

10-29-60, 94

FIGURE 3

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A. 10K AND 30K PENTABORANE FLOW SYSTEM

Figure 3 illustrates a schematic of the pentaborane flow system designed to accommodate Nan Stand. For the sake of clarity, none of the other propellant feed or ignition systems on Nan Stand are shown since they are all conventionally gas pressurized.

The propellant storage tank incorporates dual burst diaphragms, dual vents, and a nitrogen gas purge for flushing the vent lines subsequent to a test firing. All valves on the pentaborane facility are normally closed, i.e., "fail safe", with the exception of the low pressure burst diaphragm closure. In the event of failure of the vent valves to relieve tank pressure, the tank is further pressurized and relieved through the rupture of the low pressure burst diaphragm. The normally open valve can then be closed to prevent pentaborane vapors from continually issuing from the system.

The ends of the vent lines are prevented from being a hazard source through using a nitrogen flush in the vents and sealing the vent lines at the conclusion of the test day's operations.

Once the shipping cylinders are connected, the filling operation is remotely handled. Photograph 1241-3/5/60-31Q shows the pentaborane shipping cylinders next to the 420 gallon propellant feed tank. The cylinders are not disconnected after the filling operation but remain "at the ready" to receive liquid from the run tank if it is desired to empty the pentaborane system. Not only can the pentaborane be

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returned to the shipping cylinders, but it also can be transferred to a 600 gallon catch tank. This catch tank normally holds a dilute toluene-pentaborane solution, received during transfer or decontamination operations. Also provided is a steel burn basin which has been placed in the middle of a 35,000 gallon water sump. The burn basin will be used as required to dispose of the toluene-pentaborane solution. In the event of an emergency the total contents of the run tank can be disposed of in this manner.

A liquid return system has been provided to empty the line between the tank shutoff valve and the main valve at the end of the test day. Since the main propellant system consists of 2 and 3 inch pipe, a considerable quantity of pentaborane is removed from an area of potential danger created by other nearby stands firing. This operation reduces the potential spill hazards involved in the event the main propellant line is damaged by an external malfunction.

Toluene is used as the primary diluent and decontaminant. A gas pressurized tank has been installed and is capable of delivering toluene to any section of the propellant system. Not only is toluene used in the above fashion but it can be used as an inert lead during injector test operations. Photograph 1241-8/5/60-S1C is a photograph of the main valve system showing the hydrazine and pentaborane main valves and the toluene, helium, nitrogen, and water flushes for the main valve complex.

The following procedures are actually used for test operations by well trained personnel. Because of the very dynamic nature of the PB program, they may not always be up to date in this manual, but generally, they will suffice to insure personnel security.

B. PENTABORANE FILLING PROCEDURE FOR 420 GALLON RUN TANK

See Figure 3.

1. Unplug vent lines and open vent closure.
2. Check PB tank pressure, if more than 20 psig, open emergency vent and vent tank.
3. Place 15 psig of helium on helium flush hand loader.
4. Open cylinder flush.
5. Connect helium pressurizing line to points G1 and G2.
6. Open cylinder by-pass.
7. Connect helium line to points I1 and I2.
8. Open catch tank valve.
9. Open catch tank vent.
10. Open #2 disposal. Adjust helium to 25 psig.
11. Open fill #1.
12. Close fill #1 and open fill #2.
13. Close fill #2.
14. Close catch tank vent.
15. Close cylinder by-pass and cylinder flush.
16. Close disposal #2.
17. Adjust helium pressure to 75 psig.
18. Open G1 and check pressure in bottle.
19. Vent bottle to 75 psig by cylinder vent if necessary.
20. Open L-1.
21. Open fill #1.

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PENTABORANE FILLING PROCEDURE FOR 420 GALLON RUN TANK (Cont'd)

22. Open main-fill.
23. Open cylinder flush.
24. Empty bottle.
25. Close cylinder flush.
26. Close main fill.
27. Close fill #1.
28. Open G2 and check pressure in bottle #2.
29. Vent bottle to 75 psig by cylinder. Vent if necessary.
30. Open L2.
31. Open fill #2.
32. Open main-fill.
33. Open cylinder flush.
34. Close main fill.
35. Close fill #2.
36. Vent bottles to 10 psig.
37. Reduce helium pressure to 25 psig.
38. Open and close disposal #2.

