Rockwell International Corporation
Rocketdyne Division
Santa Susana Field Laboratory
Ventura County, California

Area I Thermal Treatment Facility
CAD 093 365 435

Revised Closure Plan

2 January 1992
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1.0 INTRODUCTION

This document has been prepared in response to a letter received by Rockwell International Corporation, Rocketdyne Division on 3 September 1991 from Lester Kaufman, Chief, Permits Section, Hazardous Waste Management Division, U.S. Environmental Protection Agency. Its Purpose is to present a revised closure plan which addresses inadequacies of the closure plan submitted as part of the Part A Interim status permit application for Area I Thermal Treatment area located at the Rockwell International Corporation, Rocketdyne Division's Santa Susana Field Laboratory. The Santa Susana Field Laboratory is located in the Simi Hills, Ventura County, California. The procedures describe how the permitted facility will be closed in a manner that will protect human health and the environment.

The owner/operator of the facility is Rockwell International Corporation, Rocketdyne Division. The facility is located at the top of Woolsey Canyon Road, Simi Hills, California. The mailing address for the facility is: 6633 Canoga Avenue, Canoga Park, California, 91303.

2.0 SITE DESCRIPTION

2.1 DESCRIPTION AND HISTORY OF FACILITY

The Santa Susana Field Laboratory (SSFL) is a 2700 acre complex situated at an elevation of 1850 feet in the Simi Hills on the border of Ventura County and Los Angeles County. A map noting the location of both the SSFL and the Area I Thermal Treatment Facility is given as Figure 1 of the attached Sampling and Analysis Plan. Rockwell International Incorporated, Rocketdyne Division (Rocketdyne) operates and maintains a number of rocket engine test facilities and research and development laboratories at the SSFL.

At one location at the SSFL, propellant waste is generated in small bench-scale quantities at the NAKA Research Laboratory. (The acronym NAKA stands for North American Kindleberger Atwood, a hybrid description of a laboratory derived from the previous name of Rockwell International and the founders of the laboratory.)

The NAKA Research Laboratory is located approximately nine tenths of a mile from the Thermal Treatment Facility and is not a part of the permitted unit.

Research conducted at the NAKA Research Laboratory on solid rocket and gun propellants generates waste products and cleaning materials of which the hazardous constituent is explosive, reactive or ignitable. At the Component Test Laboratory III hypergolic rocket engine ignitors were both...
produced and experimented with. Thus, a number of hypergolic ignitors required disposal. The Area I Thermal Treatment Facility was an area used for the small scale destruction of explosive wastes by open burning.

Open burning and open detonation was chosen as an alternative to transporting potentially dangerous wastes through the community. It was felt that the explosive, reactive and ignitable wastes generated at the research laboratories could be safely and efficiently treated at a remote location at the SSFL.

Strong oxidizer compressed gases are also utilized at the SSFL in a variety of experiments and processes ranging from laser research to rocket propellent preparation. Occasionally, a compressed gas cylinder that could no longer be safely transported on public roads would be destroyed at the Area I Thermal Treatment Facility.

The Area I Thermal Treatment Facility is located in a cleared area on the south side of the facilities active portion of SSFL. See Figure 1 of the attached Sampling and Analysis Plan. Access to the Area I Thermal Treatment Facility is along the Area I Road and to the west of the Perimeter Pond. The area consists of a mostly unpaved area of reasonably flat terrain which is routinely graded to eliminate vegetation.

The western portion of the facility has been used for demonstrations and training activities by Santa Susana Fire Protection. It is flat and mostly vegetation free. There are several tables, buckets, and stands that were used for the training and demonstration purposes.

On the eastern portion of the Area I Thermal Treatment Facility there are two bermed area, and old control center wall and several hundred square feet of asphalt.

One berm is located on the south side of the facility and is approximately 8 feet in height and is "L" shaped. Within the berm is a 19.5 feet by 20 feet concrete pad which was built concave to prevent any liquids from running off. Two pipe bollards that have been modified to hold cylinders are attached to this pad. The berm surrounds the southern and eastern sides of the pad.

The second concrete pad is 6.5 feet by 6.5 feet and is surrounded on all sides by an 8-foot high soil berm. A burn cage measuring six feet by six feet by six feet covered with thick, densely woven steel mesh is housed on this pad. A longitudinally split 55 gallon steel drum was housed within the cage. Explosive materials and paper, the compounds TEA and TEB, etc. were loaded into a the split drum and ignited. The steel cage eliminated the possibility of waste materials escaping the facility while treatment was in progress.
cage also acted to control wind dispersal of the ash residue.

Facility operation 1958 to 1982

The Area I Thermal Treatment Unit was intermittently operated from 1958 to 1982. To provide permitting coverage for the facility it was initially permitted as a waste pile in 1980. The area was cleaned in 1982 under Department of Health Services authority (see letter dated 3 September 1982, Attachment 1-A). The Interim Status Document was amended to include the facility as a "Thermal Treatment" facility on 15 January 1990.

