

REPAIR TANK 19

FACD MEETING NOTES & MISC NOTES

Week of May 3, 1998

By Enterprise Engineering, Inc.

Steve Brooks
Steve DiGregorio
Kathy Gardner
Larry Goodwin

Thermal Engineering Corp.

Peter Schubert
David Niio

PSG Corrosion, Inc.

Brendan Sheehan

H.H. Miura, Inc.

Melvin Yakota

DLA Project R29-86 Repair Tank 19, FISC Pearl Harbor

Pre-Design Meeting: May 4, 1998

NAME	ORGAN/CODE	JOB DESCRIPT	PHONE #
LAWRENCE W. BROADWIN	ENTERPRISE/HOISTING SYSTEMS	ENGINEER	(712) 336-3344
Kathy Gardner	Enterprise Engineering	Mech Engr / Cost Engr	(907) 563-3835
STEPHEN DiGREGGIO	ENTERPRISE ENGINEERING	PRJ MGR / STRUCT ENGR	(207) 846-3900
STEVE BROOKS	" "	PRINCIPAL / MECH ENGR	" "
EMAIL 498EEI@AOL.COM FAX 907-563-3817			
Melvin Yokota	Harold H. Miura, Inc	Sr Elec. Engr	808 961 3415
Brendan Sheehan	PSG Corrosion Engineering	Corrosion Engineering	531-3143
LOR BRIGGINS	FISC 200	Fulbright	808 471-6027
PETER SCHAUBERT	THERMAL ENG'G. CORP.	MECH. ENGR	(808) 848-6966
DAVID NIINO	THERMAL ENGINEERING CORP.	MECH. ENGR.	(808) 848-6966
LT Darren Sweet	FISC	PWO	(808) 471-0659
ENS ALEX KOINEN	FISC	PWO	(808) 471-0659
MIKE GLADSON	FISC	Planning	(808) 471-4606
RON TANAKA	PACDIV 403	PROJ DES. ENGR	(808) 474-5327
John Engle	FISC	Planning	808 471-5074

**RED HILL TANK 19
FISC PEARL HARBOR, HI
CONTRACT NO. N62742-98-C-0002
EEI PROJECT 98-2325**

**FACD
(FUNCTIONAL ANALYSIS CONCEPT DEVELOPMENT)**

WORK PLAN

WEEK OF MAY 4, 1998

BACKGROUND

Prior to FACD

The design team began gathering project information, user requirements, and existing site and utility information.

Tank Repair goals are:

- Minimize Risk of Fuel Leakage
- Maintainability (long term repair)
- Contain Leak
- Relative Ease In Locating Leaks
- Renewal of Tank - long term solution (50 year tank vs 10 tank usage)
- Cost Effective Solution
- Constructable
- Predictable Cost

BEGIN FACD

What has caused past failures?

- Original construction legacy
- Environmental conditions (corrosion)

Discuss Lessons Learned

- Tell-tale piping
- Tank welding integrity
- Batten strips
- Batten strip doubler channels
- Coatings
- Sand blasting
- Ventilation
- Mobilization repair methods
- Backside corrosion
- Tank integrity evaluation (welds, plate corrosion)

Brainstorm Major Concepts

- Infrastructure
What infrastructure issues are important? (Gauging, ATG, Ladder, Elevator, Venting, Etc.)
- Leak Detection
How can we provide tank leak prevention and/or detection?
How can we contain a leak?
- Tank in a Tank
How can we build a tank within a tank?
- Repair Existing Tank
How can we repair the existing tank to meet user goals?
- Piping
How can we assure piping integrity?
- Other issues of concern

Rank Ideas Gut Feel Index (GFI)

ENTERPRISE

HANDOUT FROM RON TANAKA
AT DAY 1 OF FACD, MAY 4

ENTERPRISE
ENGINEERING, INC.

Repair Tank 19
Red Hill, FISC Pearl Harbor, HI

FACD Schedule

Day	Date	Day No.	Agenda	Comments
SAT	5/2/98		Travel to HI EEI PSG	Arrive mid day
SUN	5/3/98	1	Team Meeting at Thermal Engineering EEI Thermal Engineering Corp. PSG Harold H. Miura, Inc.	1/2 day, start 1:00 pm
MON	5/4/98	2	Kick-off mtg. w/ gov't & tour of Tank 19 EEI Thermal Engineering Corp. PSG Harold H. Miura, Inc.	All day
TUES	5/5/98	3	FACD w/ gov't EEI Thermal Engineering Corp. PSG	All day w/ gov't, Follow-up in evening w/ project team for recap
WED	5/6/98	4	FACD w/ gov't EEI Thermal Engineering Corp. PSG	All day w/ gov't, Follow-up in evening w/ project team for recap
THURS	5/7/98	5	Evaluate/cost estimate of alternatives EEI Thermal Engineering Corp. PSG	Team effort at Thermal Engineering office all day
FRI	5/8/98	6	Evaluate/cost estimate of alternatives EEI Thermal Engineering Corp.	Team effort at Thermal Engineering office all day
SAT	5/9/98	7	Evaluate/cost estimate of alternatives EEI Thermal Engineering Corp.	Team effort at Thermal Engineering office as required
SUN	5/10/98	8	No schedule	
MON	5/11/98	9	Final FACD w/ gov't EEI Thermal Engineering Corp.	Present findings, rework project. All day if needed.
TUES	5/12/98	10	Prepare Narrative for outbrief EEI Thermal Engineering Corp. Out brief w/ gov't EEI Thermal Engineering Corp.	Morning at Thermal Engineering office Afternoon

Yarmouth, ME 04096 • 172 Main Street, P.O. Box 550 • (207) 846-3900 • Fax (207) 846-1115
Anchorage, AK 99503 • 3335 Arctic Blvd., Suite 100 • (907) 563-3835 • Fax (907) 563-3817

**Repair Tank 19
Red Hill, FISC Pearl Harbor, HI
FACD Schedule**

Day	Date	Day No.	Agenda	Comments
WED	5/13/98	11	Travel to AK (TUES PM / WED AM) EEI	
THURS	5/14/98	13	EEI	Work on final report
FRI	5/15/98	14	EEI	Work on final report

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ENGINEERING, INC.

