUSTs at the Red Hill Fuel Storage Complex at JB Pearl Harbor-Hickam. Table 1-1 provides a summary of the project scope. Figures 1-1 through 1-3 provide overviews of JB Pearl Harbor-Hickam, the Red Hill Fuel Storage Complex, and the pump house facility, respectively.

Table 1-1: Project Scope Summary

Fuel System	Designation	Tank Diameter (Feet)	Tank Height[1] (Feet)	Tank Volume[2] (Gallons)	Product	Associated Tank Piping			Comments
						Diameter (Inches) Length (Feet)	Total Length (Feet)	Volume (Gallons)	
Red Hill Underground Fuel Storage Facility	BFCUST 2	100	238	12,000,000	F-24	Critical Infrastructure	Critical Infrastructure		None
	BFCUST 3	100	238	12,000,000	F-24				None
	BFCUST 4	100	238	12,000,000	F-24				None
	BFCUST 5	100	250	12,700,000	F-24				Temporarily out-of-service
	BFCUST 6	100	250	12,700,000	F-24				None
	BFCUST 7	100	250	12,700,000	JP-5				None
	BFCUST 8	100	250	12,700,000	JP-5				None
	BFCUST 9	100	250	12,700,000	JP-5				None
	BFCUST 10	100	250	12,700,000	JP-5				None
	BFCUST 11	100	251	12,800,000	JP-5				None
	BFCUST 12	100	251	12,800,000	JP-5				None
	BFCUST 13	100	251	12,800,000	JP-5				Temporarily out-of-service
	BFCUST 14	100	251	12,800,000	JP-5				Temporarily out-of-service
	BFCUST 15	100	250	12,700,000	F-76				None
	BFCUST 16	100	250	12,700,000	F-76				None
	BFCUST 17	100	250	12,700,000	JP-5				Temporarily out-of-service
	BFCUST 18	100	250	12,700,000	JP-5				None
	BFCUST 20	100	250	12,700,000	JP-5				None
Underground Pump House Facility	BFCUST S1224	60	20	420,000	F-24				None
	BFCUST S1225	60	20	420,000	JP-5				None
	BFCUST S1226	60	20	420,000	F-76				None
	BFCUST S1227	60	20	420,000	F-76				Temporarily out-of-service

Table Notes:
1. Tank height is rounded to the nearest foot.
2. Tank volume is rounded to the nearest hundred thousand gallon.

Figure 1-1: JB Pearl Harbor-Hickam Overview

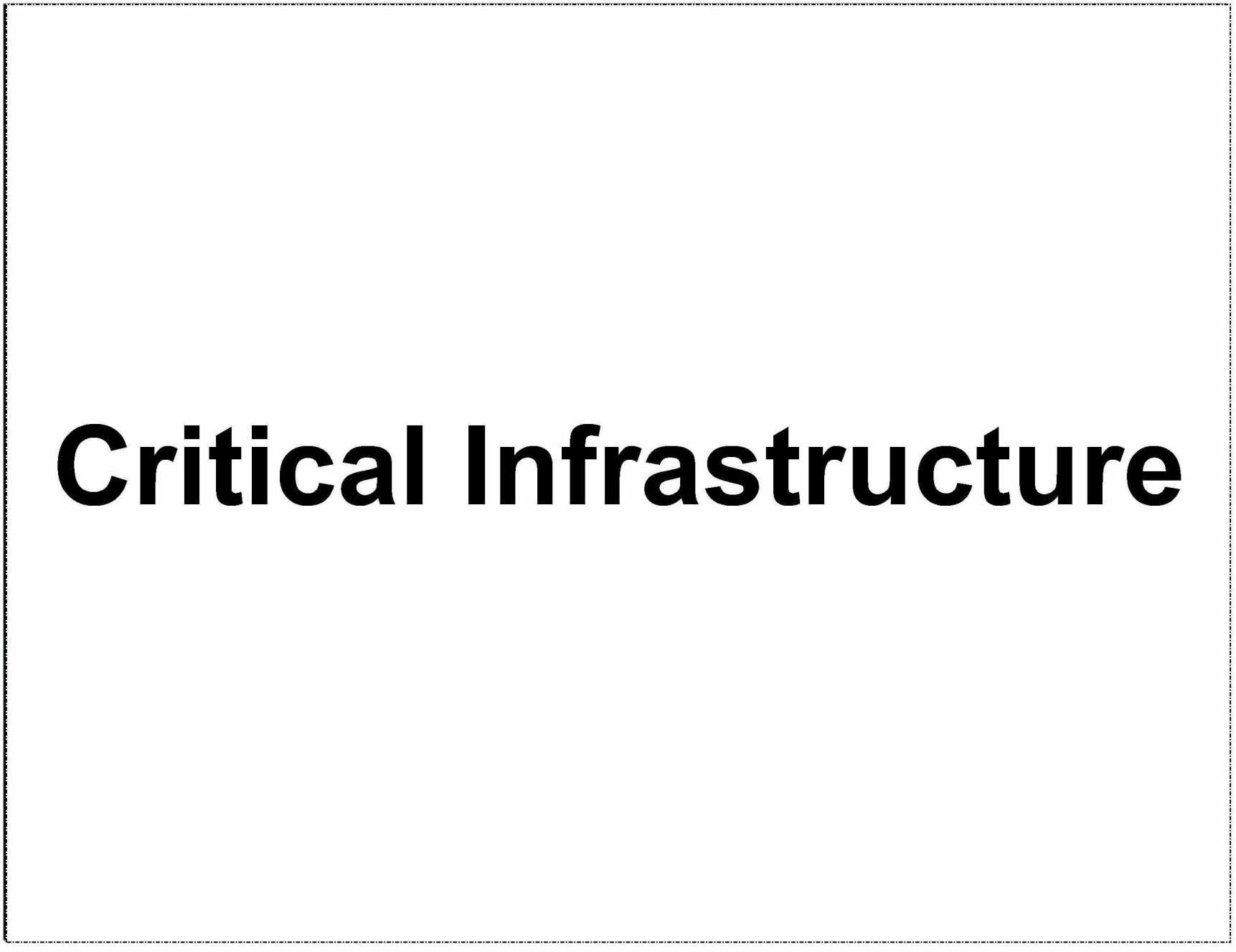


Figure 1-2: Red Hill Fuel Storage Complex Overview

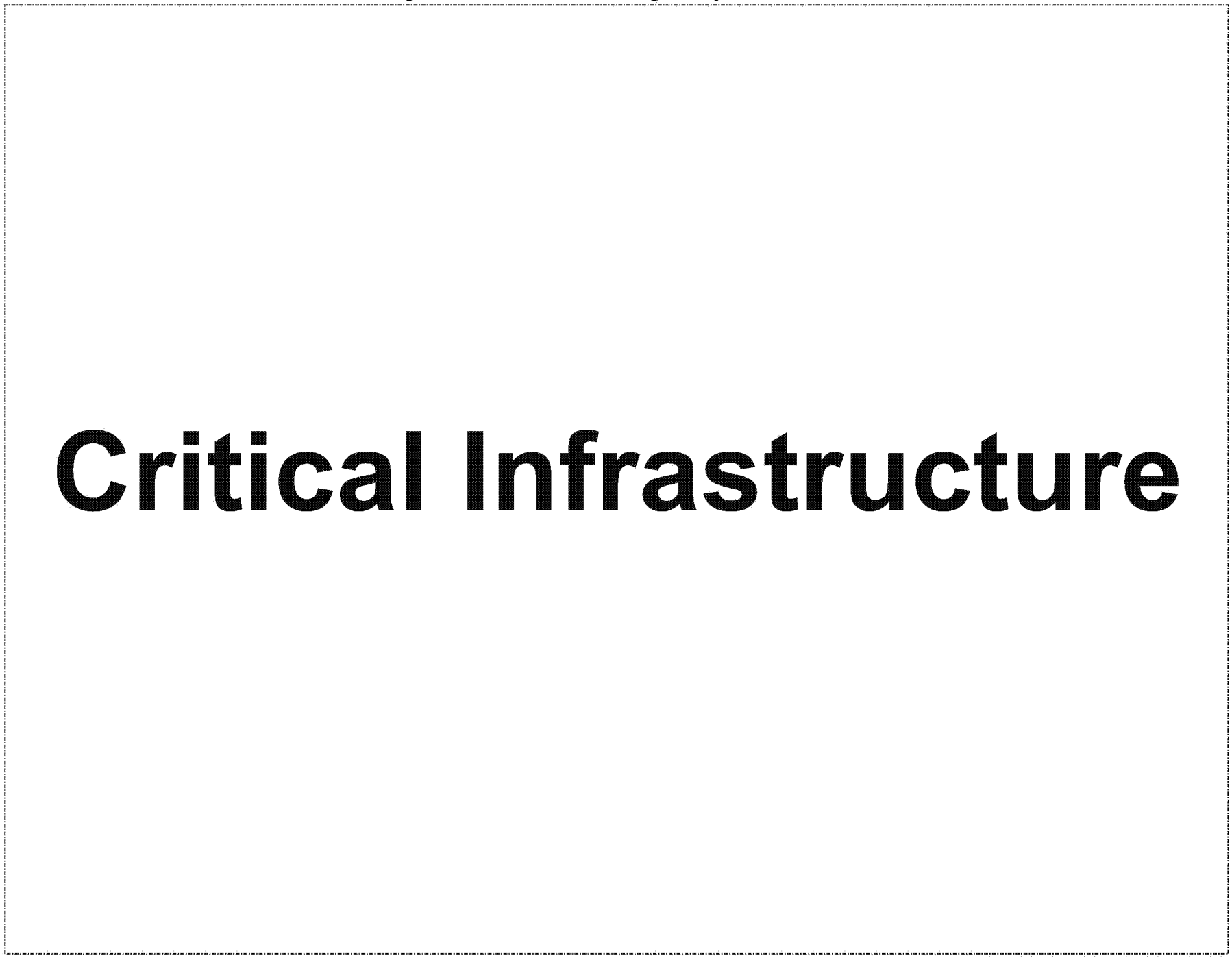
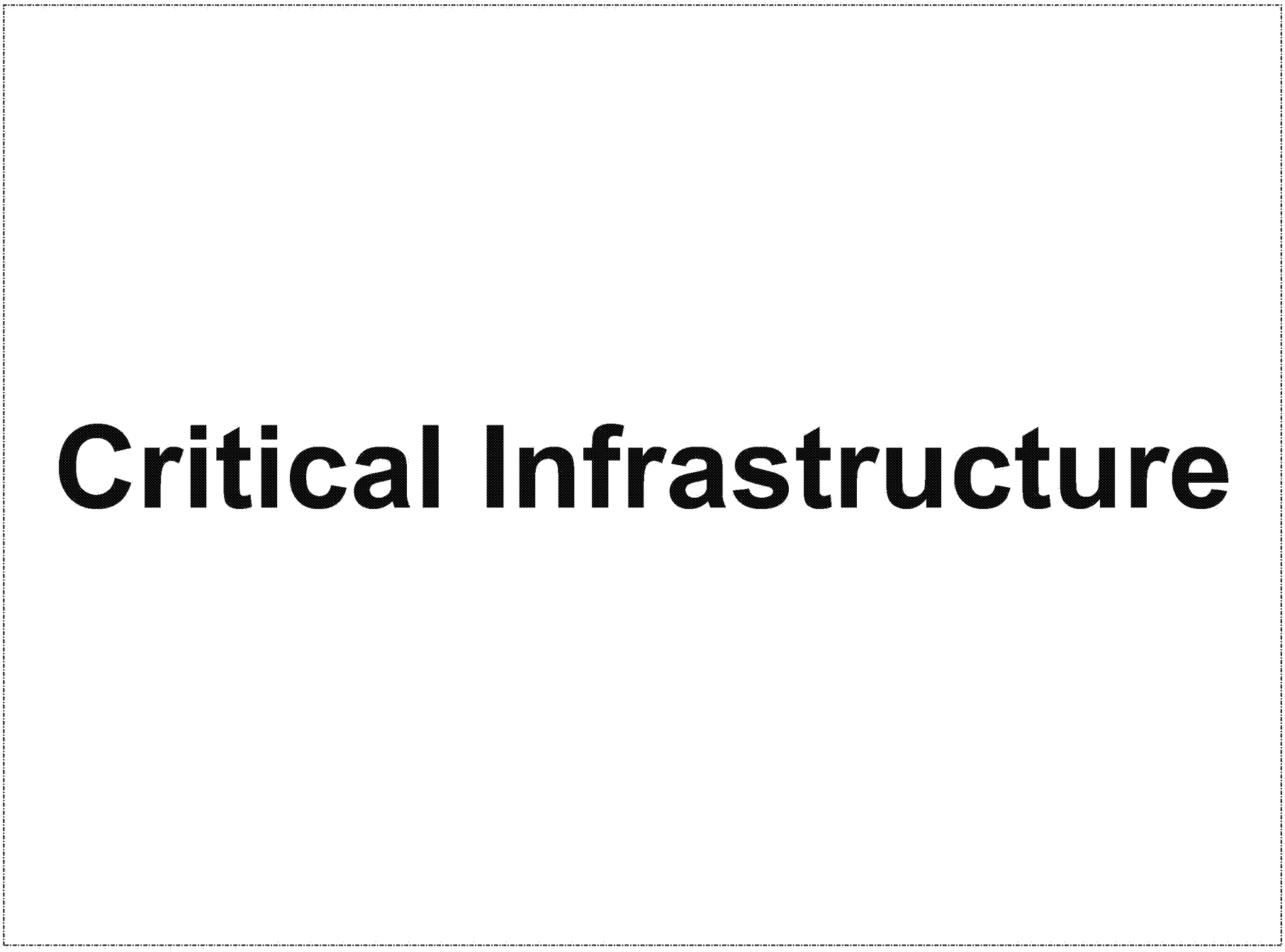


Figure 1-3: Pump House Facility Overview



1.5 Project Team

Michael Baker subcontracted MTC to perform the annual 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 of Testing Procedures Used

The testing procedures used were those defined as the MTC Precision Mass Measurement Systems SIM-1000 and CBU-1000 (24-hour) leak detection method. Determination of leakage is based on the criteria established in the Ken Wilcox Associates, Inc. third-party evaluation and as listed in the National Work Group on Leak Detection Evaluations (NWGLDE) (Reference 4.3). The MTC Precision Mass Measurement System is certified with a capability to detect leaks on a tank proportional to the product surface area with a probability of detection of 95 percent and probability of a false alarm of 5 percent. Multiple non-overlapping tests can be performed and averaged to obtain a more sensitive MDLR.

This project utilized two test units to perform five 24-hour precision tightness tests per test unit over a 5-day period (120 hours total) for BFCUSTs 2, 3, 4, 6, 7, 8, 9, 10, 11, 12, 15, 16, 18, and 20. These five 24-hour tests were averaged, meeting project scope 0.5 gallons per hour (gph) MDLR requirements.

