Scoping Comment Responses

for the

Environmental Impact Statement for Remediation of Area IV of the Santa Susana Field Laboratory (SSFL Area IV EIS)

Prepared for

U.S. Department of Energy
Energy Technology Engineering Center

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ACRONYMS AND ABBREVIATIONS

ATSDR	Agency for Toxic Substances and Disease Registry
Boeing	The Boeing Company
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
COC	contaminant of concern
COI	constituent of interest
CPEC	chemical of potential ecological concern
CSM	conceptual site model
DCGL	derived concentration guideline level
DOE	U.S. Department of Energy
DTSC	State of California Department of Toxic Substances Control
EA	environmental assessment
EIS	environmental impact statement
EPA	U.S. Environmental Protection Agency
ERA	Ecological Risk Assessment
ESA	Endangered Species Act
ESL	Ecological Screening Level
ETEC	Energy Technology Engineering Center
FWS	U.S. Fish and Wildlife Service
GIS	Geographic Information Systems
HEPA	high-efficiency particulate air
HERD	Human and Ecological Risk Division
H.R. 2764	House Resolution 2764
HSA	Historical Site Assessment
IAG	Interagency Agreement
LARWQCB	Los Angeles Regional Water Quality Control Board
MARSSIM	Multi-Agency Radiation Survey and Site Investigation Manual
MCL	maximum contaminant level
MCV	most conservative value
MDL	Method Detection Limit
NAHC	Native American Heritage Commission
NASA	U.S. National Aeronautics and Space Administration
NEPA	National Environmental Policy Act
NESHAPs	National Emission Standards for Hazardous Air Pollutants
NIOSH	National Institute of Occupational Safety and Health
NOI	notice of intent
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List

OCY	Old Conservation Yard
OHP	State of California Office of Historic Preservation
PRG	preliminary remediation goal
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
SB	Senate Bill
SRE	Sodium Reactor Experiment
SSFL	Santa Susana Field Laboratory
SSFL Area IV EIS	Environmental Impact Statement for Remediation of Area IV of the Santa Susana Field Laboratory
TCE	trichloroethylene
VOC	volatile organic compound

1.0 INTRODUCTION

In May 2008, the U.S. Department of Energy (DOE) issued a Notice of Intent (NOI) to prepare an *Environmental Impact Statement for Remediation of Area IV of the Santa Susana Field Laboratory* (*SSFL Area IV EIS*) and conduct scoping meetings. Scoping meetings were held on July 22, 2008 in Simi Valley, California; July 23, 2008 in Northridge, California; and July 24, 2008 in Sacramento, California.

Prior to the scoping meetings, a comprehensive review of all previous Area IV sampling activity was conducted. The *Draft Gap Analysis Report* presented this evaluatation of the existing chemical and radiological site characterization data to determine what additional data would be needed to prepare both a human health risk assessment and an ecological risk assessment. These assessments would be used as part of the evaluation of alternatives in the *SSFL Area IV EIS*. Additionally, two public meetings concerning the *Draft Gap Analysis Report* were conducted in Simi Valley, California, on June 10 and 26, 2008.

Because comments submitted in response to DOE's announced efforts to scope the environmental impact statement (EIS) and comments submitted on the *Draft Gap Analysis Report* were received during overlapping timeframes, many of the comments dealt with both. DOE decided to combine the comments from both efforts and respond to all comments in this comprehensive comment response document. The National Environmental Policy Act (NEPA) does not require federal agencies, nor do the Council on Environmental Quality nor DOE implementing regulations, to respond individually to scoping comments; however, DOE wanted to go beyond what was required and provide individual responses to commentors.

This comment response document is divided into four sections and two appendices, as outlined below:

Section 1.0 – Introduction. This section includes information on public meetings, project and schedule changes, and changes as a result of the scoping process.

Section 2.0 – Summary of Comments Received. This section includes a summary of the nine broad categories of comments received.

Section 3.0 – Stakeholder Concerns. This section contains 11 comments that were frequently repeated by commentors that DOE felt should be brought forward either because of the level of interest expressed by commentors or the length and complexity of the response.

Section 4.0 – Individual Comments and Responses. This section includes all comments and the corresponding individual responses.

Appendix A – Radionuclides Related to Historical Operations at the Santa Susana Field Laboratory Area IV. This white paper was written in response to a request from the State of California to provide a list of all the radionuclides from reactor operations and to reduce the list using industry accepted standards.

Appendix B – Advertising for Scoping Meetings. In response to questions about advertising, a list of all advertising done for the scoping meetings was compiled and attached to this comment response document.

Since the *SSFL Area IV EIS* scoping meetings occurred in July 2008, there have been many changes to the project. The most significant of these changes are summarized below:

- Based on provisions of the 2008 Consolidated Appropriations Act, 2008 (H.R. 2764, Public Law 110-161), DOE and the Environmental Protection Agency (EPA) signed, on July 24, 2008, an Interagency Agreement (IAG) that provides for EPA to conduct a radiological background study. At that time, DOE transferred $1.5 million in funding to EPA to conduct this work. EPA is near completion of its efforts to develop and design the background study. In December 2008, EPA provided a draft scope of work for EPA to conduct a radiological characterization study for Area IV and the adjoining northern undeveloped land. The DOE/EPA IAG was amended on February 17, 2009 to reflect the transfer of an additional $1.7 million to EPA to begin the radiological characterization study of Area IV and the Northern Undeveloped Land. On April 23, 2009 the IAG was again amended to provide to EPA the full funding ($38.3 million) that they requested for the radiological characterization study using funding provided by the 2009 American Recovery and Reinvestment Act. Initial work for planning and implementing the Area IV radiological characterization survey has begun with an expected completion date of September 2011.
- The State of California Department of Toxic Substances Control (DTSC) has the lead for determining the chemical background levels. A chemical background group has been formed and DTSC expects to complete this work by summer 2010.
- An Amended Consent Order is under negotiation between DTSC, DOE, the U.S. National Aeronautics and Space Administration (NASA), and The Boeing Company (Boeing), for cleanup of SSFL. The Revised Consent Order will further refine how remediation efforts at SSFL Area IV will be conducted.
- EPA reevaluated the entire SSFL site and, based on that evaluation, recommended that the entire site be listed on the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) National Priorities List (NPL), also called the Superfund List. The State of California did not agree, and concluded that it would be in the State's best interest to conduct cleanup under the direction of DTSC as the lead regulator. DTSC has oversight responsibility of the Resource Conservation and Recovery Act (RCRA) Facility Investigation that is being conducted for the entire SSFL site. DOE will conduct CERCLA-based human health and ecological risk assessments for evaluating the alternatives.

These changes have resulted in significant modifications to the schedule and to the project. As a result, DOE will conduct another round of scoping to further refine what will be addressed in the *SSFL Area IV EIS* as EPA nears the end of the radiological characterization. This rescoping will include an amended NOI, new scoping meetings, and an additional opportunity to comment on the scope of the *SSFL Area IV EIS*, the alternatives, and any issues pertinent to the EIS. Additional information on the changes noted above are discussed in the concerns and responses listed below.

As a result of the scoping process, DOE has added two alternatives, one specifically addressing the clean up to agriculatural future land use levels and another in which SSFL Area IV would be cleaned up and future land use would be classified as restricted open space (open to wildlife, but fenced and secured to preclude human use). In the amended NOI, all of the alternatives will be refined and better defined (including options for groundwater remediation) as part of the new scoping effort. Other changes resulting from the initial scoping process include commitment by DOE to additional methods of notifying and communicating with the public (email, newsletters, and community member help), interviewing former workers about historical operations, and developing a more comprehensive understanding of historical operations and impacts.

DOE intends to revise and finalize the Gap Analysis Report, after EPA completes the radiological background study and the Area IV radiological characterization study. Any sampling that was identified as necessary in the Draft Gap Analysis Report not conducted by EPA or DTSC will be completed by DOE prior to development of the ecological and human health risk assessments and the analysis of the alternatives for the Area IV EIS.

For the *Draft Gap Analysis Report*, many comments were received concerning sampling methodology, exposure units, contaminants of concern, sampling density, and other characterization-related topics. Because EPA now has the responsibility for the radiological characterization of Area IV and the Northern Undeveloped Area, those comments are being provided to EPA for their consideration during the development of EPA's sampling and analysis plan.

2.0 SUMMARY OF COMMENTS RECEIVED

As a result of the *Draft Gap Analysis Report* comment period and public EIS scoping process, DOE received input from 74 commentors, including individuals; elected officials; special interest groups; and local, state, and federal agencies. Written comments were received via U.S. mail, e-mail, and at public meetings. Oral comments were obtained at public meetings and documented by court reporters. Approximately 750 individual comments were received, of which approximately 40 percent were concerned with the *SSFL Area IV EIS* and 60 percent with the *Draft Gap Analysis Report*.

All comments were generally grouped into the following nine broad categories:

- **Scope of Studies (*SSFL Area IV EIS* and *Draft Gap Analysis Report*)** – These comments related to suggestions for modifying the scope of the remediation, specifically to address all of SSFL and adjacent lands.
- **Nature and Extent of Contamination** – This category included suggestions that DOE develop a full understanding of the nature and extent of the contamination to be addressed in the cleanup program, including the types of contamination (radiological or chemical), how those contaminants resulted from historical operations, the level of contamination that is attributable to background and site characteristics, and movement of contaminants in the surrounding environment.
- **Cleanup Criteria and Standards** – These comments discussed screening levels for cleanup actions and cleanup standards.
- ***Draft Gap Analysis Report* Sampling** – These comments concerned the sampling methodologies and sample density.
- **Policy Issues** – This category included a range of DOE policy issues such as process transparency, contracting issues, regulatory compliance, and listing on the CERCLA NPL.
- **EIS Process and Alternatives** – These comments were concerned with the process DOE will use to develop the EIS (such as the method of selection for the preferred alternative), the schedule, and the alternatives to be analyzed.
- **Public Involvement** – These comments concerned meeting logistics, meeting format, meeting notifications, and advertising budget.
- **Health Impacts of Previous Operations (Cumulative Health Impacts) and Proposed Alternatives** – Comments in this category related to the health effects resulting from human exposure to SSFL contamination from both the proposed alternatives and historical operations and accidents (cumulative health impacts).
- **EIS Resource Evaluations** – This category included environmental resource areas and activities that would be analyzed in the *SSFL Area IV EIS*, such as cultural resources, biological resources, water resources, and waste management.

Additional information on the comments received within these categories is presented in Table 2–1. DOE's responses to general issues raised in these comment categories are provided in Section 3. Responses to individual comments are included in Section 4.

Table 2–1. Summary of Scoping Comments by Category

Scope of Studies (SSFL Area IV EIS and Draft Gap Analysis Report) – These comments related to modifying the scope of the remediation effort, specifically to address all of SSFL and adjacent lands. Many comments requested sampling and analysis of the entire SSFL site, and provided information on DOE activities that either impacted areas beyond Area IV or took place outside of Area IV; such as gas releases from the Sodium Reactor Experiment (SRE) accident, holding ponds, or the Area I Burn Pit. Specific locations such as the Brandeis-Bardin campus and Sage Ranch Park were mentioned as areas of potential contamination.
Nature and Extent of Contamination – Most of the comments in this category were specific to the *Draft Gap Analysis Report*. The comments requested the identity of all contaminants present, their concentrations, their locations, and the potential remediation effort. Commentors also stated that, to understand the contamination issues, DOE must first understand the full history of operations and activities at the site to locate and characterize contaminants. Commentors requested a review of records, such as accident reports, log books, previous gamma walkover surveys, radionuclide monitoring, tracer studies, and air filters in buildings. Access to records was also requested. Interviews with former employees were suggested. Some comments requested information on a specific event or piece of equipment, such as the SRE accident and the Van de Graaff accelerator. Several comments noted distrust of the Historical Site Assessment document, and asked for DOE to redo the assessment. Comments on conducting the background and site characterization studies accompanied the comments addressing the nature and extent of contamination. Commentors noted a need for a site-specific background study and a site-wide gamma walkover survey. Appropriate sampling locations for background samples were also discussed. Furthermore, commentors discussed the list of radiological constituents of interest (COIs) and the processes and operations that took place. Commentors were concerned that the list presented in the *Draft Gap Analysis Report* may not be appropriate or comprehensive and asked for details on the development of the COI list. The commentors also requested information on radionuclides and their characteristics, such as half-lives, exposure scenarios, health risks, radionuclide reactions in different media, and remediation methods. Other commentors asked for the specific locations of radionuclides on the site. They also asked for information on the potential movement of radionuclides, including the effects of wind patterns on radionuclide dispersion and the effects of soil erosion and migration on radionuclide levels.
Cleanup Criteria and Standards – This category of comments discussed screening levels for cleanup actions and cleanup standards. Several comments asked for a description of the development of a screening level, such as a preliminary remediation goal (PRG) or derived concentration guideline level (DCGL), and how the levels were used. Other comments requested clarification of the relationship between different screening levels, as well as the screening criteria for chemicals and radionuclides. Comments noted the confusion over the development of PRGs in the *Draft Gap Analysis Report* and their relationship to SB 990. Several comments concerned development of the cleanup standards to be employed in the remediation. A few commentors asked that DTSC certify that SSFL is cleaned up to the highest standards. Questions were raised addressing various aspects of cleanup standards, such as achievable cleanup levels, the development and selection of cleanup levels, and the differences in cleanup standards between federal agencies.
Draft Gap Analysis Report Sampling – Sampling comment topics ranged from satisfying Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM) requirements to conducting statistical evaluations of data. Comments concerned the sample density compliance with CERCLA and MARSSIM, justification of sample numbers presented in the *Draft Gap Analysis Report*, and definitions of terms used in the report. Other comments expressed concern over perceived averaging and segmenting analytical results, and the need to use appropriate research methodology. Several commentors asked for assurance that adequate and appropriate sampling and analysis will be done.
Policy Issues – These comments concerned DOE policies for site cleanup or preparing the *SSFL Area IV EIS*, such as process transparency, contracting issues, regulatory compliance, and listing SSFL on the CERCLA NPL. Additionally, commentors asked DOE to describe how it will comply with RCRA, CERCLA, and NEPA, especially in regards to remediation selection. A few comments questioned compliance with State of California regulations, discussed the problems with accelerated cleanup programs, and suggested the completion of an environmental impact report. Some commentors asked for a

clarification of the roles of the different agencies involved at SSFL, or requested that more regulatory enforcement take place at SSFL. Several comments communicated distrust in DOE and requested that EPA take the lead on site characterization, remedy selection, and all cleanup activities. A frequent comment was the request that DOE comply with SB 990. A few commentors asked for specific information related to SB 990, such as the actual cost of compliance and the effects of SB 990 on Boeing's proposed land transfer. Commentors requested that the site be placed on the CERCLA NPL, asked about the consequences of listing the site, and indicated a preference for using the Superfund process to evaluate and select cleanup actions.

EIS Process and Alternatives – These comments were concerned with EIS processes (such as how the preferred alternative would be selected), schedule, and alternatives to be analyzed, and preferences for specific alternatives. Several comments asked for a clearly defined scope, while others asked for the scope to be redetermined. A few commentors asked for a description of the EIS process, specifically the relationship between public comments, the EIS document and the ultimate cleanup decision. Also, several comments suggested revising the *SSFL Area IV EIS* schedule. Many commentors said the list of proposed alternatives was inadequate, and DOE should consider other alternatives not proposed in the NOI. Some commentors requested a more detailed description of each alternative. A number of comments conveyed a preference for Alternative 4, Offsite Disposal of SSFL Area IV Materials. Two additional alternatives were proposed—one that complied with SB 990 and one where Area IV is cleaned up, designated as restricted open space, and fenced and secured to preclude human access. Future land uses mentioned for SSFL included general public use, an equestrian center, parkland, open space, restricted open space, agricultural, agricultural/rural residential, and rural. Also, commentors said that future land use should be considered within the context of current land uses of adjacent properties, namely agricultural and residential developments.

Public Involvement – These comments concerned meeting logistics, meeting format, meeting notifications, and the advertising budget. A few comments related to the actual logistics of the scoping process, such as the location and timing of meetings. A couple of commentors offered suggestions on the scoping meeting format. Some comments related to notification of the public of *SSFL Area IV EIS* activities. Commentors asked for details on how the public was contacted and the advertising budget. Many comments addressed a perceived lack of public awareness of the scoping meetings. Comments on the lack of participation by government representatives were also submitted.

Health Impacts of Previous Operations (Cumulative Health Impacts) and Proposed Alternatives – These comments concerned human exposure to SSFL contamination from both the proposed alternatives and historical operations and accidents (cumulative health impacts). Several commentors asked DOE to perform risk assessments and epidemiologic studies of former and current workers. Some commentors requested biomonitoring of former and current workers as well as of local residents, including an update of the cancer registry and the Agency for Toxic Substances and Disease Registry study (ATSDR). Concerns were raised over short-term health risks, particularly related to removing structures or leaving structures in place, transporting materials, and soil disturbing and cleanup activities. Commentors were also concerned with the health risks associated with each alternative. A few commentors asked about the disclosure of health risks to communities and the potential for relocation of residents at greater risk of adverse health effects.

EIS Resource Evaluations – This category included commentor concerns on environmental resource areas and issues that would be analyzed in the *SSFL Area IV EIS*, including cultural resources, biological resources, water resources, air, geology, soils, transportation of radioactive materials, and waste management.

3.0 STAKEHOLDER CONCERNS

At the public meetings, there were some specific concerns that were expressed by a number of commentors:

- Cleanup of the entire SSFL site, not just Area IV;
- Preference for Alternative 4 (i.e., off-site disposal of SSFL Area IV materials; demolition of buildings, etc.);
- Alternatives to be analyzed and DOE's method of selecting a preferred alternative;
- Request to meet the requirements of SB 990;
- Listing SSFL on the NPL;
- Health impacts of previous operations (cumulative health impacts);
- Historical operations/accidents and interviews with former employees;
- Background measurements of radiological and chemical constituents;
- Proper use of EPA PRGs;
- List of radiological COIs in the *Draft Gap Analysis Report;* and
- Notification process for meetings

These concerns and a response by DOE are detailed below.

Cleanup of the entire SSFL site, not just Area IV

A number of comments were received requesting that DOE not restrict the *Draft Gap Analysis Report* and the *SSFL Area IV EIS* to Area IV. The focus on Area IV is based on the following considerations.

- SSFL is divided into four administrative units and two undeveloped areas with DOE, NASA, and Boeing being responsible for different parts of investigations and the cleanup. Boeing owns most of the land, except for 42 acres of Area I and all of Area II, which are owned by NASA. DOE does not own any of the land; DOE's predecessors used 90 acres of Boeing's Area IV land for a number of facilities called the Energy Technology Engineering Center (ETEC). The Atomic Energy Commission (AEC) and the Energy Research and Development Administration (ERDA) contracted with Boeing and its predecessors to conduct research and related support activities at ETEC. All of these contracted activities were restricted to Area IV.

- The U.S. District Court for the Northern District of California ordered DOE to prepare the EIS for Area IV of the SSFL.

- H.R. 2764 mandates a radiological survey of Area IV and tasks DOE and EPA with developing a joint survey and an Interagency Agreement. EPA is the lead agency for this effort, and will conduct the radiological background study, the gamma walkover survey, and all associated soil sampling.

- Significant work on SSFL cleanup is underway beyond Area IV, and will include other areas that stakeholders have identified as concerns, such as the Area I Burn Pit. The various cleanup efforts are subject to applicable federal and state requirements, including the RCRA authority of DTSC for the entire SSFL site. Under DTSC orders, DOE, Boeing, and NASA are actively investigating chemical use and contamination throughout SSFL.

- Under California Environmental Quality Act (CEQA) requirements, DTSC will also be responsible for the preparation of an environmental impact report addressing cleanup for all of SSFL. This document will be prepared at the completion of the RCRA investigations.
- Stormwater runoff at SSFL is being addressed through the National Pollutant Discharge Elimination System (NPDES) permit process under the authority of the Los Angeles Regional Water Quality Control Board. NPDES controls water pollution at SSFL by regulating discharges of pollutants in stormwater. All of SSFL is subject to NPDES requirements, including the requirement to collect and treat stormwater.
- DOE is committed to identifying the extent of contamination from DOE activities at ETEC.

Preference for Alternative 4

A number of commentors indicated a preference for Alternative 4, Offsite Disposal of SSFL Area IV Materials as it was described in the NOI. DOE acknowledges this expressed preference. DOE is preparing the *SSFL Area IV EIS* in compliance with NEPA, which requires consideration of a range of alternatives. No preferred alternative will be identified until all of the alternatives have been analyzed and evaluated.

As a result of rescoping, the alternatives that are actually evaluated in the EIS will likely differ from those originally listed in the NOI. In addition, Alternative 4 as originally described in the NOI may be reworded.

Alternatives to be analyzed and DOE's method of selecting a preferred alternative

A number of commentors addressed the alternatives to be evaluated in the *SSFL Area IV EIS* questioning how DOE will select a preferred alternative. However, it is too early in the process for DOE to designate a preferred alternative, or to fully determine what might be technically or economically feasible. Under NEPA, federal agencies must prepare EISs when proposed actions may have a significant impact on the environment. The EIS must evaluate the environmental and related social and economic effects of the proposed action and a range of reasonable alternatives. NEPA requires that DOE look at "no action" as a basis of comparison among alternatives, regardless of whether the site must be cleaned up. Two no action alternatives were identified to meet the requirements for no action under both NEPA and CERCLA. For each of the three action alternatives identified in the NOI, it is DOE's intent to analyze each separately for the agricultural, residential, and open space scenarios. This analysis will be fully described in the *Draft SSFL Area IV EIS*. NEPA requires DOE decisionmakers to make informed decisions. NEPA does not require the decisionmaker to select the most environmentally benign alternative or the alternative that is preferred by the local community. However, DOE will use the nine EPA CERCLA evaluation criteria to select a preferred alternative. These include: 1) overall protection of human health and the environment; 2) compliance with applicable or relevant and appropriate requirements; 3) long-term effectiveness and performance; 4) reduction of toxicity, mobility, or volume through treatment; 5) short-term effectiveness; 6) implementability; 7) cost; 8) State acceptance; and 9) community acceptance. In an amended NOI, the range of reasonable alternatives will be further clarified and additional scoping of the *SSFL Area IV EIS* will occur. One purpose of scoping is to solicit public input on alternatives to ensure all reasonable alternatives are evaluated.

Based on the results of the EPA background study, DTSC's chemical analysis and background study, and EPA's radiological characterization survey of Area IV, the alternatives in the EIS may be revised, refined, and changed. Once EPA and DTSC complete their studies, DOE will evaluate all alternatives to assure that a full range of reasonable alternatives, including those suggested as part of the July 2008 scoping, are considered in the EIS. The two alternatives suggested during scoping (future agricultural land use and restricted open space land use) will be considered for the EIS, and other alternatives may change based upon results of these studies. DOE will conduct another round of scoping meetings when EPA is nearing completion of the radiological characterization of Area IV. When additional scoping meetings are conducted, proper public notifications including *Federal Register* notices, via the local media, and email distribution lists will be made. As part of DOE's on-going stakeholder involvement activities, discussions will be held with interested stakeholders and regulators to determine the need for additional scoping meetings.

Request to meet the requirements of Senate Bill (SB) 990

Commentors recommended that DOE pursue a cleanup program that would allow compliance with SB 990. SB 990 requires a cleanup standard for an agricultural future use scenario. As previously explained, DOE will evaluate a full range of reasonable land use alternatives as part of the *SSFL Area IV EIS*. DOE will consider future use scenarios during the EIS process to determine how to clean up SSFL Area IV. One of these future use scenarios is an agricultural scenario. DOE will also consider residential and open space scenarios. As a result of the scoping comments, DOE has added an additional alternative that is specifically designed to meet the requirements of SB 990. The additional alternative will allow the decisionmakers to compare the SB 990 alternative to other alternatives.

Listing SSFL on the National Priorities List

Some commentors requested that SSFL be included on the CERCLA NPL to assure that all of SSFL is cleaned up, not just Area IV. DOE had similarly concluded that inclusion of SSFL on the NPL would have resulted in a comprehensive, coordinated cleanup. The State of California did not agree, and concluded that it would be in the State's best interest to conduct cleanup under the auspices of DTSC as the lead regulator. Therefore, EPA has decided against including the SSFL on the NPL. Instead, DTSC will direct the cleanup of SSFL under an Amended Consent Order and DOE will conduct the cleanup of Area IV accordingly.

Health impacts of previous operations (cumulative health impacts)

A number of commentors requested that DOE analyze the health impacts of previous operations on the surrounding population. NEPA requires the analysis of cumulative impacts of past, present, and reasonably foreseeable actions. The Council on Environmental Quality's 2005 Memorandum, "Guidance on the Consideration of Past Actions in Cumulative Effects Analysis," states: "[t]he environmental analysis required under NEPA is forward-looking, in that it focuses on the potential impacts of the proposed action that an agency is considering. Thus, review of past actions is required to the extent that this review informs agency decision making regarding the proposed action." It also states: "[i]n determining what information is necessary for a cumulative effects analysis, agencies should use scoping to focus on the extent to which information is "relevant to reasonably foreseeable significant adverse impacts," is "essential to a reasoned choice among alternatives," and "can be obtained without exorbitant cost." All resource areas will be analyzed for cumulative impacts. Impacts on workers, the public, and the environment of all alternatives (including no action or containment in place) will be analyzed for comparison among alternatives.

Historical operations/accidents and interviews with former employees

A number of commentors suggested that DOE add to and clarify its understanding of the history of SSFL, including accidents, and operational practices. Many suggested conducting interviews with former employees. There are several ongoing efforts to assure that new information is included in the historical record. In addition, DOE is searching through all records in its possession or those in the possession of its contractors to assure that all relevant information is provided to DTSC as required in the RCRA Consent Order. A part of this effort will be discussions with former employees. DOE will share information about these efforts with interested stakeholders.

Background measurements and characterization of radiological and chemical constituents

Commentors requested that EPA, and specifically Mr. Gregg Dempsey, conduct the background studies and characterization of radiological and chemical constituents for the *SSFL Area IV EIS*. Background levels reflect concentrations in the bedrock and soil resulting from the geological processes that created the Santa Susana Mountains. Additionally, background levels include concentrations of radionuclides and chemicals at the site that stem from other unrelated sources. These include radionuclides from global nuclear testing and lead from automobile exhaust. These background levels are needed for comparison with concentrations found at Area IV.

DOE understands that the community holds EPA and Mr. Gregg Dempsey from EPA's Las Vegas Lab in high regard. As a result, EPA has appointed Mr. Dempsey to serve as the technical lead for both studies, and he is already taking a very active role in the work of the background study. EPA has also appointed two project managers, one to conduct the radiological background study (Nicole Moutoux) and another to conduct the Area IV radiological characterization study (Craig Cooper). DTSC is directing similar work to determine the background levels of chemical contaminants and is directing the chemical contaminant characterization of all of SSFL, including Area IV. DOE has and will continue to work closely with DTSC to ensure that efforts under the Consent Order and work on the *SSFL Area IV EIS* are coordinated. DOE will prepare CERCLA-based human health and ecological risk assessments. Input values for the risk assessments will be obtained from both the EPA radiological sampling efforts and the DTSC-led chemical survey. In addition, DOE will continue to actively engage all stakeholders in the development of the scenarios and assumptions that will be incorporated in the risk assessment process.

Commentors may provide suggestions directly to those parties involved in the determination of background or site characterization. Contact information is provided below:

EPA Background Study:
Nicole Moutoux
Project Manager
Superfund Division
U.S. Environmental Protection Agency, Region 9
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San Francisco, CA 94105
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EPA Survey of Area IV:

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Email: cooper.craig@epa.gov

RCRA Investigation of SSFL and Chemical Background Study:

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California Department of Toxic Substances Control
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Sacramento, CA 95812-0806
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Proper use of EPA Preliminary Remediation Goals (PRGs)

Some commentors questioned the PRG values used by DOE's contractors in the *Draft Gap Analysis Report*. One reason that DOE contracted the preparation of the *Data Gap Analysis Report* was to evaluate the existing information about Area IV contamination and determine how much additional sampling would be needed in order to prepare the risk assessment and the EIS. Part of this evaluation is the comparison of existing soil concentrations and the EPA PRGs. PRGs are a tool used by EPA in the evaluation of CERCLA sites to determine whether further study is warranted. PRGs are calculated acceptable soil concentrations based on probable future land use scenarios.

The EPA PRGs were used in this study in accordance with EPA guidance as one measure to screen the usability of the existing data for future risk assessment purposes. One objective of this screening was to determine what additional data would be needed from Area IV to complete the CERCLA risk assessment. Within the *Draft Gap Analysis Report* the PRGs were not used for remedy evaluation or remedy selection. EPA's guidance related to the establishment of PRGs is presented in Part B of the *Risk Assessment Guidance for Superfund*, which can be viewed at http://www.epa.gov/oswer/riskassessment/ragsb/pdf/chapt2.pdf.

DOE intends to look at the data again once EPA and DTSC have completed their background and characterization studies and determine if any additional "gaps" remain that will necessitate additional sampling.

The List of Radiological COIs in the Draft Gap Analysis Report

In comments submitted by the State of California on the *Draft Gap Analysis Report*, the State requested that the authors of the report "[p]rovide listing of all radionuclides generated during reactor operation and reduce the list using industry acceptable methods (i.e. radiological half-life)." As a response to this request, a white paper was developed including all potential radionuclides produced as a result of Area IV nuclear activities and explaining the rationale for determining whether each radionuclide remains a COI based on its half-life and other factors. This white paper is entitled *Radionuclides Related to Historical Operations at the Santa Susana Field Laboratory Area IV*. This white paper is included as Appendix A to this document. Any new radiological COIs identified as a result of EPA's background and radiological characterization studies will be included in the revised *Draft Gap Analysis Report*.

Notification process for meetings

Concern was expressed that more people were not present at the scoping meetings and information was requested on the extent of community notifications in advance of the scoping meetings, including amount of funding devoted to the advertising budget. The extent and types of outreach to the community for the scoping meetings are outlined in Appendix B. Advertising costs for the scoping meetings (newspaper ads, postage, and mailing) totaled approximately $26,000.

DOE appreciates input from commentors and will consider other means to notify the community about SSFL Area IV events, activities, reports, and opportunities for involvement in decisionmaking related to the cleanup. Some commentors suggested that DOE place members of certain neighborhoods on the DOE mailing list. DOE will place members of the public on the mailing list at their request. However, DOE welcomes help from members of the public to notify their neighbors or others in the community of important meetings held by DOE. Some commentors suggested that DOE use email to contact community members. DOE has accepted the suggestion and has begun an email notification contact list. Additionally, DOE has created a newsletter called the *Santa Susana Clean Update* that is now being sent out via email and traditional mail service with information on cleanup topics and future meetings.

4.0 INDIVIDUAL COMMENTS AND RESPONSES

Each individual comment and DOE's response is included here. Table 4–1 is a list of all commentors, the organizations they represent (if applicable), the unique document identification number, and the format of the comment (email, oral public meeting comment, letter, telephone call, etc.). Table 4–2 is a list of the individuals who signed a petition addressed to DOE The petition said, "Please consider doing the entire site, not just Area IV, and we urge you to completely clean it up to SB 990. This is important."

Following the tables are the individual comments and responses. Questions or comments that received responses at the scoping meetings are not repeated here. To see those comments, the reader is referred to the scoping transcript report located on the ETEC website.

Table 4–1. List of Commentors and Participants

Commentor	*Organization*	*Document ID#*	*Comment Source*
Elected Officials and Public Agencies			
Assembly member Julia Brownley	California State Assembly	SA-001	E-Mail
Chris Dellith	U.S. Fish and Wildlife Service	FA-001	U.S. Mail
Brian Faulkner	DTSC	SA-007	U.S. Mail
Kathleen Goforth	U.S. Environmental Protection Agency	FA-002	U.S. Mail
T.R. Hathaway	DTSC	SA-003	U.S. Mail
Jerry Hensley	California Department of Public Health	SA-005	U.S. Mail
Senator Sheila James Kuehl	California State Senate	SA-001	E-Mail
Mayor Paul Miller	City of Simi Valley	CA-001	U.S. Mail
Nicole Moutoux	U.S. Environmental Protection Agency	FA-003 FA-004	U.S. Mail U.S. Mail
Laura Rainey	DTSC	SA-004	U.S. Mail
Norman Riley	DTSC	SA-002 SA-008	U.S. Mail Scoping Oral
Thomas Seckington	DTSC	SA-006	U.S. Mail
Organizations and Interested Public			
Anonymous		IN-015	E-Mail
Anonymous		IN-081	Scoping Written
Anonymous		IN-093	Data Gap Written
Anonymous		IN-096	Scoping Written
Anonymous		IN-100	Telephone
Martha Arguello	Physicians for Social Responsibility	OR-010	E-Mail
D'Lanie Blaze	Mission Control: The Aero-Space	OR-006 OR-007 OR-047	E-Mail E-Mail E-Mail
Dorothy Boberg		IN-063	Scoping Oral
Sue Boecker	Save Open Space	OR-030	Scoping Oral
William Bowling	Aerospace Cancer Museum of Education	OR-008 OR-012 OR-019 OR-021 OR-024 OR-028 OR-034 OR-036 OR-041 OR-042	E-Mail E-Mail Scoping Oral Scoping Oral Scoping Oral Scoping Oral Scoping Oral Data Gap Oral Data Gap Written Scoping Written
Cindy Braggs	Mothers for Childhood Cancer Awareness	OR-005	E-Mail

Commentor	*Organization*	*Document ID#*	*Comment Source*
Margery Brown		IN-043 IN-044 IN-088	E-Mail E-Mail Data Gap Oral
David Carey		IN-050 IN-083	E-Mail Data Gap Oral
Philip Chandler		IN-049 IN-051	E-Mail E-Mail
Michael Collins	EnviroReporter.com	ME-001	E-Mail
Elizabeth Crawford		IN-085	Data Gap Oral
Mary Decker	City of Los Angeles	OR-011	E-Mail
Rockard Delgadillo	City of Los Angeles	OR-011	E-Mail
Snowdy Dodson	California Native Plant Society	OR-045	Scoping Written
Denise Anne Duffield	EnviroReporter.com	ME-001	E-Mail
Geoffrey Fettus	Natural Resources Defense Council	OR-011	E-Mail
Dave Einhorn		IN-073 IN-095	Scoping Oral Scoping Written
Warren Felt		IN-033	E-Mail
Trudi Ferguson		IN-045	E-Mail
Lee Frank		IN-030	E-Mail
Shirley Galat		IN-047	U.S. Mail
Robin Gilbert		IN-029	E-Mail
Charles Gonsowski		IN-065	Scoping Oral
Michael Greenfeld		IN-111	E-Mail
Daniel Hirsch	Committee to Bridge the Gap	OR-001 OR-011 OR-017 OR-027 OR-037	Data Gap Written E-Mail E-Mail Scoping Oral Data Gap Oral
Wayne Hosek		IN-079	Scoping Oral
Rob Ianotorno		IN-064	Scoping Oral
Bonnie Klea		IN-077 IN-089	Scoping Oral Data Gap Oral
Celia Lamborn		IN-098	Scoping Written
Betsey Landis	California Native Plant Society	OR-009	E-Mail
Sharon Levine		IN-071	Scoping Oral
Jeanne Londe		IN-090	Data Gap Oral
Carole Lutness		IN-032 IN-066	E-Mail Scoping Oral
Marie Mason		IN-080 IN-084	Scoping Oral Data Gap Oral
Terry Matheney	Radiation Rangers	OR-026	Scoping Oral
Cindy Mays	Mothers for Childhood Cancer Awareness	IN-005	E-Mail
Charlotte Meyer		IN-035	E-Mail
Barton Mills		IN-087	Data Gap Oral
Dan Parks		IN-078	Scoping Oral
Petition (See Table 4-2)		PE-001	Letter
Bonnie Ramey		IN-026	E-Mail
M. Carmen Ramirez	Central Coast Alliance United for a Sustainable Economy	OR-023	Scoping Oral
Dorri Raskin		IN-067 IN-075 IN-086	Scoping Oral Scoping Oral Data Gap Oral
May Reiner		IN-097	Scoping Written
Don Roache		IN-074	Scoping Oral

Commentor	*Organization*	*Document ID#*	*Comment Source*
Christine Rowe		IN-001	E-Mail
		IN-002	E-Mail
		IN-003	E-Mail
		IN-004	E-Mail
		IN-005	E-Mail
		IN-006	E-Mail
		IN-007	E-Mail
		IN-008	E-Mail
		IN-009	E-Mail
		IN-010	E-Mail
		IN-011	E-Mail
		IN-012	E-Mail
		IN-013	E-Mail
		IN-014	E-Mail
		IN-016	E-Mail
		IN-017	E-Mail
		IN-020	E-Mail
		IN-021	E-Mail
		IN-022	E-Mail
		IN-023	E-Mail
		IN-024	E-Mail
		IN-025	E-Mail
		IN-027	E-Mail
		IN-028	E-Mail
		IN-031	E-Mail
		IN-034	E-Mail
		IN-036	E-Mail
		IN-037	E-Mail
		IN-038	E-Mail
		IN-040	E-Mail
		IN-041	E-Mail
		IN-042	E-Mail
		IN-046	E-Mail
		IN-055	E-Mail
		IN-056	E-Mail
		IN-058	E-Mail
		IN-059	E-Mail
		IN-062	E-Mail
		IN-076	Scoping Oral
		IN-082	Data Gap Oral
Adam Salkin		IN-048	E-mail
		IN-052	E-mail
Jennifer Schneider		IN-070	Scoping Oral
		IN-092	Data Gap Written
		IN-099	Scoping Written
John Southwick	Radiation Rangers	OR-031	Scoping Oral
Brian Sujata		IN-053	E-Mail
Lori Tucker	Mothers for Childhood Cancer Awareness	OR-005	E-Mail
Christina Walsh	cleanuprocketdyne.org	OR-002	E-Mail
		OR-003	E-Mail
		OR-004	E-Mail
		OR-013	E-Mail
		OR-014	E-Mail
		OR-015	E-Mail
		OR-018	E-Mail
		OR-020	Scoping Oral
		OR-022	Scoping Oral
		OR-025	Scoping Oral
		OR-029	Scoping Oral
		OR-038	Data Gap Oral
David Watkins		IN-072	Scoping Oral

Commentor	*Organization*	*Document ID#*	*Comment Source*
Mary Wiesbrock	Save Open Space	IN-018 OR-016	E-Mail E-Mail
Daniel Wiseman	West Hills Neighborhood Council	OR-039	Data Gap Oral

Key: CA=local agency; Data Gap Oral=data gap meeting oral comment; Data Gap Written=data gap meeting written comment; DTSC=State of California Department of Toxic Substances Control; EO=elected official; FA=federal agency; IN=individual; ME=media; OR=organization; PE=petition; SA=state agency; Scoping Oral=scoping meeting oral comment; Scoping Written=scoping meeting written comment.

Table 4–2. Signatures on the Petition Received August 14, 2008[a]

Mary Ashley-Puchsman	Jamie Miler
Phyllis Bass	Eric Ngu
Eileen Fugin	Lynne Plabeck
Jose Guardado	Bernice Ponaman
Doreen Hawbecker	Andrew Raskin
Larry Hayes	B. Raskin
Mildred Hayes	Beatrice Raskin
Melvin Jans	David Raskin
Sharon Jans	Dorri Raskin
Sue Jasler	Ed Raskin
Kathy Keef	Nicole Raskin
A. Koretz	Andrew Ritterman
Deborah Koretz	Esther Saritzky
Paul Koretz	Kenneth Stern
Michael Kulla	Dianne Trautman
Frances Lapidis	Rochelle Trop
Dede Lester	Jana Vannini
Isaac Lieberman	Lisa Worman
Paulette Mansfield	Charlene White
David Martusulle	Illegible #1
P. Martusulle	Illegible #2
Bruce McFarland	Illegible #3

[a] Text of Petition: "Please consider doing the entire site, not just Area IV, and we urge you to completely clean it up to SB 990. This is important."

Individual Comments and Responses

	Comment	Response
	CA-001: Paul Miller, City of Simi Valley, Letter dated: 8/13/2008	
1	1. Most recently, we are supportive of the United States Environmental Protection Agency's (EPA) decision of July 2,2008, with apparent concurrence from the United States Department of Energy (DOE), to take the lead role in conducting an independent site characterization survey and study, which will serve as the basis for the remediation effort at the SSFL.	1. As the commentor noted, the U.S. Environmental Protection Agency (EPA) and the U.S. Department of Energy (DOE) signed an Interagency Agreement on July 24, 2008. As part of this agreement, DOE transferred $1.5 million in funding to EPA to enable it to conduct a radiological background study. In addition, EPA prepared a scope, schedule, and cost estimate that describes its plans for a radiological characterization survey of Area IV of the Santa Susana Field Laboratory (SSFL). DOE provided funds ($1.7 M) in February 2009 and $38.3 M through the American Reinvestment and Recover Act (ARRA) in May 2009 to fund the Area IV radiological characterization survey as requested by EPA.
2	2. The City's main concern regarding the SSFL is that the site, and all surrounding areas that may have been contaminated by SSFL activities, be remediated to a level that would ensure the health and safety of our current and future residents. The EIS should address the widely held concerns regarding off-site impacts of the SSFL. The discussion of Alternatives in the EIS should consider adjacent communities and the potential for dispersal/migration of contaminants from their original locations.	2. The intent of DOE's evaluation is to select a remediation alternative for SSFL Area IV and any offsite areas that are determined to have been contaminated by activities at Area IV. The health and safety of current and future residents is an important part of this consideration. The *Environmental Impact Statement for Remediation of Area IV of the Santa Susana Field Laboratory* (*SSFL Area IV EIS*) will analyze offsite impacts of the alternatives and the potential for the dispersal or migration of contaminants from their original locations.
3	3. The City also supports the recently passed State Legislation (SB 990) that requires cleanup of the site to EPA standards. Cleanup of the site should be achieved to a level that would accommodate the possibility of public use of the site in the future.	3. A number of commentors requested that DOE identify Alternative 4 as the preferred alternative and/or commit to cleaning up the site to a level that would comply with California State Senate Bill (SB) 990. DOE is preparing the *SSFL Area IV EIS* in compliance with the National Environmental Policy Act (NEPA), which requires consideration of a range of alternatives. DOE will evaluate an agricultural land use scenario. No preferred alternative will be identified until all of the alternatives have been analyzed and evaluated.
	FA-001: Chris Dellith, U.S. Fish and Wildlife Service, Letter dated: 8/11/2008	
1	1. The U.S. Department of Energy (DOE), as the lead Federal agency for the project, has the responsibility to review its proposed activities and determine whether any listed species may be affected. Because this project requires an EIS, the DOE has the responsibility to prepare a biological assessment to make a determination of the effects of the action on the listed species or critical habitat. If the DOE determines that a listed species or critical habitat is likely to be adversely affected, it should request, in writing through our office, formal consultation pursuant to section 7 of the Act. Informal consultation may be used to exchange information and resolve conflicts with respect to threatened or endangered species or their critical habitat prior to a written request for formal consultation. During this review process, the DOE may engage in planning efforts but may not make any irreversible commitment of resources. Such a commitment could constitute a violation of section 7(d) of the Act.	1. DOE acknowledges the process described by the commentor and intends to comply with the Endangered Species Act (ESA), including the steps described in the comment. DOE has begun the coordination process with the U.S. Fish and Wildlife Service (FWS) office.

	Comment	*Response*
2	2. The federally endangered Braunton's milk-vetch (Astragalus brauntonii) is known to occur within Area IV of the SSFL and may be impacted by the proposed remediation activities. We recommend that impacts to the Braunton's milk-vetch be evaluated for each of the potential remediation alternatives proposed in the EIS. We provided technical assistance to the DOE regarding impacts to listed species in the Area IV Borrow Pit in letters dated November 19, 1999, and February 24, 2006. Both letters outline protective measures that avoid adverse effects to Braunton' s milk-vetch during excavation and transport of material from the borrow pit. These protective measures may be applied to other remediation activities that would have similar impacts on Braunton' s milk-vetch. These protective measures include: Encircling individual Braunton's milk-vetch plants in the vicinity of remediation activities with orange plastic fencing to warn workers not to disturb the area or the plants; Routing any new access roads to avoid individual Braunton's milk-vetch plants; Limiting any new access routes to the minimum expanse necessary to allow equipment to enter the remediation area; Creating any new access routes with fill, rather the cut-and- fill, to minimize disturbance to the Braunton' s milk-vetch seed bank, Monitoring work areas and access routes to determine if any Braunton' s milk-vetch individuals germinate; and Removing any fill used to create new access roads, and aIlowing any new Braunton's milkvetch that have germinated to develop and produce seed to replenish the seedbank. This letter does not reflect a comprehensive review of the EIS Scoping Document on our part; however, we are concerned that the Area IV remediation activities have the potential to adversely affect Braunton' s milk-vetch, and these effects should be evaluated in the EIS . We also encourage the DOE to coordinate with us to ensure compliance with the Act through the consultation process. Please note that despite the incorporation of any mitigation measures developed pursuant to National Environmental Policy Act, any adverse effects to listed species that could result from the proposed project would require consultation pursuant to section 7 of the Act.	2. DOE will address the presence of Braunton's milk vetch (Astragalus brauntonii) in the project area and the potential for impacts on the species from remediation activities under consideration by DOE. DOE appreciates the technical assistance previously provided by FWS in 1999 and 2006 and will consider and incorporate the recommended protection measures as appropriate in the SSFL Area IV EIS and accompanying Biological Assessment. DOE intends to ensure compliance with the ESA through the Section 7 Consultation process and has initiated coordination with FWS.
FA-002: Kathleen Goforth, U.S. Environmental Protection Agency, Letter dated: 8/27/2008		
1	1. Employ the Federal Superfund Process. As stated in the Federal Register Notice, EPA has previously communicated to DOE that EPA believes that the federal Superfund process should be used to evaluate and select a cleanup actions at SSFL. EPA's position remains that in order for a comprehensive and fully protective cleanup of SSFL to be completed, the federal Superfund process and substantive remedy selection standards should be employed. In particular, EPA would highlight several critical elements of the federal Superfund process as reflected in CERCLA and EPA's implementing regulations, the National Contingency Plan (NCP) (40 C.F.R. Part 300). Determining the need for remedial action and assessing the level of protectiveness achieved by any cleanup alternative should be assessed through a site specific risk assessment. Consistent with the NCP and appropriate EPA Superfund guidance, the risk assessment should use reasonable maximum exposure scenarios and assess the cumulative effect of multiple contaminants (i.e. both chemical and radiological hazardous substances). Comparative analysis of possible cleanup options should use the NCP's nine criteria. See 40 C.F.R. Section 300.430(e) and (f). Especially, important are the "threshold" NCP criteria which must be met for a remedial alternative to be selected as a remedial action: overall protection of human health and the environment and compliance with applicable or appropriate and relevant legal requirements. Recommendation: EPA recommends that the federal Superfund process and substantive remedy selection standards be employed to evaluate and select cleanup actions at SSFL. We recommend that DOE conduct a complete risk assessment addressing the cumulative effect of multiple contaminants using reasonable maximum exposure scenarios.	1. As directed by the federal judge who ordered DOE to prepare an environmental impact statement (EIS) to address the remediation of Area IV, DOE will conduct a risk assessment in addition to preparing the *SSFL Area IV EIS*. DOE will conduct a human health and ecological risk assessment once EPA has completed the radiological characterization survey of Area IV and the State of California Department of Toxic Substances Control (DTSC) has reviewed the chemical characterization data provided by SSFL respondents. EPA's Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) guidance will be followed, including addressing the cumulative effect of multiple contaminants using reasonable maximum exposure scenarios. A hazardous substance nature and extent evaluation is expected to be completed prior to EIS completion.

	Comment	Response
2	2. Define Relationship of the NEPA EIS Process to Other Legal Processes. The Federal Register Notice identifies two other legal ongoing legal processes. First, the Federal Register Notice identifies that DOE, the National Aeronautics and Space Administration (NASA) and Boeing have entered into a RCRA Consent Order with the California Department of Toxic Substances Control that requires the "cleanup of all chemically contaminated soils at SSFL.. . ." Also, the Federal Register Notice mentions the federal 2008 Appropriations Law which includes the requirement "to ensure that all aspects of the cleanup of the radioactive contamination comply fully with CERCLA." However, the Federal Register Notice does not discuss how cleanup decisions will be made in compliance with these three legal processes and accompanying substantive requirements (i.e. RCRA, NEPA and CERCLA). Recommendation: EPA recommends that DOE, during the EIS process and prior to releasing a draft EIS, set forth in writing how it plans to meet and comply with the procedural and substantive requirements of NEPA, RCRA and CERCLA in selecting cleanup actions at SSFL.	2. DOE agrees that the complex regulatory environment at SSFL requires a careful approach to ensuring compliance with the substantive procedural requirements of NEPA, CERCLA, and the Resource Conservation and Recovery Act (RCRA). In response to the commentor's request to provide DOE's process for complying with NEPA, RCRA, and CERCLA, the following actions address those regulations. To comply with NEPA requirements, DOE has held scoping meetings and will develop the *SSFL Area IV EIS* as ordered by Judge Samuel Conti in May 2007. DOE is complying with RCRA by meeting its obligations under the Consent Order for Corrective Action signed with DTSC in August 2007. DOE will address CERCLA's substantive requirements when it performs the risk assessment and analysis of alternatives. DOE is complying with the 2008 Federal appropriations law through an interagency agreement with EPA, whereby full funding for the performance of an Area IV radiological characterization study has been provided.
3	3. Define the Scope of the EIS and Consider Other Alternatives. The Federal Register Notice does not clearly define the scope of the EIS. EPA is concerned that some important issues remain undefined, including that of contaminated groundwater. For example, if there is evidence that releases of hazardous substances have migrated beyond SSFL Area IV, will the EIS include the full nature and extent of contamination associated with historic activities within Area IV? Given the above concern about the scope of the EIS, EPA believes that DOE may have to consider other cleanup alternatives than the four alternatives set out in the Federal Register Notice. For example, in the Federal Register Notice discussion of Alternative 1 (the No Action Alternative) it is noted that the expected impacts would include "[u]nmitigated natural processes, including erosion, groundwater transport of contamination and concrete degradation, would be assumed to occur." However, none of the other cleanup alternatives set forth in the Federal Register Notice appear to set forth any cleanup action to address contaminated groundwater. Recommendation: EPA recommends that DOE more clearly define the scope of the EIS and consider other cleanup alternatives in addition to the four alternatives set forth in the Federal Register NOI. We specifically recommend that the Draft EIS address the issue of contaminated groundwater; the potential migration of contaminated groundwater off-site; and clean-up actions to address contaminated groundwater.	3. DOE agrees that the issue of potential contaminant migration in groundwater needs to be addressed in the *SSFL Area IV EIS*. EPA will be collecting groundwater samples as part of its characterization work and DTSC is directing RCRA corrective action evaluations of the groundwater plumes. DOE will use this information in its evaluation of groundwater remedies. The alternative descriptions will be expanded in the EIS to include groundwater contamination, potential migration, and cleanup actions (for groundwater contamination from Area IV activities) to address contaminated groundwater.
4	4. Revise Schedule Expectations. The Federal Register Notice states that DOE expects to issue the draft EIS in early 2009. Recommendation: EPA recommends that DOE complete ongoing efforts to fully define the nature and extent of hazardous substance contamination within Area IV prior to the preparation and release of the Draft EIS.	4. DOE agrees with EPA's recommendation. DOE intends to revise the schedule for the *SSFL Area IV EIS* once EPA has firmed up its schedule for the work that it is conducting as part of the radiological characterization survey for Area IV. After a review of the EPA scope and schedule and an analysis of any potential other gaps in the data, DOE will provide an updated schedule for the development of the risk assessments and EIS. As EPA notes, a complete understanding of the nature and extent of the contamination is necessary before such an action can be taken.

	Comment	Response
	FA-003: Nicole Moutoux, U.S. Environmental Protection Agency, Region IX, Letter dated: 6/26/2008	
1	The purpose of this letter is to confirm items discussed at our conference call on June 23 as well as to clarify EPA's understanding of DOE'S application of PRGs for radionuclides in the Data Gap Analysis for Santa Susana Field Lab. Please note that references here are limited to radionuclides and not chemical constituents. Our understanding from the call on June 24 is that DOE used EPA's residential PRGs as a starting point and then recalculated allowing for the resident to consume 25% of their fruits and vegetables from their backyard. This value was then referred to in Table 3-3 as the "rural resident". These values were used to screen historical data to help determine where samples should be taken in the future. I would like to point out that the terms "rural residential" and "agricultural" are often used interchangeably so it is not unreasonable that readers would assume that DOE was using EPA's agricultural PRGs for radionuclides to screen their data. In fact, the term rural resident was used in State Bill SB 990 to mean agricultural. This confusion should be addressed by DOE. We also understand from the call on June 24 that DOE intends to use EPA's agricultural PRGs for radionuclides (found at http://epa-prgs.ornl.gov/radionuclides/) as the basis for detection limits when fieldwork for the EIS is conducted.	DOE intends to use the results of the radiological background study that is being conducted by EPA, including identification of analytical detection limits based on EPA's agricultural preliminary remediation goals (PRGs), as one basis for screening existing and new data collected after release of the *Draft Gap Analysis Report.*
	FA-004: Nicole Moutoux, U.S. Environmental Protection Agency, Region IX, Letter dated: 6/26/2008	
1	[Excerpt from cover letter requesting DOE response to EPA comments on the Administrative Draft Data Gap Analysis Report] It is important to EPA that DOE send EPA a response to our initial comments to ensure that they were indeed addressed, as well as notations as to where in the draft report changes were made to address to EPA's concerns. DOE should also provide EPA with an explanation about the new information that was included in the draft report that was not contained in the preliminary report and where in the report the new information is located.	DOE sent a response to EPA's comments on the Administrative *Draft Gap Analysis Report* on June 26, 2008. The report will be revised a second time after EPA has completed the radiological characterization survey to incorporate the results of that analysis.
	IN-001: Christine Rowe, E-mail dated: 6/11/2008	
1	1. Data Gap refers to the gap in data that your team needs to perform their analysis. The community has a data gap - we do not have the documents that we need to determine what the chemicals of concern and the radioactive contaminants are.	1. DOE appreciates the commentor's frustration. The *Draft Gap Analysis Report* was prepared for the purpose of identifying the gaps in the data that will be needed to prepare a risk assessment for the *SSFL Area IV EIS* and specifying a method for collecting those data. DOE's plans for moving forward have changed significantly since the document was released to the public. The report will be revised after EPA has completed a radiological characterization survey and DTSC has reviewed the chemical characterization data provided by SSFL respondents. DOE intends to make all relevant documents available for public review and appreciates the public's ongoing interest in cleanup of Area IV at SSFL. In addition, DOE will clarify the terms used in public documents and explain the purpose of the documents that are prepared to support EIS compliance with NEPA guidelines.
2	2. There was a presentation with a slide last night. It listed the chemical symbols for the isotopes rather than spell them out. If you are doing a community presentation, those chemicals should be spelled out.	2. The *Draft Gap Analysis Report* will be revised to spell out at the first usage, and include in the glossary, the names of elements, formulas, and isotopes.
3	3. Furthermore, I spoke to your health physicist. He does not want to go into the history of these buildings. Therefore, if the community does not know what the components of the fuel rods are, if we	3. The historical information used for the Data Gap Analysis can be found in the *Draft Gap Analysis Report*, in Appendix A for chemicals and

	Comment	Response
	do not know what chemicals were used in Area IV, we do not know what was used where.	Appendix B for radionuclides. The historical information will be supplemented in the revised *Draft Gap Analysis Report* using information being gathered as part of ongoing SSFL investigations. DOE has also prepared a technical paper addressing the expected types of radionuclides associated with fuel rods. The technical paper is available on the Energy Technology Engineering Center (ETEC) website. EPA will prepare a Historical Site Assessment (HSA) as part of the Area IV radiological charazcterizaiton survey. The HSA will provide information on the radiological use of Area IV facilities. Chemical usage is depicted in the various Area IV group reports previously submitted to DTSC. The current DOE Area IV HSA is available on the ETEC website.
4	4. We also need to be assessed as to the half lives of each radiological contaminant of concern. We do know things based on DTSC meetings on what was disposed of in the Area 1 Burn Pit for example. You are not addressing the health risks. I hope that you will be in future meetings. If you explain to the community that the half lives of certain radiological contaminants are relatively short, and that they are no longer of concern, then you will have a better chance of convincing the community that there is no longer any potential health risks from radiological contaminants. If you do not go into depth about these things - what has been found recently, what the risk is, that is when the community will become irate. Your meetings with the public are supposed to be informative to those people who cannot read an almost 800 page document. I would appreciate it if each building and the chemicals can be addressed in the Data Gap presentation before we move to the next phase.	4. Half-life information for radionuclides is provided in Table 3-11 of the *Draft Gap Analysis Report*. EPA is now responsible for the radiological characterization and will have community meetings to explain their process.
	IN-002: Christine Rowe, E-mail dated 6/11/2008	
1	1. I was talking to Dr. Rucker about Tantalum. I am creating an email about how Tantalum and other materials were used in reactors at Atomic International. It is mentioned as a potentially radioactive contaminant." I believe that it was used in the SRE. I do not know why it is still mentioned as a radiological contaminant of concern - the half life appears to be about 100 days. If you sample for Tantalum, you could find radioactive materials in that "triangle" since tantalum was used for shielding.	1. Tantalum-182 can be produced from stable Tantalum-181 if it is present in a reactor. It emits strong gamma rays that could be observed from a flyover survey. As the commentor noted, it has half-life of only 115 days and, while possibly being present at the time of the flyover survey, it will have decayed to well below detectable levels by today. DOE will not eliminate any radionuclides until additional analyses are completed.
2	2. This seems to be the most fun one to read: http://www.etec.energy.gov/library/D&D_page/1994-Bldgs.005-023-064.pdf - page 11/ 72 ADOBE "Numerous buildings and land areas became radiologically contaminated as a result of the various operations which included ten reactors, seven criticality test facilities, fuel fabrication, reactor and fuel disassembly, laboratory work, and on-site storage of nuclear material. Potential radioactive contaminants identified at the site are uranium (in natural and enriched isotopic abundances), plutonium, americium-241, fission products (primarily cesium- 137 and strontium-90) , activation products (cobalt-60, europium- 152, nickel-63, promethium- 147, and tantalum-182), and tritium. Chemical contaminants, mainly chlorinated organic solvents, have also been identified in groundwater." Building 59:http://www.etec.energy.gov/library/D&D_page/1995-Bldg._059_Reactor_Vault.pdf "The results of the radiological surveys confirm that Rockwell/Rocketdyne has adequately estimated the residual radionuclide activity levels in the test cell concrete and area groundwater that were used in the RESRAD pathway analysis. In addition, the	2. DOE thanks the commentor for providing the list of documents. Many of these documents were considered as part of the Data Gap Analysis process. The Data Gap analysts will verify that all of the documents that the commentor lists were reviewed for the *Draft Gap Analysis Report*. If not, any missing documents will be reviewed and incorporated into the revised document.

	Comment	Response
	current exposure rate levels were also verified. There is, however, one exception: it is unclear from the supporting documentation as to whether or not RockwellI Rocketdyne has accounted for the residual contamination that is present within the pipe chase room for the RESRAD pathway analysis. If unaccounted for, ESSAP recommends inclusion of this additional activity for the final facility estimated dose calculations." Here is a fly over document: http://www.rocketdynewatch.org/files/pdf/eggaerial.pdf -Tantalum 182 visible Figure 13 is a gamma spectrum recorded over the Hot Laboratory. Cesium-137 and cobalt-60 are readily recognizable. Tantalum-182 is known to be present in the area; it may contribute to the other observed photopeaks at 803-, 923-, 1083-, and 1456-keV. The shape of these peaks suggests that many other sources may be contributing. Fission products and activation products are anticipated in stainless steel. Only long-lived isotopes should be prominent because the system being dismantled had already undergone 13-14 years of decay. Risk based chemicals of concern: http://www5.hanford.gov/pdw/fsd/AR/FSD0001/FSD0029/D196247199/D196247199_14441_101.pdf Please see the attached document for residual Beryllium at Atomics International http://www.osti.gov/bridge/servlets/purl/4331867-suXOtb/native/4331867.PDF - Sodium - Tantalum Capatabilty, SRE? - ours? http://en.wikipedia.org/wiki/Tantalum http://www.espi-metals.com/msds's/tantalum.pdf - Tantalum safety http://www.epa.gov/Region5/sites/fansteel/pdfs/pub_meeting_present_200805.pdf - Clean up of Tantalum facility http://www.scorecard.org/chemical-profiles/edf-risk-characterization.tcl?edf_substance_id=7440-25-7 -Tantalum has it's own "DATA GAP" http://stinet.dtic.mil/oai/oai?verb=getRecord&metadataPrefix=html&identifier=AD0420390 http://www.osti.gov/energycitations/product.biblio.jsp?osti_id=6165124 http://ntrs.nasa.gov/archive/nasa/casi.ntrs.nasa.gov/19670013537_1967013537.pdf http://www.fas.org/sgp/othergov/doe/lanl/lib-www/la-pubs/00314625.pdf http://www-rsicc.ornl.gov/Newsletters/news.66/news66.january.pdf Reactor and Weapons shielding: GEMP-388 Neutron Cross Sections for Tantalum and Tungsten A. Prince - November 12, 1965 http://ntrs.nasa.gov/archive/nasa/casi.ntrs.nasa.gov/19690007982_1969007982.pdf http://www.sc.doe.gov/bes/archives/summaries/Metallurgy_and_Materials_Summary_Book_FY1957.pdf - tantalum and other rare earth alloys.	
	IN-003: Christine Rowe, E-mail dated: 6/12/2008	
1	1. Well, you can see why we don't get Data Gap Analysis books read. This is a document that has been floating around. It has significance to both the DOE Panel and the Boeing Storm Water Panel. http://www.etec.energy.gov/Health-and-Safety/Documents/ASERS/Environmental_Monitoring_1977.pdf 1. In this document, first of all, it refers to the fact that radiological monitoring is required 10 miles out from each Atomics International facility.	1. The commentor referenced a document prepared by Atomics International, which states company policy, rather than a government regulation for environmental measurements made up to 10 miles from its facilities.
2	2. That would imply background must be much farther out than any plot on the maps that we saw last night. I highly recommend at least going to Topanga State Park, and towards Frazier Park - to the north. If you go to the immediate north, you will be near a former NIKE Air Base. You will also be in the Getty Oil Fields. That is true of in Encino as well as in Malibu - NIKE Bases. Near Thousand Oaks there are other former Rockwell facilities - I think a Superfund site in Newbury Park. Further west you hit Pt. Mugu.	2. For the purposes of *SSFL Area IV EIS*, EPA is developing a background study that will first identify appropriate locations for developing a better understanding of the background radiation found at SSFL. EPA will determine what it believes to be an appropriate distance for background sample locations

	Comment	Response
3	3. Next, page 40 is a DATA GAP. Right where the radionuclide discussion was going on. They were doing sampling in Burro Flats - which tells me that Burro Flats must be sampled now, even though it was not in AREA IV (isn't Burro Flats in NASA?) Don't have that map right in front of me. (I'll have to check out your Data Gap Maps) References are made to holding ponds. It says that the holding pond received the runoff from the whole site - all of the waste was mixed from the whole site. So that needs to be checked for radionuclides. Then it mentions Bell Creek. We know that the artificial Bell Creek has been contaminated by the storm water runoff. But this implies that the natural Bell Creek may have been a site of discharge?	3. EPA now has the lead on the radionuclide characterization of Area IV. It is DOE's understanding that EPA will sample locations adjacent to Area IV, and possibly the Burro Flats area, if sample results for Area IV indicate that contaminants have moved beyond Area IV. This includes any drainages originating at Area IV draining into adjacent areas and ponds.
4	4. It says that Atomics International had an NPDES permit for tritium at the time, so we need to be looking for tritium in all holding ponds and pathways throughout the SSFL site.	4. Tritium is a contaminant of concern (COC) that continues to be tested for in water samples.
5	5. There are charts here that show that the vegetation was sampled for radionuclides. This is very important because DTSC is about to release Dayton Canyon. Now they say that CENTEX has been patient, and that the site has adequately been tested for toxics even after high readings in the past for perchlorates and I believe Cesium (don't quote me on that one). My point here in that DTSC states that they do not know the source of these high levels of perchlorates. And they do not seem to be finding them now. So my question to the Boeing Storm Water Panel would be - "if you had perchlorates with readings like in this report, what would you say about where the perchlorates are today?" would they migrate downstream, would they go to ground water, would they be taken up by the vegetation? http://www.envirostor.dtsc.ca.gov/public/community_involvement/9655683219/Centex-Homes_Tables_Perchlorate-Analytical-Results.pdf http://www.envirostor.dtsc.ca.gov/public/profile_report.asp?global_id=70000042 Here are some radiological contaminants in Dayton Canyon: I have a little problem with radiological contaminants in Dayton Canyon since CENTEX wants to use explosives there. Now I would think since I have seen vegetative sampling on the previous document, that it would behoove the DOE to suggest to DTSC that vegetative sampling be done on Dayton Canyon before the dynamite is set off. Here is a radiological report on Dayton Canyon showing that contaminants were there just a few years ago. Are they really gone? Do you want to do sampling by your DATA GAP team? http://www.envirostor.dtsc.ca.gov/public/community_involvement/5089215934/Centex_Supp_Sampling_RAD_Investigation%20SAP_Text%20&%20Figures.pdf If you look at page 9 of this fun document: http://www. envirostor.dtsc.ca.gov/ public/community _involvement/ 5089215934/Centex_Supp_Sampling_RAD_ Investigation%20SAP_Text%20&%20Figures.pdf, you will see places for your DATA GAP analysis offsite. I do apologize if this information turns up in that document, but since the others on this cc list will not necessarily read the DATA GAP Draft, it is important for everyone to be on the same page. Now the configuration of where the sampling is being done does not mirror the maps on the CENTEX Sterling website: http://www.centexhomes-sterling.com/locator_map.html They own more than 300 acres, but only 100 acres are being sampled. The map showing home sites on the DTSC document seems to show 100 acres that look like the part of the property being developed on the CENTEX Sterling Site. That means that none of the radiological samples seem to be done on the rest of the 200+ acres that will be donated to the SMMC. http://www.envirostor.dtsc.ca.gov/public/community _involvement/1793180167/Radiological%20Characterization%20of%20Dayton%20Canyon%2C%20West%20Hills%20%283-17-08%29.pdf - page 11 of 90 So far, I see that the detection instrument	4. Sampling of Dayton Canyon and questions about The Boeing Company's (Boeing's) National Pollutant Discharge Elimination System (NPDES) permitting program are not within the scope of the *SSFL Area IV EIS*. The commentor may contact DTSC or the Los Angeles Regional Water Quality Control Board (LARWQCB) for more information about Dayton Canyon and NPDES permitting.

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	used to test the site in 2008 was not designed to truly detect whether radiological contaminants are really present. You have higher levels of contaminants closer to the high points by the lab. This would be closer to the residences of people that currently live at the top of Dayton Canyon. Then the lab questions the validity of the samples for Strontium 90. Then they question the validity of the Cesium 137 data. Uncertainties in the plutonium samples. They explain that Cesium and Strontium are products of fission and that the lab is only about a half a mile away. I ask that Mr. Johnson and Ms. Jennings as well as their new experts analyze this report to determine whether enough sampling was done. There were some high detects just three years ago in Dayton Canyon. The area of Dayton North and the area near Woolsley Canyon were not sampled. The SSMC should be assured that adequate sampling is done before a transfer is made just as the SSFL cannot be transferred until DTSC certifies that it is clean to the highest achievable standards. "The detector was designed for hard surfaces: In order to get an indication of ambient radiation levels, each accessible grid block was surveyed with a hand-held Pancake probe1. This instrument is not ideal for use in an environmental radiation survey and is more typically used to survey solid objects and personnel for surface contamination. The results from this survey were reported in units of μR/h, but it should be noted that the instrument's response in units of μR/h should not be considered an absolute measurement of the true exposure rate in the area. However, the recorded results are useful because they can be compared against each other to provide a relative indication of the ambient radiation levels at different locations in the study area." "The maximum values from each grid block were plotted on a map of the study area, with the highest 2% of the measurements2 plotted in green, and the remainder of the results plotted in blue (Figure 2-4). This presentation shows that the most of the higher results were recorded in the higher elevations in the western portion of the survey area. Since one of the objectives of the initial investigation was to determine if elevated concentrations of radionuclides were present in canyon soil, these areas were selected for follow-up soil sampling (Allwest, 2006)." "2.4.1 Quality of Sr-90 Soil Data Inspection of the Sr-90 results in Table 2-3 indicates that the results have large uncertainties associated with them. Review of the laboratory reports provided for the Sr-90 data revealed the results from the blank samples that were run concurrently with the samples at SC&A Southeastern Environmental Laboratory were higher than expected. This can indicate the presence of laboratory contamination in the samples. Contamination in the samples would explain the high Sr-90 activities and large error bars reported. Based on the high blank results, this Sr-90 data were reported in this document as provided by the lab but it was not considered to be a reliable indicator of Sr-90 concentrations in the study area" "2.4.2 Quality of Cs-137 Soil Data A similar inspection was conducted of laboratory reports provided by FGL Environment for the Cs-137 analyses. While the information available to the reviewers report is not adequate for complete validation of this data, duplicates, blanks, and generic analytical method were included in the laboratory reports.. The reports contained no information on the minimum detectable activity, blanks, sample weights, count times, or instrument background associated with these analyses. Inspection of the 38 reported results for Cs-137 indicates that the total propagated error (TPE) for the Cs-137 result in 34 samples was less than the reported result. Because most of the data is reported to be accurate within a factor of two, the data are judged to be usable with the caveat that no statement can be made about the minimum detectable concentration for each sample. "2.4.3 Quality of Pu-238 Soil Data Inspection of the Pu-238 results in Table 2-3 indicates that the results have relatively large uncertainties associated with them (when compared to the reported results). Review of the 7 laboratory reports provided for the Pu-238 data found no problems with the quality control samples associated with these results. No field blanks were	

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	available for inspection. The data are judged to be usable with the caveat that most of the sample results are less than the method detection limits for the sample." "2.4.4 Quality of Pu-239/240 Soil Data Inspection of the Pu-239/240 results in Table 2-3 indicates that the results have relatively large uncertainties associated with them (when compared to the reported results). Review of the laboratory reports provided for the Pu-239/240 data found no problems with the quality control samples associated with these results. No field blanks were available for inspection. The data are judged to be usable with the caveat that most of the sample results are less than the method detection limits for the sample." "Sr-90 and Cs-137 are produced together by nuclear fission. If these radionuclides are released into the air together they will travel along the same air currents until they are deposited on soil together. Once deposited, they will move through the soil at different rates, which means the ratios of Cs-137 to Sr-90 in surface soil will change over time. However, the ratios should change at a similar rate across the area of the hypothetical deposition, so the ratio of Cs-137 to Sr-90 should be similar from one sample location to the next." "If a large amount of Cs-137 were deposited on the soil surface in recent years (from any source) one would expect to find residual levels in the soil. Because Cs-137 tends to adhere to soil once it is deposited, it is more likely to remain on or near the surface and not seep far into subsurface soil. In areas with measurable surface deposition of Cs-137, one would expect to find concentrations of Cs-137 to be higher in surface soil than subsurface soil years after the event. To test this, the analytical results from subsurface soil samples in the study area were compared to surface soil samples to determine if they were statistically different." "Table 3-12 presents the ranked Cs-137 concentrations for the paired surface and subsurface samples. Because the sum of the subsurface ranks is between the Upper and Lower Critical Values, the sample populations are not statistically different from on another, and the hypothesis that Cs-137 is higher in surface soil cannot be proven to be true. Similar information is presented in Table 3-13 for Sr-90. Again, because the sum of the subsurface ranks is between the Upper and Lower Critical Values, the surface soil and subsurface soil data sets for Sr-90 concentrations are not proven to be statistically different from on another." "The detection limits of the analyses were above local background concentrations in most cases. This makes a comparison with regional background values difficult. The detection limits are low e ate that the levels of Cs-137 and Sr-90 in Dayton Canyon are low n so her a eas of t ountry. The laborator b instruments measuring the radioactivity in the samples. While these values have a relatively large uncertainty associated with them, they are the best available information on the concentration in those samples and are considered to be usable for a gross characterization of the study area." I ask that all of you please take this document seriously. There is nothing alarmist or opinionated about it - it has facts and questions. The fact is that the Dayton Canyon area has not been completely characterized, and that explosives could distribute the toxic chemicals and radioactive contaminants into the air, the creek, the soil. The explosives could impact the neighbors homes and health. They could disrupt work at Boeing.	
IN-004: Christine Rowe, E-mail dated: 6/19/2008		
1	1. Please incorporate this lawsuit in your Data Gap: http://www.dtsc-ssfl.com/files/lib_rcra_soils%5Cgroup_iv %5Chistorical_site_spec/PDF-FILES/HDMSt00000010.pdf I think this is another fun document - I like historical documents - I don't know which ones you have: http://www.osti.gov/bridge/servlets/purl/4218935-vdHNSf/4218935.PDF	1. The document that the commentor referenced applies to RCRA Group IV activities being directed by DTSC. DOE will review the report for findings applicable to activities within Area IV and revise the Data Gap Report accordingly.

	Comment	*Response*
	IN-005: Christine Rowe, E-mail dated: 6/24/2008	
1	These are links to previous studies, reports relative to "hot spots" that need to be surveyed. 1. http://www.cleanuprocketdyne.org/documents/DTSC/Attachment%203%20Northern_Drainage_Waste_Sampling_Final.pdf	1. DOE thanks the commentor for her efforts in identifying these documents. The Data Gap analysts have reviewed the documents for use in the Data Gap Analysis. The Northern Drainage investigation and cleanup is part of the Boeing and NASA work at SSFL and is not related to Area IV.
2	2. http://www.etec.energy.gov/Health-and-Safety/Documents/NESHAP/NESHAPS_2000.pdf - hepa filters,plumes, etc	2. National Emission Standards for Hazardous Air Pollutants (NESHAPs) data were reviewed as part of the Data Gap Analysis.
3	3. http://www.dtsc-ssfl.com/files/lib_rcra_soils%5Chistorical_docs%5Csitewide/PDF-FILES/HDMSP00130371.pdf	3. The DTSC RCRA investigation reports for Area IV were reviewed as part of the Data Gap Analysis.
4	4. "age adjusted cancer rates."	4. The document from the ATSDR is beyond the scope of the Data Gap Analysis. The Data Gap Analysis focuses on sampling requirements for removal of buildings and wastes from within Area IV.
5	5. http://www.epa.gov/region09/waste/sfund/santasusana/References/ ref-21.pdf - this mentions the orange groves at SMMC (Sage Ranch), Bell Canyon, etc I apologize if any of these duplicate previous documents - I was just looking for off site data for you, and previous background locations.	5. Investigation of Sage Ranch and its orange groves is beyond the scope of the Data Gap Analysis. The Data Gap Analysis focuses on sampling requirements for removal of buildings and wastes from within Area IV.
6	6. These are links to previous studies, reports relative to "hot spots" that need to be surveyed. http://www.atsdr.cdc.gov/hac/pha/santa/san_p1.html#_1_14 "The age-adjusted cancer incidence rates in five Los Angeles census tracts were compared to the rates for Los Angeles County as a whole. Two time periods were examined, 1978-82 and 1983-1987. Specific cancers examined included lung, bone, bladder, thyroid, Hodgkin's and non-Hodgkin's lymphomas, and leukemia (including acute lymphatic leukemia, acute non-lymphatic leukemia, chronic lymphatic leukemia, and chronic myelogenous leukemia). The report concluded that a significant increase was observed in bladder cancer during 1983-1987 for one census tract (tract 1132). This census tract adjoins the SSFL site, however it also extends more than five miles to the east, such the individual cases may not be close to the site." You should be sampling greater than 5 miles out from the SSFL property for COCs.	6. DOE acknowledges the commentor's concerns related to the potential health effects associated with historical operations of Area IV at SSFL. Other federal agencies (including National Institute of Occupational Safety and Health [NIOSH] and ATSDR, among others) have prepared studies on health effects. The *Draft Gap Analysis Report* does not address health effects. The *SSFL Area IV EIS* will provide a summary of findings of prior epidemiological studies.
	IN-006: Christine Rowe, E-mail dated: 6/24/2008	
1	1. I have not looked at all of the small maps, but I would like a large map please of the whole SSFL with the radiological samples including off site sampling in areas such as Dayton Canyon, Sage Ranch, Brandeis Bardin, Runkle Canyon, Ahmanson Ranch, Bell Canyon, Woolsley Canyon, Box Canyon, and the Chatsworth Reservoir.	1. Unfortunately, the preparation of a map illustrating sample results outside of Area IV is beyond the scope of the Data Gap Analysis. The *Draft Gap Analysis Report* focuses on sampling requirements for removal of buildings and contamination from within Area IV. However, many of the features mentioned by the commentor will be added to a regional map showing their relationship to Area IV as part of the EIS.
2	2. There must be historic data that would indicate previous gamma walk over surveys. Certainly, the documents that I have read state that radioactive monitoring was necessary 10 miles out from each Atomics International facility. I would assume that to be true for Rocketdyne and Boeing as well.	2. The *Draft Gap Analysis Report* included a review of prior gamma walkover surveys of Area IV in Sections 3.6.8 and 4.1.2.3. There are no plans for conducting surveys outside of Area IV.
3	3. Please also tell your team that they have concluded that additional air sampling is not needed. But we have ongoing remediation in the northern drainage, and Boeing is removing another building at the front entrance (if they didn't already) that should have had wipe samples, etc. Air should be monitored	3. The recommendation that additional baseline air sampling for Area IV is not necessary to support the *SSFL Area IV EIS* was based on a review of available data and the decision to use modeling to assess

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	when any soil is disturbed since we have not characterized the whole SSFL site. Your team should have the data from those other buildings, etc.	effects of building removal during remediation. Additional air sampling will occur during any DOE-directed removal action within Area IV. DOE does not have any control of Boeing activities that occur outside of Area IV, including the northern drainage cleanup work.
	IN-007: Christine Rowe, E-mail dated: 6/24/2008	
1	1. The Draft Data Gap Analysis mentions that there is no "background" for water for AREA IV. I have not looked at all of these documents, but I do believe that the first document on this link mentioned water tests done for North American Aviation (Area IV?) in 1949. http://www.dtsc-ssfl.com/files/lib_rcra_soils/historical_docs/sitewide/3197_DTSCSubmittal_SITEWIDE_03-14-2008.htm	1. Historic water data collected from within Area IV cannot be used as background data because the data were collected within Area IV, which, as a potentially contaminated area, cannot be considered a source of "background data". The data also lack the required data quality information necessary for definition of background. However, the EPA and DTSC background study will address the water background at Area IV.
2	2. There are also a couple DTSC documents on the geology and the groundwater: http://www.dtsc-ssfl.com/files/lib_rcra_groundwater/rfi_reports/225_Geology%20Report%202007%20FINAL.pdf - page 17 Adobe - high total Gamma in Happy Valley - RD 1 - 65 feet http://www.dtsc-ssfl.com/files/lib_rcra_groundwater/rfi_reports/167_SSFL_SRAM_Vol_7_Appendices_E_to_K.pdf	2. These reports were reviewed for applicability of their information as part of the Data Gap Analysis.
	IN-008: Christine Rowe, E-mail dated: 6/24/2008	
1	1. Can you please pass this link to CDM: http://www.atsdr.cdc.gov/HAC/pha/santa/san_p2.html#_1_57 It mentions an orange grove in Brandeis Bardin and other places that were sampled.	1. The Brandeis Bardin study is beyond the scope of the Data Gap Analysis. The Data Gap Analysis addresses the data needed to clean up buildings and wastes within Area IV. The CDM Team has reviewed the referenced document.
	IN-009: Christine Rowe, E-mail dated: 6/26/2008	
1	1. Please verify this report with DTSC and send it to your DATA GAP team. http://www.vcreporter.com/cms/story/detail/white_blight/6075/	1. DOE thanks the commentor for the link to the newspaper article. It references a white precipitate in a drainage not associated with Area IV.
	IN-010: Christine Rowe, E-mail dated: 6/26/2008	
1	1. SAIC - Our facilitator Ann Marshall works for SAIC. SAIC has contracts with Boeing to build "the Lead System Integrator (LSI) for the U.S. Army's Future Combat Systems (FCS) places it in a unique partnership role with government on a program that is key to the Army's transformation goals." Is this not a conflict of interest for SAIC?	1. DOE performs a conflict-of-interest analysis prior to the award of every contract. DOE identified no conflicts related to activities at SSFL for SAIC or CDM.
2	2. CDM - CDM has an excellent relationship as an environmental remediation firm. However, CDM also has contracts in places like Iraq. Has CDM got any conflicts of interest that they would like to explain?	2. CDM is a global engineering firm that supports water supply development, drinking water quality improvement, and wastewater treatment projects that improve the lives of people living in third world countries. These projects are funded by the U.S. Agency for International Development and other federal agencies. With its projects in Iraq and adjacent Middle Eastern countries as well as its domestic contracts, CDM works to improve the quality of human life and health through the design and construction of better water systems.
3	3. Why are you only looking for radiological samples in AREA IV only? Why aren't you looking at the whole SSFL for radiological contaminants? Why are you not going off site to known places that	3. DOE is investigating locations at SSFL where its prior activities may have resulted in contamination. DOE's activities were primarily located

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	have a history of radionuclides including Sage Ranch (SMMC), Dayton Canyon, Runkle Canyon, Bell Canyon, Woolsley Canyon, Ahmanson Ranch, Black Canyon, and Box Canyon? (Figure 4 - 16)	within Area IV, therefore the emphasis of DOE's investigation is on Area IV. Other portions of SSFL are being investigated by Boeing and NASA under consent orders issued by DTSC. DTSC would have to take the lead on investigations outside of SSFL because DOE has no jurisdiction to do so.
4	4. Explain a categorical exclusion - defined on page XVI	4. Under NEPA, a federal agency is exempt from preparing an EIS or an Environmental Assessment (EA) for recurring actions integral to the ongoing mission of the agency that do not individually or collectively have the potential for significant impacts. Each federal agency has the authority to establish a list of actions that are eligible for categorical exclusion. The list of actions that are eligible for categorical exclusion under DOE's purview are listed in 10 CFR 1021, Subpart D, Appendices A and B.
5	5. Who decides the Derived Concentration Guideline Level? Which regulator? page XVII	5. The Derived Concentration Guideline Levels (DCGLs) used in the *Draft Gap Analysis Report* are preliminary soil comparison screening criteria used to identify where significant soil contamination may exist and where additional sampling may be required. DOE will work jointly with EPA and DTSC to establish the final DCGLs for Area IV.
6	6. The cultural history of this site has not been addressed except as a part of the stake holders. I have addressed that in numerous emails to you. I have contacted the Santa Ynez Elders as the Tribal Government that I believe that you should have contacted, and I have indicated to them that they should be looking for your Draft Data Gap Analysis, and that they should be referring you to the closest known descendents. I have also contacted the Bureau of Indian Affairs and the Department of Interior to determine your responsibilities as a federal agency. What are your responsibilities as a federal agency to the tribes? Do you have an archaeologist monitoring AREA IV? Has AREA IV had a complete archaeological survey?	6. DOE sincerely appreciates the extensive information provided by the commentor related to the applicable cultural resources legislation. DOE intends to follow all laws concerning cultural resources and recently entered into consultation with the California State Office of Historic Preservation (OHP) and the Native American Heritage Commission (NHAC). DOE plans a full cultural resources review prior to any activities that would disturb land resources.
7	7. Could fugitive dust as defined on page XVIII be caused by dynamiting in Dayton Canyon? How will that dynamiting impact the cleanup of AREA IV?	7. Dynamite use in Dayton Canyon could create fugitive dust. However, it would not have an effect on cleanup within Area IV.
8	8. Please define the hydraulic conductivity rate better. Is the hydraulic conductivity rate of TCE? Tritium? Other COC's? the correct term for the movement offsite of many of these COC's? Please explain how fast these COC's are moving off site. - page XVIII	8. Hydraulic conductivity is the rate that groundwater (water, not the contaminants) moves through pores (gaps) in subsurface soil and bedrock. Contaminants typically move more slowly than water because they tend to adsorb to soil particles. Studies are ongoing to determine the rate of movement of contaminants, such as trichloroethylene (TCE) and tritium, in the groundwater at the site. Preliminary results indicate that contaminants only move a few feet per year, but the research has not yet been completed.
9	9. What long lived radionuclides have been determined in what quantities as a result of the current data? What are their current health risks to employees and people doing remediation? Can these radionuclides be remediated to the levels specified in SB990 to 10-6?	9. Table 3-11 in the *Draft Gap Analysis Report* lists the radionuclides that would be expected to be present in Area IV based on what is known about historical operations. The EPA will conduct a radiological survey to assess the nature and extent of radiological contamination at the site. The results of that work will be provided to DOE to support the development of the *SSFL Area IV EIS*. DOE will evaluate

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		alternatives for reducing the risks associated with site contamination in the EIS. One alternative to be evaluated will address the requirements outlined in SB 990.
10	10. Do you ever sample outliers?	10. Outliers reflect a sample result that is substantially different from the value that was expected. If sufficient data exist to establish background concentration, the outlier sample location is typically not re-sampled. The location could be re-sampled should additional information be needed to support the background study.
11	11. In your radioactive materials definition, you define it in terms of ionizing radiation. In fact, ions are not even defined.	11. The term "ionizing radiation" will be defined in the revised *Draft Gap Analysis Report*.
12	12. How can the public comment effectively on a document when terms are used that assume some knowledge of chemistry and physics.	12. DOE appreciates comments from all perspectives. Throughout the EIS process, people provide general feedback on the approach, thoroughness, and findings of the study. Individuals who are not subject matter experts can still provide important feedback to DOE. DOE intends to more fully explain technical terms to the public.
13	13. You discuss risk based cleanup criteria - but you discuss it in terms of point of departure - Point of Departure is not defined.	13. "Point of Departure" is a term from EPA guidance on cleanup decisions using EPA risk assessment criteria. It reflects the risk level predicted in the site risk assessment (typically measured in terms of number of individuals at risk per one million people) where a decision for cleanup can be made. A soil concentration, and therefore risk level, above the "Point of Departure" could result in a cleanup decision, whereas a risk level below the "Point of Departure" could result in a decision that no further action needs to be taken. Typically, the "Point of Departure" is set at the one in one million (or 1×10^{-6}) risk level. A definition of "Point of Departure" will be added to the *Draft Gap Analysis Report*.
14	14. Sample density - what is a "common density"? How do you know how many samples to take? - page XX What about peripheral properties on the SSFL and off sight - how do you determine sample density? Atomics International required sampling 10 miles form each facility - there have been at least 5 Atomics International facilities within 10 miles of the SSFL - all with a nuclear license to my knowledge.	14. Sample density reflects the number of soil samples collected per unit of study area, usually presented as the number of samples per acre. There is no "typical" sample density. Sample density is dictated by the number of samples needed to define the presence and extent of contamination and to perform the risk assessment. Locations with known contamination will have a higher sample density than locations with no known contamination. The number of samples collected is dependent on the size of the area to be investigated for contamination. The larger the area, the more samples collected. Sampling of adjacent properties is done when it is determined that contamination has moved away from the source of contamination to adjacent property. Sampling of some adjacent property is planned as part of the *SSFL Area IV EIS* analysis.