C. PENTABCRANE LIQUID RETURN TO COLUMNS FROM 420 GALLON RUN TANK

See Figure 3.

1. Vent pentaborane tank to 10 psig max.
2. Check that G1, G2, and L1 and L2 are open.
3. Open main fill.
4. Open fill #1.
5. Fill bottle to desired level.
6. Close fill #1.
7. Open fill #2.
Fill bottle to desired level.
8. Close fill #2.
9. Close main fill.
10. Close L1, L2, G1, and G2.

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D. PENTABORANE CYLINDER DISCONNECTION FROM 420 GALLON RUN TANK FILL SYSTEM

See Figure 3.

1. Set helium to 25 psig.
2. Check that sufficient toluene in catch tank.
3. Open catch tank valve and catch tank vent.
4. Open disposal #2.
5. Open fill #1.
6. Open TOL #1.
7. Flow toluene for 15 seconds.
8. Close TOL #1.
9. Close fill #1.
10. Open fill #2.
11. Open TOL #2.
12. Flow for 15 seconds.
13. Close TOL #2.
14. Open cylinder flush and cylinder bypass.
15. Purge for 15 seconds.
16. Close fill #2 and open fill #1.
17. Purge for 15 seconds.
18. Close fill #1 and cylinder flush and cylinder bypass.
19. Repeat steps 5 through 18.
20. Close disposal #2 and catch tank valve and catch tank vent.
21. Reduce helium pressure to 15 psig.
22. Open cylinder bypass and cylinder flush.
23. Disconnect L1 and L2; cap and plug.
24. Close cylinder bypass.
25. Disconnect G1 and G2; cap and plug.
26. Close cylinder flush.

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2. TRANSFER OF PENTABORANE TO CATCH TANK FROM 420 GALLON RUN TANK

See Figure 3.

1. Ascertain that PB tank pressure is vented to 50 psig or below.
2. Open catch tank fill.
3. Open emergency dump.
4. After emptying tank section, open tank shut-off and dump.
5. Open Man prevalve, close dump and open #3 disposal.
6. Close #3 disposal and open #4 disposal, then close #4 disposal.
7. Empty toluene tank into catch tank for diluent effect percentage of Pentaborane of at least no greater than 40%.
8. Close L1 and L2.
9. Open TOL #1.
10. Open TOL #2.
11. Open fill #1.
12. Open fill #2.
13. Open disposal #2.
14. Close valves in Steps 9 through 13.
15. Refill toluene tank if necessary and repeat Steps 9 through 14.
16. Vent catch tank if necessary during disposal.

F. DISPOSAL OF PENTABORANE FROM 120 GALLON RUN TANK INTO SUMP AND BURNING

See Figure 3.

1. In the event it is desired to dispose of the pentaborane directly into the sump and burn it, the following procedure should be followed:
 - a. Transfer 30 gals of toluene into the sump burn off container by following steps b through f.
 - b. Ascertain that I1 and I2 on FB cylinders are closed.
 - c. Open TOL #1 and TOL #2.
 - d. Open fill #1 and fill #2.
 - e. Open disposal #2.
 - f. Open pond valve to water sump.
 - g. When approximately 30 gals are delivered to the sump, about 1/2 to 1 inch layer of toluene on the water surface, close valves opened in steps b through f.
 - h. Remotely ignite surface of toluene floating on water by actuating igniter switch on consol, after placing ignitor in the sump.
 - i. After flame is established, commence disposing of FB in small quantities as follows: (keep FB tank pressurized to between 10 and 20 psig).
 - j. Cycle emergency dump.
 - k. After completing the emptying of the tank section, close emergency dump, open tank shutoff and main dump.
 - l. Open Man pre valve, close main dump and open #3 disposal.
 - m. Close #3 disposal and open #4 disposal.
 - n. Close #4 disposal.