3335 ARCTIC BOULEVARD
ANCHORAGE, ALASKA 99503
TEL (907) 563-3835 FAX (907) 563-3817

JOB RH-19

SHEET NO. _____

OF _____

CALCULATED BY SSB

DATE 5/4/98

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DATE _____

SCALE _____

KICK-OFF MEETING

RON TANAKA: 1. PREVENT FUEL LEAKS
2. PREVENT FUTURE LEAKS
3. IMPROVE LEAK LOCATION ABILITY
4.

SSB: RENEWAL / LIFE EXTENSION

1980 SCADA SYSTEM → SCALED
FOR REPLCMT.

IN DESIGN → TRACOR / MIKE GREEN
SPAWAR → RON FETU.

TANK LEVEL / ATC. 1/1000 FT IN CYL =
58 GAL

ON GOING EFFORT FOR LEAK DET.

AFFF FOAM SYSTEM MOSTLY
GAS SUPR (NON HOLON) CONTROL ROOMS

DOME 125 GROUT HOLES
350 PSI

WALKWAY -
190'

1-4 230' STD FILL
5-20 1

242' TEST FILL.

WATER TESTED RIGHT INTO NECK

TNIL 19 - 1ST GENERATION POLYURETHANE
(LATE 50'S)

RED HILL TANK 19
FISC PEARL HARBOR, HI
CONTRACT NO. N62742-98-C-0002
EEI PROJECT 98-2325

FACD
(FUNCTIONAL ANALYSIS CONCEPT DEVELOPMENT)

SIGN-IN

MAY 5, 1998

NAME	REPRESENTING	PHONE/FAX	E-MAIL
STEVE BROOKS	EEI	907-563-3835 3817	SSBEEI@AOL.COM
STEPHEN DiGREGORIO	EEI	(201) 846-3900 FAX - 1115	SJD@EEITEAM.COM
TOM KITCHEN	MAE	808-488-4650	
LARRY GOODWIN	EEI	(907) 563-3835 (712) 336-3342	
Brendan Sheehan	PSG Corrosion Engineering	531-3143	norust@ aloha.net
DAVID NIINO	THERMAL ENGINEERING CORPORATION	PH 808 848-6966 FX 808 848-6964	
PETER SCHUBERT	THERMAL ENGINEERING CORPORATION	PH. 808 848-6966 FX 808 848-6964	
RONALD TANAKA	PAC DIV PROJ DESIGN ENGINEER	808-474-5327 808-471-5370	
MIKE GLADSON	FISC	471-4606 474-1436 FAX	MICHAEL GLADSON @FMSSO.NAVY.MIL
Kathy Gardner	EEI	(907) 563-3835 563-3817	Klg@eei@aol.com

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FACD
(FUNCTIONAL ANALYSIS CONCEPT DEVELOPMENT)

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MAY 5, 1998

DAY 2

NAME	REPRESENTING	PHONE/FAX	E-MAIL
✓ Glenn Engle	FISC	808 471-5074 808 474-1436	Gengle@FMSa May 11, 1
✓ Jim Gamman	FISCPH	471-2380	

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ENGINEERING, INC
ANCHORAGE, AK

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ENGINEERING, INC

172 MAIN ST. • P.O. BOX 550
YARMOUTH, MAINE 04096
TEL (207) 846-3900 FAX (207) 846-1115

JOB 98-2325

SHEET NO. 1 OF

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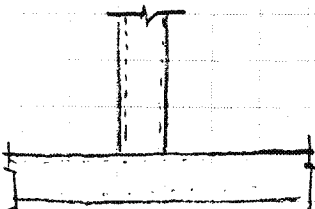
SCALE FACD MEETING

FACD MEETING

1. LESSONS LEARNED

TOM (API 635) INSPECTOR FOR DAMES & MOORE
BRIEF EVERYONE ON FINDINGS OF INSPECTION/REPAIR:

- HOLES IN UPPER DOME
- CUT COUPON FROM
- USING A/B SCAN FOR VT WELD
- EVERY COUPON OBTAINED HAD BACKSIDE CORROSION
 - DID NOT SEE DELAMINATION
 - STEEL METALLURGY APPEARS TO HAVE CHANGED
- FOUND THE FOLLOWING:
 - BLISTER IN HOLE
 - BLISTER IS CAUSED BY CORROSION HOLE FROM BACKSIDE
- 13 HOLES IN TK 10
- 4 HOLES TK 16
- INSPECTION OF TANKS IS PERFORMED BY VISUAL INSPECTION
- INTENT OF PRESENT PROJECT
 - CLEAN TANK
 - PERFORM CASUAL INSPECTION FOR PROBLEMS
 - 16, 10, 8, 7, 6
- LAST CONTRACT:
 - 1984 1 TO 16 CUT & WELD REPAIR
 - 1984 PROJECT FOUND PROBLEMS W/ WELDMANSHIP
 - PLATES ONLY VISUALLY REPAIRED
 - INSPECTION INCLUDED: VISUAL, VACUUM BOX TESTING
 - BATEMS: IN TANKS 1 TO 16?



