

The Boeing Company  
Rocketdyne Propulsion & Power  
6633 Canoga Avenue  
P.O. Box 7922  
Canoga Park, CA 91309-7922

September 25, 2001  
In reply refer to 2001RC-03454

Mr. Stephen Hsu  
Radiologic Health Branch  
Department of Health Services  
601 N. 7<sup>th</sup> St.  
Sacramento, CA 94234-7320

Subject: Request for Approval to Ship Soil from SRE to a Landfill

References:

1. "Post Remedial Action Survey Report for The Sodium Reactor Experiment (SRE) Facility, Santa Susana Field Laboratories, Rockwell International, Ventura County, California", Argonne National Laboratory, February 1984.

Dear Mr. Hsu:

As you are aware, Rocketdyne is planning to excavate a limited amount of soil from an area formerly known as the Sodium Reactor Experiment (SRE). This interim cleanup action is necessary to pre-empt further exceedences of the mercury surface water limit on our NPDES permit during the next rainy season. Mercury in soil has been found ranging from detection limits of 0.2 parts per million (ppm) to 35 ppm. The workplan for this cleanup action is currently being prepared and will be submitted to DHS when completed. See attachment 1 for a map of the subject area proposed for excavation.

Because the SRE was a former nuclear reactor facility, the DTSC has asked that DHS provide approval for the subject soil to be shipped to a non-licensed landfill.

## **1.0 Historical Background**

### **1.1 SRE Remediation and Surveys**

The SRE facility including all supporting buildings and surrounding land was radiologically remediated by Atomics International (later renamed Energy Systems Group) between 1974 and 1983. The Energy Systems Group completed a final radiological survey in 1983. The Argonne National Laboratory (ANL) completed a verification survey in 1984. Both surveys confirmed that the SRE complex had been remediated to well



below the DOE and DHS approved cleanup standards for both building surfaces and land. Post remedial samples and measurements were also well below the current DOE and DHS approved cleanup standards. DHS was provided a copy of the ANL verification survey report in July 2001 (Reference 1). The report included analysis results of soil samples taken by both ESG and by ANL.

## **1.2 SRE Release for Unrestricted Use**

Based on these two surveys, the DOE released the facility, supporting buildings, and surrounding land, for unrestricted use, in 1985 (See attachment 2, DOE letter September 24, 1985). The "SRE Certification Docket for Unrestricted Use" dated July 23, 1985 was placed in the DOE Public Document Rooms at Oakland and Washington D.C. (see also attachment 2).

## **1.3 Soil Sample Radiological Data for SRE Pond and Drainage**

As part of the post-remedial soil sampling, isotopic specific analysis was performed by ANL in the drainage channels immediately upstream of the SRE pond and in the SRE pond itself. Cesium-137 levels ranged from non-detect to 0.67 pCi/g (gross). Four of five samples were below the local background cesium-137 level of 0.21 pCi/g. All were well below the current cleanup standard of 9.2 pCi/g (net). Total uranium levels were also identical to local background levels established by ANL (Reference 1).

## **1.4 NPDES Radiological Data for NPDES Outfall # 4 Surface Water**

The proposed excavation is being performed as an interim cleanup action to help reduce mercury levels in storm water run-off which exceed NPDES monthly limits. Radiological sampling of run-off water in NPDES Outfall # 4 has never detected any radiological constituent that exceeded the NPDES drinking supplier standards. Attachment 3 provides results of NPDES required analytes, for years 1999 and 2000, for gross alpha, gross beta, tritium and strontium-90. All tritium and strontium-90 results are non-detects, and the majority of gross alpha and beta are non-detects. All results are less than drinking water supplier standards and NPDES limits.

## **1.5 Conclusion**

The SRE has been released for (radiologically) unrestricted use by DOE. The SRE area is not on the State Radioactive Material License (0015-19). Based on past soil data and current surface water data, there is no



radiological hazard associated with the SRE drainage system. Therefore additional "radiological screening" would not normally be required.