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15	15. Can you please explain terms in an easy to understand manner that is consistent - for example - there are federal standards and California standards. There are MCLS, PRGs, etc. We need to know how you have derived your background numbers and your PRGs. We need to be able to compare apples to apples.	15. Maximum contaminant levels (MCLs) are drinking water standards developed by government (state and Federal) health scientists, based on a number of criteria. As a standard, MCLs are enforceable under state and federal laws. PRGs are a planning tool used in collecting and screening soil and water data. They are not regulatory criteria (i.e., cleanup standards) for cleanup, and in accordance with state and federal guidance, cannot be used as cleanup criteria unless they are demonstrated to be protective, based on future land use considerations. For further information on how background and PRG values were developed and used in the *Draft Gap Analysis Report*, please see Sections 3.4.1 and 3.4.2 and Appendix C.
16	16. What numbers do the NPDES permits require for remediation.	16. NPDES limits are established by the regulatory agency with authority over stormwater runoff and are specified in an NPDES permit. The relevant standards can be found on the LARWQCB website, under "Cleanup and Abatement Order issued to the Santa Susan Field Laboratory," Order R4-2007-0055 (available online through http://www.waterboards.ca.gov/losangeles/board_decisions/adopted_orders/by_year.shtml). Those standards will be considered as part of the evaluation of cleanup alternatives.
17	17. There are numerous Blue Line streams on the site - Including Area IV. How are they looked at? Is the Army Corps of Engineers looking at the remediation of this site in terms of water?	17. The locations of the ephemeral drainages associated with Area IV were highlighted in blue to aid the reviewer in following their pathways. The blue highlighting of the drainages should not be interpreted to mean that those drainages contain water. The Army Corps of Engineers regulates only navigable waterways and wetlands. The dry drainages do not fit the definition of navigable waterways or wetlands; therefore, the Army Corps of Engineers is not involved.
18	18. Do you believe that offsite areas - outside the SSFL require GAMMA WALK OVERS, and analysis of groundwater, seeps and springs, soil vapor, and surface water for radionuclides? The TCE plumes already seem to be in Sage Ranch and Brandeis Bardin as well as in NASA - are you going to sample those areas for the DATA GAP?	18. Based on current information related to activities that occurred within Area IV, there is no need to conduct sampling studies beyond Area IV for purposes of the *SSFL Area IV EIS*, except in the northern buffer area and drainages leaving Area IV. DOE will also support the collection of soil samples in areas adjacent to Area IV when data collected from Area IV indicate that contamination may have migrated to the adjacent location. In the *Draft Gap Analysis Report*, the data gap analysts recommend sampling and radiological monitoring of seeps and DOE concurs with that recommendation. Any sampling of Sage Ranch, the Brandeis Bardin property, or NASA-owned properties is beyond the scope of the *Draft Gap Analysis Report* recommendations, unless it is shown that contaminants from Area IV have spread to those properties.
19	19. Define GIS.	19. Geographic Information Systems (GIS) is the term for the computer graphics programs used to display data and information on computer-generated maps.

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20	20. It states that your PRGs were developed based on an unrestricted land uses - open space and rural residential considerations. I believe that is the assumption based on future land use. But because local residents do grow their own produce and eat their own eggs, animals, etc, the higher agricultural standards should be applied as a result of SB 990 - is that a correct assumption of your PRGs? - page E1	20. The PRGs used to screen data in the *Draft Gap Analysis Report* were based on a residential land use scenario in which it is assumed that 25 percent of the resident's diet is composed of locally grown fruits and vegetables. When the *Draft Data Gap Report* is revised, DOE proposes to screen the data using the criteria being developed by the Radionuclide Background Workgroup, which will include an agricultural scenario.
21	21. I believe that you discussed this before - your detection limits above the screening criteria become the data gap. That refers to your early non detects when the instruments were not as sensitive - is that correct?- page E2	21. No, that is not correct. Detection limits were used as a screening criterion. Data with an elevated detection limit above PRGs were identified as a data gap.
22	22. You discussed the MARSSIM principles for the radionuclide contamination cleanups? Can you please define MARRSIM further. - page E2	22. The Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM) is a process developed by federal agencies to be used to determine whether a radiologically contaminated site has been sufficiently cleaned up to allow its release for general reuse. MARSSIM is defined in Section 1.7.5.2 of the *Draft Gap Analysis Report* and elsewhere in the document.
23	23. In the gamma walk over survey, you talk about drainages down gradient of AREA IV. Where have you determined would be sampled based on "down gradient of AREA IV"? - page E-3	23. The gamma walkover survey discussed in the *Draft Gap Analysis Report* will not be conducted as described. Since the report was issued, DOE and EPA have agreed to a new approach. EPA will conduct the radiological characterization survey. Follow-on surveys may be conducted by DOE after EPA has completed its work, if DOE determines that such is necessary to support development of the *SSFL Area IV EIS*.
24	24. For Groundwater, you mention that the hydrologic properties of aquifers? Are hydraulic and hydrologic a synonymous terms? What are the hydrologic properties of our aquifer(s)? - page E3	24. Groundwater is water located between rock and soil particles beneath the ground surface. Hydrogeologic properties reflect the size of particles and type of soil and rock that contain the groundwater. The spaces between soil particles vary in size and can be very small in bedrock and silt, and relatively larger in sand and gravel. Hydraulic properties reflect the rate at which water can move between the bedrock, soil, or gravel particles. The rate is slower for smaller spaces between particles (e.g., bedrock) and faster for sand and gravel. The hydrogeologic properties are discussed in Section 2.3.2 of the *Draft Gap Analysis Report*.
25	25. The future use of this site may be parkland. You talk about potential biological receptors. An equestrian center has been proposed for this site. Can your data allow for the stabling of horses and other domestic animals on this property after remediation? (Ecological risk assessments) page E-3	25. The ecological risk assessment is being designed to assess potential contaminant effects on all grazing animals.
26	26. For human health and risk assessments - has anyone considered sampling human tissue, urine, or blood - of current and former employees and local residents that have a long term exposure - biomonitoring? page E3	26. The purpose of the *Draft Gap Analysis Report* was to evaluate the data currently available and determine what additional data will be necessary in order to prepare a risk assessment to support preparation of the *SSFL Area IV EIS*. As the EIS will be focused on alternative strategies for cleanup of the contamination that remains in Area IV, biomonitoring would not provide any useful data.

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27	27. Air sampling - are you sampling all of the filters in all of the buildings? Historically, building air filters were not maintained regularly. A new building was just removed. Shouldn't there have been wipe samples and air monitoring? Shouldn't all future buildings be wipe sampled and air monitored before and during removal? - page E-4	27. Boeing continues to collect air filter samples for those buildings that are still active. Future air sampling and building wipe samples are proposed for the buildings that will be removed from Area IV.
28	28. Background - you told us that you agreed that background numbers needed to be determined and we were told that EPA would determine those numbers. Did you consider the areas that I explained would not be appropriate for background? - page E4	28. EPA will determine the appropriate areas for background sampling based on criteria that it develops.
29	29. What is a piezometer? Sampling was done in Happy Valley and in the Former Sodium Disposal Facility. Are you aware that radiological materials may have gone into the Area I Burn Pit?	29. A piezometer is a small diameter pipe installed into an aquifer that is used to monitor groundwater levels. DOE is aware that DTSC is investigating the materials that may have gone to the Area I Burn Pit, including radioactive materials. The Area I Burn Pit will be cleaned up accordingly.
30	30. On page E-5, you mention that there are 600 radiological samples required. Is that the total number of radiological samples needed or the number of new samples needed for the data gap?	30. In the *Draft Gap Analysis Report*, the analysts recommend sampling at 600 locations. Multiple samples will be collected at many of these locations, with over 2,000 samples recommended. These samples are in addition to the existing valid samples.
31	31. You state that 9 acres have an adequate gamma walk over - how many total acres are in AREA IV? Are you saying that the Gamma walk over survey only pertains to the 90 acres of AREA IV? - page E5	31. Area IV covers 290 acres. In the *Draft Gap Analysis Report*, data analysts recommend conducting a gamma walkover survey of all 290 acres.
32	32. You say that 100% gamma walk over survey is required of accessible areas? I have never seen Area IV - how much is accessible?	32. It is anticipated that less than 10 acres of the 290 acres would be considered inaccessible for the walkover survey.
33	33. On page E- 6, you state that there is no background data for groundwater. I sent some water analysis documents for before the nuclear research was being done - to my knowledge. Did you get that data?	33. DOE thanks the commentor for the submitted documents. However, the data referenced was collected over 60 years ago and will not meet the required quality control limits for groundwater characterization purposes today.
34	34. Are the high gamma levels in the Happy Valley area on the DTSC document naturally occurring? Is gamma radiation naturally occurring in water and soil?	34. DOE is not aware of high gamma levels in the Happy Valley area. DOE is aware of the DTSC-directed investigations and is awaiting those results. There are naturally occurring radionuclides that emit gamma radiation in water and soil.
35	35. You do not define TCE, 1,2-DCE, and 1,1 DCE or tritium - yet you describe them as the most frequent COIs. What are the health risks of these COIs in the quantities that you are seeing? - page E6	35. The presence of hazardous chemicals does not necessarily result in exposure; exposure to the chemicals is necessary for human health or ecological impacts to occur. Accordingly, one important step in a risk assessment is to evaluate possible mechanisms for exposing humans and other receptors to the contaminants. A site risk assessment will be performed for these chemicals, but the health risks are not known at this time. The commentor is referred to Section 4.2.1 of the *Draft Gap Analysis Report* for a discussion regarding the relationship of these contaminants with their MCLs (the health-based standards for drinking water).

	Comment	Response
36	36. I have never seen dosimeter or badge data for AREA IV. Should everyone who enters AREA IV wear a dosimeter? What are the short term health risks in AREA IV today?	36. Radiation detection equipment reveals that radiation outside the facilities in Area IV is no higher than what is currently believed to be background levels. EPA is conducting a background study at the present time. Individuals who enter buildings where radioactive materials were once used are required to wear dosimeters. There are no known short-term health risks for individuals visiting Area IV.
37	37. You need to avoid chemical symbols - or define them in a chart in the front - for example the frequent use of H3 should be defined as tritium. What does tritium break down to? What is its half life? What are the human health risks of tritium? (Table 3-2)	37. The revised *Draft Gap Analysis Report* will include definitions of chemical symbols. Tritium is a radioactive isotope of hydrogen and exists primarily in the form of tritiated water in the environment. It breaks down (decays) to helium. Tritium is continuously being formed naturally in the environment and has a half-life of 12.3 years. Exposure to tritium may increase one's chance of cancer. However, tritium emits only low-energy radiation and, because it is in the form of water, leaves the body very quickly. Therefore, the health risk per amount of exposure is one of the lowest ratios of all radionuclides.
38	38. There are fault zones and natural pathways all over the SSFL . We know that most of the site is in the Chatsworth formation. How many aquifers and small grained units are there? Where do these aquifers and fine grained units lead? There are not monitoring wells or compliance points in the southern part of the Woolsley Canyon Drainage or the Eastern Drainage. What is migrating from AREA IV through these fissures, fractures, fine grained units, etc? At what depth are they? Figure 3-3	38. There are two aquifers associated with Area IV; a shallow aquifer above the bedrock and the bedrock aquifer. Studies are ongoing to evaluate the depth and migration patterns for contaminants within the aquifers. Area IV does not drain to Woolsey Canyon or the Eastern Drainage. The relationship of Area IV with drainages will be further described in the revised *Draft Gap Analysis Report*.
39	39. Define Radiological Class - Figure 3-6	39. Radiological Class is defined in Section 3.6.3 of the *Draft Gap Analysis Report*. The definitions pertain to: (1) areas with known contamination, (2) areas of possible contamination, and (3) areas with no history of radioactive material use. Data tables in the report provide results for each of the class areas.
40	40. What is a site investigative well point? Where will the new monitoring wells be? What are the aquifer properties - explain. page E-6	40. An investigative well point is a temporary well used to access and sample groundwater. Figure 4-15 in the *Draft Gap Analysis Report* provides the locations of the proposed new wells. Details regarding aquifer properties are found in Section 4.2.2 of the *Draft Gap Analysis Report*.
41	41. Seep data - Seeps and springs need to be sampled in Black Canyon, Dayton Canyon, Woolsley Canyon, the Eastern Drainage, Ahmanson Ranch, Brandeis Bardin, Sage Ranch, Bell Canyon, Orcutt Ranch, Chatsworth Reservoir, Chatsworth Park South, and the Santa Susana Pass State Historic Park (all in the same aquifer and same Chatsworth Formation). The Callabasas Landfill should have leachate sampled - there is a concern that mixed waste that was unauthorized has been sent to the Calabasas landfill.	41. Sampling is proposed by EPA for seeps associated with Area IV (i.e., those immediately adjacent to Area IV), but is not part of EPA's scope for seeps not associated with Area IV. The sampling of leachate at landfills is the responsibility of the landfill operator in accordance with State of California Integrated Waste Management Board requirements.

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42	42. Soil Vapors - where are they near surface - AREA IV, NASA, Northern Drainage, Brandeis Bardin, Sage Ranch? At what depth are the plumes? What is the human health risk of these TCE and tritium plumes, etc?	42. Soil vapor (also called soil gas) is air found in the spaces of soil particles above groundwater. Soil vapor occurs in all soils. Soil vapor does not behave in the same manner as contaminant plumes behave in groundwater. Groundwater contamination in Area IV is discussed in Section 4.2.2 of the *Draft Gap Analysis Report*. A risk assessment using site data has not been developed to determine whether a risk exists. The contamination does not result in health effects until a human has been exposed to a contaminant. The risk assessment process will evaluate the potential for exposure to occur.
	IN-011: Christine Rowe, E-mail dated: 6/27/2008	
1	1. PRESERVATION AND TREATMENT OF CULTURAL RESOURCES The Native American Heritage Commission (NAHC) is the Trustee State Agency with jurisdiction over cultural resources See Public Resources Code 21070 and Environmental Protection Information Center v. Johnson (1985) 170 Cal App. 3d 604. Public Resources Code 21150 requires the preparation of an Environmental Impact Report for other State Agencies allocating state or federal funds to local agencies for projects significantly effecting the environment. Summary of California Public Resources Code Sections re: Preservation and Treatment of Cultural Resources PRC 5097.9 –5097.96 Creates the nine member Native American Heritage Commission appointed by the governor and directs that at least five members shall be elders, traditional people or spiritual leaders of California Native American Tribes. Directs the Commission to identify and catalog places of special religious, spiritual or social significance to Native Americans, and known graves and cemeteries of Native American on public and private lands. Authorizes the Commission to take actions and work with other state and federal agencies in investigating, reviewing, commenting and making recommendations, in order to avoid or minimize project impacts to a Native American sanctified cemetery, place of worship, ceremonial site or property that has religious significance to Native Americans. In addition the Commission is to assure Native Americans access to and prevent severe and irreparable damage to these locations. Authorizes the Commission to assist and mediate between Most Likely Descendents and landowners in order to provide for the dignified treatment and disposition of Native American human remains and associated grave goods. PRC 5097.97 Authorizes the Commission to investigate, recommend mitigation measures and request legal action in the event that the Commission determines that a proposed action by a public agency may bar appropriate access or cause severe or irreparable damage to a Native American sanctified cemetery, place of worship, religious or ceremonial site, or sacred shrine located on public property. PRC 5097.98 Requires the Commission, upon notification by a county coroner, to notify the Most Likely Descendents regarding the discovery of Native American human remains. Enables the Most Likely Descendant with the permission of the landowner to inspect the site and recommend treatment and disposition of the human remains and associated grave goods with appropriate dignity. Requires the landowner in the event no Most Likely Descendent is identified, or the descendant fails to make a recommendation or the landowner rejects the recommendation of the descendant, to re-inter the remains and burial items with appropriate dignity on the property in a location not subject to further and future disturbance. 5097.99 Prohibits acquisition or possession of Native American artifacts or human remains taken from a Native American grave or cairn, except in accordance with an agreement per Public resources code 5097.94 (l) with the landowner and appropriate Native American groups or per agreement with the Most Likely Descendent (MLD)	1. DOE sincerely appreciates the extensive information provided by the commentor on the applicable laws related to cultural resources. DOE intends to follow all laws concerning cultural resources and recently entered into consultation with OHP and NAHC. DOE plans a full cultural resources review prior to conducting any activities that would disturb land resources.

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	pursuant to PRC 5097.98. 5097.993 Prohibits a person from unlawfully and maliciously excavating, removing, destroying, injuring, defacing a Native American historic, cultural, or sacred site, that is listed or may be eligible for listing in the California Register of Historic Resources including any historic ruins, any burial grounds, any archeological or historic site, any inscriptions made by Native Americans. The prohibited act must be committed with specific intent to vandalize, deface, destroy, steal, convert, possess, collect, or sell a Native American artifact, art object, inscription or feature and must be committed on public land, or on private land, by a person other than the landowner, if such person is not otherwise acting lawfully. 5097.994 Provides that a violation of PRC 5097.993 is punishable by imprisonment in the county jail for up to one year, or by a fine not exceed ten thousand dollars, or by both. Also provides that a violation may be subject to civil penalties not to exceed fifty thousand per violation. PRC 21083.2 Requires the lead agency determine whether a project may have a significant effect on archaeological resources and requires that an EIR address unique archaeological resources. PRC 218084.1 Establishes that a project that may cause a substantial adverse change in the significance of an historical resource is a project that may have a significant effect on the environment. A historical resource is a resource listed in, or eligible for listing in, the California Register of Historical Resources. Summary of California Health and Safety Code section 7050.5 The provisions of section 7050.5 should be considered in conjunction with the provisions of the Public Resources Code Health and Safety Code 7050.5 protects Native American burials in conjunction with PRC 5097.98 in that it provides that anyone who knowingly mutilates or disinters, disturbs or removes any human remains from any location other than a dedicated cemetery is guilty of a misdemeanor. This applies to both private and public property. The section further provides that in the event of a discovery of human remains in any location other than a dedicated cemetery, there shall be no further excavation or disturbance of the site or any nearby area reasonably expected to contain remains until the coroner of the county has determined the manner and cause of death. The coroner has two working days to make the determination. If the coroner determines that the remains are not subject to his authority (meaning that the coroner has determined that the remains are not subject to investigation as part of a crime) and if the coroner determines that the remains are Native American or has reason to believe they are Native American, the coroner must contact the Native American Heritage Commission by telephone within 24 hours. The coroner is to make his determination within two working days of being notified of the discovery of the remains. Summary of SB 18 Local Government Consultation Requirements Government Code sections 65040.2, 65092, 65351, 65352, 65352.3, 65352.4, 65560, 65562.5, Civil Code section 815.3 The law became effective on March 1, 2005. It requires that prior to the adoption or amendment of a city or county's general plan, the city or county must conduct consultations with California Native American tribes for the purpose of preserving specified places, features, and objects that are located within the city or county's jurisdiction. The law defines the term "consultation." Consultation provisions include federally recognized California Native American tribes and non-federally recognized California Native American tribes that are on the contact list maintained by the Native American Heritage Commission. The law also includes provision for open space to protect California Native American historical, cultural, and sacred sites within the definition of a "local open-space plan," giving tribes the ability to hold conservation easements. Government Code section 65040.2: Consultation Guidelines Requires the Commission to consult with the Governor's Office of Planning and research (OPR) to develop guidelines for local governments to follow in consulting with tribes. Those guidelines (sometimes referred to as the SB 18 Guidelines) were published on April 15, 2005. Government Code section 65092: Public Notice to California Native American Indian Tribes	

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	Includes California Native American tribe that is on the contact list maintained by the Native American Heritage Commission in the definition of "person" to whom notice of public hearing shall be sent by local governments. Government Code section 65351: Native American tribes Involvement in General Plan Proposals Requires local planning agencies to provide opportunities for involvement of California Native American tribes on the contact list maintained by the Native American Heritage Commission in the preparation or amendment of the general plan. Government Code section 65352: Referral of Acton on General Plan Changes to Native American tribes Requires local planning agencies to refer proposed action of general plan adoption or amendment to California Native American tribes on the contact list maintained by the Native American Heritage Commission with a 45 day opportunity for comments. Government Code section 65352.3-65352.4: Consultation with Native American tribes on General Plan Proposals Requires local governments to conduct meaningful consultation with California Native American tribes on the contact list maintained by the Native American Heritage Commission prior to adoption or amendment of a city or county general plan for the purpose of protecting cultural places on lands affected by the proposal. Provides for a 90 day period for tribes to request consultation. Government Code section 65560, 65562.5: Consultation with Native American tribes on Open Space Includes protection of Native American cultural places as an acceptable designation of open space. Requires local governments to conduct meaningful consultation with California Native American tribes on the contact list maintained by the Native American Heritage Commission for the purpose of protecting cultural places located within open space. Civil Code section 815.3 Provides that a California Native American tribe on the contact list maintained by the Native American Heritage Commission may acquire and hold conservation easements. Criteria for California Native American Tribal SB 18 Consultation List California Native American tribes are listed for General Plan consultation under Government Code section 65040.2 et seq. if they meet the one or more of the following criteria: Federally recognized California Native American Tribes. California Native American tribes that function as a governmental body that carries out general government function, has regularly elected officers, operates under a tribal constitution, and maintains a tribal roll. California Native American tribes that have submitted a completed petition for recognition by the federal government. Submission of a letter of intent to petition for federal recognition is not alone sufficient for inclusion on the list. California Native American tribes possessing documentation that they were formerly recognized. California Native American tribes that are recognized as a Native American tribe by the surrounding community, including other tribes and local governments. California Naive American tribes who are members of continuously operating historical tribes that were signatories to an un-ratified treaty. California Native American tribes whose representation is through a non-profit organization dedicated to general governance and tribal community well-being and for which the majority of the non-profit's membership is not represented by any other tribal group. The Van Horn court held the following: 1. The court ordered the return of the artifacts taken from the grave and held that Public Resources Code section 5097.99 makes it unlawful to possess Native American artifacts taken from a Native American grave, unless it was in accordance with an agreement per PRC 5097.94(l) with the landowner and appropriate Native American groups or per Court Cases (California Court of Appeals) In People v. Van Horn (1990) 218 Cal App 3rd 1378 the Attorney General filed suit on behalf of the Native American Heritage Commission under Public Resources Code 5097.99 for return of artifacts (two metates) unearthed from a Native American grave and kept by an archeologist. Each individual had been buried with the stone metate fragments on his chest. The Native American remains were re-interred prior to the suit, but archeologist Van Horn	

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	refused to return the metates. agreement with the Most Likely Descendant (MLD) pursuant to PRC 5097.98. The court held that landowners do not have the right to authorize possession of human remains and burial goods. 2. The court also affirmed the authority of the MLD per PRC 5097.98 to recommend a disposition of remains and burial goods and enter into an agreement with the landowner as to disposition, thus effectively giving the MLD a choice of preservation or re-burial. 3. The court also affirmed the Commission's authority as set out at PRC 5097.94 (k) and (l) and PRC 5097.98 to mediate between landowner and Native groups and to assist in developing agreements for treatment of Native American human remains and associated grave goods; the court stating that these code sections give control of Native American remains to Native Americans acting under the supervision of the Native American Heritage Commission. 4. The court found that the language of PRC 5097.99 prohibits possession of all artifacts taken from a Native American grave, whether or not they are "associated grave goods." The court found that PRC 5097.99 applies to any artifact unearthed from a grave. 5. The court found that PRC 5097.99 applies to graves that do not qualify as "burial parks" under the general cemetery laws. 6. The court found PRC 5097.99 does not violate the constitutional restriction against establishment of religion. 1 EPIC v. Johnson arose from the Environmental Protection Center's challenge to a timber harvest plan approved pursuant to the Forest Practice Act by the California Department of Forestry (CDF). The court ruled that California Environmental Quality Act (CEQA) applies to timber harvest plans and that the CDF was required under CEQA to consult with the Native American Heritage Commission before approving the plan for a redwood grove in the vicinity of a Native American archaeological site. The Epic Court held the following: 1.The court held that CEQA section 21080.4 and CEQA guidelines section 15086 created a legal duty for the lead agency to consult with the NAHC as an agency having jurisdiction over an effected natural resource including archaeological sites. 2. The court held that the Commission has jurisdiction under Public Resources Code 5097.94 and 5097.95 to identify sites of special religious and spiritual significance to Native Americans and to consider the environmental impact on property identified or reasonably identified as a place of special religious significance to Native Americans and to make recommendations regarding sacred places located on private lands. 3. The court noted that the Commission is specifically listed in Appendix B of the CEQA guidelines as an agency with specific expertise regarding places of religious significance to Native Americans, including archaeological sites and burial grounds. 4. The Court noted that CEQA section 21083.2 and CEQA guidelines Appendix K reflect a strong legislative policy choice in favor of preservation of Native American archeological sites, cemeteries and other sacred grounds. (Appendix K provisions have been renumbered and are now found in CEQA guidelines 15126.4 (b) (3) (A).	

	Comment	Response
IN-012: Christine Rowe, E-mail dated: 6/29/2008		
1	1. The two companies, which were awarded a contract to handle the cleanup of AREA IV, SAIC and CDM, may have some conflicts of interest. SAIC has connections to Boeing, CDM does work in Iraq, both of which are likely to cause additional distrust for the community members. http://enr.construction.com/people/ topLists/topEnvDesign/topEnv_1-50.asp http://www.boeing.com/news/releases/2002ql/nr_020307s.html	1. CDM is a global environmental engineering firm that provides drinking and wastewater project support to improve the quality of human life. This includes development of water quality projects for people living in Middle Eastern countries as well as in Asia. SAIC maintains a comprehensive Organizational Conflict-of- Interest Compliance System designed specifically to assist the company in identifying and avoiding or mitigating any potential conflict situations. The SSFL project was vetted through this system and no conflict was identified. Using the standard implied in the comment, very few contractors would be free of conflicts. DOE recognizes there is mistrust in the community towards DOE and its contractors and is working to regain that trust.
2	2. Meetings always take the form of Dan Hirsch of Committee to Bridge the Gap (CBG) v DOE or DTSC, whether he is present or not. Are Dan Hirsch's calculations more accurate than the DOE's health physicist's?	2. To DOE's knowledge, Mr. Hirsch has not provided calculations relative to SSFL. DOE acknowledges that Mr. Hirsch frequently takes exception to information developed and provided by the department's scientists. DOE remains committed to providing accurate information and calculations that are based on a review of data, an evaluation of the quality of those data, and compliance with the relevant requirements for conducting risk assessments.
3	3. The community still does not know if Cal EPA or the federal EPA will lead the cleanup. It seems highly unlikely that the DOE will allow the federal EPA to oversee their work if the federal EPA does not list the site.	3. DOE agrees with the commentor that listing the site on the National Priorities List (NPL) would allow a more comprehensive look at the cleanup. However, the state does not concur with listing at this time. On July 24, 2008, DOE and EPA signed an Interagency Agreement that provides for EPA to conduct a radiological background study and a radiological study of Area IV.
4	4. SB 990 says that the whole lab must be cleaned up, yet the lawsuit brought by CBG, the National Resource Defense Council (NRDC) and the City of Los Angeles only requires an Environmental Impact Statement (EIS) for part of the contaminated land -- AREA IV. It seems as if the radiological cleanup is being done in a piecemeal fashion. Buildings that are in other areas that should be sampled for radionuclides continue to be removed without proper DTSC over sight.	4. DOE agrees that the regulatory situation at SSFL is very complicated. DOE intends to comply with all relevant laws and will clean up all contamination that is documented as resulting from activities that the agency was responsible for. Decisionmaking related to the cleanup process will move forward with the *SSFL Area IV EIS* upon completion of EPA's radiological survey and any follow-on work deemed necessary as a result of that survey.
5	5. The federal EPA says that the DOE will not let them oversee the environmental sampling performed by SAIC and CDM, yet the cleanup contract which was awarded by Congress, was meant to be shared by the DOE and EPA.	5. An Interagency Agreement between EPA and DOE was signed on July 24, 2008. This agreement states that EPA will conduct a radiological background study and a radiological characterization survey for Area IV of SSFL and subsequently amended for EPA to conduct the radiological characterization survey as more fully described in Section 3. EPA and DTSC will have the opportunity to review and comment on any document developed by a DOE contractor.

	Comment	Response
6	6. CDM is unwilling to check the whole SSFL site for radionuclides. They will not sample peripheral properties where historically radionuclides have been found and documented in the past. For example, some radioactive waste may have been sent to AREA I Burn pit, which is outside of AREA IV.	6. While DOE understands that the community is concerned about cleanup beyond Area IV, the scope of work for the *SSFL Area IV EIS* was designed to allow compliance with the federal judge's order to prepare an EIS for remediation of contamination caused by operations at Area IV. DOE will investigate any contamination found on adjacent properties that is demonstrated to be attributable to DOE activities.
7	7. In the AREA IV, the estimated sampling is equivalent of one sample per acre-- is this an adequate sampling for radionuclides in an area that has had several nuclear accidents and the deliberate incineration of radioactive waste?	7. In the *Draft Gap Analysis Report,* the analysts recommend collecting at least 4,000 samples (of which 2,000 would test for radionuclides). Area IV is only 290 acres. The 4,000 new samples would be combined with over 2,000 prior samples that were deemed acceptable for use in preparing the risk assessments. The resulting sample density would be more than 20 samples per acre. However, US EPA will be the lead agency in conducting radiological sampling in Area IV (290 acres) and the Northern Undeveloped Land (182 acres) utilizing funds provided by DOE. More than 10,000 radiological samples are planned.
8	8. While Boeing was not the initial polluter, it is the current owner/operator of much of the SSFL site. Boeing controls the data - historic, the sampling, and is currently removing assets which they claim to belong to Pratt Whitney or for RFI work or otherwise. The community does not know what is being removed, why it is being removed, and whether this is the time to remove it. There is no transparency here.	8. A federal judge mandated that DOE prepare the *SSFL Area IV EIS* to address the remediation of contamination resulting from DOE-sponsored activities within Area IV. DOE cannot proceed with cleanup activities until the EIS has been completed. DOE has no authority over private property owned by Boeing.
IN-013: Christine Rowe, E-mail dated: 6/30/2008		
1	1. Please remind the Draft Data Gap Analysis team that, so far, I have been unable to find any table that refers to what the abbreviations stand for. For example - tritium - H3.	1. A list of abbreviations is provided in the front matter of the *Draft Gap Analysis Report* (see the glossary and list of abbreviations). It will be updated in the revised report.
2	2. Also, on the maps, there is reference to Classes of Radionuclides. They are classed as 1, 2, and 3. We need the map's to identify what that means - for example - suspected area, known area, and at what levels are they known.	2. The classes of radionuclides are defined in Section 3.6.3 of the *Draft Gap Analysis Report*. The definitions pertain to: (Class 1) areas with known contamination, (Class 2) areas of possible contamination, and (Class 3) areas with no history of radioactive material use. Data tables in the report provide results for each of the class areas.
IN-014: Christine Rowe, E-mail dated: 7/8/2008		
1	1. I have requested a site tour of AREA IV – I have not had one. It is difficult to know the GAPS when I do not know what was there and what is no longer there. It is just like reading history from a book – going to see the Liberty Bell is much different than reaading about it in a book.	1. DOE is beginning a series of public tours of Area IV. DOE will ensure that all members of the public who wish to tour will have that opportunity. Tours will be announced and all interested individuals given the opportunity to participate.
2	2. page E-7: "Any body of water receiving runoff from Area IV will also be proposed for sampling under the field sampling investigation." "…. NPDES monitoring points will also be sampled should sufficient rainfall occur during the field sampling investigation." Who is doing this sampling – Boeing? Are their split samples? The LA RWQCB does not have enough compliance points to cover all of the areas of runoff from the SSFL site. We know that at one time all of the drainage was sent to one holding pond, I believe it was the Silvernale pond. Then it drained to Bell Creek. So you must look at the pathways throughout the whole SSFL site that the drainages historically passed through.	2. In the *Draft Gap Analysis Report*, the analysts recommend collection of additional samples from drainages and ponds receiving runoff from Area IV beyond those samples being collected by Boeing. The LARWQCB hosts meetings regarding the stormwater management plan it is enforcing at SSFL. Concerns regarding the plan should be addressed to the LARWQCB.

	Comment	Response
3	3. page E-7: "Any body of water receiving runoff from Area IV will also be proposed for sampling under the field sampling investigation." "…. NPDES monitoring points will also be sampled should sufficient rainfall occur during the field sampling investigation." We have had two years of extreme drought. It is very likely that many surface contaminants have blown away in the past two years. Sampling should be done after all rain events – and specifically, the sampling should not be completed until we have gone through the January and February rains in 2009. This is when you are most likely to see what is released from remediation throughout the SSFL site this past year – in terms of radionuclides especially.	3. Stormwater sampling is being conducted by Boeing following rainfall events in accordance with the sampling plan approved by the LARWQCB. The surface-water sampling work recommended in the *Draft Gap Analysis Report* would occur during and after rainfall events, when channels and ponds contain water.
4	4. ESLs – Please remember that we have large mammals – mountain lions and other cats, deer, coyotes, dogs, cows, horses, endangered reptiles, etc, in the area. This site may ultimately become parkland. Cameron Smyth is proposing to stable horses up at the SSFL site. Would it be wise to stable animals on a site that will not be considered clean enough for humans to live on?	4. DOE proposes to clean up Area IV to soil levels that would be protective of human health, domestic animals, and wildlife.
5	5. page E-8: There was a removal of a building at the front entrance about a month ago. Air samples, wipe samples, and other data that could have radionuclides should be gotten from DTSC, Boeing, and others involved with this project.	5. DOE understands that the removal of the Boeing-owned structure near the entrance to SSFL was completed in accordance with established DTSC-approved protocols. Those protocols include a requirement for two-week advance notification of DTSC to allow a DTSC presence during demolition and excavation. In this instance, DTSC was present at the start of the demolition process. All samples taken before, during, and after the removal followed established protocols. The structure was never used for radiological operations or storage of radiological materials. DOE has no jurisdiction over Boeing's activities outside Area IV. As the owner of Areas I and III, Boeing has unrestricted rights to remove any building in accordance with the protocols it has established with DTSC.
6	6. The Northern Drainage will be having ongoing excavations – air monitoring should be done there. Filters for all buildings on site should be removed and sampled for radionuclides and other toxic contaminants. Data on old filters should be evaluated – I have read that filters were not regularly changed, nor were the media probably as good years ago as they are today.	6. No activities occurred in the Northern Drainage under DOE's direction. Further, DOE has no jurisdiction over Boeing's activities outside Area IV. Northern Drainage remediation was performed by Boeing under the direction of DTSC.
7	7. Bedrock Analysis – Bedrock should include areas off site and in the buffer zone. Boeing bought the buffer zone property because Brandeis had radionuclides. Radionuclides have also been found historically at Sage Ranch, Runkle Canyon, Ahmanson Ranch, Dayton Canyon, Bell Canyon, and in the Chatsworth Reservoir. These also all have historically known natural pathways. The winds traditionally blew from the northwest to the southeast – that is why they put the Area 1 Burn Pit where they did. Therefore sampling of the bedrock should include the sandstone barriers on the whole site – not just in Area IV.	7. EPA is developing the design of the radiological characterization study for Area IV. The need for bedrock sampling has been discussed with EPA. DOE will sample bedrock at any location where the overlying soils exhibit contamination. This sampling will be consistent with that conducted as part of prior cleanup actions within Area IV.

	Comment	Response
8	8. "Background values for metals and dioxin in soil have been agreed upon by regulatory agencies for the SSFL, although there is not a similar set of background values for subsurface soil." "The radionuclide background used for this data gap analysis was based on existing offsite surface soil data." "These data may be useful for establishment of agreed upon future radionuclide background values." "However, establishment of separate background values for each of the two geological formations is desirable and additional surface soil data may be useful for that purpose." This goes back to my earlier complaint that I was not invited to your technical meeting on background. How are community members expected to react to numbers if they are not a part of the process? No one from the DOE has ever personally discussed background numbers with me. Should I accept Dan Hirsch's numbers for that reason?	8. EPA is conducting a background study. The agency has convened a Background Workgroup and continues discussions of the site's background needs with DTSC. EPA plans to conduct a broader public involvement effort at a future date. DOE encourages the commentor to participate in that larger discussion. Mr. Hirsch has not shared numbers related to site background with DOE.
9	9. "Background values for metals and dioxin in soil have been agreed upon by regulatory agencies for the SSFL, although there is not a similar set of background values for subsurface soil." "The radionuclide background used for this data gap analysis was based on existing offsite surface soil data." "These data may be useful for establishment of agreed upon future radionuclide background values." "However, establishment of separate background values for each of the two geological formations is desirable and additional surface soil data may be useful for that purpose." Many parts of the SSFL have been previously excavated and have "fill" dirt. That dirt may have even come from the contaminated Chatsworth Reservoir – where they sampled for "borrow soil" and came up contaminated. Surface and below surface soil cannot be used for background from anywhere on the SSFL site.	9. Based on information provided by Boeing, DOE understands that the fill dirt came from within DTSC approved SSFL locations and not from Chatsworth Reservoir.
10	10. "Also, there is no background data for radionuclides at depth for near surface and subsurface soils, sediment, rocks, surface water, and ground water." "Therefore, the data gaps include additional background sample analysis for radionuclides and chemicals for these matrices." I have seen historical documents on a DTSC link that have ground water analysis going back to 1948 I believe. DTSC should make those links available to you. I am sure there is all kinds of reports on that link. There has to be LA RWQCB documents on this site.	10. DOE appreciates the information provided by the commentor. However, historic data cannot be used for background purposes because it lacks the required quality control information necessary to meet today's data quality standards.
11	11. Going back to routine questions: Why is remediation ongoing throughout the SSFL site when the EIS is being done? Isn't that just stirring up more dust? Shouldn't monitoring of the whole SSFL site be done for radionuclides as all remediation work is done? Why are buildings being removed when the whole site has not been completely characterized?	11. DOE is preparing the *SSFL Area IV EIS* based on the court order relative to the previously published EA. DOE has no authority over the other areas of SSFL. The court order only addresses activities within Area IV. Investigation, cleanup, and removal of buildings within other areas of SSFL are being performed under the oversight of DTSC.
12	12. Why haven't the log books been released? We need to see dosimeter and other badge data.	12. There are a vast number of historical documents related to DOE operations in Area IV at SSFL that have accumulated over more than 50 years of operations. These documents, which may include the logbooks, are presently stored in boxes in several repositories nationwide. These documents also include such things as invoices for office supplies that were delivered and other items that are irrelevant to the scope of the project. Some documents may be classified and cannot be released without following approved protocol. DOE is committed to sharing information when possible.

	Comment	Response
13	13. page 1-2 Appendix D – Statistical Evaluation of Radiological Background Distribution "Appendix D provides Statistical P plots that demonstrate the distribution of background levels of radionuclides in Area IV. This information is used in support of derived background screening levels for radionuclides." a) Define what Statistical P plots are. b) Explain how they demonstrate the distribution of background levels of radionuclides – are you using averages? Are you sampling outliers? c) How do they support derived background screening for radionuclides?	13. a) Statistical P plots show the distribution of the data relative to an expected distribution (normal distribution, in this case). If the data are normally distributed (i.e., a bell-shaped distribution curve centered on the mean), the data points will fit along a straight line. The plots allow an evaluation of the distribution of the data and help to identify outliers in the data set. b) The plots were used to identify outliers that are not representative of the background distribution and should be eliminated from the data set. If a result does not fit with the rest of the data (e.g., it is much higher than the rest of the data) it is identified as an outlier and excluded from the data set used to define the background to prevent the distribution from being biased. Averages and 95th percentile upper confidence limits were calculated as shown in Table 3-2 of the *Draft Gap Analysis Report*.. The upper confidence limit is the point at which 95 percent of the background results are less than that level and 5 percent of the background results are above that level. The 95th percentile upper confidence limits were used for defining the background screening level. c) The Statistical P plots provide confidence in the data set that is used for the calculation of the background screening values.
	IN-015: j5toll@sbcglobal.net, E-mail dated: 7/9/2008	
1	1. I noticed the public notice about Santa Susana Field Laboratory, specifically the "remediation of Area IV". Three meetings are scheduled in a couple of weeks. One is in Simi Valley, one in Northridge, and one in Sacramento. The notice was published in the Sacramento Bee. The notice published in the Bee does not identify the site except by its name. Although space in the notice was used to show two agency logos or seals (one of them, "ETEC", is otherwise undefined), the notice does not provide any information that might inform the public about the site. A Google search reveals that the notice is about "a once prolific rocket and nuclear reactor test facility located 30 miles north of downtown Los Angeles". The next Google result refers to "RocketdyneWatch" an organization whose web home page infers that the site is "home to the world's only uncontained partial nuclear meltdown". Are these true characterizations? If so, what is the reason you have kept fundamental information like this from the notice? What characterizes the site? What should people living in Sacramento know about a facility located in Los Angeles? What is your purpose in having a meeting in Sacramento? What is your purpose in publishing the notice in the Sacramento Bee? What other meetings are planned? What other notices have been published about the "scoping"? What regulatory agency may I communicate with about this notice you have published in the Bee? I have a sense that this site is very seriously contaminated with extremely toxic materials resulting from operations funded or otherwise sponsored by the Department of Energy. The notice published in the Bee is probably an act required of the party responsible for the contamination by the California Department of Toxics Substances Control. If this is true, the responsible party is also your employer. What is the appearance of subterfuge in publishing a notice, in a community about 300 miles away from the site, that provides no useful information to the public about the site upon which a reasonable person may make a judgment regarding further participation? What efforts have been made toward members of the public who live and work in Canoga Park, Woodland Hills, Chatsworth, and Ventura to be as fully informed	1. DOE regrets that the public notice was misleading to the commentor regarding the subject of the public meeting. The commentor specifically asked why meetings were held in Sacramento. Meetings were scheduled in the state capital to facilitate the participation of state officials. As the commentor noted, meetings were also held in Simi Valley and Northridge. All were advertised in a similar manner. DOE will consider providing more information for future meeting notices in the Sacramento area. DOE maintains a project website to provide both historic and current information on the *SSFL Area IV EIS* and SSFL Area IV at http://www.etec.energy.gov/EIS/EIS.html. Other sources of information include a website operated by DTSC, as well as the sources mentioned by the commentor that were found on the Internet.

	Comment	Response
	about this site as you? What meetings have they been invited to attend?	
	IN-016: Christine Rowe, E-mail dated: 7/11/2008	
1	1. There are no large maps of the whole Santa Susana Field Laboratory site. The scale of each of these maps is different which means that you cannot move easily between maps.	1. DOE understands the rationale behind the commentor's request. The *Draft Gap Analysis Report* was prepared to support the *SSFL Area IV EIS* that will be prepared by DOE in compliance with the federal judge's order. Because the scope of the EIS is limited to Area IV, a map of the entire SSFL site was thought to be unnecessary. The report is a technical document, prepared to support decisions about how much additional data is needed to develop the EIS. As such, the scale of each map included was based on the type of information and detail needed for the display of information illustrated.
2	2. You cannot tell what buildings of concern were where on the Figures 3-5 and Figure 3-6. So unless the reader knows where they were, or has their numbers memorized, the reader cannot tell why a particular area would be of greater concern than another. So there needs to be at least one large map with all of the building names and numbers – former or currently on site, with the indication of radiological class and sampling.	2. DOE regrets that the commentor experienced difficulty viewing Figures 3-5 and 3-6 in the *Draft Gap Analysis Report*. The revised report will include a clarified key to aid identification of buildings on the maps.
3	3. I cannot tell where the SRE was on the Figures 3-5 or 3-6 even though I can see it on the RFI 5. Therefore I cannot tell if that is an area of concern on these maps. I also cannot determine what former buildings and sites are showing radiological COCs today.	3. The location of the Sodium Reactor Experiment (SRE) will be shown on revised figures. The SRE location remains an area of concern.
4	4. Since I do not have a whole site map, I cannot see where the Silvernale pond was, I cannot see how pathways routed materials to the pond, or where the pond drained into Bell Canyon.	4. Figure 4-17 of the *Draft Gap Analysis Report*, which encompasses the entire SSFL site, shows drainages originating in Area IV in relation to adjacent areas, including the Silvernale Pond.
5	5. The RFI maps show a small site map – but it is relative to the whole site – not just AREA IV.	5. The *Draft Gap Analysis Report* was prepared to provide background information to support the need for additional sampling for the *SSFL Area IV EIS* and its risk assessment, which are being prepared in keeping with a federal judge's order. The scope for this effort is limited to Area IV, as directed by the federal judge.
6	6. Maps should be drawn in a manner in which they can be superimposed. There is no way for the untrained eye to go between any of these maps.	6. DOE understands that the commentor found the maps presented in the *Draft Gap Analysis Report* to be frustrating to use. DOE will consider the commentor's request when it begins preparing the revised report.
7	7. Why is the SRE indicated as a Boeing site instead of a DOE site on the RFI?	7. As part of the RCRA chemical investigation, Boeing, on behalf of DOE, is investigating the site of the former SRE for chemical contamination. The site of the former SRE will also be assessed for further cleanup requirements in the *SSFL Area IV EIS* that DOE is preparing.
8	8. When you compare Figure 3-5 to Figure 3-6 - neither document explains which facility was where and nor are the borders clear on Figure 3-5.	8. DOE regrets that the commentor found the illustrations to be confusing. The figures will be revised for clarity when the *Draft Gap Analysis Report* is revised.

	Comment	Response
9	9. Existing buildings – where the compass is located would almost make the reader believe that is part of AREA IV.	9. Comment noted. The placement of the north arrow is a standard map practice.
10	10. How can a boundary go right through a building? This is the case in the south center of AREA IV. On Figure 3-6, these buildings appear as NA – 02 Rad Class 2-01 Does that mean these are a Sodium facility that is a Rad Class 1? The buildings appear as 4105, 4227, 268, 4264, 4109, and 4805. These buildings fall into AREA III but are RAD Class 1.	10. DOE regrets the confusion. The boundary line depicted in the figure follows the boundary of Area IV. The line served no other purpose than to depict the boundary. The first part of the Survey Unit designator stands for the Exposure Unit number. The NA stands for "Not Applicable," as it is outside the defined Area IV exposure units (i.e., it is in Area III) and the term "– 02" indicates that it is the second such unit. The second part provides the Class and a sequential designation. "RAD Class 2-01" means that it is the first RAD Class 2 survey unit in that area. It was created as such as a suspect area because of the proximity of the buildings to Area IV and the classification of the adjacent area in EU-06 as RAD Class 2. The buildings are non-radiological buildings.
11	11. Why don't you show any radiological sampling beyond the buffer zone? Some of that buffer zone was the land formerly owned by Brandeis – Bardin that was sold to Boeing. It would be good to see the intensity of the sampling outside of AREA IV. There were a number of > DCGL in the northwest buffer.	11. EPA will conduct a radiological survey for Area IV and the Northern Undeveloped Land. However, any contamination that is demonstrated to have originated within Area IV will be included in the *SSFL Area IV EIS* to support decisionmaking about remediation for Area IV.
IN-017: Christine Rowe, E-mail dated: 7/10/2008		
1	1. These are a links to an AREA IV documents http://www.eh.doe.gov/NEPA/ea/ea1345/chapter4.pdf http://www.dtsc.ca.gov/HazardousWaste/Projects/upload/SSFL_SREDecom_Report.pdf Most cultural documents for AREA IV say that there is nothing there. I may have sent this before - before I was doing the Data Gap Analysis. I am quite sure that there must be a way that you can put the Chumash cultural things into the EIS with care. What this tells me is that the Chumash were in Area IV, and that all the requirements of NEPA ? CEQA apply. Please make an effort to invite Randy Folkes, the Chumash overseer and whose mother is the closest known descendant to the site. Monitors have to make a living just like DOE employees do. I believe that Randy should be paid for his time to consult. Phone calls to agencies take his time from the field. Randy really needs access to the whole SSFL site. He should be paid to monitor remediation when there is known cultural resources nearby. He should be paid to monitor work done in the northern drainage when we know there are middens and things there should be monitored. The fact that something like a midden is present indicates the presence of these tribes. You can't say - well, they were over here but not over there. The reality is that all of those mountainous areas are littered with caves and rock shelters that may have a cultural significance. We just don't know how many of them have been surveyed. I find it disturbing that I should have to make this request when we know the significance of the Burro Flats caves. And this says that there are shelters indicating special use. Randy would like to have the appropriate training for hazmat exposure. I know that Susan Callery of DTSC has spoken to Randy. I would like him to be paid for his site visit and given the courtesy of being shown the whole site. He should wear the appropriate dosimeters/ badges just as some Boeing employees do. I am sending this information out again since there are constantly new people involved in this cleanup project. And by the way, the last line of this document is an assumption. "None of these sites are eligible for inclusion	1. DOE sincerely appreciates the extensive information provided by the commentor regarding the applicable laws related to cultural resources. DOE intends to follow all laws concerning cultural resources and recently entered into consultation with the California Office of Historic Preservation (OHP) and California Native American Heritage Commission (NAHC). DOE plans a full cultural resources review prior to any activities that would disturb land resources. In addition, DOE will fulfill its responsibilities regarding government-to-government communications with appropriate Tribal authorities.

	Comment	Response
	on the National Register of Historic Places". This whole area will hopefully qualify as a historically cultural district." That is a statement that is made when things are taken out of context. "I . CULTURAL RESOURCES There are no cultural resources located on the SRE site . The only cultural resource at the SSFL consists of a major registered prehistoric Chumash Indian site. The resource consists of numerous rock shelters, pictographs, petroglyphs, bedrock mortars, cupules, assorted artifacts , and large areas covered with midden. The major site consists of a formerly intensely occupied area of approximately 14 acres and is estimated to lie 5000 ft south of the SRE. Ongoing archeological research takes place at the site . There are also known pictographs located separate from the major site. The closest two of these are located approximately 2000 ft and 3000 ft, respectively, from the SRE. It is estimated that the site was occupied from approximately 500 A.D. to 1800 A.D." "4.7.1 Current Conditions An intensive archeological survey was conducted for Area IV in 2001 (W&S Consultants 2001). This involved (1) background studies reviewing the prehistory, ethnography, and historical land use of the study area; (2) an archival records search to determine whether any prehistoric or historical archaeological sites had been recorded or were known to exist; and (3) an on-foot survey of the study area. This survey of the entire Area IV study area resulted in the identification and recording of four archaeological sites. Each of these is located in rocky, undeveloped areas and is associated with a rock shelter or a cave. These sites are: • A rock painting on the back wall of a small sandstone cave, probably Euro-American in origin • A rock shelter exhibiting fire-blackened walls and ceiling that appears to represent a small special use area • A single bedrock mortar located on an open boulder adjacent to a rock shelter • A low rock shelter that contains a midden deposit and bedrock mortar (site integrity has been lost to previous artifact looting) Brush Fires In 2000, a concern was raised about brush fires in and around contaminated sites at the SSFL. The concern centered on the potential for brush and vegetation growing on contaminated land to become contaminated. Subsequent fires could then result in airborne contamination, which could be a hazard to firefighters and the surrounding community. To address this concern, comprehensive vegetation sampling was conducted in Area IV in 2000. One composite vegetation sample (a variety of vegetation at each location) was collected at each of 28 existing and legacy radiological facilities. For comparison purposes, two offsite samples were collected to determine the natural background. The only radionuclide found in the vegetation samples was naturally occurring potassium-40. No man-made radionuclides were found in either the onsite or offsite vegetation samples. This latest finding confirms the results from earlier sampling conducted at the SSFL. Environmental Assessment for Cleanup and Closure of the Energy Technology Engineering Center 4-17 None of these sites are eligible for inclusion on the National Register of Historic Places. Further, the sites are all located in rocky areas that have not been developed or used during DOE operations at ETEC."	
	IN-018: Mary Weisbrock, E-mail dated: 7/11/2008	
1	1. Thomas: Where was the Van de Graaff Accelerator disposed of? These records must exist. There were two according to the factual perspective of the site, so I guess we have the same questions about both the one in Building 30 and the one that was in the SRE Complex	1. DOE is in the process of collecting and reviewing historical records related to its operations within Area IV. If relevant information is found regarding the accelerators, it will be shared with the public.

	Comment	*Response*
	IN-020: Christine Rowe, E-mail dated: 7/17/2008	
1	1. I was just talking to another community member about the Draft Data Gap. There have been many fires in the area over the last 50 + years. We know that they have created a dioxin problem. What we do not know is what if any of AREA IV was burned. We don't know what other areas burned that would have had radioactive contaminants that would have been possibly exposed by the fires. Some of these radionuclides could have been taken up by plant material. They could have been in top soil. After the fires, they would have been exposed. After rains, on the bare soil, there would be erosion - releasing more subsurface particles. We need to know just what the effects of these fires were - where the contaminants could have spread.	1. Area IV has experienced natural wildfires in the past with the last event occurring in 2005. The ecological risk assessment field study will be designed to address whether the uptake of radionuclides by plants occurred from soil and whether drainages receiving runoff are contaminated with radionuclides.
	IN-021: Christine Rowe, E-mail dated: 7/17/2008	
1	1. According to this document, your EIS falls under CEQA. If that is true, then I would appreciate it very much if you contact Randy Folkes - the closest known descendent (Beverly Folkes), and invite him for a site visit before the EIS period passes. Randy, as I have said before, should be paid for his time just as an archaeologist is paid for their time since he is employed as a Chumash overseer in this area. http://www.etec.energy.gov/EIS/Documents/ Area_IV_EIS_Final%20RTP(7Sep07).pdf I am very concerned that you are seeing my comments, but not acting on them. I have been told by many archaeologists that there are different groups within the Chumash. Randy's group is the Ventureno Chumash that lived in this region. Please let me know if you have notified Beverly and Randy about the EIS.	1. DOE sincerely appreciates the extensive information provided by the commentor related to the applicable laws regarding cultural resources. The purpose of the Request for Proposals for Preparation of an EIS by DOE was to inform contractors who were interested in submitting proposals that they should be familiar with California Environmental Quality Act (CEQA) standards. The selected contractor is not required to comply with CEQA unless regulatory negotiations lead to this conclusion (see Page 10, Section 3.4 of the Request for Proposal). DOE intends to follow all laws concerning cultural resources and recently entered into consultation with OHP and NAHC. DOE plans a full cultural resources review prior to any activities that would disturb land resources. In addition, DOE will also fulfill its responsibilities regarding government-to-government communications with appropriate Tribal authorities.
	IN-022: Christine Rowe, E-mail dated: 7/19/2008	
1	1. I do not know if you have met Brigham Maher. He is making a documentary of the Santa Susana Field Laboratory site. I believe that someone from DOE should watch these videos - especially # 1, 21, and 22. http://www.youtube.com/watch?v=acwgSa9Obug&feature=related - #1 http://www.youtube.com/watch?v=ZEVgomSFgdo - #21 http://www.youtube.com/watch?v=FU48jrD4w58 - #22 I believe that these are the interviews with former employee Jim Palmer. There could be information in those videos for the Data Gap. I am not sure if I missed any of his interview - it is interspersed in the the 22 clips.	1. DOE appreciates the efforts of the commentor in identifying videos containing interviews with former employees. DOE intends to interview former employees to learn more about previous site operations. Those interviews will be conducted using a standard set of questions to allow anecdotal information to be corroborated.
	IN-023: Christine Rowe, E-mail dated: 7/25/2008	
1	1. I did not have the time to look at the documents in detail, but I did notice in some document that the Santa Susana Field Laboratory was once the home of the California Condor. That would make sense because it is not that far, as the "condor" flies, to Frazier Park and other known condor sites. Another endangered species that could call the SSFL home.	1. DOE thanks the commentor. The potential for the endangered California condor to occur on the site and to be affected by the proposed action will be addressed by DOE in the *SSFL Area IV EIS* and a corresponding Biological Assessment to be submitted by DOE to FWS in support of Section Seven Consultation under the ESA.

	Comment	Response
	IN-024: Christine Rowe, E-mail dated: 7/26/2008	
1	1. Once again I find myself writing you about the Draft Data Gap Analysis, the EIS, and my concern about the cultural aspects of the Santa Susana Field Laboratory in general. This simple article in Wikipedia should tell you the significance of water to the Chumash culture. When I tell you that there is a blue line stream - that is significant to me. http://en.wikipedia.org/wiki/Rock_art_of_the_Chumash_people#Rock_Art_Locations "Chumash Rock Art is almost invariably found in caves or on cliffs in the mountains, although some small, portable painted rocks have been discovered by Campbell Grant. The rock art sites are always found near streams, springs, or some other source of permanent water. In his research of southern California rock art, Grant recorded numerous sites from different areas that were all close to a water source. He found twelve painted sites in the highest parts of the mountainous Chumash territory, the Ventureno area. The Ventura and Santa Clara rivers and several coastal streams flow through this area. He also recorded forty-one painted rock art sites in the Cuyama region (north of the Ventureno area), where the Sisquoc River flows between the San Rafael Mountains and the Sierra Madre Mountains." I hope that Ms. Foster of SAIC will be able to find out more information on just how well AREA IV was surveyed. I hope that she will be able to also determine to what extent the whole SSFL property has been surveyed.	1. The scope of the *SSFL Area IV EIS* was dictated to DOE by the federal judge that ordered its preparation; it will focus on Area IV. The Burro Flats Archaeological site referenced by the commentor is not located within Area IV. That site is protected by its inclusion in the National Register of Historic Places, and site protection and visitation rules are strongly enforced by Boeing and NASA at SSFL. Similar sites in the vicinity have been inventoried and will be reviewed through the ongoing EIS process.
	IN-025: Christine Rowe, E-mail dated: 7/27/2008	
1	1. I looked at this abstract. While its conclusions are that some workers may have been exposed by more than one site, you will note the first few lines of the abstract: "Incomplete radiation exposure histories, inadequate treatment of internally deposited radionuclides, and failure to account for neutron exposures can be important uncertainties in epidemiologic studies of radiation workers." It is more amazing that I am reading this in a French document: http://cat.inist.fr/?aModele=afficheN&cpsidt=17698916 As I have stated, I have heard stories from former employees that some employees removed badges to do cleanup work in highly contaminated areas. Also, workers who may not have been employed by Atomics International may have gone from the "Rocketdyne" side, or the Air Force side, or even from the Fire Department, to do cleanup work in AREA IV. In turn, I do believe, based on historic documents and lab reports, that the radionuclides did not stay in "AREA IV". Therefore, workers on the whole site were, in fact, exposed when there was deliberate venting of gases and when accidents occurred. Workers were also exposed to various to airborne releases from burn pits through out the whole SSFL site. Workers were also exposed to radionuclides during various remediation and other clean up work. Finally, it is known, that children of various types of employees in certain industries are at greater risk of certain illnesses because of their parent's occupational exposures. I would like to point out that while the other exposures may have occurred at other properties, the abstract fails to address the fact that four (maybe 5) of those facilities were Atomics International properties in Canoga Park and Woodland Hills, and another facility was in Thousand Oaks. The Atomics International Science Center moved to Thousand Oaks - it also became a Rocketdyne facility. This abstract does not address the fact that the workers moved between the "hill" and those other facilities. Titre du document / Document title A comprehensive dose reconstruction methodology for former rocketdyne/atomics international radiation workers Auteur(s) / Author(s) BOICE John D. ; LEGGETT Richard W. ; ELLIS Elizabeth Dupree ; WALLACE Phillip W. ; MUMMA Michael ; COHEN Sarah S. ; BRILL A. Bertrand ; CHADDA Bandana ; BOECKER Bruce B. ; YODER R. Craig ; ECKERMAN Keith F. ; Résumé / Abstract	1. DOE appreciates the information the commentor provided on historical doses and will examine the information as part of the *SSFL Area IV EIS* cumulative impacts analysis. DOE will also conduct a workshop at SSFL so that DOE can interact with former employees and members of the community to develop a better understanding of the history of Area IV and how that may impact the analysis of alternatives.

	Comment	Response
	Incomplete radiation exposure histories, inadequate treatment of internally deposited radionuclides, and failure to account for neutron exposures can be important uncertainties in epidemiologic studies of radiation workers. Organ-specific doses from lifetime occupational exposures and radionuclide intakes were estimated for an epidemiologic study of 5,801 Rocketdyne/Atomics International (AI) radiation workers engaged in nuclear technologies between 1948 and 1999. The entire workforce of 46,970 Rocketdyne/AI employees was identified from 35,042 Kardex work histories cards, 26,136 electronic personnel listings, and 14,189 radiation folders containing individual exposure histories. To obtain prior and subsequent occupational exposure information, the roster of all workers was matched against nationwide dosimetry files from the Department of Energy, the Nuclear Regulatory Commission, the Landauer dosimetry company, the U.S. Army, and the U.S. Air Force. Dosimetry files of other worker studies were also accessed. Computation of organ doses from radionuclide intakes was complicated by the diversity of bioassay data collected over a 40-y period (urine and fecal samples, lung counts, whole-body counts, nasal smears, and wound and incident reports) and the variety of radionuclides with documented intake including isotopes of uranium, plutonium, americium, calcium, cesium, cerium, zirconium, thorium, polonium, promethium, iodine, zinc, strontium, and hydrogen (tritium). Over 30,000 individual bioassay measurements, recorded on 11 different bioassay forms, were abstracted. The bioassay data were evaluated using ICRP biokinetic models recommended in current or upcoming ICRP documents (modified for one inhaled material to reflect site-specific information) to estimate annual doses for 16 organs or tissues taking into account time of exposure, type of radionuclide, and excretion patterns. Detailed internal exposure scenarios were developed and annual internal doses were derived on a case-by-case basis for workers with committed equivalent doses indicated by screening criteria to be greater than 10 mSv to the organ with the highest internal dose. Overall, 5,801 workers were monitored for radiation at Rocketdyne/AI: 5,743 for external exposure and 2,232 for internal intakes of radionuclides; 41,169 workers were not monitored for radiation. The mean cumulative external dose based on Rocketdyne/AI records alone was 10.0 mSv, and the dose distribution was highly skewed with most workers experiencing low cumulative doses and only a few with high doses (maximum 500 mSv). Only 45 workers received greater than 200 mSv while employed at Rocketdyne/AI. However, nearly 32% (or 1,833) of the Rocketdyne/AI workers had been monitored for radiation at other nuclear facilities and incorporation of these doses increased the mean dose to 13.5 mSv (maximum 1,005 mSv) and the number of workers with >200 mSv to 69. For a small number of workers (n = 292), lung doses from internal radionuclide intakes were relatively high (mean 106 mSv; maximum 3,560 mSv) and increased the overall population mean dose to 19.0 mSv and the number of workers with lung dose >200 mSv to 109. Nearly 10% of the radiation workers (584) were monitored for neutron exposures (mean 1.2 mSv) at Rocketdyne/AI, and another 2% were monitored for neutron exposures elsewhere. Interestingly, 1,477 workers not monitored for radiation at Rocketdyne/AI (3.6%) were found to have worn dosimeters at other nuclear facilities (mean external dose of 2.6 mSv, maximum 188 mSv). Without considering all sources of occupational exposure, an incorrect characterization of worker exposure would have occurred with the potential to bias epidemiologic results. For these pioneering workers in the nuclear industry, 26.5% of their total occupational dose (collective dose) was received at other facilities both prior to and after employment at Rocketdyne/AI.	

	Comment	*Response*
IN-026: Bonnie Ramey, E-mail dated: 7/30/2008		
1	1. It is important to do the entire Santa Susana field lab/Rocketdyne site, not just area 4.	1. DOE thanks the commentor. Due to the number of similar comments received regarding this issue, the commentor is referred to DOE's response in Section 3 of this document.
2	2. I urge you to completely clean it up to SB 990.	2. DOE thanks the commentor. Due to the number of similar comments received regarding this issue, the commentor is referred to DOE's response in Section 3 of this document.
IN-027: Christine Rowe, E-mail dated: 7/30/2008		
1	For the record. I think that the location of the TCE plumes, tritium, perchlorates, etc, needs to be reassessed after the 5.4 earthquake in the Chino Hills. I do not know how this was felt up on the mountain (SSFL), but we certainly felt it down here. This should be an example to you of the seismic risk of the region, and show why I have concerns about explosions in the Dayton Canyon area. I know that some of you are not local residents. I don't know if Mr. Johnson was here for the earthquake today, but if he was, he should understand that this earthquake was just 1% of the force of the Northridge earthquake. (I believe that is what was said on the news). This earthquake reinforces my concerns about what will happen to the TCE plumes in the fine grained units should there be a severe local seismic event.	DOE appreciates the concern of the commentor regarding earthquakes. Seismic events will be evaluated in the *SSFL Area IV EIS*. DOE would like to note that the TCE plume of concern is not associated with DOE activities within Area IV.
IN-028: Christine Rowe, E-mail dated: 8/5/2008		
1	1. One full site map with parts of the peripheral properties should be included.	1. Figure 1-2 in the *Draft Gap Analysis Report* shows the entire SSFL site and the adjacent undeveloped land. The figure can be revised to indicate the adjacent properties.
2	2. There should be a base paper that shows AREA IV with all of the roads and the blue line streams and the 250 +/- structures that have been in place. The buildings should be both numbered and identified in some way - like RMHF or SRE.	2. There are figures throughout the *Draft Gap Analysis Report* that show roads and buildings (e.g., Figure 3-6) and drainages. Drainages are highlighted in blue to note their location. All of the site drainages are intermittent streams, meaning that they flow only during wet weather or as a result of drainage from springs or seeps.
3	3. The clear overlays would enable you to block out what has been removed.	3. Buildings that have been removed are shaded light gray. The commentor is referred to the legend box on each figure that provides a key for shading of existing and removed buildings.
4	4. The full size map needs to show all of the drainage pathways and the Silvernale and other ponds where everything drained to - and then include the path to Bell Creek. While I see the blue lines on my USGS maps, some maps that are recent - like GOOGLE EARTH, do not show drainage as well. So we need to be able to see historically on AREA IV and off AREA IV where any nuclear materials were used or disposed, drained, etc.	4. Drainage pathways are illustrated on a number of figures, including Figures 1-2 and 3-3. Ponds receiving runoff from Area IV are shown on Figure 2-9. They will be labeled in the revised *Draft Gap Analysis Report*.
5	5. There are notes in Appendix B where high levels of radionuclides were found in the vegetative samples. We need to do more vegetation sampling in AREA IV and offsite where there are natural pathways.	5. In the *Draft Gap Analysis Report*, the analysts recommend collection of soil and vegetation samples for analysis of radionuclide concentrations.
6	6. The overlays for the AREA IV document could be for sampling, DCGL, etc	6. DOE will consider the use of overlays in presenting information in future reports

	Comment	Response
7	7. When I get a lab result, there is a result column, and a normal range. On the legend of your maps, you should explain things. For example - DCGL - quantities greater than or less than?	7. Map acronyms are explained in text and in the glossary.
8	8. On your radiological classifications - you should define Radiological Classes - say for example, one is known to be high - for example - known levels of high radiation because there is still an actively hot building there. I don't expect you to say it in those words, but maps are supposed to be able to be interpreted. You could say that a certain color is coded in a certain manner because previous remediation occurred there, or because recent sampling indicated that designation.	8. Radiological classes are defined in Section 3.6.3 of the *Draft Gap Analysis Report*.
9	9. If I look at the site, I look at it from four directions. For example, I would look at it from the east. I would like to be able to see where the aquifers are, where they drain to. In my mind, from the geological presentation, some of AREA IV drains to Bell Canyon, and some towards Simi. But the aquifer system is under the whole site all of the way to Dayton Canyon, and most likely all of the way to Santa Susana Pass State Historic Park and Chatsworth Park South. Chatsworth Park South is closed because of lead shot, clay pigeons, and other chemicals. I requested the surface and ground water be sampled at Chatsworth Park South because they seem to have water coming out of a spring in a train tunnel and it runs into the park. There were high levels of arsenic there in the past. I want to be able to find out if the TCE and perchlorates, or even the tritium, can make there way into the seeps and springs in our parks below. You should also have a map that shows the Chatsworth Reservoir. There have been radionuclides found there in the past. There is a natural pathway to the Chatsworth Reservoir down Woolsley Canyon. But I am not sure of the Chatsworth Formation - where the aquifer system ends. So if the aquifer goes deep enough, it could be under the reservoir as well. This information is important because of future use and the current usage of the peripheral properties. We need to make sure if they are trying to recharge aquifers in the Valley - which is being proposed, whether those aquifers will be impacted by the SSFL storm water drainage or the SSFL ground water situation.	9. The sampling of areas that do not receive runoff from Area IV is outside the scope of the *SSFL Area IV EIS* as outlined by the federal judge and is therefore beyond DOE's jurisdiction.
IN-029: Robin Gilbert, E-mail dated: 8/8/2008		
1	Please consider cleaning up the entire site	DOE thanks the commentor. Due to the number of similar comments received regarding this concern, the commentor is referred to DOE's response in Section 3 of this document.
2	I urge you to clean it up to SB 990 standards.	DOE thanks the commentor. Due to the number of similar comments received regarding this concern, the commentor is referred to DOE's response in Section 3 of this document.
IN-030: Lee Frank, E-mail dated: 8/8/2008		
1	Please consider cleaning up the entire site.	DOE thanks the commentor. Due to the number of similar comments received regarding this concern, the commentor is referred to DOE's response in Section 3 of this document.
2	I urge you to clean it up to SB 990 standards. I am sending this message because I feel that government has been lax in protecting its citizens from dangerous practices. Government must take a much deeper interest in saving our environment, our habitats, from destructive human actions. We need stronger codes and better enforcement.	DOE thanks the commentor. Due to the number of similar comments received regarding this concern, the commentor is referred to DOE's response in Section 3 of this document.

	Comment	Response
IN-031: Christine Rowe, E-mail dated: 8/8/2008		
1	1. I am supposed to be commenting on the Draft Data Gap Analysis by August 14, 2008. I can tell you that I am not getting that done. One reason that I am not getting it done is that I am trying to educate myself as to the activities on the SSFL site in the past 60 years, and then I am trying to educate members of the community about what I understand. One of the biggest issues remains the Sodium Reactor Experiment (SRE) accident. ETEC has several documents on their site related to this topic. What I keep hearing is numbers - 100 times worse than, 250 times worse than, the Three Mile Island accident. This is what you are facing. http://www.loe.org/shows/segments.htm?programID=06-P13-00003&segmentID=1 The community perceives that the release of radionuclides from the SRE are the primary problem associated with the SSFL today. I have spent a lot of time talking to nuclear physicists, health physicists, etc, to try to understand the SRE. I do not believe that it is the problem today that it was 50 years ago. But that is dependent on the fact that all of the documents have not been released.	1. DOE understands that the community remains concerned about past operations and accidents that occurred in Area IV at SSFL. DOE is currently researching historical documents to learn more about the SRE incident. DOE will speak with former employees about their knowledge of past operations and accidents as the records may be incomplete or inaccurate. DOE intends to share the results of this research with the public and will use them to ensure the *SSFL Area IV EIS* is complete.
2	2. Of greater concern to me today are the existing facilities that have not been dismantled - some of which seem to be very dangerous today based on a discussion that I had with Thomas Johnson at the last Scoping meeting.	2. Limited access to former radiological buildings remains in place, based on established DOE policies for these types of buildings. Access is only granted to perform ongoing maintenance and monitoring activities, following site-specific training.
3	3. In terms of what you and Ms. Jennings should be doing, you need to put out a document that spells out to the community, in terms that they are capable of understanding - what is still there to the best of your understanding - not what is in the Draft Data Gap Analysis summary. We need to look at the broad picture - not the fine details.	3. The "Guide to the *Draft Gap Analysis Report*" is intended to assist the community in understanding the data requirements for the *SSFL Area IV EIS*. As the Executive Summary is a technical summary, it is to be expected that the technical efforts may be difficult to understand.
4	4. By this, we need a meeting that addresses specific issues - that there are 20? structures left. Current data implies that some of these areas are still heavily contaminated. Some of these areas may never be able to be remediated fully, etc. I don't think that the community understands that all of this contamination - if poured into fissures in the sandstone, if it has seeped into the surfaces below, may not be remediatable. You would have to be blowing up rock to get to the contamination which would in turn disperse the contamination. I am sure people do not understand all of this.	4. Any remedial action taken to remove contaminants and soils would be done in a manner that would not release contaminants into the environment. The measures that DOE would use to protect the environment and human health will be described in the EIS.
5	5. If the DOE wants to be trusted, they need to be seen in a more protective role than they have been seen in the past. You are, the Department of Energy - charged with government projects. If you want to be trusted, as the EPA is trusted, then you must take on a more aggressive role as an agency that is capable of learning from its mistakes.	5. DOE is committed to cleaning up the portions of Area IV that were used in past departmental operations in a manner that is protective of human health and the environment.
6	6. I invite a specific address of the Sodium Reactor Experiment and the other major facilities that were used including a plutonium facility, the sodium burn pit, the Radioactive Materials Handling Facility, the Hot Lab, the SNAP Reactors, etc.	6. DOE will address, as part of future investigations and the cleanup evaluations in the EIS, all facilities within Area IV that DOE had responsibility for operating.
IN-032: Carole Lutness, E-mail dated: 8/8/2008		
1	1. I am the Democratic candidate for the 38th Assembly District. Santa Susana is within my district. I am extremely concerned about this site as well as the Whittier Bermite site in Santa Clarita. From what I understand, the "half-measure" proposals about cleaning up Santa Susana will not really address the very serious toxic pollution and radiation problems that exist there. Half measures are not what should be considered for the health of the community and for our children's future.	1. DOE is committed to cleaning up the portions of Area IV that were used in past departmental operations in a manner that is protective of human health and the environment.

	Comment	*Response*
2	2. Please be mindful of the future repercussions of your action and insist on cleaning up the entire site.	2. The commentor is referred to the discussion in the Section 3 of this document regarding the activities that are ongoing to cleanup all of SSFL.
3	3. I urge you to clean it up to SB 990 standards.	3. DOE thanks the commentor. Due to the number of similar comments received regarding this concern, the commentor is referred to DOE's response in Section 3 of this document.
	IN-033: Warren Felt, E-mail dated: 8/9/2008	
1	Please clean up the entire site.	DOE thanks the commentor. Due to the number of similar comments received regarding this concern, the commentor is referred to DOE's response in Section 3 of this document.
	IN-034: Christine Rowe, E-mail dated: 8/9/2008	
1	I am not sure if I have sent you this document or not. But it definitely has the Areas of Concern for radionuclides offsite. AREA IV contaminants did not stay in AREA IV. You need to look at all of the pathways. I live in West Hills. Look at the maps. Look at page 4 of the Conclusions and Recommendations. Once this document was put out, the Department of Health should have put out a Health Risk warning about the food grown in these Areas of Concern. http://ssflreport.sytes.net/	DOE understands that nearby residents are concerned about the potential health effects of contamination caused by SSFL operations over many years. DOE reviewed the commentor's document. The department's interpretation of the terms used is that "Area of Concern" applies to locations where contamination is known to exist and "Potential Area of Concern" applies to locations where it is conceivable that contamination could have migrated.
	IN-035: Charlotte Meyer, E-mail dated: 8/9/2008	
1	I am currently the Special Education Coordinator of Hale Middle School which is one of the feeder schools of the area that may have been impacted by the Rocketdyne clean-up situation. I would like to suggest that any environmental report should be deemed incomplete without a study documenting the health impact on children living within and adjacent to the area in question. It would be valuable to know if there is a higher incidence of autism, asthma, birth defects etc than within the general population of the region. Thank you for your consideration.	DOE is preparing the *SSFL Area IV EIS* in compliance with all NEPA requirements. Those requirements include preparation of an assessment of the cumulative impacts of past, present, and reasonably foreseeable actions under each of the alternatives. DOE will also prepare a risk assessment that will assess the risks posed by the contamination to human health. The results of this risk assessment will be incorporated into the EIS.
	IN-036: Christine Rowe, E-mail dated: 8/10/2008	
1	1. I have spoken on the record at the Scoping meeting as preferring the federal EPA approach to the site cleanup. I have said many times that I want a complete horizontal and vertical analysis of the site and the peripheral properties.	1. DOE thanks the commentor. Due to the number of similar comments received regarding this concern, the commentor is referred to DOE's response in Section 3 of this document.
2	2. I think that it is great that the federal EPA will be determining "Background". I am also happy to see that they will be performing, if I am correct, the Gamma "Walkover" Survey.	2. Comment noted.
3	3. I do like things that will make the community comfortable in terms of who they trust to clean up the site. However, I really do not believe that the community understands the implications of SB 990 - and the affects that it has on all of the parties involved.	3. SB 990 is a California state law. If the commentor has questions regarding SB 990, DOE suggests that she talk to DTSC.
4	4. I suspect that most community members will ask for Option 4 - to clean the site up and remove every trace of the history of the site. I think it is an impractical request, and most likely impossible to achieve.	4. DOE thanks the commentor. Due to the number of similar comments received regarding this issue, the commentor is referred to DOE's response in Section 3 of this document.

	Comment	Response
5	5. 1) What are the current health risks on site? What are the current health risks off site? 2) What is remediable? I don't think we know that until we have our complete site survey. 4) Is there a real difference in the health risks to the community and the biota if the site is not cleaned up to SB 990 standards? 5) What would need to remain in place if we took Option 5? 6) What are the health risks to the employees and the community of removing every structure on this site? 7) What will the future health risks be if we cannot clean up the whole site to SB 990 standards?	5. DOE was ordered by a federal judge to prepare a CERCLA-style risk assessment. That risk assessment will be conducted after EPA has performed a radiological survey and DTSC has completed a chemical survey of the site. The results of the risk assessment will answer the questions raised by the commentor.
6	6. What is the cost to completely remediate at SB 990 standards?	6. As a part of the CERCLA analysis of the alternatives in the *SSFL Area IV EIS*, DOE will develop a CERLCA-like feasibility study that will evaluate alternatives using the nine CERCLA criteria.
7	7. We need to know the Areas of Concern. An example of the Areas of Concern is the UCLA Study that I sent previously. First, you define who is at risk. Then you tell any residents in the Areas of Concern that they must disclose their location if they sell. You tell them that they must respond to your disclosure letter. That must be pursued. If not, those Bell Canyon residents are going to be the ones who can afford to sue when a family member gets cancer. This must be done around the whole SSFL site. Using the term - 2 mile radius and 5 mile radius, as I have said in the past, is misleading. Much of the two miles fall within the site boundary. Census tract data and other studies look at where the residents live - outside the boundary. So the Areas of Concern must be defined in terms of the property's boundary - not the property's radius.	7. The commentor refers to a concept and terminology used in a publication related to a study conducted by the University of California, Los Angeles, for a different purpose. The *Draft Gap Analysis Report* was prepared to help identify additional data needed to conduct a site-specific risk assessment. The results of the risk assessment will support the *SSFL Area IV EIS* evaluation of a range of alternatives for the remediation of contamination resulting from historical operations within Area IV. The EIS will address contaminants beyond the boundaries of Area IV if it is determined that those contaminants originated in Area IV.
8	8. I realize that you don't want to disclose the contamination of this site now because you do not need more lawsuits - any of you. But let's be real here about the community's risks - please. The people on this email are smart enough to realize that there are so many environmental contaminants on this planet that the SSFL is not the only source of the cancers in the community. On the other hand, that does not mean that the site does not need to be cleaned up.	8. DOE agrees that it is responsible for cleaning up contamination that resulted from its past operations. DOE is committed to preparing the risk assessment and the *SSFL Area IV EIS* in a manner that is honest and transparent. The EIS will disclose the human health and environmental risks that would result from a range of alternatives, including a no action alternative, as required by NEPA.
9	9. I realize that the cleanup of this site will take at least a decade and millions of dollars. I would rather see the residents truly at risk be relocated than have a standard of cleanup for the whole site be forced upon the property owners.	9. As DOE is in the early stages of developing the *SSFL Area IV EIS*, the schedule and cost for the various alternatives have not yet been developed. Please also refer to the response to comment No. 6 of this comment document.
10	10. Many of the community members would say to clean the site up no matter what the cost to Boeing, NASA, or the DOE. I believe that we need to weigh the health risks for now and for the future. For example, the radionuclides. If I don't know what is still there, I don't know the risk of containing them versus the risk of removing the structures. I know that I said that in a public comment a year and a half ago. Nothing has changed since then. I still do not have my answer to that question. And I still do not know where you would take the structures to if they are removed. Can those structures be removed and transported safely?	10. The goals of planned characterization studies for both radiological and chemical contaminants are to determine what the contaminants are, what the concentrations of contaminants are, and where the contaminant concentrations are located. After the characterization studies are completed, a human health and environmental risk analysis of each alternative, including a no action alternative that would leave the contaminants in place, will be conducted. The *SSFL Area IV EIS* will analyze where the dismantled structures would be sent and what the impacts of the removal and transportation would be.