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G. COMPLETE SYSTEM DECONTAMINATION IF REQUIRED AFTER DISPOSING OF
PENTABORANE

The system should be completely filled with toluene and held for a sufficient period of time (3 to 8 hours) to insure that all PB is dissolved in toluene and disposed of by burning in the same manner as above.

The system should then be filled with the 3% NH_3 solution and held for two days. Since considerable hydrogen evolution will occur allowance must be made for the gas to escape.

The system should then be filled with an alcohol water solution and held for two more days.

The system can then be washed with water, dried, and monitored with PB detector.

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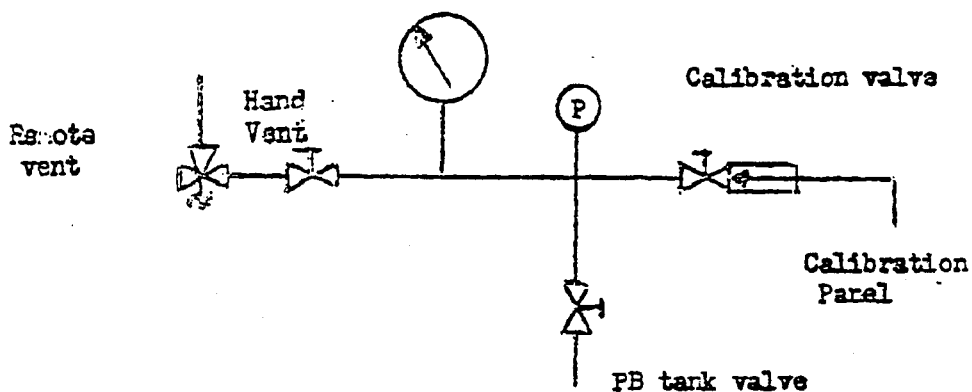
H. DECONTAMINATION OF HARDWARE, HAND TOOLS, AND EQUIPMENT

1. Prior to test operations, containers of a decontamination solution are placed in PB contaminated drum storage area. The solution for brevity will be referred to as Decon.
2. After transfer or test firings are completed and tools or hardware are to be decontaminated, the following procedures should be followed:
 - a. Prime the PB injector dome with toluene before working on the motor.
 - b. Purge PB dome at low purge pressures.
 - c. Remove instrumentation and plug the PB injection pressure lines.
 - d. Disconnect CTF lines and plug.
 - e. Disconnect hydrazine lines and plug.
 - f. Disconnect PB line and plug.
 - g. Remove hardware and place in Decon.
 - h. All tools used in the test operation are to be washed with water and then placed in Decon; then rinse tools with water and place in ethyl alcohol.
 - i. The test area is ready for hosing down with Decon, See Part I-3.

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I. CALIBRATION PROCEDURE FOR PENTABORANE TANK



1. Close PB tank valve.
2. Open hand vent.
3. Place calibration pressure on panel at higher value than in PB tank.
4. Open calibration hand valve.
5. Open remote vent and purge for 3 minutes.
6. Reduce calibration pressure to ZERO.
7. Commence calibration by closing remote vent and applying pressure from panel.
8. After calibration pressure reached, open remote vent before reducing pressure on calibration panel.
9. After calibration completed, close remote vent, calibration valve and hand vent.
10. Open PB tank valve.

J. PENTABORANE SYSTEM INSPECTION

Ex. 34 - 5295

All valves, fittings, flanges, etc., on the 10K and 30K pentaborane flow system will be inspected for pentaborane leakage, both visually and with the Remcon borane monitor weekly. The responsible project engineer is responsible for setting up a weekly inspection schedule and for seeing that this system is free from leakage.

PART III

OTHER PROCEDURES

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A. Equipment Laboratory

1. Introduction

All items, such as valves, test hardware, etc., which have been used in Pentaborane must be decontaminated at the test site, packaged in open packages and properly tagged according to REFM IV-13 prior to shipment to E.L. for service.