## 2.0 Recent Action

Notwithstanding the above described historical evidence, Rocketdyne recognized the need to provide further assurance to the community and to DTSC that the soil proposed for excavation would pose no radiological hazard to a landfill. Therefore Rocketdyne discussed additional survey and sampling activities with DHS in July 2001. Rocketdyne proposed to perform further surface scanning survey of the area proposed for excavation. Rocketdyne found no elevated radiation levels in the area proposed for excavation. Elevated radiation was found in two distinct locations in a drainage ditch (see below).

Rocketdyne further invited DHS to perform their own surface scanning survey in addition to soil sampling. This was performed on July 26, 2001. Rocketdyne also took splits of the DHS samples for analysis at Rocketdyne's counting lab. Attachment 4 shows the locations of the split DHS samples. Attachment 5 provides Rocketdyne's cesium-137 results. DHS results are pending.

Rocketdyne's gamma spec. analysis of splits of DHS soil samples at the SRE were 7 non-detects and 1 sample (#2) at 0.25 pCi/g of cesium-137, apparently in agreement with preliminary DHS results (to be reported elsewhere). No other man-made radionuclides were detected in the soil samples, with the exception of naturally occurring radionuclides at normal background levels. These samples were taken in locations in and around the proposed area of soil excavation. (See Attachments 1, 4 and 5)

## 2.1 Areas with Elevated Radiation

During Rocketdyne's pre-survey, two other locations, upstream of the proposed excavation area, were observed with elevated radiation (approximately 65% above background). These two locations were investigated. Low levels of cesium-137 were detected (see attachments 6 and 7), however the very localized nature of the contamination means that the site 15 mrem/y cleanup standard would still be met. Nevertheless, per ALARA policy, these two areas were excavated and the soil managed as radioactive waste for future disposal at a licensed or DOE approved LLRW disposal site. Soil sample results are summarized below.

### 2.1.1 Northern location (Drainage Ditch) Attachment 6.

#### **Pre-excavation and during excavation:**

11 samples ranged from non detect to 2.6 pCi/g of cesium-137.



1 sample at 17.7 pCi/g and 1 sample at 30.3 pCi/g of cesium. The higher samples were within 24 inches of each other.

**Post-excavation:** 3 samples were non-detect and 1 sample was 1.2 pCi/g cesium-137.

### **2.1.2 West Location (Drainage Ditch) Attachment 7.**

**Pre-excavation and during excavation:**

12 samples ranged from non-detect to 9.4 pCi/g cesium-137.

**Post-excavation:** 4 samples ranged from 0.1 to 0.5 pCi/g cesium-137.

## **2.2 Recent Action Conclusions**

- The northern location is 30 to 40 feet outside the boundary of soil proposed for mercury excavation.
- DHS samples #3, 4, and 5 were taken relatively close to the northern drainage ditch and all were non-detect for cesium-137 showing that migration of cesium-137 has not occurred.
- The western location is over 300 feet from the boundary of soil proposed for mercury excavation.
- Results of soil analysis of soil proposed for mercury excavation, have so far shown background or minimal levels of cesium-137.
- No man-made radioisotopes have ever been observed in NPDES monitored surface water runoff from the SRE which exceed NPDES drinking water limits.
- No soil will be excavated for mercury prior to approval of DHS.

## **3.0 Future Action**

Rocketdyne understands that the DHS results of their soil samples will be available shortly.

Rocketdyne is seeking DHS approval to excavate soil identified in attachment 1, and ship the excavated soil to a landfill (either a municipal landfill or a Class I hazardous waste landfill), based on,

- historical soil data from the early 1980's,
- the lack of any detected radioactive contamination in surface water runoff,
- current Rocketdyne soil sample data taken in July 2001 in the proposed excavation area
- current DHS soil sample data (pending)



Since the SRE is not on the State Radioactive Material License (0015-19) this is not a licensing action request.

Rocketdyne understands that DHS may wish to take additional split subsurface samples in the excavation area before it can give approval for disposal. This can certainly be accommodated.

If you have any further questions on this material or would like to schedule further visits to the site, please do not hesitate to call me at (818) 586-6140.