- NO CHEMICAL TESTING PERFORMED

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JOB 98-2325

SHEET NO. 2 OF

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SCALE FACD MEETING

OTHER PROBLEMS FOUND

- IN TANKS W/ ALUMINUM COATING IN BOTTOM DOME, THE COATING HAD FAILED/BLISTERED
- ALL TANKS HAVE NRL COATING, COATING IN GENERAL IS GOOD EXCEPT AT BOTTOM
- ONE CRACK WELD IN TANK 10 BUT WELD

2. TANK 19 HISTORY

- DECIDED TO PUT ELEVATOR IN TANK
- HAD PROBLEMS W/ ELEVATOR
- TANK 19 HAS NOT BEEN INSPECTED

3. OTHER PROBLEMS FOUND IN TANKS

- WHERE GROUT TUBES WERE REMOVED, THE COVER PLATE OVER THE OPENING WAS FOUND TO HAVE LEAKS. POROSITY IN WELD

4. ELEVATORS: TANKS 1-16 HAVE BEEN REMOVED

5. Tom (API 653)

- NOT LOOKING FOR POTENTIAL FUTURE PROBLEM
- ONLY LOOKING FOR PRESENT PROBLEMS
- TRIED BUT COULD NOT TEST LI PLATES
 - TRIED PRESSURE TO 100 PSI BUT NO BACK PRESSURE
 - TRIED INJECTING FOAM

6. LEAK DETECTION SYSTEM

PER J. GAMMEN

- 3 INSTALLATIONS
- ORIGINAL INSTALLATION HAD PROBLEMS:

- 3/4" PIPING THAT BECAME CLOGGED
- STD WALL PIPING

9 PIPES INSTEAD 12 HOLES DEVELOP

17-20 1960 PROJECT: REPLACED TELL TAILS, PUT IN HEADS IN BOTTOM
1960'S TK 5, 6, 12, REMOVED TELL TAILS 1 1/2 SCH 80 TO UPPER DOME

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ENGINEERING, INC

172 MAIN ST. • P.O. BOX 550
YARMOUTH, MAINE 04096
TEL (207) 846-3900 FAX (207) 846-1115

JOB 98-2325

SHEET NO. 3 OF 3

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CORROSION FAILURES

• WHAT HAS CAUSED PAST FAILURES?

POSSIBLE THEORIES:

- CHEMICAL ACTION BTWN STEEL & CONCRETE:
 - IS AGGREGATE REACTIVE?
 - STORAGE OF AGGREGATE / SALT SPRAY
 - MIX DESIGN
 - STEEL METALLURGY
- CRACKS / COLD JOINTS
 - MIX DESIGN
 - PLACEMENT TECHNIQUES
 - DETAILS IN FORMWORK

• WAS FUEL FOUND BEHIND SIBEL?

- J. GAMMAY: CHECK TELLTALE RECORDS

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YARMOUTH, MAINE 04096
TEL (207) 846-3900 FAX (207) 846-1115

JOB 98-2325

SHEET NO. 4 OF 4

CALCULATED BY SD DATE 5/5/98

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LEAK DETECTION SYSTEM

PEL J. GAMMAN

- THERE HAVE BEEN 3 INSTALLATIONS
- ORIGINAL INSTALLATION HAD PROBLEMS
 - TELLTALE WAS $\frac{3}{4}$ " PIPING, STD WT PIPING
 - IN CASES, CORROSION HOLES DEVELOPED IN PIPING, NOT THE TANK
- 1960: REPLACED ORIGINAR TELLTALES W/ 7 PIPES INSTEAD OF 12
 - PUT A HEADEN RING IN BOTTOM PLATE
- 1960's: 3 ID PROJECT IMPLEMENT TO REPLACE LEAK DETECTION PIPING IN TH 5, 6, 12 W/ $1\frac{1}{2}$ SCH 80 PIPING WHICH RAN UP THRU UPPER DOME TO ALLOW RUNNING OUT LINES IF BECAME PLUGGED WITHOUT HAVING TO EMPTY TANK

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ENGINEERING, INC

172 MAIN ST. • P.O. BOX 550
YARMOUTH, MAINE 04096
TEL (207) 846-3900 FAX (207) 846-1115

JOB 98-2325

SHEET NO. 5 OF 5

CALCULATED BY SD DATE 5/5/98

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LESSONS LEARNED = COATINGS

- METALIZING HAS RESULTED IN COATING PROBLEMS
- LAST COATING = 1980's
- 1-16 197E-80 1ST COATED

17-70 1960 1ST COATED

HISTORICAL ISSUES OF NOTE

- 1) 1941-43 ORIGINAL CONSTR
2) 1949- PROBL. W/ T-16 → BETHEL REPORT
3) 1978-1984 TANKS 1-16 REPAIRED
100% GALV BOX WELDS
FIXED DOME BATTEN STRIPS
→ 100% WELD SOME
→ DOUBLED Γ SOME
FIXED SOME HOLES
METALIZED FLAT FLOOR
100% NRL COATING SYSTEM (ZINC CHR PRIMER?)
2 BOOMS SET-UP
REMOVED ORIGINAL TELL-TALES

HALLINGER ENGRS
AMANCENSTZ.
AS BUILT 1985

- 4) ~~1960's~~ 60's TANK 17-20 REPAIRS
(BASED ON TANK 19 OBSERVATION)
FIXED UPPER DOME BATTENS (WELDED ALL SIDES)
TOOK OUT ORIGINAL TELL-TALES, PUT IN MODIFIED TELL-TALES
NRL COATING SYSTEM (NO METALIZING)
GROUT TUBES CUT OFF & FLAT PLATED

EAZLE & WRIGHT DESIGN
DILLINGHAM PRIME CTR
& CLARK - COATING CTR
11/63 AS-BUILT

- 5) 1990 TANK 19 PROJECT
HOISTING EQUIP/ ELEVATOR (DID NOT WORK OUT)
MODIFIED VENTILATION

ABE & SUEBODA

PROJECT CANCELED

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3335 ARCTIC BOULEVARD
ANCHORAGE, ALASKA 99503
TEL (907) 563-3835 FAX (907) 563-3817

JOB RED HILL - HISTORY
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THEIRMAL ENGR - DSGNR
DAMES & MOORE - CTR.