REFM IV-13 specifies the general procedures that the test site and receiving organizations, such as E.L., will follow when receiving decontaminated items.

2. Special Test Site Decontamination Procedure for Items Used in Pentaborane: To be Performed by Test Site Personnel.

The following decontamination procedure will be used for decontaminating items used in Pentaborane:

- a. Disassemble item, if there are several component parts, in 3% (weight) ammonium hydroxide plus 3% (weight) detergent solution. Immerse one piece items. Discard all non-metal parts in suitable contaminated containers for subsequent destruction.
- b. Rinse with water.
- c. Immerse in 92.5% ethyl alcohol.
- d. Rinse with water.
- e. GN_2 dry.
- f. Examine with Demco Pentaborane detector.

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- g. Package in open container.
- h. Tag according to REPM IV-13.
- i. Ship to E.L. E.L. will take suitable precautions according to REPM IV-13 and the PFL Safety Department and subsequently service the items. Items will be returned to test site according to REPM IV-13.

* Reference: IOL dated 18 May 1960 to Those Concerned, From R. K. Hanks, Jr. and M. C. Blum, "Servicing, By the Equipment Laboratory (E.L.) of Items Used in Pentaborane".

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PENTABORANE CHECKOUT LIST

I - AREA CHECKOUT

A. - SURE

- 1. Gates _____
- 2. Drain _____

B. - FIREX SYSTEM (Morning of Test)

- 1. Tank Farm _____
- 2. Pit #1 _____
- 3. Catch Tank _____
- 4. Floor Flush _____
- 5. Flame Bucket _____
- 6. Safety Showers _____

C. - DECON SYSTEM

- 1. Supply Tank (Gal) _____
- 2. Pump _____
- 3. Foot Bath _____
- 4. Hardware Bath _____
- 5. Tool Bath _____

D. - PRESSURIZING GAS SUPPLY

- 1. Helium Pressure _____
- 2. Open PRA Valve from OTL-I _____
- 3. Open Pit #1 & #2 Hand Valves _____
- 4. GMP Pressure _____
- 5. OTL-III GMP Bottles _____

E. - SAFETY

- 1. Breathing Bottle Bank
(1) _____ (2) _____ (3) _____ (4) _____ (5) _____
- 2. Scott Paks _____
- 3. Gra-Lite Clothing _____
- 4. Cotton Coveralls _____

F. - COMMUNICATIONS

- 1. Head Phones _____
- 2. CKT #1 _____
- 3. T.V. Camera _____

G. - MISCELLANEOUS

- 1. Boron Detector _____
- 2. Air Duct & Black House Vent _____
- 3. TCC _____
- 4. Fire Dept. Equipment _____

II - STAND CHECKOUT

<u>STAND ITEM</u>	<u>Hydration</u>	<u>NTO or OTF</u>	<u>Toluene</u>	<u>Water</u>
1. Bulker Pressure	_____	_____	_____	_____
2. Valve Checkout	_____	_____	_____	_____
3. Micro Switch Light	_____	_____	_____	_____
4. Pressure to FC or 100% Flow	_____	_____	_____	_____
5. Station	_____	_____	_____	_____
6. Pressure Flow	_____	_____	_____	_____

PENTASORANE CHECKOUT LIST

Page 0

B. SKINNER PRESSURES

- 1. Fuel & Oxidizer Main Valves _____
- 2. Tank Farm _____
- 3. Helium Flush _____
- 4. Vent Purges _____

C. -PURGES

- 1. Hand Selector Valves _____
- 2. HZ Valve Purge _____
- 3. PB Valve Purge _____
- 4. HE Injector Purge _____
- 5. PE Injector Purge _____
- 6. N1C Valve Purge _____
- 7. Gas Sampling Purge _____

