

NOTICE!

**ALL DRAWINGS
ARE LOCATED
AT THE END OF
THE DOCUMENT**

**INITIAL CERTIFICATION
RCRA HAZARDOUS WASTE TANK ASSESSMENT**

**ACCELERATED SLUDGE REMOVAL PROJECT
HAZARDOUS WASTE STORAGE TANKS**

Tent No./Tank No./RCRA ID No./Serial No.

3/D-6/25.006/C93-03053
3/D-7/25.007/C93-02899
3/D-8/25.008/C93-02881
3/D-9/25.009/C93-02967
3/D-10/25.010/C93-02939
3/D-11/25.011/C93-03333

EG&G Subcontract #MTS 350370PA3

January 13, 1994

Prepared for **EG&G Rocky Flats, Inc.**
Environmental Restoration Management
Solar Ponds Project Office
Building 80
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Golden, CO 80402-0464

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ERM-Rocky Mountain Project No R31206 0

ADMIN RECORD

TABLE OF CONTENTS

	<u>Page</u>
<i>INITIAL TANK SYSTEM CERTIFICATION</i>	ii
<i>1.0 INTRODUCTION</i>	1
<i>2.0 CERTIFICATION SCOPE</i>	2
<i>3.0 METHODOLOGY</i>	3
<i>4.0 OBSERVATIONS</i>	3
<i>4.1 Vendor Site Visit</i>	3
<i>4.2 Information Review</i>	4
<i>4.3 Shipping/Delivery/Installation Oversight</i>	4
<i>5.0 QUALIFICATIONS BASED ON INDEPENDENT CALCULATIONS</i>	5
<i>6.0 REFERENCES</i>	7

LIST OF APPENDICES

APPENDIX A	Vendor Site Visit Checklist
APPENDIX B	Information Review Checklist
APPENDIX C	Shipping/Delivery/Installation Oversight Checklists
APPENDIX D	Verification of Completion of Hydrostatic Testing Following Installation

INITIAL TANK SYSTEM CERTIFICATION

**RCRA HAZARDOUS WASTE TANK ASSESSMENT
ROCKY FLATS PLANT
MTS 350370PA3
January 13, 1994**

This document is provided for the RCRA hazardous waste tank system described below, as requested in the Statement of Work for the Independent RCRA Certification of the Accelerated Sludge Removal Project, Hazardous Waste Storage Tank System, Revision No 1 Project #MTS 350370PA3

This document is a certification of the tank system by an independent, qualified, registered Colorado professional engineer with ERM-Rocky Mountain, Inc , and has been prepared in accordance with the applicable Colorado Hazardous Waste Regulations, 6 CCR 1007-3 Section 265 192, "Design and Installation of New Tank Systems or Components "

This is an initial tank certification which is restricted to the tank and does not include ancillary equipment. Minor discrepancies or operating limitations are listed below as qualifications to this certification.

TANK SYSTEM

<u>Tent No.</u>	<u>Tank No.</u>	<u>RCRA Id. No.</u>	<u>Serial No.</u>	<u>Qualifications</u>
3	D-6	25 006	C93-03053	Manufacture date not marked on tank. Limit specific gravity (SG) of waste to 1.88, or fill only to 7 ft for SG up to 1.9.
3	D-7	25 007	C93-02899	Limit specific gravity (SG) to 1.76, or fill only to 7 ft for SG up to 1.9.
3	D-8	25 008	C93-02881	Limit specific gravity (SG) to 1.70, or fill only to 7 ft for SG up to 1.9.
3	D-9	25 009	C93-02967	Limit specific gravity (SG) to 1.80, or fill only to 7 ft for SG up to 1.9.

*Initial Tank Certification - INICERT1 RPT
January 13, 1994*

TANK SYSTEM (Continued)

<u>Tent No.</u>	<u>Tank No.</u>	<u>RCRA Id. No.</u>	<u>Serial No.</u>	<u>Qualifications</u>
3	D-10	25 010	C93-02939	Wrong capacity marked on tank Confined space entry not marked Limit specific gravity (SG) to 1.89, or fill only to 7 ft for SG up to 1.9
3	D-11	25 011	C93-03333	Confined space entry not marked where visible Manufacture date not marked on tank

CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

I hereby certify and attest, that the tank system has been examined in accordance with the regulations cited above and is assessed to be of sufficient structural integrity and is acceptable for the storing and treating of hazardous waste. This certification is based on the condition of the tank system at the time of investigation as described in the attached checklist and Initial Tank Certification Report.

Michael M Keller, PE
 Colorado Professional Engineer Signature

Jan 13, 1994
 Date



1.0 INTRODUCTION

The Rocky Flats Accelerated Sludge Removal Project (ASRP) has the objective to expeditiously remove approximately 900,000 gallons of waste materials from the 788 Clarifier and the 207 B South and C Ponds. These waste materials will be transferred via tank trucks to approximately 72 new polyethylene tanks located inside Tents 3, 4 and 6 on the 750 Pad.

DOE is requesting that the Colorado Department of Health (CDH) grant interim status to the polyethylene tanks that will be used for storage on the 750 Pad. DOE will later request a modification of the Rocky Flats Plant Part B permit to include these tanks. The tanks are currently subject to the requirements of Part 265, Subpart J of the Colorado Hazardous Waste Regulations, 6 CCR 1007-3. Section 265.192 requires that owners or operators of new tank systems obtain and submit to CDH a written assessment, reviewed and certified by an independent, qualified registered professional engineer, in accordance with Section 100.12(d) attesting that the tank system has sufficient structural integrity and is acceptable for the storing and treating of hazardous waste.

This document provides ERM-Rocky Mountain's (ERM's) assessment and initial certification of a subset of the polyethylene tanks (see list of tanks on certification sheet). Section 1.0 provides background information on the ASRP, as well as an explanation of the driving forces behind the requirement for tank assessments. Section 2.0 details the scope of this certification. Section 3.0 summarizes the methodology that ERM used to perform the tank assessments. Section 4.0 presents observations during assessment activities, and provides discussions of qualifications listed on the certification sheet. Section 5.0 includes a discussion of ERM's independent calculations and the resulting qualifications on the certification of each tank.

2.0 CERTIFICATION SCOPE

ERM completed this initial certification of structural integrity for each tank vessel, to allow EG&G to place each individual tank in service in a timely manner. A qualified, Colorado registered professional engineer with ERM has reviewed and certified the assessment in accordance with Section 100 12(d) of 6 CCR 1007-3, attesting that the tank system has sufficient structural integrity and is acceptable for the storing and treating of hazardous waste as required under Section 265 192 of 6 CCR 1007-3

ERM assessed the following items prior to preparing the initial certification

- Design standards used to construct the tanks and ancillary equipment (265 192(a)(1))
- Hazardous characteristics of the wastes to be handled (265 192(a)(2))
- Design considerations used to ensure that tank systems will withstand the effects of frost heave (265 192(a)(5)(iii))
- Design considerations used to ensure that tank foundations will maintain the load of a full tank (265 192(a)(5)(i))
- Handling procedures used to prevent tank damage during installation (265 192(b))
- Tank system integrity after installation through an inspection for weld breaks, punctures, scrapes of protective coatings, cracks, corrosion and other structural damage or inadequate construction or installation (265 192(b)(1-6))
- Tightness of tanks and ancillary equipment prior to use (265 192(d))

ERM will later prepare a final certification for all the tank systems, and provide a final report of all tank assessments, after assessing the following items

- Design considerations used to ensure that tank systems will be anchored or spaced to prevent dislodgement where the tank system is placed in a seismic fault zone (265 192(a)(5)(ii))

- Measures used to protect the ancillary equipment from physical damage and excessive stress due to settlement, vibration, expansion or contraction (265 192(e))

3 0 *METHODOLOGY*

In accordance with the "RCRA Tank Assessment Plan" (ERM 1993), ERM used a phased approach in performing the assessments on the ASRP polyethylene tanks. ERM first conducted a site visit to the Poly Cal Plastic facility in French Camp, California to verify tank manufacturing, testing and packaging procedures, and to obtain additional tank data. Concurrently, ERM began reviewing existing information, including the ASRP design criteria and the available waste characterization data. As EG&G received the tanks at the Rocky Flats Plant, ERM observed EG&G's receipt inspections to check for damage to the tanks and to ensure that the proper shipping requirements were met. During the construction phase of the ASRP, ERM was present to observe the installation and testing of the tanks.

4 0 *OBSERVATIONS*

ERM used checklists to assess compliance with design, material testing, delivery, and documentation requirements. The completed checklists are included in Appendices A, B and C.

4 1 *Vendor Site Visit*

Two engineers from ERM visited the Poly Cal Plastics manufacturing facility in French Camp, California on December 2 and 3, 1993. Appendix A contains the checklist completed for the site visit. Summary comments are provided below.

The vendor is a well-established manufacturer of polyethylene tanks. They have a permanent manufacturing facility for production and testing of the large diameter tanks specified for this project. Quality control procedures are in place to perform and

document the testing required by the ASTM standard for each tank produced. Shipping and handling procedures have been developed for off-loading and placement to prevent tank damage. As-built drawings are provided with each tank to verify compliance with the ASTM standard. Permanent tank markings identify the manufacturer, date of manufacture, capacity, maximum specific gravity allowed for tank design, and an individual serial number. All quality control documentation will be provided to Rocky Flats Plant for a permanent record.

4.2 Information Review

ERM performed independent calculations and also checked the existing engineering data and calculations for accuracy and completeness. The results of the information review are shown on the checklist presented in Appendix B. A discussion of ERM's independent calculations is provided in Section 5.0.

4.3 Shipping/Delivery/Installation Oversight

ERM observed EG&G's tank receiving inspections and reviewed EG&G's quality inspection documentation. During installation of the tanks ERM, focused on tank integrity and installation requirements. Appendix C contains the checklists completed for this oversight. A summary table of hydrostatic testing results following tank installation is provided in Appendix D.

Some of the qualifications listed on the certification sheet are related to tank markings. The missing markings do not affect the structural integrity of the tanks, although the markings should be corrected as soon as possible.

5.0 *QUALIFICATIONS BASED ON INDEPENDENT CALCULATIONS*

This section provides a discussion of ERM's independent calculations related to tank wall thickness requirements. The resulting limitations on tank fill height or specific gravity of the waste are listed as qualifications in the certification sheet.

Calculation of Hydrostatic Design Stress

ERM's independent calculation of hydrostatic design stress (SD) resulted in a value of 593 psi (hydrostatic design basis of 1250 psi multiplied by service factor of 0.475 as shown in Appendix B). This SD value is less than the 630 psi value calculated by Paxon Polymer Company (1992) using a service factor of 0.5. A service factor of 0.475 is required for wall thicknesses greater than 0.375 inches (ASTM 1998-91). Therefore, ERM used an SD value of 593 psi for independent calculations of required wall thicknesses. The revised service factor results in slight increases in the design thicknesses.