- 6) CURRENT CONTRACT (98) T-6, 7, 8, 10, 16
FIX "PROBLEMS" FROM PRIOR INSP.
QN'L INSPECTION FROM BASKET - UT/VISUAL
T-10: 13 HOLES FIXED
T-16: 4 HOLES IN UPPER DOME

REMOVING METALIZING & RECOATING FLAT BOTTOM

- 7) TANK 6 REPAIRS 93/94
REPAIRED LEAKS - WAS WOOD IN CONCR, DIRECTLY
BEHIND STEEL SHELL

- 8) LATE 60'S: T-5, 6, 12
REMOVED TELL TALKS
NEW TELL-TALK SYSTEM - WORKED WELL
DRILLED NEW ACCESS INTO TUNNEL - ABOVE
WATERLINE.
TELL-TALK EXTEND TO GAUGER ROOM FOR
BLOW-OUT.
(REMOVED WITH 78-84 PROJECT)

RED HILL TANK 19
FISC PEARL HARBOR, HI
CONTRACT NO. N62742-98-C-0002
EEI PROJECT 98-2325

FACD FINDINGS PRESENTATION

SIGN-IN

MAY 11, 1998

NAME	REPRESENTING	PHONE/FAX	E-MAIL
Kroft	FISC 700	474 6009	
Jim Gorman	FISC PH 703	471-2390	
PETER SCHURBERT	THERMAL ENGR'G. CORPORATION	(808) 848 6966	
DAVID NIINO	THERMAL ENGR. CORP.	808 848-6966 808 848-6964	
MIKE GLADSON	FISC 701MG	471-4606	
Sean Fingle	FISC 701	471-5074	
David Aetall	DEU mp	477 6798	
Frank Rechner	DEU mp / DER-PR	477 3600	frechner@ desc.dk.mil
STEPHEN DiGREGORIO	ENTERPRISE ENGINEERING, INC	(207) 846-3900 FAI - 1115	BTDC@EEITEAM.COM
Kathy Gardner	ENTERPRISE ENGINEERING INC.	(907) 563-3835 (907) 563-3817	klgee@aol.com

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FACD FINDINGS PRESENTATION

SIGN-IN

MAY 11, 1998

NAME	REPRESENTING	PHONE/FAX	E-MAIL
RONALD TANAKA	PAC DIV 403 MOT. DES. ENGR.	474-5327 471-5870	
ALEX KOMMEN	FISC T&I	471-4669	

REPAIR TANK 19

FACD FIELD NOTES

Week of May 3, 1998

By: Enterprise Engineering, Inc.
Steve Brooks
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3335 ARCTIC BOULEVARD
ANCHORAGE, ALASKA 99503
TEL (907) 563-3835 FAX (907) 563-3817

JOB EH 19 - EVAL

SHEET NO. ①

OF _____

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DATE 5/4/98

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DATE _____

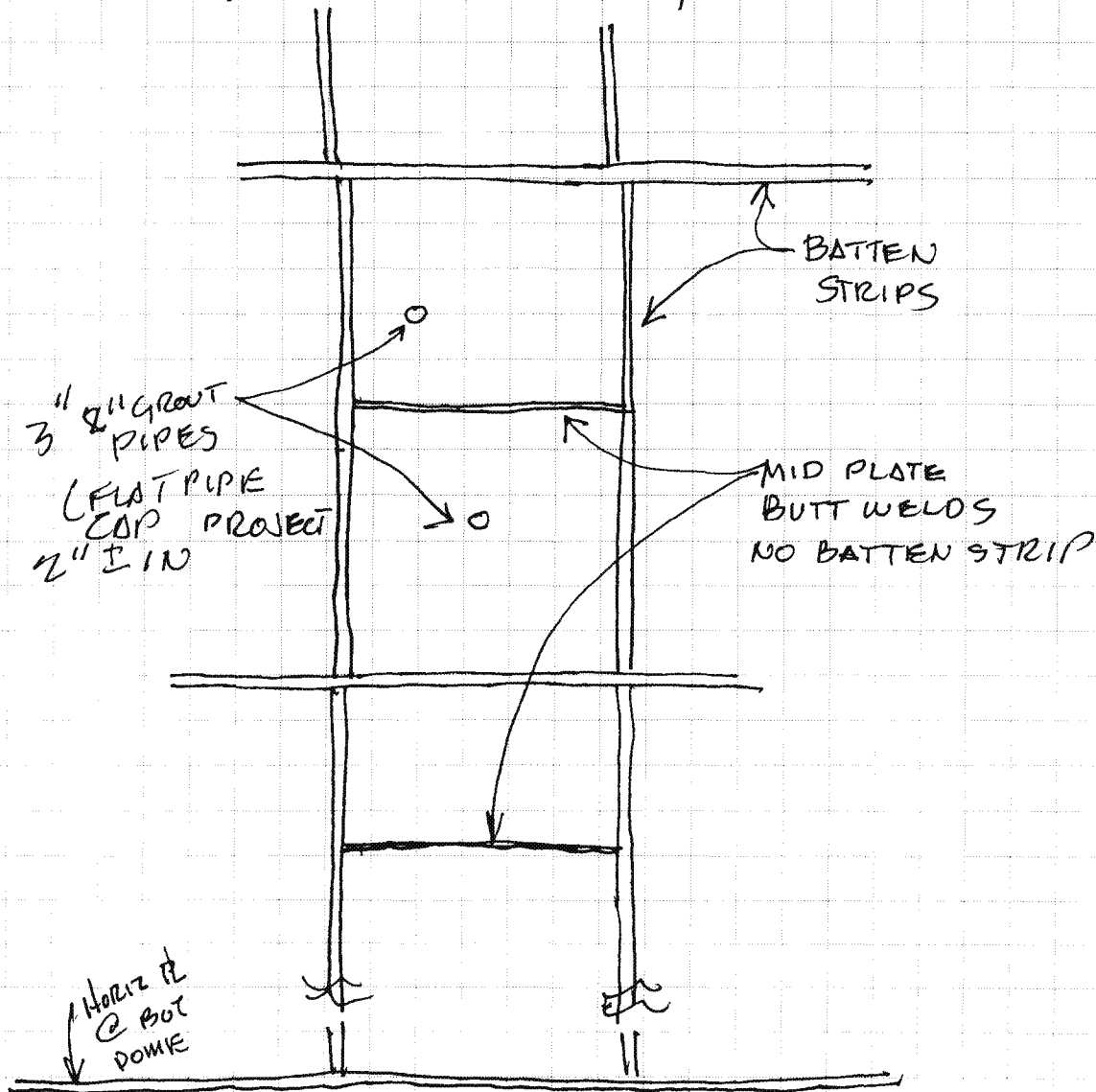
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NOTES & MISC ON TANK CONSTR - PROBLEMS, ETC