	Comment	Response
IN-037: Christine Rowe, E-mail dated: 8/10/2008		
1	I am again trying to make an effort to comment on the Draft Data Gap Analysis. What happens is that I will find terminology referred to in it, and I find myself researching that topic. Because AREA IV is not an isolated site, the natural pathways include the groundwater. I have been trying to find geologists that can explain the various formations to me. This is a link to anther more recent document on the hydraulics of the SSFL. http://www.epa.gov/region09/waste/sfund/santasusana/References/ref-20.pdf The explanation that has been made to me in the past is that the TCE plumes would remain confined in the fine grain units. (This was not a DTSC presentation - I believe that it was a Boeing presentation.) However, I have read numerous documents that state quite the opposite. This is one document that I find to be important. It discusses the complexities of the geology because there is not just one fault system at the SSFL - there are several. This document explains that the fissures can be natural pathways. But even more important, wells may have not been capped properly, holes that have been drilled over 60 years can be new pathways. Frankly, while there are people that are being cc'd on this that understand the formation better than others, this document explains the data gaps of this geological formation. We can see that the shear zone affects the direction that things flow. But paragraph after paragraph, addressing fault zone after fault zone, the author states why these fault zones are not aquitards. "There can be little doubt that the various lithologic variants, including gouge, in fault zones make water flow in the zones complex, like that in all fractures of the Chatsworth Formation, but that does not make them universal aquitards. "This study was done by Howard G. Wilshire PhD, 2006. Community members need to know the rate that these chemicals are migrating offsite. Members of the West Hills Neighborhood Council have asked if any type of tracer can be used to determine this. Has anyone used a tracer in this formation in the past? I believe that at least 70 types of chemicals, plus dies, radionuclides, and bacterial agents can be used as chemical tracers. I do want to add that the Santa Susana Pass Fault Zone has been mentioned in this document (page 12). This has been a concern of mine - whether the chemicals from the lab are reaching the Santa Susana Pass State Historic Park and Chatsworth Park South. Based on this document, I would say that answer is not clear. Runkle Canyon is mentioned, and it appears that perchlorates that are found there have their source at the SSFL. Based on all of the geologic information that we do have, and the gaps that exist, we need to be looking everywhere (the whole SSFL site and at least two to three miles from the SSFL boundaries) - not just in AREA IV, for chemicals and radionuclides from work done in AREA IV. In cases where we know that chemicals migrated beyond that distance - such as in the Arroyo Simi, we will also need to assess those pathways in the north - east to west. We need to check the Chatsworth Reservoir to the east. And we need to check all of the pathways that lead to Bell Creek and other canyons that lead to the Sepulveda Basin and beyond.	1. DOE appreciates the reference for the hydrogeology report. However, the report primarily focuses on TCE and perchlorate issues associated with Areas II and III. The contaminants mentioned in the report originated in Areas II and III as part of rocket engine testing. Groundwater contamination associated with these areas is being investigated separately by DTSC, Boeing, and NASA. In the *Draft Gap Analysis Report*, the analysts recommend additional field work needed to understand contaminant migration associated with Area IV. Current data indicates that Area IV contaminants (TCE and tritium) have not migrated far from the boundaries of Area IV. However, the recommended field work is necessary to confirm the existing data.
IN-038: Christine Rowe, E-mail dated: 8/11/2008		
1	1. I can tell by the posts that I see and the emails that I get that no one in the community is familiar with the remediation of nuclear materials. So my comment is that we need to know just how the cleanup process would be done - would you use things such as Alternative Daily Covers: http://www.nwci.com/spect-landfcvr.html	1. "Alternative daily cover" refers to the soil or similar material placed over waste at a municipal landfill at the close of each work day. The cover is intended to temporarily contain the waste, preventing it from blowing around and reducing its attraction to wildlife. Alternative daily covers would not be applicable to a soil removal action unless temporary soil stockpiles needed to be covered by tarps to minimize wind-blown dust potential.

	Comment	Response
2	2. Another question that has come up is this - how do you decide what you will do? Will that be decided after the EIS is completed and commented on? Will all of our comments be averaged to determine the best method? If the community says do Option 4, does that mean we must do Option 4?	2. DOE thanks the commentor. Due to the number of similar comments received regarding this concern, the commentor is referred to DOE's response in Section 3 of this document.
IN-040: Christine Rowe, E-mail dated: 8/12/2008		
1	1. I would like to have a chart with the radionuclides of concern - their half lives, their daughters, etc, that I could understand. I would like to see a document explain the health risks of each radionuclide. For example, I was discussing sodium 24 I believe. sodium-24 The isotope of sodium with an atomic weight of 24, and a half-life of 14.96 hr; it emits beta and gamma rays, and is more easily prepared than the longer-lived, positron-emitting 22Na (half-life, 2.605 yr). It is used to measure extracellular fluid by indicator dilution. Now I know that a lot of sodium was in the sodium burn pit. And that frightens a lot of people. The sodium was in a liquid form, I believe, when it was a coolant. The community needs to understand that the half life of the sodium 24 would be gone by now. What we don't know was what else was in those pits - what was the sodium contaminated with. So if you guys want to calm down the community, it would make sense to put in the EIS the half lives, and then explain the risks in the past - short term and cumulative. Then what is left today, and their risks - short term and long term exposure risks.	1. The commentor is referred to Table 3-10 of *Draft Gap Analysis Report*, which provides the half-lives for the radiological COCs. Included in the table are any long-lived daughter products that result from the decay of radionuclides over time. In response to the commentor's concerns about Sodium-24, the health effects of all radionuclides, based on measured concentrations, will be discussed in the risk assessment.
2	2. In the SB 990 section on page 1- 11, it mentions that soil, plant uptake, and animal tissue data are needed to assess the risk pathway. So we need to make sure that the plants are sampled both in AREA IV and off the site where there have been known high radiological readings in the past. One problem with plant uptake is that so much of the area burned in the 2005 fire. So an effort should be made to look for onsite and offsite areas that did not burn to access the plant uptake. Anything released by the plants in 2005 could have washed away during the heavy 2006 rainy season.	2. DOE agrees that biota sampling will be required both on and off site. EPA has the lead for the radiological background study, and consideration of past fires is one of its criteria for radiological background site selection.
3	3. The Gamma Walkover discusses the radioactive classes - page 3-29; where are they first defined? They are not defined in the definitions section.	3. The commentor is referred to Section 3.6.3 of the *Draft Gap Analysis Report* for a definition of radiological classes.
4	4. Figure 3-3 - Why are radiological samplings taken in certain areas when the wind patterns are different? Is this because of the 10 mile requirements for each Atomics International facility? Is this because of historical data showing that these sites had radionuclides present?	4. Figure 3-3 of the *Draft Gap Analysis Report* shows the locations where previous radiological background samples were collected. The rationale for each sampling event is not needed for current purposes. There is no requirement to sample 10 miles from the facility.
5	5. Figure 3-4 - Needs to identify existing buildings and identify roads. Also, all of the maps that show any of the rest of the site should have a better divider to show the distinct areas (I – IV).	5. Figure 3-4 in the *Draft Gap Analysis Report* is a "high-elevation" depiction of Area IV and portions of Areas II and III, thus identification of building numbers and roads would be illegible. The commentor is advised that the building numbers are displayed on Figure 3-6 of the report and all figures show locations of the roads. DOE thanks the commentor for the suggestion regarding the line dividing the functional areas of SSFL. A more prominent boundary line between functional areas of SSFL will be shown on all maps in the revised *Draft Gap Analysis Report*.

	Comment	Response
6	6. Figure 2-2 We need to see the Silvernale pond and any other ponds that we know that the toxics from AREA IV went to. I have read comments by other community members that they went to the R1 and R2 ponds as well. You need to identify those ponds - and their pathways.	6. Figure 2-1 in the *Draft Gap Analysis Report* presents the drainage patterns for Area IV. When the document is revised, the names of ponds receiving runoff from Area IV will be added to all figures depicting drainage patterns.
7	7. Since the contamination from AREA IV went to other areas, we will need a full archaeological site characterization of the complete SSFL. According to documents that I have previously sent in, the specific locations of caves, shelters, and artifacts are south of the SRE. Only with a complete site survey will these areas be protected. If remediation is done in this area, care must be taken to protect any thing of cultural interest.	7. A Class III inventory/Phase I archaeological survey has been completed for Area IV of SSFL, which included the 290-acre study area. The results of this and previous studies are currently being evaluated. In addition, any disturbance to areas outside of Area IV will also undergo evaluation.
8	8. Figure 2-6 Potentiometric Surface - I know that potentiometric was defined in the glossary. So does this refer to the building that I am hearing about that is always wet in AREA IV? Building 58? Building 100? Because a community member is stating that this building being near the surface is causing the radionuclides to get into the aquifer system. Please explain this a little better and explain what "H-H" and "I-I" are in reference to. Are the COCs in these maps just the TCE or would they potentiometric nature of these maps mean that radionuclides could get in the aquifer system here as well. Do we know the source of the liquid in the building? Are there seeps or springs there? A high water table?	8. Any building with a basement that lies below the top of the groundwater table (called the "potentiometric surface") will potentially collect groundwater unless it is pumped out. Contact between groundwater and building surfaces will not necessarily result in contamination of the groundwater. "H-H" and "I-I" are notations of cross sections that show the geology of Area IV along those lines. The inset maps in the lower left of the figures illustrate the locations within Area IV of the cross sections. The COCs in the figure only show TCE. There is a potential for radionuclides from contaminants in the soil surrounding the buildings to enter the aquifer. The source of the liquid in the basements is the high groundwater table.
9	9. Are there any known radionuclides in that area that could be a danger to the aquifer system? Or is it possible that by the time these radionuclides move through the aquifer system (fine grain units, etc.), that they will become trapped or diluted enough to not be a problem within the aquifer?	9. The primary radiological contaminant found in Area IV groundwater is tritium. Concentrations are higher than expected above background; its source probably stemmed from operations of the adjacent subsurface nuclear reactors. Tritium is an isotope of hydrogen and its chemical properties allows it to flow with groundwater; its movement is not slowed or retarded. Therefore, it may be transported from its source and be detected at several well locations so that a small plume of tritium can be mapped in Area IV. Other radiological constituents of interest (COIs) may impact groundwater, but most are not soluble in water and their transport is thus much slower than the movement of groundwater. They tend to adsorb to soil particles, slowing their movement to and in groundwater. Therefore, the majority of radionuclides may not be transported far and may only be detected at or very near their source. However, in the *Draft Gap Analysis Report*, DOE recommends additional investigation of aquifer properties that would affect movement of radionuclides to provide a better understanding of what is occurring in groundwater beneath Area IV.
10	10. page v - 3.7.3.1 - review of Groundwater CSM - define CSM - is that Conceptual Site Model – defined on page III? Define it in the acronyms please.	10. CSM stands for Conceptual Site Model. It is defined on page 3-1 of the *Draft Gap Analysis Report*. Typically, in a technical document, acronyms are only defined at their first usage. The definition will be added to the glossary.

	Comment	Response
11	11. page vii - NESHAPS - define	11. NESHAPs is an acronym defined as National Emission Standards for Hazardous Air Pollutants. In accordance with standard practice, it is defined upon its first usage (page xiv) within the text.
12	12. page vii - Spell out CPEC for Surface, then use the acronym	12. CPEC is defined in the glossary on page xiii as Chemical of Potential Ecological Concern.
13	13. page xvii - ARARS - Will SB 990 fall under ARARS for this Site?	13. DOE thanks the commentor. Due to the number of similar comments received regarding this issue, the commentor is referred to DOE's response in the introduction to this document. DOE is following the guidance and requirements for EISs, as well as CERCLA guidance in the department's analyses. The *SSFL Area IV EIS* will contain an analysis of an agricultural alternative. SB 990 will be discussed in the EIS.
14	14. page xvii - Data Quality Objective - "Developing DQOS is the first step in planning a site investigation before any data is collected." Why are we doing Scoping and responding to how we want the site remediated before the Background is determined and Sampling data is collected?	14. DOE agrees that additional data are needed to better understand the nature and extent of contamination that must be cleaned up. The *Draft Gap Analysis Report* was prepared to support decisionmaking related to the data that are needed to move forward. The development of Data Quality Objectives is a necessary first step before any new data can be collected. Scoping for an EIS allows the public an opportunity to define the alternatives that should be evaluated in the EIS. The background study is needed to determine how much contamination might be naturally found at SSFL. It will help to set cleanup objectives, as it is typically impossible to clean up to a level below naturally occurring radiation.
15	15. page xvii - there is a space (line) needed between DCGL and Detection limit page xviii - under gross alpha - it should say "from" not "form"	15. DOE thanks the commentor for noting these typographical errors. They will be corrected in the revised *Draft Gap Analysis Report*.
	IN-041: Christine Rowe, E-mail dated: 8/12/2008	
1	Who exactly has to pay to clean up AREA IV? Who is the polluter? Is it Boeing - with the previous owners A. I., etc? Or is it the DOE - with previous parties that include the Atomics Energy Commission and even the DOD? Or is it the responsibility of the federal government to fund the cleanup through Congress for the messes that it made in research over the last 50 + years? This question goes back to the future land use of the sight. Option 5 - leave something in place, clean up parts. There have been numerous options about leaving things in place and watching, etc.	DOE will be responsible for paying for cleanup of its portion of Area IV. The selected alternative for accomplishing that cleanup will be documented in a Record of Decision. The Record of Decision will be based on the final *SSFL Area IV EIS* as well as other considerations.
	IN-042: Christine Rowe, E-mail dated: 8/12/2008	
1	1. I would only want the structures currently onsite in AREA IV to remain onsite if there was a risk to public health to remove them. When I say a risk, I am referring to the risks that workers may be exposed to in dismantling and containing these facilities. I am also talking about the risks associated in the release of radionuclides into the atmosphere when the structure is dismantled and the soil is dug up.	1. All of these considerations will be analyzed as part of the *SSFL Area IV EIS* and compared to the impacts of leaving the structures in place. Some of the impacts that will be examined include impacts on workers and the public from exposure to dust and contaminants, direct radiation exposure to workers during dismantling, industrial accident rates from the demolition activities, transportation accidents and exposures during normal transportation of the demolition debris, and the impacts of waste disposal.

	Comment	Response
2	2. Once these facilities are removed from the ground, then I would want them removed from site. My concern about containment was whether the best option is to leave the structures in place, and to build a containment structure around a whole area.	2. DOE acknowledges the commentor's concerns. The EIS process will support evaluation of the impacts of the different alternatives. This evaluation will be presented in the *SSFL Area IV EIS* and should provide both the public and DOE with sufficient information to consider the different cleanup strategies.
3	3. While Option 4 is the closest to what I would like to see, I remain open to education as to why Option 5 would be the safer option for public health.	3. The analysis of each alternative will be conducted during the preparation of the *SSFL Area IV EIS*. The EIS will present enough information in the alternatives analysis that both the DOE decisionmakers and stakeholders may compare impacts such as safety among the alternatives.
IN-043: Margery Brown, E-mail dated: 8/13/2008		
1	ALTERNATIVE IV IS THE ONLY ONE THAT IS ACCEPTABLE1	DOE thanks the commentor. Due to the number of similar comments received regarding this concern, the commentor is referred to DOE's response in Section 3 of this document.
2	Background standards should be established at a considerable distance from the SSFL, in order to determine a true background. Establishing a background standard on or near the SSFL is not acceptable, because it will inevitably involve soil that is contaminated, to one degree or another. We have already had too much manipulation of background standards for money making purposes. It is patently dishonest to raise background standards in order to show that soil is "clean", when it is really contaminated.	DOE thanks the commentor. Due to the number of similar comments received regarding this issue, the commentor is referred to DOE's response in Section 3 of this document.
3	3. Much more needs to be learned about groundwater, as being a priority issue. If ground water remains contaminated, one can visualize it potentially "re-infecting" already cleaned ups areas. This could then necessitate an endless cycle of re-cleanup effort and expense. Contaminated groundwater also needs to be cleaned up or removed, in order to spare outlying residential and/or agricultural areas from becoming contaminated by migration	In the *Draft Gap Analysis Report*, the analysts recommend conducting additional groundwater investigations, in part to address concerns such as those of the commentor. The *SSFL Area IV EIS* will consider alternatives for addressing groundwater contamination and provide the basis for a long-term remedy, as necessary.
4	4. More study needs to be done regarding the potential risk of dangerous exposure caused by the removal and/or demolishing of radiologically contaminated buildings and their transportation in open trucks to dump sites. One can visualize an endless line of truck going up and down Woolsey Canyon, thru residential areas, while the wind blows around some of the contaminents in the process. It is not clear as to just how you plan to protect both the Field Lab workers and the above mentioned citizens on such truck routes.	The *SSFL Area IV EIS* will evaluate remedial alternatives for addressing site contamination and excavated materials resulting from the dismantlement of site facilities. The analysis will allow a comparison of the impacts on workers and the public that would result from transporting the waste materials for offsite disposal. Those impacts could be compared with the impacts of leaving the waste on site (no action or onsite containment). Regardless of the decision, DOE will implement the cleanup in compliance with all laws and regulations. Transportation of hazardous or radiological materials or waste is controlled under the Hazardous Materials Transportation Act of 1975, as amended (49 USC 5101 et seq.), as well as implementation regulations found in 49 CFR 171-178 and 49 CFR 383-397; EPA regulations in 40 CFR 262 for transportation of hazardous waste; and NRC regulations for packaging and transportation of radioactive material in 10 CFR 71. For example, contaminated waste cannot be transported in open trucks. If a large piece of equipment is being transported, any

	Comment	Response
		contaminated material must be fixed to the equipment via paint or some other fixative and securely wrapped or containerized, or the equipment would have to be reduced in size and placed in secure containers. Large pieces of debris or soil must be placed in "supersacks" (packing suitable for transport and direct disposal) or placed in sealed metal waste disposal boxes. Uncontaminated debris may be placed in large open trucks; however, the material must be secured under a tarp for transport over public highways. All of the waste leaving the site must meet the conditions discussed above (i.e., no open trucks with the possibility of debris blowing out of them).
5	5. Please let us know in your EIS exactly what your testing standards are: i.e....PRG's .....MCL's...etc. We are really frustrated by receiving test results showing charts with unrecognizable headings, that make it impossible to determine the results and/or exceedances. Please make these standards clear, and plan to stick with them in the future. This is not supposed to be a political game on shifting sands!	DOE understands the commentor's confusion. Please be aware that testing standards depend on the medium (air, soil, or water) that is being tested. The background levels will be determined by EPA and DTSC for radionuclides and chemicals, respectively. For water, the cleanup must reduce contamination to established MCLs as issued by EPA and the State of California Environmental Protection Agency. DOE will do its best to provide understandable result tables when it issues its data reports.
6	6. Testing for radiation really needs to be done high elevations, not just in low, accessible places. It is logical that wind driven contamination will settle first on high elevations. Such testing also needs to be planned for in various seasons...dry..rainy..etc. This also includes sampling for toxic chemicals, on land and in seeps, springs and creeks. It has recently been discovered that vegetation commonly absorbs as much as 200% more radiation and/or chemicals than does soil...thru its roots. Vegetation absolutely needs to be tested!	EPA will conduct a radiation survey consistent with agency protocols for conducting such surveys. The SSFL 'Site-Wide Risk Assessment Manual' [or SRAM] is currently being revised at the request of California DTSC. The SRAM revisions include the methodology for performing ecological risk assessments. DOE will collect biological data and conduct any future ecological risk assessments consistent with the SRAM. DOE will share its sampling approach with the community so that concerns, such as those expressed by this comment, can be adequately addressed before sampling begins.
7	7. I realize that the above are more a matter of suggestions for your EIS than they direct criticisms of the Scoping materials and meetings, per se. I must admit that it is supremely difficult to comment on a largely unread 800 page report, considering both time and eyesight- endurance deficiencies. This comment process has been like attempting to critique a book review ...without having first read the book! The 30 page summary has been very helpful, but there is no way to know if it is truly complete. I hope that you will keep your eventual EIS as brief and understandable as humanly possible. I can appreciate the technical difficulties that you would face in carrying out such a request, but even the most dedicated environmental activist does have a life!	DOE thanks the commentor for the suggestion. DOE appreciates the commentor's request that the *SSFL Area IV EIS* be as brief and understandable as possible. That is also one of DOE's goals; however, it has to be balanced with the need to provide enough information in the analysis to support the decisionmakers' needs and make it possible for the public to understand how the analysis was performed. If the data and analyses become too voluminous, DOE may decide to present some information in appendices. Also, as was done with the *Draft Gap Analysis Report*, DOE expects to prepare an Executive Summary that will summarize the major conclusions and provide a concise description of the analyses.
8	8. I would suggest that it would be wonderful and ideal if you could section off a potential draft EIS....and have meetings on only a few sections, as time allows. We would then have a chance to really focus in on, understand and absorb several sections at a time. In conclusion, I want you to know that I truly appreciate your professional abilities, and your obvious commitment to doing an excellent job. You absolutely have my trust, confidence---and support!	DOE thanks the commentor for the suggestion. DOE plans to conduct public participation activities throughout the process of preparing the *SSFL Area IV EIS* and will consider the commentor's suggestion. DOE appreciates the support.

	Comment	Response
	IN-044: Margery Brown, E-mail dated: 8/13/2008	
1	1. There are a number of earthquake faults that riddle the Santa Susana Field Laboratory, and they need to be studied by a seismologist. While earthquakes cannot be predicted as yet, a large earthquake could do a great deal of damage to buildings, and could disturb the soil, with devastating results. It is not hard to picture a large earthquake releasing radioactive substances or toxic chemicals into the air..and into neighboring communities with serious results. I would hope that any work plan would take into account this possibility, and that it would attempt to formulate some kind of plan for mitigation. In addition to being unpredictable, the "Big One" is long overdue! I have been a Red Cross Disaster volunteer for over 20 years, and would be glad to seek help from the Red Cross, if this would be of any assistance to you.	As part of the *SSFL Area IV EIS* evaluation, a geologist/seismologist will assess the potential for earthquakes and what impacts an earthquake might have on each of the cleanup alternatives. If it is determined as a result of the analysis that a mitigation plan is needed, DOE will develop such a plan.
2	2. There is a well known Indian cave on the Field Lab, although I do not know if it is located in area IV, or not. It is well known that there are paintings in the cave (or caves), and this would be an archeological treasure. There are also scattered Indian graves in the Simi Hills and Santa Susana Mountains, and their location is generally unknown. Any type of Indian involvement calls for the presence of an Indian Monitor and an Archeologist...by law. In the past, I have experienced that the Indian Nation Courts have a tremendous amount of power. The Indians are absolutely capable of filing a lawsuit that will shut down any job in a heart beat! Chris Rowe has become an expert on Indians, and we are working with them regarding Dayton Canyon, which also has an historic Indian Cave.	The Burro Flats Archaeological site, which is not located within Area IV, is under protection by its designation in the National Register of Historic Places, and site protection and visitation rules are strongly enforced by Boeing and NASA at SSFL. Similar sites in the vicinity have been inventoried and are being reviewed through the current EIS process. During the development of the *SSFL Area IV EIS*, DOE will also fulfill its responsibilities regarding government-to-government communications with appropriate Tribal authorities.
	IN-045: Trudi Ferguson, E-mail dated: 8/13/2008	
1	1. I have thought and thought about what option would be the best decision. I have been following all of the dialogue on the yahoo groups site "Rocketdyne Information Society" Yet, I fail to see where we have any scientists, geologists, hydrologists, physicists, giving their recommendation of what should be done with the site.	It is too early in the process for DOE's resource specialists to make informed recommendations regarding the best way to approach site cleanup. DOE has just begun the process of preparing the *SSFL Area IV EIS* (the EIS scoping process has just been completed). Critical next steps include completion of the chemical and radiological site characterizations, collection and analysis of historical operations data, completion of the human health and environmental risk assessments, collection of baseline data for each environmental resource area (such as cultural resources, biological resources, geological resources, water resources, etc.), and development of the analysis of a range of alternatives. Only once those steps have been completed will the resource specialists from each of the applicable disciplines be able to evaluate and compare the various alternatives for their specific resource areas.
	IN-046: Christine Rowe, E-mail dated: 8/14/2008	
1	1. Relocation - Some community members thought that the EPA buys the properties of homeowners whose properties were contaminated. The EPA told me that rarely happens - about the only time they have done it is with LOVE CANAL. What the EPA does if a neighbor's property is found to be contaminated is that they relocate the person until their property is cleaned up. So what I want is to find out whose property is contaminated by the site, and get them relocated so they can have their property cleaned up. We don't want them having another 10 years of exposure.	1. DOE will survey and sample initially in Area IV pursuant to the RCRA Consent Order and will also conduct any supplemental sampling recommended in the *Draft Gap Analysis Report* beyond sampling done by EPA under the scope of work developed under the Interagency Agreement between EPA and DOE. From this sampling, DOE will, if not done by EPA, follow the trail of any contamination outside Area IV, including offsite locations.

	Comment	Response
2	2. And Christina is right - you do need a top down approach. But you have to look at what is going on nearby too - whether it is dynamiting in Dayton, developments in Runkle, Negative Declarations for the Chatsworth Reservoir, or contamination at Corporate Pointe. In fact, I believe that I got an alert that states that Corporate Pointe is going to file a Negative Declaration - if they haven't already. Interestingly, they state in fine print that the Chatsworth Reservoir was contaminated by Hughes. I think the reservoir was contaminated by both properties - the SSFL and the Corporate Pointe site.	2. Comment noted.
3	3. I spoke to Stephanie Jennings of the DOE at length today too. Their time schedule as published has changed because they do not have a time frame yet for when the EPA will do its work. The goal of the DOE was a cleanup of certain aspects of AREA IV by 2010. That was to allow the DTSC to have most of the cleanup done by 2017. If the 2010 date is setback, then the 2017 date may be set back as well.	3. DOE thanks the commentor. Due to the number of similar comments received regarding this concern, the commentor is referred to DOE's response in Section 3 of this document.
4	4. In the meantime, I don't want the residents who are in the AREA OF CONCERN to be exposed to this cleanup for another 10 years. That is why I would like the peripheral properties to be sampled ASAP.	4. The "Area of Concern" is a study designation for the study's data collection and analysis, based on primary wind direction. The designation does not mean that those areas are contaminated, but were included in the study analysis.
5	5. Option 4 - is that my ultimate goal - yes. Parkland is that my ultimate goal - yes. I just think that I would have preferred the EPA approach where a complete site characterization, horizontal and vertical, with the peripheral properties, and the hydraulics of the Chatsworth formation and all of the fault zones, the shear zone, etc, were done first.	5. DOE thanks the commentor. Due to the number of similar comments received regarding this concern, the commentor is referred to DOE's response in Section 3 of this document.
6	6. I want to know how far off site the plumes of TCE have migrated. I want to know if the perchlorates are in the ground water or deep down at Runkle and Dayton Canyon.	6. The groundwater problems identified in the comment are related to Areas I and II. The problems are being investigated by Boeing and NASA. The commentor may address these concerns with DTSC, Boeing, and NASA.
7	7. I want Dayton Canyon sampled completely before the land is donated to the SMMC. I want to see more compliance points for the LA RWQCB in the Woolsley and Dayton Canyon drainage.	7. Sampling of Dayton Canyon and Woolsey Canyon is not within DOE's authority. These concerns may be expressed to DTSC and the LARWQCB.
8	8. What I would like is for a PH D Health Physicist to tell me the health risks that are left at the site - not just AREA IV - after the radionuclide sampling is done. I want it to be someone that the community trusts.	8. After EPA completes the radiological characterization survey, and DTSC review of the chemical sampling data provided by respondents, DOE will conduct a health risk assessment for Area IV. A health physicist will be part of that process. DTSC has regulatory oversight of all of SSFL (including DOE, Boeing, and NASA) and will require a site-wide risk assessment as part of the overall evaluation of SSFL.
9	9. I want that person to explain to me what is achievable - based on the federal EPA standards. The PRGs are just preliminary goals - the goals are really supposed to be site specific.	9. What is achievable in terms of analytical detection limits (laboratory methods and equipment) is being worked out by a technical team including representatives from EPA, DTSC, DOE, and Boeing. Their findings will be shared with the community when the studies are completed.

	Comment	Response
10	10. Bonnie Klea has told me about how if there are fissures - the workers dumped contaminants into them. So the question is - are the radionuclides deep into the bedrock? Are we going to have to break away the bedrock to get our goal of 10 -6? Is the site going to look like a moonscape when all of the work is done? Because the Draft Data Gap says that the radionuclides were taken up by the plants. So are we going to have to remove all of the plant life at the lab? And if you do that, how do you do that safely? Because there are dioxins all over the place from the 2005 fire.	10. The ongoing investigations and investigations recommended by the *Draft Gap Analysis Report* will address many of these questions. The *SSFL Area IV EIS* will address the actions that can be taken safely. These questions cannot be answered until the sampling and analyses are complete.
	IN-047: Shirley Galat, E-mail dated: 8/14/2008	
1	I strongly urge you to consider scoping the entire site of the Santa Susana Field/Lab Rocketdyne, not just area 4. It is vital to the health of the surrounding community that it be completely cleaned. I would like to hear from you on this matter.	DOE thanks the commentor. Due to the number of similar comments received regarding this concern, the commentor is referred to DOE's response in Section 3 of this document.
	IN-048: Adam Salkin, E-mail dated: 8/14/2008	
1	1. After attending all of the scoping meetings, I at least wanted to voice my opinion regarding which alternative should be used out of the 5 choices presented at this time. I believe that Alternative 4 is the most viable alternative out of those presented. The other alternatives seem to be less stringent, not as safe for the surrounding communities in the long run, or unrealistic due to SB 990 and concepts of landownership. I believe that the goal has been, and continues to be, cleaning up the site to the highest possible standards, which is only encompassed by Alternative 4.	1. DOE thanks the commentor. Due to the number of similar comments received regarding this concern, the commentor is referred to DOE's response in Section 3 of this document.
2	2. The other alternatives seem to be less stringent, not as safe for the surrounding communities in the long run, or unrealistic due to SB 990 and concepts of landownership. I believe that the goal has been, and continues to be, cleaning up the site to the highest possible standards, which is only encompassed by Alternative 4.	2. DOE thanks the commentor. Due to the number of similar comments received regarding this concern, the commentor is referred to DOE's response in Section 3 of this document.
	IN-049: Philip Chandler, E-mail dated: 8/14/2008	
1	1. DOE indicates that it will consider cumulative impacts from exposure to chemical and radiological constituents in SSFL from future land uses. DOE has previously exposed a population to these constituents therefore the cumulative impacts must not be merely prospective. The accumulated exposures to the peripheral population, workers, and visitors needs to be considered in the EIS, first and future impacts added in. Of specific interest, are the periods of time in which buildings were occupied over halogenated VOC contaminated groundwater and over which water from well(s) adjoining the radiological releases were used to provide on-site drinking water. Many of the workers and visitors are still in the vicinity of SSFL and may among those exposed again in future use scenarios. It is not reasonable to wave off past exposed populations and assume that the exposure baseline is tomorrow. All media need to be addressed, including past air and surface water exposures of the peripheral population. Remediation needs to be accomplished that does not significantly add to the past exposures of the peripheral population----including former workers at and visitors to SSFL----either within as future visitors or without at their homes or other workplaces.	1. DOE thanks the commentor. Due to the number of similar comments received regarding this concern, the commentor is referred to DOE's response Section 3 of this document.

	Comment	Response
2	2. The ecological receptors or eco-risk component necessary to support any proposed remediation by DOE must address the risk to burrowing or ground dwelling biota posed by residual volatile organic compounds (VOCs) contamination in soil and rock ("bedrock"). Rock especially is an issue since DOE has failed to adequately investigate the nature and extent. The burrowing and ground dwelling biota are perhaps even more susceptible than people given their relatively small body mass. The EIS must address these at risk biota by making the appropriate field measurements of gas phase VOCs in rock and modeling the off-gas accumulation in burrows and the flux near the ground surface. It is expected that a modified form of the Johnson Ettinger approach will need to be applied to burrows and dens.	2. In accordance with the *Draft Gap Analysis Report* recommendations, DOE will conduct an ecological risk assessment that will address potential exposure of plants and wildlife to gaseous, liquid, or solid chemical and radiological contaminants. DOE is engaged with DTSC's Human and Ecological Risk Division in development of the ecological risk assessment. The methodology for the study including these recommendations will be presented to the public before its implementation.
3	3. The EIS must provide adequate support for any data that is used to draw conclusions concerning proposed actions and alternatives. For example, to assume that filling the "bedrock" data gap with bedrock samples, as proposed, and then applying that to the EIS is unacceptable. In situ vapor phase measurements must be made in the bedrock otherwise the EIS conclusions will be inadequate.	3. DOE thanks the commentor for the suggestion. The scope of the subsurface investigation has not been developed, but this comment will be considered as part of the future data needs regarding chemical fate and transport in the bedrock system.
4	4. The EIS must justify that the wells to be used in groundwater conclusions with respect to remediation or alternatives, are sufficient to support those conclusions.	4. The *SSFL Area IV EIS* will include an evaluation of the effectiveness of groundwater remedial actions in relation to the well network.
5	5. It is not at all certain that the extent of past surface water impacts to biota have been evaluated. The EIS must adequately support any such conclusions and limitations applied in terms remedies or alternatives.	5. Where available, cumulative impacts will incorporate prior surface water and biota data. The commentor is also referred to the DOE response to the first comment (IN-049-1).
	IN-050: David Carey, E-mail dated: 8/14/2008	
1	Alternative Number Four (4) is the only alternative regarding the Department of Energy's Environmental Impact Statement as it pertains to the Rocketdyne/SSFL/DOE facility in the Santa Susana Mountains. Please use Alternative Number Four.	DOE thanks the commentor. Due to the number of similar comments received regarding this concern, the commentor is referred to DOE's response in Section 3 of this document.
	IN-051: Philip Chandler, E-mail dated: 8/15/2008	
1	1. SOIL – I concur that additional chemical and radionuclide data are required to allow adequate determination of risks of residual contamination to human health, ecological receptors and the environment. Even after all of the work at SSFL, the extent of contamination remains incompletely determined.	1. DOE appreciates this comment agreeing with the proposed approach.
2	2. GAMMA RAY WALKOVER SURVEY – I concur that additional gamma ray survey work needs to be performed. However, the walkover survey of "accessible" areas is insufficient. A low level (below 500 feet above terrain) rotary wing gamma-ray spectrometer survey must be used to [comment ends].	2. As EPA will design and conduct the gamma walkover survey of Area IV, DOE suggests that this comment be provided to EPA.
3	3. GROUND WATER – I concur that considerable additional data are needed to define horizontal and vertical extent of groundwater contamination.	3. DOE appreciates this comment agreeing with the proposed approach.
4	4. GROUNDWATER SEEPS – The CEQA document must include a longterm monitoring and response program for all seeps---whatever the next field work demonstrates. Neither DOE nor its consultants can predict when "breakthrough "might occur in any seep. Moreover, the current climate or year-to-year weather may change such that additional seeps may re-saturate. This must be a longterm commitment not just a one-time "if water is available" affair. The discussion of seeps and summary of data gaps are both unacceptable and fail to satisfy the spirit of NEPA.	4. The *Draft Gap Analysis Report* recommendation for additional seep sampling was only intended for comparing short-term data with groundwater data for site characterization purposes. Until additional analyses are available and remediation alternatives are evaluated, DOE cannot surmise the extent of a future sampling and monitoring program. However, DOE expects some level of monitoring to occur in

	Comment	Response
		the future.
5	5. SOIL PORE-GAS/ROCK PORE/FRACTURE-GAS ["SOIL VAPOR'] – I disagree. Additional data are exactly what is required for the EIS "per se". Rocketdyne and its consultants have failed to provide in situ measurement of pore and fracture space gas phase volatile organic compounds (VOCs). Residual vapor phase contamination in rock has the potential to continue to migrate to ground water and to impact the surface----humans and biota. DOE must install deep nested vapor monitoring probes in bedrock and collect data that must be included in the EIS. Moreover, a pilot vapor extraction system needs to be operated for at least one year to provide the basis for alternatives evaluation.	5. The commentor's suggestion for additional soil gas characterization will be considered as part of the design of additional groundwater investigation. For the known extent of volatile organic compound (VOC) contamination within Area IV, including existing VOC extent in soil vapor and groundwater, it is unlikely that an extensive soil vapor extraction test will be required for Area IV. More extensive soil vapor contamination exists elsewhere within SSFL, but that contamination is not related to DOE activities.
6	6. SURFACE WATER – I disagree that surface water quality is being "assessed" under the National Pollutant Discharge Elimination System (NPDES) permit. The permit's purpose is to monitor current discharge at a small number of select points. This is not the same thing as assessment and is not sufficient for EIS purposes. I request that DOE actually assess discharge from HWMUs, SWMUs, and AOCs-----this means systematic sampling under different discharge conditions at points other than those necessarily selected for NPDES purposes. Surface water exposures can occur in the drainages at points other than the NPDES points, and additional water from cleaner portions dilute the discharge before the NPDES point. In other waters exposures to biota and humans can occur that is not reflected in the NPDES monitoring. A surface water sampling program must be designed for the specific site conditions----and not merely NPDES requirements.	6. DOE concurs with the need to sample surface ponds and drainages internal to the NPDES discharge points. In the *Draft Gap Analysis Report*, analysts recommend the sampling of internal drainages and ponds receiving runoff from Area IV. This recommendation is in addition to the surface-water monitoring that is being performed under the NPDES program.
7	7. SEDIMENT – I concur that more sediment chemical and radionuclide data are necessary to allow adequate assessment of risk to ecological receptors. It may be necessary for human receptors as well. Sediment sampling must be carefully designed to target horizons in which the releases may have been "recorded". It is not acceptable to allow gross samples to be taken and claimed to be representative. Depending on the specific situation, this may mean sampling at millimeter thicknesses.	7. DOE appreciates this comment confirming the proposed approach. The suggestions related to sediment sampling will be provided to EPA to be considered during their study design.
8	8. ECOLOGICAL RECEPTORS – It is not just tissue data that must be obtained. Soil and rock data must be used to select the biota to be samples and burrowing or ground dwelling biota must be targeted. The Johnson Ettinger approach must be used to evaluate the risk to burrowing biota.	8. The commentor is referred to DOE's response to comment IN-049-2 regarding the scope of the ecological risk assessment data collection needs.
9	9. AIR – I disagree. DOE has never established the effects on peripheral population. The previous exposures must be used as an additive factor to any future risk calculated from residual contamination. In other words, that population previously exposed by DOE releases must be factored into the EIS. At present this is not being done.	9. In the *Draft Gap Analysis Report*, the analysts recommend using current soil and building data to model potential risks to the community resulting from implementation of future soil and building actions. Previously collected data cannot be used because operational air data does not reflect current conditions. Collection of air data today at the site with no operations going on would not reflect prior or future conditions. The *SSFL Area IV EIS* will address, in a cumulative impacts analysis, past air release effects relative to the community.
10	10. BUILDINGS – I concur. The data are incomplete. Similarly, this data may need to be factored retrospectively into the exposure calculations.	10. DOE appreciates this comment confirming the proposed approach.
11	11. ROCK ["BEDROCK"] – No kidding. Specifically, DOE must stop with the unsupportable assumptions that chemical contamination is trapped perpetually in the rock. See comments on vapor-phase contamination.	11. DOE appreciates this comment confirming the proposed approach.

	Comment	Response
12	12. BACKGROUND – What does CDM mean by "accepted background data in its summary? Who is to do the accepting? Acceptable data is required because DOE has failed to properly obtain it. Given the nature of Rocketdyne's work---resulting in many multiple extensive clouds of waste gases, onsite background may be indeterminate. I suggest that a statistically large number of vertical profiles be done and organic matter dated from various layers to allow samples to be analyzed from those particular points in time prior to demonstrable Rocketdyne discharges. The sample pedigree will be very important to the validity of any background conclusions drawn for the EIS.	12. By "acceptable" CDM means background data that have been developed by and agreed with by EPA, DTSC, and the community.
IN-052: Adam Salkin, E-mail dated: 8/15/2008		
1	1. I believe that the entire site should be surveyed/analyzed for both chemical and radioactive materials, including the buffer zones. It is clear that work done by the DOE has crossed over into other areas of the site in various ways. Just to name a few, materials from Area IV were placed into the Area I burn pit, contaminated water from Area IV has flowed into other areas of the site, and the boundaries that exist today are not the same as the boundaries that existed in the 1950's and 60's.	1. DOE thanks the commentor. Due to the number of similar comments received regarding this concern, the commentor is referred to DOE's response in Section 3 of this document.
2	2. I am concerned about sampling done in the past being used going forward, since the EPA has pointed out that much of that sampling was insufficient. I simply want to make sure that all samples, and methods used for taking these samples, are heavily scrutinized.	2. The *Draft Gap Analysis Report* made the recommendation that an additional 4,000 samples are needed to provide an adequate data set for determining the nature and extent of contamination that will be the focus of remedial actions. DOE agrees that existing data are inadequate to support moving forward based on current documentation.
3	3. Once samples are taken, and the numbers begin to come in, I want to make sure that the results aren't averaged out. I don't believe that a finding of a non-detect (for some reason) should be averaged with a higher reading to create a false average for a certain plot of land. Results that come from a system that would average in non-detects seem unreliable. Although there shouldn't be a lot of "non-detects," the bottom line is that these "non-detects" shouldn't pull down the average due to a problem with the sample forcing it to be called a "non-detect." The goal is to find out where higher levels of contamination are present, not what the average in a particular area has come out to be. Therefore, I believe the rule should be "No averaging."	3. The samples will be analyzed and reported in accordance with CERCLA risk assessment statistics. These statistics will identify hot spots and focus cleanup attention to them. At issue will be the sizing and location of exposure units subject to the statistical analyses. The exposure units will be developed jointly with DTSC and EPA staff to address the concern expressed in the comment.
4	4. Next, and maybe I missed this in the EIS, but I would like to see a detailed breakdown, and map, that shows the flow of water, now and in the past (including how these waterways might have changed over time) from Area IV. I would actually like to see this for the entire site. This should include, natural waterways, seeps, springs, groundwater, surface water, pipelines, ponds, etc… I believe that this would be useful in many ways, and necessary to figure out the full extent of what we are dealing with.	4. The *SSFL Area IV EIS* has not been prepared at this point, but the baseline water resources section of the EIS will include a map of the water resources. Discussion will be included on how the flow of water may have changed over time.

	Comment	Response
5	5. Lastly, regarding the Historical Site Assessment (HSA), have all historical events been considered, and can more digging be done to make sure that we know all that there is to be known before moving forward. Especially since we are relying on this information as clues on how to move forward. For example, it seems that the Gamma walkover survey has been set up in such a way that it is relying on the HSA to point out the areas that should be surveyed with a 100% survey (Class 1) while other areas will receive a lesser walkover survey (Classes 2 and 3.) It seems that if we don't have all the information then the entire site should be treated as "Class 1" including areas 1, 2, 3, and the buffer zones. I have heard at past meetings, and by SSFL workers, that logbooks were kept that would add a great deal of understanding for all of us who weren't there over all of the decades that the SSFL has existed. What is the status of finding these logbooks, and will they be used to bring us up to speed on what has gone on at the SSFL over the years?	5. The research of historical information continues for Area IV. Once this information is available and has been reviewed, the historical site assessment will be updated. The revised historical site assessment will be one basis for revising the *Draft Gap Analysis Report* conclusions and recommendations.
	IN-053: Brian Sujata, E-mail dated: 8/30/2008	
1	1. The Department has proposed alternatives that have been identified for analysis in the EIS. I have reviewed the alternatives and conclude the proposed alternatives reasonably bracket the range of expected project outcomes.	1. DOE thanks the commentor.
2	2. The proposed alternatives do not present how the alternatives will be completed.	2. The alternatives as presented during the Scoping Period are conceptual. Preparation of the analysis for presentation in the *SSFL Area IV EIS* will require much more fully developed alternatives, including assumptions about how they would be implemented. Full descriptions of each alternative will be presented in the EIS.
3	3. I believe it is now appropriate for the Department to consider the issues of public involvement and technical approach. For the general public and seasoned professionals alike, the SSFL site has a nearly overwhelming degree of regulatory complexity. At present I am aware that a CERCLA national priority listing is on hold for the site, RCRA Corrective Action is underway at the RFA/RFI stage, a site specific cleanup standard has been set by the State via SB 990, extensive surface water monitoring is being performed under a State NPDES program and the EPA has been authorized to plan a radioactive materials survey in Area IV. The SSFL also has two different owners and three accountable parties; The Boeing Company, NASA and the DOE. Each has their own staff, operating procedures and interests. The public is mostly unaware of the roles and responsibilities of the SSFL accountable parties and responds with alarm (with occasional anger) when one accountable party cannot answer a question for the other. I know of several long-time observers who believe the SSFL is in a difficult predicament today because in large measure, the SSFL accountable parties have historically declined to address the concerns of the interested public. Fortunately.. the Department as made , great strides forward by hosting a series of public meetings beginning in 2004 and by establishing an expansive website for their SSFL activities. From the public's viewpoint, however, the Department's efforts are not enough to answer their questions about Boeing activities or site-wide issues. Sadly, NASA and Boeing are only marginally responsive, having hosted only a few agency mandated NPDES public meetings. The SSFL accountable parties must speak with one voice and I ask the Department to take the initiative toward that goal. I ask the Department to make the necessary high-level contacts within The Boeing Company and NASA to establish a cooperative internal working committee focused the outcome of communicating together about SSFL as one coordinated voice. The committee is encouraged to sponsor regular public meetings where specific and general issues can be presented to the public along with other forms of public outreach it deems appropriate.	3. The commentor has identified one of the more challenging aspects of communicating with the public about cleanup at SSFL – the complexity of land ownership and regulatory considerations. DOE is committed to conducting an expansive public involvement process to support a transparent decisionmaking process regarding the cleanup of Area IV.

	Comment	*Response*
4	4. If cooperative communication by the SSFL accountable parties is not possible, I request the Department singularly continue regular meetings to directly address community concerns. Such meetings are admittedly challenging, however, they engage the decision maker in the community which inspires greater communication and helps to build a foundation of trust.	4. It is DOE's intent to begin a series of working meetings to discuss issues related to the cleanup of Area IV. DOE intends to increase dialogue with all stakeholders to increase communication.
5	5. With the will and the means to communicate with the public, our attention now turns to site cleanup. There appear to be different technical approaches proposed to accomplish the alternatives contemplated in the forthcoming EIS. Normally, a site facing cleanup follows an established process having a technical rationale but at SSFL the site is subject to a unique cleanup goal based on nothing more than punitive politics. The SB 990 cleanup goal is inconsistent with the Boeing's stated future land use for the site. Worse, it requires the novel mathematical summation of differing types of risk without an accepted technical basis so the results are subject to continual reinterpretation, revision, rework and possible incorrect decision making. The Department should consider following the CERCLA process for the remaining cleanup at Area IV. The EPA-established CERCLA process features a uniform application of a cleanup process, provides a basis of comparison with other site cleanups, has public participation requirements and is based on a technical foundation.	5. DOE thanks the commentor. Due to the number of similar comments received regarding this concern, the commentor is referred to DOE's response in Section 3 of this document.
6	6. Finally, I find NPL status for the entire SSFL appealing site the differing agencies currently involved at the site would be placed under the single CERCLA process thus speeding site completion. Isn't Boeing, NASA and the DOE interested in a conclusion to the SSFL cleanup?	6. DOE thanks the commentor. Due to the number of similar comments received regarding this concern, the commentor is referred to DOE's response in Section 3 of this document.
IN-055: Christine Rowe, E-mail dated: 7/13/2008		
1	About 18 years ago I got a letter at my current address that I was in the "prevailing winds area of the Santa Susana Field Laboratory". I was told that I would have to disclose that if I ever sold my home. I had never known about anything related to the lab at the time except that I could hear the engine tests. I had no idea at all that the DOE was there, NASA was there, what AREA IV is, or that we had reactors up there. In the past I have seen documents that show the "5 mile radius" of the Santa Susana Field Laboratory. I very carefully determined that the current radius placed my home outside the "5 mile radius". I have been trying to find which document shows that map. Currently on my lap, I have a document called the " Cancer incidence rates in five Los Angeles County census tracts." This is from October 10, 1990. On this document, the five mile radius places my census tract well within the "5 mile radius" of the lab. I question if when Boeing bought the buffer zones, if the radius was recalculated. By doing so - adding about a mile buffer to the north by Brandeis and to the east by Bell Canyon, they would move the center further west. This older map puts the "5 mile radius" to east of Canoga Avenue at Vanowen. I remember that the more recent document put the radius boundary west of Woodlake at Vanowen. I find that troubling because that means that people that probably should have been notified of DOE meetings and DTSC meetings are probably not getting the notifications.	Unfortunately, DOE has no knowledge of the letter received by the commentor. Generally, the radius used in this type of study would have originated from the center of the site and not the boundary. The addition of the buffer zones would not change the radius used in the study.

	Comment	*Response*
IN-056: Christine Rowe, E-mail dated: 7/17/2008		
1	I am a community member involved in the Santa Susana Field Laboratory cleanup. The DOE is in their "Draft Data Gap Analysis" phase. This public response period ends on August 15th. I have a hard copy of this document. So far, I have not seen a cultural section despite the fact that there are caves on the federal historic register less than a mile from the DOE AREA IV. I would like to know the DOE's obligations under NEPA to provide cultural and archeological information in this document under NEPA. I would also like to know their ongoing responsibilities in terms of locating the appropriate tribes, Native Americans, or closest descendents to this site. I am not an archaeologist, so I do not know the rules for requiring notification, monitoring during remediation, etc. I would appreciate it very much if you can explain this to me so that I can make sure that the appropriate cultural group is notified of the EIS process.	DOE will follow the applicable laws concerning cultural resources, and is in the early stages of consultation with OHP and NAHC. The Data Gap Analysis was designed to identify stakeholders' concerns regarding the existing radiological and chemical data so that additional data could be extracted in order to adequately address and fulfill the requirements of the NEPA process for the *SSFL Area IV EIS*. However, the Data Gap Analysis was not designed to address cultural resources (i.e., archeological resources and/or historic properties). The review of cultural resources is part of the EIS development process, which began with the recent Public Scoping meetings. During the EIS process, DOE will also fulfill its responsibilities regarding government-to-government communications with appropriate Tribal authorities.
IN-058: Christine Rowe, E-mail dated: 7/22/2008		
1	California Department of Health did some type of gamma survey at Sage Ranch several months ago. I would like you to get those readings from Jerry Hensley at CDPH for the Data Gap please. That way, if they found anything there, it can be added to an area that should be further researched. California Department of Public Health (CDPH) Jerry Hensley 1500 Capitol Sacramento, CA 95814 (916) 440-7966 Jerry.Hensley@cdph.ca.gov http://www.cdph.ca.gov	DOE will obtain the report and it will be reviewed prior to the revision of the *Draft Gap Analysis Report*.
IN-059: Christine Rowe, E-mail dated: 6/22/2008		
1	1. I know that you are aware of previous emails about the significance of the SSFL site to the Chumash. I want you to know this is not about just AREA IV - I am deeply involved in protecting numerous sites of cultural significance to the Chumash, Tataviam, and other cultural groups. I am going to attach correspondence that I have received recently about neighboring sites from the Native American Heritage Commission (NAHC). One attachment is on the CENTEX property in Dayton Canyon from the NAHC. The next is a letter to Eric Maher in the cultural resources area of DTSC from the NAHC. I have been referred to Mr. Maher by Susan Callery of DTSC. As Dave Singleton states, just because something is not in their file, it does not mean there is not something of significance to the Chumash people.	1. DOE will follow the applicable laws concerning cultural resources, and is in the early stages of consultation with OHP and NAHC. DOE is currently reviewing previous cultural studies and archival background information as part of the EIS process, which includes all previous archaeological work performed in the region of the SSFL Area IV project area.
2	I have recently read in a DTSC document that the site was first set aside in 1948. I believe that I may have seen references to earlier dates - let's go with this one for now. The point is that AREA IV has been off limits to the public for 60 years. There are no digs going on up there - access is limited. So while the whole area is extremely significant to the Chumash people, they are not free to roam the SSFL site and look into the caves to discover their heritage. My thought is that a complete archeological survey of AREA IV is necessary as a part of the EIS. But it is up to the archeologists and the Chumash to know what the laws are relative to this issue.	All previous archaeological work performed in the region of the SSFL Area IV project area will be reviewed as part of the EIS process; in addition, the Council on Environmental Quality regulations require consultation with the appropriate Indian tribes by providing them with opportunities to participate at various stages in the preparation of the *SSFL Area IV EIS*. The government-to-government communications with the appropriate tribal authorities will be established by DOE so that the cultural and religious significance of relevant historic properties may be identified as per Section 101(d)(6)(B) of the National Historic Preservation Act, as amended.

	Comment	*Response*
3	I have not had a chance to look at all of the maps, but so far I have not noticed where AREA IV is relative to the Blue Line Stream from Happy Valley to Dayton Canyon. The ARMY CORPS OF ENGINEERS should be looking at their maps to see if AREA IV is under their purview.	Drainages associated with Area IV were noted in site maps using a "blue line". This "blue line" has no relationship with the Army Corps of Engineers definition or regulation of waters of the state.
IN-062: Christine Rowe, E-mail dated: 8/7/2008		
1	There are so many misconceptions about what is going on the Santa Susana Field Laboratory. In Wendy's report, I saw a reference to recommendations for documents to be given to community members to post on their web sites. While that may work for those community members, and they may think it is an effective method of communication, some of those web sites are not kept up to date. Community members who have sites post what they want to post in their own time. A more effective method of communication is an email blast like the one sent out by Secretary Adams last January. Then those people who do not rely on other web sites will get the communications in a timely manner. I personally only know one member of the community who does not use email. And therefore, he would not get his notices through web sites either.	DOE will continue to use available communication methods and means to inform people of SSFL Area IV events, activities, reports, and opportunities for involvement in decisions related to the cleanup. DOE has begun to use email notifications when documents are posted on the website and as significant project milestones are reached.
2	Another recommendation was a technical body that would keep track of the cleanup at the SSFL. Again, it always seems to be a few individuals who are invited to the table, who attend background meetings, get site tours of AREA IV, and generally get updated in a more technical manner and a more frequent manner than other members of the community.	One goal of DOE's Area IV stakeholder involvement program is to be inclusive. DOE is committed to making sure that all interested members of the community are invited and feel welcome at all of the department's events.
3	There is another misconception that I believe needs to be cleared up. Once SB 990 went into effect, the Letter of Intent between Boeing and the Governor to transfer the land to the state as parkland was broken. The community is of the belief - because of statements made by Jarrod Degonia of Cameron Smyth's office, that all of the SSFL property will become parkland. I believe after speaking with Merrilee Fellows of NASA and Stephanie Jennings of the DOE, and others, that this is not in fact the case. The clean up standards of the site - for Boeing, for the DOE, and for NASA, may not all be the same. It may boil down to what the use will be in the end. And members of the community still do not understand this fact - that even if the site is listed as a federal Superfund NPL site, that the EPA may only clean up the site based on future use - that the federal government may not have to conform to SB 990 clean up standards.	DOE thanks the commentor. Due to the number of similar comments received regarding this concern, the commentor is referred to DOE's response in Section 3 of this document.
IN-063: Dorothy Boberg, Scoping Meeting transcript comment dated: 7/23/2008		
1	Why was an EIR not done in 1959 when the meltdown of the sodium cooled reactor when massive release of radiation occurred? I imagine one of the reasons is that the NEPA was signed in 1970, so that was before that law was passed. However, I was involved in doing the research for a report that was completed in 1975 called, "Nuclear Facilities and Radiation Monitoring in California." I was hired by Another Mother for Peace to do the research on this issue and when I went to Sacramento, I found out about this massive release of radiation. And so I think the federal government was very derelict in not doing something at that point to at least notify the public and start remediation at that time.	The commentor's concern is noted. At this time, DOE is committed to implementing a cleanup for Area IV that addresses remaining contamination, consistent with currently applicable laws, following completion of the proper environmental documentation.

	Comment	Response
2	Here we are at this meeting, and I have not seen a summary which I had hoped to pick up here, of the amount and location of the radionuclides and toxic chemicals on and off site. Now, I know that there were things done by different people, maybe not by your agency, that does explain some of this, and I would have hoped that you would have presented here at least a summary of what it is that we're talking about today.	DOE asked its contractor to prepare the *Draft Gap Analysis Report* to evaluate existing data and make recommendations for additional data needed to prepare environmental documentation to support decisionmaking for cleanup. Since that report was completed, EPA has agreed to conduct a survey of radionuclides within Area IV. In addition, DTSC is conducting a chemical survey. Based on those efforts, as well as DOE's data collection efforts, DOE will have a more comprehensive understanding of the nature and extent of contamination associated with Area IV. DOE intends to share that understanding with the public at that time.
3	Another question: Why are we expected to comment before probably any of us know just what is on-site?	Scoping meetings are designed to solicit input from the public on alternatives that might be evaluated, as well as community concerns that should be addressed in the evaluation of the alternatives. There will be additional opportunities to provide comments to DOE as the process continues.
4	And why were 200-plus buildings removed before any environmental impact statement was done? At least one of these mobile buildings was moved to a school site without any radiation check.	Many facilities were demolished immediately following the completion of their intended mission under DOE authority in accordance with DOE orders and policies. It should be pointed out that these actions were taken prior to DOE's decision to evaluate building removals using either an EA or EIS. The debris from these facilities was packaged on site and disposed at offsite locations in accordance with the laws and regulations that were in effect at the time. (Disposition decisions were made based upon relevant characteristics (i.e., generally uncontaminated debris, hazardous, radioactive, or mixed waste)).
5	And where is the repository for radioactive waste that may be sent off site, is it Rainy, Nevada or has that been closed? Is it someplace in South Carolina? Is it an Indian reservation? Where is the site where this radiation might be moved?	To date, all radioactive waste that has been shipped from SSFL has gone to the DOE disposal facility at the Nevada Test Site in accordance with the established waste acceptance criteria for that facility. No shipments of radioactive waste are being made at this time. Future shipments will be made to designated disposal facilities in accordance with applicable laws. Disposal options will be analyzed in the EIS and that analysis will be documented in the Draft EIS for full public review.
6	Where is the information on the cancer deaths and illnesses of workers and local residents. Some of the local residents seem to know a lot about this.	A summary of impacts of SSFL Area IV operations was not provided at the scoping meetings because DOE is in the initial stages of preparing the *SSFL Area IV EIS* and those impacts have not yet been determined. One of the purposes of EIS scoping meetings is to get input on the alternatives and issues of importance to members of public. A number of commentors indicated that health impacts on workers and local residents constitute an issue of importance to the local community. Impacts on workers and local residents under each alternative will be included in the EIS. Historical impacts on the health of workers and local residents will be analyzed to the extent needed to evaluate between alternatives and will be evaluated as part of the

	Comment	Response
		cumulative impacts analysis.
7	I am really concerned that there's no detailed analysis that you have before you expect the public to comment.	The *SSFL Area IV EIS* is in the early stages of development and the public is not expected to comment on any analyses at this point. The intent of the scoping meetings was to provide the public with an opportunity to provide input on the alternatives or issues that should be considered in the development of the EIS. The detailed analysis of alternatives will be included in the EIS and the public will be invited to comment when the draft *SSFL Area IV EIS* is issued.
IN-064: Rob Ianotorno, Scoping Meeting transcript comment dated: 7/23/2008		
1	I wanted to let people know I worked in the aerospace industry, in aero in general, JPL out in Corona and Sunnymead. There wasn't just the Rocketdyne up here. I don't know if any of you know where Box Canyon is, but there was another test lab out there. We worked on regular rockets like Alladin and Thor and all that but, I think -- I'm guessing -- because I never worked at Rocketdyne -- but that wasn't a nuclear power plant like Enrico Fermi made in Chicago or the one in New Mexico. I think they're working on that Genie rocket and the Alladin rocket and the Kiwi rocket, which they were going to add thorium, and they were going to add some beryllium, and it was the iron plasma rocket -- it's a nuclear rocket. I think that's what this program was. Now, maybe I'm letting the cat out of the bag, but Rocketdyne was out of Downey on Imperial Highway. They weren't located out here. And I did some wiring over there for Westinghouse, so I think this is low-level radar pollution, but it is radioactive, I don't think it's high and I think Boeing bought out this plant -- I think, but I'm not sure, Boeing bought out a lot of things, Douglas and all that. So they're not at fault. It's the old companies, and there was companies like Thorohiazcol and Garrett AirResearch and other companies -- like Thorahiapol that aren't around anymore, and there's a bunch more of them. Lockheed's still around, I think Raytheon and Boeing.	DOE thanks the commentor for taking the time to comment.
2	So I'm just saying, I think there is a way they could solve the problem is if they made some kind of solar power projected out there and other fuel and get water to flush out. That's about the only way they could do it really, flush out that low-level radiation. That's one of the ways.	DOE thanks the commentor for the suggestion. Solar power is often used to power monitoring equipment during and/or following a remediation effort and is likely to be included in the Area IV remediation effort. With respect to the actual remediation effort, only scientifically proven remedies may be used.
3	Now, I could be wrong though. I mean, I don't know everything about that plant. I'm just guessing because they were a rocket company, they wouldn't do what Enrico Fermi did, in Chicago if they knew the nuclear power plant could make electricity. That was done in Chicago, why would they do it here? This was a low-level to ionized to plasma-ize the rocket and they could use magnetic fields to eject it out. It was an experimental rocket that just didn't go right. 3. So that's just my opinion, so I'm not really sure because I only worked for, like I said, JPL Aerojet General, but I was familiar with plasma ion rockets so I'm just making the guess on that. So if anyone wants to talk to me about that later, you know, I'll tell them what I know from Aerojet General.	DOE thanks the commentor.

	Comment	*Response*
IN-065: Charles Gonsowski, Scoping Meeting transcript comment dated: 7/23/2008		
1	You show me -- you show me all this good motherhood stuff here of what you're going to do, but I don't see any timelines on here. You guys are not committing yourself to any timeline. It's -- you're dragging this out on and on. And I'll probably be long gone off this world before you people come up with a solution. So I would really like to see something definitive as far as the timeline.	DOE understands the commentor's frustration with the length of the decisionmaking process. Since DOE started the process to develop the *SSFL Area IV EIS* to evaluate cleanup alternatives, it has recently been decided that EPA will first conduct a radiological survey of Area IV. While this investigation will provide additional accurate information on which to base future decisions, it will slow down the process. DOE is currently revising the schedule for conducting the work based on how long EPA expects it will take to do its work.
2	And also some clarification between the two types of contamination. You have radioactive contamination, and then you have solid contamination, chemical contamination. And I think people are getting confused on those two things. You know, what are you talking about, are you talking strictly one, both? You fix the things that you're trying to do, is it addressing both of them, is it addressing one of them?	Chemical and radiological contamination is present in soil and groundwater in Area IV at SSFL. Data from EPA's radiological survey will be combined with information resulting from ongoing chemical investigations being performed by DTSC to define the nature and extent of contamination that must be addressed by DOE's cleanup.
IN-066: Carol Lutness, Scoping Meeting transcript comment dated: 7/23/2008		
1	Santa Susanna represents the type of plundering that has been done by runaway corporate power, that has been -- that the government has been hijacked, and it is time to turn this around. It is time to look to the future, to our children's and grandchildren's future, what kind of life do we want to leave to them, to a world where they can't go because of the radiation. They can't drink the water because of the perchlorate. They can't be -- feel -- ever feel safe because we allowed this and then we said we did not have enough money to clean it up. Those corporations that made billions off of this project need to be held accountable. You need to insist that that accountability is respected. Nothing but the highest standard of clean up needs to be done. There can be no superficial clean up of the soil and then forget about what's under the soil and all the poisoned wells that can seep over into new developments, such as the KB development that is proposed. There can be no ignorance of the cancers, the increased cancer rates and the increased thyroid problems that happen around these kinds of areas. I live in Valencia close to the Whittier Burn site. I have no cancer in my family and yet three years ago I developed breast cancer. One of my good friends has a friend who's an oncologist in Santa Clarita. He lives in Pacific Palisades. She asked him, why do you drive all the way from Pacific Palisades to Santa Clarita? He said, that's where the cancer is. And that's where the cancer is and will be unless we spend the money and enforce the law.	DOE acknowledges this comment.
2	We must make sure that the fox no longer guards the hen house. We must restore the needs of the people over the wants of corporate power. I am absolutely in favor that Santa Susanna be cleaned up to the strictest EPA standards, cleaned up to SB 990 standards, and clean up all areas, not just Section IV, all areas, and make no cozy deals with potential love canal developers around the surrounding area.	DOE thanks the commentor. Due to the number of similar comments received regarding this concern, the commentor is referred to DOE's response in Section 3 of this document.

	Comment	Response
3	We know in Valencia that those wells seep and they grow and they -- and they -- they develop plumes that go into other areas. We know how dangerous it is when developers control the politics. And I'm very concerned that you, as the watch guard, must protect the people's interest and my granddaughter's interest and your granddaughter's interest and your grandson's interest and the future. We have -- we are entering an era of restorative economy. We must restore the damage that has been done by runaway corporate power. We must put all of our energy into cleaning up and to creating green environmentally correct standards and developing industries that are going to restore this country to a place of safety and -- and prosperity.	DOE thanks the commentor.
4	Also, I would like you to consider not to use your two contractors. I think they're pretty cozy	DOE selected the team of contractors for this work based on a competitive bid process that evaluated possible contractors according to their professional credentials and demonstrated capability to do the necessary work. DOE will continue to monitor the contractors' work to assure that their performance complies with the highest professional standards.
5	I would suggest that Greg Dempsey of the EPA -- that you use Greg Dempsey to supervise your clean up.	DOE thanks the commentor. Due to the number of similar comments received regarding this issue, the commentor is referred to DOE's response in the introduction to this document.
	IN-067: Dorri Raskin, Scoping Meeting transcript comment dated: 7/23/2008	
1	I feel it's really important that DOE needs to be transparent, and in order for the community to trust you -- because I don't trust you, and I know a lot of the community members don't trust you. It's been a long time since '89, because you guys used to wash off the vegetables or filtered and threw away the filtered part that had the radiation.	DOE agrees that it needs to proceed transparently. DOE is committed to conducting all work related to site investigations, risk assessment, and environmental document preparation in a manner that allows public scrutiny and participation. The department would also like to assure the commentor that sampling protocols currently being used at SSFL are much different from those used in the 1980s. All sampling today is in full compliance with DTSC and EPA sampling and laboratory analysis protocols.
2	And then recently, you -- you took a section from a table and you fabricated the numbers, so my trust for the DOE is lacking. So I feel that we need EPA to be in charge with the supervising the clean up and have Greg Dempsey, which we've been asking for for a long, long time, to be in charge.	DOE regrets that so much confusion resulted from the use of the PRG tables that were included in the *Draft Gap Analysis Report*. The data for that table were taken from EPA's Region IV website, which refers to a land use scenario in which residents consume fruits and vegetables grown on their properties. EPA has assumed the leadership role in conducting a radiological survey of Area IV.
3	And also that all of the areas, not just Area IV, but the whole area, is contaminated with the chemicals and radiation -- and off the site where my friends live.	DOE thanks the commentor. Due to the number of similar comments received regarding this concern, the commentor is referred to DOE's response in Section 3 of this document.
4	And that needs to be cleaned up completely to strict EPA standards, and you need to follow the law and clean up to Sheila's Kuehl's Bill, SB 990, where it's -- according to the rural, residential clean up standards. Because there are farm animals, cows were walking around different sections of the Santa Susanna Field Lab, and we need to protect our health, and no offence to the DOE, but I'd prefer the EPA to be in charge. And you need to clean up to strict standards to Sheila's Bill 990.	DOE thanks the commentor. Due to the number of similar comments received regarding this concern, the commentor is referred to DOE's response in Section 3 of this document.

	Comment	*Response*
5	And what I want to say, too, and I forgot to mention it earlier, that I want EPA to do all of the survey, plus being in charge of cleaning up.	DOE thanks the commentor. Due to the number of similar comments received regarding this concern, the commentor is referred to DOE's response in Section 3 of this document.
6	And that as Chris talked about the groundwater, it's really important, and there's too many contaminants and with the tritium and with the different radiation, and that's it.	DOE agrees with the commentor. Investigation and cleanup of groundwater within Area IV will be a component of the *SSFL Area IV EIS* evaluation.
IN-070: Jennifer Schneider, Scoping Meeting transcript comment dated: 7/23/2008		
1	And my comment is that I feel like -- I think residents of my street need to be more informed of this process because at a couple of these I haven't seen any of my neighbors. But I think they're just not informed of what's going on. So I would like to request residents of that street receive mailings and receive more information of what's going on with this.	DOE thanks the commentor. Due to the number of similar comments received regarding this concern, the commentor is referred to DOE's response in Section 3 of this document.
IN-071: Sharon Levine, Scoping Meeting transcript comment dated: 7/23/2008		
1	This is a very serious issue. I'm a member of a number of environmental organizations Sierra National Resource defense counsel of the -- I just -- I was a legal proof reader for Citibank so I just read this really fast and I urge everybody to read this. It's really important, the whole thing, and I read the stuff that we got in the mail, and forgive me for being a pessimist, but as bad as you think it is, it's worse. It even says in here that the DOE has been criticized for not -- my own words -- not doing a better job. And that's why they're having this now. It's not because they just decided hey we're just going to do it better and better and better and better. They were told to do it better because what they were doing was not good enough. And all these things were run by Boeing, but forgive me, but if you're listening to the news at all, whether it's children's toys or the food and the drugs and everything, just because we're brought up under this -- God is watching over us. Got it at the market, it must be safe. We're finding everything, from local pesticides to everything that's causing cancer. They're expecting an epidemic of cancer. It's already happening and it's going to get more and more. Every -- I know a lot of people that have cancer at young ages. You probably know a lot of peoples -- all kinds of immune system breakdowns are happening. The rocket fuel and all this stuff is an immune disrupter and thyroid disruptor. One out of five people in the United States have a thyroid problem. I'm one of them. It affects your brain. It affects your whole -- your whole life. Okay. And it comes on suddenly, slowly, and intermittently, and it doesn't with an apex. We don't know where it comes from. So you have to connect the dots yourself and read other stuff from the environmental groups. Be aware, take off the veil of illusions that we all have because we want to believe that everybody is out for the good. And what I found -- for example when I wrote a letter to -- what was it, Union Carbide that had the spill over in India, they made their mess, ran out and left the people holding the bag and they're poor over there, and they're still suffering from it however many years later. And they encourage us to write a letter, and I wrote the letter and I got a really nice letter from some nice person who Union Carbide probably recently hired. But like they need to do, hire really nice people who really care and think they're going to help to deal with the public, good PR people, and it seems to work. The people, you know, led to a false sense of security, and they move on to the next issue, and it's kind of forgotten about it. But all the things that we'll be sweeping under the rug are going to come back and haunt us later. I'm a teacher in Los Angeles School District, I'm on the House of Representatives, United Teachers Los Angeles. I used to live in the East Valley, at the site where Francis Polytechnic High School on Roscoe Boulevard around Peoria. There's a big empty spot there and the reason it's still	DOE acknowledges the commentor's concerns about the health impacts of environmental pollutants.

	Comment	*Response*
	empty is there had been a toxic waste dump there, and they wanted to develop it, whatever. People were teaching at the school, the librarian had some kind of a central nervous system -- I don't know what happened to her or what. They investigated it, they couldn't find anything they could put their finger on. I recently met the retired principal or assistant principal from that school. There are all kinds of problems going on there. They just assumed there was nothing there because they couldn't put their finger on it. There's stuff going on. All these people don't get sick in one place for no reason, and that's just one simple toxic waste dump. And there's still stuff around there. When I went to those meetings I didn't drink their tea or their coffee because I knew what was in -- now I'm -- those meetings. I'm -- running into people. I ran into a teacher who lived -- I think it was in Simi or somewhere closer to the site than where I live in Canoga Park, and she got cancer.	
2	And I don't know what was discussed or what you guys decided, but to me, when I read at home that Alternative 4 is the only possibility, get it really taken care of. Just containing it, okay, man- -- matter cannot be -- or energy cannot created or destroyed. It just changes and goes somewhere else. You push it under the rug over here it will come out over there. It will be in your groundwater, the soil, the air, things you touch. So I'm really worried about this, and you talk about property values, my homeowners in their annual -- always talking about property values, up their houses -- forget it. Once you start with cancer clusters, no one's going to want to buy your house. So I just think Alternative 4 is the best thing. Forgive me, I don't know what you all said and I don't like to talk without knowing what was said, but I didn't have a choice tonight.	DOE thanks the commentor. Due to the number of similar comments received regarding this concern, the commentor is referred to DOE's response in Section 3 of this document.
3	So thank you for listening and I just encouraging to keep on top of this. Don't take anything for granted. The people up here are all well-meaning but the people in charge making the decisions and the private companies, sorry, they're all out for the bottom line, for themselves, and to get -- the way I can say it is to get as much as they can and get to their profit making.	DOE acknowledges this comment.
	IN-072: David Watkins, Scoping Meeting transcript comment dated: 7/22/2008	
1	You heard about people, okay, this person used to work there and his dad died of cancer and this kind of thing. I mean, you hear about that living here and you read about it in the papers, and you know, it's in the front page, and it's front page Sunday, too. And it's surprising how many people aren't aware of it, you know. So I don't know if there could be some more, you know, public awareness. Also, Simi's a wonderful community, too. There's great parks and things like that and the land value is valuable, and we want to respect all that.	DOE thanks the commentor. Due to the number of similar comments received regarding this concern, the commentor is referred to DOE's response in Section 3 of this document.
2	And it seems to me the perchlorates are a big issue according to the old timers. Because, you know, before the rocket tests they did build catching systems for the fluid that was not burned. But in the old days there was no catching systems, plus a lot, you know, you tests how to find the most volatile fluid possible and the ones that didn't cut the grade were just dumped, and things like that.	DOE understands that many people are concerned about perchlorate contamination. However, there was no testing of rocket engines within Area IV of SSFL, the area where DOE's activities occurred. While DOE understands that many people are anxious to see cleanup implemented for all of SSFL, the agency only has the authority to make decisions related to the portion of the site that DOE is responsible for.

	Comment	Response
IN-073: Dave Einhorn, Scoping Meeting transcript comment dated: 7/22/2008		
1	I live in West Hills. I live one and a half miles from the Boeing Santa Susana field lab. I believe that my area is directly affected by both storm water runoff from the Boeing Santa Susana field lab and in addition TCE migrated from the site down to my area. That's one of the reasons why the Chatsworth reservoir was closed.	DOE understands that many people are concerned about TCE contamination. However, the TCE contamination that the commentor references did not originate within Area IV of SSFL. While DOE understands that many people are anxious to see cleanup implemented for all of SSFL, the agency only has the authority to make decisions related to the portion of the site that DOE is responsible for.
2	As far as the use that's shown on the blue paper, I say none -- and the reason I'm saying it, is we have a witch's brew in that area. I don't see any use, even a park, for that property without endangering somebody's health.	DOE acknowledges the commentor's preference and will include the suggestion to clean up with no future use (except monitoring and security) of SSFL Area IV as an option within the alternatives.
3	I would like to know what the effect would be if the State, within the next several months, approves the EPA's Superfund decision. And I want to -- basically, what will that do to your environmental impact statement? MR. JOHNSON: You actually had two questions, you asked one a little bit earlier that asked about what happens -- what happens if the State approves the NPL listing for the site -- was the first question. And that will bring about some changes, but we would still have to do the environmental impact statement on whether the site is on the NPL list or not.	DOE thanks the commentor. Due to the number of similar comments received regarding this concern, the commentor is referred to DOE's response in Section 3 of this document.
4	The plan for -- that's being devised by Boeing company's consultants, scientists for storm water retention on the site calls for a design for a one-year storm. I believe that's inadequate and it should be for a 100-year storm, considering what that storm water is bringing down to other areas.	The NPDES program is under the regulatory oversight of the LARWQCB. Comments regarding the NPDES program should be directed to LARWQCB staff and discussed during scheduled public meetings regarding the SSFL NPDES program.
5	There has been a health risk assessment done by UCLA and the University of Michigan. They concluded that within one-half miles to two miles of the Boeing Santa Susana Field Lab, there's a higher risk of cancer, and I believe that needs to be addressed.	Historical health impacts will be evaluated as part of the cumulative impacts analysis. NEPA requires that cumulative impacts of past, present, and reasonably foreseeable actions are analyzed. The Council on Environmental Quality's 2005 Memorandum "Guidance on the Consideration of Past Actions in Cumulative Effects Analysis" states: "The environmental analysis required under NEPA is forward-looking, in that it focuses on the potential impacts of the proposed action that an agency is considering. Thus, review of past actions is required to the extent that this review informs agency decisionmaking regarding the proposed action." It also states: "In determining what information is necessary for a cumulative effects analysis, agencies should use scoping to focus on the extent to which information is "relevant to reasonably foreseeable significant adverse impacts," is "essential to a reasoned choice among alternatives," and can be obtained without exorbitant cost." This document can be found at: http://www.gc.energy.gov/NEPA/documents/ceq_cumulativeguidance_6_24_05.pdf. That said, the *SSFL Area IV EIS* analysis will look at available documentation on health impacts in the region surrounding SSFL. DOE is also planning a workshop with members of the public to help refine the history of the site that will aid in determining impacts of previous operations.

	Comment	Response
6	The shipping off site as one of the alternatives, I think that is a real concern. We have a cluster of families with young children that have come down with eye cancer. Eye cancer is extremely rare, and to have a cluster like that, you'd have to consider if the shipping of the radioactive materials had an effect on that.	DOE acknowledges the commentor's concern. The health impacts of each remedial alternative will be evaluated in the *SSFL Area IV EIS*. Some alternatives will ship more material off site than others. The health effects of shipping waste materials from the site will be evaluated as part of the EIS.
7	The other thing I'd like to see addressed -- I don't know if this is the -- is the fact that the Calabasas Landfill, and one other landfill, received large amounts of radioactive material which was supposed to be low level; however, there is no low -- there is -- any amount of radiological materials is dangerous. So here we have two landfills. The other one is the Bradley Landfill in Sun Valley, which is very close to a public high school and to a residential neighborhood.	DOE acknowledges the commentor's concern. However, DOE's policy is to ship radioactive materials only to disposal facilities that are licensed to receive radioactive materials.
8	But what we have been looking at is to clean up at something more stringent than simply meeting the open space or parkland requirements. And those various alternatives will be considered within the EIS.	DOE acknowledges the commentor's preference for alternatives consideration within the *SSFL Area IV EIS*.
IN-074: Don Roache, Scoping Meeting transcript comment dated: 7/22/2008		
1	Don Roache asked a question regarding contacting former employees. Here is the dialogue between Don and Stephie; Along the lines of cost effectiveness, what we've got here is a blind man trying to describe an elephant. You guys are drilling holes here, drilling holes there. No efforts have been made, as far as I know, to contact former employees and find out where certain problem issues might exist. Wouldn't that be a practical way to proceed? MS. JENNINGS: Mr. Roache, if I may attempt to answer that question? Wendy was our moderator this evening, has conducted community interviews at our request. She's interviewed now approximately 58 people and many interviews. She's asking questions that relate to how should DOE conduct public involvement activities and what sort of information or concerns do individuals have. And to be very frank and very honest, she's had trouble contacting former workers. If you would desire to be interviewed by Wendy as part of that process, please see her afterwards. And that invitation goes to any former worker who may be in the -- in the audience. It's very important that we protect the integrity and the confidentiality of those interviews, so that's why I'm not saying volunteer at this time moment. And she -- I have no idea unless, folks themselves have identified themselves to me personally Wendy interviewed me, so I have no idea who she's interviewed. And we feel it's very important to protect the integrity of the individual interviewed and the confidentiality of such. However, after the meeting if you'd like to be interviewed or know other folks, contact Wendy and she'll take care of it. Does that describe -- MR. ROACHE: I don't think that's a very effective way to find these people. These people are old, and they're not going to be around much longer -- from the hay day I'm talking about, from the Apollo days when the place was really jumping. I worked there the last -- close to 30 years, was on the wane during that time period. Plus it was a much greener place than it was in the past. I think that the -- some of the people that are in their 60s and 70s would be the appropriate folks to talk to.	DOE agrees that former site workers may have invaluable insight into historical operations. The department will attempt to contact workers as it moves ahead with the *SSFL Area IV EIS*.
IN-075: Dorri Raskin, Scoping Meeting transcript comment dated: 7/22/2008		
1	I feel that the whole area needs to be completely cleaned up to real strict EPA standards, and it should be cleaned up to a Sheila Kuehl's bill, SB 990.	DOE thanks the commentor. Due to the number of similar comments received regarding this concern, the commentor is referred to DOE's response in Section 3 of this document.

	Comment	Response
2	I feel EPA needs to be in charge of everything, and we need Greg Dempsey to supervise	DOE understands that Mr. Dempsey is held in high regard by the community. On July 24, 2008 DOE and EPA signed an Interagency Agreement that provided for EPA to conduct a radiological background study. In addition, EPA has recently received Congressional funding to conduct a radiological survey. Mr. Dempsey is part of EPA's team for conducting this work.
3	I feel the two contractors that DOE hired should be fired.	The department selected the team of contractors for this work based on a competitive bid process that evaluated possible contractors according to their professional credentials and demonstrated capability to do the work necessary. DOE will monitor performance and take actions as needed to assure that their performance complies with the highest professional standards.
	IN-076: Chris Rowe, Scoping Meeting transcript comment dated: 7/22/2008	
1	One of the people who's not filming today, Brigham May or whoever has got a number of videos up on Youtube the he flew over the site in a helicopter, and when I saw a picture of some of the holding ponds that were being aerated, I was like -- stop on that frame. So I'm concerned about the fact that things are being aerolized out of these holding ponds. I'm not sure where that pond was, but don't know if there's TCE in there or what POC's are there, so it's a big problem.	It is not clear where the holding ponds referenced in the comment are located. There are no aerated holding ponds within Area IV.
2	Dayton Canyon, that's kind of been my focus lately, because I'm really worried that DTSC is going to release it and no further action and I have a couple concerns about it. Dave Kerry and a couple other people have been -- keep going into Dayton Canyon. They keep finding the white chemical that is coming up from the ground that they don't know what it is. They think it's the Perchlorate, and he's telling me that it looks like snow, just like Runkle does. It's gotten worse. I've seen some of the lines in the creek bed and I don't know why as the creek beds dry out, this stuff seems to show up, just like Michael Collins -- Runkle Canyon, we have the same problem in Dayton.	DOE understands that many people are anxious to see cleanup implemented for all of SSFL, as well as Dayton Canyon and Runkle Canyon. DOE only has the authority to make decisions related to the portion of the site that the department is responsible for, however. The commentor may wish to share her concerns with DTSC.
3	And I have mentioned to your geologists at the last meeting I'm concerned about the use of dynamite in the canyons. And I'm assured by people that, oh, these explosives are only supposed to take the top level of the soil off, but the reality is to put Roscoe Boulevard in, they have to take out a considerable amount of block and they talk about using equipment to take out blocking, heavy ripping equipment. And that goes back with my cultural issue with Karen over there, how does dynamiting and earth-moving equipment go along with Native American monitoring?	Construction activities in canyons adjacent to Area IV are beyond the scope of the *SSFL Area IV EIS*. The commentor may want to raise these issues with the local agencies that oversee construction activities.
4	And as we talked earlier about the lawsuits, damages, there was the Capella lawsuit and the Brandeis lawsuit, which is what gave the land to Boeing and things like that. So you do need to look at those previous lawsuits.	DOE thanks the commentor for the information.