Effect of Storing Organic Compounds

Section 6.6.3 Corrosion Report contains a memo from R. G. Posgay and H. H. Butler to J. H. Templeton, dated August 18, 1993, entitled "Corrosion Evaluation of Polyethylene Containers for Storage of Pond 'C' Water and Sludge". The memo contains a discussion of chemicals which may be absorbed into the polyethylene. The author estimated that 9.94 pounds of TOC may exist at the waterline in any given tank. Since this weight is greater than 7% of the weight (36.7 pounds) of the polyethylene in a six-inch band around the tank, the author states that the material may absorb TOC and lose 10% of its tensile strength.

ERM reviewed a "General Chemical Resistance Chart for High Density Crosslink Polyethylene Tanks" for Marlex CL-100 and CL-50. Table III of this chart states that the material is generally not recommended for use above 100 degrees F with organic

chemicals ERM also reviewed literature from the Paxon Polymer Company chemical resistance A table on solvents listed a 7% permeation loss after 30 days of storage of carbon tetrachloride Therefore, ERM concluded that a reduction in design stress may be warranted for the waterline This reduction would result in an increase of 11% in the required wall thickness However, for all the tanks certified in this document, the wall thickness of the top half of the tank meets or exceeds this requirement It is assumed that the waterline will be maintained within the top half of tanks during normal storage

Calculation of Tank Wall Thicknesses

Using an assumed specific gravity of 1.9 (maximum allowed in tank), an SD value of 593 psi, and updated outside diameters, ERM calculated required wall thicknesses for the primary and secondary tanks at various sidewall heights (see Appendix B) Actual wall thicknesses provided in the quality assurance documentation provided by the manufacturer were compared to these requirements (see Appendix C) Five tanks (listed below) showed one or more measurement points within the design tolerance ($\pm 20\%$ of design thickness), although thinner than the design thickness Because of the wide spacing of measurement points (every two feet in height and at four radial points around the circumference), it is possible that even one non-compliance point may result in more than 10% or 10 square ft of the tank wall area as too thin

As a result of the above determinations, the specific gravity of the materials placed in the tanks must be limited as listed below Alternatively, a material with a specific gravity of 1.9 may be placed in the tank to a maximum height of 7.0 ft Additional wall thickness measurements in the areas of concern may be used to further refine or eliminate these limitations (eg, if non-compliance areas are less than 10% of the total area or individual areas are less than 10 square ft)

<u>Tank</u>	<u>Serial No</u>	<u>Maximum SG (Fill to 10 ft)</u>
D-6	C93-03053	1.88
D-7	C93-02899	1.76
D-8	C93-02881	1.70
D-9	C93-02967	1.80
D-10	C93-02939	1.89

60 REFERENCES

ASTM 1991 Standard Specification for Polyethylene Upright Storage Tanks ASTM Designation 1998-91 American Society for Testing and Materials, Philadelphia, Pa

ERM-Rocky Mountain, Inc December 15, 1993 RCRA Tank Assessment Plan, Independent RCRA Certification of Accelerated Sludge Removal Project, Hazardous Waste Storage Tank System, Rocky Flats Project, Solar Ponds Project Prepared for EG&G Rocky Flats, Inc , Environmental Restoration Management, Solar Ponds Project Office, Building 80, P O Box 464, Golden, CO 80402-0464 EG&G Subcontract #MTS 350370PA3

Paxon Polymer Company 1992 Letter, Mr Joe Joshi, to Mr Guy Carrow, Poly Processing Company, Monroe, LA, dated September 30, 1992

APPENDIX A
VENDOR SITE VISIT CHECKLIST

VENDOR SITE VISIT CHECKLIST

ASRP RCRA TANK ASSESSMENT
ROCKY FLATS PLANT
MTS 350370PA3

Inspector R Hea / M Keller
Date 12/2/93
Location PolyCal Plastics, French Camp, CA

	Yes	No	N/A
1 Has the tank manufacturer demonstrated experience in the manufacturing of cross-linkable polyethylene tanks of similar size and service?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2 Does the manufacturer have the capability to correlate all production and process parameters and all quality control information to a unique serial number stamped on the tank?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3 Does the manufacturer supply handling procedures to the user for off-loading and placement to prevent tank damage?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4 Are manufacturer's QC travelers supplied with each polyethylene tank (Tank information/test data for both primary and secondary tanks)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5 Is a "Certificate of Compliance" being submitted with each tank on manufacturer's letterhead stating the following?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
a Purchase Order number	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b Test performed and to which Standard or Procedure	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c Test results	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6 Are the ASRP tanks molded from high density cross-linkable polyethylene (HDXLPE)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7 Are the ASRP tanks manufactured from virgin polyethylene material?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8 Are the tanks manufactured by the rotational molding process outlined in ASTM D 1998-91?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9 Do tanks contain an ultraviolet stabilizer?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9a If so, is the stabilizer present at a level adequate to give protection for the intended service life of the tank?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9b Is the stabilizer compounded in the polyethylene?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10 Are pigments added to the polyethylene?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10a If so, are they compatible with the polyethylene, and do they not exceed 0.5% dry blended and 2% compounded in, or total weight?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11 Is the top head integrally molded with the cylinder shell?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11a Is the minimum thickness of the top head equal to the thickness at the top of the straight wall?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	Yes	No	N/A
12 Is the thickness for a full-supported flat-bottom head a minimum of 0.187 in ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12a Is the radius of the bottom knuckle of a flat-bottom tank a minimum of 1.5 inches?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12b Is the minimum thickness of the radius greater than or equal to the maximum thickness of the cylinder wall?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13 Is the top edge of the secondary tanks reinforced by design to maintain its shape after installation?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14 Are all dimensions measured externally with an empty tank in the vertical position?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15 Is the manufacturer checking and documenting tolerances?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15a Are these tolerances in accordance with ASTM D 1998-91?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16 Are tank capacities based on total tank volume?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17 Are the tanks visually inspected to ensure that the tank walls are free of visual defects such as foreign inclusions, air bubbles, pinholes, pimples, craters, cracks and delamination?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18 Are the tanks permanently marked to identify the following?			
a manufacturer	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b date manufactured (month and year)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c capacity	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d maximum specific gravity of tank design (1.9)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e serial number	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f Type I	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19 Will confined space entry warning signs as prescribed by OSHA Standard 29 CFR 1910.106 be affixed to the tanks?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20 Are chemical-resistance charts available for the polyethylene material used in the tank fabrication?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21 Will the manufacturer supply wall thickness readings along the straight wall and bottom of both the primary and secondary tanks?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22 Will these readings be recorded on the shop traveler for submittal to the user?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23 Do the shop drawings provided by the tank manufacturer have the necessary information to verify compliance with ASTM D 1998-91?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24 Are test specimens taken from the man-way, fittings cut-out, or other representative areas?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25 Does the manufacturer have a program to ensure calibration of all equipment prior to commencing fabrication and testing?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
26 Is hydrostatic-hoop-stress data available for the resin used in the tanks?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
27 Is stress-cracking resistance data available?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	Yes	No	N/A
28 Is equipment available to perform impact tests in accordance with ASTM D 1998-91?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
28a Are results from the low temperature impact test of Section 11 3 of ASTM D 1998-91 documented?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
29 Is equipment available to perform Gel Tests in accordance with ASTM D 1998-91?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
At Poly Processing in Louisiana			
29a Are results from the Gel Test of Section 11 4 of ASTM D 1998-91 documented?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
30 Is equipment available to perform hydrostatic tests on each tank?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
30a Are the hydrostatic tests performed for a minimum of 30 minutes per tank and are the tanks checked for leakage?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
30b Are results from the hydrostatic test documented?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
31 Are holes cut to be free of sharp corners?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
31a Are holes cut to have a minimum clearance to ensure best fit?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
32 Are the size, location and specification for man-ways and fittings as agreed upon by RFP?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
33 Is one fill assembly provided per primary tank and located in the man-way?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
34 Are the fill assemblies being installed at the manufacturer's site?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
35 Do vents comply with OSHA 1910 106 (or other accepted standard) for normal venting for atmospheric tanks?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
35a If not, are vents at least as large as the fitting or withdrawal connection, whichever is larger, but not less than 10 inch nominal inside diameter?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
36 Are fittings of appropriate strength to meet manufacturer and RFP specifications?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
37 Does manufacturer provide tanks with a means for overfill protection?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Comments ① These observations are based on the inspection and review of production and testing processes, along with the initial production tanks

APPENDIX B
INFORMATION REVIEW CHECKLIST

INFORMATION REVIEW CHECKLIST

ASRP RCRA TANK ASSESSMENT
ROCKY FLATS PLANT
MTS 350370PA3

Reviewer(s) Pamela J Mitchell, PE, Mike Keller, PE
Date(s) 1/13/94

TANK DESIGN

	Yes	No	N/A
1 Is the design height for the primary tank less than or equal to 12 feet?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2 Is the design diameter for the secondary tank less than or equal to 14 feet?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3 Are the secondary containment tanks designed to contain at least 100% capacity of the primary tank?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4 Is the design volume for each of the primary tanks approximately 11,150 gallons?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5 Is the design volume for each of the secondary tanks approximately 12,025 gallons?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6 Do the polyethylene's stress-cracking resistance tests indicate a 50% failure point at a minimum of 500 hours in accordance with Test Method D 1693, Condition A, full-strength stress-cracking agent?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7 Is the density of the tank polyethylene material within the acceptable design range?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8 Is the ultimate tensile strength of the tank polyethylene material within the acceptable design range?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9 Is the elongation at break of the tank polyethylene material within the acceptable design range?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10 Is the vicat softening temperature of the tank polyethylene material within the acceptable design range?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11 Is the brittleness temperature of the tank polyethylene material within the acceptable design range?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12 Is the flexural modulus of the tank polyethylene material within the acceptable design range?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	Yes	No	N/A
13 Was the formula in Section 6 1 of ASTM D 1998-91 used correctly to calculate the minimum required wall thickness of the cylindrical shell at any fluid level?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13a Have $\pm 20\%$ of the design thickness ranges been established for comparison with actual tank thicknesses?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14 Was the hydrostatic-design-stress calculated correctly in accordance with Section 6 1 1 of ASTM D 1998-91? <i>incorrect service factor</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
14a Are the tanks designed with the appropriate design hoop stress value and an adequate safety factor, using the Barlow formula for calculating wall thickness in accordance with ASTM D 1998-91?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
14b Was the tank hoop stress derated for service above 73 4°F and does the derated hoop stress exceed the hydrostatic-design-stress?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
15 Is the tank designed of sufficient structural strength, in accordance with ASTM D 1998-91 standards, to contain contents with a specific gravity of 1.9 using an appropriate safety factor? <i>with full height or 5 ft qualifications</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16 Are the seismic designs of the tanks in accordance with University of California Research Laboratory (UCRL)-15910 and RFP Standard SC-106 and are they specified for Important/Low Hazard usage category?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17 Are the tank stresses due to static, hydrostatic, and hydrodynamic forces evaluated against the tank material allowable?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18 Are all design calculations stamped by a Registered Professional Engineer?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
19 Is the manufacturer equipped to perform the Low Temperature Impact Test in accordance with Section 11 3 of ASTM D 1998-91?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19a Are test specimens cut from a manway, fitting, or other representative area?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19b Are specimens tested in a suitable apparatus with inside surface down and impacted with a dart of specified weight, height, and tip radius?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19c If the standard specimen size (5 in by 5 in or 127 mm by 127 mm) was not used, does supplier show correlation data between the actual size and the standard?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
19d Does the test report include the following?			
- Identification of the tank	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Date of test	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Foot-pounds used for test	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Pass or fail	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19e Have precision and bias been determined in accordance with Section 11 3 6 1 of ASTM D 1998-91?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