This project utilized one test unit to perform two 24-hour precision tightness tests per test unit over a 2-day period (48 hours total) for BFCUSTs S1224, S1225, and S1226. These two 24-hour tests were averaged, meeting project scope 0.5 gph MDLR requirements.

The MTC standard operating procedure includes ensuring that any isolation valve(s) are properly seated (via closing, reopening, and reclosing) and that the bleed ports of double-block and bleed isolation valves are checked for the presence of product at the conclusion of a test.

2.0 LEAK DETECTION TESTING AND RESULTS

MTC's test reports are provided in Appendix B.

The annual leak detection testing of 17 BFCUSTs was performed, by MTC, between 10 October and 27 November 2018, with no detectable leak above the test method's MDLR, resulting in passing tests. BFCUSTs 7, 15, 18, and 20 were tested at less than tank high level, per base request, due to operational issues at the time of testing.

The summary of results is listed in Table 2-1.

Table 2-1: Results Summary

Fuel System	Designation	Height[1] (Feet)	Capacity[2] (Gallons)	Product	Test Method	Certified MDLR (gph)	Test Date	Result	Test Product Height (Feet)
Red Hill Underground Fuel Storage Facility	BFCUST 2	238	12,000,000	F-24	(5) 24-hour tests	0.5	22 November - 27 November 2018	Pass	194.10[3]
	BFCUST 3	238	12,000,000	F-24	(5) 24-hour tests	0.5	26 October - 31 October 2018	Pass	201.17
	BFCUST 4	238	12,000,000	F-24	(5) 24-hour tests	0.5	31 October - 5 November 2018	Pass	201.18
	BFCUST 5	250	12,700,000	F-24	N/A	N/A	N/A	N/A[4]	N/A
	BFCUST 6	250	12,700,000	F-24	(5) 24-hour tests	0.5	13 November - 18 November 2018	Pass	212.48
	BFCUST 7	250	12,700,000	JP-5	(5) 24-hour tests	0.5	27 October - 1 November 2018	Pass	209.04[5]
	BFCUST 8	250	12,700,000	JP-5	(5) 24-hour tests	0.5	11 October - 16 October 2018	Pass	211.96
	BFCUST 9	250	12,700,000	JP-5	(5) 24-hour tests	0.5	15 October - 20 October 2018	Pass	211.78
	BFCUST 10	250	12,700,000	JP-5	(5) 24-hour tests	0.5	16 October - 21 October 2018	Pass	211.93
	BFCUST 11	251	12,800,000	JP-5	(5) 24-hour tests	0.5	5 November - 10 November 2018	Pass	211.88
	BFCUST 12	251	12,800,000	JP-5	(5) 24-hour tests	0.5	21 October - 26 October 2018	Pass	211.92
	BFCUST 13	251	12,800,000	JP-5	N/A	N/A	N/A	N/A[4]	N/A
	BFCUST 14	251	12,800,000	JP-5	N/A	N/A	N/A	N/A[4]	N/A
	BFCUST 15	250	12,700,000	F-76	(5) 24-hour tests	0.5	21 November - 26 November 2018	Pass	210.74[5]
	BFCUST 16	250	12,700,000	F-76	(5) 24-hour tests	0.5	22 October - 27 October 2018	Pass	211.94
	BFCUST 17	250	12,700,000	JP-5	N/A	N/A	N/A	N/A[4]	N/A
	BFCUST 18	250	12,700,000	JP-5	(5) 24-hour tests	0.5	8 November - 13 November 2018	Pass	147.74[5]
	BFCUST 20	250	12,700,000	JP-5	(5) 24-hour tests	0.5	10 October - 15 October 2018	Pass	204.14[5]
Underground Pump House Facility	BFCUST S1224	20	420,000	F-24	(2) 24-hour tests	0.5	1 November - 3 November 2018	Pass	14.39
	BFCUST S1225	20	420,000	JP-5	(2) 24-hour tests	0.5	18 October - 20 October 2018	Pass	14.79
	BFCUST S1226	20	420,000	F-76	(2) 24-hour tests	0.5	23 October - 25 October 2018	Pass	14.24
	BFCUST S1227	20	420,000	F-76	N/A	N/A	N/A	N/A[4]	N/A

Notes:
N/A = not applicable
1. Tank height is rounded to the nearest foot.
2. Tank volume is rounded to the nearest hundred thousand gallon.
3. Tank product level is maintained at the test product height or below.
4. Tank not tested due to being temporarily out-of-service.
5. Tank tested at the current product level, per base request, due to operational issues at the time of testing. Testing at tank high level must be scheduled when tanks return to normal operating levels.

3.0 CONCLUSIONS AND RECOMMENDATIONS

3.1 Conclusions

The 17 BFCUSTs at the Red Hill Fuel Storage Complex at JB Pearl Harbor-Hickam, Hawaii passed the 2018 annual leak detection testing.

3.2 Recommendations

The DLA Energy's Leak Detection Centrally Managed Program (CMP) manager should be notified immediately when BFCUSTs 5, 13, 14, 17, and S1227 are returned to service and when BFCUSTs 7, 15, 18, and 20 product levels are returned to normal operating levels to facilitate immediate testing, to comply with the AOC.

In accordance with the AOC, annual leak detection testing of 22 BFCUSTs at the Red Hill Fuel Storage Complex at JB Pearl Harbor-Hickam must be initiated on or before the anniversary date of 10 October 2019. The annual testing will be repeated in 2019 under the DLA Energy's Leak Detection CMP, in accordance with the AOC; other regulatory obligations are the responsibility of the base and Naval Supply Systems Command.

4.0 REFERENCES

4.1 "Final 2017 Annual Leak Detection Report of 18 Bulk Field-Constructed Underground Storage Tanks 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 Command Atlantic Contract N62470-16-D-9007-0004; Submitted by: Michael Baker International, Virginia Beach, Virginia; Date: 23 January 2018.

4.2 "Final 2018 Annual Leak Detection Report of Two Bulk Field-Constructed Underground Storage Tanks 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 Command Atlantic Contract N62470-16-D-9007, Task Order N6247018F4006; Submitted by: Michael Baker International, Virginia Beach, Virginia; Date: 15 June 2018.

4.3 Listing by the NWGLDE: Mass Technology Corp., Precision Mass Measurement Systems SIM-1000 and CBU-1000 (24 hour test), BULK UNDERGROUND STORAGE TANK LEAK DETECTION METHOD (50,000 gallons or greater)
Issue Date: 23 August 1999
Revision Date: 29 December 2011
http://www.nwglde.org/evals/mass_technology_a.html

APPENDIX A

ADMINISTRATIVE ORDER ON CONSENT

RED HILL BULK FUEL STORAGE FACILITY, OAHU, HAWAII

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 9

THE DEPARTMENT OF HEALTH
STATE OF HAWAII

IN THE MATTER OF:

THE UNITED STATES DEPARTMENT OF THE NAVY	)	EPA DKT NO. RCRA 7003-R9-2015-01
AND	)	DOH DKT NO. 15-UST-EA-01
DEFENSE LOGISTICS AGENCY	)	
RESPONDENTS	)	
RED HILL BULK FUEL STORAGE FACILITY, OAHU, HAWAII	)	

ADMINISTRATIVE ORDER ON CONSENT

1. INTRODUCTION

(a) This administrative order on consent ("AOC") is entered into voluntarily by the DEPARTMENT OF HEALTH, STATE OF HAWAII ("DOH"); the UNITED STATES ENVIRONMENTAL PROTECTION AGENCY ("EPA") Region 9; the UNITED STATES DEPARTMENT OF THE NAVY ("Navy"), acting by and through the COMMANDER, NAVY REGION HAWAII ("CNRH"); and DEFENSE LOGISTICS AGENCY ("DLA"). DOH, EPA, Navy, and DLA are collectively referred to as the "Parties." DOH and EPA are collectively referred to as the "Regulatory Agencies." This AOC is a joint administrative action taken by the DOH and EPA concurrently and pursuant to their respective state and federal authorities to regulate underground storage tanks ("USTs") and waste and to protect drinking water, natural resources, human health, and the environment.

(b) This AOC provides for the performance by Navy and DLA of a release assessment, response(s) to release(s), and actions to minimize the threat of future releases in

connection with the field-constructed bulk fuel USTs, surge tanks, pumps, and associated piping at the Red Hill Bulk Fuel Storage Facility ("Facility"), located near Pearl Harbor, on the island of Oahu in the State of Hawaii, and on any property that may be affected now or in the future by petroleum or other substances released from the Facility, as specified in Attachment A ("Statement of Work" or "SOW"). The term "Site" as used in this AOC includes the Facility and any area where petroleum or other substances released from the Facility come to be located. The primary objectives of this AOC are to take steps to ensure that the groundwater resource in the vicinity of the Facility is protected and to ensure that the Facility is operated and maintained in an environmentally protective manner.

(c) Navy and DLA's participation in this AOC shall not constitute or be construed as an admission of liability. Navy and DLA neither admit nor deny the factual allegations and legal conclusions set forth in this AOC (Sections 4 and 5, Findings of Fact and Conclusions of Law).

(d) The Parties acknowledge that this AOC has been negotiated in good faith and that this AOC is fair, reasonable, protective of human health and the environment, and is in the public interest.

2. JURISDICTION

(a) The State of Hawaii obtained EPA state program approval, effective on September 30, 2002, for Hawaii's UST program to operate in lieu of EPA's UST program under Subtitle I of the Resource Conservation and Recovery Act of 1976 ("RCRA"), as amended, 42 United States Code ("U.S.C.") § 6901 *et seq.* DOH enters into this AOC in accordance with its authority, vested in the Director of Health, to regulate USTs in conformance with EPA state program approval and the provisions of chapters 340E, 342D and 342L of the Hawaii Revised Statutes ("HRS") and the rules promulgated pursuant thereto.

(b) EPA Region 9 enters into this AOC pursuant to the authority vested in the Administrator of EPA by Section 7003 of RCRA, 42 U.S.C. § 6973, which authority has been delegated to the Regional Administrators of EPA by Delegations 8-22-A and 8-22-C (April 20, 1994), and redelegated to, among others, the Director of the Land Division of EPA Region 9 by Delegations R9-8-22-A (October 10, 2014) and R9-8-22-C (October y 10, 2014).

(c) Navy and DLA agree to undertake and complete all actions required by the terms and conditions of this AOC.

Administrative Order on Consent
In the Matter of Red Hill Bulk Fuel Storage Facility
EPA Docket No: RCRA 7003-R9-2015-01
DOH Docket No: 15-UST-EA-01

Attachment A
Statement of Work

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4. Release Detection / Tank Tightness Testing

The purpose of the deliverables to be developed and work to be performed under this Section is to document the current release detection system and tank tightness testing procedures used at the Facility, evaluate these procedures, and implement any approved modifications.

4.1 Tank Tightness Testing Frequency

Until the approval of the New Release Detection Alternatives Decision Document as described in Sections 4.6 and 4.8 below, Navy and DLA shall increase their tank tightness testing from a biennial test to an annual test no later than one year from the effective date of the AOC, continue to use an inventory control monitoring system, and conduct vapor monitoring for all in-service Tanks as per the DOH-approved "Red Hill Bulk Fuel Storage Facility, Final Groundwater Protection Plan" (Dec 2009), or DOH-approved successor plan.

4.2 Outline of Current Fuel Release Monitoring Systems Report

Within thirty (30) days from the Effective Date of the AOC, Navy and DLA shall submit a document outlining the contents of the pending Current Fuel Release Monitoring Systems Report ("Outline of Current Fuel Release Monitoring Systems Report") to the Regulatory Agencies for approval.

4.3 Current Fuel Release Monitoring Systems Report

Within sixty (60) days from the Regulatory Agencies' approval of the Outline of Current Fuel Release Monitoring Systems Report, Navy and DLA shall submit a Current Fuel Release Monitoring Systems Report to the Regulatory Agencies for approval.

At a minimum, the Report shall include:

a. Recordkeeping procedures;
b. Dynamic re-filling procedures for tank re-commissioning;
c. Dynamic filling procedures for daily operations;
d. Static and dynamic release detection systems;
e. Release detection sensitivity; and
f. The previously completed 2008 Market Survey of Leak Detection Systems for the Red Hill Fuel Storage Facility, Fleet Industrial Center, Pearl Harbor, and the 2014 Addendum I to the 2008 Market Survey.

4.4 Scoping Meeting(s) for New Release Detection Alternatives

Within sixty (60) days from the Regulatory Agencies' approval of the Current Fuel Release Monitoring Systems Report, Navy and DLA shall schedule and hold an initial Scoping Meeting to be attended by the Parties. The purpose of the Scoping Meeting is to detail the contents of the Scope of Work for the study to evaluate possible new or improved release detection alternatives. During the meeting, criteria for decision making will be discussed, and a decision will be made as to whether additional Scoping Meetings are needed.

APPENDIX B

MASS TECHNOLOGY CORPORATION'S TEST REPORTS

Precision Leak Measurement Report
P.O. Box 1578
Kilgore, Texas 75662

FISC Red Hill
Pearl Harbor, HI

Proprietary Information

Proprietary Information

Scope of Work: Furnish all required management, labor, services, materials and equipment to perform the required annual tightness testing of Tank # 2 an underground fuel storage tank located at FISC Red Hill, Pearl Harbor, HI.

Report compiled by: Proprietary Information

Date: 12-12-2018

Summary

Testing of Tank # 2 a 12,000,000 gal underground storage tank located at FISC Red Hill, Pearl Harbor, Hawaii commenced November 22, 2018 and was completed November 27, 2018. The result of that testing is that the tank system is determined to be tight to isolation. All tank valves were adequately secured such that no unusual readings were noted. Testing was performed using the Mass Technology Corporation protocols set out in the third party evaluations. All tank valves were adequately secured such that any fluid loss was isolated to leakage. Therefore, the containment integrity of the tank was not compromised and the test is considered conclusive.

Tank # 2: After 120 hours of testing the tank is certified to be tight.