D. -CANNON PLUGS

Signature, Engineer in Charge

Ex. 34 - 5300

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TEST PROCEDURE

A. Pentaborane system valve checkout

1. Begin assembly of PB main line
2. Uncap PB vents
3. Purge vent lines
4. Open PB cylinder valves
5. Open dump tank fill (catch tank fill valve)
6. Check valve activation and micro switch indicators
7. Vent PB tank for zero
8. Open PB shut-off and Pre-valve
9. After 3 minutes pressurize PB tank to 200 psi
10. Check for PB leaks
11. Vent PB tank

B. Firing procedure

1. Vent all propellant tanks
2. Check that all purges are off
3. Take preliminary zeros
4. Set PB injector purge loader to 300 psi
5. Turn on PB transducer purge
6. Turn on OTE purge
7. Operate PB & H2 valve purges for 5 seconds simultaneously
8. Open PB injector purge
9. Open gas sample purge
10. Open H2 main - 1 second bursts until primed
11. Turn on H2 injector purge for 10 seconds
12. Turn off PB injector purge when clear

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D. DECONTAMINATION SOLUTION SYSTEM IN PRA

A 9000 gallon decontamination ("Decon") solution (3% ammonia plus a.1% detergent - Lever Bros. DW 300-in water) storage and use system is now available in PRA. The solution is pumped from the 9000 gallon storage tank to the PRA test pit area, Man Stand, the pentaborane propellant feed system area, and the personnel decontamination facility. In the test pit area, two rainbirds are mounted and piped to both the "decon" system and to a fresh water system so the entire test pit and tank farm areas can be decontaminated and rinsed remotely from the PRA control center. Also, Man Stand has a remote "decon" system similar to the present firex system so the stand can be decontaminated remotely from the control center. The Man Stand firex system will be used to rinse away the "decon" solution. Also, hose bibs are located at strategic places throughout the test pit area to facilitate decontaminating of tools, hardware, transducers, etc.

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E. PERSONNEL DECONTAMINATION IN PRA

A shower and change facility is available in PRA for personnel decontamination at the daily cessation of pentaborane test activities. The facility has four rooms, a "not contaminated" change room, a shower room, a "contaminated" change room, and a toilet. The contaminated room is only considered contaminated immediately after test activities and will be decontaminated as soon as is possible after each test activity.

The following procedures will be followed by all personnel engaged in pentaborane test activities; that is, by all personnel who will actually be in the control center during the pentaborane testing.

1. At the start of any pentaborane test activity, personnel will enter the "not contaminated" change room and change into flame-proof coveralls and neoprene boots.
2. They will then proceed to the "contaminated room" and get in the Gralite suits, hood, and gloves and proceed to their test activities.
3. After the test activities are over for the day, personnel will wash their Gralites in Decon and water at the entry to the "contaminated" change room.
4. Personnel will then hang the Gralites to dry on the racks provided in the "contaminated" change room.
5. Neoprene boots will also be washed, and a washer and dryer are available to wash the flame-proof coveralls.

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6. Contaminated coveralls which will be soaked overnight in "Lecon" solution can be washed the next day.
7. The "contaminated" change room will be washed down before leaving for the day.
8. Personnel will then proceed to the shower room and wash with green soap.
9. After showering, personnel can put on the "street" clothes.

Ex. 34 - 5306

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Those Concerned

AVOID VERBAL ORDERS

M. C. Blum

INTER-OFFICE CORRESPONDENCE

591-361

PHONE 5667

SUBJECT: Securing of the Propulsion Research Area (PRA)
Test Pit Area Outside of the Basic PRA Work Week

DATE: 23 October 1960

The basic PRA work week is from 7:00 A.M. to 4:00 P.M. Monday through Friday, holidays excepted.

In order to protect any personnel who might wish to work in the PRA test pit area from the potential hazards of the Pentaborane Storage and Use system, the following procedures are established for use outside of the basic PRA work week.

1. The PRA test pit area will be chained and posted at all entry points. The PRA Group 591-361 leadman or his designee will be responsible to see that this is done daily and on weekends.
2. Anyone desiring to work in the PRA test pit area must notify Industrial Security, X5485, upon entering and leaving the test pit area. He must leave the name of the person who is responsible for the work to be conducted and the total number of personnel involved.