	Comment	*Response*
5	They need to have the site created -- DMP's created for outfalls eight and nine. So there were some of them over it in those areas -- ^ Some of it is down in Happy Valley. So they have to take out parking lot because of permits, developing problems, and things like that. So Boeing is doing work that they're obligated to do, and so then they're sampling that they're doing, and work for the Sylmar Plant, that group over here, we've got DTSC doing our enviro-work and you guys doing other work and now we're talking about the EPA doing other work and it seems like we're not coordinated. So I want to agree, I think it was Sue that said, you know, I support Superfund clean up because we need to have one coordinating agency that's doing this all at one time. And I share their frustration and their opinion in the room but, that frustration, I'm sure, is not just the community members, I'm sure it's the agency people, as well.	DOE thanks the commentor. Due to the number of similar comments received regarding this concern, the commentor is referred to DOE's response in the introduction to this document.
IN-077: Bonnie Klea, Scoping Meeting transcript comment dated: 7/22/2008		
1	I've been receiving lots of old documents from deceased workers' families, widows. I've interviewed over the weekend a 90-year-old nuclear worker who made fuel rods and worked in the SRE. And some of these old documents, they mention a big fire in 1970 – September 1970, burned the whole site, and of course they used water that was on the site to put out the fires as all the fires, they used water on site to water Bell Canyon and the other canyons that were burning. Also, in some of these old books, it says that this is -- this is a public safety program for atomic energy published by the AEC. In the very early years they said they looks for fractures rocks and they dumped -- if they had a problem with gophers, they dumped, killed the gophers. So there are a lot of things that were done, probably in ignorance, not intentionally to hurt people. And also, you know, I think Dan made a really good point that they piped that water -- they have pictures to holding tanks off site, probably in Area III, and I think that needs to be looked at if they use that water for the engine tests, then it rose in steam and it fell. So that's -- to me that's responsibility of DOE to be testing off site. Okay, they used contaminated water and they put out fires in residential communities, then that, to me, extends your commitment to clean up.	DOE appreciates the information provided by the commentor and will review all information provided by all sources. This information will be used to ensure that the *SSFL Area IV EIS* is based on all available information. DOE is committed to investigating and cleaning up wastes related to its activities within Area IV and is working closely with EPA and DTSC to see that this goal is accomplished.
2	Also the hill is 1,000 feet above the valley floor, so you can't really leave anything in place, it's going to wash down. And if anything was buried up there, it may be safe on the surface, but the rain would permeate, and it would wash down.	DOE acknowledges the commentor's concern about leaving waste in place and jeopardizing surface water and groundwater. Although DOE must evaluate a range of alternatives in the *SSFL Area IV EIS*, the agency will only select a remedy that will be protective of the surrounding community and groundwater.

	Comment	*Response*
3	Dan Parks mentioned the log books. Now that we have the NIOSH program with SEC petitions, the burden of proof is on the workers to prove that they've been exposed, so there's been a great demand to resurrect those old log books. Now, maybe Laura Hughes here from NIOSH can tell us which site the NIOSH have found to be contaminated and they have been buried. Also, the Oakridge facility for records storage is called OSTI, O-S-T-I, and that building just became eligible for payment of the workers because they're getting cancer, and they've found the records are contaminated. So our data that will be available may be limited just because of contamination. Also I mentioned that I've been interviewing former workers, and I have testimony of at least 150 field workers who were given a job for life -- for lifetime secrecy on the accidents that happened, and I have two witnesses that are still alive, and we recorded their testimony over the weekend. Also in this old atomic energy book they talk about three types of accidents; type A, which requires immediate notification to AEC headquarters, and we have those types of accidents. And type B which requires reporting within 72 hours, and type C accidents require reporting quarterly or annually. So I'm sure you will be looking for those accident reports to know where it happened.	DOE recognizes the importance of prior worker information to understanding operations at SSFL. DOE plans to perform interviews of former workers to help understand those prior operations.
4	Also, we had no news in Los Angeles. I read the Daily News and I read the L.A. Times and there wasn't one single mention of this meeting tonight. So I'm sorry. We didn't have anything in the paper, and if you're not on the mailing list, then you don't know.	DOE thanks the commentor. Due to the number of similar comments received regarding this concern, the commentor is referred to DOE's response in the Section 3 of this document.
	IN-078: Dan Parks, Scoping Meeting transcript comment dated: 7/22/2008	
1	I'm Dan Parks and I'm a former employee up at the nuclear site. It was called Atomics International when I worked there, and just in short, there's not enough time to explain or draw you pictures of all the activity that went on up at the site, most of it was pretty sloppy, and there was numerous fires, spills, contamination incidents, and I could go on for hours and never finish the story, but to restrict it only to the nuclear site, also, is ridiculous, because the rocket site, Rocketdyne had incidents night after night of spills and accidents and it should all be in the records.	DOE thanks the commentor. Due to the number of similar comments received regarding this concern, the commentor is referred to DOE's response in Section 3 of this document.
2	And then we have the infamous log books that have somehow or another vanished over a period of years. And if you really want to get to the bottom of things I say go to the log books and let the log books tell the stories. Because the log books list the names of the employees that were on scene at the time and many of them are probably victims of cancer because of what happened there. And again I'd like to highlight the log books. The log books will tell the true story. Most of the people probably whose names are in the log books have passed on but there's quite a few that are out there. I happen to know that I have probably about eight or ten friends who are still alive and we all share stories of what occurred there. And again, I hope that you express some interest to do so.	DOE plans to review available documentation that contains information regarding the operational history at the site. This will help guide the efforts to define the nature and extent of contamination. In addition, DOE looks forward to the opportunity to talk with former workers.
3	You shouldn't restrict it just to the nuclear site. It should be the whole hill because it was quite a large operation in its hay day, I would say.	DOE thanks the commentor. Due to the number of similar comments received regarding this concern, the commentor is referred to DOE's response in Section 3 of this document.
4	It should be deemed a Superfund site, in my opinion.	DOE thanks the commentor. Due to the number of similar comments received regarding this concern, the commentor is referred to DOE's response in Section 3 of this document.

	Comment	Response
5	It would be a complete fraud if you didn't investigate more. It would be irresponsible, also. I would just to say that in order to find out everything that went on up on the hill you've got to conduct an accurate investigation, just as you do in a police report. You've got to go in and you've got to interview witnesses, you've got to find out where the various incidents occurred, and go to the employees that work there, go to the people that were on the site and get their stories. Maybe there would be some way to take them up there, if not in the bus or whatever, and have them point out where this particular incident happened, this happened, the fire at the SRE, so on and so on, and do it like you do a police investigation, and then you -- then you pursue the investigation from there based on their statements. Because these were the people that were -- that can tell the true stories, and I'm included. But I've gone to these meetings for year after year now and it seems to fall on deaf ears and it's just frustrating.	DOE agrees with the commentor and is taking steps to meet with former workers to discuss activities that occurred within Area IV. DOE agrees that it would be useful to conduct a site visit with former workers. DOE will use the information gathered from the workers to help focus future investigations.
6	If you couldn't know what you're looking for, you're running blind and that seems to be the way it's been run in the past, just a shotgun effect. And again, the log books will help you to pinpoint certain incidents. I'm talking about fires, spills, and such as the -- also speaking about the sodium burn pit. That's a whole sorry in itself. I wouldn't know where to start with that. I did witness the incidents that went on there, I think, on a few occasions.	DOE is conducting a records search, including a review of logbooks if books are located. DOE will factor into any future investigations the results of this records search.
7	And also I want to talk about DeSoto. Don't forget DeSoto, that's in Canoga Park. 8900 DeSoto is the address there. I worked there myself also in the Health Physics Department, and I worked there in what they had -- what they called a hot lab and they had a fuel lab -- actually that's where the fuel was made up into elements that was eventually shipped to the Santa Sue Facility for testing and later loaded into the various snap reactors for the eventual running of the reactor.	DOE thanks the commentor for this information. However, the DeSoto facility is not part of the scope of the *SSFL Area IV EIS*.
8	So don't forget about the soil. And I'm sure that most people are aware that they had a small running -- or chain reactor there, and I've heard people make fun of it, but nevertheless it was a nuclear reactor and it was in full operation. And I -- I mentioned a hot lab. They had a hot lab there where they examined high energy radioactive materials, so that should be looked into also.	DOE thanks the commentor for the recommendation. DOE will research records for facility operations and incorporate the findings into the *SSFL Area IV EIS* as appropriate.

	Comment	*Response*
IN-079: Wayne Hosek, Scoping Meeting transcript comment dated: 7/22/2008		
1	MR. HOSEK: I'm a long time resident of Chatsworth, I just had a couple questions regarding notifying residents. Who specifically and what methods are used to notify residents in the affected areas within the communities. Do you know? MS. JENNINGS: I can answer that quickly, if you'd like. Is that okay? MR. HOSEK: I'm commenting because I should say this, I'm astounded with the absence of notification. With all the media out there that's available and perhaps later you'll address that issue. But this is -- this is typical of -- I think, of the kind of response that goes with communication. You know, meeting communications is response, and here it goes. If I wasn't on the mailing list from eight years ago, I wouldn't know a thing. Maybe it's a budget problem. Maybe you've got a budget problem, I don't know. But in my opinion, you are responsible for mediating communication to the public, you know, all the affected areas, it's your job to make sure that they all have ample access to communication, about notifications of these meetings. I don't think you have done it. Who specifically and how many residents were notified of this meeting? Does anyone know? Do you have that kind of information? MS. JENNINGS: Let me turn this on. This sort of responds to this gentleman's question over here as well. There are 410 people on the mailing list to the Santa Susanna site. We sent two mailings to that entire mailing list -- one, Beth, helped me, in May -- BETH: May 30th. MS. JENNINGS: May 30th, thank you. One May 30th that described both the gap analysis meeting and this meeting. And then another mailing list was sent on July 8th, I believe. That describes this meeting. We've placed display adds in the Los Angeles Times, in the Ventura County Star, in the Acorn -- in the Simi Valley Acorn and the L.A. News, I believe. Am I getting it right Beth? UNIDENTIFIED SPEAKER: The Ventura County Star. MS. JENNINGS: The Ventura County Star. There was an article in the Ventura County Star of Sunday, it was on the East Side section or something. And there was a little box about the meeting there. One gentleman tonight -- I forget who even, suggested pamphlets. We would love any suggestions. We really will have tried to do everything we possibly could to notify -- MR. JOHNSON: Add to that is also on the DOE, ETEC web site -- some of the other groups that are here tonight also on their web site, as well. MR. HOSEK: How long did the ads run? MS. JENNINGS: They were in the paper one day. MR. HOSEK: Who is responsible at the DOE for notifying the communities of these meetings? Who at DOE is responsible? MS. JENNINGS: As the document manager for the environmental impact statement, it would be me. MR. HOSEK: Have you considered any cable access, perhaps talking to an ad agency to discuss how you can saturate the community in scientific standards to be sure your message is reached? I mean, one ad, one day, mailing list, how many hundreds of people in the area could be impacted? It seems a little deficient, wouldn't you say? MS. JENNINGS: We will certainly consider those things. Thank you for your comments. And any other suggestions that folks have we would consider.	DOE thanks the commentor. Due to the number of similar comments received regarding this concern, the commentor is referred to DOE's response in Section 3 of this document.

	Comment	*Response*
2	MR. HOSEK: Do you have a budget for promotion? MS. JENNINGS: We have a budget for public involvement activities associated with the environmental impact statement. MR. HOSEK: Do you know how much that is for this hearing? MS. JENNINGS: I'm sorry, I don't know the numbers, but I could find out. MR. HOSEK: That would be great. How would we find that out? MS. JENNINGS: I'll be happy to answer questions -- part of the response to comments on scoping will be an answer to every single comment, and we will put that on the web site as well as if you've signed up at the back of the room, you can receive it in the mail. MR. HOSEK: Finally -- not trying to pin you down -- would you or any of your associates consider what you've done adequate in notifying the community of these meetings? MS. JENNINGS: We believed that it was. I've heard very strongly suggests that will help and we will certainly consider them.	DOE will consider other means to notify the community about all meetings and appreciates the commentor's input. A significant amount of money in the budget for the *SSFL Area IV EIS* allocated to public meetings. Any suggestions for a different approach would be greatly appreciated.
IN-080: Marie Mason, Scoping Meeting transcript comment dated: 7/22/2008		
1	I also think it needs to be looked at as a whole site since we just recently learned that things were burned in the Area I burn pit from Area IV. And that, in fact, that people that work up there used to just leave things outside the gate to be burned because they didn't want to go all the way to Area IV. And perhaps they were bringing them from other facilities. So I think for those of us that live below and have all this running down on us, there needs to be -- the scope needs to be widened.	DOE thanks the commentor. Due to the number of similar comments received regarding this concern, the commentor is referred to DOE's response in Section 3 of this document.
2	And just to comment on the truck issue, for probably ten years we heard about how safe the trucks were and it was great because you guys were safe and you took all the -- covered the trucks, and everything was wonderful. Now you've change your scenario that you don't want to bug the people on Woolsey Canyon with too many trucks. We want the stuff off the hill. We want the contamination off the hill. I don't care if it takes five zillion trucks. The thought of leaving it any of it behind it -- sorry for the people of Woolsey Canyon, but when they bought their homes they knew they were on the road to Rocketdyne, I'm sure they're not going to like my comments, but I want everything off the hill. If it means we have to have a lot of trucks, oh, well. We have to have lots of trucks because leaving it there for eternity is just not an alternative to me.	Onsite containment is included in the range of alternatives that will be presented and analyzed. The commentor's preference for removal of all contamination is noted.
3	And I think we only should be looking at agriculture and not open space because that's the only way we know it's going to get cleaned up and those of us that have been doing this for so long will have a sense of maybe peace that we didn't contaminate our children and me, now, grandchildren.	The commentor's preference is noted. DOE is following the NEPA process in its identification and evaluation of alternatives. Under the NEPA process, DOE must evaluate a range of alternatives. Included within the evaluation will be an agricultural scenario. The factors that will be included within the agricultural scenario are still being defined.
IN-081: Anonymous, July 22, 23, and 24, 2008 Scoping Meeting Issues Poster		
1	Will the EIS consider cumulative impacts?	DOE thanks the commentor. Due to the number of similar comments received regarding this concern, the commentor is referred to DOE's response in Section 3 of this document.
2	DTSC is working with Boeing to cut down on pollutant distribution OE from stormwater run-off. What is the position of DOE on that? The run-off system at this time will be constructed for only one-year storm event (SMAK amount) as opposed to 100-year event. What is the DOE's position on this or do they have a position?	DOE supports all efforts being made by Boeing and NASA in controlling surface-water contaminant migration from SSFL. The NPDES permit is held by Boeing and NASA, as the landowners. They are continuing to work with the LARWCQB regarding design storms for the control measures.

	Comment	*Response*
3	I wish we had time first to go through poster stations.	The commentor's concern has been noted and will be considered in determining the format of future public meetings. The scoping meeting format (minimizing time for DOE presentations and maximizing public comment time) was developed in response to input from community members who expressed the desire to allow sufficient time for community comment.
IN-082: Chris Rowe, Data Gap Report Meeting transcript comment dated: 6/26/2008		
1	First of all, the cleanup of the site is not the decision of the people sitting up here. It's way above their pay grade. And if you look at the cover of the book -- I think his name is David Hincks, he's somebody at the top of the pay grade that this was at least submitted to. And I looked him up, and I saw that there was an award, and one of the awards was to CDM, and I believe that it was close to $9,000,000 just to do the EIS. And if I'm wrong, they can tell me later. But I was looking up who is CDM and who is SAIC.	David Hincks was the DOE contracting official in charge of the CDM contract. He was not in a decisionmaking position regarding cleanup of Area IV.
2	And for me, I want you to know that CDM on the one hand, in my opinion, has a good reputation of doing good cleanup work, but CDM is part of a larger organization that does things, like they're involved in Iraq, and then SAIC has contacts with Boeing to do -- to build things. So I see conflicts, and I'm told that when they were given the contracts that they had to do conflict of interest for (Inaudible) better word. So the bottom line is, I'm really trying. I really want to be fair. I try not to paint everybody with the same paintbrush. Like I don't say everybody at DOE is bad. There's – I think the people that I've met at DOE, they're nice people. They're really trying hard, too. I see water board in the room, good people. DTSC in the room, good people; community members in the room, good people.	DOE thanks the commentor for its opinions.
3	But the problem is, is that the people at this level are being given a job, and they're being told do something at a certain level of cleanup, and they're – I know that in the past Liz will say "accelerated cleanup" for example. Well, I want you to know that, yes, I've seen the document about accelerated cleanup, but it actually came out under the Clinton administration. It didn't come out of the Bush administration. It's just being followed up under the Bush. So we can't say in this particular case Bush is bad and Clinton's good, or this or that or whatever.	This is not a comment on the merits of the *Draft Gap Analysis Report*. No response is necessary.
4	The bottom line is, we have to address the issues. And the thing that concerns me the most is when I'm told, for example, today, "Well, there's been some concern about Centex, and we're not going to address it."	DOE does not have the authority to provide direction to commercial development projects such as Centex. The commentor needs to discuss these concerns with state and local officials who can weigh in on local decisions.

	Comment	Response
5	Well, I'm sorry. Those drainages, number one, there's blue lines all over that site, and we cannot just look at Area IV. We have to look at the whole site. And those blue lines, those are under Army Corps of Engineers, and that means that they're supposed to be weighing in, and I don't know if they even know we're cleaning up, and they go into Happy Valley, and to Runkle, and other places. And we know. We have seen historic documents talking about radionuclides off site, and we also know that there has been historically a number of other sites all the way from the DeVry property that's got so many other names, it falls within Roscoe to the current side of Pratt Whitney and in De Soto. All of those did reactor work, nuclear research work, and they had -- under Atomics International, they had to test air sampling ten miles up from each of those sites. So we've got a history of radionuclides all over this area, and we have to look closely. We can't just look at Area IV, and we have to hold everybody accountable.	The locations of the ephemeral drainages associated with Area IV were highlighted in blue to aid the reviewer in following their pathways. The blue highlighting of the drainages should not be interpreted to mean that those drainages contain water. The Army Corps of Engineers regulates navigable waterways and wetlands. The dry drainages do not fit the definition of navigable waterways or wetlands; therefore, the Army Corps of Engineers is not involved.
6	We have to work together. I don't like the fact that we attack individuals. I don't like individual community members attacking other community members, and I don't like us attacking regulators by name. I think we need to work on this as a group.	DOE agrees that the best decisions will result from processes that treat all perspectives and individuals respectfully.
7	So I basically want to say that -- one of the things I wanted to mention earlier is that during the 1950s, we had the country's largest hot lab up on the hill, and everything from all over the United States as well as the other Atomics International and Rocketdyne Facilities, were brought from (Inaudible) -- to be examined in the hot lab, so that's another area you needed to be looking at. And so -- also, I've heard former workers say that materials that were hot were dumped in the ocean. And I was absolutely appalled when I was told this, and this was from a nuclear physicist that worked for Atomic International.	All of Area IV, including the site of the Hot Lab, will be adequately investigated by EPA in support of the analysis of the *SSFL Area IV EIS* alternatives. Any impacted area, including areas adjacent to Area IV, will also be investigated.
8	So I've been listening to what numerous people have said this evening and agree with -- I know what Bill was talking about, and Dave Carey, and they're just -- everybody's putting the picture together, you know, the people that are talking about Runkle, about Dayton and everything. And that's one reason that I got emotional, because, as you know, you're seeing the e-mails that I'm writing to you. I'm reading this. Don't take what I -- you know, the way I was speaking to you earlier personally. As I've said, I don't want to attack the individuals. I just -- I want you to understand that I'm eating and sleeping the cleanup of this site right now. And so when you guys say to me that you are not looking off site when I've seen all these historic documents that I'm reading, that I'm sending to you, and you say, "I'm not going to look at Centex" -- well, for example, Cassandra Owens is in the back of the room, and I send e-mails to Cassandra, and I say, "Cassandra, you need to have outfalls over in the eastern drainage and Woolsley drainage, and you need compliance points and things like that because we know things are running off lab up there, and so that's all going into the Woolsley eastern drainage, going into Dayton and everything, and that's not being sampled." So when I say to you, "I want Centex sampled," it's because it's on the eastern side of the property and it's getting the fallout from the site as well through Bell Creek and other things.	EPA in its characterization study will investigate for the presence of contamination in drainages that leave Area IV. DOE, however, does not have authority to investigate drainages originating in other areas of SSFL.
9	And then we also -- we got a geologist or two over here -- I'm looking at the Chatsworth formation, and we're looking at, you know, fault lines and everything like that, that you cannot tell me that all this material, radiological or chemical, is confined to Area IV.	DOE acknowledges that the geology and hydrogeology of the site are important for understanding the potential for contaminant migration from the site. What is known about the geology and hydrology is described in Section 2.3.2 of the *Draft Gap Analysis Report*. The relationship between faults and contaminant migration is still being evaluated.

	Comment	*Response*
10	1 So again, I apologize for melting earlier, but I want you to know that I'm really trying very hard to work with you, and you just have to know that these radioactive contaminants are brought here from everywhere. And as they've said, not only in the Area I Burn Bit, there was an Area IV Burn Bit, and there were pits that were -- in Area I, we know that in the '40s -- and I may have said this to you before, but in the '40s they were dumping, and the '50s, in the one pit. And then in the '60s, they went, "Whoops. We shouldn't have been doing that." So they created six lined pits, and they mixed it all -- you know, they'd separate, and say, "Okay. Let's put that into this one." And they would put things that don't combine. And then that old pit, they decided, "Okay. We're going to take that, and we're going to move it somewhere a half a mile away, and we're not going to tell anybody where we put it." So these are kind of the things that we as the community have to listen to at our workgroup meetings and we have to figure out where they're going, and what's the impact on it. And so again, I'm not attacking anyone, but I want you to understand just why we are so emotional when we make the demands for cleanup standards that we do. We do have people in the room with cancer; we do have people that are ingesting the foods.	DOE thanks the commentor. Due to the number of similar comments received regarding this concern, the commentor is referred to DOE's response in Section 3 of this document.
11	I've shown you documents that say fruit and vegetables at Sage Ranch at Brandeis-Bardin, Orcutt Ranch, people are bringing -- they're eating the citrus at Orcutt Ranch, which is just down on Roscoe, just below the site, and then people have their home gardens where you can go in and grow things there yourself. So this is why we're telling you this.	DOE acknowledges that there are locally grown fruits and vegetables.
	IN-083: David Carey, Data Gap Report Meeting transcript comment dated: 6/26/2008	
1	I stumbled upon these notebooks over there and picked up just this one right here, and I want to show a photo, actually a figure, 1-2. It shows the layouts of the Field Lab here. And here's some of the blue lines that Christine Rowe was just talking about. Along the boundaries of the Santa Susana Field Lab are these blue lines, essentially being creeks that would flow after different rain events and so forth, storm events. And the question is, or the comment is this, this prior photo here in this same notebook shows this kind of superimposed field lab over the area map, and if you look, you know, they have Canoga Park; they have this little blue blotch right here which happens to be the Chatsworth Lake Reservoir, Chatsworth, Simi Valley, Simi Hills, the Ventura/L.A. County line right where the property sits.	In the *Draft Gap Analysis Report*, the analysts recommend the investigation of drainages leaving Area IV. DOE does not have jurisdiction for the investigation of other parts of SSFL. If any contamination is determined to be related to DOE activities, DOE will determine the appropriate course of action. With regards to the remainder of SSFL, DTSC is the agency responsible for ensuring investigations of contamination issues, including the sources of the contaminants and whether the contaminants have migrated.
2	And the reason why I bring this up is because in this same binder at the end of this section over here, I believe it was Section No. 3. Okay. It's Table 3-14, "Summary statistics and chemicals detected in soil vapor" in Area IV, and it lists on the far column here on the border -- on the right border is, exceeds California Human Health screen levels. Okay. And every one of the ones that exceeded, like vinyl chloride exceeded, trichloroethylene exceeded, PCE exceeded, and this 1, 2-dichloroethylene exceeded every single one of these that's been found in the Chatsworth Reservoir. So that little blue map I showed you of the diagram is indicative of the fact that the evidence points to chemicals, radionuclides, and different contaminants, maybe even combined radionuclides with chemicals in the Chatsworth Reservoir. I'm hearing a lot tonight from the panel, from members, that you guys aren't really looking outside of these boundaries and you're not taking responsibility for the chemicals and the radio-pollution that has commenced over these years.	The drainages that leave Area IV do not flow into Chatsworth Reservoir. EPA in its characterization study will investigate contamination in drainages flowing from Area IV into adjacent areas.

	Comment	Response
3	So that is a big concern because, an example, let me show you in this little Birkenstock green box are some rocks, and I'll show you as I walk around what's on these rocks. These were found in one of these blue streams that would come off of a field lab. And Area I in historical documents show a lot of waste that was brought from Area IV onto Area I. Now this may or may not be DOE's responsibility, but this is clear evidence that was collected two days ago and also about three weeks ago, as well in the Dayton Canyon area. Okay. And what I'm hearing over all is, and I'll point the finger at DTSC, as well, is there's a "pass-the-buck-itis." It is a disease I'm sensing.	DTSC is the state agency with the lead on the investigation of Area I. Comments regarding the use of Area I should be addressed to DTSC.
4	Because what's going on is, you know, you guys are saying, "Okay. We're only going to clean it up to residential standards, not rural residential or agriculture."	A number of commentors requested that DOE commit to cleanup to a level that would allow residential land use on the site. DOE is preparing the *SSFL Area IV EIS* in compliance with NEPA, which requires consideration of a range of alternatives. No preferred alternative will be identified until all of the alternatives have been analyzed and evaluated.
5	Well, then that gets conveyed in the Dayton Canyon, as well, which is neighboring Rocketdyne, not under SB 990 law, however, sharing contamination from the site. That needs to be corrected internally, not just from the public. You guys need to look at these off-site areas and clean them up to the exact same standards as Rocketdyne. And the evidence is clear that it's being transmitted to these off-site places. I'll walk around as soon as I'm done with my comments and show these rocks to you guys. So inside the Chatsworth Reservoir in the sediment, not just from the high winds, you're going to find these -- you're going to find uranium, you're going to find various radioisotopes, radionuclides that only come from one place, you're going to find heavy metals like arsenic that only comes from one place, and it still sits there. The area Dayton Canyon, as well as -- is highly contaminated, and that only comes from one place, as well.	DOE will evaluate and clean up contamination that resulted from its activities at SSFL.
6	The data gap that you guys are proposing is missing Area I. Area I isn't even discussed. Area II, Area III, lightly discussed.	DOE's nuclear research activities occurred within Area IV, which is why the *Draft Gap Analysis Report* focuses on Area IV. Contamination within the other areas of SSFL is being investigated under orders issued by DTSC.
7	The whole mountain needs to be discussed. Mother Nature does not work in these fixed little artificial man-drawing lines. We know that. We need to look realistically how the mountain works and where the contamination goes. Go out to the neighborhoods. Look like I said last time; look from the outside in and not from the inside out. And if that means doing what you have to do in some other places like Harrisburg, Pennsylvania, you look 25 miles to find contamination, stops there and work your way back to the source of the contamination.	DOE thanks the commentor. Due to the number of similar comments received regarding this concern, the commentor is referred to DOE's response in Section 3 of this document.
8	Then you have another team independently not communicating with the outside team doing their analysis, and then independent of each other; you compare the results. That is more of a logical way and a fair way to assess the contamination.	The analysis in the *Draft Gap Analysis Report* of activities and contaminants associated with Area IV was conducted independently from DOE and Boeing influence. The document has also been reviewed by EPA and DTSC. Please see the introductory response regarding the EPA lead on the radiological investigations.

	Comment	Response
9	Looking just along the base of cliffs and not on the mountain tops, I think, is a fallacy. I don't think that's correct, I think, just based on what's been found in Dayton Canyon last time the Cesium is found along the ridge tops above the cliffs. There are several cliffs up there. That's where the markings have been found. Not down in the base, not where the heavy metals are found, not where the perchlorates are found, not in a creek bottom, but along the top. So please look everywhere and not just what's convenient and easy. So again, the off-site areas need to be looked at and tested.	In the *Draft Gap Analysis Report*, the analysts recommend investigating all of Area IV, which will include surveys of Area IV ridge tops. EPA in its characterization study will investigate areas adjacent to Area IV when it is determined that contamination from its activities has migrated to the adjacent area.
IN-084: Marie Mason, Data Gap Report Meeting transcript comment dated: 6/26/2008		
1	My name is Marie Mason, and I live in the community right below the "source." I have – and I'm not the new kid on the block. I've been doing this for 19 years now, since 1989. I have a couple things. I just want to -- I pointed it out at the workgroup meeting that we were misled at the last meeting that the EPA was going to be the lead. I think we shouldn't use those kind of words, because "lead," to me, means in charge, and now we know that we don't have an agreement with them, according to the last meeting. So I think it's really important that we all get on the same page, and we want to see the EPA be in charge. That's what we've wanted all along.	DOE thanks the commentor. Due to the number of similar comments received regarding this concern, the commentor is referred to DOE's response in Section 3 of this document.
2	SB 990 said it needs to be rural standards, not residential, and I keep reading in your documents "residential." It's not residential. It's rural.	DOE thanks the commentor. Due to the number of similar comments received regarding this concern, the commentor is referred to DOE's response in Section 3 of to this document.
3	I live below it. I don't know what's been pouring down on me for -- you know, I've lived there for 36 years, so I've only known about this for 19, but who knows how long the stuff has been coming down. I have thyroid problems. My daughter has thyroid problems. My neighbors have it. So perhaps something's going on.	DOE thanks the commentor. Due to the number of similar comments received regarding this concern, the commentor is referred to DOE's response in Section 3 of this document
4	Also, the buffer zone, you talk about the buffer zone, Area IV. The buffer zone was once off site, and then when contamination was found off site, Rocketdyne bought it. So then they can go back and say, "We don't have any contamination off site, because now it's on site," so we can't really count on the "buffer zones." And in those days when that was discovered and they bought that plan through a private negotiation with Brandeis-Bardin and through a legal action, there was no more -- we don't know about off site anymore. Now there's off site everywhere. Every place, all four areas around, there is off site. We don't know if there's any in our community because it's never been tested.	EPA in its characterization study proposes to investigate the Northern buffer zone and drainages leaving Area IV that may have been impacted by DOE activities within Area IV.
5	I'm not saying I don't trust you people, because I don't know you people. But if you're using the old figures and the old numbers and the old reports, it seems kind of silly to me to be using things that we know were wrong in the first place but now we're going to use them again, you know, when it clearly states the EPA should be doing some new -- new report -- new sampling, lots of new sampling.	The Data Gap Analysis data review process looked at all data and compared the data with current data acceptability criteria. Much of the older data was found not to meet the current criteria and is recommended for re-collection. In the *Draft Gap Analysis Report*, the analysts recommend the collection of a significant quantity of new data.
6	And to do one location per one acre, that's a lot of land. How do you -- you going to take one little spoonful? You don't take very much in the samples, because I've been up to the site numerous times, taken all their testing, going through their program, so we can watch them do this testing, and they don't take very much. So if you are going take one sample, I guess you can be like the water guy, who before he let Dan do two samples -- and they were going to release the Area IV Burn Bit -- it was done. It was closed up. We're done. There's no contamination. It's all non-detect – until Dan did his two, and then they went back and took thousands of graded dirt out of it to take away. I think it's silly. You're not going to find anything with one sample per acre. It just -- I mean I don't -- I know you can't do it every little inch, but one sample per acre just really doesn't seem like very much.	In the *Draft Gap Analysis Report*, the analysts recommend a sampling density that is greater than one sample per acre. For samples collected by DOE, the amount of soil material collected with be consistent with EPA and DTSC sampling protocols and will be adequate for the types of measurements that will be performed in analytical laboratories. EPA will present in its sampling plans its protocols for soil sampling volume and methods.

	Comment	Response
7	And I don't understand and we know everything's gone from Area IV all over that whole 2,800 acres. There are no clean areas up there. And when I read in your report that you are using some of the background from unaffected areas, I don't -- I can't even believe that's stated. There can't be unaffected areas. Everything's effected. We're probably affected. The wind blows, the rain moves it all -- it's all affected up there. And when we were told for years it was never off site and we could -- they would swear and promise, and then lo and behold, there it was. And now the buffer zone, which we're going to use, we know it's contaminated, because they bought it contaminated from Brandeis-Bardin.	DOE thanks the commentor. Due to the number of similar comments received regarding this concern, the commentor is referred to DOE's response in Section 3 of this document.
8	So I think we really need to -- you have to realize there's people that have been doing – been affected by this, and our frustration level is beyond. Mine's way beyond. I'm way tired of coming to meetings and doing this and seeing almost no progress. After 19 years, I see very little progress. And I'm more and more disillusioned. Every time I think, great, we're finally going to get somewhere, we get nowhere. We get more of the same -- more of the same numbers thrown at us that really are fudged. We're tired of the fudge. Just spend the money, DOE. And let's get done. We've wasted so much. If you go up there and we find it, oh, well, too bad, so sad. You'll have to clean it up, because you're going to end up finding it anyways, because we're not going to go away and say you've done your sampling unless Gregg Dempsey and EPA have some input.	DOE thanks the commentor. Due to the number of similar comments received regarding this concern, the commentor is referred to DOE's response in Section 3 of this document.
9	I think after 19 years we should have sent that message that some of us just don't go away. As much as we would like to go away, this is a train I'd like to not have ever gotten on, but since I'm on it, I don't really know how to get off of it. So I really would appreciate it if you would take that into consideration and stop, you know, this wasting my tax dollars. There's children in America with no food, and we're just throwing money away on studies that really aren't going to prove anything.	DOE acknowledges the commentor's concerns.

	Comment	*Response*
IN-085: Elizabeth Crawford, Data Gap Report Meeting transcript comment dated: 6/26/2008		
1	My name is Elizabeth Crawford. I'm on the website, rocketdynewatch.org. Please excuse me for those who were at the workgroup meeting the other day. This is repetition of information that I think is pretty phenomenally important for you to understand exactly what's going on here. This isn't necessarily a discussion of the gap analysis for a particular report, particular this or particular that so much it is as it is -- I'm sorry -- the latest chapter in what you guys do, which is spend resources, obfuscate, spend resources drawing up obstacles -- you know, we'll get into it in a second here. The other day -- unfortunately, you're the pointman on this, Mr. Thomas- -- Johnson, and the other day I had to kind of put you on the hot seat when I asked you to kind of give the real context of what's going on here on a national level. There's something called the Accelerated Cleanups Program, which was initiated in January 2001 with the Bush administration, wherein the Department of Energy basically threw off the hitches of any other kind of agency telling them what they should do. And they -- this program was written by Bechtel Jacobs, as in Halliburton, KB- -- Kellogg Brown & Root and so forth, the architects of the Iraq War, and you're seeing it up here on the hill. So basically what happened was when Accelerated Cleanups got ruled out, they wrote a book, and I actually have a copy of one of them, and it's called, "Applying Accelerated Cleanups to Orphan Sites Across the Country." It's an extremely handy little book. It is the textbook that you use to basically approach all of the messes that you've made across the country for 60 years. And I have it. It's called, "Moving From Mortgage Holding to Closure," meaning, get the hell out of Dodge. And how we do this is -- the first step is you -- I forget what the phrase is that's in use in the Accelerated Cleanups Program, but it is basically you reject all other agency oversight. So, bingo. Step number one, the Department of Energy walks in without telling anybody. Mike Lopez, your predecessor, states -- I think it was March of 2001 -- "Guess what? There's a new sheriff in town. Guess what? The program is called Accelerated Cleanups." Chapter 2 -- chapter 1 being, kick the EPA out of your way and thus the breaking of the 1996, I believe it was, memorandum of understanding between the United States EPA and Department of Energy. Chapter 1, checked off.	While DOE acknowledges the commentor's concerns about the accelerating cleanups document, that document is not relevant to the current effort. DOE has been ordered by a federal judge to prepare the *SSFL Area IV EIS* to evaluate the remedial alternatives for addressing contamination associated with Area IV. The *Draft Gap Analysis Report* was prepared by DOE's contractor to evaluate the documentation that is available related to Area IV contamination and make recommendations regarding additional data that is needed to prepare the EIS. The contractor has recommended extensive additional samples to support a comprehensive evaluation of the nature and extent of the contamination that must be cleaned up.
2	Chapter 2, recalculate your risks. What do you do? You bring in your own scientists; you bring in your own data. You bring in your own analysis tables. You bring in your own methods of handing samples. Let me calculate this. Oh, wow, we can leave behind 99 percent of the world's only uncontained nuclear meltdown here on the backs of the cities of Simi Valley and Los Angeles and whatnot, because according to our calculations, we're done. And any of you who are veterans that date back to 2001 will remember the environmental assessment which was the predecessor to this EIS. And the difference being is that environmental analysis is about 110 pages long, and the environmental impact statement is more like that puppy, forty stories of documents, something like that -- which is what you should do, look everywhere that you should look. So back in 2001, there's this lovely table, if you care to look it up, and it says, "Our three alternatives in handling the SSFL under Accelerated Cleanups is, Step 1" -- is Option 1, do nothing." They actually considered it. Option No. 2, cleaning up to, oh, that pesky EPA's level. "My gosh. It's going to take this many truckloads, and it's going to cost this much, and we're going to have to move this much irradiated material. Gosh, that's just too difficult. We don't want to. It takes too long. It doesn't fit with our national policy of Accelerated Cleanups. So we recalculate our risks, and, oh, my gosh, we only have to move 7,300 cubic meters of stuff as opposed to the 470,000 cubic meters of material that the EPA had said needs to be moved, moved for it to be safe." All right. Accelerated cleanups. This community went in overtime -- and Dan Hirsch, without	The commentor suggested that DOE has made a decision to leave contamination in place. That decision has not been made. No decision will be made until the *SSFL Area IV EIS* has been prepared.

	Comment	Response
	whom this whole thing would have been sewn up and, you know, wouldn't even have made history 30 years ago, 25 years ago -- got Natural Resources Defense Council to sue the Department of Energy for the health impacts that could be expected from leaving behind 463,000 cubic meters of radioactive waste that's already been identified by the U.S. EPA. We were able to get the State of California Attorney General to join. We were able to get the City of Los Angeles to join. And a couple years ago, the federal government, the federal court, ordered you to follow U.S. EPA standards -- told you, ordered you, on federal levels to use EPA standards -- to use their oversight, to get back to the drawing board of 1996. That wasn't good enough for you. No offense. Because there's way too much money at risk here. Why? Because in 49 other states or however many other states you guys operate in on -- I don't know about Hawaii. In all of your other states where Accelerated Cleanups has happened, the door has been closed, the keys have been turned over to the states, and it's "gone baby, gone." Rocky Flats Nuclear Weapons Facility applied Accelerated Cleanups. I saw your newsletters bragging about you saved America 50 years and $50 billion. How? By leaving behind 99 percent. Now it's a park, and you gave it to Colorado. All investigation seizes. Groundwater contamination, nobody will ever know. Wind rose patterns and where it all went, nobody will ever know -- gone, because you guys moved from mortgage holdings into closure. Yes, you did, in 49 other states except here. This tiny little band of people are the only place in this whole country where these people have not gotten away with it. So you ignored the U.S. EPA agreement. You ignored the federal court order. You are ignoring currently SB 990, which we all bled for. You're ignoring CERCLA. You're ignoring NEPA. You're ignoring RCRA. You probably ignored Jesus and Santa Claus, too.	
3	I don't know what it takes, you guys. You're not following the U.S. EPA standards. You're averaging; you're restricting investigation to Area IV despite tons of information, thousands of hours of testimony by other "assistant" agencies like the Department of Labor, which you know about, because we told you. It's insane. I think we're out of options. You won't listen to the U.S. EPA. You won't listen to the federal court order. You won't listen to our two senators, federal level. You certainly don't listen to Senator Kuehl.	The data review process outlined in Sections 3.1 and 3.2 of the *Draft Gap Analysis Report* is founded on EPA's principles for conducting site investigations, evaluating data, and conducting risk assessments. In addition, DOE has entered into an agreement with EPA that gives EPA the lead in conducting background and Area IV investigation for radionuclides. As such, EPA standards will be followed in conducting investigations related to Area IV contamination.
4	I can't think of anything else. So we're going to keep at this for another 20 or 30 years. You ask for comment. I really -- again you guys are at least listening because you're back at the workgroup meeting, you're at least listening because you're still having these meetings, you're at least listening because you're asking our opinion and asking our questions, specific questions about what we think about this lovely little restricted piece of survey here. I stand here saying that I will never be done until you just drop the pretense and follow the various laws that have circled you like a bunch of wagons. It's insane that you pretend that these laws and court orders don't exist. Seriously, I'm speaking English here. I fought this for eight years. So get on with it. Do the obvious. Do the things that the federal government has ordered you to do in just about every shape and form that there is to take and open this thing up. You have to listen to these people; you have to go look at the "seeps" that they bring to you. You have to go talk to the people that they bring to you who have worked on these places and know of these nuclear materials that are in Area II and Area III because they worked there. All right. Department of Labor already has all of that stuff. We've been telling you guys for two years Department of Labor has already got all that eyewitness testimony, and you're still asking us. Don't ask us anymore what we think.	DOE is continuing its efforts to locate and interview former employees with knowledge of operations and waste disposal practices during the timeframe that energy experiments were occurring within Area IV.

	Comment	*Response*
5	I should think that it would be patently clear to anybody who's listened to even half an hour of this meeting. Do your job. Do it the way the federal government has ordered you to. Stop playing stupid. Do the EPA Superfund Acknowledged Health Risk Assessment, and we won't have any more of these questions any more. What other details should we investigate? Look at your damn transcripts of the last eight years. Come on, guys. You know this stuff. It's simple. The protocol is there. It's been written; the U.S. EPA has written it. Please, follow it.	The Data Gap Analysis data review process outlined in Sections 3.1 and 3.2 of the *Draft Gap Analysis Report* is founded on EPA's principles for conducting site investigations, evaluating data, and conducting risk assessments.
IN-086: Dorri Raskin, Data Gap Report Meeting transcript comment dated: 6/26/2008		
1	I'm Dorri Raskin, and I'm also representing my friend Charles (Inaudible), who's running for assembly. And I -- I've been here -- I've been doing this for a long, long time. And I'm really disgusted, what the DOE is still doing. And I feel that EPA should be in charge and do all the survey, and we need Gregg Dempsey, which we've been asking for. It feels like 1,000 years already. We need to clean it up to real strict standards to SB 990.	DOE thanks the commentor. Due to the number of similar comments received regarding this concern, the commentor is referred to DOE's response in Section 3 of this document.
IN-087: Barton Mills, Data Gap Report Meeting transcript comment dated: 6/26/2008		
1	My name is Barton Mills. I'm a retired aerospace engineer – not Rocketdyne, but I have lived in the San Fernando Valley since 1957 and battling cancer since 1992. Everybody has heard the term "follow the money," and a short while ago Dan Hirsch mentioned financial incentives. I think it would help me and maybe some others here if we had a little better understanding of what we're facing regarding financial incentives. I'm wondering if we could ask Dan to tell us what he really meant and elaborate on what organizations may be involved and the magnitude that problem that could be causing the stumbling blocks here. Could you do that, Dan? Can we have him do that right now?	Mr. Hirsch provided a response to this comment at the meeting at the request of the commentor.
IN-088: Margery Brown, Data Gap Report Meeting transcript comment dated: 6/26/2008		
1	My name is Margery Brown, and I've been a Los Angeles County Deputy Probation officer for some 45 years now, 30 years on the job and another 15 now as a retired DPO and a reserve DPO. I'm still actually working for the Department doing investigations. My specialty was juvenile probation. I don't personally understand how this meeting continued at all after Dan got through speaking. It's incredible to me. It's like he spoke in an empty room and nobody has any hearing abilities. I've had to confront a lot of kids who've done murders and burglaries and smoked dope and run way and things like that. But somewhere along the way, part of my job has always been to try to get some kind of an explanation, a statement for the Court or a commitment as to, you know, what is going to change in the behavior of the kid I'm speaking to. I don't understand how this meeting continued without any kind of statement from anybody, and I understand, you know, that you are not personally responsible probably for all of those changed standards. Perhaps somebody else in your agency is responsible. I've been in that position, too, of having the Department criticized, or the juvenile halls, or the gang kids as if it was my personal responsibility. And I understand that perhaps you need to go back and speak to your supervisors or have some conferences with Boeing. But I don't understand the behavior of organizations that continue to behave in the same way year after year after year. I also have a hard time with people who don't follow court orders. I guess I'm naive, but when the judge orders something, you do it. And believe me, the probation officers get ordered, too, right along with the kids to do various things. I would hope that when you go back and have some feedback that you give to your supervisors and to your employer, Boeing, that you decide, you know, what the behavior of your organization is going to be. I have almost never -- and I thought I've been dealing with crime for a long time -- I've got to tell you, I've never seen criminal behavior like what I've seen since I've been	DOE is following a court order in preparing the *SSFL Area IV EIS* to evaluate a range of alternatives for cleaning up contamination that was caused by historical operations in Area IV of SSFL.

	Comment	*Response*
	on board with this bunch for the last two years -- criminal behavior, I mean, people sick, people die, nobody's taking responsibility. And in the words of Dr. Phil, you can't change what you don't acknowledge. I'd like to walk out of here knowing that we had some acknowledgment of something, that you're going to understand, and you've heard what we've said, that you're going to go back and discuss this and come up with some kind of a commitment for change.	
IN-089: Bonnie Klea, Data Gap Report Meeting transcript commend dated: 6/26/2008		
1	I'm Bonnie Klea. I'm a former worker from the nuclear area, and I have -- I'm working with all the sick workers and the deceased workers' families on a NIOSH compensation program. And just as Dan pointed out, that you've received bad data from Boeing, also NIOSH has received bad data from Boeing. They've received reports that said that nothing was released -- very, very small releases. It was all high background, and it was all global fallout. And also, even a piece in the SRE -- they're quoted in the NIOSH profile as saying, "No releases from the SRE. Everything worked as it was supposed to, everything was contained," and we know better than that. And so the workers are not getting paid. I got dozens and dozens of families that I'm working with. I've read their claims, and I've heard their stories. I've had the workers die, and they've left written and recorded testimony.	DOE thanks the commentor. Due to the number of similar comments received regarding this concern, the commentor is referred to DOE's response in Section 3 of this document.
2	Now, I have testimony of one deceased worker, and he worked in the radioactive packaging and crating, and he testified that he had to package dead deer to send out for bioassay. So why you can't get that from the Boeing Company, I don't know.	Bioassay data from prior animal studies did not meet the data requirements of the Data Gap assessments. There is no information on sample collection, preservation, shipment, and analytical procedures. In the *Draft Gap Analysis Report*, the analysts recommend collection of new biological data that meets current quality control requirements.
3	He also testified that the loading docks were contaminated. They had no monitoring on the loading docks, yet trucks would come and bring pigs, which were containers for radioactive waste, and they were all leaking. And one of them -- something blew up in one of the men's faces, and the birdcages were bad. I have another worker who testified that he was in a room that was not monitored, and the lab would bring Uranium Oxide to this little room for him to inspect in cardboard boxes, And they would catch on fire, so he had to pick up the cardboard box and run through the stairwell and through the offices to take them back to the laboratory. I also have another worker who was part of a group of "48 Fuel Assembly," a group that made the fuel rods, and they were committed to lifetime secrecy by the AEC in 1958 for being present when a large accident happened at Canoga. Now, I'm trying to get a copy of that report, but lifetime secrecy -- these workers cannot get paid. So there's a lot of secrets. There's still a lot of deception. And also, it's very -- well, I already told you that the Boeing company said that very little was released; just it's high background, and it was a global fallout, and I don't know how you're going separate the global fallout from the on-site releases.	DOE thanks the commentor. Due to the number of similar comments received regarding this concern, the commentor is referred to DOE's response in Section 3 of this document.

	Comment	Response
4	The Department of Labor has it all. I have some, but I don't know that it will be relevant. Basically, the NIOSH profile has bad data, and in my petition, which is Petition No. 93 with NIOSH -- I had -- in the petition process your petition will be accepted if you submit enough evidence that they had no monitoring, no data or bad data. And I've done that successfully, and it is now in the process and it -- my claim is being worked on by SC&A, which is a contractor for the NIOSH program. And they've done some really good work in helping different groups get paid, for instance, Rocket Glass, so I'm hopeful that I'll get at least some years that would be covered and -- where they don't have to dose reconstruction because it's just a totally failed program, and when you're try to dose reconstruction on bad data, the workers are not going to get paid, and that's what happened. And I'm trying to correct that.	The risk assessments are based on current and future conditions. DOE will not be using data collected in the past by the U.S. Department of Labor for the risk assessment.
IN-090: Jeanne Londe, Data Gap Report Meeting transcript comment dated: 6/26/2008		
1	My name is Jeanne Londe. I've been coming to these meetings, actually, since 1986 along with George and Eleanore. And I've been -- in other words, I've been sitting through these meetings for a long, long time, and I still don't do technical. But I have two questions. First of all, I'm curious as to whether or not this is new information to you. Well, maybe it's kind of a hard question to answer, but as I'm sitting here listening to everybody and seeing these reports and everything, it's been going through my mind because I get the feeling that maybe you haven't heard this information before. Okay. I don't know where to go with that. But I'm just putting it out.	Most of the information discussed at the *Draft Gap Analysis Report* meetings was considered in the *Draft Gap Analysis Report* efforts. Many members of the public recommended additional documents to review. All suggestions will be followed up on in the revision of the *Draft Gap Analysis Report*.
2	And then my second question, and this is in response to what Dan said, is that it seems to me that it's imperative to replace these contractors. And my question is, who would do that? And so I guess that that's what I'm taking home with me from this meeting with the hope that we aren't really back at ground zero, but it kind of feels that way. And, oh, well, it's just the same old same old if that's the case. But I do hope that we'll be able to get Gregg Dempsey back on board and get moving some how after all this time.	DOE acknowledges this comment. Please see Section 3 of this document for further information regarding EPA's involvement.
IN-092: Jennifer Schneider, Data Gap Report Meeting transcript comment dated: 6/26/2008		
1	I think it is very important that other areas at SSFL be evaluated as well, not only Area IV.	DOE thanks the commentor. Due to the number of similar comments received regarding this concern, the commentor is referred to DOE's response in Section 3 of this document.
2	I also believe that EPA must be involved with this as promised previously.	DOE thanks the commentor. Due to the number of similar comments received regarding this concern, the commentor is referred to DOE's response in Section 3 of this document.
IN-093: Anonymous, Data Gap Report transcript comment meeting dated: 6/26/2008		
1	Redo the entire scope of work and prepare for the new administrations direction which will create a greater accountability than the past 10 years.	DOE acknowledges this comment. The *SSFL Area IV EIS* will be re-sequenced once the schedule for the EPA radiological characterization survey has been finalized.
2	Give it over to EPA now and deflect the larger legal action that will be bigger than ever before. Pay now or pay later.	DOE thanks the commentor. Due to the number of similar comments received regarding this concern, the commentor is referred to DOE's response in Section 3 of this document.

	Comment	*Response*
IN-095: Dave Einhorn, Scoping Meeting written comment dated: 7/22/2008		
1	DTSC is working with Boeing to cut down on pollution from storm water runoff. What is the position of DOE in regards to this project? The runoff system for Boeing Santa Susana Field Lab at this will be constructed for only 1 year storm event (a small measure) as opposed to 100 year event. What is the DOE's position on this – or do they have a position on this project?	DOE supports the efforts of Boeing in the control of pollutants in stormwater originating from Area IV.
IN-096: Anonymous, Scoping Meeting written comment dated: 7/22/2008		
1	The issue is water. Simi has a large aquifer. There are 2 water district. West of Sycamore gets 10% ground mixed with imported water. East of here is 100% imported. Perchlorates and radiation in water needs to be handled first. Build a water treatment plant.	Groundwater is being investigated under the RCRA Facility Investigation. The current results do not show any perchlorate contamination within Area IV.
IN-097: May Reiner, Scoping Meeting transcript comment dated: 7/22/2008		
1	Is anyone looking into wildlife health in area? (plants, lizards, and larger animals) Birth defects, abnormalities, lowered reproductive rates, etc.	DOE will conduct an ecological risk assessment based on species common to Area IV. The SSFL 'Site-Wide Risk Assessment Manual' [or SRAM] is currently being revised by request of California DTSC. The SRAM revisions include the methodology for performing ecological risk assessments. DOE will collect biological data and conduct any future ecological risk assessments consistent with the SRAM.
2	You are looking at specific spots for testing purposes. Can one assume that areas alongside or downslope are contaminated as well, or possibly underground, well below the levels you are looking into?	It is DOE's understanding that EPA's sampling approach will incorporate areas adjacent to Area IV facilities where contaminants may have migrated and in the subsurface into bedrock.
3	In view of the UCLA study of several years ago (increased cancer rates and unusual cancer within 2 mile radius) why not assume the whole area is contaminated and treat accordingly?	DOE thanks the commentor. Due to the number of similar comments received regarding this concern, the commentor is referred to DOE's response in Section 3 of this document.
4	How can a government agency declare (eventually) that it will be safe for use as a park, agriculture, housing, etc?	Any cleanup process involves establishment of standards consistent with the expected future land use. If it can be demonstrated through sampling (soil, water, and ecological) that those standards have been accomplished as a result of the cleanup program, then the regulator can release the site for its intended use.
IN-098: Celia Lamborn, Scoping Meeting transcript comment dated: 7/23/2008		
1	How can people be good citizens and be responsible for themselves and their towns if they don't even know what goes on in the factory next door, or just up the street, because it is a government secret?	DOE recognizes the commentor's frustration with past governmental practices geared towards protection of national security. Those practices do not apply to the investigation and cleanup of Area IV. DOE is proceeding with development of the *SSFL Area IV EIS* using an open decisionmaking process, which includes considerable opportunities for public participation.
IN-099: Jennifer Schneider, Scoping Meeting transcript comment dated: 7/23/2008		
1	I'm concerned that only Area IV at SSFL is being evaluated, when the other "areas" are quite contaminated as well and should be cleaned up before any more people are affected by the hazardous chemicals in the soil/groundwater and develop cancer.	DOE thanks the commentor. Due to the number of similar comments received regarding this concern, the commentor is referred to DOE's response in Section 3 of this document.

	Comment	Response
2	My neighbor where I live in Santa Susana and many others I've met who live in my area have cancer. Additionally there is a very high rate of infant retinoblastoma cases in the Woolsey Canyon area of West Hills due to its proximity to the SSFL site, and something needs to be done to clean it up – quickly!	DOE understands that the commentor is concerned about health effects of contamination and the need to act quickly. The process that DOE must follow for conducting the cleanup includes specified steps. First, EPA will conduct a radiological survey to assess the nature and extent of radiological contamination. DTSC is overseeing a similar process to evaluate chemical contamination. Once the full extent of contamination is understood, DOE must evaluate cleanup alternatives and present the results of that evaluation in the *SSFL Area IV EIS*. Then, DOE will be able to make well-informed decisions about how best to proceed.
3	Out of the 5 alternatives proposed by the DOE, I feel that alternative 4 is the best with the exception of the potential land use scenario that may include agricultural or residential uses.	The commentor's preference is noted and as a result of public comment during the scoping meetings, DOE will also evaluate an alternative to cleanup Area IV, but prohibit any future use of the land.
4	The SSFL site must in no way be used for these purposes [agricultural or residential uses] and should be considered a Superfund site.	DOE thanks the commentor. Due to the number of similar comments received regarding this concern, the commentor is referred to DOE's response in Section 3 of this document.
	IN-100: Anonymous, Telephone message to DOE dated: 6/13/2008	
1	Voicemail message left on Stephie Jennings' system - the anonymous caller supports Alternative #4	DOE acknowledges the commentor's preference.
	IN-111: Michael Greenfeld, E-mail dated: 07/21/2008	
1	I am an interested party who knows absolutely nothing about the EIS process. Can you tell me exactly who and what the Scoping meetings are for and what the goal is for DOE and the community in these meetings?	For major Federal actions that may significantly affect the quality of the human environment, NEPA requires preparation of an EIS. An EIS is a detailed analysis of the potential environmental impacts of a proposed action and a range of reasonable alternatives. The first step in preparing an EIS is to issue a Notice of Intent (NOI) in the Federal Register and initiate the scoping process. The NOI states the need for action and provides preliminary information on the EIS scope, including the alternative actions to be evaluated, the kinds of potential environmental impacts to be analyzed and related issues. Scoping is the process in which the stakeholders are invited to provide input on the scope of the EIS, including the alternatives and environmental impacts to be analyzed. Stakeholders are also invited to provide information on any issues related to the development of the EIS they feel should be considered in the analysis. The Federal Agency (DOE in this instance) is required to hold a least one public scoping meeting where stakeholder scoping comments may be received and information about the project provided to the stakeholders. For the SSFL Area IV EIS, there have been many changes since the scoping meetings were held in July 2008 (see Section 1.0, Introduction of this comment response document) and DOE will rescope the EIS once EPA is near completion of its radiological characterization activities for Area IV of the SSFL. This will provide an opportunity for stakeholders to provide their input on the revised scope of the SSFL Area IV EIS. After the

	Comment	Response
		additional scoping is complete, the input from stakeholders will be considered in the preparation of the Draft EIS. DOE's expectation of the scoping process, including the scoping meetings, is to learn about the specific concerns of the stakeholders; use the information to refine, modify, add, or delete alternatives; and ensure that stakeholder concerns are adequately addressed in the EIS. Additional information about the EIS process can be found in the DOE brochure "DOE, NEPA, and You A Guide to Public Participation", found at http://www.gc.energy.gov/NEPA/documents/DOENEPAandYouBrochure_10_20_2006.pdf. This brochure also describes the entire EIS process including the Draft and Final EIS, public comment on the EIS, and the Record of Decision.
	ME-001: Michael Collins / Denise Anne Duffield, EnviroReporter.com. Published 8/12/2008	
1	1. "Alternative Four" designation for SSFL is our preference for cleanup of the site, described at http://www.etec.energy.gov/EIS/EIS.html. We base this preference on our knowledge of the site and our desire that the public and environmental good be foremost in decisions involving SSFL.	DOE acknowledges the commentors' preference.
	OR-001: Dan Hirsch, Committee to Bridge the Gap, Letter dated: 6/10/2008	
1	1. In 1989 a study found widespread chemical and radioactive contamination throughout the site.	1. DOE reviewed an internal EPA Region 9 memorandum sent on November 8, 1989, by Gregg Dempsey, Chief of the Field Studies Branch to Rich Valile, Assistant Director of the Toxics and Waste Management Division, titled "Report on Environmental Samples Collected at the Rocketdyne Santa Susana Field Laboratory July 1989." On page 7 of the report, the second paragraph states, "From the samples collected at SSFL, it is evident that contamination exists on site property. From the levels of contamination detected and their location, it is doubtful that contamination has spread offsite. SSFL personnel were apparently unaware of the presence of tritium at Building 59. While not an environmental concern or health risk, the source of this tritium needs to be investigated. It should also be documented that the cesium-137 around Building 64 is brought back to background levels following SSFL cleanup." This memorandum addressed conclusions of an investigation that addressed radionuclides only, not chemicals and radionuclides. If the commentor was referring to another 1989 study, DOE would be grateful for citations to that study.

	Comment	Response
2	2. Gregg Dempsey from EPA's National Radiation Laboratory in Las Vegas was brought in to review SSFL's radiation monitoring program and found it to be a joke. Vegetation samples were washed before monitoring, to wash off the radioactivity; then heated to hundreds of degrees centigrade to drive off the volatile radioactivity before measuring the ash. Soil samples were similarly heated to drive off radioactivity before measuring. The facility did not measure for tritium because they claimed it couldn't be there; when he asked to take a sample from a french drain for tritium, he of course found it. And in 1989, the site decided to try to address its very elevated radioactivity readings in groundwater by FILTERING the samples first, driving down the readings ten-fold because, of course, they were filtering out the radioactivity before measuring. Dempsey concluded that the site had a very poor grasp of where contamination was or how much there was, and that their measurements could not be relied upon.	2. DOE agrees that not all past practices are acceptable now. DOE asked its contractor to prepare the *Draft Gap Analysis Report* for the explicit purpose of determining which past data meet current data quality objectives. In the *Draft Gap Analysis Report*, the analysts recommend collection of a significant quantity of data before moving forward with the decisionmaking process for considering cleanup alternatives. DOE will use the Area IV EPA radiological characterization data and the data that has been collected by the responsible parties under DTSC oversight in order to develop a comprehensive understanding of the nature and extent of contamination that must be cleaned up.
3	3. A few years later, DOE decided to have its contractor, Rocketdyne, do an Area IV radiation survey. Dempsey reviewed that one too, and found it also to be a joke. They were waving a radiation probe on a stick back and forth in such a way that there was no way they could detect real contamination. EPA formally told DOE to withdraw the survey, that it couldn't be relied upon. DOE agreed, and promised to have Dempsey brought in to perform an independent radiation survey. That promise, by DOE and EPA, was repeated numerous times, until DOE broke its word and blocked any independent survey.	3. DOE agrees that data collected in the prior gamma walkover surveys were generally not acceptable. The Data Gap analysts evaluated the prior gamma walkover surveys from the 1990s and found that they generally do not meet current standards. In the *Draft Gap Analysis Report*, the analysts recommend that the surveys be redone, and that a 100 percent walkover survey of Area IV be performed. EPA now has the lead to conduct the radiological survey of Area IV and is developing the scope for that study.
4	4. Last year, Congress had had enough. It passed legislation requiring an independent survey, at minimum done jointly by DOE and EPA. The Congressional delegation has made clear that they intend that to in fact be an EPA survey, the long-promised Dempsey survey. Despite the law, DOE has simply ignored that legal mandate and claimed (1) it has already gone ahead and spent the money on other things, so no joint survey can occur and (2) if there is to be a survey, DOE insists on doing itself. No one will, rightly, believe any survey DOE does after its long history of cooking numbers, breaking laws, and violating basic environmental protections. That's the whole reason the Congress insisted on EPA. DOE is just stiffing the Congress, the public, and the law.	4. DOE did not ignore the mandate in H.R. 2764. H.R. 2764, passed on December 26, 2007. DOE entered into an Interagency Agreement with EPA Region 9 on July 24, 2008, that gave EPA leadership of the radionuclide survey of Area IV. Under the Interagency Agreement, DOE provided EPA with $1.5 million in funding from the 2008 appropriation provided by H.R. 2764 for EPA to begin this work. EPA prepared a scope, schedule, and cost estimate for the radiological characterization survey. Out of FY09 appropriations, DOE has provided EPA with $1.7 million to begin a radiological characterization survey of Area IV. DOE provided the remaining $38.3 M to EPA through the American Recovery and Reinvestment Act. EPA expects to complete the study by September 2011.
5	5. And that's what this whole business about this "Gap Analysis" entails. This is DOE's plan to do a Mickey Mouse minimal survey itself, incapable of finding the contamination at the site, instead of permitting an independent, thorough EPA survey. No one will believe anything coming out of this "Gap Analysis," nor should they. It is bogus, through and through.	5. In the *Draft Gap Analysis Report*, the analysts recommend collecting a large amount of new data; it is not a minimal survey. It expands the groundwater investigation and requires the collection of large numbers of new soil samples and new biota samples (plant and animal tissue), the characterization of drainages associated with Area IV, a 100 percent gamma walkover survey, an investigation of buildings with inadequate prior surveys, and background studies of soil and groundwater. Since completion of the *Draft Gap Analysis Report*, other things have changed. DOE entered into an Interagency Agreement with EPA Region 9 on July 24, 2008, that gives EPA leadership of the radiological background study and survey of Area IV.

	Comment	Response
6	6. DOE claims in the GAP Analysis that it is now complying with the 1995 EPA-DOE Joint Policy on cleaning DOE sites according to CERCLA (i.e. Superfund) standards, whether a site is a Superfund site or not.	6. The report does not make the claim that it is complying with the 1995 EPA-DOE Joint Policy. The 1995 EPA-DOE Joint Policy requires DOE to clean up facilities on non-NPL listed sites in a manner that is consistent with CERCLA. In the *Draft Gap Analysis Report*, the analysts recommend that DOE collect data that would facilitate DOE's efforts to clean up SSFL Area IV in a manner consistent with CERCLA.
7	7. It goes on to claim it is using the EPA's Preliminary Remediation Goals (PRGs) for a rural residential land use scenario as its screening levels. But in fact it is not. It has, without so disclosing, relaxed them by factors of a hundred or a thousand. Let's underscore that - without revealing the manipulation they were engaged in, they were assuming starting cleanup levels that would permit radioactive concentrations hundreds or thousands of times higher than the very EPA levels they claimed they were following, and which they are required to follow. They buried a table way back in the back of the report, presuming no one would check it against the actual PRGs. Do they think we are stupid? Did they think they could get away with it? Any contractor who would pull off a stunt like that should immediately be dismissed from the project.	7. PRGs are a screening tool used to determine the validity of prior data and to identify additional sampling needs. PRGs were not used as cleanup criteria. Cleanup criteria will not be identified until after the completion of the CERCLA analyses and *SSFL Area IV EIS*. See also Section 3.0 of this document for further discussion on the use of PRGs in the data gap analysis process.
8	8. DOE then accepts and uses many of the very measurements that EPA had rejected a decade ago and that DOE had agreed had to be redone by someone independently.	8. DOE assumes that the commentor is referring to the gamma walkover surveys conducted in the 1990's and earlier. None of the surveys of that era were accepted as meeting current guidelines. DOE proposed in the Draft Gap Analysis Report to perform a gamma walkover survey for 100% of the accessible areas in Area IV. The survey will be performed by EPA.
9	9. All the groundwater samples, filtered to remove radioactivity before being measured, are accepted whole-hog. No discussion of the filtering problem; no requirement to go back and do it right. Just wholesale acceptance of bogus measurements.	9. In the *Draft Gap Analysis Report*, the analysts recommend that additional groundwater sampling is needed because not all of the previous data meets current data quality standards. In the *Draft Gap Analysis Report*, the analysts recommend expansion of the current groundwater investigation (see page 5-1, Table 5-1). The manner in which samples will be prepared prior to analysis will be discussed in the Field Sampling and Analysis Plan.
10	10. DOE called a meeting for tonight about the report, but makes it available at the meeting itself so obviously almost no one can review it before the meeting. DOE did send CBG a copy - the day before the hearing! Obviously no serious desire to have input.	10. DOE regrets the confusion about the purpose of the first meeting after the release of the *Draft Gap Analysis Report*. The purpose of the meeting on June 10 was to introduce the complex report to the public and provide an opportunity for people to ask questions. The purpose of the subsequent meeting on June 26, 2008, was to solicit public comments on the document. DOE understands that the public needs time to review complex documents and commit to providing more time for people to comment on technical documents in the future.
11	11. ALL of the data it uses, the report says, came from Rocketdyne. There isn't a single sentence addressing the fact that the company is a convicted multiple environmental felon, for illegal disposal of hazardous materials at the site in an incident that took several workers' lives, and about which the company initially lied to regulators. Not a single sentence about how all this contamination occurred in the first place because of misconduct by the very company they are now relying upon for the data. No	11. DOE respectfully disagrees with the commentor's characterization of the report's content. There is no statement in the *Draft Gap Analysis Report* that says that all of the data came from Rocketdyne. In fact, very little of the data evaluated in the report were collected by Rocketdyne or its contractors. For groundwater, only data collected over the last

	Comment	Response
	discussion of the Dempsey findings that they were in essence cooking the data, fudging the measurements. The report just accepts the measurements, with minor exceptions, hook line and sinker.	five years were used to identify COIs. For the gamma walkover surveys, all of the Rocketdyne-era (i.e., prior to 1997) results were deemed inadequate for current radionuclide characterization. Of the radiological soil samples, 1,413 of the 1,883 samples reviewed were collected since 1997. Of the soil chemical samples, 1,024 of 1,283 samples were collected since 1997. The 1989 Dempsey Report does not accuse the investigators of either "cooking the data" or "fudging the measurements". The Dempsey Report does question the validity of the data due to the lack of a peer review of laboratory procedures and sample preparation and analytical processes. Only data analyzed in offsite laboratories were reviewed and accepted as part of the Data Gap Analysis. Much of the data collected from the time that the 1989 Dempsey Report was written was not accepted as meeting current data criteria. In the *Draft Gap Analysis Report*, the analysts recommend collection of new samples for analysis under current protocols. That report will be revised pending completion of EPA's radiological survey and DTSC's chemical survey.
12	12. To determine where to take minimal additional measurements, the report once again just repeats claims by DOE and Boeing that nothing serious happened at the site; the contamination is localized around a few buildings; and that it isn't worth taking samples elsewhere. They base where to take samples on where Boeing chose to take them before; they assume that if other areas weren't sampled, there is basically no need to sample them now. We know contamination was widespread - airborne releases falling out over wide areas from decades of illegal burning of radioactive wastes in the burn pits, releases from accidents at reactors without containment structures, contaminated water used to irrigate the property and to cool the rocket flame buckets, creating huge plumes of contaminated steam. But DOE's report ignores all that; says let's look in a couple of places only, forget everything else.	12. DOE respectfully disagrees with the commentor's characterization of the report's content. The *Draft Gap Analysis Report* makes no references to prior conclusions made by DOE and Boeing regarding the nature and extent of contamination within Area IV. The report's conclusion states that more data are required because some of the prior studies are inadequate to characterize Area IV. The report did not conclude that contamination is localized nor did it recommend sampling only where prior samples were collected. In the *Draft Gap Analysis Report*, the analysts recommend widespread sampling throughout Area IV. The recommended sampling includes areas of known operational and disposal activity as well as areas where there was no known operational or disposal activity to ensure that all potential areas of contamination are sampled.
13	13. DOE claims it will do a hand-held gamma survey, however. Whenever an agency says it will have someone walk around with a Geiger counter or something similar, you know they are trying to pull a fast one. There is no way you can detect the contaminants we are concerned about at the levels we are concerned with via a walk-over survey with a little counter. It is pure PR, pure deception. A gamma walk-over can help find REALLY HOT spots, and provide a bit of information where to take some soil samples, but to catch what we are looking for here, it's just showmanship, deception. They have to take random soil samples across the whole property, to find contamination they don't know exists, and that is what they are refusing to do.	13. The recommended gamma walkover survey is based on MARSSIM guidance jointly developed by EPA, DOE, and the U.S. Department of Defense. The survey involves the use of sophisticated radioactive emission detection instrumentation, not a Geiger counter. The field-sampling program recommended by the *Draft Gap Analysis Report* includes the use of the gamma detection instrument as an aid to locate places to sample, coupled with random sampling at locations where there is no indication of contamination above background levels. The report also recommends sampling below the ground surface and sampling of bedrock to characterize the extent of contamination. See also the information in the introduction to this document regarding EPA's lead on the radiological characterization of Area IV. EPA's scope of work also proposes that the radiological investigation of Area

	Comment	Response
		IV begin with a gamma walkover survey followed by numerous soil samples from both surface and subsurface locations.
14	14. And they essentially completely ignore SB 990, the new state law controlling the cleanup.	14. Although not related to the *Draft Gap Analysis Report*, DOE will evaluate a full range of reasonable land use alternatives as part of the *SSFL Area IV EIS*. SB 990 prescribes an agricultural future use scenario at SSFL to set a cleanup standard. DOE will consider future use scenarios during the EIS process to determine how to clean up SSFL Area IV. One of these future use scenarios is an agricultural scenario, along with residential and open space scenarios.
15	15. DOE has decided to ignore Judge Conti's ruling; the federal law about an independent survey; Congressional clear intent to have EPA do the survey; the nation's environmental laws; the public interest; and DOE's past promises.	15. DOE is complying with Judge Conti's order to prepare the *SSFL Area IV EIS*. DOE has complied with H.R. 2764 and EPA has has received full funding as requested for the radiological characterization survey of Area IV.
OR-002: Christina Walsh, cleanuprocketdyne.org, E-mail dated: 6/28/2008		
1	I wanted to give you some information based on some of the discussions from the community at the meeting, specifically Bonnie Klea. I have some documents from Dan Kurowski who is the person she mentioned who packaged up dead deer for analysis. He also discusses the blown-up "pigs" in his NIOSH application and refers to another employee as "waco" who's face it blew up into, and who later died as a result. Mrs. Kurowski has many documents and it would be very helpful for you to be able to contact her. If she is nervous or uneasy, we can certainly offer to attend OR perhaps she would be more comfortable with Bonnie there (Bonnie has had personal contact with her). It is actually photographs that Bonnie gave me from Mrs. Kurowski that refer to the OCY that we identified based on the shape of that parkinglot. We now refer to it as Dan Kurowski's parkinglot and Mrs. Kurowski seemed to like that. She seems like more than anything, she obviously wants to get paid and is one of those who has not been paid under the NIOSH claims, but also, from Dan's notes, it seemed that she really wanted his death to mean something. It seemed to me that the way the NIOSH claim form is organized, there was no real space to explain things so he wrote mostly in the margins so it might not have been accepted or understood for that reason. The photograph is shown in the OCY section of the attached DTSC document from their last meeting. Also, there is a guy who was a health physicist at the site, who attends meetings often: Dan Parks 8052084049. He is very helpful and is willing to be interviewed. I hope you already have. I didn't see him at these last meetings. Again, I can offer to attend if that makes him more comfortable, he and I have a good rapport. Perhaps it would be helpful to have someone like Dan Parks sit down (we can maybe arrange this at ACME) and we go over the HSA summary and see what sparks. It is always interesting, and maybe with your help, we can get more detail from him that might help the process. He seems to be one of the more even minded people involved. He was there in the sixties so he can offer good insight. Another one is a guy we call "uncle john" and I'm actually not sure who's uncle he is but he worked at COCA and at Area IV. If it helps, I'll see if I can find him as well. He was also very detailed in his stories where so many don't even remember what buildings they worked in...making it much harder to learn anything. Anyway, hopefully when you return, in the next few weeks, we can meet and discuss these things as well as other issues recently discussed i.e. the gap analysis moving forward.	DOE sincerely appreciates the commentor's suggestions of former employees, whom the department may want to contact to learn more about past operations in Area IV.

	Comment	*Response*
OR-003: Christina Walsh, cleanuprocketdyne.org, E-mail dated: 7/7/2008		
1	In looking at the factual perspective http://www.etec.energy.gov/library/Reading-Room/N001ER000017_Nuclear_Operations_SSFL_Factual_Perspective.pdf It refers to a second van de graaff accelerator that doesn't appear to be in the historical site assessment. Looking at Appendix B of the Gap Analysis which appears to be incomplete. This is so important and so we look forward to discussing it with you in further detail.	DOE thanks the commentor for this information. The historical site assessment discussion in the *Draft Gap Analysis Report* will be revised to note the second accelerator at SSFL.
OR-004: Christina Walsh, cleanuprocketdyne.org, E-mail dated: 7/8/2008		
1	for reference regarding my previous email [OR-003]: I am very interested in all information that might pertain to this second Van de Graaff generator that operated within the SRE complex as it may be a source that further explains the tritium problem there. This is especially important since no testing of tritium ever occurred prior to the Dempsey finding in 1989. from Page 23 "3.3.8 Operation of Particle Accelerators There are other ways to generate artificial radioactivity besides nuclear fission. One way is to bombard a target material with atomic particles which have been accelerated to high speeds by means of a particle accelerator. A common form of particle accelerator is a "van de Graaff generator"; it uses a high-voltage electrostatic field to accelerate atomic particles to high speeds (high energy levels). Collisions of these particles with a target material (such as aluminum or tritium) can generate small amounts of radioactivity. Rockwell operated a van de Graaff generator in Building 030, bombarding tritium targets with deuterons to produce neutrons. A second van de Graaff generator was operated at the SRE facility, generating neutrons for neutron activation analyses of materials. It was removed before the SRE facility was decontaminated and decommissioned."	DOE is in the process of researching historical information regarding the operations at Area IV of SSFL. If it encounters any additional information regarding the accelerator pertinent to site investigations, it will share the information with the public.
OR-005: Cindy Mays, Lori Tucker, Cindy Braggs, Mothers for Childhood Cancer Awareness, E-mail dated: 7/20/2008		
1	The EPA should do all radiological studies at the SSFL. This needs to be done correctly and if I remember correctly the DOE does not have authority over radiation- Do not let Boeing do this study that is a big conflict of interest-the only way the community will feel comfortable is if the study is done correctly by the EPA--the community does not trust DOE	DOE thanks the commentor. Due to the number of similar comments received regarding this concern, the commentor is referred to DOE's response in the introduction to this document.
OR-006: D'Lanie Blaze, Mission Control, E-mail dated: 8/2/2008		
1	WHAT ABOUT THE REST OF THE SITE? DOE activities were not only conducted in other areas of the SSFL, but contributed to the contamination of the entire facility: 1. ETEC and SABER were conducted at Area l. 2. The "Hot Fuel Storage" building was DOE, and it was located in Area l. It is referenced in the Solid Waste Management Unit Report (1991). 3. The Atomic Energy Commission (AEC) licensed the storage of Strontium-90 in Area l. 4. According to facility records, hazardous and contaminated waste were transported from the Hot Lab at Area IV for disposal at the Area l Burn Pit - a regular practice which exposed rocket engine test stand employees nearby, who were not informed of their risk or given protective gear or breathing apparatus. 5. Industrial waste water (contaminated) which originated at Area IV was used site-wide in the water reclamation system, and fed into the R2A and R2B ponds located beyond the boundaries of Area IV. 6. The dumping of molten radioactive sodium into the pond at Area IV generated a violent reaction that culminated in a cloud of contamination that rained down on employees site-wide. 7. The Aerial Radiological Survey done in 1978 of Area IV clearly shows rising RAD levels as boundary lines are approached, indicating a justified investigation into other areas. Continued focus on Area IV's 290 acres (perhaps hoping the public forgets about the other 2500) seems to be an attempt to indulge in further deflection, delay, and	DOE thanks the commentor. Due to the number of similar comments received regarding this concern, the commentor is referred to DOE's response in Section 3 to this document.

	Comment	Response
	deceit by omission. To believe that contamination "stayed within the lines" of Area IV would contradict what is known about radiation and chemical migration. A site-wide survey was promised years ago, but it was not accomplished. At the last work-group meeting I attended, the DOE representatives present could not account for the funds allocated for this task ($13 million), nor were they able to provide an answer to the obvious question, 'WHEN will a site-wide RAD survey be done?" Employees of SSFL rocket-engine test stands are now dying of occupational cancers, and they have no compensable recourse. Why? Because they worked beyond the boundaries of Area IV. It is – for many reasons - understandable why the DOE would be reluctant to be taken to task for the full extent of contamination, but it is also unrealistic. If DOE is certain they did not have a hand to play in site-wide contamination, why not indulge us with a site-wide survey in the spirit of transparency? Continued delay and effort to distract is sending the opposite message, and indicative of nothing more than a continued lack of regard for their promises, the public, former employees, as well as an insincere approach to ethical participation in the clean-up of SSFL. We need a site-wide RAD survey immediately. Further delay is inexcusable.	
	OR-007: D'Lanie Blaze, Mission Control, E-mail dated: 8/8/2008	
1	1. Please add to my previous comments that Alternative Four is the only acceptable route to take regarding the remediation of Area IV.	1. DOE thanks the commentor. Due to the number of similar comments received regarding this concern, the commentor is referred to DOE's response in Section 3 of this document.
2	2. After reading the NOI, I still find it unbelievably disheartening that the DOE continues its focus on Area IV when their activities clearly resulted in contamination of the rest of the site, including its employees in other areas. It is clear from numerous toxicological reports and surveys conducted in the past - some of which were paid for by the DOE - that investigation beyond the boundaries of Area IV is paramount for many obvious reasons. The continued deflection is frustrating; focus on 290 acres in an attempt to distract from the true scope of damage which occurred at the hands of the DOE's reckless and illegal waste disposal practices is indicative of a lack of transparency with respect to SSFL's clean-up, the safety of the public, and the harm done to the employees of SSFL.	2. DOE thanks the commentor. Due to the number of similar comments received regarding this concern, the commentor is referred to DOE's response in Section 3 of this document.
3	3. I am currently working on broadening awareness of this issue within the community and Congress. A site-wide radiological survey should commence at once.	3. DOE thanks the commentor. Due to the number of similar comments received regarding this concern, the commentor is referred to DOE's response in Section 3 of this document.
	OR-008: William Bowling, ACME, E-mail dated: 8/12/2008	
1	1. I demand that Alternative Number 4 be the Only Alternative. This calls for the removal and offsite disposal of buildings and contaminated soil.	1. DOE thanks the commentor. Due to the number of similar comments received regarding this concern, the commentor is referred to DOE's response in Section 3 of this document.
2	2. The removal of these buildings should be done under a sealed tenting system that will allow no dust or debris to become airborne. As we look back at the AREA IV Sodium Disposal Facility (SDF) Also known as the AREA IV Burn Pit and it's Interim Measure the airborne particulars should have been contained under large tenting. This Interim Measure happened around the same time as the conception of several West San Fernando Valley Retinoblastoma children, we need to be more careful.	2. DOE understands the commentor's concern regarding the potential for the release of contamination during building demolition and will make every effort to avoid that outcome.