Tank Data Tank # 2

Diameter:	100 ft.	Height:	238 ft.
Tank Type:	Vertical UST	Contents:	F24
Specific Gravity:	0.80	Product Level:	194.10 ft.
Start Date:	11/22/2018	Completion Date:	11/27/2018
		Test Results:	Certified Tight

Proprietary Information

Critical Infrastructure

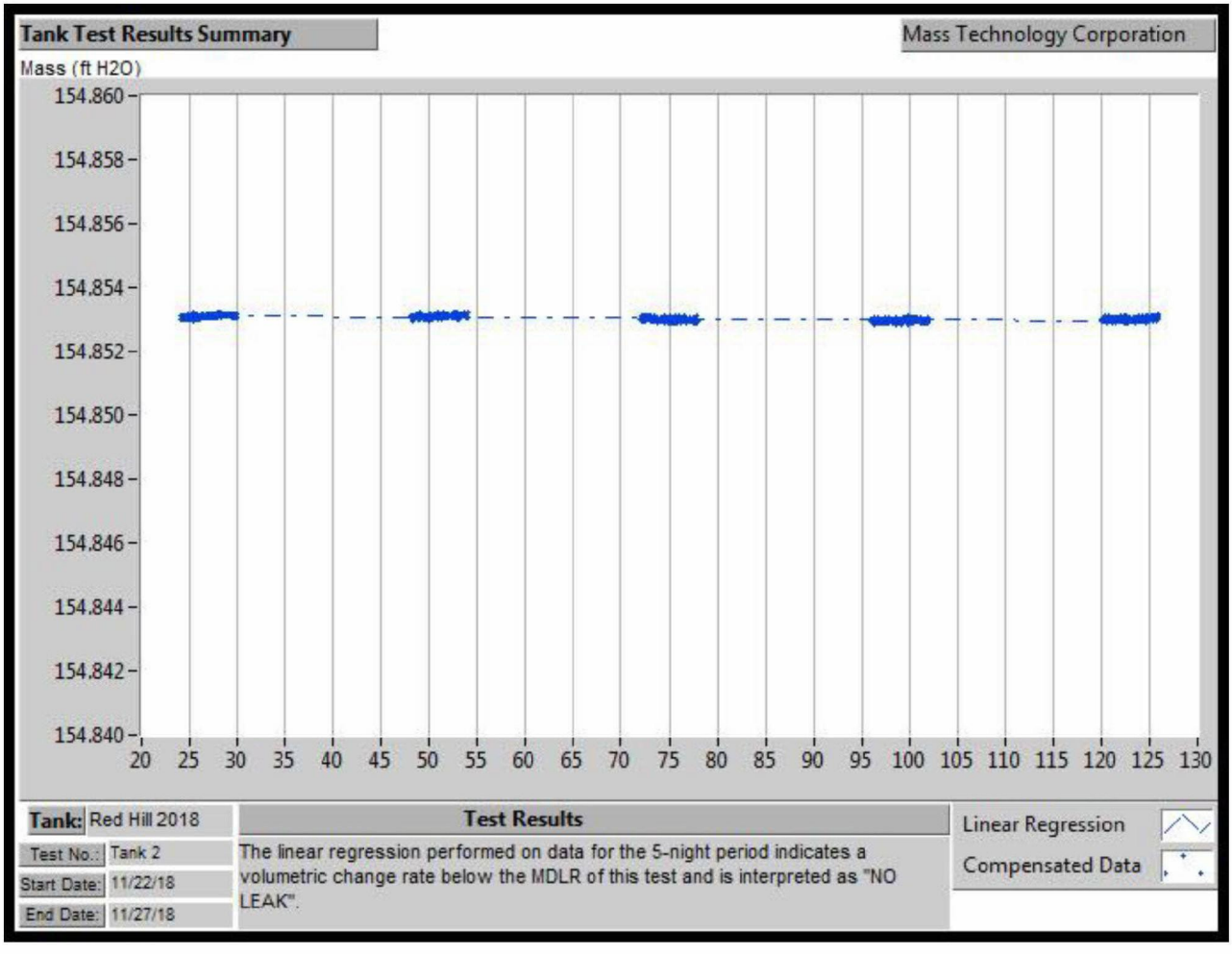
All dimensions, line locations, sizes and valve descriptions have been furnished by the facility operator.

MTC Mass Technology Corporation 2

Results

The fluid mass data was recorded over a 120-hour period. A linear regression of the recorded fluid mass data resulted in a change rate detected below the minimum detection level of 0.5 gallons per hour. All tank valves were adequately secured such that any fluid loss was isolated to leakage. Therefore, the containment integrity of the tank was not compromised and the test is considered conclusive.

Tank # 2 is certified to be tight.



Precision Leak Measurement Report
P.O. Box 1578
Kilgore, Texas 75662

FISC Red Hill
Pearl Harbor, HI

Proprietary Information

Proprietary Information

Scope of Work: Furnish all required management, labor, services, materials and equipment to perform the required annual tightness testing of Tank # 3 an underground fuel storage tank located at FISC Red Hill, Pearl Harbor, HI.

Proprietary Information

Date: 12-12-2018

Summary

Testing of Tank # 3 a 12,000,000 gal underground storage tank located at FISC Red Hill, Pearl Harbor, Hawaii commenced October 26, 2018 and was completed October 31, 2018. The result of that testing is that the tank system is determined to be tight to isolation. All tank valves were adequately secured such that no unusual readings were noted. Testing was performed using the Mass Technology Corporation protocols set out in the third party evaluations. All tank valves were adequately secured such that any fluid loss was isolated to leakage. Therefore, the containment integrity of the tank was not compromised and the test is considered conclusive.

Tank # 3: After 120 hours of testing the tank is certified to be tight.

Tank Data Tank # 3

Diameter:	100 ft.	Height:	238 ft.
Tank Type:	Vertical UST	Contents:	F 24
Specific Gravity:	0.80	Product Level:	201.17 ft.
Start Date:	10/26/2018	Completion Date:	10/31/2018
Proprietary Information		Test Results:	Certified Tight

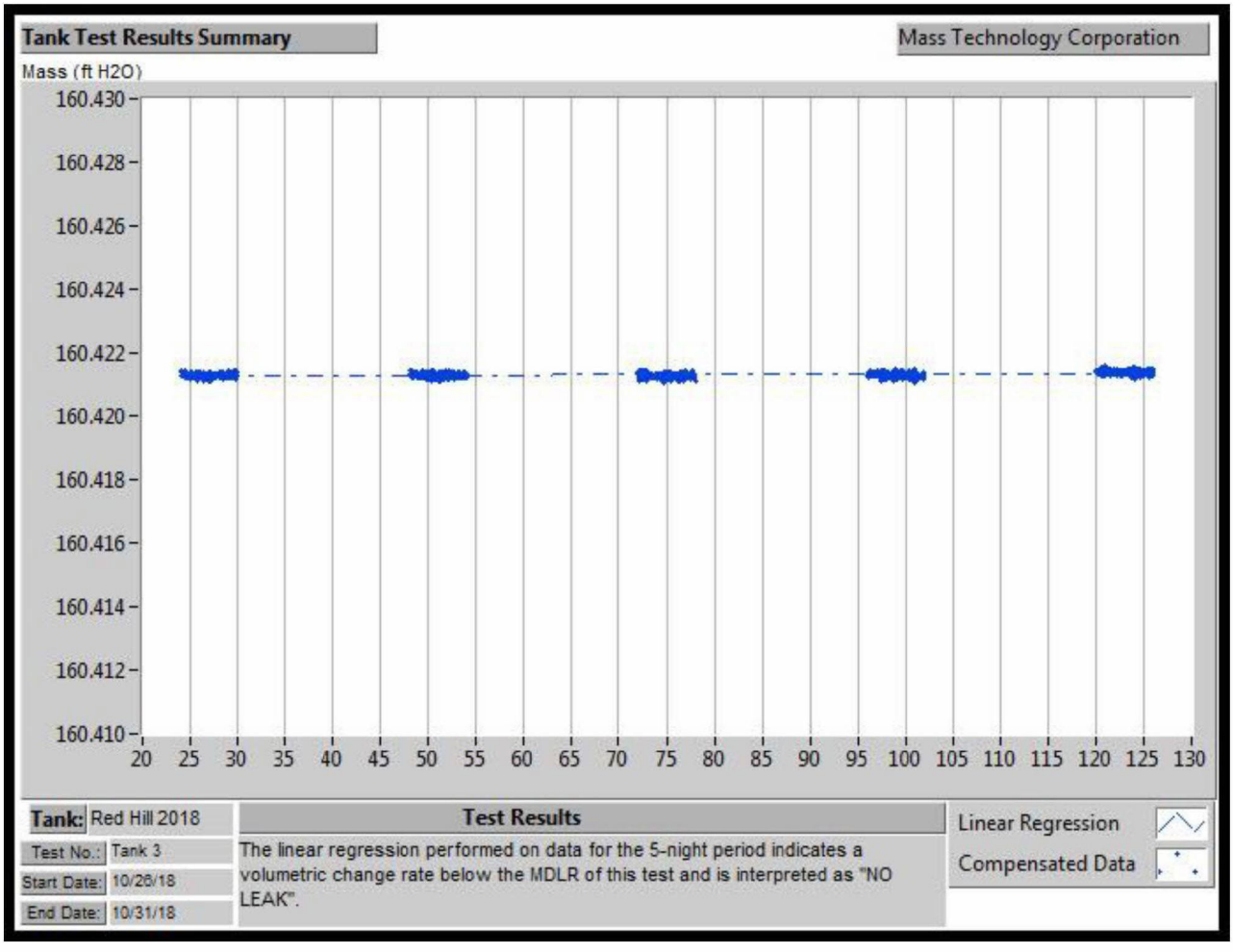
Critical Infrastructure

All dimensions, line locations, sizes and valve descriptions have been furnished by the facility operator.

Results

The fluid mass data was recorded over a 120-hour period. A linear regression of the recorded fluid mass data resulted in a leak rate detected below the minimum detection level of 0.5 gallons per hour. All tank valves were adequately secured such that any fluid loss was isolated to leakage. Therefore, the containment integrity of the tank was not compromised and the test is considered conclusive.

Tank # 3 is certified to be tight.



Mass Technology CORPORATION

Precision Leak Measurement Report
P.O. Box 1578
Kilgore, Texas 75662

FISC Red Hill
Pearl Harbor, HI

Proprietary Information

Proprietary Information

Scope of Work: Furnish all required management, labor, services, materials and equipment to perform the required annual tightness testing of Tank # 4 an underground fuel storage tank located at FISC Red Hill, Pearl Harbor, HI.

Report compiled by: **Proprietary Information**

Date: 12-12-2018

Summary

Testing of Tank # 4 a 12,000,000 gal underground storage tank located at FISC Red Hill, Pearl Harbor, Hawaii commenced October 31, 2018 and was completed November 5, 2018. The result of that testing is that the tank system is determined to be tight to isolation. All tank valves were adequately secured such that no unusual readings were noted. Testing was performed using the Mass Technology Corporation protocols set out in the third party evaluations. All tank valves were adequately secured such that any fluid loss was isolated to leakage. Therefore, the containment integrity of the tank was not compromised and the test is considered conclusive.

Tank # 4: After 120 hours of testing the tank is certified to be tight.

Tank Data Tank # 4

Diameter:	100 ft.	Height:	238 ft.
Tank Type:	Vertical UST	Contents:	F24
Specific Gravity:	0.80	Product Level:	201.18 ft.
Start Date:	10/31/2018	Completion Date:	11/05/2018
Proprietary Information		Test Results:	Certified Tight

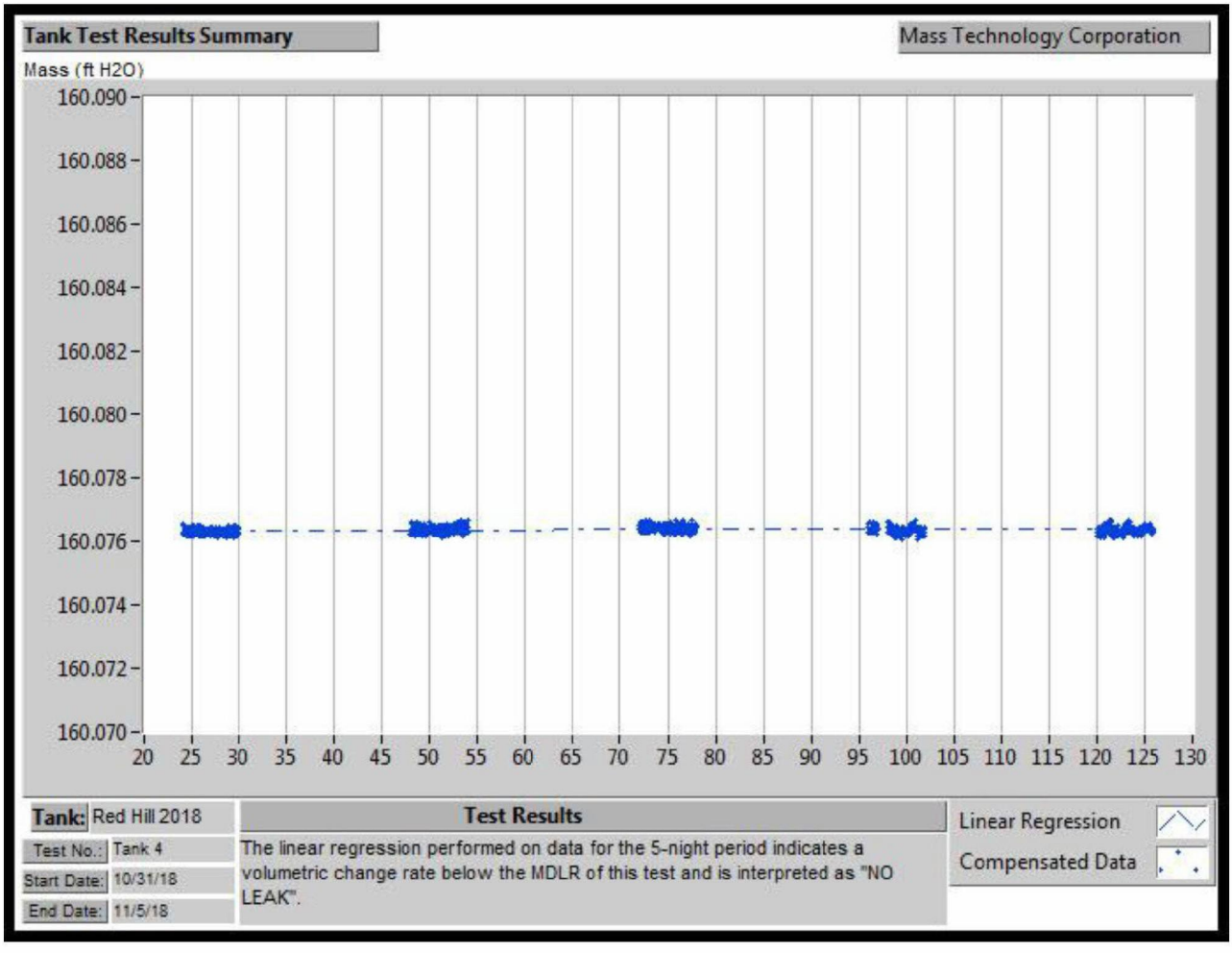
Critical Infrastructure

All dimensions, line locations, sizes and valve descriptions have been furnished by the facility operator.

Results

The fluid mass data was recorded over a 120-hour period. A linear regression of the recorded fluid mass data resulted in a leak rate detected below the minimum detection level of 0.5 gallons per hour. All tank valves were adequately secured such that any fluid loss was isolated to leakage. Therefore, the containment integrity of the tank was not compromised and the test is considered conclusive.

Tank # 4 is certified to be tight.