Sincerely,



Phil Rutherford  
Manager, Radiation Safety  
Safety, Health & Environmental Affairs

Attachments:

1. SRE soil sample mercury data and proposed excavation area.
2. "Certification Docket for the SRE and Building 003", Letter and attachment from J. K. Hartman (DOE) to G. W. Meyers, 07849RC, September 24, 1985
3. "NPDES Sample Results for Outfall #4 (SRE)
4. Locations of DHS soil samples at SRE
5. Rocketdyne radiological results of soil samples split with DHS in and around proposed excavation area
6. SRE North Trench Results
7. SRE West Trench Results

cc with attachments:

Mike Lopez	DOE/OAK
Gerard Abrams	DTSC

shea-094124





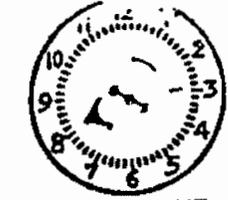


Department of Energy  
San Francisco Operations Office  
1333 Broadway  
Oakland, California 94612

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DOE  
In

ROCKETDYNE  
CORRESPONDENCE

Mr. G. W. Meyers  
Vice President  
Atomics International  
Business Segment  
Rocketdyne  
P. O. Box 309  
Canoga Park, California 91304

SUBJECT: Certification Docket for the SRE and Building 003

Dear Wayne,

Enclosed is a copy of the Certification Docket describing the remedial actions to decontaminate the SRE and Bldg. 003.

The SRE and Bldg. 003 are officially terminated from the DOE radiologically contaminated Surplus Facilities Program and are released to Rockwell International, Rocketdyne Division for unrestricted use.

If you have any questions, please call Len Lanni at (415) 273-6444.

Sincerely,

*Congratulations!*  
*J*

*[Signature]*  
James K. Hartman, Director  
Magnetic Fusion and Nuclear  
Division

Enclosure

cc w/o encl:  
Art Whitman, HQ

*Part I - 156 pgs*  
*Part II - 698 pgs*

07849 RC

(6450-01)

U.S. DEPARTMENT OF ENERGY  
SAN FRANCISCO OPERATIONS OFFICE  
MAGNETIC FUSION AND NUCLEAR DIVISION

CERTIFICATION FOR UNRESTRICTED USE OF THE SODIUM REACTOR  
EXPERIMENT(SRE) COMPLEX AND THE HOT CAVE FACILITY(BLDG. 003)

AGENCY: San Francisco Operations Office, Department of Energy

ACTION: Notice of Certification of Decommissioned Facilities for Unrestricted Use

SUMMARY: The Department of Energy has completed the radiological surveys and has taken remedial actions to decontaminate and decommission DOE contaminated areas that were found in the SRE complex and Bldg. 003. The Department, through the San Francisco Operations Office, has issued the following statement:

STATEMENT OF CERTIFICATION FOR UNRESTRICTED USE OF THE SRE COMPLEX  
AND BLDG. 003 AT ROCKWELL INTERNATIONAL'S SANTA SUSANA FIELD  
LABORATORY, CHATSWORTH, CALIFORNIA

The Department of Energy, Office of Nuclear Energy, Office of Terminal Waste and Remedial Action, Division of Remedial Action Projects and the Department of Energy San Francisco Operations Office have reviewed the remedial actions and the radiological survey reports of the SRE complex and Bldg. 003. Based on this review, DOE certifies that there is no evidence the facilities pose a radiological threat to either personnel or the environment. Therefore, the SRE complex and Bldg. 003 are removed from the DOE radiologically contaminated Surplus Facilities Program and are suitable for unrestricted use.

For further information contact:

Mr. Leonard Lanni, Project Manager  
Magnetic Fusion and Nuclear Division  
U.S. Department of Energy  
1333 Broadway  
Oakland, California 94612  
Telephone:(415)273-6444 or FTS:536-6444

SUPPLEMENTARY INFORMATION:

The Department of Energy has established a program to characterize and when necessary, correct the radiological conditions of DOE contaminated surplus facilities. The objective of the program is to insure that these surplus facilities and any associated properties in their vicinity are within or below the radiological guidelines established by the ANSI Standard N13.12 and the NRC Regulatory Guide 1.86 .