	Comment	*Response*
3	3. As we now know from various Freedom of Information Act requests, AREA IV of the SSFL is one of the most Radiological Contaminated areas of the Aerospace Industry. These shipments should be shipped to elsewhere for proper Radiological Disposal. The WM Kettleman Hills Facility http://www.invisible5.org/index.php?page=kettlemancity that has been used in the past is too close to California's Agricultural Resources. We need to dispose of this waste somewhere more remote.	3. DOE cannot make decisions regarding the ultimate disposition of materials excavated during cleanup at this time. However, DOE is committed to selecting final disposal sites based on the characterization of the waste materials and the waste acceptance criteria for the various waste disposal facility options.
OR-009: Betsey Landis, Los Angeles/Santa Monica Mountains Chapter, California Native Plant Society, E-mail dated: 8/13/2008		
1	Snowdy Dodson, President of the Los Angeles / Santa Monica Mountains Chapter of California Native Plant Society attended your July 23, 2008 Scoping meeting for the draft EIS for remediation of Area IV, Santa Susana Field Laboratory. She reported on the meeting at our Chapter Board meeting last night and indicated she had submitted brief written comments at the meeting. She encouraged me to submit comments since I was unable to attend the meeting. For ten years I have been studying a federally-endangered plant, Astragalus brauntonii (known to occur on the Santa Susana Field Laboratory site). Recently U.S. Fish and Wildlife Service, Ventura Office, contracted with me to survey known populations of A. brauntonii and report on their condition. The field research resulted in a report: "Surveys and Observations of Braunton's Milkvetch (Astragalus brauntonii) 2006 and 2007", August 31, 2007, funded by USFWS Contract #801816M190 & #801816M190/0001. In the report I included soil analyses and other research done on my own time. I have not visited the Santa Susana Field Laboratory site. Some observations: 1) A. brauntonii plants cannot be moved from one location to another without destroying the plants. 2) A. brauntonii depend on long-lived seed banks for survival. 3) Harvesting A. brauntonii seeds to plant them in a different location means that the seeds must be planted in a specific soil structure and soil chemical profile if the seeds are to germinate, the plants to mature successfully, and then to establish a resident population. Soil disturbance or soil removal at Area IV might well destroy the resident populations and seedbank of A. brauntonii. Since these reported occurrences are at the northern limit of known A. brauntonii populations, they are of great interest scientifically, especially in a time of climate change. For your information, A. brauntonii grows only in eastern Ventura County, the Santa Monica Mountains and one location in the San Gabriel Mountains (Los Angeles County), and in Gypsum and Coal Canyons in the northern Santa Ana Mountains (Orange County). It is a southern California endemic. Obviously the removal of topsoil would adversely impact other native plants dependent on long-lived seed banks as well. Severe bulldozing can adversely impact deep root systems, natural drainages, and possible vernal pool systems. Continued disturbance of topsoil, removal of topsoil and perhaps infill from unknown sources of topsoil inevitably introduce and encourage invasive weeds. I and other botanists in the Los Angeles / Santa Monica Mountains Chapter would greatly appreciate an opportunity to walk the site with Thomas Mulroy to assess its botanical resources.	DOE thanks the commentor for taking the time to organize and present the information in this comment. The information contained in this comment will be very helpful in developing impact avoidance and conservation measures. The *SSFL Area IV EIS* preparers will request a copy of the commentor's full report from FWS. If site access can be arranged within the constraints placed by ongoing activities and site policy, DOE ecologists would welcome the opportunity to walk the site with the commentor and discuss its botanical resources and conservations, especially with regard to Braunton's milk vetch.
OR-010: Martha Arguello, Physicians for Social Responsibility - Los Angeles, E-mail dated: 8/14/2008		
1	The "Alternative Four" designation for SSFL would do just that, ensuring that this polluted land is cleaned up properly. Therefore, our preference for cleanup of the site, described at http://www.etec.energy.gov/EUS/EIS.html. is "Alternative 4: Offsite Disposal of SSFL Area IV Materials" as noted at http://www.etec.energy.gov/EIS/Documents/Alternative_4.pdf.	DOE thanks the commentor. Due to the number of similar comments received regarding this concern, the commentor is referred to DOE's response in Section 3 of this document.

	Comment	*Response*
OR-011: Daniel Hirsch, Geoffrey Fettus, Rockard Delgadillo, Mary Decker, City of Los Angeles, Committee to Bridge the Gap, Natural Resources Defense Council, Letter dated: 8/14/2008		
1	1. The bulk of our comments will pertain to proposed scope outlined in the May 16 Notice of Intent. There are, however, several inaccuracies contained in the May 16 Federal Register Notice and one in particular – the description of the partial meltdown of the Sodium Reactor Experiment in 1959 – merits immediate correction before we turn to the substance of our comments. Specifically, the Federal Register notice asserts that the July 1959 reactor accident involved only melting of fuel cladding, and that, "[r]adioactive gases from the accident were contained within the facility. Over a period of two months, the gases were vented and released to the atmosphere. The controlled releases were always below those levels allowed by requirements in existence both then and today." See 73 Fed. Reg. 28438. To correct the record, the melting was not merely of the cladding, but of fuel and cladding. The overheating resulted in formation and melting of an eutectic, i.e. an alloy of the uranium fuel slugs and the stainless steel cladding that melted at a lower temperature than either would alone. Radioactive gases – and presumably particulates – were not contained within the reactor, but were intentionally purged during the accident from the core cover gas to outside the reactor, and there were also numerous high radiation levels indicating leakage. Furthermore, the facility had no containment structure, as required of modern nuclear power plants, so radioactivity that escaped the reactor vessel readily reached the environment. The intentional venting over the next two months to the atmosphere may well have included not just the gaseous radionuclides. And there is substantial question about the claim that the releases were controlled and that they were always below levels allowed by regulations in effect then or now. The levels were so high that the monitors went off-scale during the accident and there is thus no way to reliably make such a claim. The statements made in the Federal Register Notice about this serious accident are in error. We also find it puzzling that these statements are asserted in a Notice of Intent to Prepare an EIS, as they appear to prejudge significant matters that are properly the domain of what will presumably be a critical environmental analysis EIS that has not yet been prepared. Any such reinterpretation of well-established history raises troubling questions as to whether DOE intends to take a hard look, free of bias and pre-judgment, at the environmental impacts of the last several decades and its ongoing operations and cleanup of the site. The matter is important because if DOE– before even preparing the draft EIS, let alone the final EIS – is pre-determining that its activities at SSFL, including this very serious partial meltdown, resulted in no environmental releases. Such an inaccurate starting point threatens to make the "hard look" NEPA process meaningless. Furthermore, if one were to presume that that the facility allowed no radioactive airborne releases besides permissible levels of noble gases, the scope of the EIS would be impermissibly restricted to just a few potential soil spills. Of course, there were numerous other contamination events besides the SRE accident (e.g., fires in the Hot Lab, releases from burning contaminated wastes in the Sodium Burnpit, and other reactor accidents). The history of the site makes clear the potential for widespread contamination caused in part by airborne releases of materials from numerous events, including the SRE meltdown, that could result in fallout over a wide area, and which would pay no attention to artificial area boundaries, as discussed in the next section.	1. DOE must develop a more complete understanding of what happened at SSFL as a result of the partial meltdown of the SRE in 1959. The department intends to review all available documentation from the commentors' organization and others, contact former employees, review available records, and develop a more thorough history of the activities associated with Area IV. The commentors' input into that process will be appreciated.

	Comment	Response
2	2. SSFL is divided into four primary areas – Areas I, II, III, and IV – plus northern and southern buffer zones. Radioactive and chemical impacts from Area IV activities were not restricted to Area IV alone. Indeed, the McLaren-Hart study performed for Rocketdyne, under U.S. Environmental Protection Agency (EPA) oversight, found contamination had reached the Brandeis-Bardin Camp Institute and the Sage Ranch, both offsite. Monitoring performed for the site's NPDES discharge permit indicates contaminants leaving Area IV in surface runoff. For decades radioactively and chemically contaminated reactor components were burned in open pits in Area IV, with some of that contamination going airborne and falling out over a wide area. Contaminated process water, including water coming up from the ground into reactor vaults and picking up radioactivity, was run through a complex system of reservoirs, ponds, and pipes, eventually piped up to tanks outside Area IV where the water was used to quench rocket test stands after missile and rocket tests, producing huge plumes of contaminated steam that would fall out over wide areas, both on- and off-site. This same contaminated process water appears to have been used for irrigation purposes throughout SSFL. It has been recently discovered in documents obtained by the Department of Toxic Substances control that Area IV materials were taken to the burnpit in Area I and burned there, creating the potential for radioactive and/or chemical wastes from Area IV ending up in Area I, and being dispersed from there in the airborne fallout. Contaminated groundwater, surface water, and soil re-suspension and airborne releases that result in fallout of contaminated material do not "see" artificial boundary lines that may exist on a map and somehow stop their migration. Area IV activities thus have the potential to have impacted far more than Area IV – at minimum the rest of SSFL, and clearly the possibility for impacts offsite as well. Impacts of Area IV activities that extend beyond Area IV, both throughout SSFL and offsite, need to be assessed in the EIS, and remediation alternatives addressed.	2. DOE appreciates the commentors' suggestions as to which locations to investigate and mechanisms by which contamination could have migrated to areas outside the Area IV boundaries. EPA's radiological investigation includes sampling in Area IV and the Northern Undeveloped Land and following drainage features leaving Area IV as appropriate.
3	3. The EIS needs to carefully consider cumulative impacts to the environment at the site, taking into account the entire history of activities. Such a searching analysis must include but are not limited to the following: the cumulative impacts and risks from both radioactive and chemical contaminants from Area IV and the other Areas at the site; and impacts and risks from all environmental media and pathways (these should include analyses for impacts and risks related to surface soil and deeper soil contamination, surface water and groundwater contamination, vegetation, airborne contaminant releases from soil re-suspension, vapor intrusion, consumption of foodstuffs, etc.).	3. DOE agrees with the commentors; cumulative impacts of past, present, and reasonably foreseeable actions must be analyzed in compliance with NEPA and applicable guidance. An additional discussion regarding cumulative impact analysis is presented in Section 3 of this document.
4	4. In describing the entire site, the NOI notes that the Santa Susana Field Laboratory consists of Area IV, where DOE activities were primarily based; Area II, owned by NASA and operated by Boeing; Area I, part of which is owned by NASA and part by Boeing; and Area III owned by Boeing; and buffer zones. Work done on each area has contributed radioactive and/or chemical contamination to the other areas of the site. Work performed by Boeing and its predecessors on areas it owns was conducted for and under contract to various federal agencies, including DOE, NASA, and DOD divisions such as the Air Force and Navy. In describing the jurisdictional setting, the NOI goes on to note that cleanup of chemical contamination at the full SSFL site is subject to the jurisdiction of the California Department of Toxic Substances Control (DTSC) pursuant to the Resource Conservation and Recovery Act (RCRA) and state statutes, and that DOE, NASA, and Boeing are parties to a Consent Order issued by DTSC in August 2007 pursuant to RCRA and the California Health and Safety Code. The NOI notes that an Environmental Impact Report (EIR) will have to be performed related to those matters pursuant to the California Environmental Policy Act. Additionally, the full site is subject to the jurisdiction of the Los Angeles Regional Water Quality Control Board and the	4. DOE understands that many people are anxious to see cleanup activities implemented for all of SSFL. Judge Conti ordered DOE to prepare the *SSFL Area IV EIS* and publication of the Notice of Intent (NOI) began the process of complying with that order. With respect to artificially segmenting the SSFL by only preparing an EIS on Area IV, DOE only has the authority to make decisions related to the portion of the site that DOE is responsible for. Where data is available, the cumulative impacts analysis will include impacts from contaminants on other areas of SSFL and the surrounding region.

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	requirements of the site's NPDES discharge permit, which have repeatedly been violated by having contamination from the site migrate offsite in surface water releases, and cleanup of onsite contamination is required in order to prevent continued violations. Additionally, as the NOI notes, California Senate Bill 990 (SB990) was signed into law in October 2007, requiring that the cleanup of the site meet specified standards in the law and that DTSC so certify. As the NOI states, "[u]ntil this certification is completed, the land at SSFL cannot be transferred or sold." Thus, we are puzzled how the proposed scope of an EIS on this site can independently arrive at cleanup standards for chemicals in Area IV or decide what additional sampling may be needed for such chemicals, as both matters appear to be within the jurisdiction of DTSC under its RCRA authority, to which DOE is bound both by RCRA itself and the Consent Order to which it is a party. And given SB990 requirement to sum the risks from chemicals and radioactive contamination, and the authority of DTSC to address both and set up cleanup levels for both consistent with SB990's requirements, similar questions arise about the risks of artificially segmenting (and making entirely illogical) the relevant cleanup standards at the site.	
5	5. It would be particularly helpful to clarify how a DOE-run EIS dealing with radioactive and chemical cleanup related to Area IV activities can function independently of the EIR the state is to conduct on the chemical cleanup (which, clearly, is under the State's RCRA purview). Does DOE anticipate in its EIS choosing its own chemical cleanup standards and remedies? How can it do that when the RCRA power is delegated to DTSC, not DOE? How can one avoid the risk of an EIS that chooses one set of cleanup concentrations that are in conflict with those imposed by DTSC under RCRA, and to which DOE is bound also by its participation in the Consent Order? This is particularly of concern given the mismatch in schedule between the tasks in the DOE-signed Consent Order – tasks which are to be completed by 2017 – and the schedule currently proposed for the EIS and any subsequent Records of Determination. Unless significant care is taken, therefore, the EIS faces the risk of being seriously flawed by artificial segmentation. This is one site, with an array of activities undertaken by and/or for various federal entities in various areas of the site, resulting in radioactive and chemical contamination of a range of interconnected environmental media. The failure to coordinate fully and carefully with the state and meet strict, protective public health standards, given its ongoing cleanup authority and review, and with the other federal agencies whose activities contributed to the contamination of the site, and to thoroughly consider the interlocking problems associated with cleaning up all of SSFL, could be problematic and almost certain to run afoul of the law.	5. DOE agrees that the regulatory compliance process for SSFL is complicated. DOE agrees that full and careful coordination with EPA and DTSC and consideration of site complexities is especially important as the EIS proceeds.
6	6. There are some timing and sequencing matters not adequately addressed in the NOI. After initially releasing a draft Gap Analysis that proposed having DOE's EIS contractor perform additional radioactive and chemical sampling to be used in the EIS, DOE has now agreed to have EPA perform the radiological sampling. EPA is to begin with sampling for determining radioactive background levels, and then proceed to a full survey of the site itself. This will all take some time before results are available. The Draft EIS cannot be prepared until those sampling data, and additional chemical data, are finalized, as they are necessary for the analysis of impacts and remedies that is at the core of the EIS process. As to the toxic materials, DTSC is reviewing draft RCRA Facility Investigation reports (RFI) for chemical contamination, and is likely to identify needs for further work on those RFI reports and additional characterization, including potentially further sampling for background determinations. Only after RFI reports for all of SSFL are submitted, reviewed, revised as necessary with additional	6. The commentors have correctly identified many of the schedule challenges DOE faces in moving forward. It is DOE's intention to revise the schedule to incorporate several developments that were not known when the NOI was published.

	Comment	Response
	work that may be required, and finally accepted, presumably with a public comment process, will a draft Corrective Measures Study (CMS) be prepared, reviewed by DTSC, revised as necessary, made available for public input, revised further, and finalized. We don't understand the relationship between DOE's plans for an EIS and these other critical activities. The EIS process would appear to require completion of the contamination characterization and probably determination by DTSC of remedies, at minimum for the chemicals, before a draft EIS addressing impacts and remediation alternatives could be prepared. Yet the NOI speaks of issuing the Draft EIS in early 2009, just a few months from now. We note that that contemplated schedule in itself raises troubling questions about the degree to which DOE intends to faithfully follow NEPA. How can scoping comments meaningfully affect the scope of the EIS if DOE plans to issue a Draft EIS on such a complex matter merely weeks after receiving, let alone analyzing, scoping comments? Also, in the wake of the recent controversy that erupted when it was revealed that DOE had altered a critical table – the EPA PRG's – in its Gap Analysis, as well as other problems, DOE committed to revising the draft Gap Analysis, and presumably permitting review and comment of the new document. Again, this raises timing questions. We recognize that DOE now may well be contemplating a schedule different from that suggested in the NOI, but we have no idea what it may be. We believe that these timing and sequencing issues need to be addressed at the outset of this process. For example, does one not need to have in hand the results of the EPA radiation survey and the final chemical characterization that is being done under DTSC oversight before assessing impacts and selecting remedies? How can one do either without having the characterization finally completed so one knows how much contamination there is, of what kind, and where? How can DOE in an EIS determine remedies for chemical contamination, or cumulative risks from radioactivity and chemicals, be it in Area IV or including areas affected by or potentially affecting Area IV, prior to completion of the RFI and CMA processes under RCRA currently underway under DTSC authority? These issues, affecting sequencing, scope, and segmentation, and coordination of the radiological and chemical cleanup, must be addressed and done so in a fashion that complies with NEPA's "hard look" requirements.	
7	7. The proposed scope of NOI's description of the proposed alternatives for consideration in the EIS is inadequate. Under NEPA, an EIS is required to take a "hard look" at alternatives. The alternatives must be meaningful, representing the true range of real options, and they must be identified in a way that is not in fact a pre-ordained outcome. The fundamental alternatives are not included in the NOI; rather the proposed scope has detailed "non-starter" alternatives that lead automatically to one vaguely described choice, while simultaneously failing to put forth meaningful alternatives. Alternative 1 is the No Action. Alternative 2 is virtually identical to Alternative 1 – no cleanup at all – but with monitoring. Alternative 3 is undefined "onsite containment" of contamination; Alternative 4 is "offsite disposal of contaminated media"; and Alternative 5 is an unspecified combination of onsite containment and offsite disposal. Since DOE is contractually bound to clean the site up for unrestricted use, and since onsite containment isn't possible anyway, this set of alternatives is essentially meaningless. The site is to be cleaned up. The issue is to what standards. And on that central matter, the NOI is completely silent as to alternatives. The NOI, in Alternatives 3-5, says each alternative would involve containment and/or cleanup "aligned with potential future land use scenarios including, but not limited to, agricultural, residential, and open space." As written—and as read by the public—that statement clearly means that the containment or cleanup will meet standards for agricultural, residential, and open space land uses; for all practical purposes, cleaned up to whichever of those land use scenarios produces the lowest permissible remaining contaminant	7. The alternatives will be further clarified and additional scoping of the *SSFL Area IV EIS* will occur in a supplemental NOI. The alternatives will be refined and better defined as part of the subsequent scoping. One purpose of scoping is to get public input on alternatives to ensure all reasonable alternatives are evaluated. NEPA requires that DOE look at "no action" as a basis of comparison among alternatives, regardless of whether the site must be cleaned up. For each of the three action alternatives, it is DOE's intent to analyze each separately for the agricultural, residential, and open space scenarios. This analysis will be fully described in the EIS.

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	concentration.	
8	8. The devil is in the details, and those details are not identified in the NOI. In the draft "Gap Analysis," however, DOE has, on the one hand, appeared to define the agricultural land use scenario as consistent with SB990's agricultural/rural residential scenario, which in turn is based on EPA's published Preliminary Remediation Goal (PRG) table for radionuclides based on EPA's default parameters for that land use scenario. Indeed, elsewhere in the GAP Analysis, states directly it is using EPA's radiological PRGs for the agricultural scenario, using EPA's default inputs. However, as the Committee to Bridge the Gap revealed in its comments on the Gap Analysis, the PRG table actually included in the Gap Analysis had altered virtually every one of EPA's PRG values, relaxing them by orders of magnitude. DOE had apparently redefined the agricultural scenario – and the suburban residential scenario—ignoring all of the EPA default input values. DOE had removed from the agricultural scenario all of the agricultural components – removing milk, beef, poultry, eggs, and fish and 75% of the fruit and vegetables included in the EPA default assumptions. For the residential scenario, DOE had removed the backyard garden in EPA's default assumptions. At the public meetings on the Gap Analysis, DOE promised to fix these problems and use the EPA radiation PRGs and the EPA default parameters for those PRGs for a true agricultural/rural residential land use scenario. We look forward to that being the case.	8. DOE thanks the commentors. Due to the number of similar comments received regarding this concern, the commentors are referred to DOE's response in Section 3 of this document.
9	9. Even with those matters resolved – cleanup will be to the agricultural/residential land use scenario, using EPA's default assumptions for its radiological PRGs and using the EPA agricultural radiological PRGs – other matters need to be resolved in the EIS that are not identified in the NOI scope.	9. The *Draft Gap Analysis Report* does not establish cleanup levels for Area IV. Cleanup levels will be established using the EPA CERCLA process and analyzed as part of alternatives in the *SSFL Area IV EIS*.
10	10. For example, we presume, although the NOI does not so state, that the cleanup standards and guidance will follow EPA's CERCLA guidance, as required in the 1995 EPA-DOE Joint Policy on cleaning up DOE nuclear sites consistent with CERCLA, irrespective of NPL status. Thus risk, not dose, will apply; as will CERCLA's requirement to use the 10-6 risk level, and only falling back if necessary and if the nine balancing criteria are met, and then only falling back the minimum necessary.	10. DOE intends to evaluate and clean up Area IV in a manner that is consistent with CERCLA guidelines. DOE agrees that CERCLA risk, not dose, will apply. This will include application of the nine CERCLA criteria and cleanup to a point where the incidence of cancer could be increased by one additional cancer fatality for every one million people living in the vicinity of the site (i.e., a cancer risk of 0.000001 or $1x10^{-6}$).
11	11. If DOE intends to make a case for cleanup standards for particular radionuclides that exceed the EPA PRG for the agricultural/rural residential scenario using EPA's default inputs, it needs to do that in the EIS for each radionuclide.	11. DOE agrees with the commentors and will present the analysis for each radionuclide separately in the risk assessment appendices, including an assessment of the relative contribution each radionuclide makes to overall increases in risk.
12	12. Individual proposed background values and detection limits need to be fully identified and addressed in the EIS, for both radioactivity and chemicals. These need to be based on the work of the technical panel including EPA currently meeting on the radioactivity issues, and similar new values for the chemicals (as old background values for the toxic materials were based in large measure on samples taken onsite at SSFL and thus cannot be considered valid background measurements).	12. DOE agrees with the commentors. The *SSFL Area IV EIS* analysis will be based on background levels developed by EPA for radionuclides and DTSC for chemicals (metals and dioxins).
13	13. The actual choice of specific cleanup levels cannot be put off to some post-EIS nebulous process. The key decisions to be made in the EIS are the actual choice of specific cleanup values.	13. DOE is following the NEPA process in its identification and evaluation of alternatives. Under the NEPA process, DOE must evaluate a range of alternatives. The NEPA alternatives evaluation will incorporate the CERCLA nine criteria assessments that will provide the required information for the decisionmakers.

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14	14. Consideration also needs to be taken of the effect of the cleanup standards not merely on the prospective land uses of SSFL in the future, but land use—agricultural/rural residential—in nearby offsite areas. In other words, if land use just on the other side of the SSFL boundary is agricultural/rural residential, the land use on the SSFL side of the boundary is not in itself dispositive, as one must protect the people and environment a few feet on the other side of the boundary line as well.	14. The cleanup standards to be addressed in the *SSFL Area IV EIS* will consider protectiveness based on reuse of Area IV and the potential for exposure to receptors in the vicinity of Area IV.
15	15. Also, we presume the cleanup standards will be "not to exceed" levels—i.e., if one finds contamination above the cleanup level, one cleans it up. Averaging a sample location that exceeds the cleanup limit with areas that are below the limit so as to not clean up contamination found would be unacceptable. If a child playing in a backyard is exposed to elevated radiation, that should not be permitted because a few acres away there are places with radiation that is not elevated.	15. Consistent with CERCLA, DOE will address "hot spots" as part of the evaluation, so any location with elevated concentrations will be incorporated into the cleanup decision.
16	16. And when multiple contaminants are found (e.g. several radionuclides, or radionuclides and chemically toxic materials), or exposure possible through multiple pathways, the resulting individual cleanup levels need to be adjusted downward so as to assure that the cumulative risk from all contaminants and pathways is at 10-6 or as close to that level as feasible.	16. DOE agrees with the commentors and will assess human health risks posed by multiple contaminants and associated with multi-pathway exposures.
17	17. DOE has requested that we suggest language for use as the Preferred Alternative, and we do so here, along with a variant of it as a second alternative, both of which would comply with SB 990. Certain other matters (e.g., groundwater, final remedy for the Former Sodium Burnpit) that need to be addressed in the alternatives are discussed later in our comments. We believe that the Preferred Alternative in the EIS should be meeting the standards in SB990, as set forth below. Resistance to compliance with the requirements of SB990 would be counterproductive to the progress of the cleanup while entities resolve attempt to resolve the dispute. And at the end of the day, whether or not DOE believes itself subject to the terms of SB990, the site would still have to be cleaned up to SB990. Two cleanups, one to a lesser DOE standard and then thereafter to a second, more exacting cleanup performed by a private party, the landowner, makes no sense environmentally, economically, or otherwise. Although we believe DOE must comply with SB990, we also believe this issue need not be addressed in the EIS. By voluntarily choosing to comply with the cleanup standards in SB990 as the Preferred Alternative, this potential issue becomes moot. We strongly urge DOE to adopt such a course as the preferred alternative. Specific language could read as follows: Preferred Alternative Cleanup shall meet the standards and other requirements of SB990. In particular, the cumulative risk from radiological and chemical contaminants at the site shall be summed, and the land use assumption shall be either suburban residential or rural residential (agricultural), whichever produces the lower permissible residual concentration for each contaminant. In the case of radioactive contamination, the department shall use as its risk range point of departure the Preliminary Remediation Goals (PRG) issued by the Superfund Office of the United States Environmental Protection Agency in effect as of January 1, 2007. Cleanup shall aim at a cumulative cancer risk of 10-6 (one in a million) from radioactive and chemical contaminants together; however, if well established background levels or the best detection limits reasonable exceed the 10-6 value, the cleanup level for that contaminant will not be set below those background levels or detection limits. In practical effect, this alternative would involve setting the cleanup level for individual radioactive contaminants at the greater of the following: the EPA published agricultural default PRG for radioactivity, background, or the detection limit. For chemicals, for which EPA has not published agricultural default PRGs, 10-6 values for individual contaminants will be calculated using the same default assumptions upon which EPA based its default	17. DOE appreciates the effort that went into defining an alternative that would meet the requirements of SB 990. That alternative will be evaluated in the *SSFL Area IV EIS* along with other alternatives that had already been identified.

	Comment	Response
	agricultural/radiological PRGs, and the cleanup level will be the greater of the 10-6 level, background, or the detection limit. When multiple contaminants are present, the "sum of the fractions" rule will be employed to adjust downward individual cleanup levels so as to maintain acceptable aggregate risk, but in no case will cleanup below background or detection limits be required. For chemicals, hazards in addition to cancer will also be considered. The background levels and detection limits for radioactivity shall be those established by EPA in its background radiation study for the site being prepared pursuant to the 2008 Inter-Agency Agreement with DOE and in conjunction with the Technical Working Group on those matters convened by DTSC. Similar processes involving the community will be used to establish detection limits and background values for chemicals via measurements in appropriate offsite locations. The proposed background and detection limits, and the basis for them, are include in Tables __ and Appendix __ of the Draft EIS, for public review and comment. The land use scenarios used in establishing cleanup criteria will be, as indicated above, the rural residential (agricultural) scenario and the residential (suburban residential), whichever produces the lowest concentration for permissible exposure for the contaminant in question. In defining each scenario, the EPA default assumptions used in its radiological PRGs for those scenarios will be employed. The cleanup levels will be "not to exceed levels," i.e., if contamination is found above that level, it will be cleaned up. Averaging with less contaminated sample locations will not be permitted. Variant 1: Same as the Preferred Alternative, but with the following additional provision: Cleanup shall aim for a cumulative cancer risk of 10-6 (one in a million) from radioactive and chemical contaminants together; however based on the nine CERCLA balancing criteria, if necessary for a particular contaminant, the cleanup level may fall back from 10-6, but only the minimum degree necessary and in no case resulting in a cumulative risk greater than 10-4. Cleanup below background levels or detection limit will not be required. The contaminants for which the Department is proposing falling back from the primary cleanup standard (the 10-6 level, background, or the detection limit, whichever is greater) are identified in Table ___ of the Draft EIS, including the proposed cleanup level and associated estimated risk. The analysis of the nine balancing criteria to justify the proposed fallback is found in Appendix ___.	
18	18. Groundwater: Characterization of groundwater contamination and contemplated remedies need to be addressed in depth. At present there is ambiguity as to whether EPA's radiation monitoring work is to include groundwater. We believe it must. We also are concerned about the practice over two decades of filtering water samples, which reduces the measured value in the filtered water, and of not saving and measuring the filter. Measurements over a number of quarters are needed of water either without filtering or with adding the contamination found in the filtered water to the amount found on the filter. Resolution of the tritium plume and the numerous gross alpha exceedances that have been reported even with filtering needs to occur. And thorough review of how to remediate the chemical and radioactive contamination found in the groundwater needs to be undertaken in the EIS.	18. DOE agrees that additional characterization of groundwater is needed to support evaluation of the various cleanup alternatives that will be analyzed in the *SSFL Area IV EIS*. DOE is aware that EPA plans to sample groundwater, but the department does not know the details of that planned effort.
19	19. Sodium Burnpit: The sodium burnpit, in which radioactively and chemically contaminated sodium-coated reactor components were, in violation of the requirements in place at the time, burned/reacted in water-filled pits, resulted in extensive contamination of the burnpit and surrounding areas. An "interim remedy" was undertaken a decade ago, removing some soil and replacing with nearby soil, but leaving the contamination in the fractures in the bedrock beneath the soil to be addressed in a final remedy later. That contamination can continue to migrate into the groundwater, exacerbating its pollution. That final remedy needs to be considered in the EIS.	19. DOE agrees with the commentors. Alternatives for accomplishing a final remedy for the Sodium Burn Pit, among other Area IV locations, will be analyzed in the *SSFL Area IV EIS*.

	Comment	Response
20	20. Area IV Landfill: Given that radioactively and chemically contaminated wastes ended up being burned in the Sodium Burnpit when not supposed to be, as discussed above, there is a similar concern that such wastes could have ended up in the Area IV landfill. The landfill rests above a ravine that drains into Simi. Remedy for the landfill problem –including possible exhumation – needs to be considered, particularly in light of how difficult it would be to adequately characterize it. If radioactive wastes are buried here and there in it, the likelihood of a probe finding it may be small, but the problem posed may be large.	20. DOE agrees that sampling is needed to characterize the Area IV landfill (also known as the Building 56 landfill), including the debris field extending downslope of the location. If sampling indicates that contamination remains in the landfill, then the *SSFL Area IV EIS* will evaluate alternatives for reducing the risks associated with that contamination.
21	21. Contaminated Process Water Pathways: Contaminated water was pumped into a complex system of reservoirs, tanks and piping and used for a variety of purposes across the property—irrigation, quenching rocket test stands, etc. The impacts and necessary remedies for those impacts, given the prospect of spreading contamination well away from the initial area in which the water was contaminated, need to be addressed.	21. DOE will conduct an assessment of the water distribution system related to Area IV and ponds in other areas receiving this water.
22	22. Characterization and Disposal of Wastes: The NOI asserts in its description of its proposed alternatives that radiological wastes would go to "an approved, out of state disposal facility" and "non-radiological" wastes would go to "approved disposal or treatment facilities." The NOI does not define "radiological," "approved," or "treatment." Approved by whom? Does one mean a "low-level" radioactive waste (LLRW) disposal facility licensed under 10CFR61? Or merely approved by the project proponent, DOE, even if not licensed to take radioactive wastes? SSFL has a troubled history of calling radiologically contaminated wastes "non-radiological wastes" and sending them to local municipal landfills neither licensed nor designed for radioactive wastes, or sometimes chemical waste dumps also not licensed or designed for such radwaste. And what is meant by "treatment"? The use of the "Tennessee loophole" by which wastes are sent there and end up in local garbage dumps not licensed for radioactive waste? Furthermore, how would wastes be characterized as "radiological"? In the past, DOE has tried to claim wastes that had added radioactivity (i.e., contamination) were not radioactive waste and could be sent to schools, farms, children's zoos, etc. This matter must be addressed directly, and any wastes with measurable added radioactivity need to go to licensed LLRW or mixed waste disposal sites.	22. Waste from cleanup and decommissioning of Area IV is expected to include soil, unusable equipment, unusable supplies, and building debris. Consistent with current practice, building debris and soil would be sampled for radiological constituents by the site operator, DOE, and regulatory agencies such as the California Department of Health Services. DOE expects to ship hazardous and non-hazardous wastes off site for appropriate treatment and disposal to facilities that are permitted under RCRA regulations. In the past, DOE has shipped hazardous and non-hazardous wastes to permitted California landfills. DOE will ensure that all radioactive waste will be shipped to a lisenced low level radioactive, hazardous, or mixed waste disposal facility. The Draft EIS will contain a full discussion and analysis of all disposal options.
23	23. Negotiations Between the State, Boeing, and Community Representatives: As you know, under the auspices of the Secretary of Cal-EPA, negotiations have been underway for a number of months between Boeing, the State, and community representatives on a global resolution of cleanup issues. DOE, U.S. EPA, and NASA have been attending as well. One of the most productive things DOE could do in its NEPA process is to participate actively and cooperate thoroughly with efforts to reach this overall agreement, go along with what is reached between the primary parties, and get this long controversy behind us.	23. DOE has and will continue to participate in these discussions. The department shares the commentors' expressed desire to strive for agreement to analyze alternatives through the deliberative EIS process interactively involving all stakeholders. It should also be noted that DOE owns no land at SSFL, but only leases land. Additionally, DOE only has the authority to make decisions related to the portion of the site that DOE is responsible for.
24	24. CERCLA and ESA: The EIS should include having DOE live up to the 1995 Joint Policy and thus following EPA CERCLA guidance for the cleanup. The site is zoned RA, residential agriculture, and under CERCLA guidance should thus be cleaned up to that land use scenario, as close to 10-6 as possible. This would in essence follow SB990, but on an independent basis.	24. DOE is committed to complying with the 1995 Joint Policy Guidance as well as EPA CERCLA guidance for the cleanup. It should be noted that CERCLA guidance requires that a site be cleaned up to the most likely future land use and not, as the commentors suggest, to the existing zoning. In any case, decisionmaking leading up to the implementation of the cleanup will follow the requirements outlined under NEPA. Committing to any particular outcome of the NEPA decision process would be a violation of the federal agency's obligations under that law.

	Comment	Response
25	25. Additionally, the EIS should include careful consideration of ESA matters, including protection of endangered and threatened species.	25. The *SSFL Area IV EIS* will include careful consideration of the effects of the project on listed and proposed endangered and threatened species and their habitats in compliance with the ESA. The EIS will include identification of measures to avoid, minimize, or compensate for impacts on these species, thereby protecting endangered and threatened species.
26	26. Compliance with Regulations and Statutes: The NOI contains a puzzling passage in describing how it will present alternatives. It says it will discuss "whether legislation or regulatory modifications may be needed to implement the alternative under consideration." In general, we believe DOE should be complying with regulation and statute, not proposing alternatives that would violate them. And when statute exists, such as SB990, rather than considering ways to resist it, it should choose to clean the site up according to its standards, as a matter of policy if for no other reason, but also as a way of avoiding ending up in court over refusing to comply with applicable law.	26. DOE will comply with all applicable state and federal laws.
27	27. Thorough Consideration of Offsite Impacts: The facility is located on a hilltop, so contamination on the property "wants" to move offsite, via wind and water, to the areas below. Those areas are populated, in part with rural residential uses, and whatever land use one assumes on top of the hill, the people on the other side of the site boundary need to be protected as well. And the long time periods for which some of these contaminants are dangerous need to be taken into account.	27. EPA plans to investigate the extent of contamination on adjacent property originating from any of its Area IV facilities. This includes the Northern Undeveloped Land and drainages extending outward from Area IV or the Northern Undeveloped Land.
28	28. For more than half a century the federal government engaged in activities at SSFL that caused significant and lasting damage to the environment, both on- and off-site. For years, DOE has resisted full compliance with the environmental laws of the land, both federal and state. The Federal Court's careful ruling in NRDC v. DOE, WL 2349288 (Cal 2007) provides DOE the opportunity to change course, perform a thorough cleanup that protects public health and the environment in California for the long-term, and get this controversy behind it. We urge DOE to get on board; to not resist cleanup to SB990 requirements; to perform a full and thorough EIS that considers the range of impacts of its activities on all of SSFL and neighboring areas, as well as the cumulative impacts of contamination throughout SSFL; and to fully coordinate with the other entities involved so we have a thorough, comprehensive cleanup of SSFL that finally protects the public and the environment. DOE now has a chance to do it right, and we strongly urge the Department to seize that opportunity.	28. DOE thanks the commentor. DOE is committed to preparing a full and thorough EIS.
OR-012: William Bowling, ACME, E-mail dated: 8/15/2008		
1	1. The 2005 Boeing Historical Site Assessment (HSA) needs to be redone entirely with oversight of Community Members. It is crucial that former employees be contacted for interviews as they are the key to finding pollution sources.	1. There are several ongoing efforts to ensure that new information is included in the historical record as it is discovered. In addition, DOE is searching through records in its possession to ensure that they are provided to DTSC as required in the RCRA Consent Order. A part of this effort will be discussions with former employees. DOE will share information about these efforts with the interested stakeholders. As part of its Area IV radiological characterization survey, EPA will develop a new HSA.

	Comment	Response
2	2. EVERY BUILDING in AREA IV, no matter how small, large or what was conducted in that facility HAS TO BE CONSIDERED AS RADIOLOGICAL!!! We have made the mistake in the past of AREA IV building removals without oversight and the health of the surrounding neighborhoods have suffered. With only a few buildings left, each one should be looked into, historically, with a fine-tooth comb. As you may know, there are buildings built on top of slabs of former Radiological buildings. So the history of each building is key in closure. For example, you know Building 4038 as your former ETEC Offices, yet before the addition of square footage, this building was used for Nuclear Research.	2. DOE understands the commentor's concerns about the potential release of radiological contamination resulting from demolition of existing facilities. DOE believes that there is adequate information about each building to predict the potential hazards related to demolition. EPA is conducting a full radiological characterization of Area IV.
3	3. All of the former areas of operation including completed and "Clean Closed" areas of D & D need to be looked into for Chemical and Radiological Soil contamination throughout AREA IV.	3. DOE agrees with the commentor and intends to investigate all locations (including all former operating areas) within Area IV for contamination.
4	4. The Buffer Zones Southern and Northern need to be looked into as part of your Analysis as they received run-off from AREA IV.	4. EPA will investigate the Northern Buffer area and drainges leading from within Area IV.
5	5. The Buffer Zones Southern and Northern need to be looked into as part of your Analysis as they received run-off from AREA IV. These areas need to be cleaned up to Senate Bill 990 Standards…It is the law. The AREA IV Borrow pit is a large concern as it was also used as a return pit or dumping ground. This area and all roads leading up to it need to be sampled and cleaned up to SB 990 Standards. The Former Sodium Disposal Facility or AREA IV Burn Pit needs to be re-evaluated and cleaned up to SB 990 Standards.	5. EPA will investigate all of Area IV and immediately adjacent property. DOE will use this data to define the extent of contamination as part of the *SSFL Area IV EIS*. Cleanup of contamination will be consistent with the processes for alternatives evaluation as provided in CERCLA guidelines.
6	6. The groundwater can be linked to operational areas by "Fingerprinting" the sources and determining how far they have migrated, clean up until that point.	6. This comment will be considered as part of the design of the Area IV groundwater investigation needed to evaluate alternatives in the *SSFL Area IV EIS*.
7	7. The logbooks from all the AREA IV Facilities should be considered in this analysis as they are key to the incidents of every building and storage area of AREA IV.	7. DOE is conducting an extensive review of historical documentation related to Area IV operations, accidents, and incidents.
8	8. All of these are issues that need to be dealt with before and soil and/or Buildings in AREA IV is disturbed.	8. The *Draft Gap Analysis Report* presents the results of the initial review of pertintent information. The *Draft Gap Analysis Report* will be revised based upon all of the regulator and stakeholder comments. Before any soil and/or buildings in Area IV are removed the following actions need to have been completed: (1) a thorough sampling effort (done by EPA and under DTSC RCRA authority), (2) sampling in all media as recommended in the *Draft Gap Analysis Report*, (3) a CERCLA human health and ecological risk assessment, (4) a thorough analysis of alternatives for the *SSFL Area IV EIS* and a record of decision. DOE is committed to including stakeholders and regulators in each step in the process.
OR-013: Christina Walsh, cleanuprocketdyne.org, E-mail dated: 8/14/2008		
1	1. We believe that cumulative risks based on both chemical and radiological impacts to the site must be considered and the approach seems to artificially segment the impacts making them individually less significant (which previously resulted in a flawed FONSI decision according to the Northern California Superior Court decision) which would have resulted in NO FURTHER INVESTIGATION when known contamination has been migrating off-site for decades.	1. The combined effects of chemical and radiological contamination will be evaluated in the human health and the ecological risk assessments. In addition, those risks will be evaluated within the context of cumulative impacts associated with each of the cleanup alternatives in the *SSFL Area IV EIS*.

	Comment	Response
2	2. Averaging and Segmentation: The approach to identifying "gaps" should first include this primary gap of segmentation. Averaging of results over zones would also artificially lower the need for further investigation by including low and nondetects averaged with the detects found in the zone, thus resulting in an average result that might fall under the "action levels" while not paying adequate attention to the results found in those areas. These higher findings are important clues to migration pathways not previously identified. We have unexplained elevated concentrations of both chemical and radioactive contamination downgradient from the lab in all directions. The pathways followed are not adequately understood to properly apply corrective measures and therefore must be analyzed for new pathways not previously identified. Detection levels should not be explained away as anomalies. Instead, a scope of work should be developed to thoroughly investigate these issues so the unanswered questions of elevated strontium and cesium (among others), which are both fission products that resulted from the work that went on at the SSFL site, can be explained and remedied. In recent seep and springs analysis done in November of 2007, elevated strontium was identified in an offsite seep leading to Dayton Canyon. This further demonstrates a need for sitewide investigation.	2. The evaluation of data needs for the risk assessment and the calculation of risk values will be performed in a manner consistent with CERCLA guidelines for risk assessments. CERCLA risk assessments do not "average" the data. Data analysis factors an exposure point concentration that considers concentrations above the mean. It is DOE's intention to investigate the extent of contamination for radionuclides that originated from its activities within Area IV and spread to adjacent areas if the data collected identify a need for such.
3	3. Need for Sitewide investigation for proper completion of EIS Sitewide investigation is a necessary step to identifying the hazards left behind from 50 years of ultrahazardous activities. Radiological investigation of all 4 operational areas as well as the buffer zones to the north and south of the site must be included due to previous findings of radiological contaminants that have migrated from their origin at the site. Borrow areas for soil backfilling operations have been used resulting in "moved" soils from area to area and across property boundary lines. This requires close investigation to understand possibly buried or covered surface soils and debris as these activities have been documented in historical reports. We are very concerned that the Data Gap does not acknowledge the need to investigate the entire site despite the fact that hazardous waste was moved from area to area, including areas outside of Area IV.	3. DOE thanks the commentor. Due to the number of similar comments received regarding this concern, the commentor is referred to DOE's response in Section 3 of this document.
4	4. While the responsibility for the impacts of rocket-test operations lie with Boeing, NASA and related entities as described, such as the Department of Defense, the investigation of how chemical and radiological impacts from DOE operations and how they occurred in concert with rocket-test operations and how facilities with common features were shared should be explored. It is crucial that all chemical and radiological impacts are properly identified for corrective measures as necessary to meet State Law requirements as set forth in SB 990.	4. DOE is following the NEPA process in its identification and evaluation of alternatives. DOE will evaluate chemical and radiological impacts and cumulative impacts as mandated by the NEPA process. Included in the evaluation will be an agricultural scenario. The factors that will be included within the agricultural scenario are still being defined. There are ongoing discussions between the State and responsible SSFL parties on the scope of the scenario prescribed by SB 990. How the scenario will be applied has yet to be determined.
5	5. Data Gap Analysis Methodology In the executive summary it states that more than 200 reports and more than 30000 data records were reviewed. Considering that more than 30000 rocket tests occurred at the SSFL and operations of over fifty years must be considered, these numbers are staggeringly low! Historical records should include the logbooks of every facility in Area IV as we are told by former workers that these logbooks would provide the necessary information to understand those operations, accident/event documentation and daily insight to the risks and hazards involved. Soil and groundwater impacts must be considered sitewide in order to make an accurate and responsible determination for corrective measures needed at the site. Full historical review of each building must include all former uses of the building. We have examples of buildings that were used as seemingly benign storage, were also used for contaminated laundry. The radioactive contamination resulting from these operations also emphasizes the human impact of these operations, and how contaminants	5. The purpose of *Draft Gap Analysis Report* was not to reconstruct the history of the site (to develop a comprehensive understanding of all historical operations and incidents/ accidents). It was developed to: 1) determine the necessary data to prepare the human health and ecological risk assessments and the *SSFL Area IV EIS*, 2) establish data quality objectives for the necessary data, 3) evaluate the existing data to see if it is of sufficient quality to use moving forward, and 4) recommend additional sampling needed to develop a complete data set that will support moving forward. Logbooks tell an important story regarding historical operations – but are not relevant to the purpose of the *Draft Gap Analysis Report*. The approach being taken by DOE is to

	Comment	Response
	may have been carried home to their families by employees who's clothing had become contaminated. This also emphasizes the risk of causing further impacts to ecological receptors from wind and rain moving the contaminants from the top of "The Hill" down to the people below. This should be looked at from the facility outward until a true delineation of the COI impacts of each. It is especially important to emphasize in the northern buffer zone(s) which is not adequately shown to be targeted for sampling. These areas are extremely steep and filled with seeps and springs that have not been adequately identified.	determine the quantity of contamination to clean up and the process for cleaning it up. However, DOE is also conducting efforts to more fully understand all historical operations and plans to review as many logbooks as possible, in addition to interviewing former workers.
6	6. Sitewide approach necessary to find all impacts in need of remediation In addition to all the historical maps submitted under cleanuprocketdyne.org's comments on the EIS Scoping Alternatives (please consider each of the maps in HDSME00000001.pdf of the historical documents provided) as additional proven evidence that operational boundaries did not necessarily apply to the contaminants derived from those operations. Another example that illustrates that the workers went beyond the operational boundaries to: work, park their car, and ate lunch in various areas outside of Area IV. For example, there was "Goldie's Lunch Shack" at the Bowl Area in Area I which is also considered to be part of ETEC in looking at the ETEC brochure and the even in the map as recent as 1980 indicates this to be true. "Goldie's Lunch Shack" was a permanent structure that was open daily during operations for meal support for the site due to it's remote location according to Rocketdyne1 a published historical book on the site. 1 Rocketdyne By Robert S. Kraemer, Vince Wheelock, American Institute of Aeronautics and Astronautics and published by AIAA which is self-titled the "World's Forum for Aerospace Leadership	6. DOE appreciates the commentor bringing this information to the department's attention. Each of the documents mentioned in this comment will be considered during the revision of the *Draft Gap Analysis Report* and the development of the *SSFL Area IV EIS*.
7	7. The discussion on the evaluation and suitability of the radionuclide data makes a statement (Para. 3, page E-2) "…under principles stated in the Multi-Agency Radiation Survey and Site Investigation Manual. " This leaves the impression that only certain principles and sections of the manual were applied. The Data Gap Report should be modified to include an affirmative statement that all guiding principles of MARSSIM are being applied to the EIS reporting process.	7. DOE agrees that MARSSIM provides valuable guidance for this project. It should be noted that MARSSIM was developed to assure decisionmakers that a site has been cleaned up and can be released for its intended reuse. It is less helpful in evaluating cleanup alternatives.
8	8. According to MARSSIM the absence of radioactive contamination can be demonstrated by: (1) documenting the amounts, kinds and uses of radionuclides as well as the processes involved; More specifically, process knowledge and the nature of the use that either no or immeasurable quantities of radioactive material remain onsite—whether on surfaces, buried, imbedded, submersed, or dissolved. The submittal to the regulatory authority should include possession history, use of the radioactive materials, and, where applicable, results of all leak tests throughout the operational history of the site. Buried radioactive contamination There have been numerous documented and undocumented burials of contaminated waste, equipment and debris in onsite landfills that were neither designed for such storage, nor were they lined to prevent migration of the contaminants. There have been some failed attempts to find buried debris have occurred over the years. Part of the Data Gap must include a real effort to locate and identify all buried debris. Therefore the Gamma Walkover Survey must be enhanced to include a detailed thorough search for alpha and beta emitters as well. This is part of the MARSSIM process and should be implemented here.	8. It is not possible for a gamma walkover survey to identify alpha and beta emissions from radionuclides in soil. Often these emitters are collocated with radionuclides that emit gamma radiation. Soil sampling is required to identify the alpha- and beta-emitting radionuclides. EPA now has the lead in conducting the radionuclide investigation of Area IV. It is expected that EPA will base its study on the principles of MARSSIM.

	Comment	Response
9	9. Data Gap Study Results It is stated that the GIS database was queried to determine what chemicals and radionuclides had been detected in Area IV as well as the frequency of detection and the number of samples exceeding the PRG, MCL, and ESL screening criteria. This is a flawed approach as many radionuclides were either never sampled for, or rarely sampled for based on an argument that they didn't need to look. Example: finding of tritium in 1989, only after the insistence by USEPA [Dempsey] that sampling for tritium was necessary. They found tritium despite the arguments that there was no need to look. The query of a database where insufficient sampling has been done historically would then give you an artificially low result of findings that the Data Gap approach stated will further compound the lack of sampling with a lack of a need to look further. This is not the purpose of a data-gap approach. In order to find all the potentially missing data so that all radioactive contamination may be identified, the full library of COIs according to USEPA and CDPH that have been specifically defined for the SSFL must be used here as well. Removal of any data using an arbitrary number such as 20 samples for frequency of detection comparison is inappropriate due to the past practices of lacking sampling programs for certain COIs and therefore inappropriate.	9. The data queries performed as part of the data gap analyses were not done to remove data; they were done to: 1) see what data (analytes) had been looked for in the past, 2) determine whether insufficient samples had been collected, and 3) determine whether prior investigations may have missed some analytes that should have been looked for. In the *Draft Gap Analysis Report*, analysts recommend an expansion of the analyte list, not a reduction. DOE agrees that sampling and surveys should investigate for the presence of all COCs.
10	10. Soil – Delineation of soil contamination must move outward to buffer zone(s) and off-site locations where deemed appropriate based on the unique geologic properties of the formation below, the steep down-gradient terrain leading to a children's camp as well as looming housing developments nearby. This should be reflected in all maps included in the report.	10. DOE intends to investigate the extent of contamination on adjacent property that originated from a DOE facility within Area IV. The EPA radiological investigation will also include the Northern Undeveloped Land.
11	11. Gamma Walkover Survey - Walkover Survey should be supplemented by an effort to identify alpha and beta emitters as well and should use instrumentation and equipment and procedural guidelines based on CDPH and USEPA recommendations. Survey procedures as written by CDPH for the recent Area 1 Burnpit RAD screening should be applied here, to include specifications of walking speed, distance to ground, as well as grid design.	11. DOE thanks the commentor. Due to the number of similar comments received regarding this concern, the commentor is referred to DOE's response in Section 3 of this document. DOE recommends that the commentor discuss this concern with EPA personnel while they design the survey.
12	12. We are very concerned to see that the claim of "100% Gamma Walk-over Survey states in section E-5 that "Nearly 100% of the accessible portions of Area IV have been subject to some level of ground survey in support of building removals…" It further states that the recommendation is for a 100% walkover of all areas that lack MARSSIM compliant surveys. In one sentence it states that nearly the entire site has been surveyed and then goes on to state that only 9 acres were actually MARSSIM compliant. Statements by USEPA and CDPH have been made, claiming prior surveys were not done adequately or with the right equipment or protocols, so all areas must be re-done under current protocols with USEPA and CDPH recommended equipment using all the data available than that which was referenced to make decisions on "impacted areas" in the past. 100% in this context is taken to mean 100% of the site by the public, and that is very different from 100% of the portions of the site that are deemed by DOE to be impacted. The fact that DOE prior assessment of the site resulted in a FONSI decision further illustrates the potential bias in this process.	12. The *Draft Gap Analysis Report* states that while nearly all of Area IV has been subjected to a gamma walkover survey at one time or another, only nine acres received MARSSIM-compliant surveys. That is the basis for the *Draft Gap Analysis Report*'s recommendation that Area IV (not just impacted areas) receive a new gamma walkover survey. EPA has the lead for performing this survey.
13	13. Groundwater - Site Conceptual Model submitted to DTSC has been rejected based on the fact that the retardation and dispersion theories have not been adequately demonstrated with site-derived data. Recent hydrologic tests should be analyzed in this process to help determine aquifer connection based on reactions to recent core-hole pump tests.	13. DOE agrees that additional groundwater hydrogeologic characterization work is warranted for Area IV.

	Comment	Response
14	14. Groundwater Seeps have not been adequately identified specifically in the northern buffer zone(s). This step of identification of seeps should be further investigated to give a more complete look at these migration pathways for contaminants coming off the hill. The statements made in this section of the gap analysis leave the reader believing that groundwater seeps will only be investigated if there is adequate water for sampling. This is a crucial step that must be scheduled based on rain events and not driven by a reporting schedule. We have had rain each and every year so there is no legitimate excuse for lacking data except that no priority has been put on this sampling. This is one of the primary drivers to better understanding the impacts to the surrounding communities below. A sampling work plan should be implemented with scheduling directly related to rain events of the coming season. This must be considered a significant gap that must be resolved in the EIS process.	14. DOE agrees that the current data are inadequate to understand the role of seeps in providing a migration pathway for contamination. In the *Draft Gap Analysis Report*, the analysts recommend further investigation of seeps. DOE will provide to EPA the commentor's suggestions regarding investigating seeps in the Northern Undeveloped Land and developing a sampling plan that relates to sampling during rain events.
15	15. Soil Vapor – SV testing is extremely useful in determining the impacts of shallow groundwater contamination as well providing better insight to the flow of the shallow vs. deep aquifers below the site. Soil vapor sampling using EPA specified sampling density grids will help identify areas that are currently less understood due to lacking historical records. Especially in areas such as the road leading from The Old Conservation Yard (OCY) to well RD56a and RD56b that is pictured here with what appears to be hundreds of barrels and containers of waste (which was the purpose of the OCY), but in this case, it is shown that the storage of the barrels of waste went beyond the property boundary and that of the operational area of the facility. This road leads to Areas II and III and therefore further supports the need for site-wide investigation that is not limited to Area IV.	15. Soil vapor sampling is being performed in Area IV under the RCRA Facility Investigation with DTSC oversight. DOE appreciates the submission of the photograph documenting the location and operation of the Old Conservation Yard (OCY).
16	16. Surface Water impacts that have not been adequately addressed, and are illustrated here based on these storage areas not adequately addressed in the gap analysis. It is stated in the Surface Water summary that NPDES monitoring is "deemed sufficient" however recent submissions from the public have resulted in new sampling being necessary because of missed drainages that were not captured under the NPDES monitoring program. Specifically, the Building 56 Landfill and Excavation area which is a connection to groundwater is considered a data gap by the monitoring program and therefore new sampling points have been suggested to support outfall 7 as well as outfalls 5 and 6 from the Sodium Burnpit and ESADA portions of Area IV that are missed. This must also be considered a significant data gap here. Effluent drainage from Building 100 is also not adequately captured and this housed several reactors in addition to the computerized tomography equipment that is considered to be the largest in the world. Reviewing recent EECA reports identifying these areas as non-radiological despite their nuclear operational history must also be considered significant data gaps. The data collected from the sampling in response to Watercode 13383 in the following document: http://cleanuprocketdyne.org/documents/Waterboard/OrderWateCode13383.pdf Please consider this data in the gap analysis and additional sampling to properly identify missed drainages in the area, including many seeps and springs that may have not been identified. The lower portion and road leading to the left in the photograph shown below, of the Old Conservation Yard in Area IV, leads to RD56a and based on the rock formations on the lower right, the waste storage went far beyond the intended boundaries of the facility. This is also a very steep hillside leading down to the Brandeis Bardin Camp. Please note that RD56a is placed outside of Area IV. Under Media Evaluated (Table ES-1), it is acknowledged that there are gaps in building surface data and that additional data is required to assess human health risks. In addition, photographic data to document effluent pipes and other important features prior to demolition of any more buildings on the site, would lead to more efficient evaluation of the contamination to be found. By understanding where the pipes were, we can	16. DOE agrees with the commentor's suggestion that additional surface water and sediment data are needed. The *Draft Gap Analysis Report*, recommends collection of additional data within Area IV and adjacent areas. Specific suggestions made by the commentor will be considered during development of the sampling plan.

	Comment	Response
	then have a better idea as to where leaks may have occurred since the HSA (Historical Site Assessment) was not adequately reviewed for this data gap analysis. Data presented in the Group 6 report of the RCRA Facility Investigation indicates that pipes led from the SRE scrubbers to the SRE pond for release and was distributed to the reclaimed water system in some cases. This describes many points of failure when considering pipe leaks that occurred. The SAIC 1991 Technical Enforcement document states many examples of leaks from USTs and ASTs as well as pipe distribution systems that sometimes went unchecked for more than a year. These are examples that emphasize the importance for an accurate visual picture of each facility, supporting storage and tanks and distribution systems and how the facility supported or interacted with the operations of other facilities across the site including wastewater storage ponds like the R2 and Silvernale.	
17	17. Air - It is astonishing to see that air is not considered to be a data gap. In just recent weeks I was reminded of the 2005 fire that swept across the site and burned several "out buildings" We have seen from the photographs shown on the news and online that the fire burned across Area IV, right up to the boundary of Building 55 (the Nuclear Materials Building, which is somehow not considered radiological on the EECA map shown last year). There have been concerns by firefighters who fought the blaze as to what they might have been exposed to, and they were told that no information was available. This must be considered a data gap and should be investigated accordingly. The 2005 brush fire as well as regular fire events that occurred at the site must be considered to be extraordinary in nature with much higher potential for risk to the public and therefore all ambient air data must be provided for all fire events and should also include data for weeks following each event to follow the change in air quality and smoke impacts which may contain these radioactive elements due to the burning of potentially contaminated vegetation.	17. The air data gap conclusion is based on operational data needs, not an air quality analysis of infrequent fire events.
18	18. Sediment – Internal drainages should be considered a data gap especially since so much effort has been put on removing internal compliance points which has resulted in a further lack of data. Sampling should include deeper sampling where sediment meets bedrock, going 5-10ft bgs. There is lacking data to understand the stratus of the strike and dip geology and how migration to these sediment drainages specifically to the north of the site should be investigated further. In a recent YouTube short film published under the title "Corrupted Nature" by Brigham Maher, testimony was shown regarding the lacking equipment and expertise for monitoring of radionuclides by Ventura County which we also see in the responses by Ventura County post 2005 fire when at the October Workgroup Meeting (10/05) a representative from Ventura County AQMD testified that it was really just a courtesy call because they "…don't have the ability to monitor up there." This emphasized the importance of adequate monitoring that should be made available for review in this important process where these primary decisions are being considered – what to do moving forward. We would encourage you to review all 33 episodes of the "Corrupted Nature" series because it shows the communities concerns but also provides first-hand accounts by former workers who are telling us what happened and what to look for (episode 29). We hear about buried waste, we know about undocumented landfills such as the one just to the south of Coca that we have identified to representatives of Boeing, NASA, and DOE. We learned of this area from first-hand accounts from former workers pointing at a map and talking about how they got there from the front gate. They spoke of moving from area to area, as well as of burying contaminated equipment and debris which was also discussed in the NIOSH hearings held in Simi Valley so we know that it did at least occur some of the time because we have many personal stories that support this claim and many more that	18. In the *Draft Gap Analysis Report*, the analysts recognize that additional sediment data are needed from internal drainages. DOE thanks the commentor for providing this information.

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	are shown in the interviews of neighbors and former workers of the site on "Corrupted Nature." The testimony provided in the Cappello-Noel trial (Lawrence O'Connor v Boeing), included testimony of the firefighters that worked at the site who handled the Burn pit operations and spoke of out-of-control quantities of reactive and very dangerous materials. Discussion in the litigation transcripts regarding the Ultra-Hazardous Activity Doctrine which we believe applies here, also supports and acknowledges the many years of operations where the greatest care was not taken, at least not in the case of where to put the waste. We must move forward now with a lvel of caution and standard appropriate with this known information. Historical photographs of the OCY were provided by Mr. Dan Kurowski through discussions with his widow (he was a former worker who spent many years at the SSFL). Mr. Kurowski's application for the Energy Workers Radiation Compensation Act was denied, stating that his dose was too low despite the fact that a co-worker (last name - Waco) died of acute radiation exposure from an accident where one of the casks exploded (referred to as pigs by the employees) where Mr. Kurowski was standing nearby. He also made claims that he observed a deer drinking from the Silvernale Pond, then staggering just a few feet and dying. Part of his job based on instructions from his supervisor at the time, included packaging up the deer and other wildlife specimens for shipment and analysis. Mr. Kurowski died of cancer but his records, application and narrative information is a valuable resource that should be thoroughly reviewed in this process to help gain better insight to the practices that went on at the time and to hopefully preclude others from his fate.	
19	19. California Radioactive Materials Regulations As an Agreement State under the provisions of the Atomic Energy Act, CDPH has oversight authority of the cleanup of radioactive materials. Cleanup and release of facilities with radioactively contaminated materials must be performed in accordance with California regulatory standards. The DOE must consider these standards as part of the decontamination and decommissioning of Area IV facilities. The DOE must therefore make an affirmative statement on the DOE's intent to follow SB990 standards, which are specifically the standards set forth by the State of California. Associated drainages to Area IV must include all drainages site-wide, leading from the site to the surrounding communities in all directions regardless of operational area. Faults that extend across the site, extend beyond these property boundaries and also act as migration pathways that emphasize the potential risk for cross-contamination from area to area.	19. The Atomic Energy Act Agreement between the State of California and the United States does not allow for regulatory jurisdiction by the State over source, byproduct and special nuclear materials that are the responsibility of the U.S. Department of Energy. DOE will consider California standards as part of its decontamination and decommissioning of SSFL Area IV facilities.
20	20. Senate Bill 990 Consideration An affirmative statement on the intent to follow standards set forth based on SB990 should be included and should specifically use the PRG table as defined by USEPA with out alteration. This statement should not only include EIS evaluation of rural residential risk assessment, but also include assurances that every effort will be made to use the lowest scientifically available detection limits, and chemical analysis processes as recommended by USEPA and CDPH as necessary to get the best possible information on the more difficult radioisotopes such as strontium 90. This needs to include higher counting time for sample analysis and prior agreement on how to deal with non-detects within this process. Input parameters should not be adjusted to reduce the ecological receptor risk based on consumption of homegrown fruits, vegetables and animals for meat and dairy products.	20. DOE is following the NEPA process in its identification and evaluation of alternatives. Under the NEPA process, DOE must evaluate a range of alternatives. An agricultural scenario will be included within the evaluation. The factors that will be included within the agricultural scenario are still being defined. There are ongoing discussions between the State, DOE, NASA and Boeing on the scope of the scenario prescribed by SB 990. How the scenario will be applied has yet to be determined. DOE recognizes that there is ongoing work concerning background levels and associated detection limits. It is DOE's intention to use the work of the EPA-led Background Workgroup for the radiological background study in terms of the lowest scientifically available detection limits and how to deal with non-detects. The information produced by EPA will be used in the risk

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		assessments and the evaluation of alternatives for the SSFL Area IV EIS.
21	21. In addition to community concerns about prior shipments offsite for disposal, we are also concerned about the level of documented disposal information. We have seen photographs on GoogleEarth that show what appears to be several trucks moving down the road in the buffer zone (south). We have also seen photographs last February that indicate what appears to be trucks on the Chesebro Fire Road that leads to the Calabasas Landfill back entrance. In our last visit to see the burnpit in Area 1 where we were accompanied by Blythe Jameson and Art Lenox as well as Gerard Abrams and Laura Rainey of DTSC when a panel truck drove up from the Bell Canyon entrance to the south. There is documentation about onsite disposal and burial within .5 miles of the burn pit and therefore this should be investigated in the gap analysis process. Records confirm disposal to the local landfill in Calabasas including liquid hazardous waste. While we have been assured that these back roads are not an appropriate transportation route for waste disposal, we continue to see evidence to the contrary that should be further investigated.	21. There is much ongoing activity at SSFL being conducted by Boeing and NASA. All DOE activity related to Area IV was suspended in July 2007. The only ongoing work being conducted by DOE is sampling as directed by DTSC under the RCRA program. Any work currently being conducted by Boeing or NASA is being conducted with DTSC oversight.
22	22. There are concrete and soil debris piles throughout the site in all operational areas as well as in the buffer zones. It was widely known that environmental decontamination by way of decay over time, was used historically throughout the site, and therefore because these piles are not labeled, it must be assumed that they many contain radioactively contaminated materials and therefore should be sampled using the highest scrutiny using the most thorough RAD class and exposure unit protocols and sampling density.	22. DOE intends to investigate the extent of the spread of contamination to adjacent property that is related to DOE activities with Area IV. Prior to disposal, all existing debris piles are analyzed for the presence of radionuclides and hazardous chemicals.
23	23. It seems that MARSSIM survey unit size limits have been modified to reduce the sample numbers claiming that it will still be proportional to contamination potential. The purpose of the MARSSIM survey unit size limits is to avoid missing potential areas of contamination by averaging too wide an area. This is an important example that demonstrates that MARSSIM is not being adequately followed and provides a risk that the reduced sample density will result in a reduced clean-up of contamination at the site. MARSSIM guidelines are to be followed in all areas and this appears to be another example showing that this is not necessarily the case based on statements in the Data Gap Analysis Report.	23. MARSSIM was developed to assure decisionmakers that a site has been cleaned up and can be released for reuse. That is, MARSSIM principles are normally applied after cleanup. MARSSIM was not developed for a site investigation that supports cleanup alternative evaluations. Therefore, MARSSIM is being used as a guidance document, not a ruling document, for the Data Gap Analysis. MARSSIM guidelines are being followed to assist in the design of the field program to determine the nature and extent of contamination. No averaging of data was performed in applying those principles.
24	24. Aerial Dispersion/Evaporation Skyline Tanks and Sprinkler System were documented to be used for the purpose of evaporation of contaminated water. This activity resulted in spreading the contaminated water over a wide area therefore all of the SSFL property in areas 1, 2, 3 and 4 must be considered.	24. EPA will conduct a radiological survey for Area IV. Boeing and NASA will conduct radiological surveys for their properties as dictated by DTSC in the revised Consent Order. In addition, chemical surveys are being conducted over all of SSFL under DTSC direction. DOE is confident that these surveys will provide adequate opportunity to characterize the nature and extent of contamination across SSFL.
25	25. Soil Sampling Soil Sampling in the past has had challenges with adequate soil for sampling being available due to the rock outcroppings that cover so much of the site. Sampling depth should be 2-10ft bgs with an effort to go deeper when possible. Because of splits, and the number of regulatory entities interested in sample results, a special effort to increase sample size so that adequate soil material is available to analyze for all constituents of interest (COIs) using the varied processes necessary to garner those results.	25. DOE appreciates this comment confirming the proposed approach.

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26	26. Figure 1-3 - Exposure Units (EU) Boundaries drawn to divide the Area IV portion of the site into 16 exposure units create an artificial segmentation of areas of concern, which could then result in a sampling workplan that will separate areas from the operational areas they belong or are related to. If historical data is to be used, these boundaries should coincide.	26. The exposure units were developed using MARSSIM guidance, incorporating process history and existing data.
27	27. Hot Lab RIHL Building, which was removed years ago, is in exposure unit EU09 and is included with Building 55 (nuclear materials building) but the footprint of the parking lot to this facility is in EU12. The parking lot would be an important point-source for loading and unloading mishaps which did occur. It is widely known that the most likely time for spills and reactive accidents is during anytime which the material is mobilized or transferred. This facility received waste from all over the country as well as from the Canoga, and DeSoto-Rocketdyne facilities. The RIHL footprint burned in the 2005 fire spreading the contamination through the combustion of surface vegetation leading to these contaminants being spread across a wider area through resulting brush-fire smoke blowing throughout the local area.	27 .DOE assumes that the commentor is referring to Building 4020, the Hot Laboratory. The parking lot mentioned is not adjacent to the building, but is located on the other side of a street from the Hot Laboratory to the south. It is isolated from the building and was evidently used for car parking. It would not have been used for loading, unloading, or any kind of material mobilization or transfer. The facility had access from the road for transfer activities that did not involve the parking lot. The following statement from the final status survey is informative: "Minor spills resulted in low levels of contamination in the soil along the West Side of the building. Spills occurring during the transfer of radioactively contaminated water from the Liquid Waste Holdup Tank contaminated some soil near the northwest corner of that building. Possible leaks from the piping, and through the building floor, may have contaminated extensive areas of soil around and under the building. Contamination from casks stored in the Holdup Yard potentially could have contaminated the soil in that area." All of these areas are included in the Class I area surrounding the building. At the time of the fire in 2005, the facility had already been decontaminated and released for unrestricted use. Any remaining contamination that could have been dispersed by the fire would have been insignificant.
28	28. Exposure Units Segmentation and Exclusion Exposure Units exclude buffer zone areas to the north despite reassurances that these areas will be sampled. They need to be included in the primary workplan and not be treated as an after-thought.	28. DOE thanks the commentor. Due to the number of similar comments received regarding this concern, the commentor is referred to DOE's response in Section 3 of this document.
29	29. EU01 includes the Old Conservation Yard (OCY) but fails to include the lower road area previously referenced that had historical radioactive waste storage. This area must include the buffer zone portions as they are directly related to historical operations and releases of hazardous materials. In Figure 1-4 showing RAD class determinations, it shows this same area where hundreds of barrels and casks were stored as class 3, thereby recommending the lowest possible sampling quantity per acre. Figure F1-14 shows that only one sample was taken at each of these areas. The lower road area should be added to a new EU zone and perhaps the remaining buffer zone areas should be divided into two or three additional exposure unit zones.	29. The commentor suggests reclassification of some areas for the purposes of sampling and investigation. DOE will forward this comment to EPA givent that EPA will be re-evaluating the the MARSSIM classifications for Area IV. For the purposes of the Data Gap Analysis Report, the classifications were based on known historical uses of each area. The classifications noted are preliminary classifications; if additional data supports changing the classification to the next level it will be done according to MARSSIM. The northern and southern debris areas along the road leading to Area II and III as well as the North Slope debris area, including the area in the buffer zone, were classified as Class 2 Radiological Survey areas as they were disposal areas and therefore suspect even though no known radiological material was disposed in these areas. The North Slope Storage Area was classified as a Chemical Use Area, but was not classified as a Class 2 Radiological Survey Unit since there is no known use of it for storage of radioactive material. The B204 W Debris Area

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		was classified as a Chemical Use Area, but was not classified as a Class 2 Radiological Survey Unit since there is no known use of it for disposal of radioactive material but only for chemical disposal. The North Slope Storage Area and the B204 W Debris Area will be classified as Class 2 Radiological Survey Units in the revised *Draft Gap Analysis Report* as suggested by the commentor.
30	30. EU03 is the SRE facility but excludes the related hazardous waste storage facility artificially segmenting these operations HWMF Building T133 which has moved from one end of the SRE facility to the other and currently is the only standing structure remaining within the SRE complex. Downstream areas from SRE pond which had releases both downstream and through effluent pipes to other areas must be further sampled on a much tighter grid leaving no areas without samples within this facility area. The top of the road where they had "temp hot storage" historically, is excluded from this area as well, and this is inappropriate as this was some of the most hazardous materials. The delineating circles identified as North Slope Debris Areas A, B, and Storage Areas do not adequately define these areas and inadequate sampling has been shown for any determinations to be made here. Debris on this hillside has been observed by the writer to include a storage can (possibly 30 gallon size) with a very thick lid that could indicate radioactive material storage in the past and should be further reviewed and sampled for verification.	30. DOE believes that it is appropriate to separate the SRE and Building T133 into separate investigation units. This will result in a more accurate characterization as the two buildings had distinctly different functions and it is not expected that the same contaminants would be found in both units. DOE believes that the downstream drainage area from the SRE pond was appropriately classified as Class 1. The commentor is correct that the effluent pipe discharge and drainage areas should be classified as Class 1 and will be included through the extension of the EU-01 Rad Class 1-02 survey unit boundary to encompass the discharge and drainage areas. At the commentor's suggestion, DOE will change the classification of the North Slope Debris Area B and the North Slope Storage Area to Class 2. The commentor's concerns about "the top of the road where they had temp hot storage" are a bit confusing, as available documentation indicates that the Building 133 Debris Area contained construction debris. If the commentor can provide additional documentation of this area, DOE is willing to consider reclassification to Class 1 or Class 2.
31	31. EU06 includes the RMHF but the drainage where the effluent waste-water pond was formerly located before it was replaced (or enhanced) by adding a large Baker Tank for off-site disposal.	31. Based on a review of the "Characterization and Final Status Survey Report: Radioactive Materials Handling Facility Holdup Pond (Site 4614)," CABRERA Project No. 07-1002.00, March 2007, DOE believes the entire footprint of the RMHF Holdup Pond (4614) to be within the EU-06 Rad Class 1-01 Survey Unit.
32	32. Exclusion of ASTs In the example Survey Unit Delineation in Figure 1-4 there are two circles that are displayed in white which would indicate that these areas would not qualify for any of the three classifications, leaving the impression that these areas would not be sampled at all. Both of these areas are identified as NE AST 731, and SW AST 732 respectively. Above Ground Storage Tank footprints should not be excluded from sampling as this contradicts the very purpose of looking where we think contamination might reside.	32. The white areas shown inside the class area only indicate the former locations of structures that have been removed. They do not indicate that these areas are not included in a RAD Class Area. They are classified the same as the RAD Class Area in which they are located.
33	33. Figure F1-0 showing the EU01 Chemical Use Areas indicates an area identified as B204 W Debris Area. Since Building 204 is a NASA building in Area II, this demonstrates that contaminants do not follow property lines, nor to the operating and disposal practices based on this information. All areas must be included in the EIS process because they are co-mingled in both operational, disposal and remedial practices.	33. DOE will forward this comment to EPA who will be conducting the radionuclide characterization of Area IV.

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34	34. Reports Evaluated HSA has not been adequately reviewed and included in this process. Complete operational history of every building must be reviewed carefully. Buildings were moved and operational purposes changed which can both have profound impacts on the determination radiological and chemical impacts. In addition to the reports listed, SAIC 1991 Technical Enforcement document for the RFA should also be reviewed as it shows the history of many releases that don't seem to be equally documented in the HSA. Many releases were documented with lacking follow-up analysis and/or reporting. This should be considered a gap, and all findings should included supportive follow-up data as to how the release was actually handled, and final impacts reviewed. Radiological Survey of the Shipping/Receiving and Old Accelerator Area – Buildings T641 and T030 written by J.A. Chapman in 1988 should also be included in this review as it gives additional insight into the Van De Graaff Accelerator program and related tritium issues. It is also indicated in the factual perspective that there was a second Accelerator so more investigation to review all related documents that can fill in this data gap should be reviewed.	34. DOE is in the process of conducting research on historical records and Boeing is engaged in a similar activity. These records, coupled with records provided by the community, will be used to update the historical records review when the *Draft Gap Analysis Report* is revised.
35	35. Figure 2-2 Geologic Map of the Chatsworth Formation at the SSFL It is noted that the original file was obtained from MWH from the RCRA RFI Report Surficial Media Operable Unit 2004. The original indicates a known fault titled the "Delta Structure" which is deleted from this figure. This is of great concern as this is an existing fault and possibly a migration pathway for subsurface contaminants from stormwater runoff.	35. The figure used in the *Draft Gap Analysis Report* is from MWH RCRA RFI Report Surficial Media Operable Unit 2004 as footnoted. The geologic Delta Structure is not shown in the original MWH figure. However, the Delta Structure is shown in some later MWH geologic maps (e.g., Group 4 Southern Portion of Area II RCRA Facility Investigation August 2007). The structure is mapped in Area II and undeveloped land south of Area II. The structure's nearest surface trace is approximately 1,600 feet east of Area IV. Therefore, it is not expected that this feature is a migration pathway from Area IV. However, the geologic map that includes the Delta Structure that is being used in recent RFI documents will be obtained from the RFI consultant and will be included in the revised *Draft Gap Analysis Report*.
36	36. Figure 2-3 Location of Perched and Continuous Near-Surface Groundwater It is indicated on this figure that the Building 56 Landfill Excavation is filled with groundwater and has had very little sampling historically. There are also two small faults that run along the landfill area that is very steep down-gradient slope. It is documented that the SCTI Reactor Facility was deposited here, and therefore should have much higher degree of sampling here.	36. In the *Draft Gap Analysis Report*, the analysts recognize that this location still requires characterization. This includes soil sampling and the installation of a monitoring well, as there are no wells in the vicinity.
37	37. Table 2-1 SSFL Area IV Sources of Radionuclide Data Each of these listed reports are indicated as "complete" which seems to indicate they are without gaps. SAIC 1994 (final) is an example where releases were documented but inadequately identified or quantified. We have questions as to the definition of "Complete" in this context.	37. The usage of the term "complete" does not indicate that there are no data gaps. It only indicates that the study documented by the report has been completed, rather than being ongoing.
38	38. DQO Objectives It is inappropriate to alter the PRGs to be used for rural residential human health screening to include the consumption of fruits and vegetables only. Existing ranches in the area include chickens, goats and cattle. Spatial and temporal boundaries need to incorporate buffer zone areas and special attention should be given to fault areas such as around the B56 Landfill area and the Northern fault to understand migration pathways and how operational activities may have moved material to areas down-gradient from Area IV. Previous vertical efforts to find "clean" to delineate nature and extent have been incomplete. This effort should be expanded so that eventual dispersion both down and out, are more completely understood.	38. The PRGs were not altered. They were used as developed by EPA. The EPA PRG scenario includes consumption of fruits and vegetables as a default parameter. In the *Draft Gap Analysis Report*, the analysts recognize the inadequacies of the existing data and recommends collection of a significant number of new samples.

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39	39. Null Hypothesis The averaging process described here is completely inappropriate considering the high values that would be found in areas where known concentrations have been found, and averaging them with areas of non-detects would result in a false confidence level of artificially low results and therefore, all sampling should be compared to the EPA defined PRG for all constituents in the library of COIs without averaging. Background Wilcoxon Rank Sum Test should be used to determine statistical differences between the geologic formations that exist at the site and those neighboring the site in each direction, for metals and radioisotope evaluation. By understanding the statistical differences between the formations, we should be able to use distance as a consideration in that wind changes in direction and velocity must be tempered with the topographic features that will impact those directions, making it much more difficult to rely on.	39. No averaging of data was performed during the screening of data. The absolute values of all results were compared with their screening criteria to assess whether each result exceeded the criteria. The statement referenced in the comment reflects an assumption that the data were averaged and whether or not the average would exceed a criterion. PRGs are only one of the criteria for which data should be screened. Background is a relevant screening criterion, as is the ability to detect an analyte (i.e., analytical detection limit). The manner in which background data will be evaluated should be discussed with EPA and DTSC. They are conducting independent background studies for radionuclides and chemicals, respectively.
40	40. Groundwater Maximum Contaminant Levels It is inappropriate to characterize the assumption for groundwater use as drinking water as a non-starter, when Simi Valley uses a percentage of groundwater in their drinking water supply. This has been proven and therefore, should be acknowledged here as a current condition, not as a conservative assumption. Bedrock Bedrock must be demonstrated as a barrier for contaminants and the nature of the groundwater both near-surface and deeper must be better understood to make alternative evaluations in the EIS. The cracks in the bedrock including the fault system that runs across the site should be carefully evaluated as they conflict with the "barrier" premise.	40. Groundwater beneath Area IV is currently not a drinking water source. It is inappropriate to directly connect Area IV groundwater with water supply production wells located miles from the site. In the *Draft Gap Analysis Report*, the analysts recommend further investigation of Area IV bedrock to better understand the site hydrogeologic conditions.
41	41 Results of Screening for Soil COI Identification It is stated that in order "to accomplish the first data screen, pre-remediation soil data from remediated areas were removed from the dataset. Thus all data in the dataset represents soil that has not been removed from Area IV." We acknowledge that it is important to understand the current conditions of the site so that we understand how to move forward with clean-up activities. However, the removal of this information from the dataset used to determine COI identification could potentially a COI that has migrated down-gradient from it's origin and would therefore be missed in the COI investigation of other exposure units as well as potentially sitewide misses. It is important to consider the number of years that a potential COI may be been in the soil and potentially washing downstream with each rain event prior to any soil removal activities. Step Four – Assess detection frequency of data This exclusion of data due to infrequency of sampling is inappropriate, especially using 20 samples as the benchmark point of departure for being deemed infrequent. Previous findings of tritium and very infrequent sampling of many other radionuclide based on the argument that it wouldn't be found have proven to be incorrect. Because so many source areas have had inadequate sampling over the years, they would easily qualify to be over-looked because (B56 Landfill is an excellent example of this).	41. Existing pre- and post-remediation samples were considered as part of the COI review. All contaminants detected in pre-remediation samples remain COIs for the Data Gap Analysis. The tritium issue is related to its not being sampled for, not because it was eliminated as a COI due to infrequent detections. There have been thousands of samples collected since the time tritium was reported, providing a solid basis for decisions regarding the frequency of detection.
42	42. Determination of Required Number of Samples 3.6.6.1 Radionuclide Sample Number for Risk Assessment and Delineation based on MARSSIM It is inappropriate to lessen the intent of MARSSIM by stating that it is merely being used as "an analysis tool for the design of a characterization survey…" rather than as a final status survey, therefore the MARSSIM size limitations and sample density were modified. Reduction by a factor of four will result in failing to adequately identify areas in need of remediation, soil removal and other protective measures.	42. The use of MARSSIM criteria is entirely within the MARSSIM guidelines. The MARSSIM sample density recommendation is based on site process history and prior sampling results. Regardless, EPA now has the lead on the Area IV radiological investigation and DOE will observe its recommended sample density.