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P.O. Box 1578
Kilgore, Texas 75662

FISC Red Hill
Pearl Harbor, HI

Proprietary Information

Proprietary Information

Scope of Work: Furnish all required management, labor, services, materials and equipment to perform the required annual tightness testing of Tank # 6 an underground fuel storage tank located at FISC Red Hill, Pearl Harbor, HI.

Report compiled by: Proprietary Information

Date: 12-12-2018

Summary

Testing of Tank # 6 a 12,700,000 gal underground storage tank located at FISC Red Hill, Pearl Harbor, Hawaii commenced November 13, 2018 and was completed November 18, 2018. The result of that testing is that the tank system is determined to be tight to isolation. All tank valves were adequately secured such that no unusual readings were noted. Testing was performed using the Mass Technology Corporation protocols set out in the third party evaluations. All tank valves were adequately secured such that any fluid loss was isolated to leakage. Therefore, the containment integrity of the tank was not compromised and the test is considered conclusive.

Tank # 6: After 120 hours of testing the tank is certified to be tight.

Tank Data Tank # 6

Diameter:	100 ft.	Height:	250 ft.
Tank Type:	Vertical UST	Contents:	F24
Specific Gravity:	0.80	Product Level:	212.48 ft.
Start Date:	11/13/2018	Completion Date:	11/18/2018
		Test Results:	Certified Tight

Proprietary Information

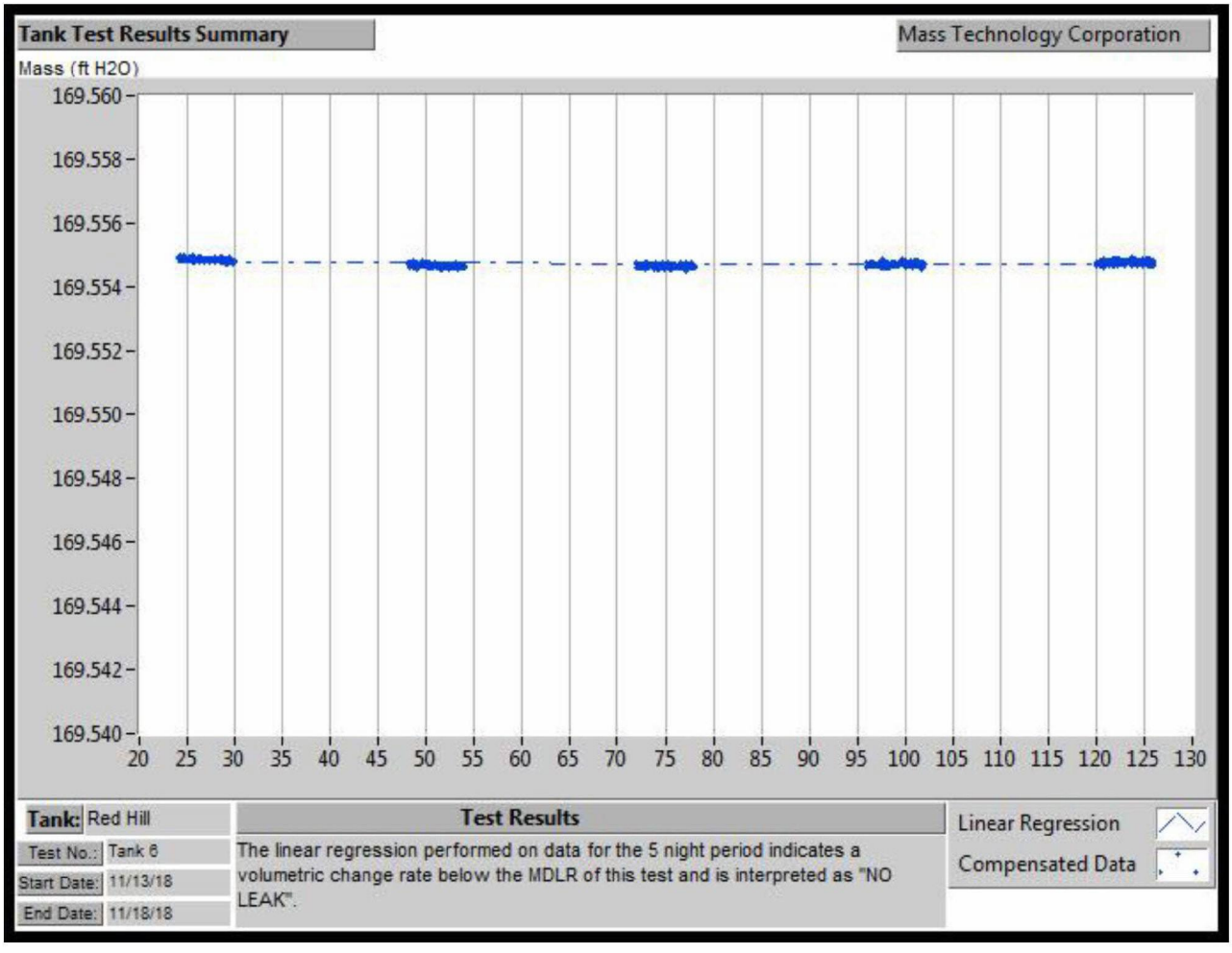
Critical Infrastructure

All dimensions, line locations, sizes and valve descriptions have been furnished by the facility operator.

Results

The fluid mass data was recorded over a 120-hour period. A linear regression of the recorded fluid mass data resulted in a leak rate detected below the minimum detection level of 0.5 gallons per hour. All tank valves were adequately secured such that any fluid loss was isolated to leakage. Therefore, the containment integrity of the tank was not compromised and the test is considered conclusive.

Tank # 6 is certified to be tight.



Mass Technology CORPORATION

Precision Leak Measurement Report
P.O. Box 1578
Kilgore, Texas 75662

FISC Red Hill
Pearl Harbor, HI

Proprietary Information

Proprietary Information

Scope of Work: Furnish all required management, labor, services, materials and equipment to perform the required annual tightness testing of Tank # 7 an underground fuel storage tank located at FISC Red Hill, Pearl Harbor, HI.

Report compiled by: **Proprietary Information**

Date: 12-12-2018

Summary

Testing of Tank # 7 a 12,700,000 gal underground storage tank located at FISC Red Hill, Pearl Harbor, Hawaii commenced October 27, 2018 and was completed November 1, 2018. The result of that testing is that the tank system is determined to be tight to isolation. All tank valves were adequately secured such that no unusual readings were noted. Testing was performed using the Mass Technology Corporation protocols set out in the third party evaluations. All tank valves were adequately secured such that any fluid loss was isolated to leakage. Therefore, the containment integrity of the tank was not compromised and the test is considered conclusive.

Tank # 7: After 120 hours of testing the tank is certified to be tight.

Tank Data Tank # 7

Diameter:	100 ft.	Height:	250 ft.
Tank Type:	Vertical UST	Contents:	JP-5
Specific Gravity:	0.82	Product Level:	209.04 ft.
Start Date:	10/27/2018	Completion Date:	11/01/2018
Proprietary Information		Test Results:	Certified Tight

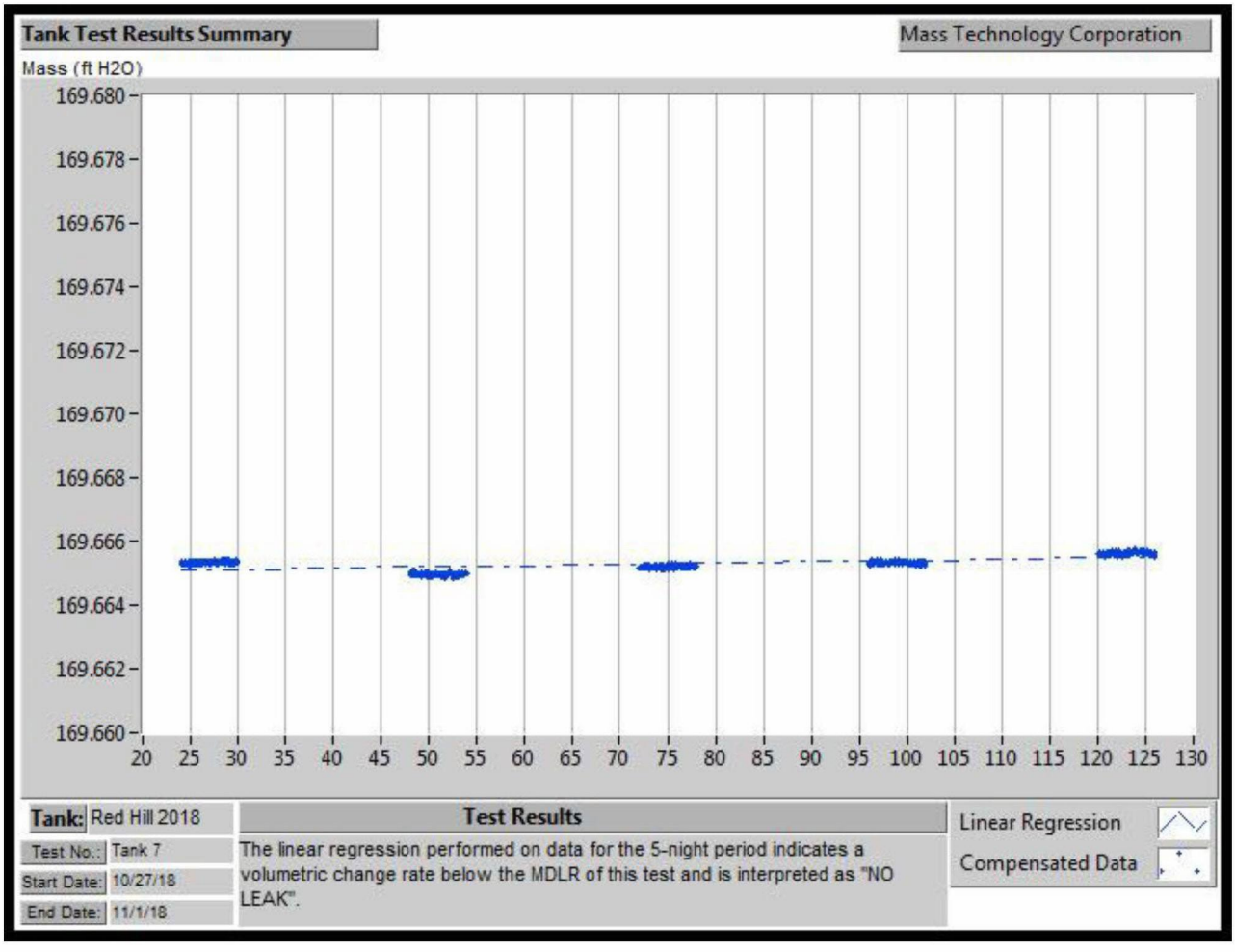
Critical Infrastructure

All dimensions, line locations, sizes and valve descriptions have been furnished by the facility operator.

Results

The fluid mass data was recorded over a 120-hour period. A linear regression of the recorded fluid mass data resulted in a leak rate detected below the minimum detection level of 0.5 gallons per hour. All tank valves were adequately secured such that any fluid loss was isolated to leakage. Therefore, the containment integrity of the tank was not compromised and the test is considered conclusive.

Tank # 7 is certified to be tight.



Mass Technology CORPORATION

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P.O. Box 1578
Kilgore, Texas 75662

FISC Red Hill
Pearl Harbor, HI

Proprietary Information

Proprietary Information

Scope of Work: Furnish all required management, labor, services, materials and equipment to perform the required annual tightness testing of Tank # 8 an underground fuel storage tank located at FISC Red Hill, Pearl Harbor, HI.

Report compiled by: **Proprietary Information**

Date: 12-12-2018

Summary

Testing of Tank # 8 a 12,700,000 gal underground storage tank located at FISC Red Hill, Pearl Harbor, Hawaii commenced October 11, 2018 and was completed October 16, 2018. The result of that testing is that the tank system is determined to be tight to isolation. All tank valves were adequately secured such that no unusual readings were noted. Testing was performed using the Mass Technology Corporation protocols set out in the third party evaluations. All tank valves were adequately secured such that any fluid loss was isolated to leakage. Therefore, the containment integrity of the tank was not compromised and the test is considered conclusive.

Tank # 8: After 120 hours of testing the tank is certified to be tight.

Tank Data Tank # 8

Diameter:	100 ft.	Height:	250 ft.
Tank Type:	Vertical UST	Contents:	JP-5
Specific Gravity:	0.82	Product Level:	211.96 ft.
Start Date:	10/11/2018	Completion Date:	10/16/2018
Proprietary Information		Test Results:	Certified Tight

Critical Infrastructure

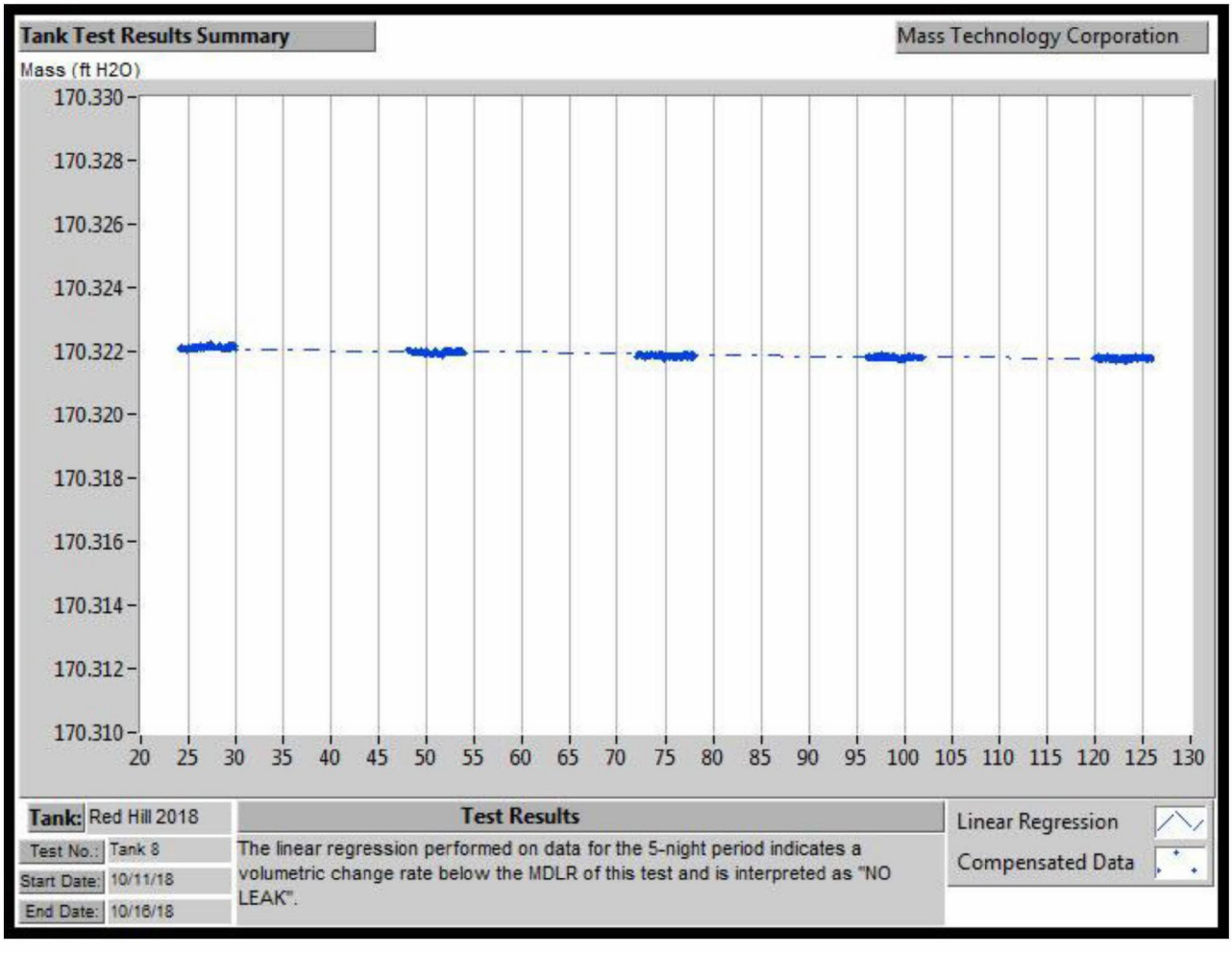
All dimensions, line locations, sizes and valve descriptions have been furnished by the facility operator.