	Yes	No	N/A
20 Is the manufacturer equipped to perform the Gel Test in accordance with Section 11 4 of ASTM D 1998-91?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20a Are the test specimens taken from a manway, fitting, or other representative area which is normally removed from the tank before use?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20b Is the ASTM D 1998-91 test procedure in Section 11 4 7 and equation in Section 11 4 8 used?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20c Do test reports include the following?			
- Identification of the tank	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Date of test	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Percentage of Gel calculated	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Precision and bias	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
20d Is a 60% minimum gel level inside of the wall used to determine pass/fail?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21 Is the manufacturer equipped to hydrostatically test tanks in accordance with Section 11 6 ASTM D 1998-91?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21a Are the tanks hydrostatically tested with the proper final fittings?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21b Do test reports include the following?			
- identification of the tank	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- duration of the test	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- observance of leakage	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22 Are the size, location and specification for man-ways and fittings correct?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23 Do calculations performed to determine vent size comply with OSHA 1910 106 (or other accepted standard) for normal venting of atmospheric tanks?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23a If not, are vents at least as large as the fitting or withdrawal connection, whichever is larger, but not less than 1 0 inch nominal inside diameter?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24 Are plastic fittings designed in accordance with ASTM D 1998-91?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25 Are plastic fittings made of Schedule 80, Type I, Grade I polyvinyl chloride (PVC) and pipe grade polyethylene?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
26 Are the tank fittings located in areas of extra thickness for added rigidity and structural integrity?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
27 Is the fill assembly designed to withstand hydrodynamic loadings and does it minimize the possibility of splashing on the underside of the closed tank top?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
28 Are all components contacting the tanks designed of compatible materials?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
29 Will PVC joints be solvent welded in accordance with ASTM D 2855?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
30 Are metal components designed to be A36 mild steel unless otherwise specified?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
31 Are gaskets designed to be Ethylene Propylene Diene Monomers (EPDM)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

	Yes	No	N/A
32 Is a leak detection system designed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
33 Are provisions made to ensure hydraulic communication between the primary tank bottom and the leak detection device(s) under fully loaded conditions?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
34 Is the sensor designed to be located at or near the bottom of the secondary tank so any leakage from the primary tank would be detected as early as practicable?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
35 Is the tank leak detection system self-contained, battery powered, and have a flashing light to signify a detected leak?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
36 Does the sensor have a low voltage battery indicator?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
37 Is the detection system capable of remaining in alarm mode (light flashing) for a minimum of 48 hours and is the alarm light enclosure rated NEMA 4X?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
38 Are the tanks going to be heated?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
38a If no, were the tanks designed to compensate for freeze and thaw?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

WASTE CHARACTERIZATION

1 Is all the appropriate and necessary characterization data of the chemicals and concentrations in the sludge and pond water available?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1a Is specific gravity defined?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1b Are the waste settling properties defined?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1c Is the chemical composition defined?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1d Are the radioactive properties of the waste defined?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1e Is the pH of the waste defined?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2 Is the volume of waste from each of the solar ponds available?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3 Has an assessment of the corrosion resistance of high density cross linked polyethylene (HDXLPE) to the solar pond water and sludge been performed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4 Has a determination been correctly made that the inorganic compounds present in the pond water or sludge are compatible with the HDXLPE material?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5 Has a determination been correctly made that the organic compounds present in the pond water or sludge are compatible with the HDXLPE material?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6 Were calculations correctly performed to determine the effect on the strength of the tank due to absorption of the active organic compounds?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7 Were Total Organic Carbon (TOC) concentrations accounted for in determining the shell wall thickness of the tank?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

- | | Yes | No | N/A |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|-------------------------------------|--------------------------|
| 8 Has a determination been correctly made that the radiological compounds present in the pond water or sludge are compatible with the HDXLPE material? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 9 Based on the waste characterization data and the chemical-resistance properties of the polyethylene material, are the ASRP tanks compatible with the wastes to be stored in them? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 10 Are the fabricated nozzles, gaskets, and other fitting accessories chemically compatible with the materials to be handled in the tanks? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 11 Are the bolts securing mechanical fittings manufactured of materials compatible with tank contents? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 12 Does the specific gravity used for the structural design meet or exceed the specific gravity of the waste? <i>possible 1995 (analytical data)</i> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

Comments _____



ERM

Project ASRP Tank Assessment MTS 350370+3 Proj No R31206 D Task 1 Sheet 1 of 1
Subject Hydrostatic Design Stress Calculation By Pamela J Mitchell Date 12/22/93
Support to In-Station Renew Checklist, No. 14a Checked by E GRAHAM Date 1/11/93

Intent: Calculate hydrostatic design stress based on hoop stress test results

Methodology: obtain input data from available documents

Equation Reference: ASTM 1993-91, Section 6.1.1 (Safety Factor)

Assumptions and Input data:

Ref 1 provides hydrostatic design basis (HDB) = 1250 psi

Calculation:

SD = Maximum recommended hydrostatic design stress (psi)

$$SD = HDB \times SF$$

$$SF = 0.475 \text{ (for wall thickness above 0.375 inches)} \text{ (Ref 2)}$$

$$SD = 1250 (0.475) \\ = \underline{\underline{593.75 \text{ psi}}}$$

Ref. 1 - letter from Edward F Kozlowski to Joseph Jushi, Sept 30, 1993

Ref. 2 - ASTM-1993-91, Section 6.1.1



ERM

Project ASRPTANL Assessment MTS35U370P43

Proj No R 312060 Task 1

Sheet 1 of 2

Subject Wall Thickness Calculation

By Pamela J Mitchell PE

Date 12/22/93

Support Interim Renew Checklist, No. 13

Checked by E GRAHAM

Date 1/13/94

Intent Calculate required wall thickness for primary tank and containment tank using Barlow formula.

Methodology: obtain input data from available documents

Equation Reference: ASTM 1998-91, section 6.1 $T = \frac{0.433 \times SG \times H \times OD}{2SD}$

Assumptions and Input Data

SG = SPECIFIC GRAVITY = 1.9

H = fluid head in tank (ft) = PRIMARY TANK = 10 ft, CONTAINMENT = 11 ft

O.D. = outside tank diameter (in)

= 160 in (primary)

= 165 in (containment)

SD = hydrostatic design stress (psi) =

= 593 psi (see Hydrostatic Design Stress calculation)

Note: THIS NUMBER IS REDUCED FOR CALCULATIONS AT THE FILL LINE TO ACCOUNT FOR THE POTENTIAL ABSORPTION OF TOTAL ORGANIC COMPOUNDS (TOC) RESULTING IN A 10% REDUCTION IN TENSILE STRENGTH (REF 1). $\therefore SD = (9 \times 593) = 534 \text{ psi}$

Calculations

T = WALL THICKNESS (IN)

$$T = \frac{0.433 \times SG \times H \text{ (ft)} \times O.D. \text{ (in)}}{2 \times SD \text{ (psi)}}$$

PRIMARY:

$$T = 0.433 (1.9) H (160) / [2 (593)]$$

$$T = 0.111 H$$

PRIMARY (AT FILL LINE):

$$T_{\text{FILL LINE}} = 0.433 (1.9) H (160) / [2 (534)]$$

$$= 0.123 H$$

CONTAINMENT

$$T = 0.433 (1.9) H (165) / [2 (593)]$$

$$T = 0.114 H$$

CONTAINMENT (AT FILL LINE):

$$T_{\text{FILL LINE}} = 0.433 (1.9) H (165) / [2 (534)]$$

$$= 0.127 H$$

Ref 1 - Section 4.6.3 (11) - Dept. of Environmental Health, 1992 - 243 from T. G. Boyer and H. B. Baker to J. H. Kempton. Discussion Evaluation of Polyethylene Containers for Storage of Fuel "C" Water and Sludge.



ERM

Project ASRP TANK ASSESSMENT MTS 350370 PA3 Proj No R31206 0 TASK 1 Sheet 2 of 2
 Subject WALL THICKNESS CALCULATION By E. GRAHAM Date 1/13/94
 SUPPORT TO INFORMATION REVIEW CHECKLIST, No 13 Checked by PJM. tchell Date 1/13/94

CALCULATIONS (CONTINUED): PRIMARY TANK

STRAIGHT SIDE WALL HEIGHT ASTM CALCULATED WALL THICKNESS ASTM CALCULATION 20% ASTM DESIGN THICKNESS

$$H \quad T = \frac{0.433(19)H(160)}{0.111H} / [2(593)]$$

NOTE AN ADJUSTMENT IN THE HYDROSTATIC DESIGN STRESS AT THE FILL LINE MUST BE MADE TO ACCOUNT FOR THE POTENTIAL ABSORPTION OF TOCS RESULTING IN A REDUCTION IN TENSILE STRENGTH OF 10%.

$$* T_{\text{FILL LINE}} = \frac{0.433(19)H(160)}{0.123H} / [2(9)(593)]$$

H	T		
* 1	0.187	(MINIMUM ASTM THICKNESS ALLOWED)	0.187
2	0.222		0.187
3	0.333		0.266
4	0.444		0.355
5	0.555		0.444
6	0.666		0.533
7	0.777		0.622
8	0.888		0.710
9	0.999		0.799
10	1.110		0.888

CONTAINMENT TANK

$$H \quad T = \frac{(0.433)(19)H(165)}{0.114H} / [2(593)]$$

$$* T_{\text{FILL LINE}} = \frac{(0.433)(19)H(165)}{0.127H} / [2(9)(593)]$$

H	T		
* 1	0.187	(MINIMUM ASTM THICKNESS ALLOWED)	0.187
2	0.228		0.187
3	0.342		0.274
4	0.456		0.365
5	0.570		0.456
6	0.684		0.547
7	0.798		0.638
8	0.912		0.730
9	1.026		0.821
10	1.140		0.912
11	1.254		1.003

APPENDIX C
SHIPPING/DELIVERY/INSTALLATION OVERSIGHT CHECKLISTS

SHIPPING/DELIVERY/INSTALLATION OVERSIGHT FORM

ASRP RCRA TANK ASSESSMENT
ROCKY FLATS PLANT
MTS 350370PA3

Inspector M Keller, R Hea
Date 12/16/93, 11-194

RCRA No 25 006
RFP Tank No D-6
Primary Tank Serial No C93-03053
Secondary Tank Serial No C93-03046
Tent No 3