EXISTING COATING: GREEN COLOR, LATE 1960'S
NRL SYSTEM PER J. GAMMON. NO YELLOW
PRIMER NOTED. GENERALLY WELL ADHERED.

MEASURED THICKNESS - .11 → .12 MILS

TOOK SAMPLES FOR LAB TESTING



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3335 ARCTIC BOULEVARD
ANCHORAGE, ALASKA 99503
TEL (907) 563-3835 FAX (907) 563-3817

JOB

RH TANK 19

SHEET NO.

②

OF

CALCULATED BY

SSB

DATE

5/4/98

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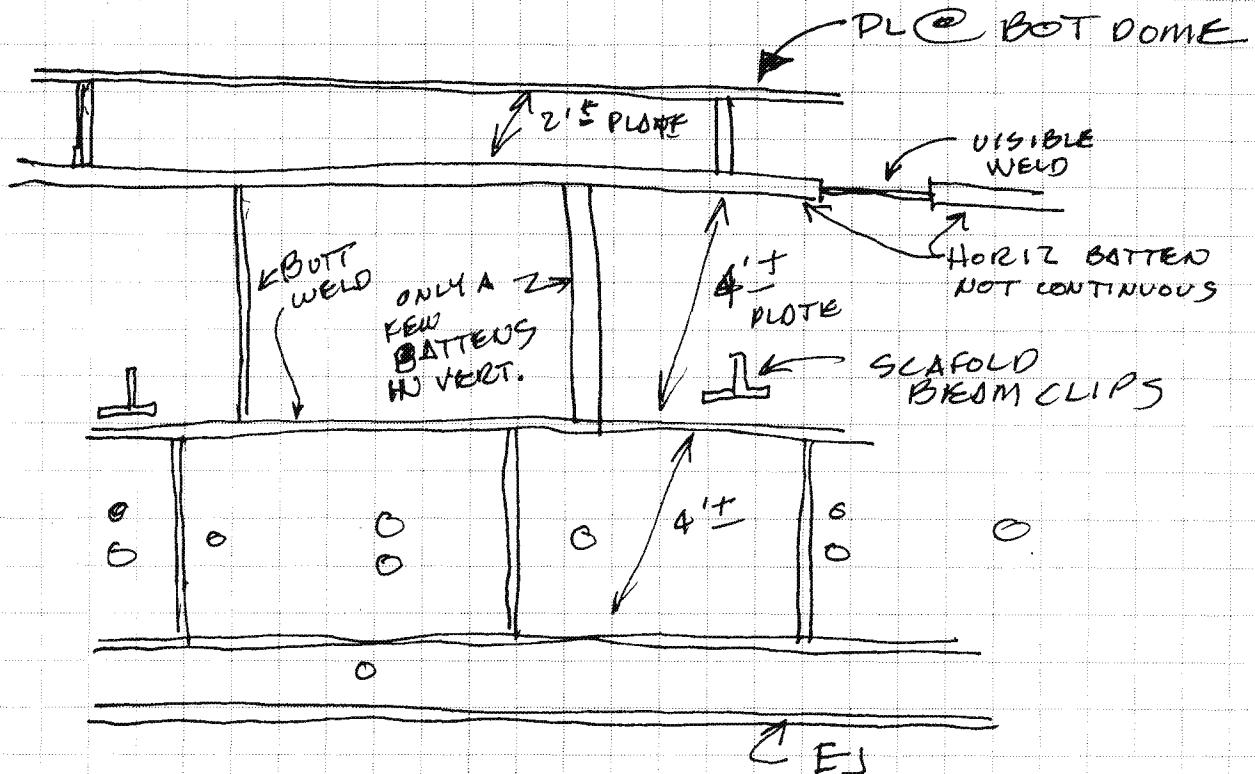
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20.1 O₂
20.4 O₂
20.4 O₂

0% LEL
0% LEL
0% LEL

SJD GAS TESTS



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3335 ARCTIC BOULEVARD
ANCHORAGE, ALASKA 99503
TEL (907) 563-3835 FAX (907) 563-3817

JOB

RH TANK 19

SHEET NO.

3

OF

CALCULATED BY

SSB

DATE

5/4/98

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DATE

SCALE

TELLTALE SYSTEM IN TANK 19 -
SOME STILL PRESENT IN TANK. PER
JIM G, WAS REPLACED SYSTEM IN 60'S

SOME JUST JUMP OVER EXP JOINT -
OTHERS GO UP TO TOP OF TANK
AS STATIC GROUND ~ MAYBE 8
TELLTALE TOTAL

COATING

BOT. DOME (11 MIL THICK
DOME PLATE .237

BOTTOM PLATE HAS YELLOW PRIMER

FLAT FLOOR ~ 11 MILS THICK

- 1) FLAT FLOOR - .48" BY UT (1/2" BY DRS?)
- 2) " " " " "

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ENGINEERING, INC.