Mass Technology 2

Results

The fluid mass data was recorded over a 120-hour period. A linear regression of the recorded fluid mass data resulted in a leak rate detected below the minimum detection level of 0.5 gallons per hour. All tank valves were adequately secured such that any fluid loss was isolated to leakage. Therefore, the containment integrity of the tank was not compromised and the test is considered conclusive.

Tank # 8 is certified to be tight.



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P.O. Box 1578
Kilgore, Texas 75662

FISC Red Hill
Pearl Harbor, HI

Proprietary Information

Proprietary Information

Scope of Work: Furnish all required management, labor, services, materials and equipment to perform the required annual tightness testing of Tank # 9 an underground fuel storage tank located at FISC Red Hill, Pearl Harbor, HI.

Report compiled by: **Proprietary Information**

Date: 12-12-2018

Summary

Testing of Tank # 9 a 12,700,000 gal underground storage tank located at FISC Red Hill, Pearl Harbor, Hawaii commenced October 15, 2018 and was completed October 20, 2018. The result of that testing is that the tank system is determined to be tight to isolation. All tank valves were adequately secured such that no unusual readings were noted. Testing was performed using the Mass Technology Corporation protocols set out in the third party evaluations. All tank valves were adequately secured such that any fluid loss was isolated to leakage. Therefore, the containment integrity of the tank was not compromised and the test is considered conclusive.

Tank # 9: After 120 hours of testing the tank is certified to be tight.

Tank Data Tank # 9

Diameter:	100 ft.	Height:	250 ft.
Tank Type:	Vertical UST	Contents:	JP-5
Specific Gravity:	0.82	Product Level:	211.78 ft.
Start Date:	10/15/2018	Completion Date:	10/20/2018
		Test Results:	Certified Tight

Proprietary Information

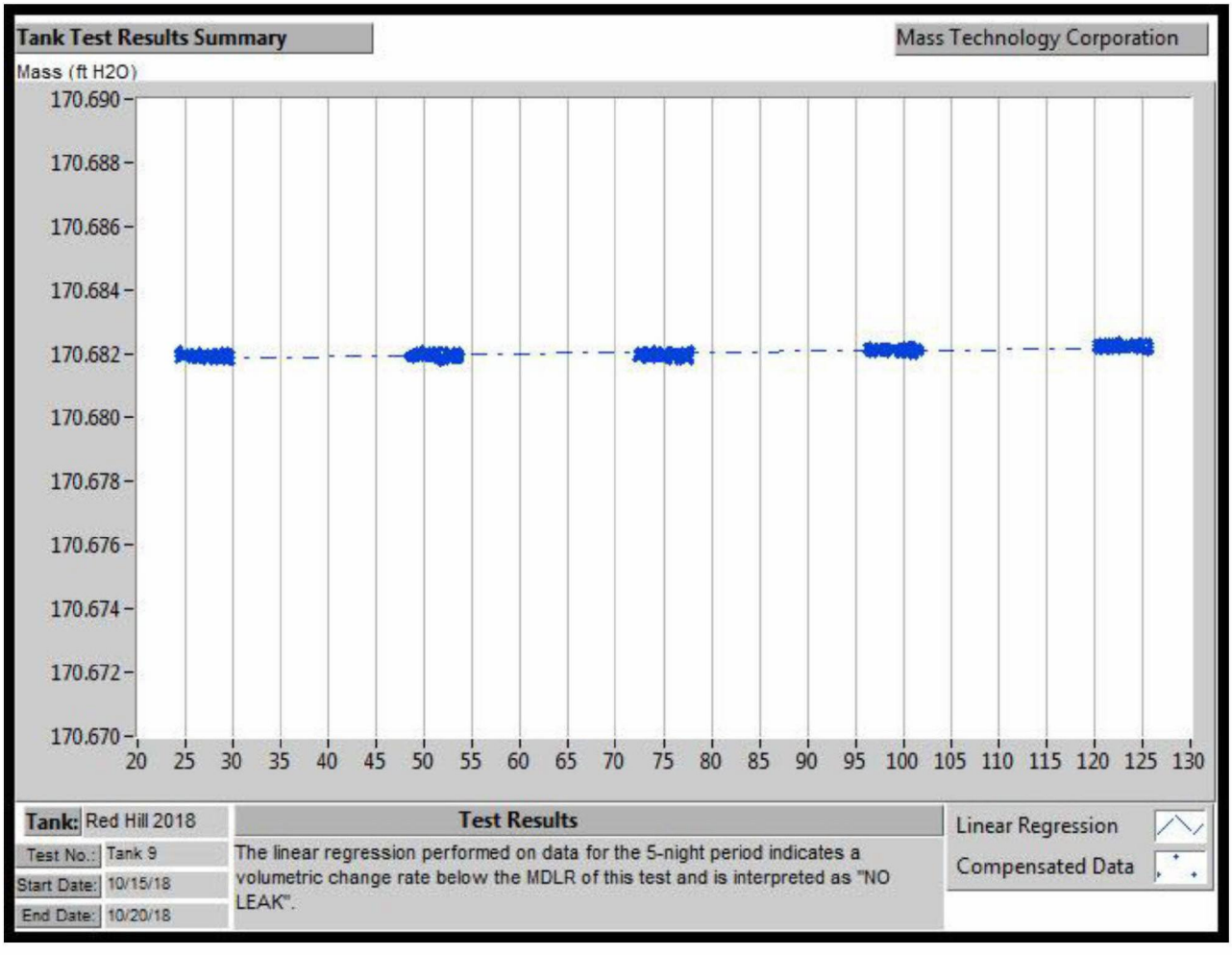
Critical Infrastructure

All dimensions, line locations, sizes and valve descriptions have been furnished by the facility operator.

Results

The fluid mass data was recorded over a 120-hour period. A linear regression of the recorded fluid mass data resulted in a leak rate detected below the minimum detection level of 0.5 gallons per hour. All tank valves were adequately secured such that any fluid loss was isolated to leakage. Therefore, the containment integrity of the tank was not compromised and the test is considered conclusive.

Tank # 9 is certified to be tight.



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FISC Red Hill
Pearl Harbor, HI

Proprietary Information

Proprietary Information

Scope of Work: Furnish all required management, labor, services, materials and equipment to perform the required annual tightness testing of Tank # 10 an underground fuel storage tank located at FISC Red Hill, Pearl Harbor, HI.

Report compiled by: **Proprietary Information**

Date: 12-12-2018

Summary

Testing of Tank # 10 a 12,700,000 gal underground storage tank located at FISC Red Hill, Pearl Harbor, Hawaii commenced October 16, 2018 and was completed October 21, 2018. The result of that testing is that the tank system is determined to be tight to isolation. All tank valves were adequately secured such that no unusual readings were noted. Testing was performed using the Mass Technology Corporation protocols set out in the third party evaluations. All tank valves were adequately secured such that any fluid loss was isolated to leakage. Therefore, the containment integrity of the tank was not compromised and the test is considered conclusive.

Tank # 10: After 120 hours of testing the tank is certified to be tight.

Tank Data Tank # 10

Diameter:	100 ft.	Height:	250 ft.
Tank Type:	Vertical UST	Contents:	JP-5
Specific Gravity:	0.82	Product Level:	211.93 ft.
Start Date:	10/16/2018	Completion Date:	10/21/2018
Proprietary Information		Test Results:	Certified Tight

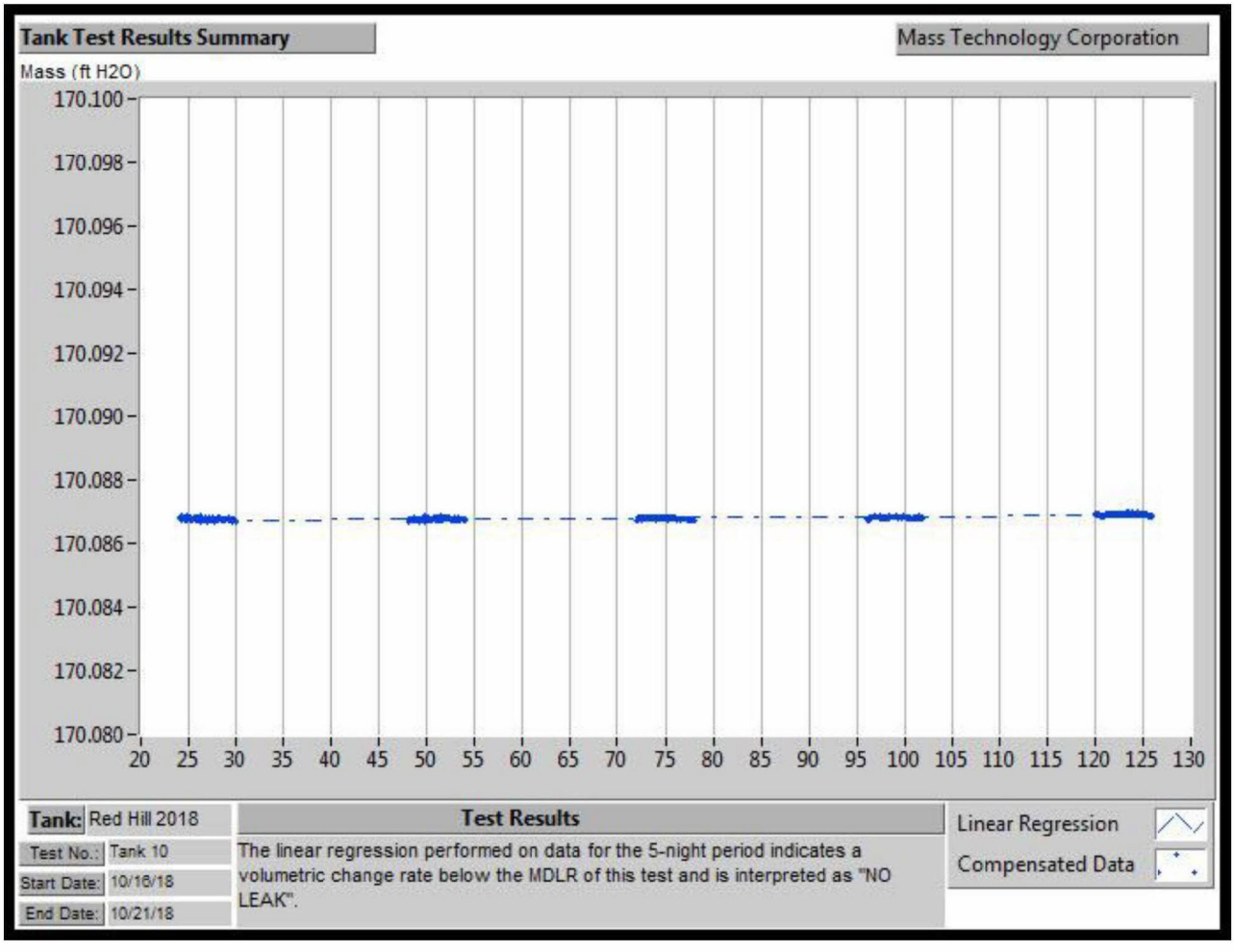
Critical Infrastructure

All dimensions, line locations, sizes and valve descriptions have been furnished by the facility operator.

Results

The fluid mass data was recorded over a 120-hour period. A linear regression of the recorded fluid mass data resulted in a leak rate detected below the minimum detection level of 0.5 gallons per hour. All tank valves were adequately secured such that any fluid loss was isolated to leakage. Therefore, the containment integrity of the tank was not compromised and the test is considered conclusive.

Tank # 10 is certified to be tight.



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FISC Red Hill
Pearl Harbor, HI

Proprietary Information

Proprietary Information

Scope of Work: Furnish all required management, labor, services, materials and equipment to perform the required annual tightness testing of Tank # 11 an underground fuel storage tank located at FISC Red Hill, Pearl Harbor, HI.

Report compiled by: **Proprietary Information**

Date: 12-12-2018

Summary

Testing of Tank # 11 a 12,800,000 gal underground storage tank located at FISC Red Hill, Pearl Harbor, Hawaii commenced November 5, 2018 and was completed November 10, 2018. The result of that testing is that the tank system is determined to be tight to isolation. All tank valves were adequately secured such that no unusual readings were noted. Testing was performed using the Mass Technology Corporation protocols set out in the third party evaluations. All tank valves were adequately secured such that any fluid loss was isolated to leakage. Therefore, the containment integrity of the tank was not compromised and the test is considered conclusive.

Tank # 11: After 120 hours of testing the tank is certified to be tight.