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43	43. Section 4 – Data Gap Analysis Results It is very troubling that so little data exists with regard to a statistical approach. Historically, samples were not consistently analyzed for the same suite of analytes so comparisons were less meaningful. Exposure land use scenarios should not be used to reduce the number of samples needed because Boeing is required to clean-up the site to SB990 which requires the use most protective clean-up standard which would be rural-residential.	43. One of the many recommendations of the *Draft Gap Analysis Report* is to collect data in a consistent manner so that risk-based alternatives can be evaluated. The use of exposure land use scenarios is consistent with the EPA CERCLA process. DOE has signed an agreement with EPA that allows DOE to use CERCLA guidance as one basis for the investigation and cleanup of Area IV.
44	44. EU1 – Our concerns for OCY as previously identified should be reiterated here. In addition, whether the barrels were stored intentionally or not, several removal activities have taken place, each with specified intent to clean up the area, and remove all cs-137 contaminated soils. Yet each time, there was still additional cesium detects that were still above recommended levels. There have been fires and storm events that have taken place over the years that would erode and expose this area and new depths due to resulting sediment erosion and migration from those events. It should be understood that the tightest sampling density should be used since the point of failures for releases here were primarily unknown and may have continued in some cases for years at a time.	44. The proposed initial sampling density is based on the historical knowledge and data that have been collected for this location.
45	45. EU2 – The NCY and Ash Pile areas include a large flat area that consists of many debris piles, many of which have vegetation growth atop making them possibly difficult to identify. Samples should be done deeper to ensure that all buried or re-configured debris and ash are properly characterized. There is much open space in this unit that appears hummocky and therefore should be sampled as class 1. Averaging is particularly ill-advised here because we know less about what we are looking for and low and non-detects could potentially average away the contamination being remediated under the guise that the average was below the DCGL. This is a concern for all exposure units described herein.	45. This comment will be considered as part of the design of the Data Gap Analysis sampling investigation, which will be conducted following EPA's investigation. The scope of EPA's investigation currently is not known.
46	46. EU3 – Hillside hot-temp storage of rad-waste is not considered here because of flaws in applied EU boundaries. Additional gaps should include the surface water concrete swale that moves stormwater runoff from operational areas of the SRE where effluent pipes were located and led from scrubbers to ponds, to below the outfall monitoring location for outfall 4. More extensive survey is needed of the pond and pipes, which led to the former location of the HWMF Building 133. Pipe footprints (influent and effluent), should include entire length of piping with step out sampling in drainages down-gradient because any leaks that might have occurred here could be identified as serious gaps that would explain more of the groundwater contamination that we already see. This should be done for the pipe system stormwater that run/ran across edge of hillside from SRE toward the OCY. Inadequate sampling for tritium should be addressed here as well. SRE Pond had a release drainage pipe leading down-gradient to the Brandeis Bardin Camp which had both controlled and uncontrolled releases. Step-out drainage sampling for this area is critical to understanding COIs specifically related to the SRE operations related to stormwater run-off.	46. Almost all of the area under discussion has already been classified as Rad Class 1 or Rad Class 2. If the phrase "hillside hot-temp storage of rad-waste" area is referring to the location of Building 133, it is already Class 1 in EU-04. The surface-water concrete swale is a recent addition and has been classified as Class 2. The pond and discharge areas are classified as Class 1 and are believed to be adequate to cover the drainage area including the pipe. The stormwater discharge pipe that ran toward the OCY is included in either Class 1 or Class 2 area, except for a short distance at the east side of EU-03. This short distance will be added to the EU-03 Rad Class 2-01 footprint in response to this comment. The former location of Building 133 (formerly known as 4724) was classified as Class 2. However, the area around this location will be reclassified as Class 1 in response to this comment.
47	47. Description of estimated releases from SRE 1959 accident in appendix B is insufficient and inaccurate. In one part of the report, it describes only the cladding as being damaged where in the HSA it states that 13 of 43 fuel elements were damaged. The estimate of release has been widely disputed by experts and therefore all deposition and testimony data from witness Arjun Makijani, which was disputed in the "Christian Report" should be included here and considered for this purpose. We believe that the most conservative and protective approach must be taken here and assume the higher estimates as proposed by the SSFL-Panel Study and [Makijani] as we are analyzing	47. The general SRE area has already been classified to the most stringent level. While the information relative to the accident may be informative, it does not dictate any changes in the scope of the sampling measures. The EU-03 Rad Class 1-01 Survey Unit will be extended to include locations of Buildings 4653, 4686, 4723, 4724, 4688, and 4695 instead of Rad Class 2 in response to this comment.

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	this data in order to propose the most comprehensive workplan to identify all COIs. If that is truly the purpose of NEPA, then we must consider all of this data as well, because it is "probable" according to many experts. The questions should be asked: If this is true, where should we look?" for each finding/conclusion in the SSFL-Panel Study. Building 4273 was used for contaminated laundry from personnel from the SRE operations where known accidents and spills occurred due to the storage and operations. Loading area should be specifically sampled using closer/tighter sample density and should be considered a gap here since the 1988 survey was inadequate. Two additional buildings are referenced in appendix B to be related to 4273, with no further information. These buildings should also be considered a gap. 4695 is where cold-trap fission impurities were stored. There were documented leaks that are not adequately identified. References to results "below allowable limits" is not sufficient for determination here. 4686 Temp Hot Storage of irradiated core components was up on the hill that is partially excluded from this EU. It is crucial that a more serious look at this operation, how storage was kept, leaks, cracks, and other migration pathways from this area down the hill, must be identified in detail.	
48	48. All plumbing contracting and operational records (for ALL exposure units) should be examined for this area to determine what other events may have transpired that would contribute to releases from Area IV facilities. These records often include narratives for scope of work, which provides insight into the purpose and intent at the time. These records should include all operational records for design and modifications of evaporation dispersion sprinkler systems in on operational areas such as Skyline, Happy Valley, EU14, 15, 16 where the Borrow area is located as well as any other open-space regions on the SSFL where sprinklers have been installed either currently or historically.	48. DOE proposes to investigate the extent of contamination related to its activities within Area IV. This includes evaluating the water distribution system related to Area IV.
49	49. EU4 HWMF is currently the only standing facility in the SRE Complex, which was "clean-closed" for one purpose, and then became a drum storage area. This area should also be more closely investigated for additional leach-fields as there were prior documents such as SAIC1994, which indicated that the location for many of these leach-fields was unknown. The open-space areas should therefore be upgraded to higher sample density and quantity for this unit and additional depth of 10-15ft bgs should be added to understand the vertical nature and extent of these areas.	49. All areas surrounding this facility are already classified as Class 1 and will receive the highest sampling density.
50	50. The Van De Graaff Accelerator with tritium-associated releases was in this EU. In addition, the factual perspective indicates that a second accelerator was in the SRE complex. More information must be reviewed to thoroughly understand this data gap. Tritium findings in figure 4-3 support this need for further investigation.	50. These areas are already classified as Rad Class 1 and will receive the highest degree for investigation, including sampling for tritium.
51	51. 4513 Parking lot was re-paved, reconfigured and has been used as a staging area for contaminated waste as well as probable previous use for staging for decay over time. This practice happened throughout the site and continues today, and should be considered a data gap.	51. This location will be considered as part of the revision of the *Draft Gap Analysis Report*.
52	52. EU5 – Not enough is known about these areas. Building 29 after excavations were backfilled to allow for continued use and barrels of unknown contents must be assumed, in this case, to be radioactively contaminated soils. Both radium and cesium contamination is known from documented accidents that contaminated the area as well as personnel. Coal Gasification activities should also be reviewed more carefully to understand the relationship between this area and the Area 1 Bowl area referenced in historical documents to also engage in this operation. Similar sampling for the same suite of analytes in the Bowl Area should occur. PDU operations and releases require further scrutiny. The sampling class in EU5 is not consistent with these known operations, and should be upgraded to the	52. The area around Building 29 is already classified as Rad Class 1 and will receive the highest level of investigation. DOE is aware of PDU coal gasification activities in EU-06 but not in EU-05. Additional chemical sampling will be performed on soils from the PDU area. Investigating activities in Area I is outside the scope of the *SSFL Area IV EIS*.

	Comment	Response
	closer sample density shown in Class 1.	
53	53. EU6 - Leachfields identified in this unit should also be sampled at a third depth of 10-12 ft bgs.	53. This comment will be considered as part of the revision of the *Draft Gap Analysis Report*.
54	54. The removed buildings in EU6 associated with the operations of 4024 and the RMHF are zoned in the lowest class (3) for sampling density and quantity. Background is described at an astonishingly high 40μR/hr and 8,000 cts/min and then an additional 5 μR/hr is added to describe "acceptable limit" and should be considered a serious gap and be upgraded to the highest class for sampling. The standard here for "acceptable" should be examined more carefully.	54. It is unclear which buildings are being referred to. The removed buildings on the map are shown in white to indicate only that they have been removed. They are classified as the same classification as the area around them. Buildings 4025, 4925, and 4926 were not associated with Building 4024 operations but were part of the Sodium Component Test Installation (SCTI) Maintenance and Storage, Remote Handling Mock-up Facility and were not known to contain radioactive or nuclear materials. The gamma background reported in the HSA reference associated with building 4793 of 40 iR/hr and 8,000 cts/min) was explained as being "shine" from the RMHF area. This information is provided for historical purposes and does not indicate any data that will be used in the risk assessment. Building 4793 was classified as Rad Class 1. The reference to 5 μR/hr is unclear.
55	55. RMHF asphalt has been contaminated through numerous spills and other incidents. The cracks are intermittently resealed using an asphalt swill, but cesium and strontium as well as plutonium has been found to have leaked through the surface and contaminating everything placed on the surface including the tires of parked trucks. Many fires and other accidents, pressure release events that resulting in fires that further migrated these contaminants to surrounding areas. The associated drainage of the RMHF should also be considered a data gap.	55. This comment will be considered during revision of the *Draft Gap Analysis Report*.
56	56. Extraordinarily high beta/gamma was found in vegetation here demonstrating the impacts to the local environment. This further supports the need for investigation of the impacts from recent and historical brush fires that burned the surrounding vegetation releasing this high beta and gamma activity to the surrounding environs.	56. All RMHF areas and drainage areas are classified as Rad Class 1 and will be investigated at the highest concentration of sampling. Other surrounding areas were classified as Rad Class 2. Elevated beta gamma readings may occur due to the "shine" from the radiological waste stored at the RMHF.
57	57. EU9 includes the SPTF (buildings 461/2/3) which are zoned as "class 3" inappropriately as there are documents including SAIC 1991(4) that state that the building 100 trench was formerly located below these buildings and was used for the burning of waste and construction debris. In the context of being the largest sodium pump test facility in the world, and proximity to the primary nuclear work done at the site, this area should be zoned as class 1. Consideration of prior brush fires that may have spread contamination to these surrounding areas also supports this concern.	57. According to the SAIC 1994 report, the former location of the Building 100 trench was "used for burning and disposal of construction debris and possibly hazardous substances." There is no known use of the trench for disposal of radioactive material. However, based on comment, the area of the former location of the Building 100 trench will be considered suspect and reclassified as Class 2 when the *Draft Gap Analysis Report* is revised.
58	58. Hotlab footprint as previously mentioned, excludes the parking lot footprint, which is crucial and should be sampled at the same higher level due to its historical operations that included nationwide materials received for de-cladding process.	58. The mentioned parking lot is not adjacent to the building but is located on the other side of a street from the Hot Laboratory to the South. It is isolated from the building and was evidently used for car parking. It would not have been used for loading, unloading, or any kind of material mobilization or transfer. The facility had access from the road for transfer activities that did not involve the parking lot.
59	59. EU10 states that the vertical extent of the contamination present at the Building 100 Trench may be accomplished visually. This approach is inappropriate as there is much conflicting information as to	59. The current Building 100 Trench is easily located visually and on the map. The former location of the Building 100 Trench was

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	even the location of the Building 100 trench including statements made in SAIC 1994 that the SPTF (Buildings 461/462/463 were built on top of the trench formerly used to burn debris and waste. – another potential burn pit.	described in the SAIC 1994 report. According to that report, the former location of the Building 100 trench was "used for burning and disposal of construction debris and possibly hazardous substances." There is no known use of the trench for disposal of radioactive material. However, based on comment, the area of the former location of the Building 100 trench will be considered suspect and reclassified as Class 2 when the *Draft Gap Analysis Report* is revised.
60	60. The parking lot area used to store contaminated stormwater systems should also be sampled at higher levels.	60. This comment will be considered during revision of the *Draft Gap Analysis Report.*
61	61. Building 56 Landfill and excavation area should be sampled for all operational COIs of the former SCTI facility. This area is zoned for radiological class 3 except for the landfill area which is considered class 2. This is inappropriate since so little is known about the contents of this landfill. The excavation portion has had little to no sampling and while it is acknowledged that this is a gap, it is still classed at the lowest possible scrutiny level which is wholly inappropriate.	61. The need to investigate this location further is identified in the *Draft Gap Analysis Report.*
62	62. EU11 FSDF for interim measures had a clay-cap placed on the surface from soils found nearby at the site. This process was not considered acceptable by the public and a data gap as to the efficiency of this cap and resulting possible down-gradient contamination from seeps and springs and stormwater runoff passing across the area. The daily burn activities of this facility including the pistol range, which was used for the purpose of releasing toxic materials (gaseous or through violent reaction, combustion) over a wide area. This is therefore an area where aerial dispersion must be considered and weighed more heavily.	62. This comment will be considered during revision of the *Draft Gap Analysis Report.*
63	63. Reviewing Figure 4-11 shows us that chemical COIs in this area are clearly leaving the site down a drainage that is not completely understood. There are concrete swales that move and divert drainage that may cause contaminants to be missed by monitoring points for stormwater at outfalls 5 and 6 and therefore further sampling down drainage to delineate the nature and extent of these COIs is necessary. This comment also applies to EU10 for the Building 56 Landfill and excavation area which also show contaminants above the DCGL for this drainage that is also potentially missed by outfall 7 which is located up-gradient from these detects and up-gradient from the landfill itself.	63. These comments will be considered during revision of the *Draft Gap Analysis Report.*
64	64. EU12 includes pond dredge area, which is where the dredging materials from the Silvernale and R2 ponds have been deposited. In addition to the likely chemical contaminants from this procedure, it likely buried the missing uranium slug and therefore requires more thorough search using equipment to locate this material sub-surface. The Radiological class determined for this area is therefore inappropriate and should be upgraded to Class 1 for higher sample density.	64. This comment will be considered during revision of the *Draft Gap Analysis Report.*
65	65. EU13 Esada pistol range should be investigated more closely. Highly penetrating materials were used for this purpose as it was also used to ignite at distance, release gaseous materials from sealed containers at distance, all releasing toxic contaminants to the environment. Shielding materials, lead and cesium should be specifically looked for. This area should be upgraded to class 1 and distance should be considered.	65. This comment will be considered during revision of the *Draft Gap Analysis Report.*
66	66. EU14/15/16 – "the shark" as referred to by CDM analysts. We have received some claims from former workers that the borrow-area used for backfilling has also been backfilled with materials from other areas of the site. It is therefore necessary to look at this area with a greater degree of scrutiny. More samples, for COIs based on the operations of Area IV as a whole using adequate sampling	66. This comment will be considered during revision of the *Draft Gap Analysis Report.*

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	densitys and quantities to determine any change in deposited materials. Possibly the statistical testing of the Wilcoxon Rank Sum test can be used to identify foreign soils from outside the zone vs. soils found in this valley area.	
67	67. We are pleased to see the proposal of additional shallow wells in figure 4-15 but feel it could be expanded further to better delineate the radioactively impacted shallow groundwater. Figure 4-16 of existing soil samples indicates that most of the site with few exceptions, has not been adequately sampled and look forward to this new and more serious look at the impacts. We hope that our comments illustrate to you, the need to look more, and include open-space areas where disturbed soils exist.	67. This comment will be considered during revision of the *Draft Gap Analysis Report*.
68	68. Finally, we hope that the PRG issue with clear and agreed parameters can be resolved so that the real problems of finding solutions to difficulties in analysis, counting times, margins for error based on increased counting and Chrome chemical analysis where appropriate will be explored and used so that all parties involved including DOE, EPA and CDPH, DTSC and the public can rely and trust the data that comes from the EIS produced.	68. DOE is committed to working with EPA, DTSC, and the community to find solutions to the technical issues associated with sampling and analysis.
69	69. We believe that additional sampling is needed, beyond the suggested number with emphasis to going to bedrock or just short of bedrock to understand the sediment that may have gathered or settled at the cross-section where soil meets bedrock, potentially changing migration velocity and direction depending on the local conditions of each area. Going beyond 10 feet is important where possible.	69. This comment will be considered during revision of the *Draft Gap Analysis Report*.
70	70. Averaging is inappropriate and we hope to see a sampling plan consistent with the concerns of the community about adequacy, quantity, quality of analysis, depth, statistical sampling density to look at all impacted areas sitewide based on the migration pathways discussed herein.	70. Data collected from Area IV will be analyzed and evaluated using statistical methods consistent with CERCLA and EPA risk assessment guidance.
	OR-014: Christina Walsh, cleanuprocketdyne.org, E-mail dated: 8/14/2008	
1	1. Notification of the public The effort to notify and engage the public in this process was insufficient. People who will be directly impacted by these decisions were not adequately notified in that the process itself lacked sufficient information to allow the average community member living near the site to even be aware of the decisions currently being considered. The words, "nuclear clean-up" should have been included to emphasize the importance of the decisions being made. Notification should have included the entire mailing list to all interested parties as well as all residents within at least a five-mile radius of the site.	1. DOE thanks the commentor for the suggestions regarding meeting notifications. The commentor is referred to Section 3 of this document for a discussion on DOE's efforts to notify the interested public regarding these meetings and to Appendix B for a full listing of the kind and number of notifications that were done.
2	2. Notification of Regulatory and Elected officials There were two meetings held in Sacramento for the specific purpose of soliciting comments from regulatory and elected officials. We appreciated that meetings were held in Sacramento giving an opportunity for the staff of legislative and regulatory offices to be educated in this important process and the alternatives being presented by the Department of Energy. However, no one attended from those offices with the exception of staff from DTSC including Project Director Norman Riley. This was extremely disappointing and believed to be due to the fact that the legislative offices were not specifically notified. This is a crucial step if this is to be a truly serious look at the alternatives and the giant problem faced in determining clean-up corrective measures. We specifically asked who was expected to attend and were given a response that it wasn't known. Therefore a conclusion can be drawn that no specific invitation to these people went out.	2. DOE understands the commentor's concern regarding meeting notifications. The commentor is referred to Section 3 of this document for a discussion on DOE's efforts to notify the regulatory and elected officials regarding these meetings.

	Comment	*Response*
3	3. Information Presented in NOI The description of the SRE nuclear accident was not properly described in the NOI to readily explain the issues being considered. The NOI leaves the impression that only the cladding melted when the fuel itself also melted and "controlled releases" to the environment continued for weeks after the accident. After nearly fifty years, it is really time to acknowledge it for the serious accident that it was, and act accordingly and protectively. Based on how the information is presented, it leads the reader (and potential attendee to these meetings for solicitation of comment) to believe that nothing serious happened. This is extremely important considering that most people throughout the surrounding communities know very little about the history of the site. Based on the records provided in the RCRA Group 6 SRE data tell us that there is no reason to believe that all releases were below safe levels when in fact, the radiation release data indicates that it went off-scale and therefore could not be verified to be "safe." Assumptions made of "probable safety" have brought us to the position we find ourselves in now, with many unknowns within an area of extreme hazard as stated by the Hazardous Activity Doctrine. No more assumptions can be accepted. We must use scientific data analysis using current sampling and analysis practices as recommended by CDPH and USEPA.	3. DOE will correct as appropriate the description of the SRE in the revised NOI. DOE is initiating an effort to compile records and information related to all activities at ETEC. As part of that effort, former workers and all stakeholders will be asked to participate and provide any information that they may have on the history of the site.
4	4. Information Presented at Scoping Meetings We appreciated all the expertise that was provided at the meetings in the form of consultants present to answer questions based on the information provided on the posters. I did feel however, that since the meeting began promptly and provided little opportunity to make use of these resources to answer questions, because it would mean missing a substantive part of the meeting. For future purposes, a period of time would be reserved to get informed and put into context the information presented to afford the opportunity for people to better understand how these decisions will impact them. I believe this would result in more relevant and useful public participation.	4. DOE appreciates the commentor's recognition of its efforts in planning and implementing the meetings.
5	5. We were concerned about the recommendation by the Sandia representative that Thorium should not be looked for at the site because it wasn't used. The OMR (Organic Moderated Reactor) as well as the 4th stage of the SRE both used thorium so we found it to be of concern that some of the experts were not adequately informed of the basic nuclear operations of the site and still provided recommendations that were not in keeping with the protective clean-up that the community has been promised over the years.	5. DOE regrets the statements made by one of its consultants at the meeting. The Sandia representative was only involved in the review of the document, not in its findings or recommendations. Thorium was included in the COI list for the same process history as that which the commentor is referencing.
6	6. With SB990 as law mandating the strictest clean-up to residential standards, such a recommendation by a consultant to look for "less" despite the operational history of the site is of great concern and also contrary to the protections of SB990.	6. DOE appreciates the commentor's input. The commentor is referred to Section 3 of this document for a discussion regarding SB 990.
7	7. We must look for ALL radioisotopes in the library as defined by CDPH and USEPA and any recommendations to look for less must first be demonstrated based on historical data to be reasonable and factual. In this case it was not, and should be emphasized that such recommendations as we move forward in this process must not be allowed to reduce the quality of the characterization and/or clean-up levels.	7. DOE appreciates the commentor's input. The commentor is referred to EPA's radiological survey of Area IV for its scope. Section 3 of this document provides further discussion on this topic.
8	8. While a "no action" alternative is part of the NEPA process, it is not necessary to offer two alternative solutions that suggest doing nothing. Alternative 1 is unrealistic because it would not be legally viable for the DOE to choose to discontinue monitoring as required under the NPDES permit for dischargers of pollutants to the waterways of these United States.	8. DOE understands the commentor's concern regarding NEPA alternatives. DOE elected to have two "no action" alternatives: a no action alternative and a no action alternative with the addition of monitoring and security. Together, these alternatives meet the intent of the no action alternative specified by NEPA and also CERCLA. DOE

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		agrees that Alternative I is not realistic because DOE cannot walk away from the site without continued monitoring, as the commentor mentioned, and continued security. However, Alternative I is included for a comparison of alternatives. The commentor is referred to Section 3 of this document for additional discussion on this topic.
9	9. Alternative 3 is not a viable option as DOE does not own the land, and rather leases the land and therefore would not be able to make a decision of onsite storage of nuclear waste when Boeing has committed to donating the property as parkland. When asked about this in the verbal comment period during the Scoping Meetings, it was suggested that DOE might purchase the land from Boeing thereby making onsite containment feasible. But SB990 prevents Boeing from being able to sell or transfer the land until deemed clean by DTSC. Based on the timing of the Consent Order requirements, which DOE has signed, it seems premature to present a solution of partial onsite and partial offsite storage of the nuclear waste from the SSFL.	9. DOE understands the commentor's concern regarding alternatives proposed to be addressed in the EIS. An on-site alternative is consistent with the CERCLA evaluation of alternatives. The commentor is referred to Section 3 of this document for additional discussion on this topic.
10	10. Because no percentage of each, or any level of detail is presented for Alternative 5, it does not appear to be a serious alternative for consideration at this time without a clear presentation of the actual alternative solution to include scientifically based decisions and specifications, justified by thorough sampling analysis to allow for an informed decision-making process.	10. DOE understands the commentor's concern regarding NEPA alternatives. The commentor is referred to Section 3 of this document for additional discussion on this topic. The rationale behind each alternative will be explained in the amended NOI.
11	11. Alternative IV is therefore the only viable option for the State.	11. DOE understands the commentor's concern regarding NEPA alternatives. The commentor is referred to Section 3 of this document for additional discussion on this topic.
12	12. Boeing has committed to clean the site up consistent with state law, citing the very portion of state statute that includes SB990. Furthermore, the LOI committed Boeing to transfer the land for use as parkland. And lastly, it committed Boeing to cleaning up the site to the residential standard, as set forth in the law; and SB990 requires cleanup to either suburban residential or rural residential levels, whichever produces the greatest cleanup. Any clean-up that falls short of these commitments will result in a second costly clean-up.	12. DOE acknowledges this comment.
13	13. The entire site must be considered for the EIS because the entire site was impacted by the contaminants based on the decades of operations. The effluent sewage and storm-water runoff drainage systems led to the Silvernale and R2 Ponds outside of the Area IV boundary and therefore must also be considered within the EIS for radiologically impacted areas. These maps are provided in the McLaren Hart study previously done on the site.	13. DOE understands the commentor's concern regarding the need to clean up all of SSFL. The commentor is referred to Section 3 of this document for additional discussion on this topic.
14	14. Following are historical maps of the site from 1956 through 1980 demonstrating the fact that parts of Area IV were previously considered to be in Area III and other property boundaries to be inconsistent with the current understanding of the areas of DOE responsibility.	14. DOE understands the commentor's concern regarding the historic mapping of Area IV. DOE intends to complete the investigation and cleanup up all areas associated with ETEC activities, regardless of relationship to historic mapping.
15	15. The SSFL Panel Study concluded that impacts went far beyond the property boundaries of the site, and in to the surrounding communities. Certainly we must then consider the entire site for impacts that may be related.	15. DOE understands the commentor's concern regarding the extent of contamination related to its activities in Area IV. DOE intends to complete the investigation and cleanup off all areas associated with ETEC activities, including contamination that may have migrated from Area IV.

	Comment	*Response*
16	16. The marketing material sent out by DOE regarding the features and services provided by ETEC include photographs of the Bowl Area which further demonstrates this connection and responsibility for potential and probable impacts.	16. The "marketing material" referenced by the commentor is actually a public information pamphlet to inform the public of activities at SSFL. The preparers of the pamphlet used photographs characteristic of SSFL overall and not necessarily those of activities that DOE was actually engaged in at SSFL, such as work in the Bowl Area. Use of such photographs should not be construed as meaning DOE work occurred within the Bowl Area. DOE had no operations within the Bowl Area.
17	17. Data provided in the historical documents from the Area I burn-pit indicate the use of Cesium and also had a license for Strontium work in Area 1. Based on the relevant testimony from the Cappello-Noel litigation regarding the burn-pit, there was often material stockpiled that was inadequately labeled so they really didn't know what they where burning. Moreover, they wrote many inter-office memorandums that describe an overwhelming pressure to produce while the design of the pit facility areas was not intended for the massive quantities that were being burned. A bad idea compounded by improper quantities and safety practices that we will continue to pay for in impacts to the surrounding environment for decades.	17. The Area I burn pit is being investigated under the DTSC consent order. DOE will await those findings to review the results of that investigation.
18	18. Additionally, there were diagrams of drains installed in these pits for dilution of solvents, acids and other highly reactive products that also included waste from Area IV. These drains led to nearby creeks and ephemeral streams that added another migration pathway to the people below. These migration pathways of the pollutants used, including radiological fission products from the nuclear work done at the site. These must be investigated and therefore included in the scope of the EIS process.	18. Much of the area addressed in this comment is included under the DTSC consent order investigations. Those locations associated with Area IV activities and not addressed under the RCRA RFI work will be investigated by DOE.
19	19. Data presented in the NOI indicates that the scoping process is only to encompass the Area IV portion of the site according to DOE. Following are historical maps provided in the sitewide historical documents that demonstrate vastly different property boundaries over the years (HDMSE00000001.pdf). Contamination knew no borders, especially when effluent pipes took contaminated water from Area IV to other areas of the site in Areas II and III. These include both sewage and storm-water effluent pipes. Documents indicate that burn records for the Area I burn-pit included materials from Area IV and records also indicated Cesium which again, supports the theory that radioactively contaminated waste did impact areas beyond Area IV. The contaminated waste was moved from place to place and often buried onsite with no record as to the location other than relative distance from the facility it came from. These are all indicators that the entire site MUST be characterized and properly remediated based on activities by DOE and other entities at the site over a fifty year period. From 1956, notice the outline of Area III extending throughout most of what is currently known to be Area IV demonstrating a change in operational practices showing sitewide distribution of related pollutants. In 1980, the map provided shows a portion of Area 1 (the Bowl Area) as part of the operational area of the nuclear development lab referred to here as the Energy Systems Group. In addition to brochures promoting the ETEC facility and the programs available also showed the Bowl VTS as part of ETEC. The Bowl is located in Area I. This original brochure can be provided to DOE for reference upon request. Based on the information provided in the SRE data in Group 6 of the RCRA RFI reports, effluent waste-water from the scrubbers was piped into the SRE and nearby ponds further illustrates that contaminants did not know property borders. Information detailed in the McLaren Hart Study shows plutonium findings in Area II in surface water	19. DOE intends to release a supplemental NOI and EIS scoping period following completion of the EPA radiological survey of Area IV. See Section 3 for further discussion on this issue.

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	run-off and there were a number of ponds throughout the site that were used for burning of waste-water runoff. Decades of burning of waste in the Sodium Burnpit as well as the Area I Burnpit resulted in waste fall-out across a wide area depending on the direction and velocity of the wind on a daily operational basis. These impacts of aerial dispersion crossed these property boundaries as well.	
20	20. The USEPA looked at the site for CERCLA superfund listing recommendation several times where it failed to score because they looked only at Area IV and only at the radiological impacts. SB990 mandates that the cumulative impacts of both chemical and radiological releases must be considered. After finally agreeing to look at the entire site holistically, the site did finally score and has been recommended for Superfund Status. It is for these same reasons that we feel it necessary to consider the entire site here. The impacts have already been proven by the EPA CERCLA Superfund scoring results.	20. The commentor is referred to Section 3 regarding EPA's recent NPL listing recommendation for all of SSFL.
21	21. Continued violations of the NPDES permit (National Pollutant Discharge Elimination System) demonstrating that radiological contaminants have and continue to migrate offsite to neighboring communities, which further demonstrates the need to consider all areas of the Santa Susana Field Laboratory.	21. DOE is not aware of NPDES permit violations related to radionuclides in stormwater monitored at Area IV.
22	22. Past practices of disposal and onsite burial of waste as resulted in Judge Conti taking jurisdiction of the site because of the profound violation of trust with the public and broken promises of clean-up over the years. The regular practice of burying waste, contaminated equipment and the use of Borrow areas for the purpose of back-filling soil throughout the site, make it necessary to include all 4 operational areas as well as buffer zones for scoping characterization and remediation activities.	22. DOE understands the commentor's concerns. The commentor is referred to Section 3 for further discussion on these issues.
23	23. The recent misrepresentation of the PRG table in the Gap Analysis and consequent lack of trust on the part of the public resulted in EPA finally demanding that the lead in the radiation soil survey promised by HR2764 because of continued erosion of trust with the public.	23. DOE understands the commentor's issue. The commentor is referred to Section 3 for further discussion on use of PRGs in the Data Gap report.
24	24. Transparency and a true attempt to step-up and resolve these issues by way of proper and transparent characterization of the work needed, are a necessary step to reduce the hazards of this site to the people already living below the site, downstream in all directions. We need DOE to continue in efforts to build trust with the community by allowing EPA to lead these important survey to protect the integrity and credibility of the data that we all need in order to make final remedy decisions that are protective of the surrounding communities and follow state law as written in SB990.	24. DOE will continue to involve the community in the process. As described more fully in Section 3, EPA is now conducting a radiological background study and a radiological characterization survey of Area IV and the Northern Undeveloped Land.
OR-015: Christina Walsh, cleanuprocketdyne.org, E-mail dated: 8/20/2008		
1	I just read Jerry Hensley's comments and was really surprised to hear about some of the COIs that were not included "Table 3-11 Radiological Contaminants of Interest List of all potential radionuclides not referenced. No reference to Pa-231 and other Th-232 fuel activation products, missing additional isotopes in list, and no reference to californium, antimony, holmium, niobium, promethium, and zirconium. Provide justification or reasons for not listing the above-mentioned radionuclides as radiological contaminants of interest." I am also very interested in reasons for these exclusions. Just off the top of my head, I've run into signs all over the site, including the HWMF B133 that say the word "zirconium" or "zirconiumhydride" and find it astonishing that it could then be excluded from the COI for any reason. I have also been part of a team that literally found antimony in the creek of the northern drainage and seen the same material in a box at the site located at COCA and reported such. This material containing antimony was used for pipe insulation and would be expected site wide.	The potential radionuclide list came from the HSA and EA as referenced in the text and in Table 3-10 of the *Draft Gap Analysis Report*. Additional radionuclides were added based on process knowledge from other reactor and fuel separation facilities and half-life considerations. Pa-231 is not a Th-232 fuel activation product. It is the daughter of U-235 and is considered in equilibrium with it. Th-232 was not used as a fuel but rather was contained in some fuel as a fertile component to "breed" new fuel components. Therefore, no Th-232 fission products should be present. The transuranic listed (californium) is not produced in significant amounts in reactors due to the number of nuclear reactions required to produce it. Zirconium-95 and Niobium-95 have half-lives less than 1 year. Pm-147 and Sb-125 may be added since they

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		have half-lives of just over 2 years, but Sb-125 is not likely to be present in significant amounts at this point since they are not produced in large amounts in reactors and Pm-147 is not a significant dose contributor. Ho-166 is not a fission product of U-235 and has a half-life of less than 1 year. The use of metals zirconium and antimony would be reflected in the chemical COI list and not in the radionuclide COI list.
2	I would like to see the COI library as defined by CDPH and EPA be used here. Can you please clarify on where we are on this?	EPA will provide this library as one product of the Background Workgroup that it is leading.
OR-016: Mary Weisbrock, Save Open Space/Santa Monica Mountains, E-mail dated: 8/30/2008		
1	1. SOS supports Alternative 4: Offsite Disposal of SSFL Area IV Materials-demolition of buildings, wastes, radiological and chemical contaminants, aligned with the only acceptable future land use scenario of open space as mandated by SB 990.	1. DOE appreciates the comment. The commentor is referred to Section 3 for further discussion on the basis of alternatives proposed to be addressed in the EIS.
2	2. EPA SHOULD BE IN CHARGE OF EIS 1. US EPA needs to initiate and take charge of an independent investigation, characterization and clean – up of the site. 2. US EPA needs to take charge of the regulators who seem to have been wandering around with blinders on for the last 15 years. When members of the public know more about the site, we have a problem. The polluter's own employees testified that they watched toxic clouds float up from burn pits and watched these same clouds float over populated areas. The public has been misled by the polluter's mantra "Nothing has gone off site". (Firemen's declarations from the Cappello lawsuit) Area IV wastes were disposed of at this Area I Burn pit. Air dispersal also occurred at the sodium burn pit.	2. As described more fully in Section 3, EPA is now conducting a radiological background study and a radiological characterization survey of Area IV and the Northern Undeveloped Land. EPA could not, as suggested by this commentor, be in charge of the EIS, as the court ordered DOE to conduct the *SSFL Area IV EIS*. DOE did ask that EPA become what is called a "Cooperating Agency" for the EIS. Cooperating agency status would have provided EPA with formal review and comment authority over the EIS. EPA has declined that offer on multiple occaisions; however, DOE still will submit drafts of all EIS-related reports to EPA for review and comment. Another means by which EPA could have a larger role at SSFL is to have SSFL listed on the NPL under the CERCLA program. EPA has determined that the site qualifies for listing. DOE has recommended to EPA that it proceed with listing.
3	3. SCOPE With EPA procedures and grids implemented, the new scope should include the entire SSFL field lab and nearby properties (Dayton Canyon, Woolsey Canyon, Runkle, and the Calabasas Landfill which received thousands of tons of Rocketdyne wastes). It is inadequate to just limit the scope to Area IV. Past Area IV operational activities contaminated surface/groundwater and air pathways with Area IV toxics over the entire SSFL facility and nearby properties. Air dispersal of Area IV toxics from the Sodium Burn Pit and Area I Burn Pit occurred for decades. Depending on the time of year, the winds blow in all directions through SSFL and nearby properties. Area IV wastes contaminated the sewage lines, drainages and impoundments. Area IV deep groundwater contamination continues through fractures and the many faults which criss cross SSFL carrying the groundwater contamination to lower area watersheds and eventually to Ringe Dam, Sepulveda Dam and the Arroyo Simi. Retention ponds, skim ponds, reservoirs, catch ponds, and spray fields are all interconnected throughout the entire SSFL filed lab and into surrounding off site areas. (Enclosure #1)	3. DOE understands the commentor's concerns regarding the need to investigate and cleanup all of SSFL. The commentor is referred to Section 3 for further discussion on this topic.
4	4. PAST TESTING CAN NOT BE TRUSTED Soil Testing: The number of soil samples tested for specific radionuclides in off site areas is not adequate. Nor can past testing results be trusted. All past	4. In the *Draft Gap Analysis Report*, the analysts reviewed the prior data and recommended the collection of approximately 2,000 more

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	testing should not be considered. This EIS should require that all soil testing be redone utilizing EPA grids. Tests should include testing for specific radionuclides including but not limited to enriched uranium and plutonium. The number of testing sites in the past has been very inadequate. An EPA grid should be applied to all areas in the broadened scope. The impoundments were not "clean closed." These areas need to be re dug up and tested by EPA grids until the bottom level is reached where there are no contaminants. Clean Closure must then be required of all impoundments, landfill areas, ponds, leech fields, etc.	radionuclide samples. However, since that recommendation, EPA has taken the lead on the radionuclide investigation of Area IV. DOE does not know in what manner EPA intends to sample Area IV.
5	5. We do not support the inadequate walk over gamma testing which is being proposed. We believe that walk overs will not give adequate readings. Since radioactive decay is intermittent, the Geiger counter must be held in place for a significant amount of time and not in motion readings. The distance from the Geiger counter to the ground is also critical to get true readings. EPA grid testing for actual SSFL specific radionucleids should replace these inadequate walk overs.	5. It is standard practice, including that followed by EPA, that, prior to soil sampling, the study area is surveyed using radioactivity detection instruments. The gamma walkover survey proposed in the *Draft Gap Analysis Report* would not involve the use of a Geiger counter. A series of much more sensitive instruments would be used. The survey as proposed in the *Draft Gap Analysis Report* is identical to the survey proposed by EPA. DOE has signed an interagency agreement with EPA, and has provided EPA with funding that gives EPA the lead in performing the walkover surveys.
6	6. Water Testing: Past testing filtered the samples for radionuclides and metal tests. All past testing which filtered the water sample should be discounted and not used at all. All past testing overseen by the Rocketdyne's Analytical Chemistry division should not be accepted. It appears that past SSFL Analysis under Rocketdyne is questionable from the Court Documents (Enclosures #2 CV 97-1554-DT; Mr. Cappello quote on Page 58, Line 6 in the case record). All Court Depositions including this one needs to be released for historical information for this EIS. Per Freedom of Information Act, SOS makes this formal request of DOE in this letter. In order to get adequate information for this EIS, these court deposition documents must be made available to the public by DOE. "It has been reported that three of the four public supply wells (in Simi Valley) that were sampled for radiological had concentrations above MCL" (California Department of Water Resources, 2003, from report by Ali Tabidian Oct 2006). Over the years there were enforcement letters sent by DHS to the Simi Valley water company on radiological exceedances. Unfortunately, when requested that source water radiological testing be done on these drinking water well sources, it appears that the source water samples were filtered before testing for radiological levels which falsely lowers the radiological levels. In addition, specific SSFL radionuclides were not tested for. New national regulations require source water testing be done. In the case of SSFL, where ground water is used for drinking water in Simi Valley, the rad testing needs to be done for specific SSFL radionuclides and filtering must not be allowed to falsely lower the actual results in the interest of public health and safety. There exists the possibility that the current well testing method is not requiring the collection of the samples through "purging" technique. By not purging, the results will not reflect a true value. The EIS should require all well samples by collected by purging.	6. Past analytical results produced by Rocketdyne were not used as part of the Data Gap Analysis. Only the most recent groundwater data were used in the Data Gap Analysis evaluations and recommendations for additional investigation. All proposed future sampling for EIS data analysis purposes will follow EPA purging and sample collection procedures. See comment below (#7) for information on how to make a Freedom of Information Act Request.
7	7. NUCLEAR REACTORS INFO INADEQUATE SRE and SNAP were among the SSFL experimental reactors without containment domes. Fission gas releases went everywhere. In order to really know what really happened in the operation of these nuclear reactors, DOE must release the operational logs of the SRE and SNAP. It appears that the SRE reactor never was working right from the very beginning. SOS requests per Freedom of Information these logs. This EIS will be inadequate if the information in these logs is not a part of this investigation. DOE must release the logs of all the	7. Freedom of Information Act requests must be submitted through the DOE website (www.energy.gov), which has a link at the bottom of the page that allows submission of the request electronically. DOE agrees that the operational logs for ETEC are important in developing the history of operations. DOE is searching its records for these logs and other documents and will also attempt to discover if Boeing

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	SSFL nuclear reactors and any/all films on these reactors. The SRE cleanup log revealed that it was a sloppy SRE cleanup with more accidental releases into the environment and the groundwater.	and/or Rockwell retained possession of these logs.
8	8. TRANSURAMIC WASTES The issue of RH-Tru wastes needs to be an issue. The RH-Tru wastes consist of two waste streams at SSFL. : "(1) hot laboratory drain line residue and (2) a single drum of debris waste from multiple. The drain line residue is currently stored in 28 concrete-shielded 55-gallon drums and one 30-gallon drum. An additional amount of 22 gallons of sludge is estimated to be in a 3000 gallon drain tank and about 10 gallons of residue in two weir boxes". (Enclosures #3) This is the transuranic waste that we know about. What about all concrete –shielded drums? This issue should be evaluated in this EIS. Was any of this sent off site? What was the route? When was it sent? How was it transported? How much remains on site?	8. Issues raised in this comment will be addressed both in the *SSFL Area IV EIS* and through additional radionuclide investigations of Area IV.
9	9. LONG TERM STEWARDSHIP/OPEN SPACE The only possible future for the adjacent properties that had drainages is for permanent open space. This includes Runkle Canyon, Dayton Canyon, Black Canyon and other properties adjacent to the main road into SSFL. Also, since the Calabasas Landfill accepted thousands of tons of Rocketdyne wastes in the 1970s, its adjacent properties (Heschel and Mindor) should also not allowed to be developed. Development will mean massive grading potentially causing toxic dust to be air borne. Development will mean toxic soil gas and potential exposure of Rocketdyne contaminants to any people residing in the new houses and/or school children utilizing the school buildings. (A new elementary school is planned in the shadow of the Calabasas landfill.) Boeing should consider applying for a state/federal tax credit to purchase these privately owned properties as open space wildlife corridor/and or public parkland depending on the degree of contamination.	9. The decisions for land development near SSFL or other facilities are the responsibility of local agencies. DOE will not be involved in those decisions.
10	10. Broad Epidemiological Study Now Necessary All the information about the Area I Burn Pit Activities proves that a 5 mile 360 radius epidemiological study of all cancer cases and neurological diseases should be performed. Area I Burn Pit also handled wastes from Area IV. There is now a retinoblastoma cluster in an approximately 5-mile radius of SSFL. Did the transport of Area IV radioactive wastes cause genetic damage in these retinoblastoma babies? How many physicians are in the dark about the history of SSFL? How many diagnosis are delayed because of lack of knowledge about SSFL? Has there been an physician alert concerning bladder cancers (state study) and retinoblastomas in the West Valley, lung cancer in Simi Valley (Ventura County Health registry), melanomas (UCLA study)and thyroid cancers (Dr. Mack's book) in the shadow of the Santa Ana winds in greater Calabasas area.? If not, this needs to be done without any further delay. A broad new epidemiological study must be done and it must be an independent study by UCLA.	10. The conduct of additional epidemiological studies is beyond DOE's jurisdiction. This matter should be discussed with public health agencies with responsibilities and expertise in these matters. DTSC is in the process of evaluating the Area I burn pit.
11	11. More in-depth evaluation of airborne chemical releases from SSFL operations, including air dispersion modeling of past accidents and disposal activities, and compilation and use of a consistent, site-specific meteorological data set to improve the assessment of past exposures to these substances.	11. NEPA requires that cumulative impacts of past, present, and reasonably foreseeable actions are analyzed. The CEQ's 2005 Memorandum "Guidance on the Consideration of Past Actions in Cumulative Effects Analysis" states, "The environmental analysis required under NEPA is forward-looking, in that it focuses on the potential impacts of the proposed action that an agency is considering. Thus, review of past actions is required to the extent that this review informs agency decisionmaking regarding the proposed action." It also states, "In determining what information is necessary for a cumulative effects analysis, agencies should use scoping to focus on the extent to which information is"relevant to reasonably foreseeable significant

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		adverse impacts,' is "essential to a reasoned choice among alternatives, and can be obtained without exorbitant cost." This document can be found at: http://www.gc.energy.gov/NEPA/documents/ceq_cumulativeguidance_6_24_05.pdf. That said, the EIS analysis will look at available documentation on health impacts in the region surrounding SSFL. DOE is also considering a workshop and interviews with former workers and with members of the public to help refine the history of the site to aid in determining impacts of previous operations.
12	12. Development of a regional hydrogeological flow model and additional monitoring at down-gradient springs or seeps in Simi Valley and Santa Susana Knolls to evaluate the potential for deep fracture flow and potential future exposure. Also, even though it may not be related to SSFL, additional source characterization of the perchlorate detection in Simi Valley should be conducted.	12. The groundwater perchlorate issue is not related to DOE's activities within Area IV. Boeing and DTSC are investigating the perchlorate groundwater problem under separate studies.
13	13. Additional radiological characterization of Area IV with more sensitive instrumentation and appropriate grid spacing to assure a lower detection limit.	13. In the *Draft Gap Analysis Report*, the analysts recommend conducting another survey of Area IV using sensitive instrumentation. EPA now has the lead on conducting this study.
14	14. A re-analysis of the cancer registry data including additional years of newly available cancer data and updated demographic information should be conducted to see if the apparent increase in the incidence rates of bladder and lung cancers persist. A more in-depth evaluation of cancer data should be conducted that addresses environmental exposures from the SSFL….	14. Impacts on workers, the public, and the environment from all alternatives (including no action or containment in place) will be analyzed for comparison between alternatives. However, as previously indicated in response to one of earlier comments, the environmental analysis required under NEPA is forward-looking, in that it focuses on the potential impacts of the proposed action that an agency is considering. Thus, review of past actions is required to the extent that this review informs agency decisionmaking regarding the proposed action. However, available health impacts documentation will be reviewed. (See also response to comment OR16-11 in this comment document.)
OR-017: Daniel Hirsch, Committee to Bridge the Gap, E-mail dated: 9/8/2008		
1	1. Alteration of PRG Table This discussion must by necessity begin with some attention given to the fiasco that resulted from the alteration—an action approaching fabrication—of numbers in the key table in the Gap Analysis, those purporting to represent EPA's radiological Preliminary Remediation Goals (PRGs) for the rural residential land use scenario, supposedly using EPA's default parameters. In fact, the Gap Analysis table (Table 3-3) altered virtually all of those numbers, substituting values as much as twenty thousand times higher (e.g., levels that would permit tens of thousands of times higher concentrations of radioactivity to be left in place rather than cleaned up.)1 This deception, which CBG revealed, has caused a tremendous loss of credibility for DOE and its EIS contractors, and created a cascade of consequences. For example, it contributed to EPA's public condemnation of DOE's conduct and its decision to insist that it rather than DOE do the radiological characterization of the site. In its 2 July 2008 letter to DOE, EPA stated: Recent events have led EPA to re-evaluate the DOE proposal that we have been considering for SSFL. We are concerned about DOE handling of issues under NEPA. For example, although DOE stated in their draft EIS Data Gap Analysis Report that EPA default Agricultural preliminary remediation goals (PRGs) for radionuclides would	1. EPA's PRG table and default parameters were not altered. The *Draft Gap Analysis Report* utilized EPA PRGs in accordance with the EPA guidance that accompanies the PRG tables. Please see the discussion in Section 3 of this document regarding the uses of PRGs for planning investigations. DOE disagrees with the commentors depiction of the selection of PRG's that were used in the Draft Data Gap Analysis; however, DOE wil revise the Gap Analysis using the full agriculturial scenario assuming 100% subsistence from the land. Commentor is mistaken in his claims that radiolocial sampling would be performed by Boeing. At no time did DOE state that the future EIS radiological sampling would be performed by Boeing, and, in fact, was proposed to be conducted by CDM or its subcontractor.

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	be used as screening levels for radiological work conducted at the site, the screening levels used in the DOE report to evaluate existing data were in some cases several orders of magnitude higher than published EPA Agricultural PRGs. When DOE was questioned about this issue by the public on June 19, and again in the technical meeting held at DTSC's offices on June 20, DOE representatives failed to explain whether they in fact plan on using EPA's Agricultural PRGs as the basis for detection limits in their radiological investigation. In addition, during the technical meeting on June 20, DOE informed EPA for the first time that some of the radiological sampling propose to be done by DOE would actually be done by Boeing, so that sampling efforts and costs could be shared. DOE's plans to have Boeing conduct radiological sampling were never disclosed before the meeting and are contrary to DOE's representations to EPA that DOE radiological sampling would be conducted by DOE's contractor, CDM. These events demonstrate a significant lack of transparency in DOE's interactions with EPA and the public. These events have damaged DOE's credibility and DOE has misrepresented EPA's role as an oversight agency. (emphasis added) The draft Gap Analysis stated in numerous places that it was using the EPA agricultural/rural residential PRGs, consistent with SB990, as screening levels for radioactivity, and that it was using the EPA defaults for this. EPA itself was initially misled by these misrepresentations, to the extent that EPA actually congratulated DOE for having done so, stating in its initial comments on the Draft Gap Analysis, "we appreciate DOE using PRGs developed by the Superfund program as the basis for many of the screening levels...." These actions – fabricating the data in a key table, claiming to use EPA's default parameters when in fact one threw virtually all of them out – has undermined any chance of public confidence in this NEPA process, unless radical changes are immediately made. There needs to be an investigation as to how those numbers were altered; who was responsible; who was aware; and who wasn't aware but should have been. As I indicated in my oral testimony, Thomas Rucker of SAIC's Oak Ridge office (more about the SAIC problem in the discussion below) told me at the hearing that he had been responsible for the alteration of those numbers but that he did so under direction from DOE to not use the EPA agricultural/rural residential PRGs and defaults, despite the claim in the EIS to the contrary. In the June 2008 DOE document, "Toward Cleanup at Santa Susana: A Guide to the Draft Gap Analysis Report," DOE states: "The bottom line is that DOE has committed to an independent data collection process in which its contractor, CDM will be expected to arrive at its own conclusions." It went on to say, "The data gap scientists used an approach based on these premises: Total independence. No predetermined decisions regarding the validity of existing data and supporting studies. The data gap scientists worked independently of DOE, Boeing, and its consultants in reviewing and analyzing data and reports." None of this appears true. As discussed below, SAIC, not CDM, is doing all the work on the radioactive contamination. And Dr. Rucker of SAIC indicated that DOE directed SAIC not to use the SB990/EPA agricultural/rural residential PRGs and defaults, resulting in the fabrication of the key PRG table, demonstrating that there is in fact no independent data collection process or independent reaching of conclusions. The entire NEPA process for this EIS is now under a cloud.	

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2	2. The Previously Undisclosed Role of SAIC The deception engaged in by SAIC, with apparent direction from DOE, is made considerably worse by the recently discovered deception by DOE regarding SAIC's role in the EIS process in the first place. On 10 January 2008, DOE issued a news release announcing it had selected the consulting firm CDM to prepare the EIS: "The Department of Energy (DOE) today awarded a task order to CDM of Chantilly, Virginia, to perform an Environmental Impact Statement (EIS) that will examine cleanup options for the remediation of the 290-acre Area IV of the Santa Susana Field Laboratory (SSFL)." Not a word was mentioned about anyone other than CDM doing the work. The draft Gap Analysis has CDM's name on the bottom of every page. The cover to the document has CDM in large letters and then a strange phrase in smaller letters, "A Joint Venture with SAIC & DSO." There is no explanation what this might mean. The Introduction states that the "Gap Analysis was prepared by CDM"; the only reference to SAIC is a single sentence saying that "technical support was provided to CDM in preparation of this report by Science Applications International Corporation (SAIC)." In the wake of the debacle involving the alteration of the PRG table, and the statement by SAIC's Rucker that he was responsible for the values included in it, I contacted you by phone to inquire what was meant by "A Joint Venture with SAIC & DSO," having been led to believe by the DOE January 2008 press release and other statements that the Gap Analysis was prepared by CDM and the EIS is to be prepared by them. You indicated that DSO, which does public involvement work, had no direct involvement in the content of the Gap Analysis report. But you indicated to my astonishment that SAIC was responsible for the parts in the Gap Analysis and EIS that deal with radioactivity, with CDM dealing with the chemical contamination. Since the EIS is for SSFL Area IV, which was the site of DOE nuclear activities, it is the analysis of the radioactive contamination that dominates the EIS process. It is flabbergasting that DOE would announce that CDM was preparing the Gap Analysis and EIS, while in fact SAIC was responsible for the principal aspects of both. These actions create the appearance that DOE--knowing the controversy surrounding SAIC's reputation -- deliberately hid from the public SAIC's role and instead pretended that the NEPA analysis was being prepared by CDM when the core of it was being written by SAIC. SAIC is widely viewed as a DOE contractor that will say whatever DOE wishes it to say, and is mired in conflicts of interest. Indeed, in the last few weeks, a federal jury found SAIC guilty of defrauding the federal government and violating conflict of interest rules in its nuclear consulting work. This was a suit brought against SAIC by DOE's sister agency, the Nuclear Regulatory Commission. A copy of the NRC's press release announcing its victory in court against SAIC is attached, along with a major article from the Washington Post on the subject, and an additional article as well. DOE's decision to keep SAIC's role in preparing the EIS and GAP Analysis secret is in keeping with a failure to "get it" about the community's concern about DOE, transparency, independence, and true commitment to clean up. It appears there is a predetermined outcome to the EIS; and DOE hired, then kept secret, a controversial contractor charged with and now convicted of conflicts of interest and fraud. The fabrication of the PRG table now becomes more understandable—performed, at DOE's direction, by a contractor that engenders no trust and has been convicted of illegal acts.	2. While CDM was the primary contractor hired to prepare the *SSFL Area IV EIS*, SAIC's role was not hidden by DOE. SAIC was identified in the *Citizen's Guide to the Data Gap Analysis* and the company's role and the personnel involved were introduced at both public meetings where the Data Gap Analysis was presented. DOE does not believe that the results of the referenced lawsuit create a conflict of interest or otherwise require that SAIC be disqualified from working on the EIS. See also prior response regarding the allegation of PRG fabrication.
3	3. SAIC should be removed from the project. The work it did for the Gap Analysis needs to be withdrawn.	3. SAIC brings technical and scientific resources necessary to understand and interpret prior activities within Area IV. After completion of the sampling that is currently being done by EPA and under DTSC orders, the Data Gap Analysis will be revised.

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4	4. Since EPA is now to do the radiological characterization, all radiation aspects of the Gap Analsys should be withdrawn and await EPA's work.	4. DOE will revise the *Draft Gap Analysis Report* based upon the results of EPA's radiological characterization survey.
5	5. CDM's involvement needs to be rethought. It either acquiesced in, or did not catch, SAIC's fabrication of the PRG table.	5. See responses to the accusations that the PRG table was altered. PRGs presented in the *Draft Gap Analysis Report* were used in a manner consistent with EPA CERCLA risk assessment guidance. See the introduction to this document for additional information regarding the uses of PRGs.
6	6. CDM's use of the same inappropriate inputs to establishing screening levels for chemicals needs to be fixed. CDM used a suburban residential scenario that excluded a backyard garden, and a rural residential/agricultural scenario that excluded essentially all agricultural pathways (no beef, milk, poultry, chickens, fish, etc.). In essence, CDM and SAIC both (based on direction from DOE?) converted the rural residential scenario into the suburban residential, and watered down the suburban as well. EPA's PRGs for radiation assume a suburban residential family gets 25% of its fruit and vegetables, and for the ag/rural residential scenario, 100% of fruits, vegetables, beef, milk, poultry, eggs, and fish. The latter is what is assumed in SB990. The Gap Analysis should use those assumptions, for both radiological materials and chemicals. The Analysis needs to be redone accordingly, and recirculated for comment. DOE committed at the hearing to do so.	6. The PRGs used for the chemical screening did incorporate the background garden scenario, including consumption of fruits and vegetables. These PRGs were generated using State of California EPA default parameters because the chemical PRG tables do not include this pathway. Nonetheless, DOE will revise the chemical PRGs and rescreen the data following completion of the DTSC-led chemical COI background study. As the commentor has suggested, the revised Draft Gap Analysis Report will include a scenario that assumes 100% subsistence from the property.
7	7. Both the rad and chemical gap analyses created screening levels based on a combination of PRGs and detection limits. As discussed above, the PRGs used for both analyses are erroneous, based on incorrect input assumptions, and need to be redone to fit the default parameters used by EPA in its rad PRGs. But the detection limits are also wrong. A taskforce including EPA, the state, community stakeholders, etc. has been meeting to establish background and detection limits. Those values, when established, should be used in the Gap Analysis. A similar process needs to be followed for the chemicals. The screening levels then determine the analysis for how many samples need to be taken, and where. None of this can be done now, not until background, detection limits, PRGs, and other factors are resolved.	7. DOE recognizes that a task force including EPA, DTSC, and community organizations is in the process of reevaluating background levels at SSFL. DOE will rescreen the data for Area IV once the findings of the task force become available.
8	8. We were distressed by the small number of samples recommended and claims made about which areas should be surveyed with greater intensity and which with less. The Historical Site Assessment is completely unreliable. The assumption that contamination occurred only near known buildings appears unsupportable. Pathways such as contaminated process water being used for irrigation or for cooling flame buckets of rocket test stands haven't been examined, nor airborne deposition of releases from burn pits or accidents. The sample number and location need to be redone, based on redoing the above-discussed inputs; and then released again in draft form so we can comment on what is actually proposed.	8. In the *Draft Gap Analysis Report*, the analytsts recommend the collection of over 4,000 additional samples, a number that DOE does not consider small. In the *Draft Gap Analysis Report*, CDM recommends sampling all of Area IV, not just locations near buildings. In the report, the analysts also recommend sampling of drainages leaving Area IV, including water and sediment from the ponds that were once part of the rocket engine quenching water recovery system. The *Draft Gap Analysis Report* will be revised to incorporate the results of the RCRA Facility Investigation (RFI) study and background investigations being led by EPA and DTSC and the onsite radiological survey being performed by EPA.
9	9. The relationship between DOE's EIS and Gap Analysis on the one hand and DTSC's RCRA process on the other needs to be clarified. We don't understand how DOE can be proceeding on the chemical part of the EIS in the fashion in which it appears to intend. DTSC has jurisdiction over the chemical cleanup, pursuant to delegated RCRA authority. DOE cannot set cleanup standards for chemical contamination. That is DTSC's job. We therefore don't understand what DOE intends for	9. DOE is required to comply with the RCRA Consent Order that DOE voluntarily entered into with the state and develop the *SSFL Area IV EIS* as ordered by the U.S. District Court. In addition, DOE is required to comply with H.R. 2764 and its requirements to conduct a radiological background study and radiological characterization survey

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	the chemicals. The rad part of the EIS is suspended pending completion of the EPA radiation survey. But the chem part is at best duplicative of DTSC's work, and at worst contradictory of it. There is a Consent Order in place. RFI reports are being done, but have not been approved by DTSC which may require further work and most likely will. Underlying issues – background (which has not, as stated in the Gap Analysis, been approved by DTSC but which will require new measurements), filtering, detection limits, adequacy of past measurements, etc. – need to be resolved. A corrective measures study will need to be produced. It is unclear how DOE can decide on its own now what cleanup steps on chemical contamination it will follow when that decision is up to DTSC and is a number of years off in the future.	of Area IV. At this point, it is unclear to DOE how all the various efforts will be reconciled; however, DOE is committed to working closely with DTSC and EPA to ensure that all activities are integrated and coordinated. DOE recognized this problem early in the process and invited DTSC and EPA to become "Cooperating Agencies" on the *SSFL Area IV EIS*. Both agencies declined. DOE plans to take the results of the RCRA analysis and the EPA radiological characterization survey and use them in the EIS, in the human health and ecological risk assessments as well as the evaluation of alternatives.
OR-018: Christina Walsh, cleanuprocketdyne.org, E-mail dated: 6/6/2008		
1	First I want to say thank you. I have just begun looking at the Data Gap Analysis (and no, I haven't read all 793 pages yet . . . but the exec summary is interesting and encouraging in that is shows a new effort that makes me feel like I can sleep a little better at night. 100% walkover? Did I read that right? Very encouraging. I do have several questions already, but will save them and organize them before I send them to you. I am curious what format the GIS database is in and whether it would be possible for us to have a copy of it for the museum? Database analysis with query abilities would be wonderful in allowing us to answer some of our own questions. (shorten the list)	DOE appreciates the commentor's efforts and initial comments on the *Draft Gap Analysis Report*. The database that will be used in the characterization of Area IV remains in development. The data that will be used to support the evaluation of alternatives in the *SSFL Area IV EIS* will be released with the draft EIS.
OR-019: William Bowling, Aerospace Cancer Museum of Education, Scoping Meeting comment dated: 7/23/2008		
1	I would like to talk about the northern buffer zone and the Brandeis Bardeen campus and I think there should be a lot more looked into the northern buffer zone as far as the work that you're doing	In addition to Area IV, investiationg of the Northern Undeveloped Land is included in the radiological characterization scope to be performed by EPA. Epa also intends to investigate the extent of contamination to adjacent properties that originated from its activities within Area IV.
2	I would like you to also look at the MWH report on the off site seeping springs	DOE appreciates this suggestion. The report referenced by the commentor and others will be considered as part of the revision of the *Draft Gap Analysis Report*.
3	That seems to be a concern about groundwater issues. We took a tour with DOE and Boeing in building 4024 towards the beginning of this year. And we went into this three stories deep sealed reactor building and there's groundwater bubbling up. And Phil Rutherford claimed it's been there since he's been there, and he's been there 25-plus years, if there's groundwater bubbling into a sealed reactor building, where is it going? We need to look at the off-site streams and springs report and see if there's a connection there. And it could beyond the buffer zone and I want you to take that into consideration.	This location was identified in the *Draft Gap Analysis Report* as requiring additional groundwater investigation. Groundwater in Area IV is also proposed for sampling under EPA's site characterization. If EPA does not perform sampling of this location or of seeps, DOE will collect groundwater and seeps samples for radionuclide analyses. Groundwater seeping into Building 4024 is sampled prior to its disposition.
OR-020: Christina Walsh, cleanuprocketdyne.org, Scoping Meeting comment dated: 7/23/2008		
1	First off it's really nice to see Dorothy here in this room today. Dorothy wrote information into a report in 1975 that was later looked at, you know, this is really where one of the sources was to the material that Dan and his students as they first discovered this information in 1979. And this is crucial because, you know, we talked about the attendance here, yesterday and so forth, and when we think about the initial press release, you pointed out so well that there was no EIR in 1959 as you said. And you know, in 1959, if I'm not mistaken, the press release said something like, "fuel rods parted at the lab." There was very little information that any normal, everyday person could possibly understand to	DOE agrees that public awareness of past events and participation in current activities in connection with SSFL Area IV is important and leads to better decisions made by the government. The department continuously works to ensure that its information is not only technically accurate, but that it is expressed in a way that a non-technical person can understand. DOE agrees that, in 1959, such an approach may not have been used when information was released to

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	be related to them or important to their daily lives. And that's -- that continues to be something that I think we need to focus on now, you know. The EIS scoping meetings for the nuclear clean up of the Santa Susanna Field Lab where nuclear accidents have occurred in the past. This is -- these are true statements that I think need to be acknowledged as -- as these meetings go forward because that's how you get people to go, oh, my God, maybe this does apply to me. Because that's the only way that real public participation can happen is because they need to make a decision that this meeting is more important than the other things that are going on their daily lives. We all have responsibilities that we have to meet that way.	the public. Fortunately, this approach has been modified through the years so that people can gain a full understanding of past activities and future plans at Area IV as the remediation process progresses.
2	And groundwater, as Bill is pointing out, is so important and it is not, I think, discussed or acknowledged enough here because that's a profound impact that we know has already happened. We know it's been ongoing, and we don't know enough about where it is going. We really don't know.	DOE agrees that there is currently inadequate documentation to understand the impact that Area IV operations have had on groundwater. While EPA has the responsibility for the radiological characterization of Area IV, if EPA does not collect all the samples recommended in the *Draft Gap Analysis Report*, DOE will collect the samples.
3	This is a picture of the field lab, post fire in 2005. And one of the things that I think is so important about this photograph is because it shows this was -- this outline, you can actually see the outline of the old parking lot where the hot lab was, this is where the cladding operations -- from all over the country came up to the lab to happen here. There were radiological releases based on this ongoing activity, and this area all burned. You can see the line to prevent these buildings from burning that are still in existence. One of which -- this one here, is the nuclear materials building. So we have questions about what went on there because it really isn't talked about enough, in my opinion. But to know that these lines are here where it did not burn means that there were fire fighters, a line of them, working very hard to prevent further damage as this fire swept across the site. I don't believe it's the first time that that happened. I believe in 1970 there was also a massive fire that actually swept across the site -- it came close, the surrounding areas, we're talking about background, we're trying to go ten miles out -- we're trying to go -- we're trying to go away from the site. We have to know when these massive fires happened. We've all the seen in the Porter Ranch, seen the Simi Hills burn up year after year. You don't know which way it's going to go. You've seen that big black cloud that fills every pool in the valley so we know it is carrying contamination with it.	DOE understands the commentor's concern that evidence of past fire fighting practices revealed heroic measures to protect certain onsite facilities. The department has no particular concerns at this time about the footprints of the former facilities. Nonetheless, EPA is conducting a radiological survey and DTSC will oversee the chemical survey performed by the responsible parties. The area under question will be surveyed in both efforts. If evidence is found that elevated contamination levels remain in those areas, they will be targeted for cleanup.
OR-021: William Bowling, Aerospace Cancer Museum of Education, Scoping Meeting comment dated: 7/23/2008		
1	I'd like to say that Alternative 4 is the only alternative.	DOE acknowledges the commentor's preference. The commentor is referred to the introduction as to why DOE must evaluate a range of alternatives under NEPA.
2	And I'd like to say SB 990, that bill 990 is law, and it should be taken into consideration on any remediation up on the Area IV.	The commentor is referred to the introduction for a discussion regarding DOE's inclusion of SB 990 as one alternative in the *SSFL Area IV EIS*.
3	I'd also like to point out, last night during the Simi Valley scoping meetings, the community as well as myself had a lot of concerns about the interim measures of the sodium burning pit and the remediation that went on there. And I wanted to touch on that today so I went line to the e-text reading room section of your web site under historical documents where the former sodium disposal facility documents are. And each document comes up as "page not found." So everything on your web site is working except for the documents under the sodium burning pit. Each one of those documents,	DOE thanks the commentor for pointing out a computer problem with the documents on the website. No documents were removed from the website. This problem was corrected immediately upon identification. If the commentor notices any further computer problems, he should contact DOE and it will be corrected.

	Comment	Response
	page not found, page not found, page not found. And I mean, knowledge is power, the scoping meetings were taken on and you removing the resources from the public is doing the public a disservice.	
	OR-022: Christina Walsh, cleanuprocketdyne.org, Scoping Meeting comment dated: 7/23/2008	
1	The preferred alternative, the scoping itself, as far as looking at the various alternatives, the five alternatives that we see here that we're supposed to be talking about, the first thought that I feel is inappropriate is the fact that there are two no-action alternatives. I understand in your description that you're compelled to provide a no-action alternative, but indeed, you provide two and you're not compelled to do that. And to -- and I feel that the idea that a stop action and stop monitoring, I don't feel that that is a real alternative. Because there are laws, both federal and state laws, require monitoring, continued monitoring because of the issues that have happened. So I feel that that is a concern. And I wanted to say that Option 4, which would be to containerize and move off site the contamination, I think is most appropriate because we've been very assured that the proper U.S. EPA's remedial practices would be used to protect the workers that do this work, as well as the loading of these trucks.	DOE interprets compliance with the requirements of NEPA and CERCLA as requiring two slightly different "no action" alternatives. The department regrets the confusion that this causes. As the commentor points out, it is extremely unlikely that either of those alternatives could be selected by the decisionmaker. They will provide a basis for comparison with the other alternatives. In other words, the reduction in risk that would result from the action alternatives, below what would be expected to occur under the no action alternatives, will help everyone understand the alternatives.
2	So in thinking that this is not an appropriate storage site for permanent nuclear waste, it is clearly not intended for that, it's a leaky mountain top. So I feel in that sense the only appropriate alternative really is to remove the contamination, and that is only possible if it is properly characterized. And that's where this radiation soil survey that really needs to include all drainages related to the operations, and that includes one, two, three, and four areas.	DOE notes the commentor's expressed preference for offsite disposal over onsite containment. The onsite containment alternative is "reasonable" under NEPA, which dictates that DOE evaluate a range of alternatives. DOE will not select a preferred alternative until after the analysis has been completed.
3	As I mentioned, there are landfills already on the site, including -- and those are very steep and they're unlined. And that again underscores the issue that it is inappropriate for any kind of permanent storage. We've had an ongoing and constant connection to groundwater that I think needs to be more actively addressed and highlighted to be important so the people that are making these decisions that are being asked to comment to the public understand what that impact means. That is a resource that we are losing because of impacts, radiological and chemical, to the aquifers below the site.	DOE is just now in the early stages of preparing the *SSFL Area IV EIS* and has not begun the analysis of the impacts associated with each alternative. The commentor's concerns are noted and will be evaluated during the analysis of the alternatives.
4	And there is no site-conceptual model that has been accepted by the State of California that states that that is going off site. In fact, they have rejected that model and have stated that that work needs to happen. And the response, I have to say, I've been very disappointed in. So I hope we can look at that and take a very active role in doing that.	The process used by DTSC to identify a remedy in compliance with RCRA is called a Corrective Measures Study. DOE is committed to working closely with DTSC in the development and analysis of remedial alternatives that will address the requirements of DTSC's Corrective Measures Study.
5	The other thing I wanted to point to is land use, the discussion of the intended land use of the site. And I think that it is only appropriate to remember that the land use on the top of the mountain needs to be consistent with that that is already existing around the mountain, and that is all the people that live surrounding -- these communities have grow closer and closer, and we're already there. And it is above those communities, and I think that is very important. It is zoned as agricultural, and there is agricultural use going on today. And I think it's just completely inappropriate to negate or forget that that is happening now.	DOE agrees that cleanup of Area IV should be consistent with the expected land use for the site, which will consider any existing and planned residential developments in the areas downhill of Area IV.
	OR-023: Carmen Ramirez, CAUSE, Scoping Meeting Comment dated: 7/22/2008	
1	I'm here today to make a link between something that's happened in Oxnard, which is the Halaco Metal Recycling Plant, which is an EPA Superfund site, thankfully. And we believe that there's a	DOE has no record of any waste from Area IV going to any recycling facility, including the Halaco Metal Recycling Plant.

	Comment	Response
	possible leak because radioactive material has been found there. There is some possibility that some of the radioactive material from Santa Susana found its way to Oxnard, and that toxic site is sitting right on the edge of the ocean subject to -- there's some protection going on, certainly thanks to the EPA covering the 700,000-plus cubic yards of toxic materials sitting on the ocean, on the beach, next to very sensitive wetlands area. And so I'd like to make that link and to basically say that this is a great opportunity for we, as Americans, as Venturans, as people working for government, people engaged in civic responsibility, to make amends by doing the best possible clean up of this area. We humans have been playing with fire since the Manhattan project, and this is the fall out, literally, and we know that nuclear energy is now being considered possibly a way out of our oil predicament, and I wanted to say this to all here and to anybody seeing this later, this is not, and this is the proof of it.	
2	So I want to just call on this to really just analyze -- to the agencies, thank you so much. You have the power. We give you the power. We want you to use your power to clean it up. This is what our money is going for. We have to be responsible to the future and to everybody that's been suffering. I have a friend who was a principal for a long time in Moorpark for a long time, subject to the water issues and that are coming possibly in contact with the materials at the site. And he'd say, We just really couldn't figure out why so many children have cancer. We have a suspicion, we have a belief, and we need to use the precautionary principle and clean it up and not let it happen anymore. Thank you for being here. And I know that are many, many people of conscience, and you're going to work on cleaning this up for us, and I know my tax dollars are well spent.	DOE thanks the commentor for the submitted comments and concerns. DOE will incorporate this concern into the *SSFL Area IV EIS* evaluation of alternatives where appropriate.
OR-024: William Bowling, Aerospace Cancer Museum of Education, Scoping Meeting comment dated: 7/22/2008		
1	I would also like to address something to Ms. Jennings. She read earlier -- she read alternatives three and four out of sequence and it might confuse people in further meetings and I would suggest if it was scripted to change that around. Because, you know, the alternative four, which I agree with, was said in alternative three. I don't want to confuse people with that.	DOE apologizes for any confusion that may have occurred by reading the alternatives on the posters out of sequence. Ms. Jennings provided a correction at the meeting.
2	Also, please adhere to Senate Bill 990 when making any of these decisions.	The commentor is referred to the introduction for a discussion regarding how DOE will incorporate the elements of SB 990 into the evaluation of alternatives in the *SSFL Area IV EIS*.
3	I think disclosure should be made to the neighborhoods, especially the close neighborhoods as far as the Brandeis Bardeen Campus and Bell Canyon.	Results of the EIS analysis will be made available to all interested members of the public. DOE is seeking input on additional ways to notify the public of meetings and providing updates on the progress of the cleanup-related activities. DOE, as a result of public input, has been developing an email database, but cannot put members of the public on either its mailing list or email database without their permission.
4	And when you're doing remediation, it might want to be done on certain days when children aren't attending camp or anything like that. Because the children are more at risk right now -- you know, they consume and inhale more of their body weight than adults do.	Cleanup activities will be done in a manner protective of the public's health, including children. Once the levels of contamination and the potential for health impacts have been determined, a list of requirements for cleanup activities will be created.
OR-025: Christina Walsh, cleanuprocketdyne.org, Scoping Meeting comment dated: 7/22/2008		
1	And I would like to emphasize, I really -- I thought that was well put to say that the precautionary principle should be adhered to here and really taken seriously. You know, one of the things that I was	The commentor is referred to Section 3 for a discussion regarding how cleanup of the entirety of SSFL is being addressed by all parties

	Comment	*Response*
	a little bit -- I must say I'm troubled by, is the discussion of a proposed land use. And I know that this is a current topic of discussion, but Senate Bill 990 dictates a cleanup standard for the site that the State and Boeing must adhere to. So anything aside or less than that requires a secondary cleanup that is inappropriate and adds potential risk to existing communities that are already there. I'd also like to point out that the fact that SB 990 is in place because agricultural does already exist. We live all around the site. There are ranches, there are farms, there are people that have consumed their own products and have done so for decades and decades. So just to emphasize that we are already here and I think that needs to be considered very carefully.	involved.
2	I understand these different alternatives between on-site and off-site disposal, I agree that we have to be very, very, very, careful on how we handle that in our entire -- we've talked about the entire areas of this country, Utah, Nevada, and Savannah River that are dedicated to just basically nuclear garbage dumps. It's a travesty, really, and I think we need to make sure that this does not become any such place. This is an amazing place and it needs to be protected as it should be for all of the cultural and other resources that it has and in addition to it being an existing and growing population, to be a growing -- we have – we have -- real estate developments that are blooming on all sides of the site.	The commentor's concerns are noted. DOE agrees that SSFL and the surrounding areas are beautiful and have significant cultural and ecological resources that need to be protected.
3	But the word "containerize," keep it safely on site, unless we look everywhere we need to look on site, and we're already in a place where we don't think that's happening because it's not acknowledged that the entire site is potentially contaminated. It's acknowledged by experts and scientists the potentially surrounding areas beyond the site are contaminated. So indeed, one should then consider the fact that the entire site should be considered to be radiologically contaminated and therefore handled as such. Containerizing the top of a leaky mountain isn't containerized. Either cracks or dead rock that travel we don't know where. In the '90s we used to think we knew where groundwater went.	The commentor's preference for no containment in place at SSFL is noted. The safety of this alternative will be evaluated in the *SSFL Area IV EIS*.
4	So I would really ask that that be carefully considered because containerization has not happened now, it has not happened today, because until we look at the entire site and until we properly look at all of those quadrants and zones and acknowledge how much radiation is potentially there, I don't feel that containerization is possible. So I would like to hope that that would be the proposed method.	The commentor's preference is noted. Please also see the response to the previous comment. The evaluation of the effectiveness of an onsite containment alternative will also include the practicality of implementing such an alternative within Area IV.
5	In response to comments and questions from David Watkins regarding a water treatment plant, IN-072. Sure. I just wanted to say, in response to your comment about a treatment plant. There has been previous concern in previous meetings about groundwater contamination and finding of contaminants in Simi Valley. So in the scoping process, really, I think it's very appropriate that he's asking whether that can be a part of this clean-up process as it applies to these off-site areas that have been impacted and have already been studied. So I just want to say that I do see relevance there and I just wanted to point that out.	DOE appreciates the commentor's concern regarding groundwater contamination. The current data for Area IV show that contaminants have not moved away from Area IV. As part of further groundwater studies, DOE will provide data that demonstrate the extent of contamination associated with Area IV.
OR-026: Terry Matheney, Radiation Rangers, Scoping Meeting comment dated: 7/22/2008		
1	You know, you were saying that you wanted the community's input and to know what people felt, and yet I look around and there just doesn't seem to be a whole lot of the community here. Even though I am one of the Radiation Rangers involved with Runkle Canyon, I live right there. We're the ones that presented the article and as a matter of fact, there's the man back there that founded that, John, he's one of the Radiation Rangers. When we had brought that last time, we had felt that there was good concern for -- for what we had found and the fact that it seems like stuff might be leaking off of there or into our canyons or into our valley. You being a new citizen to Simi Valley, even from this vantage point, I work just behind here, I know well from work, you have a beautiful view of our Valley. We	DOE is disappointed in the turnout for these meetings. Please refer to the introduction for a discussion regarding the activities that DOE implemented to advertise the meetings to the interested public.

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	have a beautiful valley, and a lot of people -- and yet directly across from us is that Del Taco, and I watched about a month ago that poor man trying to get a sign put up on his Del Taco thing. There was a big to-do in the city council about it because he had gotten a beautiful sign that had gotten okayed, but the city expected an opaque sign behind that, and this huge on-going upheaval and controversy and discussion and everything went on and on and on and on and the guy kept pleading his case, I have four other Del Tacos in the city. You've okayed it and I've already paid for it. My whole point is this didn't seem to be advertised very well. I had someone bring a paper and bring to me, hundred yards from where I work, and that's why I'm here and I let John know. It seems that if we really wanted the community's input -- you know, I can't believe that all those people would be concerned about that Del Taco and if you were to tell these people that are toxins, cancerous toxins could be coming down that mountain and off this hill and that their decisions might impact how you go about that clean up, I bet you their children and their lives would sure enough drive them to be down here. And I can't believe that we can look around and you're paying the amount of money that you are to have this set up and not advertise enough to let these people know in this city -- and if you could do this, ask your neighbors, did you know about the toxins up here in the hill or did you know that we're having work shop groups or -- where's the city counsel? We do have one representative over there, I believe. But it just seems if you guys are really serious, I'm glad to see the EPA is involved. I just want honest answers. But if you really wanted to find out the community's beliefs or their feelings on these things I believe they really need to know the truth of what's really involved. It's kind of shocking that they don't. None of the people that I work with up here knew, and that's hundreds. And I know all the people down there that I've talked to don't know. But there are a lot of people that if they would have known this was going on would have been here tonight -- advertise, advertise, advertise. It's kind of like saying I'm going to feed everybody who wants to eat. Dinner time. Dinner time. Nobody wanted to eat. You know. If you were letting everyone know you were making free meals -- if everybody were to realize the consequences of what could be up there -- we don't know, but what could be up there. I cannot believe that you would not have some community overlooking this whole valley -- some community response, and I think it's almost a travesty that if you panned around and see this many empty chairs. I can't believe that out of everybody in Simi Valley they'd be more concerned about an opaque Del Taco sign than they are about the health and welfare of their children in their community. I don't know. But since you guys are being up front and you do want to be concerned and do you want to help, I believe that we need to be more up front in bringing the community really into what's going on. Let them know. We have a right to know. We have a right to know, act. We have the right to know. I feel it's a travesty to have such a thing set up like this and not -- not make it available, not make it known.	
OR-027: Dan Hirsch, Committee to Bridge the Gap, Scoping Meeting comment dated: 7/22/2008		
1	I'll try and be as concrete about the deficiency in the scoping notice and what needs to be done and if there were to be an honest environmental impact statement as possible, so let me give you a few examples of the problems. The scoping notice appears to be focused solely on Area IV of the Santa Susanna Field Laboratory. As we all know, if there's area -- if there's Area IV, there's likely to be an Area I, II, and III, and there are indeed are on this facility, and there are two buffer zones -- at least two. All together, the Santa Susanna Field Laboratory is about 2850 acres. The scope of the EIS as opposed by the ^ URE ^ is restricted to a few hundred acres that is a form of artificially segmenting the environmental impact of the DOE activities at the site. We know that the contamination from	The focus of the *SSFL Area IV EIS* is on Area IV because the decision of the District Court of Northern California ordered DOE to prepare the EIS for Area IV. Please see the introduction for further discussion on this issue.

	Comment	Response
	Area IV has not stopped at the boundary of Area IV. Radionuclides and toxic chemicals don't read maps, don't start to blow in the wind and fall down as though there's a hematic seal or glass wall when they get to the artificial boundaries written on a map. We know that the radioactive contamination has migrated beyond Area IV. In 1993 and again in 1995, studies done by McLaren Hart ^ , under the supervision of Greg Dempsey of EPA found that contamination had migrated from Area IV on to the Brandeis Bardeen Camp Institute, which is not even part of Santa Susanna Field Lab. It's not parts of Areas I, II, III, or IV or the buffer zone. The buffer zone, the northern buffer zone had been part of Brandeis -- eventually had to be part of the buffer zone because of the contamination so the DOE tried to argue saying the contamination wasn't off site, and then changed boundaries. Contamination was also found in another part of Sage Ranch. Sage Ranch is way away from Area IV and yet it was found to be -- have radioactive as well as chemical contamination. Radioactive contamination has also been found in Runkle Canyon off the property, which is to the east of Area I. And a lot of Strontium 90 found in Runkle Ranch off the property, off of Area IV to the north and west. We know that there are a large number of mechanisms whereby contamination from DOE's activities at Area IV migrated beyond there. For decades, the Department, violating it's own rules and every environmental law there was, illegally burned radioactive and chemically contaminated waste in open burn pits, what's called sodium burn pits. Those were, work in the site was with sodium reactors, and so the sodium-contaminated components with radioactive and chemical contamination illegally burned in these open pits, so the airborne release fell out over wide areas. We know that there were accidents at at least four reactors at the site -- the six, the SRE, the most famous one being the '59 partial meltdown, the staff ATR, the staff ADR. And those were fires at the hot lab. We know that there were releases from the plutonium fabrication facilities. These were airborne releases, and there's nothing to prevent the airborne contamination to go beyond the Area IV boundaries. And in fact there's substantial evidence that it indeed did so. It now appears that there were wastes taken from Area IV taken to the burn pit in other areas of the site, and burned there, and this had caused a whole new review by the ^ tox efficiency. Lastly we know that contaminated water from the site did not remain in Area IV. There was a unique plumbing system in which contaminated water from Area IV was pumped through a series of ponds and pipes up to the holding tanks in other areas and then used as industrial process water for the entire site, used to quench the rocket test stands so that when the rockets would be tested, the contaminated water would be used to produce these massive plumes of contaminated steam. That fall out would fall out over wide areas. Additionally it appears that that contaminated water was also used for irrigation throughout much of the site. So there was an extraordinary mechanism for taking the contamination of the property and moving it throughout the facility. Therefore, first point is simply that Area IV should not be the restricted scope of this EIS but should be the entire -- areas, frankly on site and off that are potentially affected by the half century of sloppy practices by the Department of Energy and its predecessor agency, the Atomic Energy Commission.	
2	It is true that my group, the Committee To Bridge The Gap, along with the Natural Resources Defense Counsel and the City of Los Angeles are in large measure responsible for the existence of this environmental impact statement by having sued the Department of Energy in U.S. District Court. I want to make clear, however, that our suit was not merely over contamination in Area IV. It was over the environmental impacts of the Department of Energy's activities in Area IV. Those environmental impacts extend far beyond the site, the site of Area IV. And it is our view that an EIR will be incomplete if it fails to look at the full impacts of the Department's activities at Santa Susanna. And does not address remedies for those impacts and also fails to address the cumulative impacts from its	When presented with information from CBG, NRDC, City of Los Angeles, the U.S. District Court judge ordered an EIS for Area IV, not all of SSFL. DOE agrees that the *SSFL Area IV EIS* must evaluate alternatives for cleaning up contamination that resulted from DOE's operations at SSFL. DOE's operations at SSFL were confined to Area IV. DOE is committed to supporting EPA and DTSC RCRA investigations that will document the extent of Area IV radiological and chemical contamination. The department will prepare a human health

	Comment	Response
	activities and the activities of other governmental agencies on the site. Understand our situation here. This is a governmental facility operated under contract to the U.S. government by a succession of companies, now Boeing, before that the Rocketdyne division of what was then Rockwell, before that North American Aviation, and so on. Those activities occurred on a mountain top, and they felt that they were above and exempt from the environmental laws of the country. What happened there was done often not with classified secrecy but just with a cloud of secrecy, and very bad things happened for the environment. They contaminated the site, but more than that, because it's on a mountain, the environmental impacts extend beyond the mountain.	risk assessment and an ecological risk assessment. Then, DOE will prepare the EIS to evaluate a range of alternatives, as required by NEPA, for cleaning up the contamination that its operations caused. That is what the federal judge ordered DOE to do, and that is what the department is doing.
3	And what worries me about the scope, proposed scope of this EIS, is that I -- it does appear to be preordained, the outcome. The focus is solely on the proposed land use for the site, top of the mountain, when the environmental impacts go far beyond the impact on the site. If the Department chose, which is all the signals that we've been getting, to claim that the site, despite its zoning is agricultural, despite all the agricultural activity around it, instead said we are only going to consider this to be open space, then there would be zero clean up of the site, and the people who live below it, those of you in this audience and the many others who aren't here, would continue to be exposed. Because your land use is much more intense than an open-space use. The open space -- the trick that they're using is they say someone will hike through it only a few hours a year and therefore they can divide the contamination by, let's say eight hours by the 18 hours -- 8,760 in a year. Whereas if you're residential or agricultural residential, then you are exposed virtually the entire year and you have to have much greater clean up. So what I am concerned about is not just the land-use scenario, it has to be the current zoning. It has to be added, but also the assumptions the DOE is going to use in what would be considered agricultural.	DOE has not selected a preferred alternative. DOE will not select a preferred alternative until after completing the analysis of the alternatives. DOE will evaluate in the EIS an agricultural alternative that considers 100% of an individual's subsistence from the land.
4	I also want to make clear that there have been negotiations going on for a number of months now between the State, Boeing, the community, with DOE present, U.S. EPA present as well. And that one of the alternatives that should be looked at here, and again is really what the Department should do, is finally ending this controversy and saying we're going to stop being the obstructionist. We're going to stop being the one that stops the clean up at the site. We're going to stop this dragging out forever causing more tax dollars to be sent and more and more contamination to leak off the hill because we haven't cleaned it up in a timely fashion.	DOE is committed to following all applicable laws and will proceed with cleanup as quickly as possible.
5	What I don't understand about this entire EIS process is that the State of California has a parallel process underway under federal law, the Resource Conservation Recovery Act, RCRA, for cleaning up the chemicals. Now that DOE has finally agreed to let EPA do the survey for the radiation, the gap analysis for the EIS is still moving forward on the chemicals. And I don't understand that. The State has pending before it RCRA facility investigation reports, RFI reports, on the same area. The State has yet to come up with the clean up standards for the chemicals for this area. The State has yet to come up with cumulative risks for the chemicals and the radioactivity. So it seems to me that DOE is moving on a train that is completely in the opposite direction than what everybody else is moving on, and wasting tax payer dollars at the same time because we're having to do it twice. And coming up, likely, with conclusions and results that will be less protective of the public than RCRA will require from the chemicals through state supervision and what SB 990 requires for the radiation and the chemicals and what EPA CERCLA guidance requires for both pursuant to the 1995 joint agreement between DOE and EPA. So at bottom, the EIS should be examining, if exams anything, as its preferred alternative, to clean the site up consistent with SB 990, consistent with what the state's doing	The relationship of the *SSFL Area IV EIS* to the ongoing EPA studies and RCRA compliance activities being directed by DTSC is discussed in the introduction. The commentor is referred to the introduction for a presentation of the issues raised by this comment.