	Yes	No	N/A
1 Were manufacturer's instructions for off-loading, and placement provided prior to shipment?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2 Were manufacturer's QC travelers supplied with each polyethylene tank (Tank information/test data for both the primary and secondary tanks)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3 Were all manufacturer-specified requirements for shipping followed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
a Was the primary tank nested inside the secondary tank for shipment?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b Were the tanks covered to prevent debris contamination?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c Were tanks positively vented during transport?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d Were all fittings and flange faces protected from damage during transport?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e Were loose items protectively packed separately and not left inside tanks where damage to tank may have resulted?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<i>overfill float tube repaired & inspected 1/7/94</i>			
4 Were manufacturer's instructions for off-loading followed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
a Was offloading completed without mishap?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5 Are the primary tanks permanently marked with the following?			
a manufacturer	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b date manufactured (month and year)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c capacity	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d maximum specific gravity of tank design	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e serial number	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f Type I	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g confined space entry marking	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6 Are the secondary tanks permanently marked with the following?			
a manufacturer	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b date manufactured (month and year)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c capacity	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d maximum specific gravity of tank design	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e serial number	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f Type I	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

overfill pipe broken

	Yes	No	N/A
7 Are the outer surfaces of the secondary tank free of signs of damage (weld breaks, punctures, cracks, corrosion and other structural damage)? <i>Superficial scrapes.</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8 If the secondary tank was damaged, was the primary tank inspected for damage?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
9 Is one fill assembly provided per primary tank and located in the man-way?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10 Is the fill assembly constructed of schedule 80 PVC and installed properly?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11 Are all edges, where openings are cut into the tanks, trimmed smooth?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12 Is the asphalt surface level?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
a If no, was sand or padding used to provide an even surface on the asphalt for tank placement?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
13 Was the existing asphalt surface permanently marked to indicate the proposed location of all tanks?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14 Were manufacturer's instructions for assembly and placement followed without mishap?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15 Following installation is the secondary tank free of weld breaks, punctures, cracks, corrosion and other structural damage?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16 Was a hydrostatic test conducted at the time of installation by filling the tank completely with water and checking for leaks? <i>Accepted 1/6/94</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17 Are proper warning signs affixed to the tank? <i>Confined Space, RCRA & RFP Tank #s</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18 Is ancillary equipment supported and protected against physical damage and stress due to settlement, vibration, expansion and contraction?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19 Is leak detection equipment installed (near the bottom, between primary and secondary tanks) and operating properly?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
a If no, will visual inspection of secondary containment be performed daily to detect leaks? <i>(until installation of electronic leak detector)</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20 Were all fittings installed in accordance with design specifications?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21 Is a 3-inch PVC Vent fitting placed in the center at the top of the primary tank and does it consist of a 3-inch National Pipe Thread (NPT) bulkhead fitting made of PVC?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22 Is a vent system installed and operational?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23 Are tanks permanently housed in tents constructed of a polyester substrate coated with polyvinyl chloride?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24 Are spacers or equivalent installed between the primary and secondary tank?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- | | Yes | No | N/A |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|--------------------------|--------------------------|
| 25 Is the tank located at least one foot from the tent fabric? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 26 Does the space between the primary and secondary tank allow for visual inspection or the installation of leak detection equipment? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| a Is the space adequate to implement waste removal strategies? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 27 Was a polyethylene mesh installed between the bottom surfaces of the primary and secondary tank to allow leak detection between tanks?
<i>Per shipping bill, cant visually verify</i> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 28 Is the liquid level float assembly marked to indicate when the level is at the tangent line?
<i>Per design spec, cant visually verify</i> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Comments _____

 Overfill float tube repaired &
 inspected on 1/7/94

Project ASRP Tank Assess Proj No R31206 0 Task 1 Sheet 1 o 1
 Subject Performance Data By E Graham Date 1/12/93
 Serial No C93-03053 Checked By _____ Date _____
 Date Shipped 12/13/93

Test	Pass/Fail	Specific Data	Date Completed
Impact Test (< -20°F)	P	-31°F	12/10/93
Gel Test (> 65%)	P	71.6%	12/9/93
Wall Thickness Test	F		
Cross-Linked Repairs	P	No repairs made	
Hydrotest (30 min minimum)	P	30 minutes	12/11/93

Comments The data collected at 270 degrees and 1 ft from the bottom of
the tank was equal to 0.991 inches. This value is below the ASTM calculated
value of 0.999 not including the 20% tolerance. Since the area involved is unknown
but potentially greater than 1 sq ft (ASTM D 1998-91) the tank cannot be filled to a
height of 10 ft and hold materials having a specific gravity of 1.9

Maximum Allowable Fill Height @ S.G. = 1.9 7 ft *
 Maximum Allowable S.G. @ Fill Height = 10ft 1.88

* If more data points were taken, the allowable fill height could be much closer to the
 original 10 ft value



POLY CAL PLASTICS

A Division of Abell Corporation

WALL THICKNESS MEASUREMENTS

PRIMARY

page 4 of 4

FROM BOTTOM	FCP DESIGN	ASTM MINIMUM	ACTUALS			
			0°	90°	180°	270°
1	1.00	0.80	1.025	1.003	1.001	991
3	0.78	0.62	1.191	.945	.987	961
5	0.56	0.45	.640	.981	1.051	1.000
7	0.50	0.40	.711	.653	.652	.648
9	0.50	0.40	.506	.501	.566	.632

FLOOR THICKNESS

MEASURED FROM 0° ACROSS THE FLOOR TO 180°

FEET FROM

EDGE	DESIGN	MINIMUM	ACTUALS
2	0.50	0.38	.493
4	0.50	0.38	.501
6	0.50	0.38	.713
8	0.50	0.38	.743
10	0.50	0.38	.499
12	0.50	0.38	.503

MHL 11/4/92

Revised 11/22/93

SHIPPING/DELIVERY/INSTALLATION OVERSIGHT FORM

ASRP RCRA TANK ASSESSMENT
ROCKY FLATS PLANT
MTS 350370PA3

Inspector R Hea / M. Keller
Date 12/14/93
11/7/94
RCRA
11/7/94

RCRA No 25 007
RFP Tank No D-7
Primary Tank Serial No C93-02899
Secondary Tank Serial No C93-02961
Tent No 3

	Yes	No	N/A
1 Were manufacturer's instructions for off-loading, and placement provided prior to shipment?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2 Were manufacturer's QC travelers supplied with each polyethylene tank (Tank information/test data for both the primary and secondary tanks)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3 Were all manufacturer-specified requirements for shipping followed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
a Was the primary tank nested inside the secondary tank for shipment?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b Were the tanks covered to prevent debris contamination?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c Were tanks positively vented during transport?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d Were all fittings and flange faces protected from damage during transport?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e Were loose items protectively packed separately and not left inside tanks where damage to tank may have resulted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>overfill float tube broken - fixed & checked</i>			
4 Were manufacturer's instructions for off-loading followed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
a Was offloading completed without mishap?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5 Are the primary tanks permanently marked with the following?			
a manufacturer	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b date manufactured (month and year)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c capacity	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d maximum specific gravity of tank design	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e serial number	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f Type I	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g confined space entry marking	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6 Are the secondary tanks permanently marked with the following?			
a manufacturer	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b date manufactured (month and year)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c capacity	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d maximum specific gravity of tank design	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e serial number	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f Type I	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	Yes	No	N/A
7 Are the outer surfaces of the secondary tank free of signs of damage (weld breaks, punctures, cracks, corrosion and other structural damage)? <i>Superficial scrapes & scratches</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8 If the secondary tank was damaged, was the primary tank inspected for damage?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
9 Is one fill assembly provided per primary tank and located in the man-way?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10 Is the fill assembly constructed of schedule 80 PVC and installed properly?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11 Are all edges, where openings are cut into the tanks, trimmed smooth?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12 Is the asphalt surface level?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
a If no, was sand or padding used to provide an even surface on the asphalt for tank placement?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
13 Was the existing asphalt surface permanently marked to indicate the proposed location of all tanks?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14 Were manufacturer's instructions for assembly and placement followed without mishap?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15 Following installation is the secondary tank free of weld breaks, punctures, cracks, corrosion and other structural damage?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16 Was a hydrostatic test conducted at the time of installation by filling the tank completely with water and checking for leaks? <i>Accepted 12/30/93</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17 Are proper warning signs affixed to the tank? <i>Confirmed SPOC, tank & RCRA #s stenciled on</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18 Is ancillary equipment supported and protected against physical damage and stress due to settlement, vibration, expansion and contraction?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19 Is leak detection equipment installed (near the bottom, between primary and secondary tanks) and operating properly?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
a If no, will visual inspection of secondary containment be performed daily to detect leaks? <i>(until installation of electronic leak detection system)</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20 Were all fittings installed in accordance with design specifications?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21 Is a 3-inch PVC Vent fitting placed in the center at the top of the primary tank and does it consist of a 3-inch National Pipe Thread (NPT) bulkhead fitting made of PVC?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22 Is a vent system installed and operational?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23 Are tanks permanently housed in tents constructed of a polyester substrate coated with polyvinyl chloride?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24 Are spacers or equivalent installed between the primary and secondary tank?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- | | Yes | No | N/A |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|--------------------------|--------------------------|
| 25 Is the tank located at least one foot from the tent fabric? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 26 Does the space between the primary and secondary tank allow for visual inspection or the installation of leak detection equipment? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| a Is the space adequate to implement waste removal strategies? <i>spacing is tight ~ 1 inch on low side but can</i> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <i>Additional spacing blocks to be inserted to it</i> | | | |
| 27 Was a polyethylene mesh installed between the bottom surfaces of the primary and secondary tank to allow leak detection between tanks? <i>between primary & secondary to improve spacing</i> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <i>pr shipping bill, cant visually verify</i> | | | |
| 28 Is the liquid level float assembly marked to indicate when the level is at the tangent line? <i>pr design spec, cant visually verify</i> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Comments Overfill float tube repaired &
checked on 1/7/94

Project ASRP Tank Assess Proj No R31206 0 Task 1 Sheet 1 o 1
 Subject Performance Data By E Graham Date 1/12/93
 Serial No C93-02899 Checked By _____ Date _____
 Date Shipped 12/8/93

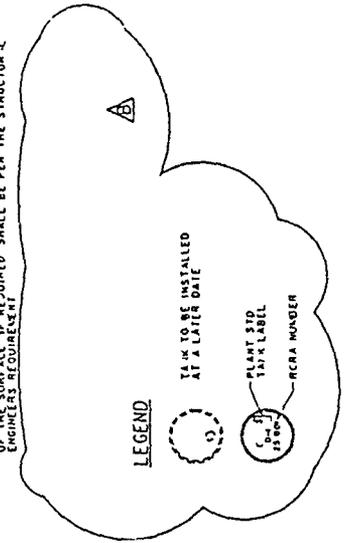
Test	Pass/Fail	Specific Data	Date Completed
Impact Test (< -20°F)	P	-37°F	12/2/93
Gel Test (> 65%)	P	72.3%	11/26/93
Wall Thickness Test	F		
Cross-Linked Repairs	P	No repairs made	
Hydrotest (30 min minimum)	P	35 minutes	12/3/93

Comments The data collected at 0 and 180 degrees at 1 ft from the bottom of the tank was equal to 0.924 in and 0.972 respectively. These values are below the ASTM calculated value of 0.999 not including the 20% tolerance. Since the area involved is unknown but potentially greater than 1 sq ft (ASTM D 1998-91) the tank cannot be filled to a height of 10 ft and hold materials having a specific gravity of 1.9.