Tank Data Tank # 11

Diameter:	100 ft.	Height:	251 ft.
Tank Type:	Vertical UST	Contents:	JP-5
Specific Gravity:	0.82	Product Level:	211.88 ft.
Start Date:	11/05/2018	Completion Date:	11/10/2018
		Test Results:	Certified Tight

Proprietary Information

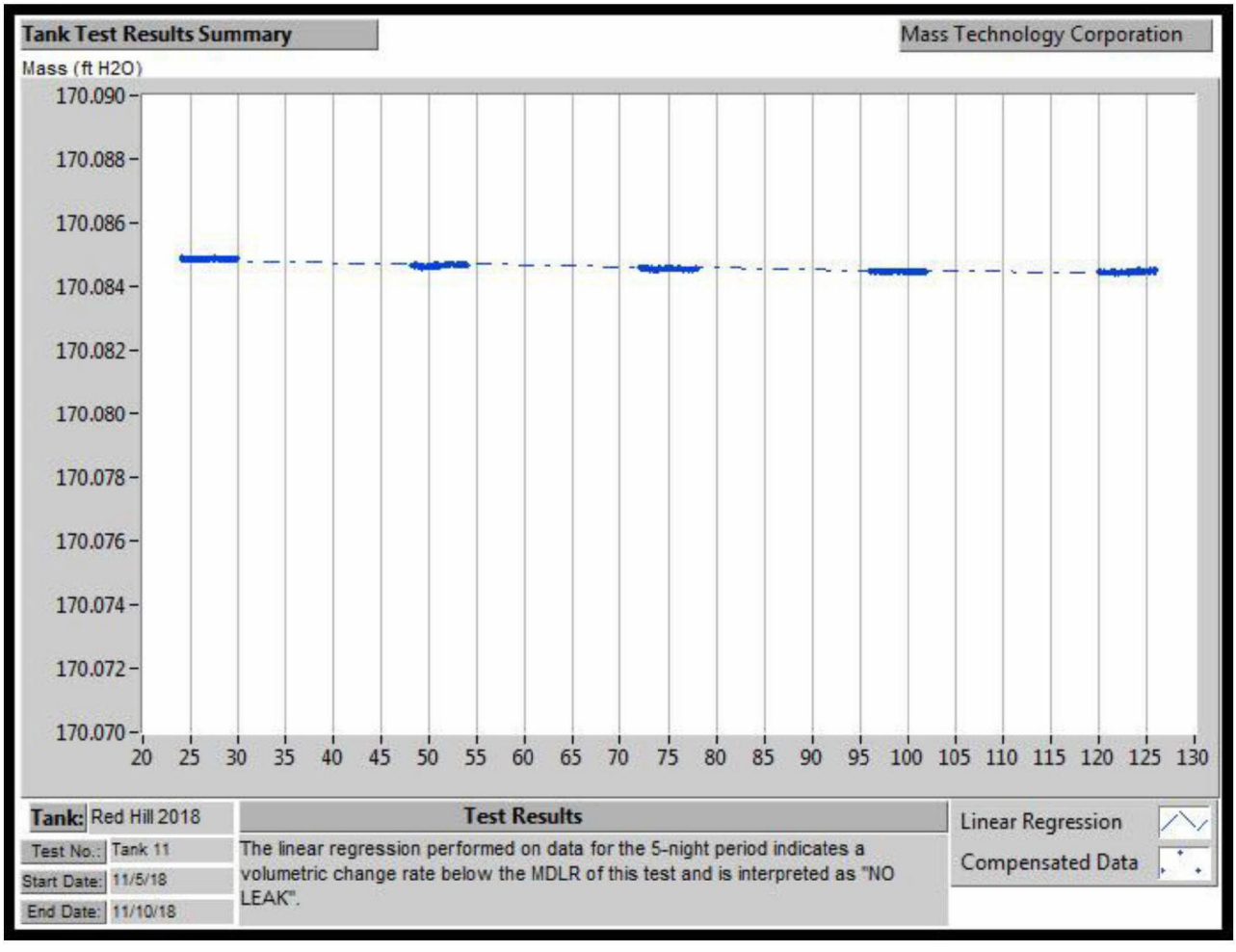
Critical Infrastructure

All dimensions, line locations, sizes and valve descriptions have been furnished by the facility operator.

Results

The fluid mass data was recorded over a 120-hour period. A linear regression of the recorded fluid mass data resulted in a leak rate detected below the minimum detection level of 0.5 gallons per hour. All tank valves were adequately secured such that any fluid loss was isolated to leakage. Therefore, the containment integrity of the tank was not compromised and the test is considered conclusive.

Tank # 11 is certified to be tight.



Mass Technology CORPORATION

Precision Leak Measurement Report
P.O. Box 1578
Kilgore, Texas 75662

FISC Red Hill
Pearl Harbor, HI

Proprietary Information

Proprietary Information

Scope of Work: Furnish all required management, labor, services, materials and equipment to perform the required annual tightness testing of Tank # 12 an underground fuel storage tank located at FISC Red Hill, Pearl Harbor, HI.

Report compiled by: **Proprietary Information**

Date: 12-12-2018

Summary

Testing of Tank # 12 a 12,800,000 gal underground storage tank located at FISC Red Hill, Pearl Harbor, Hawaii commenced October 21, 2018 and was completed October 26, 2018. The result of that testing is that the tank system is determined to be tight to isolation. All tank valves were adequately secured such that no unusual readings were noted. Testing was performed using the Mass Technology Corporation protocols set out in the third party evaluations. All tank valves were adequately secured such that any fluid loss was isolated to leakage. Therefore, the containment integrity of the tank was not compromised and the test is considered conclusive.

Tank # 12: After 120 hours of testing the tank is certified to be tight.

Tank Data Tank # 12

Diameter:	100 ft.	Height:	251 ft.
Tank Type:	Vertical UST	Contents:	JP-5
Specific Gravity:	0.82	Product Level:	211.92 ft.
Start Date:	10/21/2018	Completion Date:	10/26/2018
		Test Results:	Certified Tight

Proprietary Information

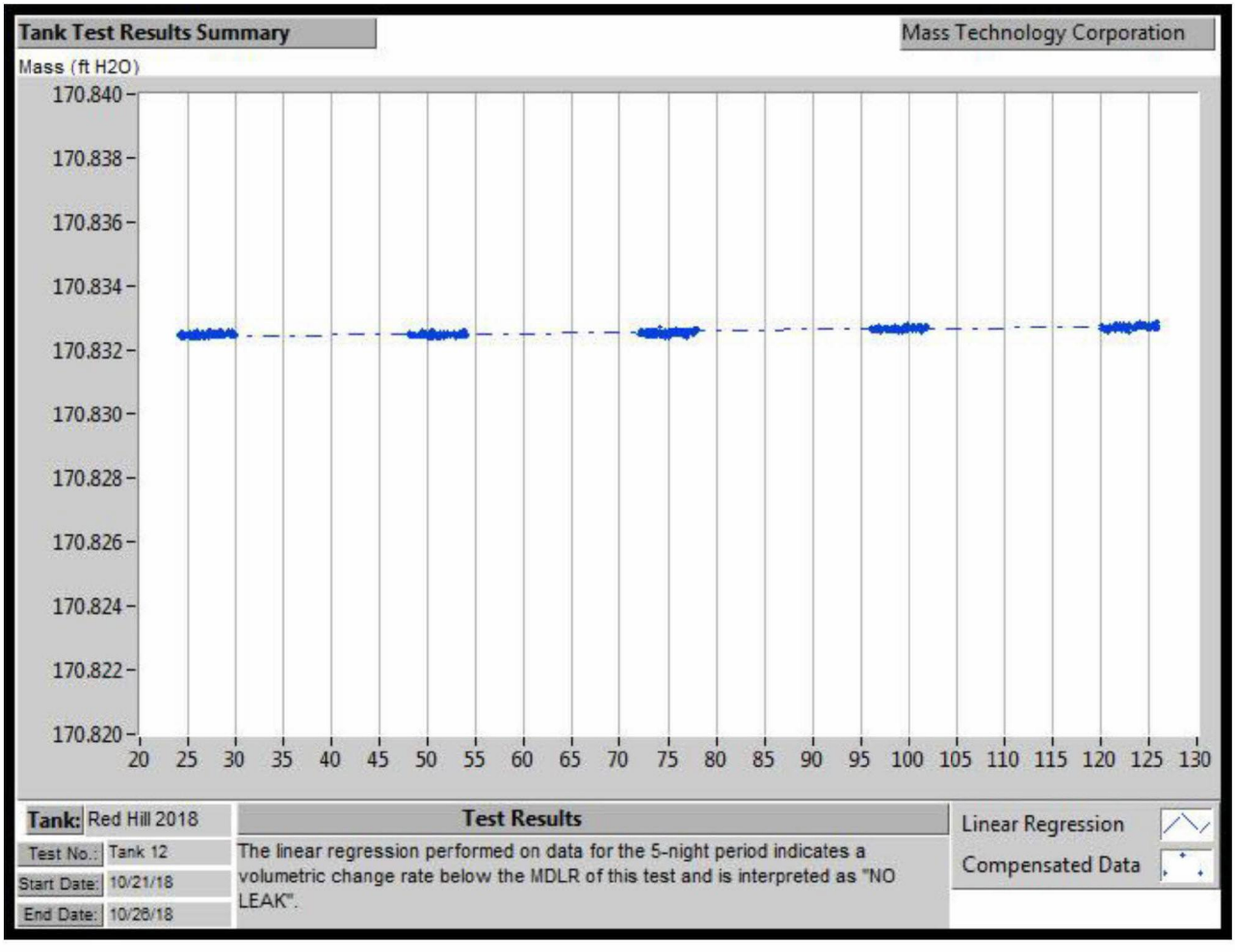
Critical Infrastructure

All dimensions, line locations, sizes and valve descriptions have been furnished by the facility operator.

Results

The fluid mass data was recorded over a 120-hour period. A linear regression of the recorded fluid mass data resulted in a leak rate detected below the minimum detection level of 0.5 gallons per hour. All tank valves were adequately secured such that any fluid loss was isolated to leakage. Therefore, the containment integrity of the tank was not compromised and the test is considered conclusive.

Tank # 12 is certified to be tight.



Mass Technology CORPORATION

Precision Leak Measurement Report
P.O. Box 1578
Kilgore, Texas 75662

FISC Red Hill
Pearl Harbor, HI

Proprietary Information

Proprietary Information

Scope of Work: Furnish all required management, labor, services, materials and equipment to perform the required annual tightness testing of Tank # 15 an underground fuel storage tank located at FISC Red Hill, Pearl Harbor, HI.

Report compiled by: **Proprietary Information**

Date: 12-12-2018

Summary

Testing of Tank # 15 a 12,700,000 gal underground storage tank located at FISC Red Hill, Pearl Harbor, Hawaii commenced November 21, 2018 and was completed November 26, 2018. The result of that testing is that the tank system is determined to be tight to isolation. All tank valves were adequately secured such that no unusual readings were noted. Testing was performed using the Mass Technology Corporation protocols set out in the third party evaluations. All tank valves were adequately secured such that any fluid loss was isolated to leakage. Therefore, the containment integrity of the tank was not compromised and the test is considered conclusive.

Tank # 15: After 120 hours of testing the tank is certified to be tight.

Tank Data Tank # 15

Diameter:	100 ft.	Height:	250 ft.
Tank Type:	Vertical UST	Contents:	F76
Specific Gravity:	0.84	Product Level:	210.74 ft.
Start Date:	11/21/2018	Completion Date:	11/26/2018
		Test Results:	Certified Tight

Proprietary Information

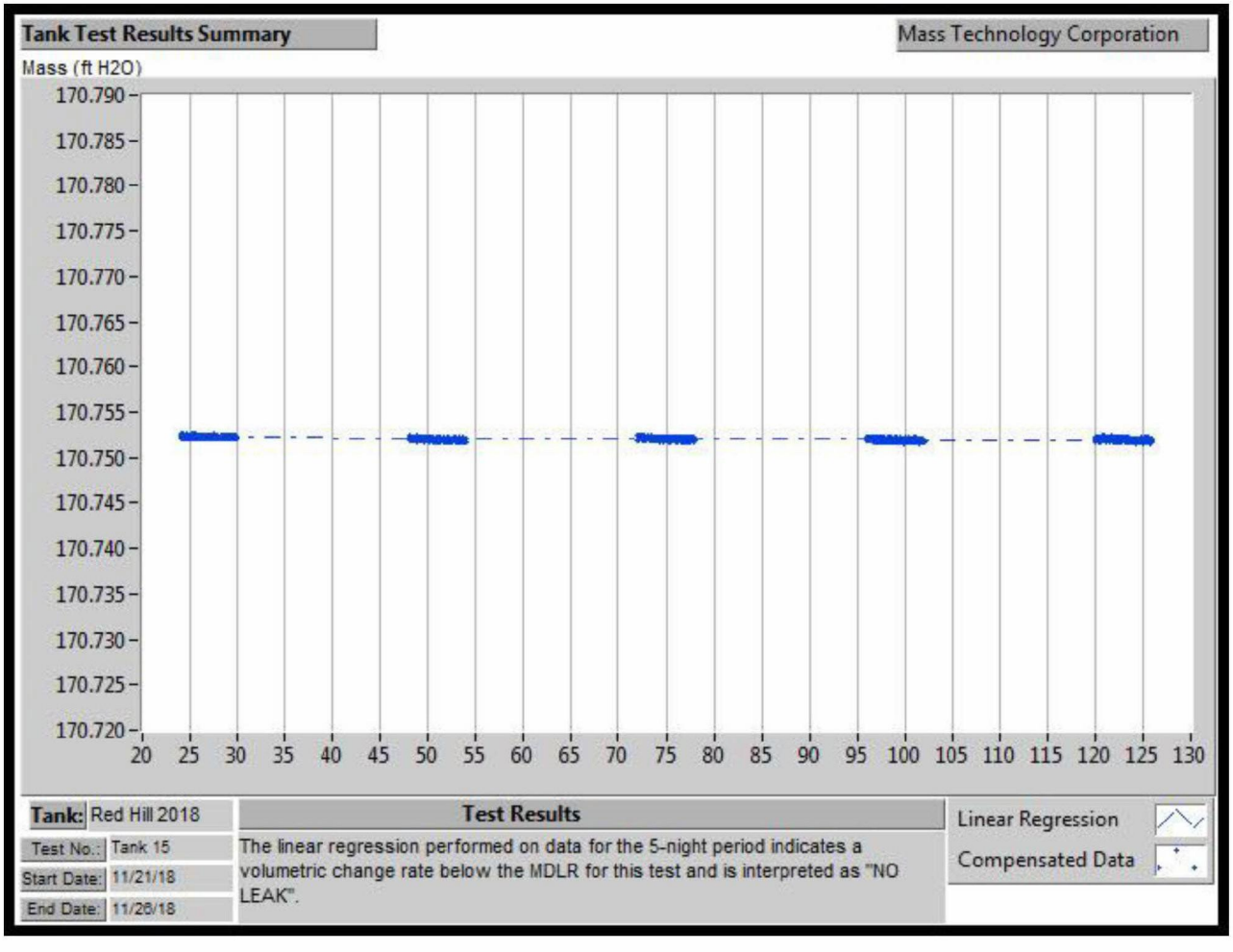
Critical Infrastructure

All dimensions, line locations, sizes and valve descriptions have been furnished by the facility operator.

Results

The fluid mass data was recorded over a 120-hour period. A linear regression of the recorded fluid mass data resulted in a change rate detected below the minimum detection level of 0.5 gallons per hour. All tank valves were adequately secured such that any fluid loss was isolated to leakage. Therefore, the containment integrity of the tank was not compromised and the test is considered conclusive.

Tank # 15 is certified to be tight.