Approved:



M. C. Blum
Senior Research Engineer
Liquid Propulsion
Research

9/59/11

G. S. Gill
Group Scientist
Liquid Propulsion
Research

MOB:ra

cc: Research Supervision
Maintenance
Industrial Engineers
Industrial Security
E. L.
Fire Dept.

W. Colwell	D/591-361
R. Gordon	D/551
E. Higgins	D/551
H. Weiss	D/596-160

Ex. 34 - 5307

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NAHETTE PROCEDURES

I. Area Checkout

- A. See attached sheet

II. Pre-run Procedures

1. N_2H_4 and CTF Priming Operations

- a. Open tank shut-off
- b. Open hand valve
- c. Open pre-valve (remote)
- d. Open hand bleed valve and close
- e. Close pre-valve (remote)

2. Prime CTF line

- a. Hook up CTF bleed line to #4 Main valve
- b. Open Nan tank shut-off and pre-valve
- c. Open pre-valve (remote)
- d. Pressurize CTF tank to 50 psi
- e. Open main valve #4 until system is primed
- f. Close pre-valve (remote)

3. Set gas and liquid purge pressures

- a. N_2 for CTF - 100 psig
- b. H_2 for FB - set after run to 25 psig
- c. H_2 for P_2 - 300 psig
- d. Pressurize water tank - 100 psig
- e. Pressurize toluene tank - 100 psig

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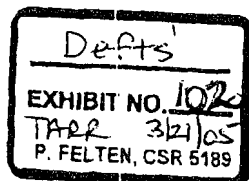
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BURN PIT DISPOSAL INVENTORY

YEAR	MATERIAL	QUANTITY	SOURCE	DISPOSAL METHOD
1961	ACETONE	110 gal	CANOGA	BURN
		110 gal	B LAB	
1961	AMMONIA	205 gal	PHOTO	DILUTION
1961	BORON FUEL	110 gal	CANOGA	BURN
1961	BORON TRIFLUORIDE	240 ft ³	A I	DESTRUCTION
		5 lbs	A LAB	
1961	CARBON TETRACHLORIDE	110 gal	B LAB	BURN
1961	CESIUM	2 lbs	CANOGA	BURN
1961	DECON SOLN.	110 gal	CANOGA	DESTRUCTION
1961	DITTO FLUID	110 gal	CANOGA	BURN
1961	ETHYLENE DIAMINE	55 gal	SPA	BURN
1961	FLUSHING OIL	385 gal	CANOGA	BURN
1961	GASOLINE	110 gal	CTL 3	BURN
1961	GEAR OIL	165 gal	DRUM STORAGE	BURN
1961	HEPTANE	500 gal	QUICK MIX	BURN
1961	HEXANES	1045 gal	CANOGA	BURN
		55 gal	DRUM STORAGE	
		55 gal	B LAB	
	TOTAL	1155 gal		
1961	HYDRAULIC OIL	55 gal	CTL 4	BURN
1961	HYDRAZINE	6845 gal	CANOGA	BURN
		55 gal	DELTA	
		55 gal	CTL 3	
	TOTAL	6955 gal		
1961	ISOPROPYL ALCOHOL	110 gal	CANOGA	BURN
1961	LACQUER Dilute	55 gal	DRUM STORAGE	BURN
1961	LITHIUM CHLORIDE	825 gal	CANOGA	DISSIPATION IN H ₂ O
1961	MAGNESIUM	820 gal	SPA	BURN
1961	METHYL ALCOHOL	110 gal	B LAB	BURN
1961	MISC. FLAMABLES	2186.5 gal	CANOGA	BURN
1961	MISC. LAB CHEMICALS	200 gal	CANOGA CHEM	BURN
1961	MIXED OXIDES	300 lbs	SPA	BURN
		300 lbs	CANOGA	
	TOTAL	600 lbs		
1961	MYDYNE	5200 gal	SPA	BURN
		420 gal	CTL-3	
	TOTAL	5620 gal		