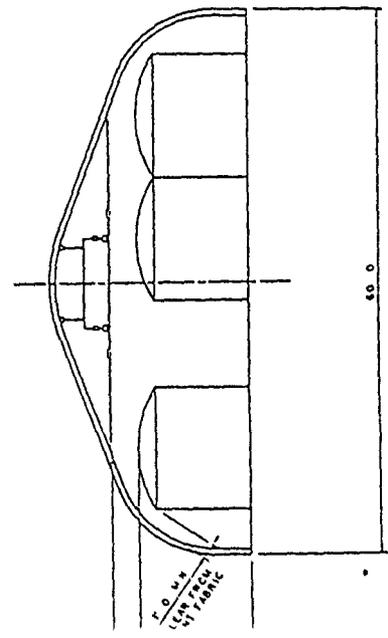
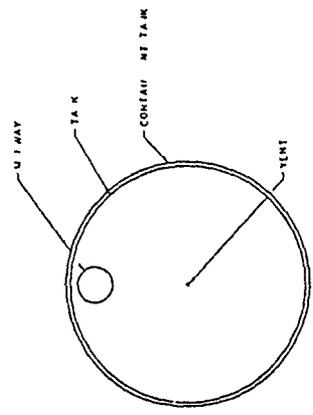
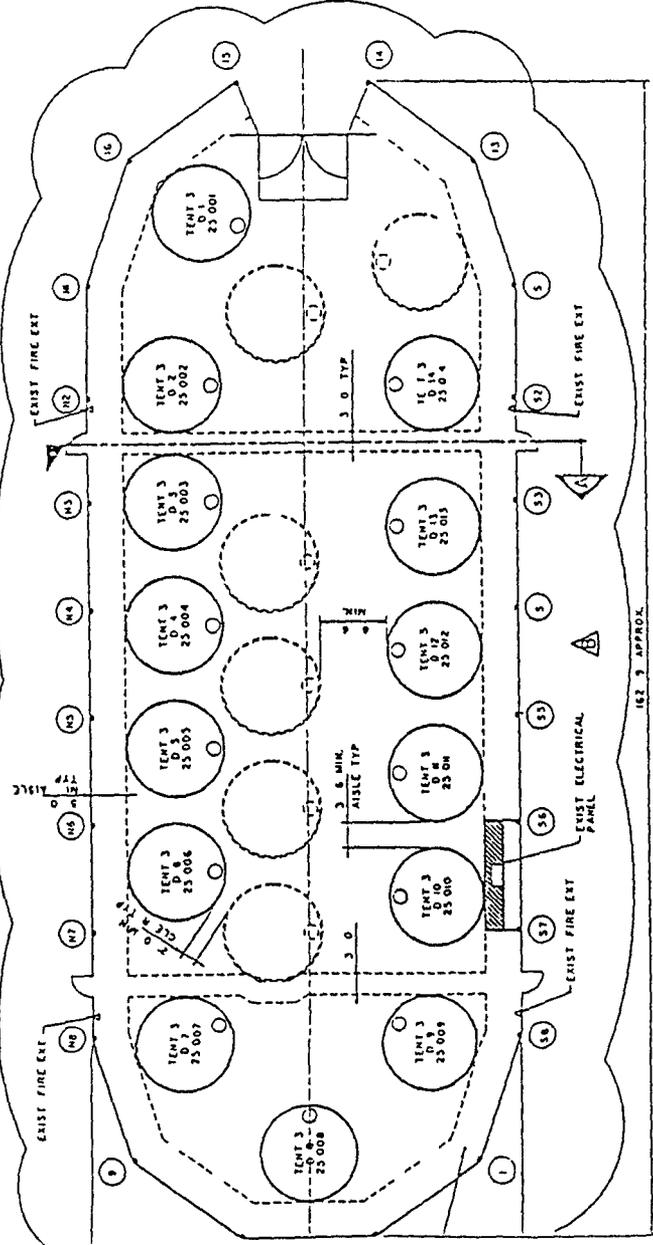
Maximum Allowable Fill Height @ S G = 1.9 7 ft *
 Maximum Allowable S G @ Fill Height = 10ft 1.76

* If more data points were taken, the allowable fill height could be much closer to the original 10 ft value.

- NOTES**
- 1 REMOVE CONCRETE BARRIER IN FRONT OF EXISTING ELECTRIC CAB
 - 2 THE PRECISION SUBCONTRACTOR SHALL DETERMINE TANK PLACEMENT & MAINTAIN ALL MINIMUM AISLE AND TENT CLEARANCES AS SHOWN ON DRAWINGS
 - 3 TANKS SHALL NOT BE PLACED ON EXISTING CONCRETE PADS (SEE 1)
 - 4 MAINTAIN 1'0" CLEAR BETWEEN THE TANK AND TENT FABRIC
 - 5 AFTER INSTALLATION PAINT EGRESS AISLES ON FLOOR. AISLE LINES SHALL BE 3" WIDE PAINTED FEDERAL SAFETY YELLOW. ALL EXISTING EGRESS LINES WHICH CONFLICT WITH NEW EGRESS ROUTES SHALL BE REMOVED OR RELOCATED WITH NEW EGRESS ROUTES
 - 6 SEE DRAWING 30008-401 FOR TENT PIPING
 - 7 SEE DRAWING 30008-150 THRU 756 FOR LEAK DETECTION SYSTEM
 - 8 THE LOCATION OF EACH TANK ON THE 750 PAD SHALL BE MARKED WITH A 12" DIA. CONCRETE PAD. THE LOCATION OF EACH TANK SHALL INDICATE THE OUTSIDE DIAMETER OF THE SECO DARY CONTAINMENT TANK. A MEMBER OF STRUCTURAL ENGINEERING SHALL CHECK EVERY TANK FOR LEAKS. THE LOCATION OF EACH TANK SHALL BE MARKED WITH AN ENGINEER'S REQUIREMENT



TANK RCRA NUMBER	PRIMARY TANK SERIAL NUMBER	SECONDOARY TANK SERIAL NUMBER
25 001	633 02 32	633 03170
25 002	633 02 30	633 03174
25 003	633 02 33	633 02940
25 004	633 03 14	633 03248
25 005	633 03 15	633 03300
25 006	633 03033	633 03046
25 007	633 02899	633 0 941
25 008	633 02888	633 02923
25 009	633 02847	633 02977
25 010	633 02939	633 03058
25 011	633 03133	633 03302
25 012	633 03107	633 03338
25 013	633 030 1	633 03095
25 014	633 03072	633 017 4



KEYWORDS

1. ACCESS TYP
2. AIRFLOW
3. AIRFLOW
4. PRODUCT
5. FLOOR
750 PAD
TENT #1
DETENT #2

KEY PLAN
SCALE 1/4" = 1'0"

CURRENT STATUS AS OF 1-4-84

1. 11/23/83 (C) 1/23/83
2. 11/23/83 (C) 1/23/83
3. 11/23/83 (C) 1/23/83
4. 11/23/83 (C) 1/23/83

ORIGINAL IS USE

1. 11/23/83 (C) 1/23/83
2. 11/23/83 (C) 1/23/83
3. 11/23/83 (C) 1/23/83
4. 11/23/83 (C) 1/23/83

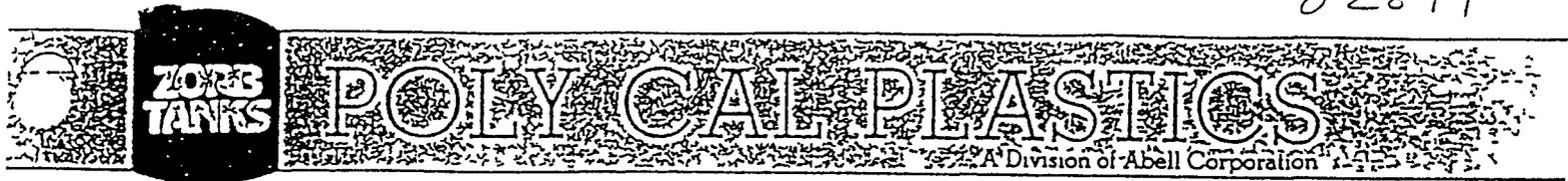
U.S. DEPARTMENT OF ENERGY
DOE-A-130-USE
MARKING

ACCIDENT SOURCE REGIONAL PAGE
TANK INSTALLATION PLAN SECTION
TENT #3

U.S. DEPARTMENT OF ENERGY
DOE-A-130-USE
MARKING

0 51006-200 B

COMPUTER GENERATED



WALL THICKNESS MEASUREMENTS

PRIMARY

page 4 of 4

FROM BOTTOM	PCP DESIGN	ASTM MINIMUM	ACTUALS			
			0°	90°	180°	270°
1	1 00	0 80	.924	1174	.972	1171
3	0 78	0 62	.948	.985	1058	1312
5	0 56	0 45	.826	904	896	885
7	0 50	0 40	618	756	.704	.777
9	0 50	0 40	.684	775	.748	695

FLOOR THICKNESS

MEASURED FROM 0° ACROSS THE FLOOR TO 180°

FEET FROM

EGDE	DESIGN	MINIMUM	ACTUALS
2	0 50	0 38	611
4	0 50	0 38	750
6	0 50	0 38	776
8	0 50	0 38	.980
10	0 50	0 38	829
12	0 50	0 38	.835

MHL 11/4/93

Revised 11/22/93

SHIPPING/DELIVERY/INSTALLATION OVERSIGHT FORM

ASRP RCRA TANK ASSESSMENT
ROCKY FLATS PLANT
MTS 350370PA3

Inspector R Hea / M Keller
Date 12/14/93
11/7/94
RCA
11704

RCRA No Z5 008
RFP Tank No D-8
Primary Tank Serial No C93-02881
Secondary Tank Serial No C93-02895
Tent No 3