Facility operation 1982 to 1990

The wastes handled at the facility since 1982 are EPA characteristic wastes, D001 (ignitable) and D003 (reactive). These wastes include strong oxidizers and hypergolic propellants such as chlorine pentafluoride (a.k.a "Compound A"), Tetrafluorohydrazine, and solid propellant and reactive/ignitable scraps from R&D operations including HMX, RDX, ammonium perchlorate, nitrocellulose, and nitroglycerine. Associated with these wastes were limited quantities of solvents and kerosene used in the clean up and safe storage of the explosives.

2.2 GEOLOGY

Refer to the attached Sampling and Analysis Plan for a description of the geologic and hydrologic conditions.

2.2.1 RELATIONSHIP OF THE FACILITY TO THE 100-YEAR FLOODPLAIN

A. Floodplain Location

The Santa Susana Field Laboratory, which includes the Area I Thermal Treatment Facility, does not lie within the 100-year floodplain.

1. Source of Data:

Federal Insurance Administration
Department of Housing and Urban Development
Flood Hazard Boundary Map
Ventura County, California

Map No. 46, Revision Date - 10/18/77

2. A Copy of the flood map is given in attachment VII.

3. 100 - Year Flood Level:
The SSFL Area I Thermal Treatment Facility is located along the top of a ridge in the Simi Hills. The SSFL is located at an approximate average elevation of 1,800 feet above sea level. The highest 100-year flood level projected for the valley areas on either side of the SSFL site is an elevation of approximately 1,200 feet.

No flood protection devices or procedures since the Santa Susana Field Laboratory lies above the 100-year flood plain.

2.3 HYDROGEOLOGY

2.3.1 SURFACE WATER

Surface water from rainfall at the Area I Thermal Treatment Facility which does not infiltrate into the ground runs off to the Perimeter Pond which is sampled on a weekly basis for chlorides, nitrates, fluorides, arsenic, and volatile organic compounds. Historical data suggest the rainfall runoff from the area has not resulted in contamination at the sampling location.

The Perimeter Pond is a part of the SSFL reclaimed water system. The reclaimed water system, during normal operation and rainfall events, eventually becomes full. The water from this system is then discharged to Bell Canyon Creek. Analysis of the discharge waters is performed as specified in the NPDES permit number CA0001309.

2.3.2 GROUND WATER

A discussion of the groundwater at the facility is provided in the attached Sample and Analysis Plan.

2.4 METEOROLOGY

A Annual Surface Wind Rose is given as attachment VIII. As can be seen there are predominantly north westerly winds with a significant amount of south easterly flow. Only a very small percentage of the flow is in a north easterly or south westerly direction.

2.5 PREVIOUS INVESTIGATION AND REMEDIATION

In early 1982, during the process of removing debris and waste from the Area I Thermal Treatment Facility, Rocketdyne notified the California Department of Health Services and the Regional Water Quality Control Board that significant concentrations of contamination were located. A map noting the locations of the previous excavation is included as Figure 6 of the attached Sampling and Analysis Plan.

The contaminants were excavated and disposed of in accordance with the California regulations under the
oversight of Department of Health Services staff. Laboratory analysis of the soil samples following removal confirmed that the significant contamination was removed. Copies of the correspondence confirming contamination removal are found in attachment I.

2.6 QUANTITIES OF HAZARDOUS WASTE TREATED AT THE FACILITY

During a typical treatment event between .5 and one pound of waste explosive materials were treated. The estimated monthly quantity of wastes that were generated (and therefore disposed of) was approximately 30 pounds, dependent on the activity level, with an estimated average of 7 to 8 pounds per month. This quantity represents the total amount of waste generated by the NAKA Laboratory and includes the slurry waste generated.

The waste consisted primarily of paper towels and cotton swabs used for cleaning, explosive material and limited quantities of liquids. The amount of the wastes treated at the Area I Thermal Treatment Facility is listed in Table 1.

Table 1. Estimated quantities of hazardous wastes treated at the Area I Thermal Treatment Facility. These estimates are based on area treatment logs that were kept as part of the normal operation. The monthly values were derived from the average annual values from the treatment logs.

<table>
<thead>
<tr>
<th>NAKA Increment</th>
<th>Propellents</th>
<th>TEA/TEB</th>
<th>Gas Cyl's</th>
</tr>
</thead>
<tbody>
<tr>
<td>Per month (lb.)</td>
<td>24.72</td>
<td>1.92</td>
<td>1.28</td>
</tr>
<tr>
<td>Months per year</td>
<td>10</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Years in operation</td>
<td>8</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Estimated lbs treated</td>
<td>1977.36</td>
<td>153.6</td>
<td>102.4</td>
</tr>
</tbody>
</table>

2.7 PRE TREATMENT WASTE HANDLING

The explosive waste was accumulated near the generating area in an explosive test cell in velostat bags placed in an approved non-sparking aluminum container. Hazardous wastes were not stored at the Area I Thermal Treatment Facility.
The handling processes for the explosive waste are discussed in detail in Operations Plan, Section 2.8.