	Comment	Response
	on RCRA, and consistent with what we're trying to work out in this negotiation process with all the other parties.	
6	There's no reason why the environmental impact statement can't be done right which is to say we're stopping at this time. We're waiting for EPA to do the radiation survey because we need the radiation data to be able to do our EIS. And we're not going to go ahead and do the chemicals ourselves because we don't have a lot of credibility and our consultants at CDM and SAIC have been extraordinarily wounded in their credibility by the monkey business that was played by the fabrication of that table which led to EPA's letter of a couple weeks ago saying that EPA has lost all credibility because of that action. There's no reason to pay CDM and SAIC to do what the state is doing on the chemical. The state is currently reviewing these RFI reports. If there are data gaps, the State will order Boeing and DOE to go out and take additional ER measurements. The State's the one that's supposed to be coming up with the clean up standards for the chemicals and under SB 990 for the radiation.	DOE understands the commentor's concern. DOE agrees that it cannot move forward with many of the efforts required for preparing the *SSFL Area IV EIS* until such time as EPA and DTSC have completed their ongoing investigations. It has always been DOE's plan to use the information collected in compliance with the RCRA consent order under DTSC's jurisdiction for the chemicals. CDM, DOE's contractor, recommended that additional data (beyond what will be collected by DTSC) will be needed to prepare the risk assessments and the EIS. DOE is committed to collecting all of the data necessary to prepare the risk assessment and EIS properly.
OR-028: William Bowling, Aerospace Cancer Museum of Education, Scoping Meeting comment dated: 7/22/2008		
1	I'd like to talk about the sodium burn pit interim measure. During that time the removal of soil and everything, we've seen several cases of retinal blastoma during that year a lot of the children were conceived. So what I would like to see in the future, and I would like you to take into consideration, sterile environment sealed tenting and get them as big as these rooms. You've seen them in triage areas during environmental disasters. You could better control the airborne contaminates if you put this over the site you're remediating and we wouldn't have any of the off winds that go south, to the east, into Woodland Hills causing these retinal blastomas.	Contrary to the commentors statement alleging linkage between site cleanup activities and retinoblastoma, no definitive evidence linking the two have been established. Appropriate fugitive dust control measures will be used during all soil and building removal actions performed within Area IV.
2	I'd like to make a suggestion to contact the public -- you've had a good point and I think one thing that wasn't done is e-mail blasts. And I'm sure you can get a database if you have a load e-mail database, I'm sure Boeing or NASA could loan you their e-mail database and stretch this out further. Because a lot of people check their e-mail more than their post office box or their mailbox.	DOE appreciates the suggestion is currently collecting the email addresses of interested individuals and has instituted email updates.
OR-029: Christina Walsh, cleanuprocketdyne.org, Scoping Meeting comment dated: 7/22/2008		
1	And one of the things that has been brought up tonight is about noticing the meeting and how – how to get more people to know about it, and I realize it is correctly titled the EIS scoping meeting, but to the general public, without the words, you know, it is a nuclear clean up. It is a radiation contamination clean up. That's what it is, and in the absence of those words in the title of the meeting it doesn't really have any great meaning to the general public. It doesn't deal with this or go to meetings on a regular basis and lead their lives.	DOE's notification mailings, *Federal Register* notices, and other public outreach efforts have identified SSFL as a location of nuclear research with a need for cleanup activities. Additional information regarding community notifications and processes is provided in Section 3 of this document.
2	In addition, I was looking at -- I was thinking about some of these issues about what should be included in the scoping. And we've talked about, you know, appendix B, and was it D, that shows the historical site assessment, but every detail, every incident that has happened up there needs to be looked at in that sense. You know, in the Boeing reading room, there's a report called the Christian report which is the response to the testimony of an expert witness on the environmental side about this very clean up. But there is no report about his testimony so that his side of the story, his actual testimony of this entire report was written about is not included, and that very much needs to be included during this scoping because that's what -- those depositions, those -- did the testimony of all this prior litigation, and I believe the consent order mandates that all this be provided, and it's been put together in a place that -- that can be reviewed. And I think that in this process all of that	DOE appreciates the suggestion that it review the testimony of the expert witness that prompted the Christian report. In addition, DOE will consider all uses and purposes for each facility requiring investigation and cleanup.

	Comment	Response
	information that has been put together based on the consent order has to be reviewed, has to be reviewed. Prior use of buildings, you know, not just the use of its last -- its last use on the site, but, you know, there are buildings that were storage -- storage units but prior to that they were contaminated laundry facilities. It's very important understanding that the effluent from the SRE scrubbers, went directly to these ponds that were distributed crap from around the sites. That's all very important.	
3	And I would like to finally add, you know, 1.4 traffic accidents -- 1.4 fatality traffic accidents, and that is the line I think in 2004 that I first heard that broke my head they were not going to clean up this site based on the idea that they were going to save 1.4 lives in the trucks that will be going down the hill. That, I felt, was outrageous then and I hope we're not going back to that thinking.	DOE has been ordered to prepare the *SSFL Area IV EIS* in compliance with NEPA. DOE has committed to conduct a human health and ecological risk assessment, consistent with CERCLA requirements for Superfund cleanups. Traffic accidents will be evaluated, along with a multitude of other criteria.
OR-030: Sue Boecker, Save Open Space, Scoping Meeting comment dated: 7/22/2008		
1	One of the first -- well, not first, but among some of the first meetings I attended were with ATSDR -- I think I got it right. Anyway, they were told nothing had gone off the hill, everything was fine, not to worry. And really and truly, Dan Parks said it. I live -- I live over in Oak Park, which is right by a hills. And in every house on my cul-de-sac there has been cancer. And now my friend, who lives in Agoura Hills, has breast cancer and the people in each house adjacent to her over in Liberty Canyon there's a street, every house on both sides of the street has cancer or has had. So I think it's -- I mean people on my street have died from brain cancer, from all -- well, breast cancer, all different kinds of cancer. And I think that you need to bring ATSDR back in this process, let them know what has been found and what has been discovered in the documents, the old documents, so that they can look and they can know that they need to look all the way around -- Simi Valley, Santa Susanna, West Hills, Calabasas, Agoura Hills, Oak Park, and, again, especially Simi.	ATSDR is a federal public health agency of the U.S. Department of Health and Human Services. According to the agency's website, ATSDR is directed by congressional mandate to perform specific functions concerning the effect on public health of hazardous substances in the environment. These functions include public health assessments of waste sites, health consultations concerning specific hazardous substances, health surveillance and registries, response to emergency releases of hazardous substances, applied research in support of public health assessments, information development and dissemination, and education and training concerning hazardous substances.
2	Anyway, I drew up a little map -- community, not very legible, however. But I think it's important that they be involved in this EIS process, that this is a disclosure process. It is -- you can't disclose what you don't know, and I think that they are probably the best suited to know about that, to make the risks known to people livings in the area.	DOE appreciates the map submitted by the commentor. The department is committed to involving the public throughout the preparation of the *SSFL Area IV EIS* and appreciates any suggestions about how to do a better job of communicating with the public.
3	We respectfully request that prior to any decision about the scope of the EIS for Area IV that the actual logs which Dan Parks alluded to be made available to the public. We've been told we need to go through a freedom of -- we need to make the Freedom of Information Act request. Well, the last one we did took a year to get anything back, and that really is unacceptable because I'm sure this process will go along a little quicker than that. So I think Department of Energy needs to cough those up. They need to be made available for public scrutiny and we need to have time to go through them, and we also need to know as much as possible about the people that checked in at the front gate and went to work at Area I and checked in but then took the bus over to Area IV and worked. I mean, they may all be dead by now, but that's -- that's another thing that needs to be looked at.	DOE agrees that logbooks would provide an invaluable source of information about historical operations. The department has undertaken a search of its own records for these logbooks. DOE has also requested that Boeing search its records for these logs. The commentor is advised that Freedom of Information Act requests must be made through the DOE website at www.energy.gov and then by clicking on a link for Freedom of Information Act at the bottom of the page that allows a request to be submitted electronically.
4	Two, we -- please follow the most stringent available sampling and laboratory protocols from U.S. EPA and/or California DTSC or California DHS, whenever you can find the most conservative, meaning that you will look for the lowest amount of radiation or chemical contamination that's possible to know. It needs to be not only in Area IV but as Marie said, all over the hill and in the surrounding communities. You need to take raw samples. This acidifying and filtering in the field and tossing the filters away is ridiculous. That cannot happen in this -- in this case. Hopefully, as was discussed a few weeks ago, EPA will be running this process, because DOE -- I mean the community	DOE understands that many in the community have concerns about the manner in which past sampling was conducted. EPA will be conducting a radiological survey of Area IV and DTSC is overseeing a similar survey for chemical contamination. DOE will use the results of EPA and DTSC directed sampling as needed to prepare the human health and ecological risk assessments and the *SSFL Area IV EIS*.

	Comment	Response
	has no faith in the Department of Energy anymore. There -- the ashing of soil samples has got to -- you can't do it. It has to be done so that you could find out, not so that you can hide contamination. A grid needs to be laid out for sampling locations, not just randomly saying, oh, well, we'll take some here and some there. Starting -- and then working outward from the most contaminated locations in Area IV. Presumably that would be the -- I'm sorry. I'm not quitting in a minute. I'm representing a group of people. Preferably the SRE location or the radioactive storage materials and handling facility would be a -- good places to begin. The driving the little golf cart around and trying -- and taking samples of the radiation is ridiculous. It needs to be done properly. There needs to be counters there. I've had a Geiger Counter and it comes up sporadically. It needs to be overtime. As you work -- as you move away, if you find higher levels of contamination, mark the location -- well, they'll all be marked -- go back to that location and re grid the place and go over that.	
5	Sample all media, soil, rocks, surface water, groundwater especially, alluvial soil, the drainages, multiple depths. On Ahmanson Ranch, there was -- in water well No. 1 they found at 550 feet below that ranch, which is lower than SSFL, they -- we -- they found Perchlorate and radioactive radionuclides.	In the *Draft Gap Analysis Report*, the analysts recommend sampling all media at multiple depths.
6	Since there was no containment structure up there and there were multiple meltdowns of core -- whatever they're called, the fuel rods, you need to look for all fission products and all the chemicals that were used and created up there.	DOE understands the commentor's concern that radionuclides may remain. EPA under its characterization study will analyze samples will for all potential radionuclides that would still exist 25 years after the end of operations of the last reactor. See also additional information provided in the Section 3 of this document.
7	Look first in Area IV, of course, in the soils and drainages and groundwater, and the surrounding areas, particularly Santa Susanna Knowles areas, Runkle Canyon, Minor Canyon, Sage Ranch, Dayton Canyon, Bell Canyon, Las Virgenes Canyon in the deep groundwater.	EPA's Area IV characterization study will investigate the extent of soil and groundwater contamination related to its activities within Area IV, including surface water in those drainages that lead from Area IV to other areas.
8	I'll be quick. I wish I could tell you the name of the report, but there's -- there's a graph, and it has the months along the bottom, and it has the radio -- radioactive thing, line, graph, that goes up and down. And every time they started the reactors, the SRE reactor, the radioactivity -- I think it was vented to the environment, would go way up, and then it would come -- kind of -- come back down, maybe it would do a couple of blips. But then when the reactor melted, it went clear off the page, the line did, and the comment in the document accompanying this graph said that their instruments were not calibrated to measure this. Well, of course they weren't. It was melting down, and it -- it melted and melted, and it went on for weeks, and it went into the environment. It went all over. And I think probably that the dumb thing never, ever worked right in the first place, because when they turned it on, up went -- there were spikes of radioactivity. I mean, these were the kinds of things -- I'm not a physicist, I'm not an -- you know, I'm just a person, but when something is -- it wasn't right. It was never right. And it needs to be looked at because they didn't even have a containment structure. All these fissionable products went everywhere, and the wind is another factor. We have Santa Ana winds, so when the stuff gets dispersed, it can land someplace but when the Santa Ana winds blow, it blows it everywhere.	DOE understands that many in the community are concerned about the potential release of radionuclides following the partial meltdown of the SRE. DOE is conducting research into the accident for a better description of what happened. EPA as part of its characterization study will analyze samples for all radionuclides potentially remaining following cessation of reactor operations more than 25 years ago.
9	I suggest larger type. I suggest saying something about a nuclear cleanup in big, bold letters. I suggest signs. I suggest one of -- one of you going -- determining when the next meetings are going to be and go to the Thousand Oaks City Council, go to the Simi Valley City Council, go to the Ventura Board of Supervisors, go to L.A. -- make every effort to contact every public -- because that costs you nothing,	DOE appreciates the commentor's suggestions. The department will continue to use as many communication methods as it can to inform people about opportunities for their involvement in cleanup decisions related to SSFL Area IV.

	Comment	Response
	they're public comments, and they might even put you on their agendas. And go every time, every week, to have somebody there saying we're going to have a meeting about the nuclear cleanup at Santa Susanna. That would go a long way.	
	OR-031: John Southwick, Radiation Rangers, Scoping Meeting comment dated: 7/22/2008	
1	I'm thinking as I look around here at the dismal turn out from the citizens of Simi. And I go back to about two or three weeks ago, the city of Simi Valley put on a free fireworks show. They plastered the whole city with signs. You could not drive anywhere in the city of Simi without seeing this free July 4th fireworks event. There were so many people there that every single parking place in the city was jammed in the area where they had the fireworks. And my concern is that the amount of people here are not representative of the city of Simi, and it should be your concern, because if you take this back to your superiors and you say, well, there were 25 citizens there from Simi Valley, this is not good. If I think that -- you should think about doing this over, have another meeting, get some media attention. We've been -- as Radiation Rangers, we've successfully stopped a project by KB Homes building by Rocketdyne. We've stopped them now for two years, and we don't think they're ever going to build up there. So with community involvement, if you get a few folks involved, you can do things. We also, at city council meetings, plastered the area with leaflets. We got so many people at a city council meeting we filled up the whole place. So it can be done if a few little people like me and the Rangers can do these things, surely the big arm of Uncle Sam could put out a few leaflets and get the citizens alerted to be here. They are concerned. They're concerned, and we know they're concerned because we speak with them. If we didn't speak with -- there are people in Simi Valley, for instance, that don't know there was a meltdown up there at Rocketdyne. There are still people here that don't know that. Your job, if you're going to do this, is to get the folks here.	DOE was disappointed by the turnout for the scoping meetings, too. The department expended considerable effort to announce the scoping meetings – but the commentor's suggestions are appreciated and will be considered as the project moves forward. See also additional information provided in the introduction to this document.
	OR-034: William Bowling, Aerospace Cancer Museum of Education, Scoping Meeting comment dated: 7/24/2008	
1	In Alternative 4, groundwater remediation should be looked into. In figure 4-2 of your Data Gap Analysis you will see the groundwater from Area 4 leads into the American Jewish University's Brandeis-Bardin campus and also off-site to the south towards the LA River. It is the head waters of the LA River, the Bell Canyon area, which Area 4 drains into.	Impacts on all aspects of the environment – including groundwater – will be evaluated under all of the alternatives. The purpose of the environmental documentation prepared in compliance with NEPA is to allow comparison among a range of alternatives.
	OR-036: William Bowling, Aerospace Cancer Museum of Education, Data Gap Meeting comment dated: 6/26/2008	
1	I have a brochure here from the ETEC center, which has a photograph of the bowl area in Area I on the front cover, and I made a colored Xerox copy to present to you. And this is just an example of the work that the DOE was doing in Area I, which is not in the scope of the EIS, and I think that Area I should be looked into. Also, the SAIC document from 1991, on page 4-25, it says, "Two coal gasification systems from DOE Programs from the 1970s were in the Bowl Area I." So there's another document.	DOE only has the authority to make decisions related to the portion of the site that it is responsible for. The *SSFL Area IV EIS* will address cleanup of all contamination that is attributable to DOE's historical operations within Area IV. Area I is currently being investigated under the auspices of DTSC's RCRA investigations. Should the findings of the DTSC-led study indicate that wastes located in Area I are related to DOE activities, DOE will take appropriate action.
2	And also, thanks to Barbara Johnson. She gave us a bunch of boxes and stuff. And we went through them and we found the radiological characterization plan of the Santa Susana Field Laboratory from March 30th, 1994, and it shows the storm drain system and water runoff running from Area IV into Area III, so this should be looked into, as well. Also, in this document it has the sewage treatment plant in Area III and the sewage treatment water waste from Area IV going into Area III, and I'll present this to you, as well.	DOE appreciates the information provided by the commentor. The department will review the information and incorporate what it learns into the revision of the *Draft Gap Analysis Report.* The information will also be useful for EPA as it develops the Field Sampling and Analysis Plan for characterization of Area IV.

	Comment	Response
3	Also, in this document it has a sump pump from the sodium reactor experiment --which is the worst nuclear meltdown that we had in the United States -- and there's a pipe and a sump pump for the SRE pond that goes all across Area IV, Area III, down into the Silvernale Pond, which drains eventually into the R2 Pond, into the L.A. River, and I think these areas should be looked at, as well.	DOE appreciates the information provided by the commentor. The department will review the information and incorporate what it learns into the revision of the *Draft Gap Analysis Report*. The information will also be useful as DOE develops the Field Sampling and Analysis Plan for additional sampling.
OR-037: Dan Hirsch, Committee to Bridge the Gap, Data Gap Meeting comment dated: 6/26/2008		
1	This is going to take more than ten minutes. I'm not going to do my full statement now. I want to make a basic statement and have others comment and then come back for my more detailed comments. I need in my comments to try to tell you the other side of what you've just been told. We're a third of the way through what should have been the public comment period. I hope we'll have enough time to actually have public comment. This enterprise is supposed to be conducted under the National Environmental Policy Act, or NEPA. And under NEPA, that requires a hard look at alternatives, an honest, independent look at the potential environmental impact of the project and the alternative actions that can be taken.	The Data Gap Analysis is not being conducted to develop alternatives for the SSFL Area IV EIS. The Data Gap Analysis is being conducted to identify the data necessary to conduct risk assessments consistent with CERCLA guidelines. Alternatives to be addressed in the EIS will be discussed and developed separately from the activities needed to complete the chemical and radiological characterization of Area IV.
2	At the core of that determination is what cleanup level you use; that's really what this EIS is about -- how much of the mess that this agency made on that mountain this agency is going to agree to clean up, how much of the risk to those of you who live below it they are going to agree to reduce.	The SSFL Area IV EIS will analyze a range of cleanup alternatives addressing potential cleanup levels. The alternatives will address current and future risks based on the cleanup levels evaluated. The community will be given the opportunity to comment on those analyses. The EIS will provide the basis for the cleanup decision but the actual cleanup level will be presented in the Record of Decision for the EIS.
3	They are not doing this voluntarily. They're doing this because the group that I'm part of, the Committee to Bridge the Gap, along with the City of Los Angeles and the Natural Resources Defense Council, sued them in federal court because for decades they had thumbed their noses at the federal law NEPA, also the Superfund law, CERCLA, and other laws. They had felt they were above the environmental laws of the nation. They have spent on the order of a quarter of a billion dollars on the RAD cleanup, primarily just the buildings, without ever doing an environmental impact statement. So we went to federal court and the judge, Judge Conti, issued a blistering decision finding them in violation of the nation's environmental laws, ordering an environmental impact statement and requiring that he hold onto this case to see if they, in fact, finally comply. So this is not a voluntary enterprise. This is after decades of flaunting the law. The question is whether DOE has now gotten the message and is going to stop flaunting the law.	The commentor correctly states that DOE is preparing the SSFL Area IV EIS because DOE was ordered to do so by a federal court.
4	We mentioned a couple other aspects of this. DOE is bound by a 1995 joint policy with U.S. EPA to clean up all of its nuclear sites, including Santa Susana, consistent with the EPA's Superfund guidance -- Superfund, or the law called CERCLA, C-E-R-C-L-A. They have ignored that requirement, as well, year after year after year, and that requirement requires them to clean it up to the strictest of the EPA standards.	The 1995 Joint Policy was established for decommissioning of facilities, not environmental cleanup. However, DOE does intend to complete the SSFL Area IV EIS, incorporating CERLCA elements as appropriate.
5	Many of you were involved last year in helping get passed a state law, SB 990, which requires this site to be cleaned up to those strictest EPA standards, and those are defined in the law as "rural residential/agricultural" -- same thing, rural residential agricultural, same scenario. And it specifies certain, what I call, preliminary remediation goals or PRGs. EPA has set in a table that it publishes as what the law requires.	The EPA table referenced in the comment includes separate PRGs for the residential land use and agricultural land use scenarios. The EPA table does not include PRGs for a "rural residential/agricultural" scenario. DOE has agreed to evaluate an agricultural scenario consistent with the pathways in the EPA PRG table.

	Comment	Response
6	Now we are in a NEPA process, which means that that decision as to how clean they're going to agree or how dirty they're going to insist on leaving it is to be made through a process whereby you were supposed to have real input and they're supposed to make an honest appraisal of it. There is a scoping hearing next month to even just determine the scope of the environmental impact statement. And then a -- long from then, there's supposed to be a draft environmental impact statement. All of those are supposed to be open-minded to what will be the final remedy here. What will be the cleanup standards?	The SSFL Area IV EIS will analyze a range of alternatives but will not select the cleanup standard. The cleanup standard will be developed and analyzed during the process of remedy development and evaluation consistent with CERCLA and NEPA guidelines.
7	So the greatest "fib" in NEPA and the greatest violation of law is to prejudge that outcome, to decide it before you even start it -- what cleanup level you're going to use, how dirty they're going leave it, how much Cesium they're going to make you exposed to by living down the hill, how much TCE or perchlorate you'll be exposed to living on the other side. That is not supposed to be decided until they've gone through this process, and they're supposed to have their mind open and take in all of the data and truly independently decide what to do.	The SSFL Area IV EIS will analyze cleanup standards, but will not select or prejudge the cleanup standard. The cleanup standard will be developed and analyzed during the process of remedy development and evaluation consistent with CERCLA and NEPA guidelines.
8	But in this so-called "gap analysis," they actually tipped their hand; they actually went ahead and decided before we've even had the scoping hearing, let alone the draft EIS, that they are not going to clean this site up consistent with SB 990. They're not going to clean it up consistent with the EPA Superfund requirements. They're going to do what they have been doing all along. And they weren't even willing to be honest about it. They misled in this gap analysis. Not only did they mislead you, they even misled the EPA. EPA went away from the gap analysis with the assurances DOE had given it, believing that the gap analysis required the use for these new measurements that they claimed they were going to make, the use of the EPA rural residential/agricultural preliminary remediation goals using EPA's default parameters.	The Draft Gap Analysis Report does not analyze or select the cleanup standard, nor is it a decision document. The report identifies the data necessary to complete characterization of Area IV for purposes of conducting risk assessments consistent with CERCLA guidelines and to analyze risk-based alternatives in the SSFL Area IV EIS. The radiological PRGs used in the data gap radiological soil analyses are residential PRGs taken directly from EPA's website and are based on EPA's default parameters. The PRGs were not altered in this analysis. The EPA website table can be viewed at http://epa-prgs.ornl.gov/cgi-bin/radionuclides.rprg_search. This website does not contain rural residential/agricultural PRGs. However, when the Draft Gap Analysis is revised a thorough analysis will be conducted using an agricultural scenario which assumes 100% subsistence from the land.
9	EPA was so pleased with that, that they even said "Thank you" in their cover letter of their comments. "We appreciate the fact that you are using our preliminary remediation goals." The problem was it was a lie. It was a lie.	EPA's "thank you" to DOE "for the opportunity to review the Preliminary Draft Gap Analysis Report for Area IV" was related to EPA's use of the document in understanding the scope of the "joint radiological survey" being developed by EPA and DOE. EPA's statement regarding DOE's use of using PRGs developed under the Superfund program recognized that the PRGs used came from EPA's table.

	Comment	Response
10	CDM, SAIC, DOE made people believe that they were complying with the law, made people believe that they were going to, in fact, use those PRGs and went ahead and changed the table. Some of you were at the meeting last week, but let me show you what they did. First of all, this is from the gap analysis, and you will see here that they say that the radiological PRGs for the Santa Susana Field Lab are based on default EPA methods. Understand EPA had certain default assumptions -- how much milk you get from the site, how much vegetables you get from the site. So they're telling us that they used the EPA default methods and the EPA PRGs that you can get from this web page. That web page is this. Pretty dense. Dozens of pages, at least tens of pages of different radionuclides. And this is the table that was put into the gap analysis. Now, obviously they assume that no one would check, compare the two. I guess they think we're pretty stupid. If you compare the first four tables, four columns, those are all correct. Those come from that EPA chart. But they changed all of these, both the rural residential and the residential, the suburban residential, from the EPA table, and not just a little bit.	The radiological PRGs used in the Data Gap Analysis for the radiological soil analysis were residential PRGs taken directly from EPA's website, based on EPA's default parameters. The PRGs were not altered in this analysis. The PRGs used were on the website table that the commentor momentarily displayed on the screen. The EPA website table can be viewed at http://epa-prgs.ornl.gov/cgi-bin/radionuclides.rprg_search. The PRG table displayed by the commentor (PRGs for Superfund), which is attached to the comment response, is the basis for PRGs used in the Data Gap Analysis. The table includes separate PRGs for agricultural, residential, and industrial scenarios. It also displays the default parameters applicable to these PRGs. With the exception of actinium, in which a lower PRG was used, no changes were made to the PRGs listed in EPA's table. The EPA PRG table does not include either a "rural residential" or a "suburban residential" PRG. The PRGs used in the data gap screening were EPA's residential PRGs, including the consumption of fruits and vegetables, taken from the website table referenced by the commentor.
11	Let me give you a handful of examples just to compare. Okay. For Americium-241, the people you just heard make the presentation claim that EPA PRG for rural residential was 1.9. In fact, it's .0132 or 144 times more protective than what they claimed. If you go to Iron-55, they claimed that EPA's PRG was 2700, but the table is actually 0.821. That's nearly 3300 times higher level of radioactivity they were saying would be the starting point cleanup level. By the way, they're using these through the screening to determine what measurements they'll make at the site. So they're setting their screening levels at thousands of times higher than you need to see the actual cleanup level required by SB 990, required by the EPA CERCLA rules, required by that 1995 joint agreement. For Cobalt-60, it's 40 times higher; Cesium, 50 times higher. Take a look at Iodine-129. They told us that the PRG from EPA is 0.6 when it's 0.00003, nearly 20,000 times higher.	The commentor is comparing the agricultural PRG with the residential PRG, both of which are contained in EPA's Superfund PRG table.
12	Now this is a table buried a couple hundred pages into a document. There was never any expectation that we could catch it. They say EPA itself, who's table it was, didn't catch it, who's table it was that was being misrepresented.	The PRG table (Table 3-3) was not buried "a couple of hundred pages" into the document. It was presented in Section 3 of the Draft Gap Analysis Report (see Section 3.4.2.3, page 3-22).
13	Now you need to remember there's one other law that DOE is supposed to be complying with, and that is an appropriation bill passed last year that requires that DOE enter into a joint agreement with EPA for what would be a minimum -- a joint survey, DOE doing much of the survey work. Congressional (Inaudible) really EPA to do that, so -- but the minimum is it's supposed to be a joint survey, but they prejudged that, as well. The chart that was presented here a little earlier in the meeting says that they intend to go into the field in the fall, DOE, its contractor, to do the measurements. There are negotiations going on right now to say no. The law requires it to be at minimum joint with EPA. DOE is refusing to let EPA go onto the site to make the primary measurements. They want their own contractor to do it -- the same contractor that fabricated, manipulated, altered the table of the EPA cleanup levels and the screening levels that were supposed to be used for the survey.	Since the release of the Draft Gap Analysis Report, DOE and EPA have entered into an Interagency Agreement allowing EPA to have the lead on the gamma walkover survey, the radiological soil background study, and radiological soil sampling within Area IV. DOE has never refused to allow EPA access to Area IV to conduct the survey. Until the congressional direction, the issue has been under what authority and funding mechanism EPA could accomplish such a survey. There were no fabrications of the PRGs used in the data gap data screening. The PRGs used came directly from the EPA website referenced above.

	Comment	Response
14	And by the way, the gap analysis accepts all of those readings, all of those measurements. We were told it's quote, unquote, independent. "Independent" is an Orwellian term to describe what just happened. They say that their data comes from Boeing. Yes, that's the whole problem. They have bought entirely with a few exceptions the material presented to them by the company and the agency that created the contamination in the first place by violating the law over and over again and lying about it, and then their own contractor lies, as well.	The statement that the Data Gap Analysis "accepts all of those readings," a reference to the 1989 EPA study findings, is not true. The Draft Gap Analysis Report finds the results of earlier studies at Area IV do not meet current data criteria and recommends repeating most of the earlier work.
15	So we have a federal law that says we can't trust DOE to do the survey itself. Federal law requires that EPA be deeply involved in that survey -- measurements on the site. And yet this whole little farce that we have here today is because they're ignoring the federal law, and they're going to send CDM or Boeing or whatever DOE contractor onto the site in a couple months to take the measurements that the Congress said was supposed to be done by the EPA.	The federal law that the commentor refers to requires that DOE and EPA enter into an Interagency Agreement (IAG) to jointly conduct the Area IV radiological characterization survey. The agencies signed the IAG on 7/24/2008 whereby EPA would take the lead for completing both the offsite background study and the onsite gamma walkover survey and radiological characterization survey of Area IV.
16	So let me tell you one other big part of the fabrication that's in here which is very troubling. And again, remember that NEPA is supposed to be open-minded about what you're going to do until the end. You're not supposed to decide that you're going to leave the vast bulk of the contamination up there. First of all, you're not supposed to decide that at all, but if you're going to decide it, you should decide it at the end of the process when you've heard all the comments, done all the research, really been independent.	DOE will comply with all aspects of NEPA and, because of that, cannot make any commitment to any cleanup standard until EPA completes the radiological background and characterization survey, and DTSC completes the chemical background study. Once these sampling results are known, DOE will conduct a CERCLA-based risk assessment, analyze alternatives and issues and then propose a cleanup action. Agreeing to any cleanup standard now is predetermining a NEPA outcome, which is not allowed under NEPA guidelines.
17	And by the way, one little comment: If these folks were really "independent," we would not find that all of the sources they cite are Boeing and DOE. You would have thought that one of the first things that an entity that really wanted to prove it was independent would do, would pick up the phone and call me and others of you, and say, in my case, "Mr. Hirsch, we understand that you followed the site for 30 years. We understand that you co-chair the Santa Susana Field Advisory Panel that oversaw the worker studies, that oversaw the community studies. We understand you've got file cabinet after file cabinet. We understand that you believe a lot of the data we have are lousy. "Can we come and see your stuff? Can we talk to you? We really are independent. We're not in the pocket of DOE, who hired us, or Boeing." Not a word from them. They just issue a report and hope that we don't catch the problems in it.	DOE has contacted Mr. Hirsch regarding his files and performed an initial review of the files for information relative to the Draft Gap Analysis Report. A follow-on review of Mr. Hirsch's files will be conducted to copy any relevant information. The initial review indicated that most of the records were part of the dataset generated by the site.
18	Let me tell you about one other thing about the Superfund rules of EPA that they are required to follow, and they claim they're following here and are violating.You are supposed to look for any contaminations above your cleanup level, and generally you're supposed to clean it up. You are -- these are what I call, "not-to-exceed levels." You are not to average them, and you're particularly not to average them over large areas. In these volumes, however, buried in them, we discovered that what they've done is they've created what they call exposure units, of approximately 20 acres, and they are averaging the readings over the 20-acre exposure unit. Think about it this way. If you are going to go build a home, which is what they're supposed to be looking at, possible residential use, and you're concerned that your child is going to play in your backyard or that you are going to be eating vegetables from your backyard garden, eggs from a chicken that is scratching in the backyard, whatever, and you got a lot of Cesium and a lot of Strontium, and a lot of perchlorate in your backyard, you don't want DOE to say, "We're not going to clean it up because there's a backyard 20 acres away that is very low on those things. We'll average them in." That's not permitted, but they've	The subdivision of Area IV into smaller units, many of which are significantly smaller than 20 acres, was done for the purposes of evaluating existing data and for identifying additional data collection needs. The smaller units were not developed for purposes of a future risk assessment. The sizing of the exposure units for performing the risk assessment will be determined only after all data have been collected and reviewed.

	Comment	Response
	done that again. So they inflated by a hundred to a thousand-fold the screening level over what they claimed they were using just by using the wrong PRGs, by changing them. And I'll tell you in a moment how they did that.	
19	But beyond that, they've now increased by maybe another order of magnitude by averaging. They've made a big deal to you that they are going to make -- take 600 locations for radioactive measurements. I want to remind you that the site is 2,850 acres. That's one location per 5 acres. The chance of finding something when you're taking something a few inches as you're boring and you're doing it one per 5 acres is close to zero. They'll say, "Oh, you shouldn't compare it to the whole site," although we say yes, they should measure the whole site. They'll say you should just compare it to Area IV and the buffer zone near Area IV. That's one location per acre. The chances of finding it are close to zero. And then, as I say, they set their screen levels so high and then they're averaging further. They set it up so it cannot possibly provide any information that's useful, and so it cannot possibly leave open the opportunity of complying with the law -- SB 990, the state law, the appropriation law that requires EPA's deep involvement in doing the survey -- not CDM, not DOE -- and of the '95 policy agreement that they will follow suit. They violated all of that before they even started.	Area IV is not 2,850 acres in size; it is 290 acres in size. In the Draft Gap Analysis Report, the analysts recommend sampling for radionuclides at more than 600 locations within Area IV. Samples collected from 600 new locations coupled with existing data identifying contamination means that, for Area IV, there would be over 1,000 sample locations spread across the 290 acres. Sample density would be more than 1 sample per acre, not less. DOE is developing the SSFL Area IV EIS at the direction of a court order. This EIS will be in compliance with NEPA procedures and guidelines. EPA is conducting the Radiological Background Study and the Area IV radiological characterization Study as described more fully in Section 3. No judicial entity has yet determined that DOE has violated the law as the commentor suggests.
20	Before we have a draft EIS, which says we want to violate, they were supposed to consider all alternatives in EIS. They foreclosed those alternatives already in the scoping -- in this quote, unquote gap analysis. Now, remember, the purpose of a gap analysis is to say Boeing may not have done a great job so far. DOE may not have done a great job so far. Some of these data or many of the data may have been cooked, literally. We're going to fill those gaps independently. But they didn't do that. They relied on DOE and Boeing's assertions.	DOE is not violating NEPA. The purpose of the Data Gap Analysis was to review the quality of prior data. The results of the data review determined that some of the data did not meet requirements for a risk assessment. In the Draft Gap Analysis Report, the analysts recommend recollection of much of the prior data and collection of approximately 4,000 additional chemical and radiological samples.
21	For example, they divided the areas into three hierarchies, and they say -- when Boeing says that there's very little chance that we contaminated Area C, we will believe them and therefore take very few samples, if any, in Area C.	The subdivision of the site into the three categories was based on guidelines developed for investigation of facilities where radioactive materials were used. Boeing had no participation in identification of the survey areas. The process is consistent with EPA recommendations for Area IV with a focus on collecting data within Area C.
22	They rely on something called a Historical Site Assessment done by DOE, an absolute piece of junk. It takes DOE's assertions that nothing happened and just repeats them. You would think for a historical site assessment that they would have a detailed, deep analysis, for example, of the worst known accident at the site, the SRE meltdown.	Contrary to the commentor's assertion, the HSA does not conclude that "nothing happened" within Area IV. It provides process history as to where activities occurred that potentially led to soil and water contamination.
23	How did they manipulate those PRGs? Let me tell you the little secret. Under EPA default assumptions, which is what they said they used, the residential scenario assumes you've got a backyard garden and you get 25 percent of your fruits and vegetables from your backyard garden They decided after saying they were using the default assumptions to change them so you got none of your fruit or vegetables from your backyard garden. The residential -- rural residential scenario using EPA default -- that you get all of your fruits and vegetables, all of your eggs, all of your poultry, all of your beef, all your milk, and all of your fish, because you are a resident farmer -- they said they used those defaults, but then they went ahead and changed them all. So they got none of your fish, none of your beef, none of your poultry, none of your eggs, none of your milk, and only 25 percent of your fruits and vegetables. They converted the rural residential agriculture scenario into the residential, then downgraded the residential while telling EPA they used EPA's defaults. That's enough to disqualify	The PRGs used in the analysis were taken directly from EPA's website and PRG table. There were no changes to the PRGs or the default parameters published by EPA. The commentor's use of terminology is not consistent with the EPA terminology as used on the EPA website.

	Comment	Response
	this contractor right now. They should be out, processes stop.	
24	They say we recognize that we probably shouldn't be using on-site locations for background measurements because they could be contaminated. So they used Boeing's measurements that were for recreation that are just slightly off site in areas that we already know are contaminated in the areas nearby, but then they go ahead in the chemicals and use data that are largely on site, even when they said that that doesn't make sense. Now they're telling us that EPA is trying to figure out how to do background right, but they're not really going to wait for that. They're going to be out on the field now taking their measurements. And we're told, by the way, that they're going to try to make some changes. "Yeah, we kind of should have been more direct or candid about the PRGs we were using. We'll fix that in an annex" -- that you and I don't get to comment on.	In the Draft Gap Analysis Report, the analysts recommend the conduct of a background study that addresses the communities' concern that the samples not be influenced by activities at SSFL. EPA has the lead in conducting the radiological background study and DTSC, the chemical background study.
25	And you saw that they're going to come up with a work plan. "Oh, don't worry if we didn't tell you where to take the measurements now or how we are going to take them. That will come out in a work plan." No evidence there's going to be comment opportunity for that by us or by EPA or by the State, because they're going to be out in the field in the fall. It's in violation of the Federal Appropriation, violation of doing an independent review for NEPA. Why does it matter? Why does it matter? If you do radiation measurements that can't find the contamination of concern, you automatically leave that stuff behind. And why would they want to do that? If they find it, then they're going to have to pay to clean it up, so it's cheaper to pay someone now and set a screening level so high you can't find it and pick locations that aren't going to show it.	DOE intends to share all work plans and sampling plans for future sampling with the public and to request public participation in the planning effort. The regulatory agencies will also be part of the review process for any DOE generated document. EPA will conduct the radiological studies for background, Area IV, and the Northern Undeveloped Land while chemical studies will be conducted under the direction of DTSC. The process utilized by both regulatory agencies includes significant public involvement.
26	If you have DOE going out to select locations for those samples, you'll have negative results. They have a financial incentive to make it negative, and their entire history is making it negative, And what they've done to cook the gap analysis shows already that it cannot be trusted. They have violated the fundamental NEPA process from the very beginning by having prejudged the outcome, cooking the numbers, and not even letting people know. So we have a problem. Rocketdyne was found guilty of felony environmental crimes a decade ago for illegally disposing of hazardous materials. Their information can't be trusted, but the DOE contractor is using it entirely. And the DOE contractor cooks the numbers.	The Draft Gap Analysis Report does not identify the locations where samples are to be collected, only the numbers of samples. The specific locations of samples to be collected will be addressed in the Field Sampling and Analysis Plan. This plan will be shared with the public and DOE will seek public comment on the sampling approach and where samples are proposed for collection.
27	EPA's Las Vegas radiation office under Gregg Dempsey should then do the radiation survey as was promised by DOE a decade ago and is the Congressional intent of that appropriation language. And the survey has to be done to SB 990's standards and to the EPA Rural Residential CERCLA PRGs, and they "pretended they worked."	EPA, with the involvement of Gregg Dempsey, has the lead on conducting the gamma walkover survey and the radiological survey of Area IV and the Northern Undeveloped Land.
28	They can't permit EPA to do the survey because Gregg Dempsey might find the contamination and they'll have to pay to clean up. It's cheaper to hire a contractor that will make sure that if you don't find the contamination that you continue to go off the site and into each of your bodies. So some of you get cancer. They don't care because it saves them money. Now let me give you one concrete example for a moment. Let's see if we can get this to work. Take a look. The initials look familiar. The name of the company looks familiar. This is a document that they haven't presented to you -- by the same company, Science Applications Incorporated, and it's from a few years ago. I'll show you the significance in a moment.	DOE and EPA have entered into an Interagency Agreement that gives EPA the lead on the radiological study of Area IV and the Northern undeveloped Land. DOE has also provided EPA with the full funding requested for the investigation and evaluation ($40 M).

	Comment	Response
29	Now I'm going to embarrass one of the people in the panel, but I think it's important. Dr. Rucker from SAIC came up to me during the break, and he said he was the person responsible for the issue with the PRGs. And he said that he had been instructed by DOE not to consider the agricultural scenario, the agricultural land use that we have on SB 990, that we have in the EPA requirements, that that's why they ended up putting in what they called "rural residential" and incorporating no cows, no milk, no poultry, no eggs, no fish, and only 25 percent fruits and vegetables hoping to slide through.	Dr. Rucker did not inform Mr. Hirsch that DOE had instructed him to not consider the agricultural scenario. What Dr. Rucker told Mr. Hirsch is that the "rural residential" scenario was based on the most likely future land use for Area IV. EPA's residential scenario for radiological PRGs incorporates consumption of locally grown fruits and vegetables in the diet. EPA's agricultural scenario incorporates meat, poultry, fish, and other animal products raised on the site (full subsistence on the land).
30	So your question would be: In a system where there is no economic incentive, would not a contractor at SAIC say, "I can't do that, sir"? First of all, I know there are cows. My own report shows them. And secondly, we are under an obligation under NEPA, under the federal law, to consider a full range of alternatives, not prejudge it, and to consider its compliance with SB 990. On page 1-11 of the gap analysis, there's a single paragraph on Senate Bill 990 -- this is again the state law that requires them to clean up to that agriculture scenario.	The Draft Gap Analysis Report does not establish the cleanup standard for Area IV of SSFL. The EIS will evaluate the SB990 scenario as requested by the commentor.
31	Remember, the area zoned RA-5, residential agriculture, the use around the site -- we've gone through this dozens of times. Marge "Weaves" has goats and stuff. The people who live up in Sage Ranch have pigs and chickens and gardens and orchards. Cows are going all over the place. Brandeis Camp has herds of cattle with gardens. This is the current land use, and that's what the law requires, and that's what EPA requirements requires. But okay, maybe they're going reject that at the end of the process. It can be an open process. It can conclude for some honest reason not to do it. But we've just seen from their own document that they've concluded before they begin the process. This says that SB 990 will be considered. It prohibits the sale, lease, sublease, or transfer of land until the director of the Department of Toxic Substance Controls certifies that the land has undergone complete remediation pursuant to the applicable standard. The standard identified in SB 990 is cleanup to agricultural land for use. So those sentences seem to be telling that they're going to consider doing that. The next sentence says the SSFL Area IV EIS will evaluate a rural residential risk-assessment scenario to address this land-use consideration. Sounds like they are, in fact, going to comply, but then there's a parenthetical insertion in the middle of that sentence. They will evaluate a rural residential risk-assessment scenario, parenthesis, incorporating locally grown fruits and vegetables as a portion of the resident's diet, end paren -- no fish, no cow, no milk, no poultry, and only a portion of the fruits and vegetables despite that fact that 990 requires considering 100 percent of it. So they're telling us today what the EIS is going to do in the future when EIS hasn't even been started. We have a hearing next month of what the scope should be. There's a draft that's supposed to come out in the future. They have already decided that they will not consider compliance with SB 990. They will not comply with the EPA CERCLA requirements. They've already decided the EIS, and when the people from SAIC were told, don't consider that scenario, they went ahead. Why? They would never get another contract from DOE if they said no. The document says that this is an independent analysis. This isn't independent. Do you know where the SAIC folks come from? The card that I just received, Oak Ridge, anyone know what's in Oak Ridge? A big DOE nuclear facility, Contaminated DOE nuclear facility. So it's already been decided. This is a show. There's no intent to listen to your comment. They already decided they will not comply with our state law, will not comply with the EPA standards, won't even consider them in the EIS. But they wouldn't even be up front about it; they had to hide it and make it sound like they were -- that they were using the EPA's rural residential numbers.	The Draft Gap Analysis Report does not establish the cleanup standard for Area IV of SSFL. DOE has committed to revise the Draft Gap Analysis Report using as a screening tool a scenario that considers an individual's full subsistence from the land. In addition, DOE will consider an alternative during the SSFL Area IV EIS alternative analysis that is functionally equivalent to SB 990. It is premature to agree to any cleanup standard prior to the completion of EPA and DTSC sampling work, risk assessment, and EIS alternative analysis.

	Comment	Response
32	The Department of Health Services did one analysis of the water monitoring of the this site, and DOE has said that even with the filtering, it turns out they were elevated above -- it was called the maximum concentration limit time after time after time for gross alpha and gross beta. But DOE said, "Oh, don't worry, it's going to be background, we're not going to look at it, it has to be natural, natural Uranium." The Department of Health Services looked at those damn things -- it's kind of funny that virtually all of the elevated radiation readings and groundwater are in Area IV, and virtually none of them in areas I, II, III. Isn't that strange if it's due to nature that all of the natural radioactivity turned up in the area where the unnatural radioactivity from the nuclear work was being done. This is not being looked at. The filtering of the groundwater and of the surface water is not being looked at. We need to have compliance with the federal law. And right now that means EPA must do the survey. Not a little bit of looking over your shoulder, because you lied, you misled in the very first document, and they couldn't even catch it because they had to trust the sister agency. So it makes no sense to waste the government's money by you doing it wrong then trying to catch some of it -- only catching some of it, and then it all having to be done again. And since it's clear from the gap analysis that you're not going to even consider compliance with the state law or with the EPA CERCLA requirements and are violating NEPA by not even considering that as an alternative, the whole thing is a sham.	DOE and EPA have entered into an Interagency Agreement that gives EPA the lead on the radiological study of Area IV. As part of the analysis of a full range of alternatives within the SSFL Area IV EIS, DOE will evaluate an alternative that is functionally equivalent to SB 990.
33	Now, one last thing on -- I'm getting nudged, so I'll sit down in just one more moment. There will be many more comments, but I don't want to keep you later than the time. We ran through an hour with their presentations, but it's 9:30 now. I know it's getting late. But here's my basic just procedural comment: They are using bogus background numbers. And they now agree that under Dempsey there will be some effort to come up with new background numbers. You cannot go forward with this study until those new background numbers are out because your entire analysis of how many samples to take, where to take them, is based on what you're calling the DCGL. And the DCGL is based on two wrong sets of numbers, the PRGs that you fabricated and Boeing's background numbers taken close to the site which are also all wrong.	The radiological background data used in the Data Gap Analysis came from samples collected outside of SSFL. Until EPA completes the new background study, it cannot be determined how representative the existing background data set is of actual background levels. DOE agrees that it is important to wait until completion of the EPA-led background study before continuing the Data Gap Analysis. The PRGs used in the screening of radiological data were not fabricated and were taken directly from the EPA Region 4 website. They were used as presented without any alteration.
34	Because both sets of numbers for the DCGL are wrong and both are going to be revised, it's impossible for you to go forward and do your survey in the fall. You're going to have to go back, wait until the new background numbers are out, wait until the detection limits are -- (Inaudible). It's okay. Some day we'll tell you the story of the nuclear dog while she's up there -- both sets of numbers are going to have to be revised, are going to be revised, and then the entire analysis has to be done over again, the statistical test, the determination of how many samples, where to take them. And in addition, there are negotiations going on between DOE and EPA about letting EPA do that survey, and there is intervention by the Congressional delegation. So what worries me is that there's an effort to rush this, to go in and do something that will be completely wrong and unreliable and is going to have to be done again or your entire EIS falls, and it's likely when it's challenged in court. So to be practical, I think, irrespective of the basic difference between your presentation and what you've heard from the community and all the larger issues, in the real world, you can't move forward. You yourself said that you're going rely on Dempsey's background numbers. You yourself had said the you're going to do new analysis based on the agricultural PRGs, neither of which we have been able to see, neither of which the public has been able to comment on, but also, you haven't seen. So you have to then, once you got both new numbers, you have to redo the entire analysis, and then you got to let us see it. So this rush to do this in the fall before a change in the administrations on January 20th is unseemly	DOE agrees that it is important to wait until completion of the EPA-led background studies and the radiological study of Area IV and Northern Undeveloped Land before continuing the Data Gap Analysis.

	Comment	Response
	and needs to stop. So let's try to do right. Let EPA do the survey, let them do this analysis, do not have it under a cloud of suspicion because of the lack of independence and because of the mischief that's already been done in your draft. There is no longer any credibility. Even for your own self-interest, you don't want the government to be forced to do the survey twice, you don't want to be thrown out by a court once again for an EIS that was done in a faulty way and in a way that had prejudged the outcome before it began. So my plea, which is the plea we've had for years, is live up to the commitment DOE made a decade ago. Let EPA's Gregg Dempsey back on the property to do that survey. You will then be free of any accusation that you have a conflict of interest, that you're cooking the numbers, that you're not putting in the correct tables. Let EPA do the survey. The question I asked at our meeting last week, which I'm not going to repeat as a question, but I just asked hypothetically or rhetorically for any of you is, if you really have no economic self-interest in not finding the contamination, then there is no reason for you not to simply say, "Dempsey, come in and do this." It would have no negative effect on you if you found stuff. So I think that's what everyone wants; not a little bit of EPA looking over your shoulder and catching part of things that aren't right, and this and others, and having to do everything, you do -- you do your review, they do their review, and you then disagree. It gets us nowhere. Let EPA do the survey. Let your EIS truly consider the full options which include compliance with SB 990 and EPA Superfund rules, which is what you're legally required to do and morally required to do. And at the end of the day, my plea, each of us has to meet our maker some time. You don't want to be at that point and look back and say, "I did something because I needed the job. I did something because I was under pressure from an agency, and I ended up contributing to some carcinogenic materials getting into innocent members of the public and causing them cancer." You don't want that on your conscience.	
	OR-038: Christina Walsh, cleanuprocketdyne.org, Data Gap Meeting comment dated: 6/26/2008	
1	I'm with cleanuprocketdyne.org, and I've been following this issue for -- both as a resident and actively since 2001 now -- with the website, and now the Aerospace Cancer Museum of Education, which recently opened. You know, we've waited so long. We've waited so long for this to be done right, and promises have been made, and a joint study is one of the promises that were made. And I think that it's time, you know, to build trust. And, really, the only way to do that is to allow EPA to be an active joint participant as -- as it was promised. You know, we've talked about, you know, letting specifically Gregg Dempsey and his team to lead this survey and the background study that would enable us to go forward and actually progress towards the cleanup. Twenty, thirty years have gone by for some people, and we're still waiting for it to begin. So I think, you know, it's a nonstarter if we can't even get started here and come to some level of agreement. I know that there can be compromise, but there has to be acknowledgment that EPA has to be part of that equation. That is one of the most important promises that I think -- you know, based on past behavior, based on the court order, I think it is -- it is a valid issue to say that, based on the prior behaviors that were discussed by Judge Conti, it is appropriate that they would lead that study.	DOE understands that Mr. Dempsey is held in high esteem by the community. Since the comment was provided, Mr. Dempsey is now leading the EPA team investigating Area IV. See the discussion in Section 3 of this document for more details regarding EPA's involvement.
2	Some additional comments that I'd like to make about some of the issues here: I think that it's also important that in order for this to go forward that it is agreed upon on what to do with these samples -- how to consider them, how to consider non-detects, how to consider, how to find those detection levels when there are real scientific problems of doing so.	EPA and DTSC are currently evaluating the detection levels for the radiological samples. DOE will use the technically achievable levels that are identified as part of the determinations made by these two agencies.

	Comment	Response
3	But there are also ways to find answers here that I don't think are being adequately considered here, and I think that is one of the most important things. Averaging of these exposure units really can erase the problem areas so that no action is taken in areas where we really need action to be taken.	The data to be incorporated into the future risk assessment will not be averaged to reduce areas of elevated contamination, also called "hot spots." Hot spots will be identified and addressed separately as part of cleanup decisions.
4	This has been coming off the site. It has been flowing down the hill, it has been going by the wind for decades and decades. You know, we saw these pipes. The old -- this comes from the radiation study from 1993 -- right, Bill? -- where it shows the pipes. Those stormwater pipes, sewage pipes that lead throughout the site. They lead to Area III. They lead down to the R2 Pond, and that leads to L.A. River, so that's completely different from looking at this site as just a map of the ETEC portion. You know, we've talked about the fact that these sample dots, we don't see them in the buffer zone, and I've heard reassurance, and I'd like that, that those areas, those drainages, will be adequately looked at. But we, you know -- at this point, we really need to see. We need to see that on a diagram. We need to be able to trust it.	DOE will investigate contamination throughout Area IV, including adjacent areas where contaminants may have migrated. The planned radiological study to be conducted by EPA includes Area IV, the Northern Undeveloped land, and drainages leaving Area IV.
5	And so many meetings have been spent by so many of these people without being able to trust because the promises have indeed been broken in the past, maybe not by the people that are sitting before us now. But you know what? These people have been sitting here for a very long time, and we need to have those promises kept. That's the only way that I think we can really move forward.	DOE understands that many stakeholders have been involved for a very long time. The department appreciates their continuing interest in cleanup of SSFL.
6	The grid, you know, it needs to be tighter. There are some -- I know that there are a lot of people that still want to comment, and I don't want to take too much time. We need to make sure that you're taking an adequate sample size of each of these samples so that the splits that we're asking for between EPA and between true, independent sampling can only happen if there's enough of everything so that it can be adequately dealt with.	The *Draft Gap Analysis Report* provides recommendations on the numbers and approximate locations for additional samples. The recommendations are based on statistical analyses of the existing data and determination of where contamination may extend. The Field Sampling and Analysis Plan will provide additional details on where samples will be collected and for what purposes. However, EPA is conducting the Radiological Background Study and the Area IV radiological characterization Study as described more fully in Section 3.
OR-039: Daniel Wiseman, West Hills Neighborhood Council, Data Gap Meeting comment dated: 6/26/2008		
1	I'm a member of the Board of Directors of the West Hills Neighborhood Council. And several years ago -- I'm sorry. Several years ago, we became concerned with the Santa Susana Field Lab in its relationship to its surrounding areas, and especially to the area of Dayton Canyon. The Neighborhood Council, which is a city- authorized -- chartered, actually, part of the Los Angeles city government, and our purpose is to represent our community and represent the concerns of our community to all of the government and all the agencies of the community. We're also supposed to represent anyone who lives, works, or owns property in our neighborhood. By that we define a stakeholder. That means that the Santa Susana Field Lab workers, the owners, the governmental agencies that supervise them, the residents of the community, the people who own businesses in the community are all part of our concern. Now, when the review of the Dayton Canyon by the DTSC was coming to a very critical point earlier this year, we became aware of the PEA -- I'm not good at these abbreviations. But I think that's the Preliminary Evaluation -- I'm pretty close on that. And there was a radiological evaluation for radiation hazards, as well. Those documents were brought forward, we got into the act a little bit late, but we're able to put a comment into the minds of the DTSC folks. And if I understand correctly, the final document has not been written. We're still interested in that, because what the West Hills Neighborhood Council is really doing is it's representing the concern of the residents and the people	DOE understands that many stakeholders have been involved for a very long time. DOE appreciates their continuing interest in cleanup of SSFL.

	Comment	*Response*
	who are involved in the neighborhood in any way, whatsoever. What you're hearing today from the several of the people who commented already and from many others that we've been aware of is a serious concern, a serious anxiety, that there is serious human health and environmental health hazard involved here. I'm glad to see the Department of Toxic Substance Control involved in this, the Water Control Board, and many of the others. I want to put a very heartfelt invitation for each and every one of you agencies to participate in the West Hills Neighborhood Council Santa Susana Mountain Area Committee. That's what we call ourselves now.	
2	As you've heard already from the commenters -- and I believe I've heard from the Department of Energy and many others -- this isn't a segmentable issue. It's not just Area IV. It's the whole Santa Susana Mountain. It's the water that's flowing in five, six, seven different directions -- north, south, east and west. It's the possibility that there is ground contamination in a very, very unusual geological setup.	DOE understands that many people are anxious to see cleanup activities implemented for the entire SSFL. However, DOE only has the authority to make decisions related to the portion of the site that it is responsible for. See additional discussion in Section 3 of introduction of this document.
3	My understanding of this mountain is the subsurface geology of this is quite unique and has the potential, at any rate, for moving these various dangerous and every other chemical that's in the ground in peculiar and quixotic ways. We were doing this several years ago. We're trying to find some type of geologist who can help us understand this. We've asked many of our government agencies to run some test-runs of putting a dye up or a target or a sample that can be measured at various points and then see if you can recover that in other areas. That hasn't happened.	DOE agrees that all parties need to have a better understanding of the subsurface geology of the site. The *Draft Gap Analysis Report* recommended additional investigation of the groundwater to develop a better understanding of how groundwater moves below Area IV.
4	We've asked DTSC and many -- the Water Control Board and some of the other agencies to study this thing as a whole, not study it as done here to this data gap, which is Area IV only, and we hope that this holistic approach -- that's a dirty word for a doctor to be saying. I am an M.D., by the way, so I shouldn't use the word "holistic" -- a total approach to this, I think, is something that's necessary. Our committee is going to be meeting regularly. I want to get -- collect as many cards from you that I haven't got already so that I can at least put you on the e-mail list and be on the e-mail list for you so that we can effectively do what is necessary to make this the safest area possible, an area we can mitigate, to answer the concerns of this community so the people are not living in fear, to let people know who have already suffered from various illnesses whether there's a high or a low likelihood that those illnesses are related to the fact that they live in this area -- thyroid disease from the perchlorate, cancerous diseases from the many of the organics and from the radiation. These illnesses are associated, but usually by statistical studies. I am a physician, as I've said, and I've been involved in a whole series of community health problems for over 40 years. It is not easy, and it is not really the most valid way to figure out whether there's a hazard by doing a survey. UCLA and USC medical schools in this neighborhood, they've done several surveys -- and I'm sure you may have some of their documents. We can provide them if you don't -- that would suggest – they can only suggest that there is a increase in serious disease. We need, I think, to get those people who have expertise in a wide variety of science together. And I hope that the Santa Susana Mountain Area Committee at West Hills Neighborhood Council can be a place in which we can use as a hub for this kind of information and try to get some kind of a documentation, some kind a resolution so that we don't live in fear.	DOE acknowledges the commentor's concern.
OR-041: William Bowling, Aerospace Cancer Museum of Education, Data Gap Meeting comment dated: 6/26/2008		
1	Review the SAIC RCRA Facility report dated July 10, 1991 and the Rockwell Radiological Characterization Plan of March 30, 1994.	DOE appreciates the commentor's suggestions for documents that should be reviewed.
2	Investigate Building 19 and 59 to the north as it drops down a berm, was used as a dumping ground.	All buildings within Area IV will be investigated for the presence of

	Comment	*Response*
		chemicals and radionuclides.
3	The Northern Buffer Zone has been used as a dump for decades and should be included as a potential source of contamination.	EPA's scope includes the radiological characterization of the Northern Buffer Area adjacent to Area IV. DTSC is directing the investigation of waste disposal for other parts of the northern buffer zone.
4	ETEC operated in the Bowl Area I of the SSFL and it should be included. Also the Area I Burn Pit is impacted from ETEC Bowl Area I disposal.	ETEC did not have any operations within any portion of Area I. All of the DOE-directed activities occurred within Area IV. The Area I Burn Pit is being investigated by Boeing as directed by DTSC.
	OR-042: William Bowling, Aerospace Cancer Museum of Education, Scoping Meeting comment dated: 7/22/2008	
1	Full disclosure is needed to adjacent properties on when and how the removal/remediation begins. The Brandeis-Bardin Institute needs to be closed during days of remediation as too many children are potentially at risk.	DOE will not conduct any removal or cleanup activity in Area IV that would put the local community at risk. All actions will be performed safely and in a manner protective of the environment.
	OR-045: Snowdy Dodson, CA Native Plant Society, Scoping Meeting comment dated: 7/23/2008	
1	As president of the California Native Plant Society, Los Angeles/Santa Monica Mountains Chapter, I am concerned for the impact to California native flora. Specifically there are documented endangered plants on site that must be protected. Also, other plants such as native oaks, grasses, shrubs and flowering annuals that could be harmed if significant amounts of soil were to be removed. Additionally soil disturbance increases the likelihood of the introduction and takeover by non-native invasive plants that would displace the native flora.	DOE thanks the commentor for the submitted comment. Impacts of the proposed remediation activities, including soil removal, on the California native flora will be addressed in the biological resources section of the *SSFL Area IV EIS*. The analysis will incorporate native flora, including oaks, grasses, shrubs, flowering annuals, and herbaceous perennials, as well as endangered or threatened plants such as Santa Susana tarplant and Braunton's milk vetch. As part of the analysis, DOE will include mitigation measures designed to avoid, minimize, or offset potential effects on native plants. Additionally, impacts on plant species protected by the ESA will receive further analysis under the requirements of Section 7 of the ESA in consultation with FWS. Impact avoidance, minimization, and compensation measures will be developed through the consultation. The potential for introduction and take over by invasive nonnative plant species that could displace the native flora will be addressed and considered in development of mitigation measures through both the EIS and the consultation.
	OR-047: D'Lanie Blaze, Mission Control:The AeroSpace, E-mail dated: 9/30/2008	
1	1. I remain concerned about the true impact of DOE activities at SSFL. Recently Senator Boxer demanded that the DOE "promise" to clean up Santa Susana Field Laboratory (SSFL). The DOE promised to clean-up the areas for which they are "responsible." With regard to the site-wide contamination the DOE themselves have documented, if their intention is to keep their promise to Senator Boxer, it's apparent that attention to Areas l, ll and lll will be required. DOE's "official" work area (Area IV) consists of 290 acres, and represents a much smaller degree of accountability than the 2,850 acres of SSFL's Areas l, ll, lll and IV. However, the documents cited below detail the DOE's "unofficial" decision to expand their work areas, hazardous waste storage areas, and disposal areas into Areas l, ll and lll. The DOE was not exclusive to the boundaries they were given to work within. They operated with rampant disregard for environmental and employee safety. They themselves have documented it, making their promise to Senator Boxer open to interpretation - not only by the State	1. The commentor is referred to the discussion in the introduction as to why DOE's efforts are focused on Area IV.

	Comment	Response
	Officials, but the Communities to whom they have also made this promise.	
2	2. With respect to what the DOE is "responsible" for, here is what their Survey of Activities at SSFL (authored by the DOE's own Environment, Safety and Health Office of Environmental Audit) as to say. In several areas, this report details DOE activities in Areas l and ll of SSFL, "...Inadequacies in the Area ll hazardous waste storage facility, which may result in the improper storage or release of DOE-generated hazardous wastes..." It describes the unpaved surfaces - in Area ll - upon which containers of DOE's hazardous waste were stored, accidents involving the containers, leaking containers, and containers which were noticed to bulge from exposure to solar radiation. This same report references diversion dikes designed to convey storm water run-off away from areas where hazardous wastes had been buried, which were breached during preliminary clean-up efforts and had not been replaced. As a consequence, storm-water running down slope through the areas "passes through the Area l Burn Pit and burial site on its way off site." (Please see: http:// www.TheAeroSpace.org front page, SITEWIDE.PDF pages 72 & 116) Upon consideration of the Area l Burn Pit Record, wherein the retrieval of contaminated material from Area IV's Hot Lab occurs and is disposed of in the Area l Burn Pit, it's impossible not to contemplate the DOE's assertion that storm water "passes through the burn pit on its way off site." An interoffice memo entitled, "The Leachable Legacy," describes Area l Burn Pit's drainage into Bell Creek, a tributary of the LA River. It concludes with a warning to Rocketdyne that potential "Love Canal" charges may apply if the Area l Burn Pit was not immediately addressed. The report was written in the 1980's. There has still been no radiological survey of the Area l Burn Pit, or Areas l, ll or lll of SSFL. The RCRA Facility Assessment Report of Solid Waste Management Units conducted by SAIC in 1991 describes contamination resulting from the site-wide water reclamation system, which transported industrial waste water from Area IV's Radioactive Material Disposal Facility. This vile mixture was contaminated with transuranics, fission products, and a solvent known as "Big K" that has been linked to methylethylketone, a carcinogenic. The water was dumped into the R2A and R2B Ponds, and the Silvernale Reservoir in Areas l, ll and lll. It was used by Rocket Engine Test Stand Personnel to hose off their work areas, unbeknownst to them to be radiologically contaminated, and resulting in the further contamination of themselves, each other, and the environment. The RCRA mentions contaminated soil from Area IV's Borrow Pit being found site-wide after use in trenches and other projects, and soil in Area l contaminated with Strontium-90 - easily explained by the Atomic Energy Commission (AEC/DOE) License to Store Strontium-90 in Area l (noted by Rocketdyne employees in the RCRA report to be used for DOE's SABER project, and ETEC). Presently, the Rocket Engine Test Stand Personnel - who signed up to help win the Race to Space, not to work with nuclear reactors - are not eligible to apply for benefits under the EEOICPA (Energy Employee Occupational Illness Compensation Program Act of 2000). They are languishing without compensable recourse for their cancers because the DOE did not "officially exist" in their areas.	2. DOE thanks the commentor for the information and will review the websites and reports mentioned. The department notes that SSFL cleanup is under way beyond Area IV under federal and state regulatory authority, including compliance with RCRA under the direction of DTSC for all of SSFL. Under DTSC orders, DOE, Boeing, and NASA are actively investigating chemical usage and contamination throughout SSFL. Under CEQA requirements, DTSC will ensure that an Environmental Impact Report is prepared addressing cleanup for all of SSFL. Stormwater runoff is also being addressed for SSFL through the NPDES permit process. NPDES controls water pollution at SSFL by regulating discharges of pollutants in storm water. All of SSFL is subject to NPDES, including the requirement to collect and treat stormwater.
3	3. Are we willing to believe that - in defiance of science - DOE's contamination at Area IV respected property and boundary lines? That it somehow skipped over 2500 acres, but landed in the communities surrounding SSFL? And what about the hard evidence that exists, implicating the DOE in site-wide contamination after decades of disrespect for boundary lines, the environment, and employee safety? If the DOE is as committed to the responsible clean-up of SSFL as it recently promised Senator Boxer and her constituents, it would certainly be expected that the aforementioned is immediately - and completely - followed up with the performance of a site-wide radiological survey.	3. As ordered by the U.S. District Court to prepare an EIS for Area IV, DOE will utilize the existing acceptable radiological and chemical data, new radiological data obtained by EPA, and new chemical data obtained under the direction of DTSC as the primary source of information for the EIS. Any additional data deemed necessary (not obtained by either EPA or under DTSC direction) will be obtained by DOE contractors CDM or SAIC.

	Comment	*Response*
	This would result in assessing the damage, providing adequate guidelines pertaining to responsible and reasonable clean-up, and employee inclusion under EEOICPA for every SSFL worker throughout Areas l, ll, lll and IV. Assuming that the DOE is in fact motivated by an ethical agenda to keep its promise to address everything they're "responsible for," I enthusiastically await the fulfillment of this promise. "Absolutely."	
PE-001: List of 44 Names, Petition dated: 8/14/2008		
1	Please consider doing the entire site, not just area 4	The petitioners are referred to the discussion in Section 3 as to why DOE activities are focused on Area IV.
2	We urge you to completely clean it up to SB 990	The petitioners are referred to Section 3 for a discussion of how SB 900 will be addressed as an alternative within the EIS.
SA-001: State Senator Sheila James Kuehl, Assemblywoman Julia Brownley, California Legislature, Letter dated: 8/12/2008		
1	1. One of the failings of the EA noted by the Court was that it "does not address contamination from other non-radiological sources – though it admits their existence – and the possible combined health effects of such contamination with radioactive contamination." The EIS must assess the cumulative impacts both at Area IV and those caused by the activities at Area IV.	1. DOE agrees with the commentor that regulatory compliance and integration will be very complicated for the cleanup of SSFL. The revised Consent Order requires completion of all cleanup activities by 2017, yet there are few activities that DOE can pursue at this time, given other schedule constraints. The commentor is also referred to the introduction of this document for further discussion regarding this important issue. The EIS will address cumulative impacts.
2	2. DOE (NASA, Air Force, Navy, etc.) work occurred on Areas I, II and III; indeed NASA owns Area II and part of Area I. The chemical and radioactive contaminants generated by the activities undertaken by the DOE over the decades were not confined to the four corners of Area IV. They were carried by wind, rain, explosive forces, surface and groundwater, and through fractures in the earth far beyond Area IV, creating a zone of risk, the extent of which may never be fully known. Removing only the cancer itself, when it is known to have spread, does little for the patient's, or, in this case, the public's, ultimate health and wellbeing. The impacts of Area IV activities on the entire SSFL site and surrounding neighborhoods must be identified and assessed.	2. DOE agrees that the relationship between the various parties is confusing. The commentor is referred to Section 3 of this document for more information regarding this issue and how it is being addressed across SSFL.
3	3. It is of concern that the DOE continues to waffle on the precise standards that will be applied to the remediation. The Court's 2007 order referenced, with respect to the Draft EA, its "ambiguity as to purpose, scope, and context," citing the EPA's harsh criticism that the DOE "should apply CERCLA's 1x10-6 departure point." Having found that the DOE is in violation of NEPA, the Court did not make a specific finding as to the CERCLA claim, but invited the parties to bring such claims back at such time as there was reason to believe that any actions by the DOE gave rise to such a claim. However, the Court did go on at considerable length in the opinion discussing CERCLA standards, including citing a 2003 report from the U.S. Senate Appropriations Committee that said that the DOE's then refusal to apply the CERCLA standards "may represent an unacceptable deviation from the Department's commitment in a 1995 Department of Energy-EPA Joint Policy…" The standard for remediation of Area IV should be the CERCLA standards as set forth more specifically in SB 990 (see below).	3. DOE intends to comply with the 1995 Joint Policy requirements related to completion of decontamination and demolition of the remaining buildings in Area IV. Cleanup of soil and groundwater will be evaluated in the *SSFL Area IV EIS* and CERCLA requirements will be considered in those analyses.

	Comment	*Response*
4	4. More specifically, as the principal co-author and author, respectively, of State Senate Bill 990 which is now California law, we believe that the standards set forth in SB 990 should become the Preferred Alternative in the EIS. Any resistance by DOE to cleaning the site up to SB 990 levels will only lead to years of further litigation, conflict between the state and DOE, and delay of final cleanup and resolution of this long controversy. While SB 990's various provisions clearly apply to the cleanup, DOE should simply agree in the EIS to comply with the state law/SB 990 standards voluntarily.	4. DOE is following the NEPA process in its identification and evaluation of alternatives. Under the NEPA process, DOE must evaluate a range of alternatives. Included within the evaluation will be an agricultural scenario consistent with SB 990. It is premature and in violation of NEPA to select a cleanup remedy until these analyses have been completed. DOE has committed to complying with all applicable federal, state, and local laws in its cleanup at SSFL.
SA-002: Norman Riley, CA Department of Toxic Substances Control, Letter dated: 8/14/2008		
1	1. Foremost among those is the observation that there are significant outstanding and unanswered questions about DOE'S plans to integrate the EIS into the corrective action schedule for the SSFL as a whole. On one hand DOE asserts that it exercises prepotent authority over radiologic cleanup and is not subject to the requirements of SB 990 as it pertains to radiologic control. On the other, DOE advances no such argument with respect to chemical cleanup, but nevertheless intends to proceed with an EIS that will address both chemical and radiologic cleanup, knowing full well that DTSC must approve the selection of remedies designed to address chemical contaminants directly or coincidentally, and will be in no position to do so ahead of completing its own California Environmental Quality Act (CEQA) review. As a practical matter, our analysis cannot precede completion of the investigation (RFI) and technology evaluatian (CMS) phases of the SSFL project. According to schedule developed under the August 2007 Consent Order signed by DOE, the State's CEQA review will not be completed until November 2014. The remedy to be preferred in the EIS will therefore not be implementable until about 2015 at the earliest, and there is no guarantee that it will be the remedy ultimately chosen by DTSC. While it may be possible to segment the cleanup of soils across the SSFL in various ways, the situation is more complicated for groundwater given the need for a single comprehensive and cohesive site-wide cleanup strategy. Why then should DOE hasten to complete what is essentially a provincial EIS? Why not instead direct the supporting funds toward the completion of the survey required by H.R. 2764, which will provide information vital to our collective understanding of site conditions and enable DOE to produce a much better NEPA document?	1. DOE is committed to completing the requirements of H.R. 2764 and will do so prior to completing the *SSFL Area IV EIS*. DOE is required to comply with the Consent Order that it voluntarily entered into with the state. This Consent Order is currently being revised based on all that has happened at SSFL since it was signed in August 2007. New schedules based on the revised Consent Order are being prepared as well. Please see the Section 4 of this document for further discussion regarding all site activities. DOE shared the sequencing concerns addressed by the commentor with the other parties involved and will work expeditiously with EPA, DTSC, and the community to ensure that all actions are coordinated.
2	2. Some of the screening values used for rural residential Preliminary Remediation Goals (PRGs) may not be in compliance with Senate Bill 990 requirements. This recent legislation became California law effective January 1, 2008 (Stats. 2007, c. 729, Sec. 1) and is codified at California Health and Safety Code, Section 25359.20 et seq.. A copy of this language is attached for your reference. Hereinafter, this law will be referenced as SB 990 as a matter of convenience. The appropriate agricultural rural residential PRGs should be used. The use of more conservative agricultural rural residential PRGs as screening values will likely result in identification of more data gaps.	2. EPA has taken the lead on convening a Background Workgroup for developing appropriate measures for radionuclides. DOE is awaiting the outcome of the Background Workgroup's findings to establish the new criteria by which the available data will be screened. EPA also has the lead for conducting the Area IV and Northern Undeveloped Land investigation and evaluation. The *Draft Gap Analysis Report* will be revised once those efforts are complete.
3	3. Knowledge of historical site process information has increased, largely as a result of historical documents recently made available by Boeing. The Data Gap Analysis Report heavily relies on the Historical Site Assessment (HSA; Sapere Consulting, Inc., 2005). The HSA, however, does not incorporate much of the historical site information that has been more recently provided. This recently available historical chemical use and release information is critical for better understanding and defining chemical use areas. It is thus not clear that the Data Gap Analysis Report utilized this recent information. For example, the Report indicates that 200 documents were reviewed for the data gap analysis.	3. DOE recognizes that under the ongoing RFI work, additional historical background information is being collected and reviewed. In addition, EPA plans to perform its own historical assessment of Area IV independently of assessments performed by others. Once this new background information is available and the HSA updated, the new information will be incorporated into the Data Gap Analysis process. The revised *Draft Gap Analysis Report* will be partially based on this new information.

	Comment	Response
4	4. DOE needs to obtain and review the historic documents provided with the several Group RFI Area Reports affecting Area IV. Because of the large volume of this data, these documents should be obtained directly from Boeing. There are tens of thousands of historical documents available for Area IV that describe historical chemical andlor radionuclide usage and releases. Because it is not clear that this information has been fully utilized in the data gap analysis, there is concern that the chemical use areas may not be sufficiently defined. Sufficient definition of chemical use areas is needed in order to determine the data needs as part of the data gap analysis.	4. DOE agrees that these documents need to be reviewed along with recently collected RFI data in revising the Data Gap Analysis. DOE proposes to incorporate this information into the database developed for the Data Gap Analysis and revise the *Draft Gap Analysis Report*'s findings and recommendations accordingly.
5	5. A key component of the data gap evaluation process involves identification of constituents of interest (COI). DTSC concurs with establishing a COI list, but does not concur with the screening process. The potential COIs are first listed as all chemicals for which samples were analyzed in soil at Area IV. The list is then reduced by removing chemicals that were analyzed, but not detected. Chemicals that were detected but at concentrations less than the established background values were also removed. Also, chemicals with maximum concentrations less than one-tenth the PRGs were removed from the COI list. In addition, chemicals without available toxicity criteria were removed from the COI list. Chemicals that were infrequently detected were also removed from the COI list. DTSC does not concur with this process of removing chemicals from the COI list. The criteria appear to assume that characterization is sufficiently complete to justify the screening process. Characterization is not complete, and a significant amount of sampling is ongoing as part of the RFI. Chemicals that have not been detected may be detected in the future. Chemicals that have not been detected at concentrations exceeding their associated background values may be detected at elevated concentrations in the future. Also, certain chemicals having no significant toxicity can be important solvents andlor carriers for chemicals or radionuclides into the environment. Removal of these chemicals from the COI list would effectively limit characterization of releases, particularly to groundwater, associated with non-toxic carriers. A multi-media evaluation should be conducted to ensure that all COIs listed for any specific environmental media are also included as COIs for other environmental media. Comparison of the COI list for soil and groundwater suggests that this multimedia evaluation was not conducted. For example, anions are listed as COIs in groundwater (fluoride, nitrate-N, and perchlorate), but are not listed for soil.	5. DOE accepts the comment and will rescreen the data. The department will not remove COIs based on frequency of detection or concentrations relative to background. In essence, all detected COIs will remain COIs until thoroughly evaluated in the risk assessment process. The *Draft Gap Analysis Report* will be revised to incorporate the cross-media assessment to ensure that any COI related to any media will become a COI for all media, as appropriate.
6	6. The groundwater investigation activities at the site are ongoing. The groundwater conditions at the site are complex and are not well understood. Therefore, the information presented and the conclusions reached in the report regarding the extent of contaminants and the need for additional data should be considered as an approximation based on current understandings. It is certain that as additional groundwater data are collected and the RCRA Facility Investigation (RFI) reports are submitted, additional data gaps will be identified and additional investigation work will need to be conducted.	6. DOE agrees that the ongoing RFI work may lead to additional data gaps for groundwater. DOE will consider the results of the studies in revising the Data Gap Analysis of groundwater data needs.
7	7. Temporary monitoring points do not provide temporal data that is often critical in understanding the overall groundwater quality. Therefore, DTSC does not recommend the use of temporary points beyond that of a screening tool.	8. DOE would like to discuss this issue with DTSC staff. DOE would prefer not to install monitoring wells that do not have a long-term purpose.
8	8. The Data Gap Report states "If contamination at concentrations significantly above an MCL is detected, the multi-channel well (DOE7) in rock shall be installed." The Data Gap Report does not specify what concentrations would be deemed significant. DTSC would consider any concentration above MCL significant.	9. DOE will remove this language from the *Draft Gap Analysis Report*. DOE would like to work with the DTSC hydrogeologist in the identification of a groundwater concentration that would trigger the requirement for a new monitoring point.