	Yes	No	N/A
1 Were manufacturer's instructions for off-loading, and placement provided prior to shipment?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2 Were manufacturer's QC travelers supplied with each polyethylene tank (Tank information/test data for both the primary and secondary tanks)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3 Were all manufacturer-specified requirements for shipping followed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
a Was the primary tank nested inside the secondary tank for shipment?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b Were the tanks covered to prevent debris contamination?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c Were tanks positively vented during transport?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d Were all fittings and flange faces protected from damage during transport?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e Were loose items protectively packed separately and not left inside tanks where damage to tank may have resulted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4 Were manufacturer's instructions for off-loading followed? <u>1/7/94</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<u>overfill float tube broken - fixed & checked</u>			
<u>RCA 11/7/94</u>			
a Was offloading completed without mishap?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5 Are the primary tanks permanently marked with the following?			
a manufacturer	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b date manufactured (month and year)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c capacity	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d maximum specific gravity of tank design	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e serial number	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f Type I	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g confined space entry marking	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6 Are the secondary tanks permanently marked with the following?			
a manufacturer	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b date manufactured (month and year)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c capacity	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d maximum specific gravity of tank design	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e serial number	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f Type I	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	Yes	No	N/A
7 Are the outer surfaces of the secondary tank free of signs of damage (weld breaks, punctures, cracks, corrosion and other structural damage)? <i>superficial scrapes & scratches</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8 If the secondary tank was damaged, was the primary tank inspected for damage?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
9 Is one fill assembly provided per primary tank and located in the man-way?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10 Is the fill assembly constructed of schedule 80 PVC and installed properly?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11 Are all edges, where openings are cut into the tanks, trimmed smooth?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12 Is the asphalt surface level?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
a If no, was sand or padding used to provide an even surface on the asphalt for tank placement?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
13 Was the existing asphalt surface permanently marked to indicate the proposed location of all tanks?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14 Were manufacturer's instructions for assembly and placement followed without mishap?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15 Following installation is the secondary tank free of weld breaks, punctures, cracks, corrosion and other structural damage?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16 Was a hydrostatic test conducted at the time of installation by filling the tank completely with water and checking for leaks? <i>Accepted 12/29/93</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17 Are proper warning signs affixed to the tank? <i>confined space, tank & RCRA # stenciled</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18 Is ancillary equipment supported and protected against physical damage and stress due to settlement, vibration, expansion and contraction?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19 Is leak detection equipment installed (near the bottom, between primary and secondary tanks) and operating properly?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
a If no, will visual inspection of secondary containment be performed daily to detect leaks? (int.) <i>installation of electronic leak detection system</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20 Were all fittings installed in accordance with design specifications?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21 Is a 3-inch PVC Vent fitting placed in the center at the top of the primary tank and does it consist of a 3-inch National Pipe Thread (NPT) bulkhead fitting made of PVC?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22 Is a vent system installed and operational?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23 Are tanks permanently housed in tents constructed of a polyester substrate coated with polyvinyl chloride?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24 Are spacers or equivalent installed between the primary and secondary tank?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- | | Yes | No | N/A |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|--------------------------|--------------------------|
| 25 Is the tank located at least one foot from the tent fabric? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 26 Does the space between the primary and secondary tank allow for visual inspection or the installation of leak detection equipment? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| a Is the space adequate to implement waste removal strategies? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 27 Was a polyethylene mesh installed between the bottom surfaces of the primary and secondary tank to allow leak detection between tanks?
<i>According to shipping bill - cont visually verify</i> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 28 Is the liquid level float assembly marked to indicate when the level is at the tangent line?
<i>per design spec, cont visually verify</i> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Comments overflow float tube repaired &
checked on 1/7/94

Project ASRP Tank Assess Proj No R31206 0 Task 1 Sheet 1 o 1
 Subject Performance Data By E Graham Date 1/12/93
 Serial No C93-02881 Checked By _____ Date _____
 Date Shipped 12/8/93

Test	Pass/Fail	Specific Data	Date Completed
Impact Test (< -20°F)	P	-41°F	12/3/93
Gel Test (> 65%)	P	75.9%	12/2/93
Wall Thickness Test	F		
Cross-Linked Repairs	P	No repairs made	
Hydrotest (30 min minimum)	P	35 minutes	12/7/93

Comments The data collected at 270 degrees and 1 ft from the bottom of
the tank was equal to 0.893 inches. This value is below the ASTM calculated
value of 0.999 not including the 20% tolerance. Since the area involved is unknown
but potentially greater than 1 sq ft (ASTM D 1998-91) the tank cannot be filled to a
height of 10 ft and hold materials having a specific gravity of 1.9.

Maximum Allowable Fill Height @ S.G. = 1.9 7 ft *
 Maximum Allowable S.G. @ Fill Height = 10ft 1.70

* If more data points were taken, the allowable fill height could be much closer to the
 original 10 ft value

ZORB
TANKS

POLYCAL PLASTICS

A Division of Abell Corporation

WALL THICKNESS MEASUREMENTS

PRIMARY

page 4 of 4

FROM BOTTOM	POP DESIGN	ASTM MINIMUM	ACTUALS			
			0°	90°	180°	270°
1	1 00	0 80	1 004	1 002	1 015	.893
3	0 78	0 62	1 207	1 129	817	984
5	0 56	0 45	682	.919	.950	1 058
7	0 50	0 40	729	1 078	736	1 001
9	0 50	0 40	.595	897	.783	610

FLOOR THICKNESS

MEASURED FROM 0° ACROSS THE FLOOR TO 180°

FEET FROM

EDGE	DESIGN	MINIMUM	ACTUALS
2	0 50	0 38	.667
4	0 50	0 38	.704
6	0 50	0 38	.904
8	0 50	0 38	.828
10	0 50	0 38	737
12	0 50	0 38	520

MHL 11/4/93

Revised 11/22/93

SHIPPING/DELIVERY/INSTALLATION OVERSIGHT FORM

ASRP RCRA TANK ASSESSMENT
ROCKY FLATS PLANT
MTS 350370PA3

Inspector M. Keller to Hea
Date 12/16/93 1/7/94

RCRA No 25 000
RFP Tank No D-9
Primary Tank Serial No C93-02969
Secondary Tank Serial No C93-02979
Tent No 3

	Yes	No	N/A
1 Were manufacturer's instructions for off-loading, and placement provided prior to shipment?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2 Were manufacturer's QC travelers supplied with each polyethylene tank (Tank information/test data for both the primary and secondary tanks)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3 Were all manufacturer-specified requirements for shipping followed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
a Was the primary tank nested inside the secondary tank for shipment?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b Were the tanks covered to prevent debris contamination?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c Were tanks positively vented during transport?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d Were all fittings and flange faces protected from damage during transport?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e Were loose items protectively packed separately and not left inside tanks where damage to tank may have resulted?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4 Were manufacturer's instructions for off-loading followed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
a Was offloading completed without mishap?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5 Are the primary tanks permanently marked with the following?			
a manufacturer	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b date manufactured (month and year)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c capacity	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d maximum specific gravity of tank design	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e serial number	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f Type I	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g confined space entry marking	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6 Are the secondary tanks permanently marked with the following?			
a manufacturer	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b date manufactured (month and year)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c capacity	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d maximum specific gravity of tank design	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e serial number	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f Type I	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	Yes	No	N/A
7 Are the outer surfaces of the secondary tank free of signs of damage (weld breaks, punctures, cracks, corrosion and other structural damage)? <i>Superficial Scrapes</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8 If the secondary tank was damaged, was the primary tank inspected for damage?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
9 Is one fill assembly provided per primary tank and located in the man-way?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10 Is the fill assembly constructed of schedule 80 PVC and installed properly?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11 Are all edges, where openings are cut into the tanks, trimmed smooth?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12 Is the asphalt surface level?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
a If no, was sand or padding used to provide an even surface on the asphalt for tank placement?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
13 Was the existing asphalt surface permanently marked to indicate the proposed location of all tanks?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14 Were manufacturer's instructions for assembly and placement followed without mishap?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15 Following installation is the secondary tank free of weld breaks, punctures, cracks, corrosion and other structural damage?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16 Was a hydrostatic test conducted at the time of installation by filling the tank completely with water and checking for leaks? <i>Accepted 1/5/94</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17 Are proper warning signs affixed to the tank? <i>Confined space, tank e RCRA #5 stenciled on</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18 Is ancillary equipment supported and protected against physical damage and stress due to settlement, vibration, expansion and contraction?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19 Is leak detection equipment installed (near the bottom, between primary and secondary tanks) and operating properly?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
a If no, will visual inspection of secondary containment be performed daily to detect leaks? <i>(until installation of electronic leak detection system)</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20 Were all fittings installed in accordance with design specifications?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21 Is a 3-inch PVC Vent fitting placed in the center at the top of the primary tank and does it consist of a 3-inch National Pipe Thread (NPT) bulkhead fitting made of PVC?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22 Is a vent system installed and operational?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23 Are tanks permanently housed in tents constructed of a polyester substrate coated with polyvinyl chloride?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24 Are spacers or equivalent installed between the primary and secondary tank?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- | | Yes | No | N/A |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|--------------------------|--------------------------|
| 25 Is the tank located at least one foot from the tent fabric? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 26 Does the space between the primary and secondary tank allow for visual inspection or the installation of leak detection equipment? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| a Is the space adequate to implement waste removal strategies? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 27 Was a polyethylene mesh installed between the bottom surfaces of the primary and secondary tank to allow leak detection between tanks?
<i>Per shipping bill, cant be visually verified</i> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 28 Is the liquid level float assembly marked to indicate when the level is at the tangent line?
<i>Per design spec, cant visually verify</i> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Comments _____

Project ASRP Tank Assess Proj No R31206 0 Task 1 Sheet 1 o 1
 Subject Performance Data By E Graham Date 1/12/93
 Serial No C93-02967 Checked By _____ Date _____
 Date Shipped 12/13/93

Test	Pass/Fail	Specific Data	Date Completed
Impact Test (< -20°F)	P	-33°F	12/9/93
Gel Test (> 65%)	P	75 2%	12/8/93
Wall Thickness Test	F		
Cross-Linked Repairs	P	No repairs made	
Hydrotest (30 min minimum)	P	33 minutes	12/8/93

Comments The data collected at 180 degrees and 1 ft from the bottom of
the tank was equal to 0 944 inches This value is below the ASTM calculated
value of 0 999 not including the 20% tolerance Since the area involved is unknown
but potentially greater than 1 sq ft (ASTM D 1998-91) the tank cannot be filled to a
height of 10 ft and hold materials having a specific gravity of 1 9

Maximum Allowable Fill Height @ S G = 1 9 7 ft *
 Maximum Allowable S G @ Fill Height=10ft 1 80

* If more data points were taken, the allowable fill height could be much closer to the
original 10 ft value

ZORB
TANKSPOLY CAL PLASTICS
A Division of Abell Corporation

WALL THICKNESS MEASUREMENTS

PRIMARY

page 4 of 4

FROM BOTTOM	PCP DESIGN	ASTM MINIMUM	ACTUALS			
			0°	90°	180°	270°
1	1 00	0 80	1 049	1 057	944	1 159
3	0 78	0 62	.939	1 231	1 119	1 051
5	0 56	0 45	.705	1 064	.871	866
7	0 50	0 40	.588	.652	617	.885
9	0 50	0 40	624	708	724	793

FLOOR THICKNESS

MEASURED FROM 0° ACROSS THE FLOOR TO 180°

FEET FROM

EDGE	DESIGN	MINIMUM	ACTUALS
2	0 50	0 38	681
4	0 50	0 38	649
6	0 50	0 38	942
8	0 50	0 38	790
10	0 50	0 38	710
12	0 50	0 38	592