Mass Technology CORPORATION

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P.O. Box 1578
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FISC Red Hill
Pearl Harbor, HI

Proprietary Information

Proprietary Information

Scope of Work: Furnish all required management, labor, services, materials and equipment to perform the required annual tightness testing of Tank # 16 an underground fuel storage tank located at FISC Red Hill, Pearl Harbor, HI.

Report compiled by: **Proprietary Information**

Date: 12-12-2018

Summary

Testing of Tank # 16 a 12,700,000 gal underground storage tank located at FISC Red Hill, Pearl Harbor, Hawaii commenced October 22, 2018 and was completed October 27, 2018. The result of that testing is that the tank system is determined to be tight to isolation. All tank valves were adequately secured such that no unusual readings were noted. Testing was performed using the Mass Technology Corporation protocols set out in the third party evaluations. All tank valves were adequately secured such that any fluid loss was isolated to leakage. Therefore, the containment integrity of the tank was not compromised and the test is considered conclusive.

Tank # 16: After 120 hours of testing the tank is certified to be tight.

Tank Data Tank # 16

Diameter:	100 ft.	Height:	250 ft.
Tank Type:	Vertical UST	Contents:	F76
Specific Gravity:	0.84	Product Level:	211.94 ft.
Start Date:	10/22/2018	Completion Date:	10/27/2018
		Test Results:	Certified Tight

Proprietary Information

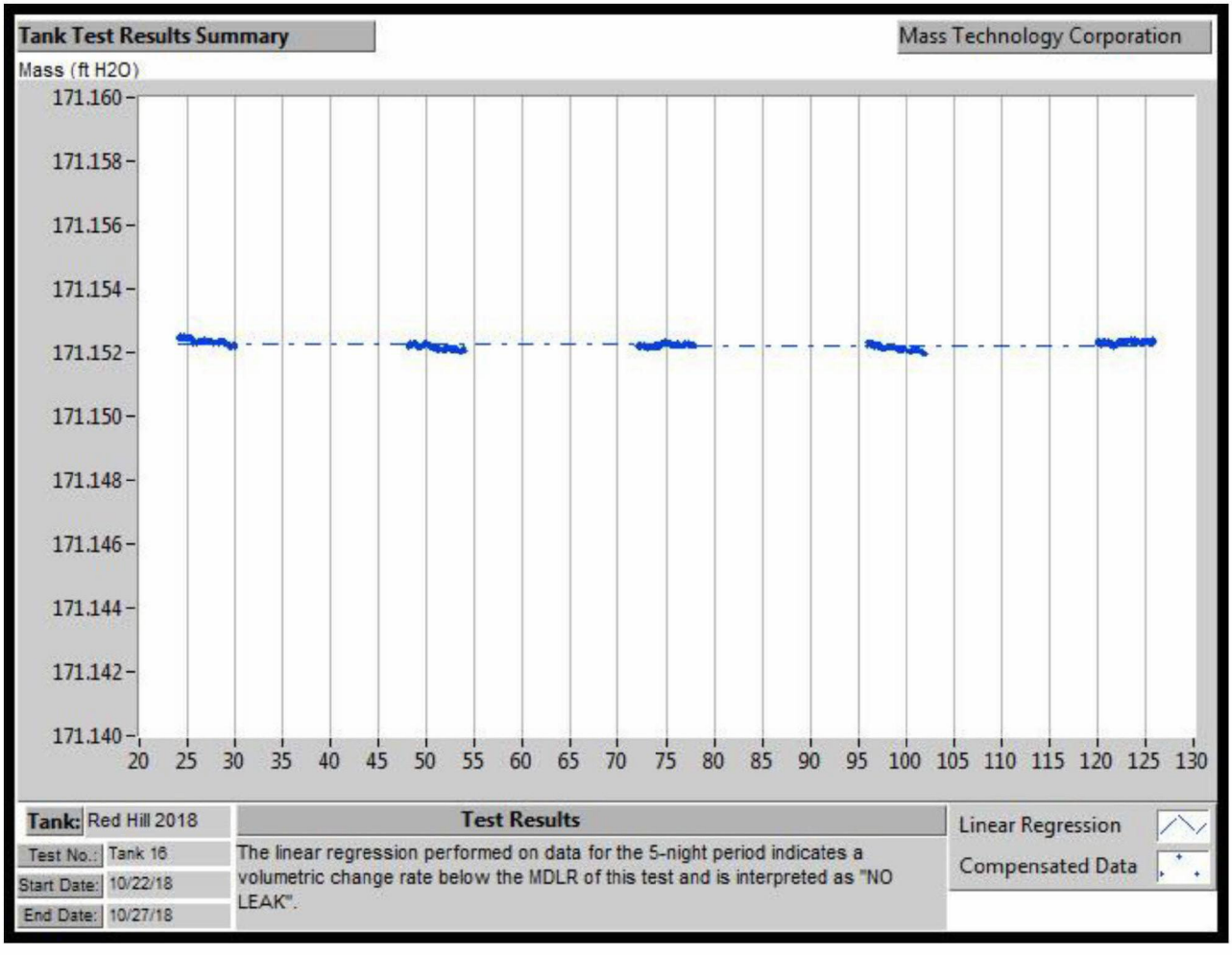
Critical Infrastructure

All dimensions, line locations, sizes and valve descriptions have been furnished by the facility operator.

Results

The fluid mass data was recorded over a 120-hour period. A linear regression of the recorded fluid mass data resulted in a change rate detected below the minimum detection level of 0.5 gallons per hour. All tank valves were adequately secured such that any fluid loss was isolated to leakage. Therefore, the containment integrity of the tank was not compromised and the test is considered conclusive.

Tank # 16 is certified to be tight.



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P.O. Box 1578
Kilgore, Texas 75662

FISC Red Hill
Pearl Harbor, HI

Proprietary Information

Proprietary Information

Scope of Work: Furnish all required management, labor, services, materials and equipment to perform the required annual tightness testing of Tank # 18 an underground fuel storage tank located at FISC Red Hill, Pearl Harbor, HI.

Report compiled by: **Proprietary Information**

Date: 12-12-2018

Summary

Testing of Tank # 18 a 12,700,000 gal underground storage tank located at FISC Red Hill, Pearl Harbor, Hawaii commenced November 8, 2018 and was completed November 13, 2018. The result of that testing is that the tank system is determined to be tight to isolation. All tank valves were adequately secured such that no unusual readings were noted. Testing was performed using the Mass Technology Corporation protocols set out in the third party evaluations. All tank valves were adequately secured such that any fluid loss was isolated to leakage. Therefore, the containment integrity of the tank was not compromised and the test is considered conclusive

Tank # 18: After 120 hours of testing the tank is certified to be tight.

Tank Data Tank # 18

Diameter:	100 ft.	Height:	250 ft.
Tank Type:	Vertical UST	Contents:	JP-5
Specific Gravity:	0.82	Product Level:	147.74 ft.
Start Date:	11/08/2018	Completion Date:	11/13/2018
Proprietary Information		Test Results:	Certified Tight

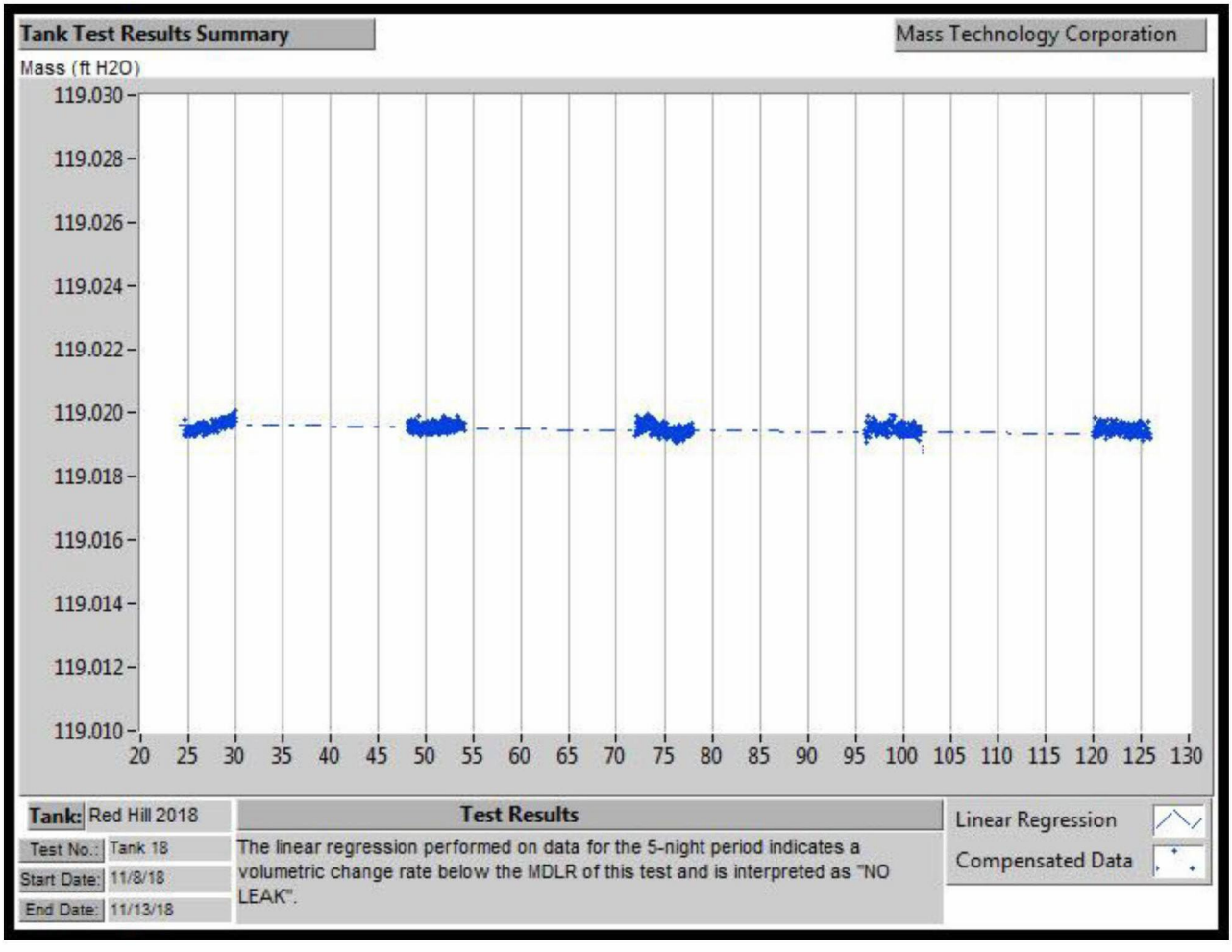
Critical Infrastructure

All dimensions, line locations, sizes and valve descriptions have been furnished by the facility operator.

Results

The fluid mass data was recorded over a 120-hour period. A linear regression of the recorded fluid mass data resulted in a change rate detected below the minimum detection level of 0.5 gallons per hour. All tank valves were adequately secured such that any fluid loss was isolated to leakage. Therefore, the containment integrity of the tank was not compromised and the test is considered conclusive.

Tank # 18 is certified to be tight.



Mass Technology CORPORATION

Precision Leak Measurement Report
P.O. Box 1578
Kilgore, Texas 75662

FISC Red Hill
Pearl Harbor, HI

Proprietary Information

Proprietary Information

Scope of Work: Furnish all required management, labor, services, materials and equipment to perform the required annual tightness testing of Tank # 20 an underground fuel storage tank located at FISC Red Hill, Pearl Harbor, HI.

Report compiled by: **Proprietary Information**

Date: 12-12-2018

Summary

Testing of Tank # 20 a 12,700,000 gal underground storage tank located at FISC Red Hill, Pearl Harbor, Hawaii commenced October 10, 2018 and was completed October 15, 2018. The tank contained JP-5 and a precision leak test was conducted. The result of that testing is that the tank system is determined to be tight to isolation. All tank valves were adequately secured such that no unusual readings were noted. Testing was performed using the Mass Technology Corporation protocols set out in the third party evaluations. All tank valves were adequately secured such that any fluid loss was isolated to leakage. Therefore, the containment integrity of the tank was not compromised and the test is considered conclusive.

Tank # 20: After 120 hours of testing the tank is certified to be tight.

Tank Data Tank # 20

Diameter:	100 ft.	Height:	250 ft.
Tank Type:	Vertical UST	Contents:	JP-5
Specific Gravity:	0.82	Product Level:	204.14 ft.
Start Date:	10/10/2018	Completion Date:	10/15/2018
Proprietary Information		Test Results:	Certified Tight

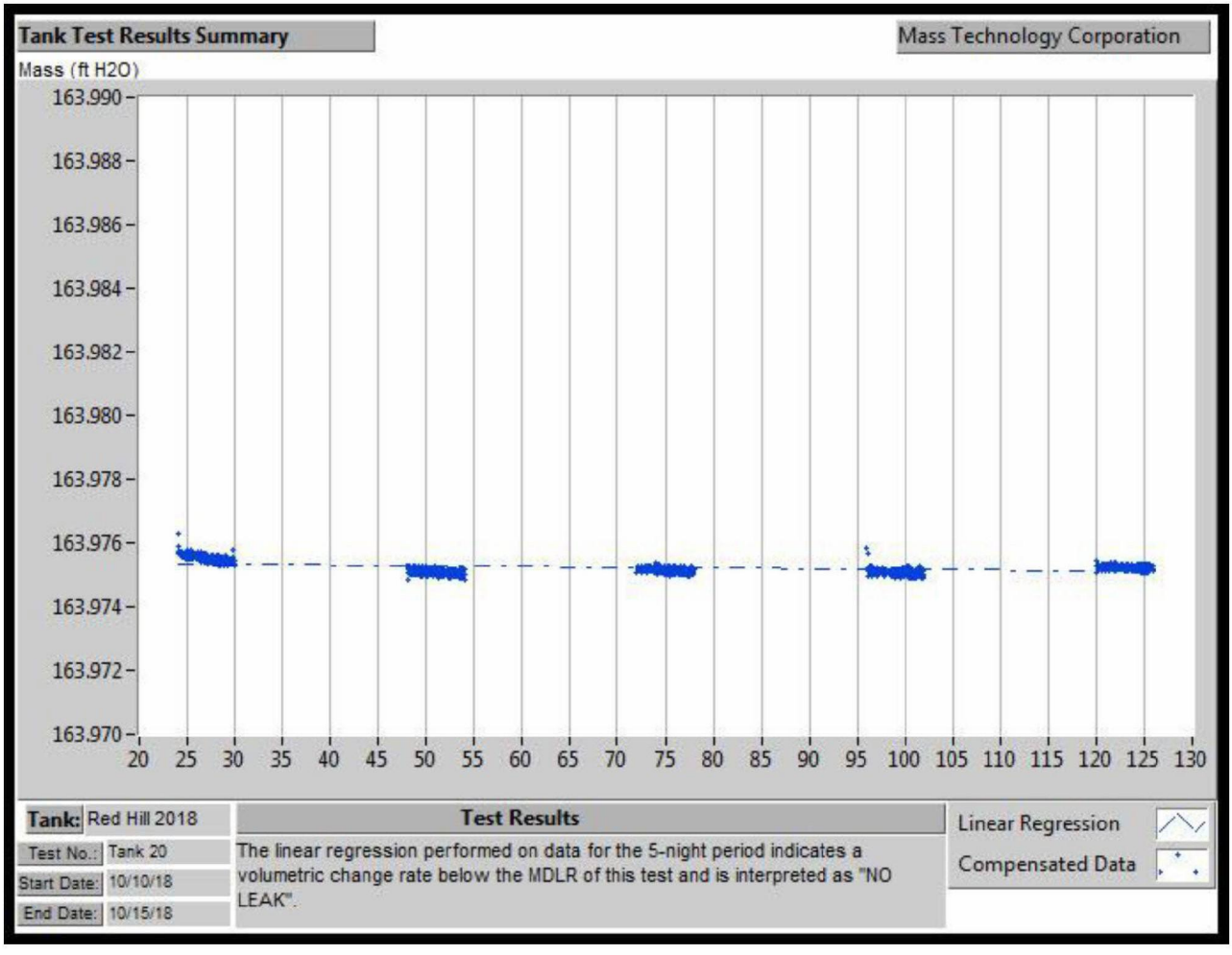
Critical Infrastructure

All dimensions, line locations, sizes and valve descriptions have been furnished by the facility operator.