3335 ARCTIC BOULEVARD
ANCHORAGE, ALASKA 99503
TEL (907) 563-3835 FAX (907) 563-3817

JOB

RH TANK 19

SHEET NO.

(4)

OF

CALCULATED BY

SSB

DATE

5/4/98

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SCALE

MTG: 8:00 @ JIM'S OFFICE

ACCESS PHONE NO. 471-0830

.245 SHELL UT (BARK SPOT
BACKER STRIP - .182

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TEL (907) 563-3835 FAX (907) 563-3817

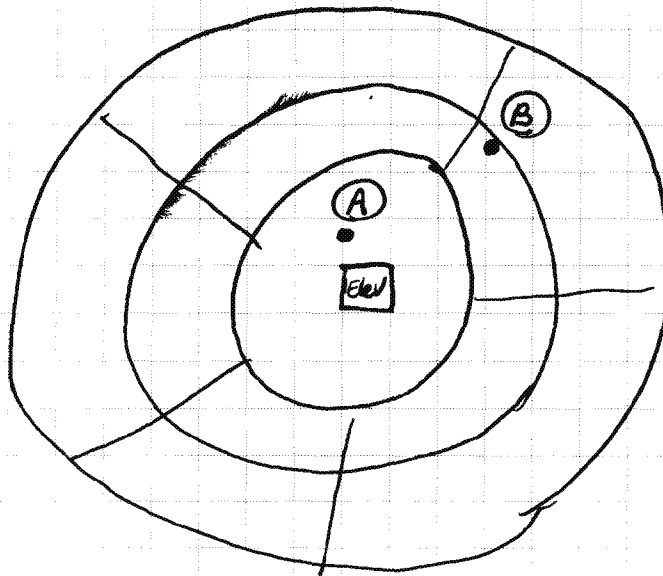
JOB RH TANK 19
SHEET NO. _____ OF _____
CALCULATED BY _____ DATE 4
CHECKED BY FIELD NOTES DATE 5/1/98
SCALE _____

FIELD SAMPLES - COATINGS

1. SAMPLE FROM TANK WALL NEAR UPPER ENTRY

2. " " TANK FLOOR (A)

3. " " TANK FLOOR (B) AT SPRING
COURSE



FLOOR

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JOB RH TANK 19
SHEET NO. FIELD TRIP OF
CALCULATED BY DATE
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7'x3'5" DOOR #1

↑ OUT

3'10" x 6'6" DOOR #2

↓ IN

" " DOOR #3

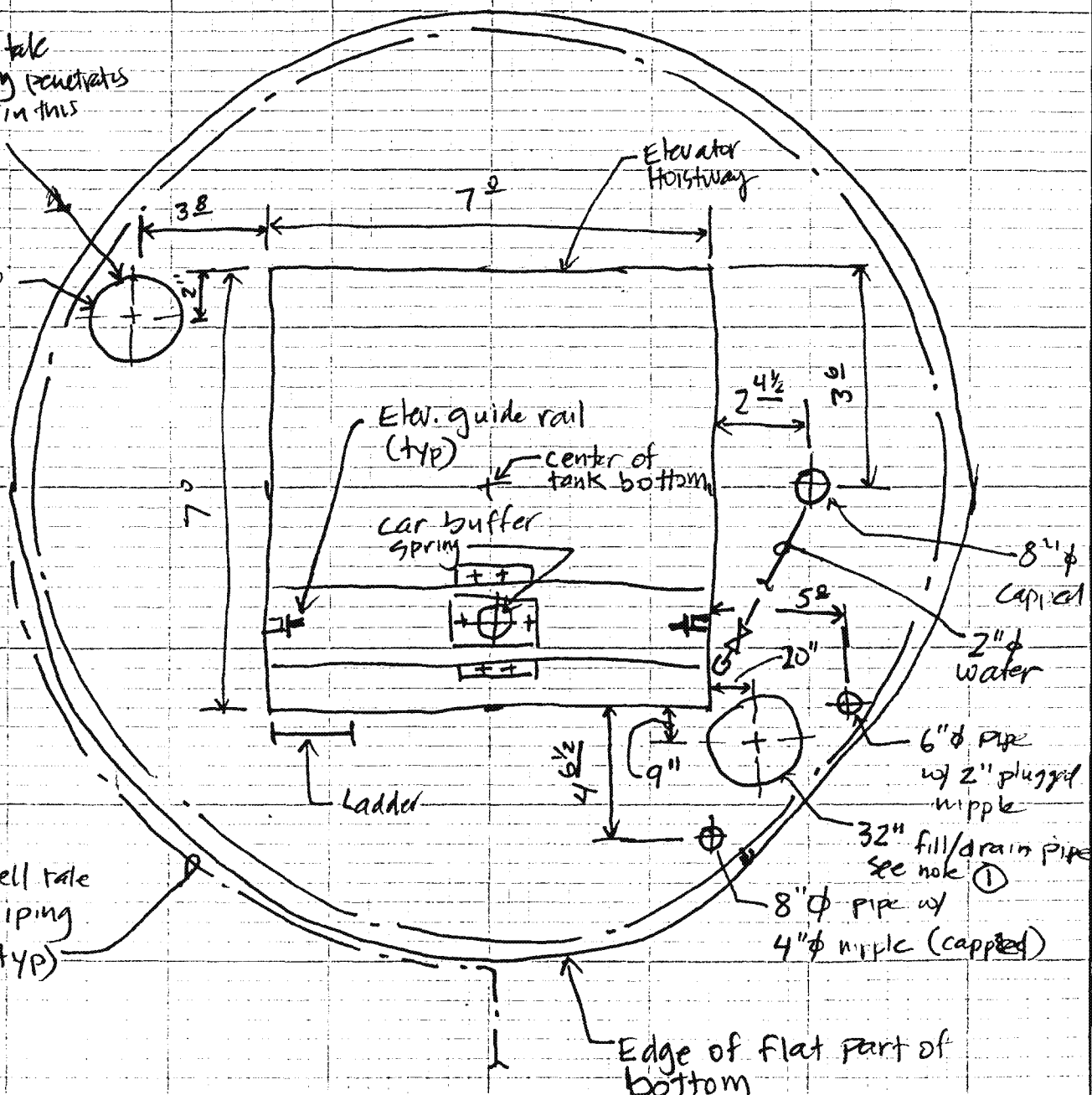
Notes

- ① Fill/draw line ends in gooseneck approx 10-12 ft above tank bottom

12 - 3/4" PIPES
(or 12 PIPES?)