2.8 HAZARDOUS WASTE CHARACTERISTICS

2.8.1 PROPELLENTS

This section discusses the characteristics of the hazardous wastes handled at the Area I Thermal Treatment Facility.

Each bag of waste generated contained a small quantity of explosive material. The composition of the energetic material was placed on the bag label.

Each bag contained 0.5% to 5% (by weight) of the energetic material with the balance consisting of various cleaning materials such as paper towels and cotton tipped applicators, etc.

Some of the waste was generated in the cleaning of processing equipment. This waste consisted of oxygenated solvents, such as acetone, ethanol, isopropyl alcohol, and water containing trace amounts (less than five percent) of binders, oxidizers, plasticizers, and metals. For safety and handling purposes, this liquid slurry was mixed with an absorbent material to isolate potential explosive components and prevent any free liquids.

The monthly quantity of wastes generated from the NAKA Laboratory was between one and 50 pounds, depending on the activity, with an estimated average of 25 pounds per month.

2.8.2 PYROPHORIC WASTES

Each container of waste generated contained no more than 1/3 of a gallon of hypergol. The hypergol was covered with a layer of RP-1 to fill the container. This prevented spontaneous ignition during accumulation of the waste.

Small quantities of the surplus hypergolic compounds Triethylaluminum (TEA), and Triethylboron (TEB) were placed into a 55 gallon split steel drum located on the concrete pad and ignited. The waste materials were contained within the split drum to eliminate the possibility of soil contamination.

2.8.3 COMPRESSED GAS CYLINDERS

The contents of the occasional oxidizer compressed gas cylinder destined for detonation at the facility varied. All of the cylinders treated at the facility contained gases. Records indicate that the leaking or damaged cylinders containing such various gases as argon, hydrogen, fluorine, etc. were strapped to a metal pipe and pierced with a high-
powered bullet. The piercing was performed following notification of the local Air Quality Management District.

2.9 TREATMENT RESIDUE MANAGEMENT

The composition of the waste propellant material treated was similar. It is therefore reasonable to assume that the treatment residues are similar. The products of treating the propellant wastes are carbon monoxide, carbon dioxide, water, nitrogen, nitrogen oxides, hydrogen chloride, potassium chloride, aluminum oxides, magnesium oxides, and carbon.

Following treatment of the propellant waste, the residue or ash was placed in a plastic container and a representative sample submitted to the Analytical Chemistry Laboratory for analysis of Title 22 metals. An example of a typical ash residue is attached as Attachment III. Based upon the results of the analysis, the ash residue was disposed properly.

The residues from the treatment of the TEA and TEB wastes are aluminum oxides and a boron salt. The containers were disposed of as non-hazardous waste since there were no remaining hazardous residues following combustion.

Debris following the detonation of the compressed gas cylinders were collected and disposed of as a non-hazardous waste.

3.0 CLOSURE

3.1 CLOSURE PLAN ORGANIZATION

A phased approach will be used for the implementation of the closure activities set forth in this closure plan. Figure 1 gives the management structure that will be used to monitor and control the implementation of this closure plan.

3.2 CLOSURE REQUIREMENTS

3.2.1 PERSONNEL QUALIFICATIONS

All personnel working on closure activities at the Area I Thermal Treatment Facility will have the appropriate training to work in a hazardous waste facility as specified in 29 CFR 1910.1200.

3.2.2 HEALTH AND SAFETY PLAN

A health and safety plan will be created before the closure activities begin. In general, the plan will consist of a monitoring procedure that insures that the appropriate level of personal protection is maintained by all site personnel, an identification of the hazards that may exist at the...
ADDENDUM TO SECTION 3.3.3 PHASE I CLOSURE ACTIVITIES OF THE AREA I THERMAL TREATMENT FACILITY REVISED CLOSURE PLAN

The following shall be added:

Metallic structures found to be hazardous shall be steam-cleaned in order to decontaminate. After steam cleaning, the structures shall be resampled. If the results of the sample analysis show that the samples are non-hazardous, it will be disposed of as non-hazardous waste. If the samples show that the structures remain hazardous, it shall be placed into Department of Transportation-specification (DOT-specification) 15-yard hazardous waste bins for transportation to an approved treatment, storage and disposal facility.

During all demolition and decontamination procedures, modified level D and level C safety protection will be required for all site workers. The level of protection required will depend on the hazardous waste involved. Personnel health and safety monitoring shall be conducted during the demolition and decontamination procedures.