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The SRE complex, located at the Rockwell's Santa Susana Field Laboratory, Chatsworth, California, consists of a series of buildings used to support the Atomic Energy Commission activities to demonstrate the feasibility of a high temperature sodium-cooled graphite-moderated reactor as the heat source for a central power station.

The Hot Cave Facility, Bldg. 003, located at the Rockwell's Santa Susana Field Laboratory, was used to analyze fuel burn-up samples for the System for Nuclear Auxillary Power (SNAP) Program and the evaluation of various irradiation experiments.

Radiological surveys conducted before the decontamination and decommissioning activities for the SRE complex and Bldg. 003 showed gross contamination of mixed fission products and beta-gamma emitters.

The remedial actions, including decontamination and decommissioning for both the SRE and Bldg. 003 were completed in 1982.

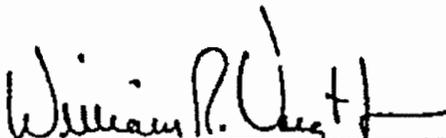
Based on the review of the final remedial action project report, the San Francisco Operations Office has concluded that the SRE complex and Bldg. 003 are radiologically acceptable and suitable for release for unrestricted use and are therefore removed from the Surplus Facilities Program.

These findings are supported by the Department of Energy's Certification Dockets for the SRE complex and Bldg. 003. The dockets are available for review between the hours of 8:00 a.m to 4:00 p.m. Monday through Friday (except Federal holidays) at the following locations:

1. U.S. Department of Energy  
San Francisco Operations Office  
Technical Information Center  
1333 Broadway  
Oakland, California 94612
2. U.S. Department of Energy  
Public Document Room  
Forrestal Bldg. Room 1E-190  
Washington, D.C 20545

Date:

July 23, 1985

  
William R. Voigt, Jr., Acting Director  
Office of Terminal Waste Disposal  
and Remedial Action  
DOE/HQ

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**Attachment 3. NPDES sample results from Outfall 4 (SRE) do not show any evidence of contamination**

Year	GROSS ALPHA		GROSS BETA		TRITIUM		Sr-90	
	Results pCi/L	Non-Detect						
1999	0.5	Yes	2.3	Yes	87	Yes	0.5	Yes
	3.1	No	23	No	0	Yes	0.3	Yes
	0	Yes	4	No	0	Yes	0.1	Yes
2000	1	Yes	9	No	70	Yes	0.2	Yes
	0.009	Yes	0.904	Yes	134	Yes	0.661	Yes
	0.114	Yes	5.23	No	-73.3	Yes	0.373	Yes

RADIOACTIVITY	Detection Limits	Drinking Water Standards
GROSS ALPHA	2 pCi/L	15 pCi/L
GROSS BETA	4 pCi/L	50 pCi/L
TRITIUM	390 pCi/L	20,000 pCi/L
STRONTIUM-90	0.8 pCi/L	8 pCi/L



**Attachment 5. Table 2**

**RADIOLOGICAL SOIL SAMPLING RESULT SUMMARY**

<b>Map Sample Identifier<sup>a</sup></b>	<b>Sample Identifier</b>	<b>Description</b>	<b>Cesium-137 (pCi/g)</b>	<b>Minimum Detectable Activity</b>
1	ENV-01-0066	SRE, RHB Soil Sample Split #1	NDA	9.47E-02
2	ENV-01-0067	SRE, RHB Soil Sample Split #2	0.25	9.08E-02 <sup>b</sup>
3	ENV-01-0068	SRE, RHB Soil Sample Split #3	NDA	1.15E-01
4	ENV-01-0069	SRE, RHB Soil Sample Split #4	NDA	8.25E-02
5	ENV-01-0070	SRE, RHB Soil Sample Split #5	NDA	8.40E-02
6	ENV-01-0071	SRE, RHB Soil Sample Split #6	NDA	7.17E-02
7	ENV-01-0072	SRE, RHB Soil Sample Split #7	NDA	1.08E-01
8	ENV-01-0073	SRE, RHB Soil Sample Split #8	NDA	1.05E-01
-	ENV-01-0074	SRE, RHB Soil BKG in Area IV	NDA	1.11E-01
-	ENV-01-0075	SRE, RHB Soil BKG in Sage	0.11	1.40E-02