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BURN SET DISPOSAL INVENTORY

YEAR	MATERIAL	QUANTITY	SOURCE	DISPOSAL METHOD
1961	NITROGEN TETROXIDE	6585 gal 2150 gal 1000 gal	CANOGA BRAVO III ENG. + MAT Service	DILUTION
	TOTAL	9735 gal		
1961	PENTABORANE + RF-1	520 gal 865 gal	"A" LAB CANOGA	BURN
	TOTAL	1385 gal		
1961	PERMANGANATE MIX	55 gal	INST- LAB	BURN
1961	POTASSIUM	7 lbs	CANOGA	BURN
1961	Red Fuming HNO ₃	15 gal 1270 gal	SPA CANOGA EGA	DILUTION
	TOTAL	1285 gal		
1961	RP-1	220 gal 660 gal	CANOGA HEAT TRANS. LAB	BURN
	TOTAL	880 gal		
1961	SODIUM	830 lbs 50 lbs 25 lbs	CANOGA HOT FUEL LAB SETF	BURN
	TOTAL	905 lbs		
1961	Solid Propellants	100 lbs	Quick Mix	BURN
1961	VM + P Naptha	330 gal	DRUM STORAGE	BURN
1961	GRAND TOTAL gal. GRAND TOTAL lbs	54,535 gal 3,115 lbs		



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BURN PIT DISPOSAL INVENTORY

YEAR	MATERIAL	QUANTITY	SOURCE	DISPOSAL METHOD	
1962	ALCOHOL	55 gal	SPA	BURN	
		220 gal	CANOGA		
		TOTAL 275 gal			
1962	AMMONIA	233 gal	PHOTO	DILUTION	
1962	AMMONIA PERCHLORATE	225 lbs	NAKA	DETONATION	
1962	BLASTING CAPS	3	EDWARDS	DETONATION	
1962	CALCIUM HYDRIDE	400 lbs	CANOGA	DILUTION	
1962	CAUSTIC SODA	1.0 gal	SPA	DILUTION	
1962	CHROMIC ACID	25 gal	BOWL AREA	OFF SITE	
1962	DECON	220 gal	CANOGA	BURN	
1962	DIETHYLCYCLOHEXANE	16.5 gal	SPA	BURN	
1962	DINITROTOLUENE	1 lb	NAKA	BURN	
1962	ELECTRIC IGNITERS	95	WAREHOUSE	BURN	
1962	ETHYLENE DIAMINE	375 gal	CANOGA	BURN	
1962	FLUORINE	6 lbs	CANOGA	DESTRUCTION	
1962	GASOLINE	55 gal	NEPTUNE Protect	BURN	
1962	Hybrid Motor Grains	120 lbs	NAKA	BURN	
1962	HYDRAZINES	1450 gal	SPA	BURN	
		1 lb	A LAB		
		5 lb	NAKA		
		1315 gal	CANOGA		
Totals		2765 gal	6 lbs		
1962	HYDROCARBONS	8030 gal	SPA	BURN	
1962	JP-4	4000 gal	ENGINE TEST	BURN	
1962	Lithium Hydride	1 lb	SPA	BURN	
		Lithium	5 lbs		CANO
		TOTAL	6 lbs		
1962	Metricol-tri-nitrate	25 lbs	NAKA	BURN/DESTRUCTION	
1962	Misc. Waste Chem	50 gal	Inst. LAB		
		3 gal	A LAB		
		850 gal	NAKA		
		1975 gal	CANOGA		
		TOTAL	2878 gal		
1962	MYDYNE	125 gal	CANOGA	BURN	
62	NTO	1800 gal	SPA	DILUTION	
		2 gal	B LAB		
		TOTAL	1802 gal		
1962	NITROGLYCERIN	4 gal	B LAB	DESTRUCTION	
1962	NITRO-GUANIDINE	6 lbs	NAKA	DESTRUCTION/BURN	