Results

The fluid mass data was recorded over a 120-hour period. A linear regression of the recorded fluid mass data resulted in a leak rate detected below the minimum detection level of 0.5 gallons per hour. All tank valves were adequately secured such that any fluid loss was isolated to leakage. Therefore, the containment integrity of the tank was not compromised and the test is considered conclusive.

Tank # 20 is certified to be tight.



Mass Technology CORPORATION

Precision Leak Measurement Report
P.O. Box 1578
Kilgore, Texas 75662

FISC Red Hill
Pearl Harbor, HI

Proprietary Information

Proprietary Information

Scope of Work: Furnish all required management, labor, services, materials and equipment to perform the required annual tightness testing of Tank # S1224 (Surge 1) an underground fuel storage tank located at FISC Red Hill, Pearl Harbor, HI.

Report compiled by: **Proprietary Information**

Date: 12-12-2018

Summary

Testing of Tank S1224 (Surge 1) a 420,000 gal underground storage tank located at FISC Red Hill, Pearl Harbor, Hawaii commenced November 1, 2018 and was completed November 3, 2018. The result of that testing is that the tank system is determined to be tight to isolation. Testing was performed using the Mass Technology Corporation protocols set out in the third party evaluations. All tank valves were adequately secured such that any fluid loss was isolated to leakage. Therefore, the containment integrity of the tank was not compromised and the test is considered conclusive.

Tank # S1224 (Surge 1): After 48 hours of testing the result is tight.

Tank Data Tank # 1224 Surge 1

Diameter:	60 ft.	Height:	20 ft.
Tank Type:	Vertical UST	Contents:	F24
Specific Gravity:	0.80	Product Level:	14.39 ft.
Start Date:	11/01/2018	Completion Date:	11/03/2018
		Test Results:	Certified Tight

Proprietary Information

Critical Infrastructure

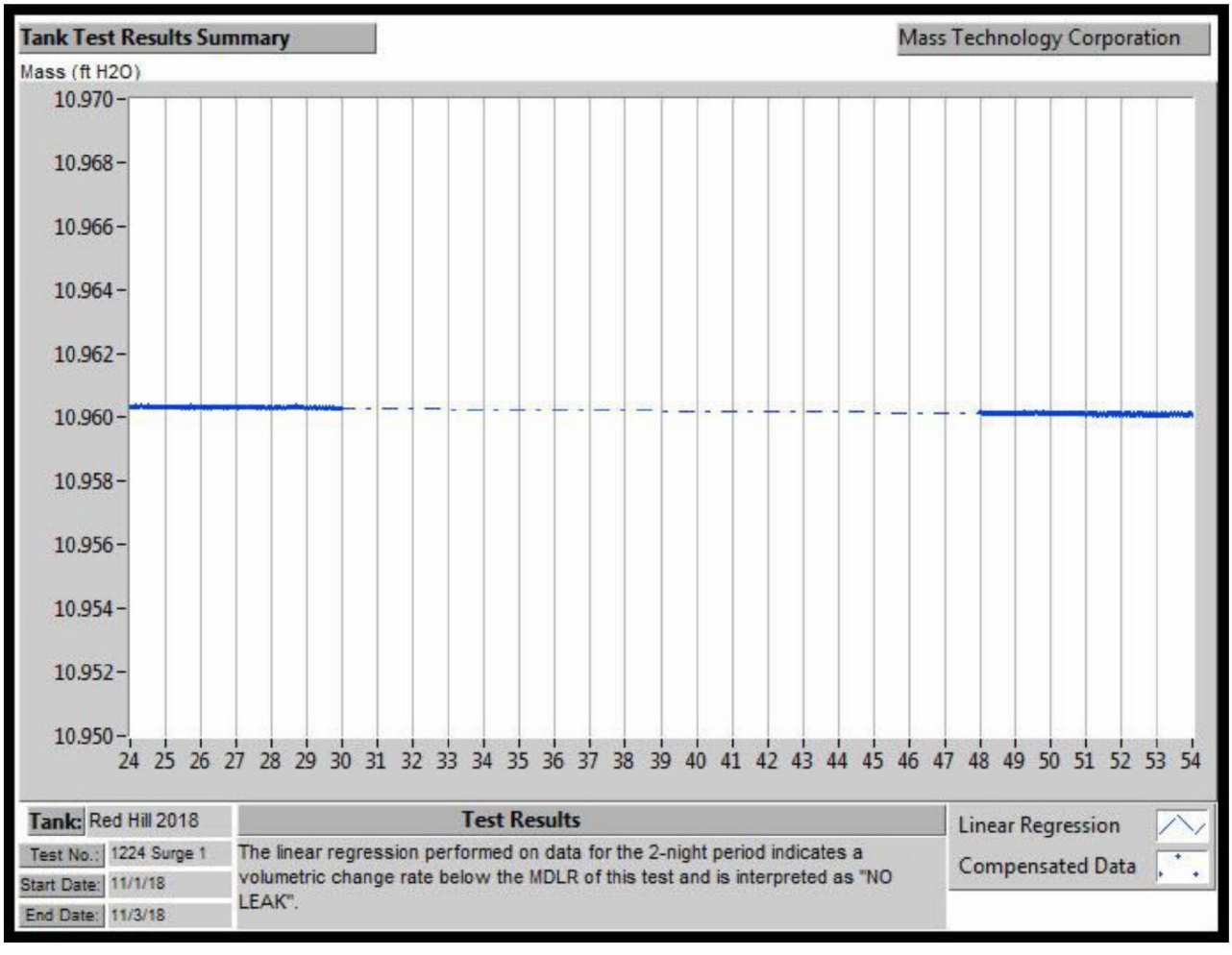
All dimensions, line locations, sizes and valve descriptions have been furnished by the facility operator.

Mass Technology 2

Results

The fluid mass data was recorded over a 48-hour period. A linear regression of the recorded fluid mass data resulted in a change rate detected below the minimum detection level of 0.5 gallons per hour. All tank valves were adequately secured such that any fluid loss was isolated to leakage. Therefore, the containment integrity of the tank was not compromised and the test is considered conclusive.

Tank S1224 (Surge 1) is certified to be tight.



Precision Leak Measurement Report
P.O. Box 1578
Kilgore, Texas 75662

FISC Red Hill
Pearl Harbor, HI

Proprietary Information

Proprietary Information

Scope of Work: Furnish all required management, labor, services, materials and equipment to perform the required annual tightness testing of Tank S1225 (Surge 2) an underground fuel storage tank located at FISC Red Hill, Pearl Harbor, HI.

Report compiled by: **Proprietary Information**

Date: 12-12-2018

Summary

Testing of Tank S1225 (Surge 2) a 420,000 gal underground storage tank located at FISC Red Hill, Pearl Harbor, Hawaii commenced October 18, 2018 and was completed October 20, 2018. The result of that testing is that the tank system is determined to be tight to isolation. Testing was performed using the Mass Technology Corporation protocols set out in the third party evaluations. All tank valves were adequately secured such that any fluid loss was isolated to leakage. Therefore, the containment integrity of the tank was not compromised and the test is considered conclusive.

Tank S1225 (Surge 2): After 48 hours of testing the tank is certified to be tight.

Tank Data Tank S1225 (Surge 2)

Diameter:	60 ft.	Height:	20 ft.
Tank Type:	Vertical UST	Contents:	JP-5
Specific Gravity:	0.82	Product Level:	14.79 ft.
Start Date:	10/18/2018	Completion Date:	10/20/2018
		Test Results:	Certified Tight

Proprietary Information

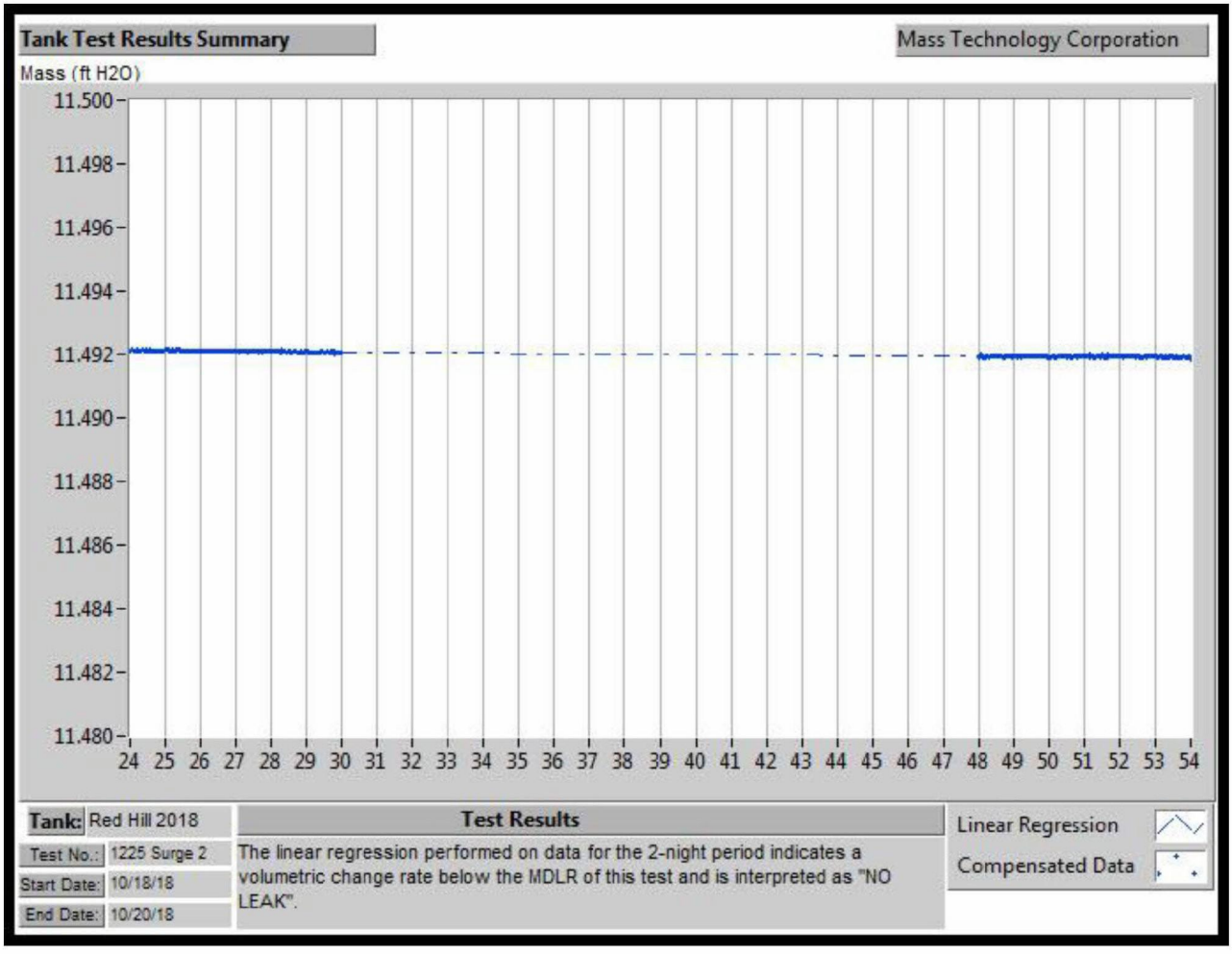
Critical Infrastructure

All dimensions, line locations, sizes and valve descriptions have been furnished by the facility operator.

Results

The fluid mass data was recorded over a 48-hour period. A linear regression of the recorded fluid mass data resulted in a change rate detected below the minimum detection level of 0.5 gallons per hour. All tank valves were adequately secured such that any fluid loss was isolated to leakage. Therefore, the containment integrity of the tank was not compromised and the test is considered conclusive.

Tank S1225 (Surge 2) is certified to be tight.



Precision Leak Measurement Report
P.O. Box 1578
Kilgore, Texas 75662

FISC Red Hill
Pearl Harbor, HI

Proprietary Information

Proprietary Information

Scope of Work: Furnish all required management, labor, services, materials and equipment to perform the required annual tightness testing of Tank S1226 (Surge 3) an underground fuel storage tank located at FISC Red Hill, Pearl Harbor, HI.

Report compiled by: **Proprietary Information**

Date: 12-12-2018

Summary

Testing of Tank S1226 (Surge 3) a 420,000 gal underground storage tank located at FISC Red Hill, Pearl Harbor, Hawaii commenced October 23, 2018 and was completed October 25, 2018. The result of that testing is that the tank system is determined to be tight to isolation. Testing was performed using the Mass Technology Corporation protocols set out in the third party evaluations. All tank valves were adequately secured such that any fluid loss was isolated to leakage. Therefore, the containment integrity of the tank was not compromised and the test is considered conclusive.

Tank S1226 (Surge 3): After 48 hours of testing the tank is certified to be tight.

Tank Data Tank S1226 (Surge 3)

Diameter:	60 ft.	Height:	20 ft.
Tank Type:	Vertical UST	Contents:	F76
Specific Gravity:	0.84	Product Level:	14. 24 ft.
Start Date:	10/23/2018	Completion Date:	10/25/2018
		Test Results:	Certified Tight

Proprietary Information

Critical Infrastructure

All dimensions, line locations, sizes and valve descriptions have been furnished by the facility operator.

Results

The fluid mass data was recorded over a 48-hour period. A linear regression of the recorded fluid mass data resulted in a change rate detected below the minimum detection level of 0.5 gallons per hour. All tank valves were adequately secured such that any fluid loss was isolated to leakage. Therefore, the containment integrity of the tank was not compromised and the test is considered conclusive.

Tank S1226 (Surge 3) is certified to be tight.