MHL 11/4/93

Revised 11/27/93

PO BOX 80

8055 S ASH

FRENCH CAMP CA 95231

PHONE STOCKTON EXCHANGE (209) 952-6904

TELEFAX NO (209) 932-0455

SHIPPING/DELIVERY/INSTALLATION OVERSIGHT FORM

ASRP RCRA TANK ASSESSMENT
ROCKY FLATS PLANT
MTS 350370PA3

Inspector M. Keller R Hea
Date 12/16/93, 1/7/94

RCRA No 25-010
RFP Tank No D-10
Primary Tank Serial No C93-02939
Secondary Tank Serial No C93-03058
Tent No 3

? correct
✓
RCH
1/7/94

	Yes	No	N/A
1 Were manufacturer's instructions for off-loading, and placement provided prior to shipment?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2 Were manufacturer's QC travelers supplied with each polyethylene tank (Tank information/test data for both the primary and secondary tanks)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3 Were all manufacturer-specified requirements for shipping followed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
a Was the primary tank nested inside the secondary tank for shipment?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b Were the tanks covered to prevent debris contamination?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c Were tanks positively vented during transport?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d Were all fittings and flange faces protected from damage during transport?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e Were loose items protectively packed separately and not left inside tanks where damage to tank may have resulted?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4 Were manufacturer's instructions for off-loading followed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
a Was offloading completed without mishap?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5 Are the primary tanks permanently marked with the following?			
a manufacturer	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b date manufactured (month and year)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c capacity <i>Wrong Capacity on tank 12,025 vs 11,150</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d maximum specific gravity of tank design	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e serial number	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f Type I	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g confined space entry marking	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
6 Are the secondary tanks permanently marked with the following?			
a manufacturer	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b date manufactured (month and year)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c capacity	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d maximum specific gravity of tank design	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e serial number	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f Type I	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	Yes	No	N/A
7 Are the outer surfaces of the secondary tank free of signs of damage (weld breaks, punctures, cracks, corrosion and other structural damage)? <i>Superficial Scrapes</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8 If the secondary tank was damaged, was the primary tank inspected for damage?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
9 Is one fill assembly provided per primary tank and located in the man-way?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10 Is the fill assembly constructed of schedule 80 PVC and installed properly?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11 Are all edges, where openings are cut into the tanks, trimmed smooth?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12 Is the asphalt surface level?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
a If no, was sand or padding used to provide an even surface on the asphalt for tank placement?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
13 Was the existing asphalt surface permanently marked to indicate the proposed location of all tanks?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14 Were manufacturer's instructions for assembly and placement followed without mishap?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15 Following installation is the secondary tank free of weld breaks, punctures, cracks, corrosion and other structural damage?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16 Was a hydrostatic test conducted at the time of installation by filling the tank completely with water and checking for leaks? <i>Accepted 1/3/94</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17 Are proper warning signs affixed to the tank? <i>has RCRA & RFP tank #s, missing confined space entry sign</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
18 Is ancillary equipment supported and protected against physical damage and stress due to settlement, vibration, expansion and contraction?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19 Is leak detection equipment installed (near the bottom, between primary and secondary tanks) and operating properly?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
a If no, will visual inspection of secondary containment be performed daily to detect leaks? <i>(until installation of electronic leak detector)</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20 Were all fittings installed in accordance with design specifications?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21 Is a 3-inch PVC Vent fitting placed in the center at the top of the primary tank and does it consist of a 3-inch National Pipe Thread (NPT) bulkhead fitting made of PVC?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22 Is a vent system installed and operational?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23 Are tanks permanently housed in tents constructed of a polyester substrate coated with polyvinyl chloride?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24 Are spacers or equivalent installed between the primary and secondary tank?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- | | Yes | No | N/A |
|-------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|--------------------------|--------------------------|
| 25 Is the tank located at least one foot from the tent fabric? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 26 Does the space between the primary and secondary tank allow for visual inspection or the installation of leak detection equipment? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| a Is the space adequate to implement waste removal strategies? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 27 Was a polyethylene mesh installed between the bottom surfaces of the primary and secondary tank to allow leak detection between tanks? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 28 Is the liquid level float assembly marked to indicate when the level is at the tangent line? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Per shipping bill, cant visually verify

Per design spec, cant visually verify

Comments _____

Project	<u>ASRP Tank Assess</u>	Proj No	<u>R31206 0 Task 1</u>	Sheet	<u>1 o 1</u>
Subject	<u>Performance Data</u>	By	<u>E Graham</u>	Date	<u>1/12/93</u>
Serial No	<u>C93-02939</u>	Checked By	<u> </u>	Date	<u> </u>
Date Shipped	<u>12/13/93</u>				

Test	Pass/Fail	Specific Data	Date Completed
Impact Test (< -20°F)	P	-32°F	12/9/93
Gel Test (> 65%)	P	71 5%	12/3/93
Wall Thickness Test	F		
Cross-Linked Repairs	P	No repairs made	
Hydrotest (30 min minimum)	P	35 minutes	12/9/93

Comments The data collected at 0 degrees and 1 ft from the bottom of the tank was equal to 0.998 inches. This value is below the ASTM calculated value of 0.999 not including the 20% tolerance. Since the area involved is unknown but potentially greater than 1 sq ft (ASTM D 1998-91) the tank cannot be filled to a height of 10 ft and hold materials having a specific gravity of 1.9.

Maximum Allowable Fill Height @ S G = 1.9	7 ft *
Maximum Allowable S G @ Fill Height = 10ft	1.898

* If more data points were taken, the allowable fill height could be much closer to the original 10 ft value



POLY CAL PLASTICS

A Division of Abell Corporation

WALL THICKNESS MEASUREMENTS

PRIMARY

page 4 of 4

FROM BOTTOM	PCP DESIGN	ASTM MINIMUM	ACTUALS			
			0°	90°	180°	270°
1	1 00	0 80	.998	1 094	999	1 181
3	0 78	0 62	.932	.927	1 244	874
5	0 56	0 45	.641	1 087	987	821
7	0 50	0 40	.755	.625	589	779
9	0 50	0 40	.872	.790	569	824

FLOOR THICKNESS

MEASURED FROM 0° ACROSS THE FLOOR TO 180°

FEET FROM

EDGE	DESIGN	MINIMUM	ACTUALS
2	0 50	0 38	748
4	0 50	0 38	757
6	0 50	0 38	909
8	0 50	0 38	.701
10	0 50	0 38	.665
12	0 50	0 38	.650

MHL 11/4 93

Revised 11/22/93

SHIPPING/DELIVERY/INSTALLATION OVERSIGHT FORM

ASRP RCRA TANK ASSESSMENT
ROCKY FLATS PLANT
MTS 350370PA3

Inspector 11 Keller, R Hea
Date 12/23/93, 1/7/94

RCRA No 25 011
RFP Tank No D-11
Primary Tank Serial No L-95-C3553
Secondary Tank Serial No C-95-C5712
Tent No 3

	Yes	No	N/A
1 Were manufacturer's instructions for off-loading, and placement provided prior to shipment?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2 Were manufacturer's QC travelers supplied with each polyethylene tank (Tank information/test data for both the primary and secondary tanks)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3 Were all manufacturer-specified requirements for shipping followed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
a Was the primary tank nested inside the secondary tank for shipment?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b Were the tanks covered to prevent debris contamination?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c Were tanks positively vented during transport?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d Were all fittings and flange faces protected from damage during transport?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e Were loose items protectively packed separately and not left inside tanks where damage to tank may have resulted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4 Were manufacturer's instructions for off-loading followed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
a Was offloading completed without mishap?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5 Are the primary tanks permanently marked with the following?			
a manufacturer	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b date manufactured (month and year)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c capacity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d maximum specific gravity of tank design	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e serial number	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f Type I	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g confined space entry marking	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6 Are the secondary tanks permanently marked with the following?			
a manufacturer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b date manufactured (month and year)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c capacity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d maximum specific gravity of tank design	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e serial number	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f Type I	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

*12/27 LST - 1/7/94
Keller - R Hea*

	Yes	No	N/A
7 Are the outer surfaces of the secondary tank free of signs of damage (weld breaks, punctures, cracks, corrosion and other structural damage)? <i>5/12/2011 502324</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8 If the secondary tank was damaged, was the primary tank inspected for damage?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
9 Is one fill assembly provided per primary tank and located in the man-way?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10 Is the fill assembly constructed of schedule 80 PVC and installed properly?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11 Are all edges, where openings are cut into the tanks, trimmed smooth?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12 Is the asphalt surface level?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
a If no, was sand or padding used to provide an even surface on the asphalt for tank placement?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
13 Was the existing asphalt surface permanently marked to indicate the proposed location of all tanks?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14 Were manufacturer's instructions for assembly and placement followed without mishap?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15 Following installation is the secondary tank free of weld breaks, punctures, cracks, corrosion and other structural damage?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16 Was a hydrostatic test conducted at the time of installation by filling the tank completely with water and checking for leaks? <i>Accepted 1/7/94</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17 Are proper warning signs affixed to the tank? <i>Has RCRA & RFA tank #s, confined space entry sign not visible</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
18 Is ancillary equipment supported and protected against physical damage and stress due to settlement, vibration, expansion and contraction?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19 Is leak detection equipment installed (near the bottom, between primary and secondary tanks) and operating properly?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
a If no, will visual inspection of secondary containment be performed daily to detect leaks? <i>(until installation of electronic leak detector)</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20 Were all fittings installed in accordance with design specifications?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21 Is a 3-inch PVC Vent fitting placed in the center at the top of the primary tank and does it consist of a 3-inch National Pipe Thread (NPT) bulkhead fitting made of PVC?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22 Is a vent system installed and operational?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23 Are tanks permanently housed in tents constructed of a polyester substrate coated with polyvinyl chloride?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24 Are spacers or equivalent installed between the primary and secondary tank?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- | | Yes | No | N/A |
|-------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|--------------------------|--------------------------|
| 25 Is the tank located at least one foot from the tent fabric? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 26 Does the space between the primary and secondary tank allow for visual inspection or the installation of leak detection equipment? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| a Is the space adequate to implement waste removal strategies? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 27 Was a polyethylene mesh installed between the bottom surfaces of the primary and secondary tank to allow leak detection between tanks? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 28 Is the liquid level float assembly marked to indicate when the level is at the tangent line? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Per shipping bill, cant visually verify

Per design spec, cant visually verify

Comments _____

Project ASRP Tank Assess Proj No R31206 0 Task 1 Sheet 1 o 1
 Subject Performance Data By E Graham Date 1/12/93
 Serial No C93-03333 Checked By _____ Date _____
 Date Shipped 12/20/93

Test	Pass/Fail	Specific Data	Date Completed
Impact Test (< -20°F)	P	-34°F	12/15/93
Gel Test (> 65%)	P	73.5%	12/20/93
Wall Thickness Test	P		
Cross-Linked Repairs	P	No repairs made	
Hydrotest (30 min minimum)	P	35 minutes	12/15/93