Tell tale
Piping penetrates
floor in this
area

16" ϕ



tell tale
Piping
(typ)



THERMAL ENGINEERING
CORPORATION

SUBJECT

Tank 19, Red Hill

Tank Bottom - Flat portion

DATE 5/4/98

BY DHN

SHEET 1 OF 1

JOB NO 98047

ELECTRICAL NOTES

ELECTRICAL WORK

1.0 General Overview

The electrical work for the Tank No. 19 repair work will involve two categories of work. The first category includes temporary electrical work required to support Tank No. 19 repair activities. The second category includes permanent electrical work associated with an automatic tank gauging/inventory system and a high level alarm system.

2.0 Temporary Electrical Work

2.1 Construction Trailers

Up to three construction trailers are anticipated, each with a 60A, 120/240V, 1 phase, 3-wire service. The trailers will be placed outside ADIT 5 or ADIT 6. To provide power to the trailers, the following temporary facilities are recommended:

- a. A 70A, 3 pole, 480V molded case circuit breaker in existing Panel P in Substation R20 across from the Gauger's Station in the Lower Access Tunnel.
- b. A 3/C#1/0 interlocked armored cable from Panel P routed via Elevator 72 service shaft to the entrance to ADIT 5 or via Elevator 73 service shaft to the entrance to ADIT 6.
- c. A meter socket, watthour meter, three 40A, 3 pole, 480V enclosed molded case circuit breakers and three 15 kVA 480-120/240V dry type transformers should be located outside ADIT 5 or ADIT 6.
- d. A 3/C#2 Type SO cable routed from a 15 kVA transformer to 60A, 2P, 240V enclosed molded case circuit breaker at each trailer, with circuit breaker enclosure connected to two 3/4" (19 mm) dia x 8'-0" (2438 mm) copper clad steel ground rods.

2.2 Upper Tunnel

a. Welding Machines

The following is recommended to accommodate two 300A arc welders:

- 1) 35 GRC, 3-1/C#2 from existing Panel P1, Circuit 8 (100A circuit breaker) to a new junction box.
- 2) Two 60A, 480V enclosed molded case circuit breakers and two 60A, 480V welding receptacles.

All construction must conform to Class 1, Division 2.

b. Lighting

It is recommended that general lighting be provided by installing a total of twenty-one 400 watt metal halide floodlights (NEMA 7 x 6 beamsread). Seven luminaires should be mounted on the center tower at the 30m, 45m and 60m levels. Each cluster of seven luminaires can be powered from an existing 20A, 1P, 277V molded case circuit breaker in Panel P1.

c. General Power

It is recommended that power for small tools and task lighting can be obtained from existing Panel P2 which is located in the Tank No. 19 Upper Tunnel Gallery. The panel is supplied from a 9 kVA 480-208Y/120V dry type transformer. Panel P2 has the following existing branch circuits.

- 1) Three 20A, 1P molded case circuit breakers, each dedicated to a 20A, 1 phase, Class 1, Division 2 receptacle mounted below Panel P2.
- 2) Three spare 20A, 1P molded case circuits breakers.
- 3) Two spare 20A, 3P molded case circuit breakers.

2.3 Lower Tunnel

a. Welding Machines

Provisions for one 300A arc welder is recommended. The following is recommended to accommodate the arc welder:

- 1) Temporary equipment rack in the Tank 19 Lower Access Tunnel Gallery.
- 2) New Class 1, Division 2, 480V, 3 phase, 225A main lug panelboard with one 60A, 3 pole, 480V branch circuit breaker, one 20A, 3 pole, 480V branch circuit breaker, and six 20A, 1 pole, 277V branch circuit breakers.
- 3) 3/C#4/0 flexible cord approved for extra hard usage and a 200A receptacle to connect new panelboard to existing 200A Class 1, Division 1 receptacle.
- 4) 60A, 3P, Class 1, Division 2 receptacle connected to 60A, 3 pole, 480V circuit breaker in new panelboard. Receptacle can be mounted below new panelboard.

b. Lighting

It is recommended that general lighting be provided by installing seven 400 watt metal halide floodlights (NEMA 7 x 6 beamsread) on the center tower at the 15m level. The seven luminaires can be powered from one 20A, 2P, 480V molded case circuit breaker in the new 480V panelboard.

c. General Power

The following provisions are recommended to provide power for small tools and task lighting:

- 1) A 9 kVA 480-208Y/120V dry type non-ventilated transformer with primary connected to the 20A, 3P circuit breaker in the new 480V, 3 phase panelboard.
- 2) A Class 1, Division 2, 208Y/120V panelboard with 40A, 3P main circuit breaker, two 20A, 3P branch circuit breakers, and six 20A, 1P branch circuit breakers.
- 3) Three 20A, 1 phase, Class 1, Division 2 receptacles mounted below 208Y/120V panelboard.

2.4 Tank No. 19 Temporary Supply Fan

It is recommended that power for a 20 Hp temporary supply fan located at grade level above Tank No. 19 be provided with a 40 kW portable generator, a NEMA Type 3R combination starter and temporary wiring.