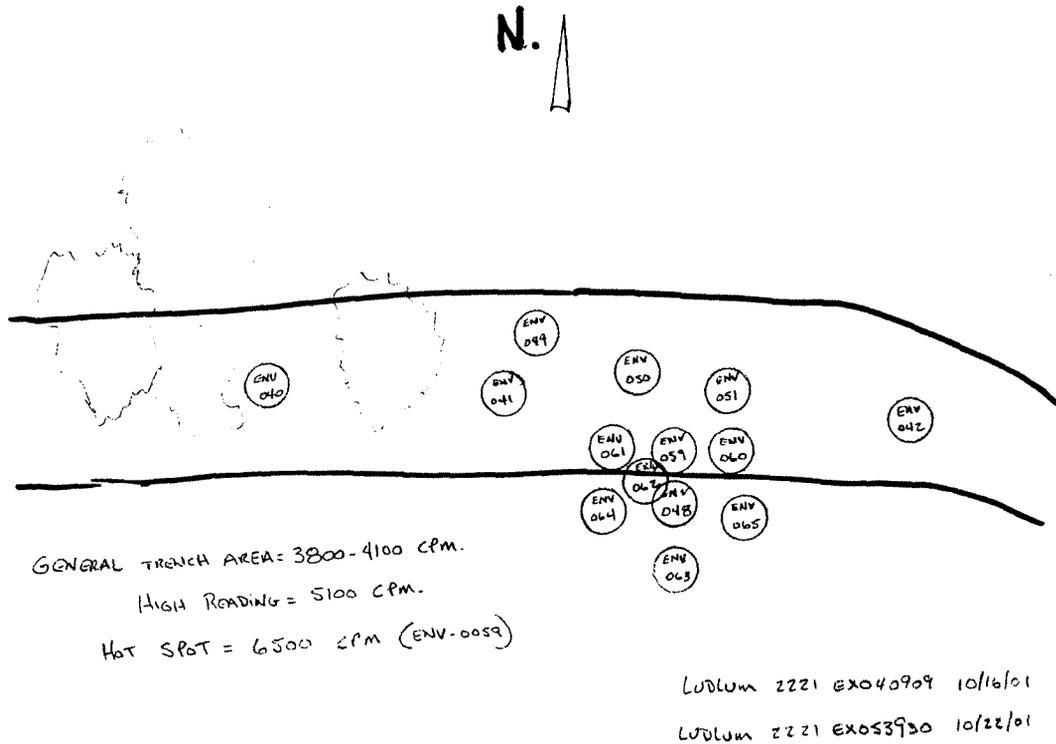
Note: Cesium-137 was the only man-made radionuclide detected in Rocketdyne split samples collected during Department of Health Services/Radiological Health Branch sampling at SRE during July 2001. Soil samples were analyzed for gamma-emitting radionuclides; all other naturally occurring radionuclides were detected at background levels. Sampling results from DHS/RHB are pending.

<sup>a</sup> Identifiers correspond to sample location labels on Figure 6.

<sup>b</sup> Uncertainty 7.99E-02

pCi/g = picocuries per gram  
 NDA = non-detectable activity

## Attachment 6. SRE North Trench Results



Date of Sample	Sample ID	Location / Description	PCI/g Cs-137
07/20/01	ENV-01-0031	SRE, Soil from north trench	3.6
07/20/01	ENV-01-0032	SRE, Rocks from north trench	ND
07/24/01	ENV-01-0039	SRE, Soil from north under rock	0.5
07/24/01	ENV-01-0040	SRE, soil from north trench excav	0.6
07/24/01	ENV-01-0041	SRE, soil from north trench excav	2.6
07/24/01	ENV-01-0042	SRE, soil from north trench	1.1
07/25/01	ENV-01-0048	SRE North trench bed rock	17.7
07/25/01	ENV-01-0049	SRE North trench soil	2
07/25/01	ENV-01-0050	SRE North trench soil	2.1
07/25/01	ENV-01-0051	SRE North trench soil	2.2
07/26/01	ENV-01-0059	SRE North trench bed rock	30.3
07/26/01	ENV-01-0060	SRE North trench bed rock	0.3
07/26/01	ENV-01-0061	SRE North trench bed rock	1.9
07/27/01	ENV-01-0062	SRE North trench Hot Spot after Excavation	1.2
07/27/01	ENV-01-0063	SRE North trench Hot Spot after Excavation	ND
07/27/01	ENV-01-0064	SRE North trench Hot Spot after Excavation	ND
07/27/01	ENV-01-0065	SRE North trench Hot Spot after Excavation	ND