Comments _____



POLYCAL PLASTICS

A Division of Abell Corporation

WALL THICKNESS MEASUREMENTS

PRIMARY

page 4 of 4

FROM BOTTOM	PCP DESIGN	ASTM MINIMUM	ACTUALS			
			0°	90°	180°	270°
1	1 00	0 80	1 090	1 070	1 040	1 008
3	0 78	0 62	1 259	1 013	1 153	1 121
5	0 56	0 45	1 31	1 016	1 124	1 027
7	0 50	0 40	718	628	544	679
9	0 50	0 40	550	.599	536	602

FLOOR THICKNESS

MEASURED FROM 0° ACROSS THE FLOOR TO 180°

FEET FROM

EDGE	DESIGN	MINIMUM	ACTUALS
2	0 50	0 38	.521
4	0 50	0 38	.525
6	0 50	0 38	.533
8	0 50	0 38	.662
10	0 50	0 38	.601
12	0 50	0 38	.521

MHL 11/4/93

Revised 12/7/93

APPENDIX D
VERIFICATION OF COMPLETION OF HYDROSTATIC TESTING
FOLLOWING INSTALLATION

VERIFICATION OF COMPLETION OF HYDROSTATIC TESTING FOLLOWING INSTALLATION

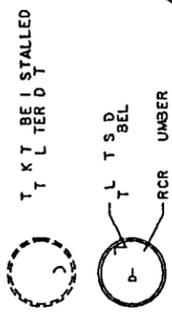
EG&G completed hydrostatic testing following installation of the ASRP tanks listed below. A description of the testing procedure and documentation of the test results are included in the Rocky Flats Plant's Integrated Work Control Package (IWCP) TD073141, Rev 0, titled "ASRP Tank Installation at the 750 Pad, Tents 3, 4 and 6". For each tank, the start and stop times of the test are recorded in the IWCP. The tank is checked for leaks by an inspector from EG&G's Facilities Inspection group, who documents the result in the IWCP. The following table provides the start and stop times and test results for each tank included in this certification package.

RCRA Unit No	RFP Tank No	Tent No	Serial No	Start		Stop		Test Result
				Date	Time	Date	Time	
25 006	D-6	3	C93-03053	01/05/94	14 50	01/06/94	14 50	Pass
25 007	D-7	3	C93-02899	12/29/93	10 30	12/30/93	10 30	Pass
25 008	D-8	3	C93-02881	12/28/93	14 00	12/29/93	14 00	Pass
25 009	D-9	3	C93-02967	01/04/94	12 55	01/05/94	12 55	Pass
25 010	D-10	3	C93-02939	12/31/93	10 00	01/03/94	10 00	Pass
25 011	D-11	3	C93-03333	01/06/94	12 10	01/07/94	12 50	Pass

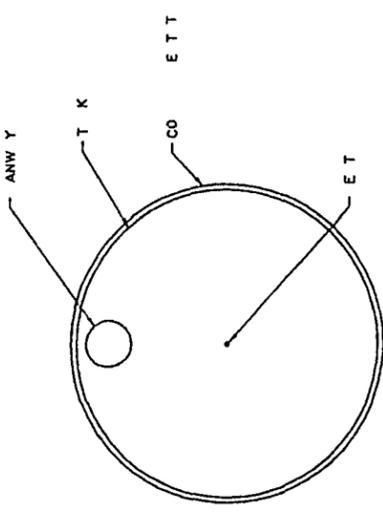
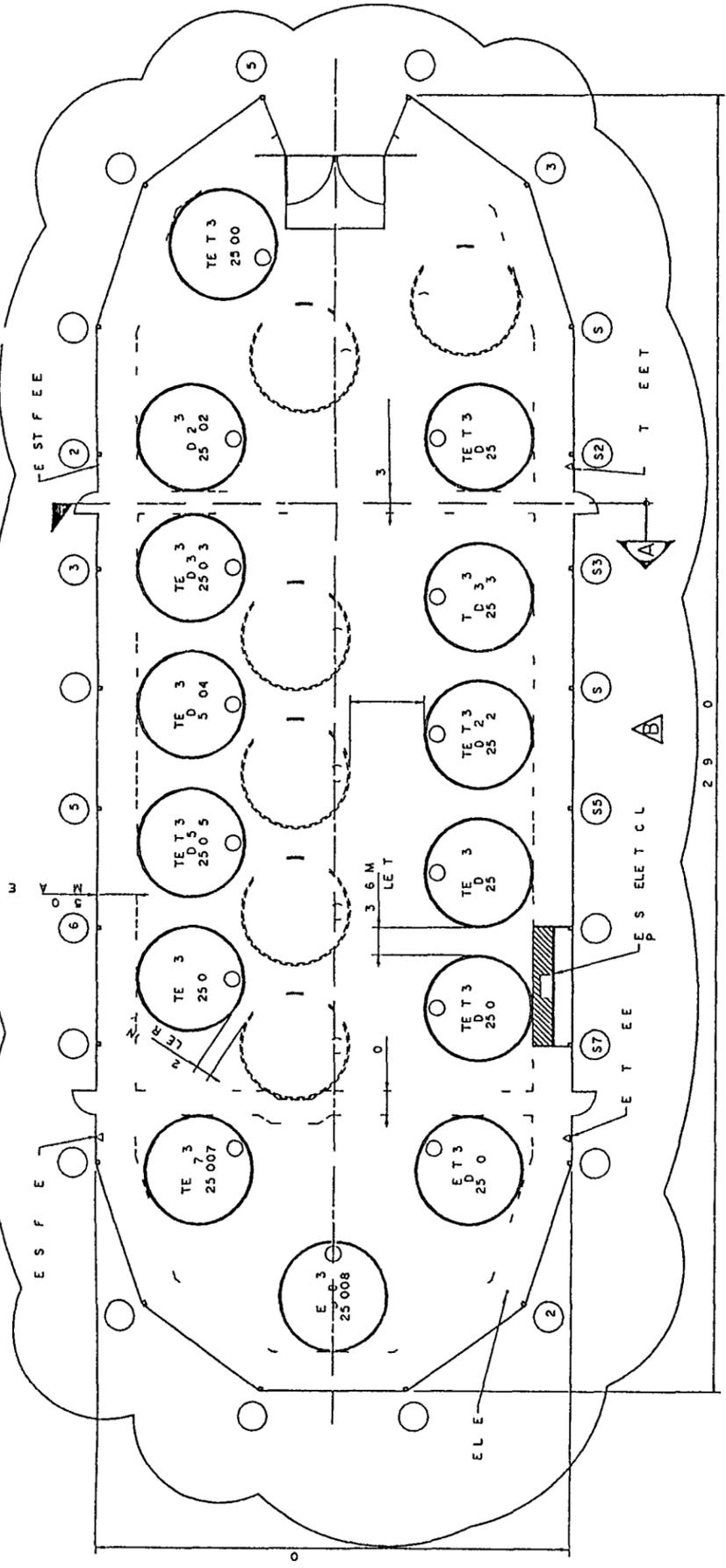
NOTES

1. REMOVE CRET BRRER FROM FRESH ELECTRICAL
2. L. BETWEE COL S6 & S7
3. T. FRICTIO S BC T TRS LL DETER NET K PLACE E T SLE D E T C L E R C E S
4. S. OWN DR W G
5. T. S LL T BE PL D ONE IST RETE P DS FL F
6. TA LE BETWEEN T E TAN D TENT F BR C
7. TER ST L T P T EG ESS SL S ON FLOOR SL L E
8. E ST G E RESS INES WH C CO L T WITH NEW EGRESS R UTES
9. SEE DR W G 5 06 0 FOR VE T PIP G
10. SEE DR W G 5 006 750 THRU 756 FOR LEAK DETECT O SYSTE .
11. T LO TO F E CH TANK ON THE 750 P D S LL BE R KED
12. W T E L L O W P T P O T PL GENE T THE MA SH LL
13. D C T E T E O T S I D E D M T E R E T E S E C O D R Y C O T T
14. T K A M B E R O F S T R U C T U R E G E T C H E C K E C H
15. L C T A F A C E O F S T R U C T U R E T O C G T H E T C H E C K E C H
16. F T S F A C E I F R E Q U I R E D S H A L L B E P E R T H E S T R U C T U R E L
17. E G E E R R E D R E M E N T

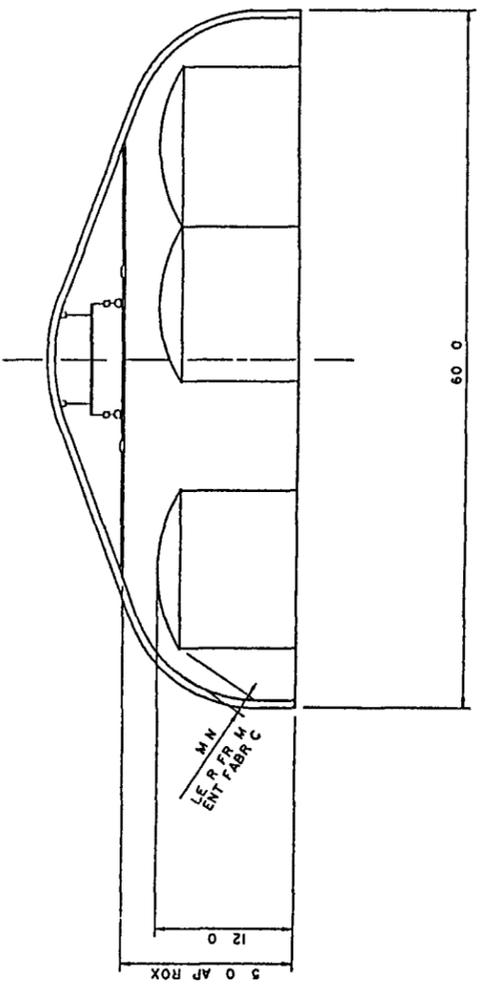
LEGEND



T K M B R	SER L MBE	SECO DA Y T SER L UMBER
25 0	C 93 03 32	C 93 03 37
25 0 2	C 93 29 5	C 93 33 7
25 0 0 3	C 3 33 5	C 3 29
25 0 0	C 3 03 3 5	C 93 03 3 8
25 5	C 93 03 3 5	C 93 03 3 0
5 0	C 93 03 5 3	C 3 03 6
25 7	C 93 02 8 9	93 02 9 6
2 0 0	C 3 2 8 8	C 93 02 8 9 5
25 0 0 9	C 3 9 6 7	C 93 2 9 7 9
25 0	C 3 02 9 3 9	C 93 03 5 8
25	C 3 3 3 3 3	C 93 3 3 2
25 0 2	C 93 03 2	C 3 3 3 3 8
25 0 3	C 93 03	C 93 03 0 5
25 0	93 3 0 7 2	3 3 0 6



TANK DETAIL
SCALE 0



SECTION A
SCALE 0

KEYWORDS	ACCELER ED	DE CR NO	DATE	RTIME T
2. SL. DG				
3. REMO L			11-17-93	
4. P O ECT			11-17-93	
5			11-17-93	
750 P D			11-17-93	
E T 3			11-17-93	
750 PAD			11-17-93	