3.0 Permanent Electrical Work

3.1 Power for Cathodic Protection System (Additive Bid Item)

Power for the cathodic protection rectifier will be provided from an existing 20A, 2P, 480V branch circuit breaker in Panel P2.

3.2 ATG/Inventory and High Level Alarm System

Conduit and wiring will be provided.

LABORATORY TEST RESULTS



CT&E Environmental Services Inc.

Laboratory Division

Laboratory Analysis Report

May 13, 1998

Collin Dey
Enterprise Engineering Inc.
335 Arctic Blvd Suite 100
Anchorage, AK 99503-4570

Client Name	Enterprise Engineering Inc.
Project ID	Red Hill Tk 19: 98-2325.15 [982157]
Printed	May 13, 1998

Enclosed are the analytical results associated with the above project.

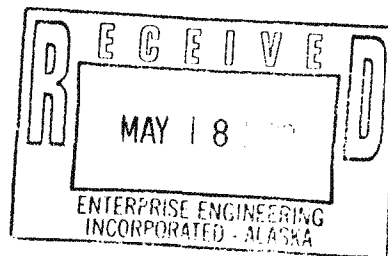
As required by the state of Alaska and the USEPA, a formal Quality Assurance/Quality Control Program is maintained by CT&E. A copy of our Quality Control Manual that outlines this program is available at your request.

Except as specifically noted, all statements and data in this report are in conformance to the provisions set forth in our Quality Assurance Program Plan.

If you have any questions regarding this report or if we can be of any other assistance, please call your CT&E Project Manager at (907) 562-2343.

The following descriptors may be found on your report which will serve to further qualify the data.

- U - Indicates the compound was analyzed for but not detected.
- J - Indicates an estimated value that falls below PQL, but is greater than the MDL.
- B - Indicates the analyte is found in the blank associated with the sample.
- * - The analyte has exceeded allowable limits.
- GT - Greater Than
- D - Secondary Dilution
- LT - Less Than
- ! - Surrogate out of range



200 W. Potter Drive, Anchorage, AK 99518-1605 — Tel: (907) 562-2343 Fax: (907) 561-5301
3180 Peger Road, Fairbanks, AK 99709-5471 — Tel: (907) 474-8656 Fax: (907) 474-9685



CT&E Ref.# 982157001
Client Name Enterprise Engineering Inc.
Project Name/# Red Hill Tk 19: 98-2325.15
Client Sample ID Tank Wall
Matrix Other Solids (Wet Weight)
Ordered By
I VSID

Client PO#
Printed Date/Time 05/13/98 14:53
Collected Date/Time 05/05/98 00:00
Received Date/Time 05/08/98 14:30
Technical Director: Stephen C. Ede

Released By 

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Results by Graphite Furnace								
Chromium	20900	14100	mg/Kg	SW846-7191		05/12/98	05/13/98	KGF
Results by Graphite Furnace								
Lead	49.7	14.1	mg/Kg	SW846-7421		05/12/98	05/13/98	KGF



CT&E Ref.# 982157002
Client Name Enterprise Engineering Inc.
Project Name/# Red Hill Tk 19: 98-2325.15
Client Sample ID Tank Spring Course
Matrix Other Solids (Wet Weight)
Ordered By
F/SID

Client PO#
Printed Date/Time 05/13/98 14:53
Collected Date/Time 05/05/98 00:00
Received Date/Time 05/08/98 14:30
Technical Director: Stephen C. Ede

Released By

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Metals by Graphite Furnace								
Chromium	4920	454	mg/Kg	SW846-7191		05/12/98	05/13/98	KGF
Metals by Graphite Furnace								
Lead	140	18.1	mg/Kg	SW846-7421		05/12/98	05/13/98	KGF



CT&E Ref.# 982157003
Client Name Enterprise Engineering Inc.
Project Name/# Red Hill Tk 19: 98-2325.15
Client Sample ID Tank Bottom
Matrix Other Solids (Wet Weight)
Ordered By
PWSID

Client PO#
Printed Date/Time 05/13/98 14:53
Collected Date/Time 05/05/98 00:00
Received Date/Time 05/08/98 14:30
Technical Director: Stephen C. Ede

Released By

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Metals by Graphite Furnace								
Chromium	7150	999	mg/Kg	SW846-7191		05/12/98	05/13/98	KGf
Metals by Graphite Furnace								
Lead	102	25.0	mg/Kg	SW846-7421		05/12/98	05/13/98	KGf

982157

PO#:

CHAIN OF CUSTODY

Reports to:

Invoice to:

L

Page 1 of 1

ENTERPRISE ENGINEERING INC.

ENTERPRISE ENGAGEMENT

CT

....., Inc.

3335 ARCTIC BLVD SUITE 700

ANCH 17 99503

Phone: 863-3235 Fax: 563-3817

QUOTE # 3634

Contact person for questions concerning these samples:

CON. DE

Phone: 563-3835

Fax: 563-3817

Special Instructions: RUSH TURNAROUND AS QUOTED

[illegible]

Sample Receipt:		Relinquished By:		Relinquished By:		Relinquished By:	
Number of Containers	Signature: <i>[Signature]</i>	Time: 2:30	Signature:	Time:	Signature:	Time:	Signature:
COC Seals/Intact Y/N/NA	Printed Name: <i>CAROL L. DEY</i>	Date: 5/8/98	Printed Name:	Date:	Printed Name:	Date:	Printed Name:
Temperature	Received By:		Received By:		Received at Laboratory By:		
Turnaround Required	Signature:	Time:	Signature:	Time:	Signature: <i>[Signature]</i>	Time: 11:30	
Data Deliverables Required Level I Level II Level III	Printed Name:	Date:	Printed Name:	Date:	Printed Name: <i>HALL</i>	Date: 5/8/98	