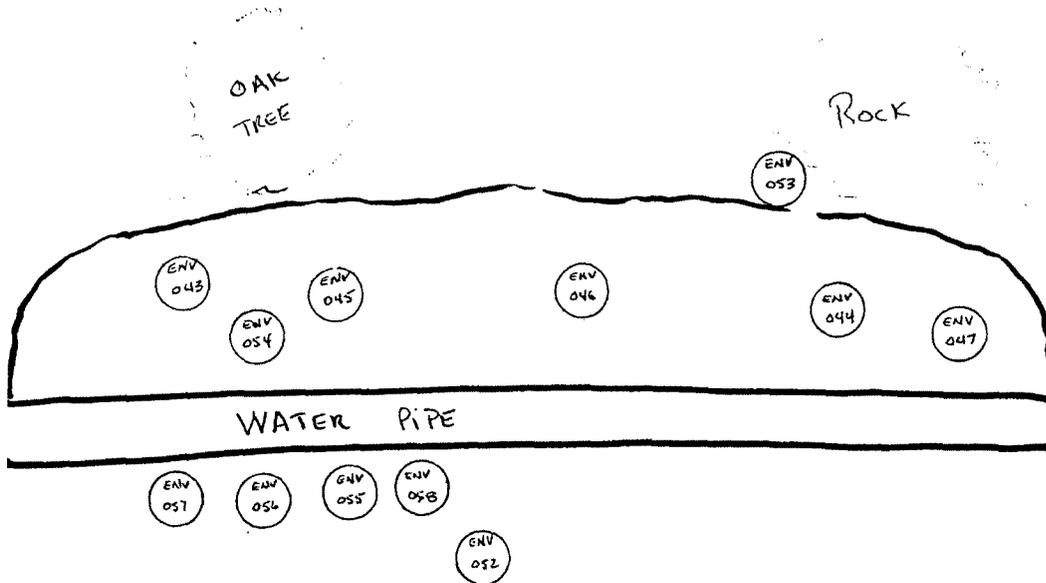
←

Excavated

←

# Attachment 7. SRE West Trench Results

W. 



GENERAL TRENCH AREA = 3400-3500 CPM.

High Reading = 5800 CPM. (ENV-0046)

LUDLUM 2221 EX040909 10/16/01

LUDLUM 2221 EX053930 10/22/01

Date of Sample	Sample ID	Location / Description	PCi/g Cs-137
07/20/01	ENV-01-0033	SRE, soil from west trench #1	9.1
07/20/01	ENV-01-0034	SRE, soil from west trench #2	9.4
07/24/01	ENV-01-0037	SRE, soil west alluvial #1	2.9
07/24/01	ENV-01-0038	SRE, soil west alluvial #2	8.9
07/25/01	ENV-01-0043	SRE, soil from west trench #1	2.8
07/25/01	ENV-01-0044	SRE, soil from west trench #1A	5.9
07/25/01	ENV-01-0045	SRE, soil from west trench #2	5.7
07/25/01	ENV-01-0046	SRE, soil from west trench #3	4.5
07/25/01	ENV-01-0047	SRE, soil from west trench #1	1.2
07/25/01	ENV-01-0052	SRE, soil from west excav.	ND
07/25/01	ENV-01-0053	SRE, soil from west excav.	6.3
07/25/01	ENV-01-0054	SRE, bed rock from west trench	0.2
07/26/01	ENV-01-0055	SRE, bed rock from west trench	0.5
07/26/01	ENV-01-0056	SRE, bed rock from west trench	0.4
07/26/01	ENV-01-0057	SRE, bed rock from west trench	0.1
07/26/01	ENV-01-0058	SRE, bed rock from west trench	0.3