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BURN PIT DISPOSAL INVENTORY

YEAR	MATERIAL	QUANTITY	SOURCE	DISPOSAL METHOD
62	OXYGEN Difluoride	2 L. eq. 2 lbs.	SPA PRA	DETONATION
1962	PENTABORANE	75 gal 1090 gal 70 gal	PRA A LAB SPA	BURN
	TOTAL	1235 gal		
1962	Plastisol Nitrocellulose	5 lbs	NAKA	DETONATION
1962	POTASSIUM	4 lbs	CANOGA	BURN
1962	POTASSIUM Perchlorate	25 lbs	NAKA	BURN
1962	Pyrophoric Aluminum	6 lbs	SPA	BURN
1962	Red Fume Nitric Acid	520 gal 1050 gal	SPA CANOGA	DILUTION
	TOTAL	1570 gal		
1962	RJ-1	3600 gal 300 gal	DELTA-1 WAREHOUSE	BURN
	TOTAL	3900 gal		
1962	STODDARD SOLVENT	415 gal	ERS	BURN
	TEA	50 gal	A LAB	BURN
1962	TURBINE SPINNER GRANULES	1550 lbs	WAREHOUSE	BURN
1962	SODIUM NITRATE	55 gal	ERB	DETONATION
1962	UDMH	1790 gal	CANOGA	BURN
1962	WASTE oil	250 gal 3025 gal	Equip lab	BURN
	TOTAL	3275 gal		
1962	WASTE POLYMERS	175 gal	C LAB	BURN
	GRAND TOTALS	33012 gal 2427 lbs		



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BURN PIT DISPOSAL INVENTORY

YEAR	MATERIAL	QUANTITY	SOURCE	DISPOSAL METHOD
1963	AMMONIA	145 gal	Photo	DILUTION
1963	BARIUM CHLORIDE	50 lbs	CONSERVATION	DILUTION
1963	BERMITE CARTRIDGE	72	WAREHOUSE	BURN
1963	BORON 90%	1 gal	CANOGA	DESTRUCTION
1963	CAUSTIC SODA	650 gal	SPA	DILUTION
1963	CESSION	5 lbs	CANOGA	BURN
1963	Chemicals, Unknown	21 gal	CANOGA	BURN
		35 gal	C LAB	
	TOTAL	56 gal		
1963	Chloride Trifluoride	10 gal	A LAB	DESTRUCTION
1963	Chlorobutadiene	80 lbs	C LAB	DESTRUCTION
1963	Cyclo-tetramethylene			DESTRUCTION
	NITRAMINE	5 lbs	HAPPY VALLEY	
1963	DITHYLENE TRIAMINE	500 gal	SPA	DESTRUCTION
1963	Electric IGNITER	555	WAREHOUSE	BURN
		20	bowl AREA	
	TOTAL	575		
1963	ETHYLENE DIAMINE	150 gal	SPA	BURN
1963	FLUORIDE	105 lbs	SPA	DESTRUCTION
		6 lbs	CANOGA	
	TOTAL	111 lbs		
1963	HYDRAZINE	520 gal	SPA	BURN
		140 gal	B LAB	
		5 lbs	CANOGA	
	TOTAL	5340 gal ; 5 lbs		
1963	HYDROCARBONS	14800 gal	SPA	BURN
1963	ISOPROPYL BUTANE	625 lbs	NEPTUNE PROJECT	BURN
1963	JP-4	500 gal	SPA	BURN
1963	MAGNESIUM	200 lbs	CANOGA	BURN
1963	Metals, ALKali	5 lbs	CANOGA	BURN
1963	Misc. Acids	150 gal	CANOGA	DILUTION
1963	MURIATIC ACIDS	50 gal	CANOGA	DILUTION
1963	NITROCELLULOSE	25 lbs	CANOGA	DESTRUCTION
3	NTO	100 gal	B LAB	DILUTION
		177 gal	SPA	
		2010 gal	BRAVO	
	TOTAL	2287 gal		
1963	Oil, WASTE	10 gal	WAREHOUSE	BURN
1963	Polyethylene Glycol	55 gal	HAPPY VALLEY	Detonation



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