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9	9. There is connectivity between these surface water bodies and the groundwater that needs be evaluated. Groundwater wells adjacent to the R2 and Silvernale Ponds should also be sampled for radionuclides.	9. DOE agrees that this connectivity should be evaluated. If the data are not collected under any ongoing or planned investigation, this connectivity will be addressed in the *Draft Gap Analysis Report* recommendations.
10	10. Figure 3-2 SSFL Area IV Preliminary Conceptual Model for Ecological Receptors The figure implies that onsite groundwater will not be assessed. Please clarify why.	10. DOE regrets the confusion. Figure 3-2 of the *Draft Gap Analysis Report* was intended to illustrate DOE's plans to assess groundwater through sampling of seeps and other surface water that originated as groundwater.
11	11. The bedrock at the site is permeable and is highly fractured so the term "barrier" is not appropriate.	11. This language will be removed from the revised *Draft Gap Analysis Report*.
12	12. Data should be evaluated dividing groundwater into perched groundwater and regional Chatsworth groundwater rather than the arbitrary divisions of "near-surface" and "Chatsworth".	12. The *Draft Gap Analysis Report* will be revised to address this comment.
13	13. Direct exposure to groundwater should be considered a complete pathway due to occurrence of artesian conditions in Area IV and the possible presence of seeps.	13. DOE agrees. The *Draft Gap Analysis Report* will be revised to address this comment.
14	14. Sampling of Area IV will need to address both human and ecological risk assessment requirements. The appropriateness of the selected Environmental Screening Levels (ESL) and PRG concentrations needs to be addressed prior to this sampling. Once this is resolved, DTSC will likely accept the described approach in which the lower value (PRG or ESL) is used to determine sampling needs. A summary table of the ESL's and their source for each ecological receptor in Area IV should be provided in the Data Gap Report and future ecological assessments based upon it.	14. DOE agrees. DOE would like to meet with DTSC's ecological risk assessment staff to develop the requirements of the ecological assessment.
15	15. The dioxin congener Toxicity Equivalency Factors (TEFs) used in the report need to be from most recent revision of the WHO dioxin publication (Van den Berg et al 2006).	15. DOE agrees and will update the analyses according to the comment.
16	16. Be advised that new background levels for metals and dioxins in soil are being developed for the SSFL site. This information will be provided when it is complete and will supersede the current levels referenced on page E-8 of the Data Gap Report.	16. DOE is a participant in the Background Workgroup, during which revisions of the background values for metals and dioxins are being discussed. DOE will revise the Data Gap Analysis once the new background values are available.
17	17. SB 990 requires an assessment of potential exposures under other, more health conservative, scenarios. These scenarios will result in the inclusion of pathways, i.e., ingestion of meat, milk, eggs, and water, which will then result in increased estimates of potential exposure.	17. When the *Draft Gap Analysis Report* is revised, DOE will consider the scenario that the commentor has described. In addition, an alternative that uses the described scenario will be evaluated as part of the *SSFL Area IV EIS*.
18	18. The data for the basis of the recommendations for the Corrective Measures Study (CMS) are incomplete.	18. As more data on site conditions become available, DOE will work with DTSC in developing recommendations for the Corrective Measures Study.
19	19. All complete pathways and all chemicals of potential concern must be included in the risk assessment.	19. The risk assessment will address all pathways discussed and agreed upon with DTSC risk assessor staff.
20	20. The human health sections of the risk assessments will be evaluated on the basis of the pathways, Constituents of Potential Concern (COPCs), Exposure Point Concentrations (EPCs), and parameters selected to estimate potential exposures under the scenarios required by SB 990.	20. DOE, as stated in the NOI to prepare the *SSFL Area IV EIS*, will evaluate baseline and cleanup risks based on multiple scenarios including open space, residential, and agricultural (i.e., SB 990).
21	21. California Department of Public Health has regulatory oversight for Building 4100 in Area IV.	21. The text will be corrected to address this comment.

	Comment	Response
22	22. SB 990 requires that residual radioactivity not exceed suburban residential or rural residential (agriculture) Environmental Protection Agency (EPA) preliminary remediation goals (PRG). The Data Gap Report does not address SB 990 criteria. SB 990 references published values which are default and are conservative for residual radioactivity. The Data Gap Report references site specific values and are less conservative than the default parameters. Reference should be made to the default agriculture scenario.	22. DOE has agreed to revise the *Draft Gap Analysis Report* and use the SB 990 scenario as described by the commentor.
23	23. Provide listing of all radionuclides generated during reactor operation and pare the list down using industry acceptable methods (i.e. radiological half-life).	23. Attached to this comment response document is a technical paper evaluating and listing all radionuclides potentially generated during reactor operations, along with the rationale (e.g., half-life) for the radionuclides that still might be present at SSFL.
24	24. Use new background values for SSFL site. This will alleviate any errors introduced by using generic correction factors.	24. DOE is awaiting the results of the new background studies as one input for revising the *Draft Gap Analysis Report*.
SA-003: TR Hathaway, CA Department of Toxic Substances Control, Memorandum dated: 7/20/2008		
1	1. The area addressed by this gap analysis must be clearly defined and consistent throughout the document. There are occasional references to the ETEC area and other referenes indicate that the entire Area IV is considered.	1. The *Draft Gap Analysis Report* will be revised to provide consistency in presenting the scope of the *SSFL Area IV EIS*. Although ETEC only occupied a portion of Area IV, the EIS will address all of Area IV.
2	2. Although this document purports to address SB 990, by calculating PRGs which it states are consistent with SB 990, it does not. Page l-11, section 7.6.3, states that the DOE calculated exposure estimate includes fruit and vegetable ingestion. SB 990 implies that an agricultural scenario, which includes several other food pathways, must be addressed and that the most conservative cleanup levels must be utilized.	2. The *Draft Gap Analysis Report* will be revised to incorporate the findings of the Background Workgroup in relation to background values and detection limits relative to an agricultural scenario (i.e., SB 990).
3	3. Page E-1, The last paragraph states that screening criteria were utilized. The use of screening criteria is not clear. The Human and Ecological Risk Division does not approve the use of screening criteria such as PRGs to eliminate chemicals from the risk assessment. Inorganic chemicals may only be eliminated by comparison with an acceptable background data set which is unimpacted by site activities.	3. The *Draft Gap Analysis Report* will be revised to address the screening criteria that were specifically used for the identification of COIs and the rationale for elimination of any COI.
4	4. Page E-3, Table ES-1 on page E3 reports that the NPDES program assesses surface water in the Area IV. This statement may not be true for surface water bodies that do not discharge through the monitoring points. This point is adequately addressed on page E-7 in the Surface Water section.	4. In the *Draft Gap Analysis Report*, the analysts recommend sampling of internal drainages and ponds that are not addressed through the NPDES program.
5	5. Page E-6, Last paragraph, the definition of soil vapor is incorrect. Soil vapor concentrations are present in air due to volatilization from soil and groundwater and are not, as is stated, concentrations in soil.	5. The definition of soil vapor will be corrected in the revised *Draft Gap Analysis Report.*
6	6. Section 3.1.6, page 3-2 reports screening against PRGs, MCLs, and ESLs, but does not indicate the identity of chemicals or samples eliminated using these criteria.	6. Section 3.1.6 of the *Draft Gap Analysis Report* presents the methods and criteria used for screening. Tables presenting the screening results based on these criteria are presented in Section 4.
7	7. Section 3.3.1 refers to a Conceptual Site Model (Figure 3-1) but does not address the subject of which food pathways will be considered in the gap analysis.	7. The *Draft Gap Analysis Report* will be revised to address two pathways: that of a resident farmer who grows 25 percent of his or her fruits and vegetables and an agricultural scenario consistent with the requirements of SB 990.
8	8. Section 3.3.1- 2, page 3-13, lists specific pathways which will be included in the data gap analysis	8. The *Draft Gap Analysis Report* will be revised to incorporate an

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	but does not address the agricultural scenario which would include meat milk and eggs.	agricultural scenario based on the findings of the Background Workgroup.
9	9. Section 3.3.1.2, page 3-13, lists specific pathways or offsite receptors but does not address potential chemical exposures during transportation.	9. The *Draft Gap Analysis Report* will be revised to address pathways for exposure to the public during transportation of waste from Area IV.
10	10. The Rural Residential Exposure Pathways section, page 3-15, which are complete include edible plant tissue ingestion.	10. DOE agrees with the comment.
11	11. Figure 3-1 indicates that ingestion of edible vegetation will be only quantitatively addressed. This does not appear to be consistent with SB 990.	11. The *Draft Gap Analysis Report* will be revised to address an agricultural scenario consistent with the findings of the Background Workgroup.
12	12. Page H-4 refers to an agricultural scenario, however only a rural residential scenario has been addressed. Please correct this misleading statement,	12. The *Draft Gap Analysis Report* will be revised to incorporate an agricultural scenario as mandated by SB 990, consistent with the findings of the Background Workgroup.
13	13. SPECIFIC COMMENTS (PRG Spreadsheet) 1. Please check the name of the congener in cell A650? (2,3,7,8 is not hexa-). However, the "HCDB mix" notation in cell A651 may, but does not, address this discrepancy. 2. Potential double counting of congeners and TCDD TEQ may occur 3. Pathways and intake parameters that are utilized in PRG calculation are not identified. The text and the CSM don't reference intake parameters, i.e. ,fruit and vegetable intake and % of crop that is homegrown.	13. DOE thanks the commentor for the specific comments. The department will consider them while making revisions to the *Draft Gap Analysis Report.*
14	14. The Human and Ecological Risk Division recommends that this report be accepted following adequate responses to the general and specific comments (above). The characterization is incomplete and the agricultural scenario, as specified by SB 990, has not been addressed. The recommendations of the Geological Services Unit and the rural residential scenario, as specified by SB 990, must be addressed prior to final approval. All complete pathways, as specified by SB 990, and all chemicals of potential concern must be included in the risk assessment.	14. The *Draft Gap Analysis Report* will be revised to incorporate the comments submitted by the Human and Ecological Risk Division (HERD).
SA-004: Laura Rainey, CA Department of Toxic Substances Control, Memorandum dated: 8/12/2008		
1	1. GSU generally concurs with the process for identifying data gaps. There are, however, some concerns. First, some of the screening values used for rural residential Preliminary Remediation Goals (PRGs) may not be in compliance with Senate Bill 990 requirements. Although GSU defers to DTSC's Human and Ecological Risk Division to comment on these PRG values, GSU understands that the appropriate agricultural rural residential PRGs should be more conservative. The use of more conservative, revised agricultural rural residential PRGs as screening values could likely result in identification of more data gaps.	1. DOE intends to revise the *Draft Gap Analysis Report* based on the findings of the two background studies (those conducted by EPA and DTSC) and the determination of detection limits for the radiological and chemical COIs identified from those studies (SB 990 scenario).

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2	2. Second, knowledge of historical site process information has largely increased as a result of historical documents recently made available by Boeing. The Data Gap Analysis Report heavily relies on the Historical Site Assessment (HSA; Sapere Consulting, Inc., 2005). The HSA, however, does not incorporate much of the historical site information that has been more recently provided. This recently available historical chemical use and release information is critical for better understanding and defining chemical use areas. It is not clear that the Data Gap Analysis Report utilized this recent information. For example, the Report indicates that 200 documents were reviewed for the data gap analysis. GSU understands that there are tens of thousands of historical documents available for Area IV that describe historical chemical and/or radionuclide usage and releases. Since it is not clear that this information has been fully utilized in the data gap analysis, there is concern that the chemical use areas may not be sufficiently defined. Sufficient definition of chemical use areas is needed in order to determine the data needs as part of the data gap analysis.	2. DOE recognizes that additional efforts to obtain and review historical information for SSFL are ongoing. The *Draft Gap Analysis Report* will be revised and updated based on the new historical information produced by these efforts.
3	3. Third, a key component of the data gap evaluation process involves identification of constituents of interest (COI). GSU concurs with establishing a COI list, but does not concur with the screening process. The potential COIs are first listed as all chemicals for which samples were analyzed in soil at Area IV. The list is then reduced by removing chemicals that were analyzed, but not detected. Chemicals that were detected but at concentrations less than the established background values were also removed. Also, chemicals with maximum concentrations less than one-tenth the PRGs were removed from the COI list. In addition, chemicals without available toxicity criteria were removed from the COI list. Chemicals that were infrequently detected were also removed from the COI list. At this time, GSU does not concur with this process of removing chemicals from the COI list. These criteria appear to assume that characterization is sufficiently complete to justify their use. Characterization is not complete, and a significant amount of sampling is ongoing as part of the RFI. Chemicals that have not been detected may be detected in the future. Chemicals that have not been detected at concentrations exceeding their associated background values may be detected at elevated concentrations in the future. Also, certain chemicals having no significant toxicity can be important solvents and/or carriers for chemicals or radionuclides into the environment. Removal of these chemicals from the COI list would effectively limit characterization of releases, particularly to groundwater, associated with non-toxic carriers.	3. The *Draft Gap Analysis Report* will be revised to address this concern. The analysis will be updated to include any additional COIs identified during the RFI work and no COI will be excluded based on background or PRG relationships. COCs will be identified during data evaluation as part of the risk assessment process.
4	4. Fourth, a multi-media evaluation should be conducted to ensure that all COIs listed for any specific environmental media are also included as COIs for other environmental media. Comparison of the COI list for soil and groundwater suggests that this multi-media evaluation was not conducted. For example, anions are listed as COIs in groundwater (fluoride, nitrate-N, and perchlorate), but are not listed for soil.	4. The *Draft Gap Analysis Report* will be revised to incorporate the cross-media assessment to ensure that any COI related to any medium will become a COI for all media, as appropriate.
SA-005: Jerry Hensley, CA Department of Public Health, Memorandum dated: 8/5/2008		
1	1. 1.4.4 California Radioactive Material Regulations. This section is incorrect. Under current agreements, California Department of Public Health has regulatory oversight for Building 4100 in Area IV.	1. DOE appreciates the suggested clarification and will revise the *Draft Gap Analysis Report* accordingly.
2	2. Section 1.6.1 Risk-Based Decision. SB-990 requires that residual radioactivity not exceed suburban residential or rural residential (agriculture) Environmental Protection Agency (EPA) preliminary remedial goals (PRG). This document does not address SB-990 criteria.	2. The *Draft Gap Analysis Report* will be revised to incorporate the findings of the Background Workgroup, including new background values and detection limits for radionuclides relative to an agricultural re-use scenario.

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3	Section 1.6.3 Senate Bill 990 Consideration. SB 990 references published values which are default and are conservative for residual radioactivity. This document references site specific values and are less conservative than the default parameters.	3. The *Draft Gap Analysis Report* will be revised to incorporate the findings of the Background Workgroup including new background values and detection limits for radionuclides relative to an agricultural reuse scenario.
4	4. 2.4 Sources of Data, Table 2-1 Add Document A4CM-AR-0005. Reference to SRE pond and drainage of water should be added to Historical Site Assessment. Specific information is referenced in Section 5.5.2. Although water was sampled and analyzed, residual radioactivity below detection limits can still be present and accumulate in low lying drainage areas. The specific reference follows: "The SRE Pond level was limited by transferring water to a channel draining to the Silvernale Pond in SSFL Area III. A sump pump at the pond drew water from the pond and pumped it through a 4 in. pipe whose outlet was at a culvert under the main access road to Area IV, at the edge of the Old Conservation Yard. The drainage channel was asphalt covered for a few hundred feet downstream of that point. Further drainage was along the uncoated natural channel."	4. The *Draft Gap Analysis Report* will be revised to incorporate this comment.
5	5. Section 3.2.5 Step 5 - Develop the Analytical Approach. Provide listing of all radionuclides generated during reactor operation and pare list down using industry acceptable methods (i.e. radiological half-life).	5. To address this comment, the consultant team has performed an analysis of radionuclides associated with SSFL Area IV activities and issued a report entitled *Radionuclides Related to Historical Operations at the Santa Susana Field Laboratory Area IV*. This paper is included as an appendix to this comment response document.
6	6. 3.2.6.1 Derived Concentration Guideline. PRG values referenced in this section are not based on SB-990. Recommend using background plus 1E-6 agriculture PRG risk values as starting point and indicate reason for increasing screening values above this value.	6. The *Draft Gap Analysis Report* will be revised to incorporate the findings of the Background Workgroup, including new background values and analytical detection limits based on an agricultural reuse scenario.
7	7. 3.2.6.3 Confidence Interval: The alpha (5%) and beta (10%) values referenced are consistent with accepted industry practices. The LBGR was set to one half of the DCGL, however, the DCGL values are significantly higher than those based on SB-990. The alpha and beta values are appropriate to industry accepted practices. Setting the LBGR to 50% of DCGL, as an initial data point in MARSSIM, may not be appropriate when compared to SB-990 PRG values. Recommend looking at sample variability or twice sample variability for LBGR starting point.	7. Because the existing sample data set was collected over a large span of time based on varying programmatic objectives and sensitivities and with varying data recording practices, evaluation of the variability of the existing data is distorted by the varying practices and does not indicate the variability that can be expected to exist in the site environment or that might be obtained by current analytical sensitivities. Therefore, the MARSSIM recommendation of setting the LBGR to 50 percent of DCGL as an initial data point was deemed appropriate.
8	8. 3.2.6.5 Measurement Quality Objectives (MQOs) Q1: Recommend against using correction factor for calculating MDL. Use new background values for SSFL site. This will alleviate any errors introduced by using generic correction factors. Q2: Recommend using all non-detect values in calculations	8. No correction factor was used. The method detection limit was determined directly from the MDA or error in order to provide a consistent approach to the definition of Method Detection Limit. Background values were incorporated in the analysis. New background values will be used in the future when obtained. All detect values were used in the calculations. The use of non-detect values where the detection limit did not meet the sensitivity objectives (DCGLs) would bias the results. By eliminating these data, the data gap is potentially increased and requires more samples. DOE's approach is more conservative. By removing the non-detects and recommending resampling, DOE can demonstrate greater confidence in the presence

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		or absence of contamination within Area IV.
9	9. 3.3.1.2 Potential Exposure Pathways Recommend referencing SB-990 parameters. If anticipated site specific values differ, provide recommended changes along with reasons.	9. The *Draft Gap Analysis Report* will be revised to incorporate the findings of the Background Workgroup, including the new background values and analytical detection limits, in relation to an agricultural future-use scenario.
10	10. 3.4.1.2 Radionuclides Recommend evaluating information after new background study to determine impact due to radiological decay and natural erosion of soil for radioactivity from nuclear weapons fallout.	10. The *Draft Gap Analysis Report* will be revised to incorporate the findings of the Background Workgroup, including the new background values and analytical detection limits, in relation to an agricultural future-use scenario.
11	11. 3.4.2.3 Radiological PRGs Information does not reference values in SB-990. The radiological PRGs for the SSFL are based on default EPA methods presented on the following web site: http://epa-prgs.ornl.gov/cgi-bin/radionuclides/rprg_search, to meet SB-990, reference default agriculture scenario.	11. The *Draft Gap Analysis Report* will be revised to incorporate the findings of the Background Workgroup, including the new background values and analytical detection limits, in relation to an agricultural future-use scenario.
12	12. 3.5.10 Walkover Radiation Surveys. CDPH is interested in methodology/procedure planned for walkover gamma radiation survey. Recommend use of systems utilizing larger volume sodium iodide detectors (10cm by 10cm by 40 cm) with integrated GPS and spectral storage capability. This will provide a complete record of all information and will reduce detection limits, allow post processing to reduce impact of Compton scatter and allow evaluation of spectral information for elevated measurement locations. Use of portable instruments to report data after response time smoothing will require statistics applicable to response time calculations.	12. DOE accepts this comment. The *Draft Gap Analysis Report* will be revised to address this comment.
13	13. 3.6.3.1 Definition of Survey Units Recommend using default MARSSIM survey unit size. If survey unit passes statistical tests then additional work is not necessary.	13. DOE accepts this comment. The *Draft Gap Analysis Report* will be revised to address this comment.
14	14. 3.6.6.1 Radionuclide Sample Number for Risk Assessment and Delineation Based on MARSSIM Recommend recalculating sample density using SB 990 PRG values. Recommend using a relative shift of 1 instead of 1.5 for survey units without sufficient data to calculate sample density. This will increase number of samples but is still within acceptable MARSSIM variability and is conservative.	14. DOE will use the radiological data collected by EPA under its studies for use in evaluating risks for Area IV. Included in the analyses will be an SB 990 agricultural scenario.
15	15. 3.6.8 Gamma Walkover Survey Data Gap Analysis Methodology CDPH is interested in methodology/procedure planned for walkover gamma radiation survey. Recommend use of larger volume sodium iodide detectors with GPS and spectral storage capability for post processing and lowering detection limits for large areas. Use of a system that captures values only after response time calculations requires applicable statistics and may not meet site requirements.	15. DOE accepts this comment. The *Draft Gap Analysis Report* will be revised to address this comment.
16	16. 3.11 Building Data Gaps Analysis Methodology Recommend additional information on tritium and other low energy beta emitters at sites where there is a potential for generation or use. Gross alpha or gross beta measurements will be significantly under reported or not detect low energy beta emitters.	16. Tritium cannot be measured via survey techniques. Sampling data is necessary and will be obtained when not available. A few other low-energy beta emitters (e.g., plutonium-241) may also require sampling and analysis if identified as COCs. However, most beta emitters, including ones with energy as low as technetium-99 (beta max of 0.273 MeV) can be detected via survey instruments, although appropriate instrument calibration may be necessary if they are known to be present.

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17	17. Exhibit 3-1a Recommend use of new radiological background study determine what effect SB-990 will have on this flow chart. Survey unit classifications were calculated using other than SB-990 values. Recommend reevaluating survey unit classification until new radiation background study is completed. Using the percentages of the DCGLs referenced in this report to classify survey units when evaluated against SB-990 might be impossible.	17. The flow chart itself would not change with changed background or PRG values. The results might change when using different screening values. The agricultural scenario, using the default exposure pathways, will be applied in the revised *Draft Gap Analysis Report*. The CDM/SAIC team has already compared the data gap results using the default exposure pathways for the agricultural scenario and found no significant difference in the resulting classification of areas and resulting number of samples for the data gap DOE has already recommended using the updated background values for the screening that will be performed for the risk assessment and establishment of remediation levels. They will be used for the revised *Draft Gap Analysis Report* if they are obtained in time.
18	18. Exhibit 3-1b Recommend using MARSSIM survey unit sizes. If data satisfies MARSSIM statistics, then locations can be released without additional sampling efforts.	18. EPA will conduct a radiological characterization survey for all of Area IV and the Northern Undeveloped Land regardless of past radiological activities. Although MARSSIM generally is used for final status surveys (performed at the conclusion of remedial activity), there is still future remediation that will be required for both radiological and chemical contamination. It is not anticipated that any areas will be released as a result of the EPA survey.
19	19. Figure 3-6 Provide sample information on all locations. Unable to locate data from the SRE facility after remediation.	19. It would be impractical to provide all sample data on the figure or in the report. Such an effort is not necessary to identify future data needs. A statistical summary of the sample data for each survey unit is provided in Appendix G of the *Draft Gap Analysis Report*. The need for additional radiological data will be reassessed after EPA completes its surveys. If any additional data is needed, more samples will be collected and analyzed.
20	20. Table 3-2 Provide information on effects of radiological decay, soil erosion and migration (horizontal and vertical) on background radioactivity levels.	20. Erosion and migration effects are site specific (geological formation and topography) and cannot be calculated. These effects are discussed qualitatively in Appendix C. These objectives, including decay, will be met by the planned background study.
21	21. Table 3-3 Radionuclide Soil Human Health PRGs are not based on SB-990	21. The *Draft Gap Analysis Report* will be revised to incorporate the findings of the Background Workgroup, including new background values and analytical detection limits, in relation to an agricultural future-use scenario.
22	22. Table 3-11 Radiological Contaminates of Interest List of all potential radionuclides not referenced. No reference to Pa-231 and other Th-232 fuel activation products, missing additional isotopes in list, and no reference to californium, antimony, holmium, niobium, promethium, and zirconium. Provide justification or reasons for not listing the above-mentioned radionuclides as radiological contaminants of interest.	22. The potential radionuclide list came from the HSA and EA as referenced in the text and in Table 3-10 of the *Draft Gap Analysis Report*. Additional radionuclides were added based on process knowledge from other reactor and fuel separation facilities and half-life considerations. Protactinium-231 is not a thorium-232 fuel activation product; it is the daughter of uranium-235 and is considered in equilibrium with it. Thorium-232 was not used as a fuel, but rather was contained in some fuel as a fertile component to "breed" new fuel components.

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		Therefore, no thorium-232 fission products should be present. The transuranic listed, californium, is not produced in significant amounts in reactors due to the number of nuclear reactions required to produce it. Zirconium-95 and niobium-95 have half-lives of less than 1 year. Promethium-147 and antimony-125 could be added as they have half-lives of just over 2 years, but antimony-125 is not likely to be present in significant amounts at this point in time since they are not produced in large amounts in reactors and promethium-147 is not a significant dose contributor. Holmium-166 is not a fission product of uranium-235 and has a half-life of less than 1 year. As a result of other comments regarding the list of radiological COIs, a white paper has been developed to demonstrate all potential radionuclides produced as part of Area IV activities, and rationale as to why or why not each radionuclide remains a COI based on its half-life and other factors. This paper is entitled *Radionuclides Related to Historical Operations at the Santa Susana Field Laboratory Area IV* and is included as an appendix to this document.
23	23. 4.1.1.2 Characterization and Extent of Contamination Approach Detection limits may not be lower than SB-990 PRG values. Recommend analyzing subsurface samples when the surface sample shows significantly elevated levels. This will assist in evaluating contamination depth profile.	23. This suggestion agrees with DOE's approach for radionuclides presented in Section 4.1.2.2 of the *Draft Gap Analysis Report*.
24	24. 4.1.2.3 Gamma Walkover Survey Data Gap Statistics are not referenced for portable radiation instruments used for gamma walk over survey - survey reports noted below. Specific issue is using data after being manipulated (smoothed) by instrument response time averaging vice audible response in MARSSIM. The document will need to address the instrument response time, detection limits and additional other impacts to include response time settings. 1. Final Status Survey Report: Characterization and Final Status Survey Radioactive Materials Handling Facility Perimeter, Cabrera Services, March 2006 (8 survey units located north and west of the Radioactive Materials Handling Facility); 2. Final Status Survey Report: Final Status Survey Post Historical Site Assessment Sites, Block 1, Cabrera Services, March, 2007 (Sites 4023, 4028, 4030, 4363 and 4583 as noted in the report); 3. Characterization and Final Status Survey Report: Radioactive Materials Handling Facility Holdup Pond (Site 4614);	24. Instrument response times and calculation of the reported detection limits based on NUREG 1504 methodology were addressed in the referenced reports and their associated field implementation procedures. These can be found on the ETEC website. EPA now has the lead on the gamma walkover survey and plans a 100 percent survey. Therefore the prior survey data will be replaced with new data.
25	25. 4.8.2 Ambient Air Data Request additional information on sampling points for Hot Lab. In this section elevated values were noted "On four occasions the north and west Hot Lab samples exceeded the alpha DCG limits" based on the conservative use of the Pu-239 concentration guide. The report concludes that "The activity detected in ambient air is attributed to naturally occurring radioactive materials." Was the sample point before or after the facility HEPA filter? Residual radioactivity from radon progeny on air sample filters in the exhaust duct after the HEPA filter is normally very low or non-existent, however, filters prior to the HEPA filter may contain elevated levels of naturally occurring radon progeny.	25. The referenced report assumed that ambient air samples are taken after air exited high-efficiency particulate air (HEPA) filters. The naturally occurring radionuclide(s) may have been something other than radon progeny.

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26	26. 4.8.4 Conclusions There is insufficient air sample data to accurately quantify any releases during the early operations of the reactors and associated facilities.	26. The purpose of the Data Gap Analysis process was to identify data needed to analyze impacts of building decontamination, demolition, and removal. The air data from any early operations were not proposed to be used, nor would they be representative of future conditions at the site. Future air concentrations will be based on modeling of soil and surface contamination concentrations.
SA-006: Thomas Seckington, CA Department of Toxic Substances Control, Memorandum dated: 8/11/2008		
1	1. It should be clearly noted that the groundwater investigation activities at the site are ongoing. The groundwater conditions at the site are complex and are not well understood. Therefore, the information presented and the conclusions reached in the report regarding the extent of contaminants and the need for additional data should be considered as an approximation based on current understandings. It is certain that as additional groundwater data is collected and the RCRA Facility Investigation (RFI) reports are submitted, additional data gaps will be identified and additional investigation work will need to be conducted.	1. The authors of the *Draft Gap Analysis Report* recognized the status of current groundwater investigations and recommend conducting additional groundwater investigations. The results of the RFI studies will be incorporated into the revised *Draft Gap Analysis Report* and the recommendations for additional groundwater studies will be revised accordingly.
2	2. 1.7.8 Seeps, page 1-16 "Groundwater Seeps have been identified by prior investigations at locations downslope for Area IV." Artesian conditions have been reported in the RMHF drainage. There has not been sufficient evaluation completed to assess if these conditions may result in a seep in the vicinity of this area. The presence of a distinct lineament and reported fractures strongly suggest the presence of a fault within the RMHF drainage that extends to the SRE area. A seep(s) therefore may be present within Area IV, that is, within this drainage during periods of high groundwater elevation.	2. The authors of the *Draft Gap Analysis Report* recognized that the current understanding of the relationship between seeps and groundwater is incomplete. They recommend additional groundwater and seep investigations.
3	3. 1.7.8 Seeps, page 1-16 "It is important to note that because the investigation record indicates that seeps are only present in the rainy season, sampling of seeps, like surface water, is an opportunistic activity. '" Many of the seeps do not flow much beyond the rainy season, however, numerous seeps flow well into the late summer and many flow year round. This statement should be revised.	3. The *Draft Gap Analysis Report*, and recommended seep investigation, will be revised to address this comment.
4	4. 2.1 Location, page 2-1 "It is bound on the north and south by undeveloped land owned by Boeing and to the west by property owned by the Brandeis-Bardin Institute." Please verify the current name of the Brandeis-Bardin Institute. Also, the KB Homes/Runkle Canyon property borders the property to the west. Please revise as necessary.	4. The *Draft Gap Analysis Report* will be revised to address this comment.
5	5. 2.3.2.1 Geology, page 2-4 "Fractures and joints are widespread in the Chatsworth Formation and are important conduits for groundwater and contaminant movement. " The nature of the fractures and joints is under evaluation. The term conduit implies significant flow and may give the false impression of the true nature and behavior of the faults. This statement should be revised.	5. The *Draft Gap Analysis Report* will be revised to address this comment.
6	6. 2.3.2.2 Hydrogeology, page 2-5 "Also, sitewide recharge is estimated to be 2 centimeters (0.95 inches) per year (about 5 percent of 46 centimeters (18 inches) using the chloride mass balance method." A range of recharge values have been calculated for the site ranging from 2 to 12 percent. This statement should be revised.	6. The *Draft Gap Analysis Report* will be revised to address this comment.

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7	7. 3.3.1.2 Potential Exposure Pathways, Groundwater Exposure Pathways, page 3-1 5 "Direct exposure to groundwater is an incomplete pathway for future industrial workers and recreational visitors, since neither would have access to water supply wells." Direct exposure to groundwater should be considered a complete pathway due to occurrence of artesian conditions in Area IV and the possible presence of seeps. In addition, it should be noted that the California Regional Water Quality Control Board - Los Angeles Region (CRWQCB-LAR) Basin Plan designates the groundwater as beneficial use.	7. The *Draft Gap Analysis Report* will be revised to address the LARWQCB designation for site groundwater.
8	8. 3.5.2 Groundwater, page 3-27 "Data gaps related to groundwater media are being addressed as two media: near surface (or shallow) groundwater and the deep groundwater associated with bedrock" Data should be evaluated dividing groundwater into perched groundwater and regional Chatsworth groundwater rather than the arbitrary divisions of "near-surface" and "Chatsworth".	8. The *Draft Gap Analysis Report* will be revised to address this comment. Data will be evaluated by dividing groundwater into "perched" and "regional Chatsworth" rather than the arbitrary divisions of "near-surface" and "Chatsworth."
9	9. 3.5.11 Bedrock "Bedrock in some in some instances can act as a barrier to contaminant migration or can harbor contaminants (i.e., be media of concern)." The bedrock at the site is permeable and is highly fractured so the term "barrier" is not appropriate. This statement should be revised.	9. The *Draft Gap Analysis Report* will be revised to address this comment.
10	10. 3.6.1.1 Review of the RCRA Program Documents, RCRA Facility Investigation, page 3-30 "In 1999 the DTSC identified two Operable Units (OUs) at the SSFL.." The two OUs were proposed by Boeing and agreed upon by DTSC.	10. The *Draft Gap Analysis Report* will be revised to address the operable unit designations.
11	11. 3.7.1 Identification of Groundwater COIs, page 3-42 "Groundwater COIs were identified by screening reported groundwater concentrations of all detected constituents against one-tenth the EPA Region 9 PRGs and one-tenth the MCLs." Any detected anthropogenic chemical should be identified as a COI. For naturally-occurring constituents, any concentration above the approved Groundwater Comparison Concentrations should be considered a COI.	11. The *Draft Gap Analysis Report* will be revised to drop the criterion of one-tenth of the MCL.
12	12. 3.7.4 Evaluation of Efficacy of Groundwater Monitoring Network, page 3-43 "Are monitoring wells installed in locations and at depths to properly delineate plumes of detected groundwater contamination?" Please clarify how this will be determined when groundwater flow directions at the site are not known.	12. Given that the site is located along the top of a ridge line, it is assumed that groundwater will flow away from the site in the direction of terrain. It is recognized that the fractured bedrock system makes it difficult to pinpoint the specific direction of groundwater flow at any location of the site. However, the community's concern is that contaminated groundwater is moving laterally from the site. One purpose of the proposed well is to address that concern. DOE wants to work with DTSC's hydrogeologists in the selection of the location of any new well.
13	13. Figure 3-2 SSFL Area IV Preliminary Conceptual Model for Ecological Receptors The figure implies that onsite groundwater will not be assessed. Please clarify why.	13. The figure referenced by the commentor shows that onsite groundwater is proposed to be assessed through groundwater expression at seeps and springs.
14	14. 4.2.4 Data Gaps in Groundwater Monitoring Network, page 4-19 "If contamination at concentrations significantly above an MCL is detected, the multichannel well (DOE7) in rock shall be installed." Please clarify what concentrations would be deemed "significant". The GSU would consider any concentration above MCL significant.	14. DOE would like to work with the DTSC hydrogeologist to identify a groundwater concentration that would trigger the requirement for a new monitoring point.

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15	15. 4.2.4 Data Gaps in Groundwater Monitoring Network, page 4-19 "Collect a shallow groundwater sample (via a new monitoring well or temporary point); if elevated constituents are detected, install a deeper monitoring well)" Temporary points do not provide temporal data that is often critical in understanding the overall groundwater quality. Therefore, DTSC does not recommend the use of temporary points beyond that of a screening tool.	15. DOE would like to discuss with the DTSC hydrogeologist acceptable methods of collecting groundwater data for locations where a permanent monitoring point may not be warranted.
16	16. 4.7.2.4 Offsite Surface Water and Sediment, page 4-23 "There is a potential data gap for the ERA for bodies of water located outside the boundaries of Area IV that both contain water for sufficient duration to support aquatic life and are potentially impacted by migration of contaminants from Area IV. Pond R2 in Area II and Silvernale Pond in Area III are potential offsite locations that will require samples to be analyzed for radionuclides. " There is connectivity between these surface water bodies and the groundwater that needs be evaluated. Groundwater wells adjacent to the R2 and Silvernale Ponds should be also be sampled for radionuclides.	16. The *Draft Gap Analysis Report* recommendations will be revised to address this comment.
SA-007: Brian Faulkner, CA Department of Toxic Substances Control, Memorandum dated: 8/12/2008		
1	1. HERD accepts the suggested approach in which the human preliminary remediation goals (PRGs) and ecological screening levels (ESLs) are compared and the lower of the two is used for efficiently addressing sampling data gaps and needs for Area IV site characterization. However, the appropriateness of the selected ESL and PRG concentrations still needs to be addressed, see the comments regarding the ESLs in this memo and the comments in the memo from T.R. Hathaway regarding the human PRGs.	1. The human health PRGs will be re-evaluated once the results of the Background Workgroup determination of background and analytical detection limits is complete. The *Draft Gap Analysis Report* will be revised to incorporate the findings of the Background Workgroup studies.
2	2. The report appears to address the HERD recommended sampling depths for ecological receptors in the text (section 3.2.4.2.). All future sampling and analysis will need to comply with HERD guidance for ecological risk assessments, regardless of whether or not the human PRGs or ecological ESLs are the lowest value for individual chemicals, so that hazards can be adequately determined for ecological receptors. The sampling plan needs to include a sufficient number of samples to define the required range for the calculation of EPCs for ecological receptors from 0-6 ft bgs as per HERD Econote 1 (1998). This comment is only meant to draw attention to the subject, and does not require a response.	2. DOE is committed to developing a Field Sampling and Analysis Plan for the collection of ecological receptor data that are fully compliant with HERD recommendations.
3	3. The need for the separate consideration of sump soil and sump water from soils and groundwater is not explained adequately in the report. There is no mention of either of these in the "media of interest" description in the executive summary or section 1.7.5 (soil data evaluation) and no mention of on-site sumps in section 2 (site description) that might explain the need for this approach. HERD does not necessarily disagree with doing this, but requests an explanation of why it is needed, how samples will be collected, to what depths samples will be collected, and if/how the collected data will be evaluated differently from other soil and water samples.	3. It is believed that most sumps are located in or near one or more buildings. Soil and/or water associated with sumps may or may not be applicable to the Ecological Risk Assessment (ERA), depending on exposure potential. Sump soil and water will be considered and fully evaluated in the ERA for those locations where there is significant potential for ecological exposures to sump soil or water. Chemical concentration data for these media will be evaluated separately because it is expected that ecological exposures to these media will be unique and limited. A member of the ERA field team will visit the site to confirm the location of all sumps and to evaluate the completeness of exposure pathways for all sumps of interest. The sampling process and criteria will also be described in the Field Sampling and Analysis Plan.

	Comment	Response
4	4. Separate consideration of seeps from other waters may not be necessary for risk assessment. HERD does not necessarily disagree with this approach either, but please explain in some detail the reason for considering seeps separately and how these water samples will be evaluated differently from groundwater and surface water.	4. The authors of the *Draft Gap Analysis Report* recommend the evaluation of seep samples, which originate from groundwater, as an ecological receptor exposure pathway. EPA plans to collect seep samples for radionuclide characterization and Boeing continues sampling of seeps. For the purposes of the EIS, seep samples will be screened against Ecological Screening Levels (ESLs) for surface water and then carried forward in the ERA as appropriate.
5	5. HERD also requests that a summary table be added to the report that lists the ESLs for each ecological receptor to be evaluated and the sources of the ecological ESLs to be used in the future assessment of Area IV.	5. The ESLs, as requested, will be provided for ecological receptor groups (such as freshwater fish, benthic macroinvertebrates, birds, or mammals) in the revised *Draft Gap Analysis Report*. Representative and specific ecological receptors will be identified and assessed in the ERA. These will likely include avian and mammalian receptors selected to represent specific trophic levels for food web models. Additionally, species-specific toxicity reference values will be identified and selected for use in risk estimation for those chemicals that are retained for full evaluation in the ERA.
6	6. Page E-8: "Background levels for metals and dioxin in soils have been agreed upon by regulatory agencies for SSFL". While this is true, a new background chemical set is currently being developed for SSFL that may supersede the current background data set. This comment is informational and does not require a response.	6. DOE is aware that DTSC is taking the lead in evaluating a new background data set for chemicals. The *Draft Gap Analysis Report* will be revised to incorporate the new values.
7	7. Section 1.7.9 (Surface Water and Sediment), Page 1-17: The fourth paragraph describes sampling of sediments in Area IV, but based on the site description, the seasonal drainages that are purported to contain sediments are probably closer in character to soil, as there are no permanent or semi-permanent seasonal surface waters in these areas. These areas generally only contain water during rain events, which means that most of the time they are dry, and seasonal drainages generally lack riparian or wetland plant species. HERD recommends that for both risk assessment purposes and inorganic background comparisons, that the drainage media be treated as soil and not sediment. Given the potential for transport of contaminants through water in the drainages during storm events, however, HERD agrees that drainages that have not been sufficiently sampled constitute a data gap for soils that must be filled. HERD also agrees, however, that it is appropriate to consider all permanent or seasonal ponds or areas in which wetland affiliated communities (containing Typha spp., for example) grow as containing sediments rather than soils.	7. For the most part, samples from intermittent drainages will be considered soil. There are some places on the site where the solid media samples would be most appropriately considered sediment and evaluated as such (e.g., pond and wetland areas).
8	8. Section 3.2.4.2 (Vertical sub-boundaries): In this section it is written that sediments will be sampled only for the top 0.5 ft for risk assessments. Given the site history and use of sites such as the Sodium Reactor Experiment (SRE) pond for wastewater containment, HERD recommends that sediment sampling be conducted from 0-6 ft bgs as per soils to better characterize the vertical extent of contamination present in the sediments.	8. Sediment is a surface sample. For locations where surface distribution of contaminants is important, the shallow sample will be collected. The need to sample at deeper intervals to address the ecological risk to burrowing animals is recognized in the *Draft Gap Analysis Report*. In that instance, samples are recommended for collection over the 0-6 feet bgs interval. The Field Sampling and Analysis Plan will provide the data quality objectives addressing the purpose of collection of sediment and deeper interval samples.

	Comment	Response
9	9. Section 3.2.6.5 (Measurement of Data Quality Objectives), page 3-1 1: "Acceptable historical data were used as reported without further validation." While HERD may accept this approach, the criteria used to determine what constitutes "acceptable historical data" must be discussed in detail. The data quality objectives for usable historical data in the risk assessment must be described.	9. For the purpose of the *Draft Gap Analysis Report*, historical data were compared with data acceptability criteria. DOE uses the term "acceptable historical data" for data that have a documented quality control history including a sampling plan, knowledge of analytical methods, and identified detection limits, and that have been subject to a data review and validation process. Data missing any of this information were deemed unacceptable.
10	10. Section 3.3.2 (Ecological Risk Assessment) Page 3-16: "Air pathways (inhalation), while potentially complete for surface-dwelling terrestrial wildlife species, are not evaluated for chemicals, because they are considered less significant relative to other routes of exposure." HERD recommends that this statement be revised to make it clear that this pathway will be evaluated for burrowing terrestrial mammals (using the deer mouse as the surrogate species), as per section 3.5.4.	10. The pathway for burrowing terrestrial mammals uses the deer mouse as the surrogate species. It will be evaluated in the ecological risk assessment. DOE looks forward to meeting with HERD staff to discuss and develop the pathway model for this evaluation.
11	11. Section 3.3.2 (Ecological Risk Assessment) Page 3-19: "No geographic distribution of higher dioxin concentrations, indicative of a wind-borne distribution from SSFL source areas, was identified." This conclusion appears to based on the results of 17 samples, collected from amongst the "19 widely spaced sites located up to 4.8 km away from SSFL" used for the background study, as stated on page 3-18. This does not seem like very many samples when drawn from such a large number of locations over 4.8 km range, and no indication is given regarding the distribution of the samples. HERD recommends that this statement be supported by a sampling location/concentration map.	11. Since release of the *Draft Gap Analysis Report*, DTSC has taken the lead on performing the background study, which will include dioxins. DOE trusts that DTSC is considering this distribution issue in its design of the background study.
12	12. Section 3.4.1.2 (Background/chemical)/Table 3-1 (SSFL Area IV soil background comparison values for metals and dioxins:" a. "The background dioxin congener and toxicity equivalent (TEQ) values are shown in table 3-1 ." There are no TEFs that are specifically listed in the table, only a column labeled "concentration." If these concentrations are the TEQs then revise the table to reflect this. HERD also recommends that the TEFs be included in the table. b. There is also no listing for 2,3,7,8 TCDD background concentration in table 3-1, but a 2,3,7,8 TCDD TEQ is listed in tables 3-7 (Chemicals detected in Area IV soil) and 3.8 (Selection of chemicals of interest in Area IV soils) as "TCDD-TEQ (Total all)." Please add the 2,3,7,8 TCDD background to table 3-1. c. The WHO study by Van den Berg et al (1998) is cited as the source for dioxin congener TEFs. This document has been revised; please use Van den Berg (2006) as the source for dioxin TEFs in soil.	12. Table 3-1 will be revised to address these comments as part of the revision to the *Draft Gap Analysis Report*. The TEFs will be revised to incorporate the most recent source for their values.
13	13. Section 3.4.3.2 (Ecological Screening Levels for Chemicals): "In some cases, ESLs are general, and do not represent a toxicity threshold, but instead, are recommended values to protect a specific land use, such as agriculture." A concentration that is meant to protect agriculture is not an ecological screening level.	13. The commentor is correct and the text and proposed ESL application will be revised to address the comment.
14	14. Section 3.4.3.2 (Ecological Screening Levels for Chemicals): "Although inhalation can be a significant route of exposure for certain organisms, adequate means to independently assess this exposure route are generally unavailable." This statement is not really accurate; accepted methods do exist for modeling inhalation exposure from soil vapor.	14. DOE agrees with the comment and looks forward to working with HERD in developing the ecological risk inhalation exposure model.

	Comment	Response
15	15. Section 3.4.3.2 (Ecological Screening Levels for Chemicals): "The ESLs selected for use as ecological PRGs for surface water, sump water, and groundwater seep data." ESLs and Preliminary Remediation Goals (PRGs) are not necessarily the same values, and the terms should not be used interchangeably. In some parts of the text the term "ESL" is used for chemical screening levels, while "PRG" is used as the term for screening levels for radionuclides. If ESLs have been selected for chemicals to serve as chemical PRGs then please make that clearer, otherwise revise the applied terminology for consistency in this section and in other sections in which it occurs.	15. DOE regrets any confusion caused by inconsistent use of terminology. DOE will revise the *Draft Gap Analysis Report* to assure consistent use of terminology and include explanations for clarification.
16	16. Section 3.4.3.2 (Ecological Screening Levels for Chemicals): As mentioned in other comments, refer to Van den Berg (2006) for dioxin congener TEF values.	16. The dioxin TEF values will be updated to reflect the most recent reference.
17	17. Section 4.7.6.1.3 (Numbers and types of samples), pp 4-28 through 4-30: HERD would like the opportunity to be involved in the discussions regarding biota sample collection for the determination of bioaccumulation factors (BAFs) for ecological risk assessment on Area IV.	17. DOE appreciates the opportunity to work with HERD to develop agreement around the sample program design and sample collection for the ecological risk assessment.
18	18. Tables 4-6 through 4-14: Please define the acronym MCV used in these tables, it is not in the footnotes or in the acronyms and it is not in the abbreviations list in the front of the report. Based on the table, HERD surmises that MCV stands for "most conservative value," but the report needs to define the acronym MCV.	18. MCV stands for "most conservative value." The text, tables, footnotes, and list of abbreviations will be revised to include this definition.
19	19. Table 4-14 (Preliminary selection of soil gas COPECs for ecological receptors): The title is inconsistent with the rest of the text; please revise "soil gas" to read "soil vapor."	19. The *Draft Gap Analysis Report* will be revised to address this comment.
20	20. Figure 3-2 (SSFL Area IV preliminary conceptual model for ecological receptors): Please revise the conceptual site model figure so that it contains the soil vapor inhalation pathway for the deer mouse receptor, as is discussed in section 3.5.4 of the report.	20. Figure 3-2 in the *Draft Gap Analysis Report* will be revised to address this comment.
21	21. Future sampling and analysis needs to comply with HERD guidance for ecological risk assessments, regardless of whether or not the human PRGs or ecological ESLs are the lowest value. The description of activities in this section do not specifically address the needs of soil sampling for ecological risk assessment for chemicals (0-6 ft bgs) but HERD recognizes the potential for overlap between this and requirements for soil sampling for human risk assessment.	21. DOE recognizes the distinction between the human health and ecological risk assessment data collection goals. DOE looks forward to meeting with HERD to develop a program that maximizes the overlap in data collection requirements for both types of risk assessments.
22	22. HERD recommends that the sections of the report related to the ecological risk posed by chemicals in Area IV be accepted, but only following adequate responses to HERD comments in this memorandum. As stated previously, HERD requests the opportunity to be involved in future discussions of biota sampling for the development of site-specific bioaccumulation factors to be used for the ecological risk assessment.	22. DOE looks forward to productive discussions regarding the development of the ecological risk assessment, including the site-specific bioaccumulation factors.
SA-008: Norm Riley, CA Department of Toxic Substances Control, Scoping Meeting comment dated: 7/24/2008		
1	And I paused back there because I wanted to make sure that I understood the on-site containment option which has been described as an action alternative. I don't see how it can be. It contemplates, as I understand it, that this debris -- demolition materials and perhaps contaminated soil -- will be left on the site perhaps entombed in a landfill, for example. I don't understand how the Department of Energy can seriously contemplate that option given that it doesn't own any of the property there at the Santa Susana Field Lab. That is -- all the 90 acres that are leased by DOE are owned by the Boeing Company. It is hard to imagine that Boeing would agree to such a proposal. Perhaps you have worked that out, but I don't know. Given the possibility that they might not it doesn't seem like an option that is worth giving much consideration to.	DOE is required to evaluate a full range of alternatives. Inclusion of an onsite containment alternative does not mean that DOE would select it as a preferred alternative.

	Comment	Response
2	Related to that point, I would like to remind DOE that there is a lot of talk about the possibility that after the property is cleaned the Boeing Company will transfer the property to the state and that the property will thereafter be used as park land or open space. In my conversations with the resources agency that would be responsible for managing this property on behalf of the state they have indicated that they are not interested in accepting property that has waste material on it -- containments on it. Obviously, all of this is very tentative and I am not here to speak for the resources agency, but I would urge that you consider that -- that you factor that into your thinking about these options. This point that I am raising now goes not only to the viability potentially of the third alternative, but also, obviously, to Alternative number 5.	The commentor raises a valid point and DOE will include the potential viability of the various alternatives in the evaluation. In fact, DOE's selection of an alternative will include all of the nine EPA CERCLA evaluation criteria. These include: 1) overall protection of human health and the environment, 2) compliance with applicable or relevant and appropriate requirements, 3) long-term effectiveness and performance, 4) reduction of toxicity, mobility, or volume through treatment, 5) short-term effectiveness, 6) implementability, 7) cost, 8) State acceptance, and 9) community acceptance.

APPENDIX A
RADIONUCLIDES RELATED TO HISTORICAL OPERATIONS AT THE SANTA SUSANA FIELD LABORATORY AREA IV

Radionuclides Related to Historical Operations at the Santa Susana Field Laboratory Area IV

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Science Applications International Corporation

March 2009

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ACRONYMS

AETR	Advanced Epithermal Thorium Reactor
BWR	boiling water reactor
CDPH	California Department of Public Health
DOE	U.S. Department of Energy
ETEC	Energy Technology Engineering Center
IAEA	International Atomic Energy Agency
KEWB	Kinetics Experiment Water Boiler
kW	kilowatts
NMDF	Nuclear Materials Development Facility
PRG	Preliminary Remediation Goal
PWR	pressurized water reactor
SRE	Sodium Reactor Experiment
SSFL	Santa Susana Field Laboratory
USEPA	U.S. Environmental Protection Agency

GLOSSARY

activation product – A nuclide, usually radioactive, formed by the bombardment and adsorption in material with neutrons, protons, or other nuclear particles.

AEC – U.S. Atomic Energy Commission

corrosion product – An activation product formed by the activation and oxidation of metals

criticality – The condition in which a system is capable of sustaining a nuclear chain reaction.

DOE – U.S. Department of Energy

EIS – Environmental Impact Statement –

Environmental Assessment – A written environmental analysis which is prepared pursuant to the National Environmental Policy Act to determine whether a federal action would significantly affect the environment and thus require the preparation of a more detailed environmental impact statement.

EPA – U. S. Environmental Protection Agency

ETEC – Energy Technology Engineering Center

fertile material – Substance capable of becoming fissile, by capturing neutrons, possibly followed by radioactive decay; e.g., Th-232, U-238, Pu-240.

fission product – A nuclide resulting either from the fission of heavy elements such as uranium. Usually radioactive.

fission yield – The fraction of fissions resulting in a specified fission product.

fuel assembly – Structured collection of fuel rods or elements, the unit of fuel in a reactor.

fuel cladding – The outer metal jacket of a nuclear fuel element or target. It prevents fuel corrosion and retains fission products during reactor operation and subsequent storage, as well as providing structural support. Zirconium alloys, stainless steel, and aluminum are common cladding materials.

fuel element – Arrangement of a number of fuel rods into which the nuclear fuel is inserted in the reactor.

half-life – The time in which one-half of the atoms of a particular radioactive isotope disintegrate to another nuclear form. Half-lives vary from millionths of a second to billions of years.

high enriched uranium – Uranium enriched to at least 20% U-235.

kW – Kilowatt – A unit of electrical power equal to a thousand watts (joules per second)

low enriched uranium – Uranium enriched to less than 20% U-235. (That in power reactors is usually 3.5 - 5.0% U-235.)

MW – Megawatt – A unit of electrical power equal to a million watts (joules per second).

noble gas – Any of the chemically inert gaseous elements of the helium group in the periodic table

nuclear activation (neutron) cross section – Cross section: a measure of the probability of an interaction between a particle and a target nucleus, expressed in barns (1 barn = 10^{-24} cm^2).

nuclear reactor – A device in which a fission chain reaction can be initiated, maintained, and controlled. It's essential components are fissionable fuel, moderator, shielding, control rods, and coolant.

nuclide – Elemental matter made up of atoms with identical nuclei, therefore with the same atomic number and the same mass number (equal to the sum of the number of protons and neutrons). Also referred to as an isotope of an element.

Particle Accelerator – A scientific instrument that increases the kinetic energy of charged particles

PRG – Preliminary remediation goal

radioactive decay – The change of one radioactive nuclide into a different nuclide by the spontaneous emission of alpha, beta, or gamma rays, or by electron capture. The end product is a less energetic, more stable nucleus. Each decay process has a definite half-life.

radionuclide – An unstable nuclide that undergoes spontaneous transformation, emitting radiation.

Risk – The probability of a detrimental effect of exposure to a hazard.

risk assessment – The science of studying the amount of risk associated with doing something.

site characterization – A general term applied to the investigation activities at a specific location that examine natural phenomena and human-induced conditions

spent fuel – Used fuel assemblies removed from a reactor after several years use and treated as waste.

spontaneously fissionable (fissile) material – Substance in which fission occurs spontaneously, not induced by an incident particle.

SSFL - Santa Susana Field Laboratory

transuranic –Refers to any element whose atomic number is higher than that of uranium (atomic number 92), including neptunium, plutonium, americium, and curium. All transuranic elements are produced artificially and are radioactive.

unirradiated – Not having been exposed to radiation

Van de Graaff Generator – Electrical device that produces a high voltage by building up a charge of static electricity

EXECUTIVE SUMMARY

This paper summarizes the history of nuclear operations at Area IV of the Santa Susana Field Laboratory (SSFL) and identifies the radionuclides that would result from documented processes. It also presents the results of calculations estimating which radionuclides could still be present in 2009 in significant concentrations. These calculations are based on the initial production amounts of each radionuclide and the radioactive decay that has occurred since last production. The calculations also evaluate the proportion each radionuclide would contribute to the overall potential dose and associated risk in SSFL Area IV.

The U.S. Department of Energy (DOE) commissioned this research because the California Department of Public Health (CDPH), other regulators, and stakeholders asked, in various ways based on a 2008 analysis of existing data, the question: Based on existing knowledge of SSFL Area IV nuclear operations and documented radioactive decay rates, what radionuclides might still be present in significant quantities today? In response, this paper was prepared using the best available references describing the history of radiological operations, processes, and uses. As the research progressed, DOE recognized that this paper could be used as a reference point not only to respond to the various questions CDPH and others had asked, but also to meet two additional objectives: 1) to ensure that all significant contributors to risk are included in the planned Risk Assessment, and 2) to help prioritize analytical requirements for new samples to be collected for pending studies.

This paper does not evaluate the actual concentrations remaining in the environment in Area IV of the SSFL or the actual dose. The actual concentrations present in Area IV of SSFL and resulting risk to the public depend on the quantities of radionuclides that were released to the environment and the residual persistence in the environs after previous remediation efforts. These questions will be the focus of the radiological survey and sampling efforts currently in planning by the U.S. Environmental Protection Agency (USEPA). Rather, this paper documents the potential that each identified radionuclide could be present in significant quantities today, and in what proportion, relative to the other radionuclides identified based on the initial production rates and the rate at which each radionuclide decays. In other words, this paper provides a list of "suspects" – radionuclides that both were in the area and are known to have relatively long half-lives. DOE offers this list so the teams of scientists investigating contamination can prioritize their sampling and analyses toward these radionuclides. Following completion of the EPA's radiological survey and a chemical survey being conducted by the California Department of Toxic Substances Control, DOE will prepare human health and ecological risk assessments to support of the Environmental Impact Statement currently being developed.

The majority of process related radionuclides at the SSFL Area IV resulted from the following activities:

- operation of ten nuclear reactors,
- operation of seven criticality test facilities,
- manufacture of reactor fuel assemblies,
- disassembly and inspection of reactors and used reactor fuel assemblies,
- preparation of radioactive materia1 for disposal, and
- on-site storage of nuclear materia1.

In addition to those operations, smaller quantities of radionuclides were associated with small-scale laboratory work that included the following activities:

- fabrication, use, and storage of radioactive sources;

- research focused on reprocessing spent nuclear fuel;
- operation of particle accelerators;
- research using radioisotopes; and
- miscellaneous operations and commercial items that used radioactive materials.

In compiling the list of radionuclides that would have been produced as a result of the documented reactor processes, radionuclides with half-lives of less than one year were not considered. The rationale for this is that only 0.0000002 percent or less of the original radioactivity would remain after the 29 years (the time that has elapsed since the last reactor was shut down on the SSFL Area IV, in 1979 and the production of radionuclides ceased). Standard references were used to calculate the relative quantities of fission products, activation products, and transuranic radionuclides in spent reactor fuel that were produced in reactors. These quantities were then adjusted to account for radioactive decay since cessation of reactor operations. The identity and amounts of accelerator and research related radionuclides were also qualitatively evaluated.

This evaluation has resulted in a list of radionuclides that are expected to have the potential to contribute more than 1 percent of the current activity. They are:

Reactor fuel-related radionuclides:

- Two isotopes of thorium – Th-228, Th-232;
- Three isotopes of uranium – U-234, U-235, U-238;
- Four isotopes of plutonium – Pu-238, Pu-239, Pu-240, Pu-241;

Reactor fission products:

- tritium (H-3, an isotope of hydrogen,),
- strontium-90 (Sr-90),
- cesium-137 (Cs-137),
- promethium-147 (Pm-147), and
- europium-155 (Eu-155);

Reactor activation products:

- beryllium-10 (Be-10),
- cadmium-113m (Cd-113m),
- two isotopes of europium – Eu-152 and Eu-154, and
- uranium-233 (U-233);

Reactor-produced transuranics:

- Four isotopes of plutonium – Pu-238, Pu-239, Pu-240, Pu-241;
- Americium-241 – Am-241; and
- Curium-244 – Cm-244;

Accelerator activation product:

- tritium (H-3); and

Research-related radionuclides:

- Three isotopes of uranium – U-234, U-235, U-238;
- Neptunium-237 (Np-237);
- Four isotopes of plutonium – Pu-238, Pu-239, Pu-240, Pu-241;
- Cobalt-60 (Co-60);
- Cesium-137 (Cs-137); and
- Promethium-147 (Pm-147).

This paper also presents the results of calculations to evaluate the risk these radionuclides could present. The radionuclides that contribute greater than 1 percent of the risk potential are the same as those listed above, except that reactor produced fission products Pm-147 and Eu-155, reactor produced activation product Co-60, and all reactor produced transuranics are not included in the list that produce 99% of the risk. However, some of these are still included as fuel or research related risk contributors. A combined priority list based on the potential to contribute to greater than 1% of the risk include: Th-228, Th-232, U-234, U-235, U-238, Pu-238, Pu-239, Pu-240, Pu-241, H-3, Sr-90, Cs-137; Be-10, Cd-113m, Eu-152, Eu-154, U-233, Np-237, Co-60, Cs-137, and Pm-147.

The calculation of relative activity, dose and risk percentage could be quantitatively performed only for radionuclides in spent reactor fuel, based on the available references for relative production amounts. However, radionuclides associated with fuel elements, used in the manufacture of fuel assemblies, are assumed to have the potential to contribute more than 1 percent of the current activity, dose, and risk. Based on this review, radionuclides in spent nuclear fuel and fuel elements are expected to be responsible for the majority of SSFL Area IV contamination. Information about specific concentrations, quantities, and processes for radionuclides from research was not available. Thus, no relative activity information is available and therefore the relative potential for contamination is unknown. As a conservative precaution, these radionuclides were included in the list above, for further investigation.

1.0 BACKGROUND AND PURPOSE

The U.S. Department of Energy (DOE) commissioned this paper to summarize the history of nuclear operations at Area IV of the Santa Susana Field Laboratory (SSFL) and identify the radionuclides that would result from those operations. DOE asked that the author also present the results of calculations to estimate which radionuclides could still be present in 2009 in significant concentrations. This paper provides these calculations based on the initial production amounts of each radionuclide relative to all others and the radioactive decay that would have occurred since production. The calculations also evaluate how much each radionuclide would contribute to the overall potential dose and associated risk that might exist at SSFL Area IV.

DOE initiated this paper after receiving comments on the *Draft Gap Analysis Report*, submitted for regulatory and public review on June 1, 2008. That analysis was conducted to determine whether existing data for Area IV of the SSFL are adequate for the purpose of developing and evaluating risk-based cleanup alternatives in an Environmental Impact Statement. Section 3.2.5.3 and Table 3-11 of the report included a list of radionuclide contaminants of interest developed from the radionuclide lists contained in the *Historical Site Assessment*[1] and the *Environmental Assessment*[2], supplemented by additional radionuclides based on process knowledge from other reactor and fuel separation facilities, and filtered on the basis of half-life considerations.

In his review comments, Jerry Hensley of the California Department of Public Health requested that a new listing of all radionuclides generated during reactor operations be provided and pared down using industry acceptable methods (i.e., radiological half-life). A number of other reviewers from both regulatory agencies and the public also requested more information about radionuclides related to all processes and their current significance, while taking into consideration half-life and health affects. This information is needed not only to make sure that all significant contributors to risk are included in the Risk Assessment, but also to aid in prioritization of target analytes for new sampling and analysis efforts. This paper has been drafted to respond to these comments and requests and to meet these needs.

2.0 SCOPE AND APPROACH

This paper provides a review and an evaluation of the best available references describing the historical radiological operations related to nuclear reactor research conducted by DOE and its predecessor, the Atomic Energy Commission. This review also includes other nuclear research operations conducted in Area IV of the SSFL. While it is understood that the process descriptions in these references may not be exhaustive, it is believed that they represent the types of radiological processes that were performed in Area IV of the SSFL and include all significant radionuclides that were used or produced. DOE plans to compile further records and information related to all activities at the Energy Technology Engineering Center (ETEC). As part of that effort, former workers and all stakeholders will be asked to provide any

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[1] *Historical Site Assessment of Area IV Santa Susana Field Laboratory,* Sapere Consulting, Inc. and The Boeing Company for the Department of Energy Under Contract DE-AC03-99SF21530 (May 2005). http://etec.energy.gov/Cleanup/Historical-Site-Assessment.html

[2] *Environmental Assessment for Cleanup and Closure of the Energy Technology and Engineering Center, Final.* U.S. Department of Energy, NNSA Service Center, Oakland, CA (March 2003). http://etec.energy.gov/Regulation/RegDocs/ETECEA.pdf

information that they may have on the history of the site. If additional information is collected that changes the conclusions of this paper, it will be revised accordingly.

This paper provides a summary of the historical nuclear operations and a list of the associated process-related radionuclides produced at Area IV of the SSFL. It also includes an evaluation of the probability for each radionuclide to be present at the current time in significant concentrations. The potential for these radionuclides to be present today has been evaluated based on the initial relative production amounts and radioactive decay since their production. The significance of each radionuclide's contribution to the potential dose and associated risk is also evaluated.

This paper does not evaluate the actual concentrations remaining in the environment in Area IV of the SSFL or the actual dose, but only the potential for the current likely presence of each radionuclide relative to all others. The actual concentrations present in Area IV of SSFL and resulting risk to the public depend on the quantities of radionuclides that were released to the environment and the residual persistence in the environs after previous remediation efforts. That subject will be the focus of the radiological survey and sampling efforts currently in planning by the U.S. Environmental Protection Agency (USEPA) and the dose/risk assessment aspect of the EIS that DOE will complete following the USEPA's radiological survey and a chemical survey being conducted by the California Department of Toxic Substances Control.

3.0 SUMMARY OF NUCLEAR OPERATIONS AT SSFL AREA IV

Process-related radionuclides at the SSFL Area IV were primarily the result of the following activities:

- Operation of ten nuclear reactors
- Operation of seven criticality test facilities
- Manufacture of reactor fuel assemblies
- Disassembly and inspection of reactors and used reactor fuel assemblies
- Preparation of radioactive material for disposal
- On-site storage of nuclear materia1.

Small-scale laboratory work, including the activities below, may have involved smaller amounts of radionuclides:

- Fabrication, use, and storage of radioactive sources
- Research on reprocessing used reactor fuel
- Operation of particle accelerators
- Research using radioisotopes
- Miscellaneous operations
- Commercial items which use radioactive materials.

4.0 SSFL AREA IV NUCLEAR OPERATIONAL HISTORY

4.1 REACTOR OPERATIONAL HISTORY[3]

The majority of man-made radioactivity at the SSFL Area IV is the result of the operation of ten nuclear reactors. The amount of radioactivity generated by a nuclear reactor depends largely on the amount of heat it generates, called its "power level" and the period of operation. The reactors operated at the SSFL Area IV all had very low power levels: six had power levels of less than 100 kilowatts (kW), three had power levels of 600 to 1,000 kW, and one (the Sodium Reactor Experiment, or SRE) was a 20-MW test reactor. By comparison, reactors used for commercial electric power generation have thermal power levels of 3,000 MW or more. The reactors were operated in seven different facilities. Table 1 lists the name, facility number, facility name, nominal power level, and operating period for each reactor.

Table 1. Reactor Operations at the SSFL Area IV

Operation Name	Bld. No.	Facility Name	Power Level (kW)	Operating Period
KEWB	4073	Kinetics Experiment Water Boiler	1	7/56 - 11/66
L-85/AE-6	4093	L-85 Nuclear Experiment Reactor	3	11/56 - 2/80
SRE	4143	Sodium Reactor Experiment	20,000	4/57 - 2/64
SER	4010	S8ER Test Facility	50	9/59 - 12/60
S2DR	4024	SNAP Environmental Test Facility	65	4/61 - 12/62
STR	4028	Shield Test Irradiation Facility	50	12/61 - 7/64
S8ER	4010	S8ER Test Facility	600	5/63 - 4/65
STIR	4028	Shield Test Irradiation Facility	1,000	8/64 - 6/73
Sl0FS3	4024	SNAP Environmental Test Facility	37	1/65 - 3/66
S8DR	4059	SNAP Ground Prototype Test Facility	619	5/68 - 12/69

A nuclear reactor contains nuclear fuel, usually in the form of fuel assemblies, composed of spontaneously fissionable (fissile) radioactive material (e.g., uranium-235 or plutonium-239) plus other materials that may be added for various purposes (e.g., thorium as a fertile material for breeding fissile uranium-233), contained within a cladding material (usually steel, aluminum, or zirconium). The fuel assemblies are arranged in a "core", and surrounded by reflectors, shields, and containment vessels. Two reactors that operated at the SSFL Area IV, the Kinetics Experiment Water Boiler (KEWB) and the L-85 Nuclear Experimentation Reactor, had fuel in the form of liquid solutions of uranyl sulfate.

Several incidents occurred during the operating history of the SRE reactor that resulted or may have resulted in the releases of radionuclides to the environment.[4] On June 4, 1959, an explosion resulting from an unexpected hydrogen-oxygen reaction blew a fuel element (which was undergoing sodium cleaning) out of the wash cell. On July 12, 1959, depletion in coolant flow due to blockage resulted in overheating and damage to 13 of 43 fuel elements in the reactor core. During this event, the damage to these assemblies caused failure of cladding on all seven fuel rod elements, and some iron uranium

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[3] Largely abstracted from *Nuclear Operations at Rockwell's Santa Susana Field Laboratory – A Factual Perspective,* Rockwell International, Report N001E1R000017, October 2, 1990, Revision B. http://www.etec.energy.gov/library/Reading-Room/N001ER000017_Nuclear_Operations_SSFL_Factual_Perspective.pdf.

4 Historical Site Assessment of Area IV Santa Susana Field Laboratory, Sapere Consulting, Inc. and The Boeing Company, for the U.S. Department of Energy, Ventura County, CA, Contract DE-AC03-99SF21530, May 2005.

eutectic was molten for a short period of time in the reactor. Between 5,000 and 10,000 curies of mixed fission product were released and contained in the primary sodium cooling system. It was calculated that approximately 28 curies of Kr-85 were released to the environment. The Kr-85, a non-reactive noble gas, quickly dispersed in the atmosphere. On March 12, 1960, a contaminated sodium fire broke out in the sodium service vault. Personnel were unable to extinguish the fire with standard suppression equipment, so the vault was sealed and purged with argon gas. Accidents such as these and others likely resulted in accidental release of radionuclides to the environment likely contributed to the overall amount of contamination that may be present. However, they in general do not impact the identity or relative ratios of radionuclides to each other that may currently be present in the environment, which is the subject of this paper.

4.2 CRITICALITY TEST FACILITY OPERATIONAL HISTORY[5]

A controlled nuclear chain reaction can be sustained only when neutrons generated by fission of reactor fuel balance the neutrons used up and lost. When the reactor is adjusted so that this balance is achieved, it is said to be "critical". Criticality can be achieved in several ways: for example, by bringing parts of a core of fissionable material together (to reduce the number of neutrons that escape); by removing control rods (to reduce the number of neutrons captured in the control rods); or by increasing the number of neutrons reflected back into the core. Criticality Test Facilities were built to conduct tests to aid in developing new types of reactors by determining exactly which reactor configurations are critical, and how criticality is affected by changes in reactor design parameters. The criticality tests were operated at a very low power level (up to a few hundred watts), and neutron levels were correspondingly very low. Thus, a large number of criticality tests could be performed in the same test facility without generating much by-product radioactivity.

There were dozens of criticality tests performed at the SSFL Area IV, in seven different test facilities. Table 2 lists these facilities, their facility number, and operating periods.

Table 2. Criticality Test Facilities at the SSFL Area IV

Facility Name	Bldg. No.	Operating Period	Notes
SNAP Critical Test	4373	1957-63	First SNAP-2 Criticality Tests
Organic Moderated Reactor	4009	1958-67	Basic Tests of Reactor Concept
Sodium Graphite Reactor	4009	1958-67	Basic Tests of Reactor Concept
SNAP Critical Equipment Lab.	4012	1961-71	Later SNAP Criticality Tests
Fast Critical Experiment Lab.	4100	1961-74	Started as AETR
SNAP Flight System	4019	1962	SNAP Flight System Criticality
SNAP Transient Test	4024	1967-69	SNAP Transient Response Tests

4.3 MANUFACTURE OF REACTOR FUEL ASSEMBLY OPERATIONAL HISTORY[6]

As part of the nuclear reactor development work performed for the government, three different reactor fuel manufacturing operations were performed at the SSFL Area IV. The first operation was the assembly of fuel elements for the SRE. The second operation was manufacture of plutonium fuel, and the third was

[5] *Nuclear Operations at Rockwell's Santa Susana Field Laboratory - A Factual Perspective.*
[6] *Ibid.*

manufacture of uranium carbide fuel. There was also a Fuel Storage Facility, which stored the special nuclear materials (enriched uranium and plutonium) used to make reactor fuel.

The SRE fuel elements were assembled in the Engineering Test Building (Building 4003). Uranium and thorium metal slugs were brought into the SSFL Area IV for this purpose. In Building 4003, the slugs were loaded into metal tubes, the interstices were filled with sodium metal, and the tubes sealed. Although fuel elements for three cores for the SRE were prepared, only two cores were used. The third core was eventually shipped off-site. The first core did not contain thorium.

The plutonium fuel manufacturing facility, named the Nuclear Materials Development Facility (NMDF; Building 4055) was built specifically for development work involving plutonium. It was completed in 1967 and operated until 1979. Its operating history is summarized in Table 3.

Table 3. Operations at the Nuclear Materials Development Facility

Operating Period	Operation
1967 – 1968	Development of Analysis Technologies for uranium-plutonium oxide fuels
4/68 – 6/69	Recycle of scrap uranium-plutonium fuel
7/68 – 6/70	Development of technologies to mix tungsten into uranium-plutonium carbide fuel
4/70 – 9/70	Preparation of samples for uranium-plutonium oxide irradiation studies
9/70 – 3/74	Idle
1974 – 1975	Bench scale tests-recovery of plutonium from simulated waste
1975 – 5/77	Mixed uranium-plutonium carbide fuel fabrication
5/77 – 11/78	Partial decontamination and clean-up
11/78 – 11/79	Fabrication of depleted uranium carbide fuel
11/79 – 10/82	Idle
10/82 – 10/86	Decontamination and decommissioning
7/87	Released for unrestricted use

The uranium carbide fuel manufacturing pilot plant was located in Building 4005. It was a small scale production facility built to study the operations associated with manufacturing reactor fuel assemblies from uranium carbide. In the pilot plant, uranium oxide was reacted with graphite to convert it to uranium carbide, which was then cast into pellets, machined to the proper dimensions, and assembled into cladding tubes to make fuel assemblies. Initial operations were performed using depleted uranium to test the equipment, and then enriched uranium was used to make fuel assemblies for a critical assembly to be built at another AEC facility. Operations were completed in about nine months in 1967 and production was small.

The plutonium and uranium carbide materials were stored in the Fuel Storage Facility (Building 4064), a vault built to provide secure storage for fissile fuel material (enriched uranium and plutonium) used to make reactor fuel. The building was constructed above ground using concrete and concrete blocks, to comply with the AEC criteria for vaults for storage of fissionable materials.

4.4 DISASSEMBLY AND EXAMINATION OF REACTORS AND USED REACTOR FUEL ASSEMBLIES OPERATIONAL HISTORY[7]

A number of operations were performed remotely in the heavily-shielded Hot Laboratory (Building 4020, the "Hot Lab"), built in Area IV specifically to provide protection during processes that involved highly radioactive materials. These operations included:

- **Fuel assembly performance evaluation.** During reactor test operations, it was often necessary to examine reactor fuel assemblies and other test specimens to evaluate their performance, which involved the handling and examination of highly radioactive items.

- **Reactor disassembly.** When each reactor operation was completed and the reactor was no longer needed, it was removed from its operating location, disassembled, its fuel removed, its radioactive structure cut into pieces suitable for shipment. The radioactive material was shipped off-site for appropriate processing and disposal. Given the highly radioactive materials involved, the disassembly, fuel removal, and size reduction operations were also usually performed using the Hot Lab.

- **Used fuel disassembly.** The Hot Lab was also the location for work involving disassembly of used irradiated reactor fuel generated outside the SSFL. The fuel elements were shipped into the Hot Lab, disassembled or separated from their cladding material, and the separated materials then packaged and shipped back to other DOE facilities.

- **Manufacture of sealed sources.** The Hot Lab was also used to manufacture sealed radioactive sources (see below), for performing leak testing of sources, and for cutting and machining operations involving radioactive cobalt-60.

Construction of the Hot Lab facility was completed in 1959, and it was in use until 1989 when it underwent decontamination and decommissioning. The Hot Lab was used to examine fuel and/or components from the SRE, SER, S2DR, S8ER, S8DR, and S10FS3 reactors operated at the SSFL Area IV, the OMR and SGR criticality test facilities at SSFL, and the Piqua, Ohio, reactor. It was also used to declad fuel from the, EBR-I, EBR-11, Hallam, Fermi, and SEFOR reactors from other DOE sites.

4.5 FABRICATION, USE, AND STORAGE OF RADIOACTIVE SOURCES OPERATIONAL HISTORY[8]

A variety of radiation sources were used in the Hot Lab, including sources essential for the calibration of the many instruments required to detect and measure radioactivity at SSFL Area IV. These instruments were calibrated periodically, using known quantities and types of radioactivity. The calibration "sources" produced in the Hot Lab consisted of sealed containers that contained small measured quantities of radioisotopes. Other sources produced in the Hot Lab included those for radiography, irradiation testing, and other applications. The sources manufactured in the Hot Lab were used in various facilities at the SSFL Area IV and elsewhere. Only a small number of commercially-produced calibration sources are currently in use at SSFL today. Although approximately 140,000 curies of radioactive material (primarily promethium-147) were fabricated into sources at the Hot Lab, only a small fraction of this activity would remain today due to radioactive decay of the sources produced, especially for the promethium sources.

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[7] *Ibid.*
[8] *Ibid.*

4.6 RESEARCH ON REPROCESSING USED REACTOR FUEL OPERATIONAL HISTORY[9]

The used fuel assemblies from nuclear reactors contain unused fuel materials, and fission and activation products. Rockwell International developed a process to effect a partial separation of used fuel, removing part of the fission products so that the material could be used again as reactor fuel. Tests were performed in a well-shielded "Hot Cave" located in Building 4003, the Engineering Test Building. These experiments used up to one-kilogram quantities of un-irradiated uranium and thorium, and up to 100-gram quantities of highly irradiated materials.

4.7 PARTICLE ACCELERATORS OPERATIONAL HISTORY[10]

Another way to generate artificial (induced) radioactivity is to bombard a target material with atomic particles that have been accelerated to high speeds by means of a particle accelerator. A common form of particle accelerator is a "Van de Graaff generator", which uses a high-voltage electrostatic field to accelerate atomic particles to high speeds (high energy levels). Collisions of these particles with a target material (such as aluminum or tritium) can generate small amounts of radioactivity. Rockwell International operated a Van de Graaff generator in Building 4030, which bombarded tritium targets with deuterons to produce neutrons. The neutrons produced could then make other materials radioactive. A second Van de Graaff generator was operated at the SRE facility, generating neutrons for neutron activation analyses of materials. It was removed before the SRE facility was decontaminated and decommissioned.

4.8 RESEARCH USING RADIOISOTOPES OPERATIONAL HISTORY[11]

Some of the research done at the SSFL Area IV required the use of special radioisotopes. For these tests, small quantities of specially-prepared radioisotopes were brought to the SSFL Area IV, used in laboratories under controlled conditions, and then either transported off the facility or stored under controlled conditions if reuse was required.

One research program that required the use of radioisotopes was the TRUMP-S program. Although the original plan was to perform the TRUMP-S tests in the Hot Lab at the SSFL Area IV, the test program was transferred to the University of Missouri. Seventy-five grams of depleted uranium, five grams of plutonium, and four grams of neptunium, were received at SSFL Area IV and stored in Building 4064 before being shipped to the University of Missouri sometime after 1990.

Another research program that used a radioisotope was a corrosion test program carried out in the Corrosion Testing Laboratory (Building 4023). A pumped sodium corrosion test loop was built there, and used to study the deposition behavior of activation products (Mn-54 and Co-60) in flowing sodium so as to develop more effective traps for these isotopes. An activated piece of fuel cladding containing these isotopes was used in these tests.

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[9] *Ibid.*
[10] *Ibid.*
[11] *Ibid.*

5.0 RADIONUCLIDES ASSOCIATED WITH IDENTIFIED OPERATIONS AT SSFL AREA IV

5.1 RADIONUCLIDES ASSOCIATED WITH REACTOR OPERATIONS, CRITICALITY TEST OPERATIONS, MANUFACTURE OF NEW AND DISASSEMBLY OF USED FUEL ASSEMBLIES, AND WASTE OPERATIONS

Operation of a nuclear reactor not only involves the use of nuclear fuel but also creates three types of by-product radionuclides: fission products, transuranics, and activation products. When part of the fissionable material in the fuel element is used up, or when a reactor is decommissioned, the fuel elements are removed from the reactor. These "spent" fuel elements contain the fission products and transuranics generated by operation of the reactor, and the activation products in the cladding. The same radionuclides associated with reactor operations are also associated with criticality test operations, disassembly of used fuel assemblies, and waste operations since they all are related to nuclear reactor operations either as new fuel or fuel with the operational by-products.

5.1.1 Reactor Fuel Radionuclides

The radioactive material placed in a reactor includes the nuclear fuel made up of fissile radioactive material (e.g., uranium, plutonium) and other fuel elements (thorium). Although plutonium fuel was manufactured at SSFL Area IV, according to operational descriptions, none of the reactors or criticality experiments operated at SSFL Area IV used plutonium as a fuel. Many of the reactors, including the SRE, which produced the vast majority of the power generated, used a low-enriched uranium fuel (3-5 percent U-235 content by mass). However, according to operational descriptions, all reactors and criticality experiments associated with the SNAP program used high-enriched uranium fuel (~90 percent U-235 content by mass).[12]

The majority of the radioactivity in unirradiated low-enriched uranium fuel is from the isotope U-234 (75-85 percent) with lesser amounts from U-238 (10-20 percent) and only a few percent from U-235 (~5 percent).[13] In high-enriched unirradiated uranium fuel, even more of the radioactivity is from U-234 (~95 percent) while very little is from U-238 (less than 1 percent).[14] Sometimes thorium was added as a fertile material for breeding fissile U-233. According to operational descriptions, only two reactors, the Sodium Reactor Experiment (SRE) and the Advanced Epithermal Thorium Reactor (AETR), used fuel that contained thorium as a fertile material.[15] The thorium isotopes present in the fuel would have consisted mainly of Th-232 and its decay progeny Th-228 in partial equilibrium.

The manufactured plutonium fuel was actually a mixture of plutonium and uranium oxide pellets. The plutonium would have been comprised primarily of the isotope Pu-239, with lesser amounts of Pu-238, Pu-240, and Pu-241. There is no evidence that the plutonium fuel or plutonium-uranium mixed fuel was ever used as fuel for any onsite reactors.[16]

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[12] *Ibid.*
[13] *Health Physics Manual of Good Practices for Uranium Facilities*, Idaho National Engineering Laboratory, EGG-2530 UC-41, June 1988, pp 2-10 and *Guide of Good Practices for Occupational Radiological Protection In Uranium Facilities*, U.S Department of Energy, DOE-STD-1136-2000, August 2000, pp 2-10.
[14] *Ibid.*
[15] *Nuclear Operations at Rockwell's Santa Susana Field Laboratory - A Factual Perspective.*
[16] *Ibid.*

Table 4 provides a summary of fuel element radionuclides that were used or produced in SSFL Area IV and thus could be potentially present today.

Table 4. Summary of Fuel Element Radionuclides

Radionuclide	Half-life
Th-228	1.91 y
Th-232	14.0 by
U-234	246 ky
U-235	704 my
U-238	4.47 by
Pu-238	87.7 y
Pu-239	24.1 ky
Pu-240	6.56 ky
Pu-241	14.4 y

y = years; k = thousand; m = million; b = billion

5.1.2 Fission Product Radionuclides

When a reactor is operated, atoms of the fissionable material split, releasing neutrons and heat, and leaving behind fragments of the atom called fission products, which are made up of various isotopes of newly-formed elements. Some of the neutrons that are released are captured by other atoms of fissionable material, and these capture reactions cause some of these atoms to split, releasing more neutrons and heat and creating more fission products in a controlled "chain reaction."

Most of the fission products from a nuclear reactor are radioactive, emitting beta and gamma radiation. The fission products and fission yields can be identified by review of a Chart of the Nuclides.[17] Fission yields vary by radionuclide in a predictable way as demonstrated by Figure 1. The fission yields vary depending on the fuel used and are identified separately in the chart for U-235 fission products and U-233 fission products. All of the fissile fuel utilized at SSFL Area IV was U-235; however, since thorium was utilized as a fertile fuel element in some reactor experiments, some fission products from U-233 fission may have also been produced. Tables 5 and 6 list the fission product radionuclides with half-lives longer than one year along with their fission yields for U-235 and U-233 fuel, respectively.

A one-year cut-off was used since the decay of radionuclides is exponentially proportional to their half-life. After 10 half-lives, the fraction of original radioactivity remaining is reduced by decay to 0.1 percent. After 20 half-lives it is reduced to 0.0001 percent of the original amount and after 30 half-lives, it is reduced to 0.0000001 percent of the original amount. After 10 half-lives of any radionuclide, the radioactivity is usually considered to be insignificant. However, to be conservative, any radionuclide with a half-life greater than one year was included in the potential list. Any radionuclide with a half-life of less than one year will only have 0.0000002 percent or less of the original activity remaining after 29 years that have elapsed since the last reactor was shut down on the SSFL Area IV and the production of fission products ceased.

[17] *Nuclides and Isotopes,* Fourteenth Edition, General Electric Company, 1989.

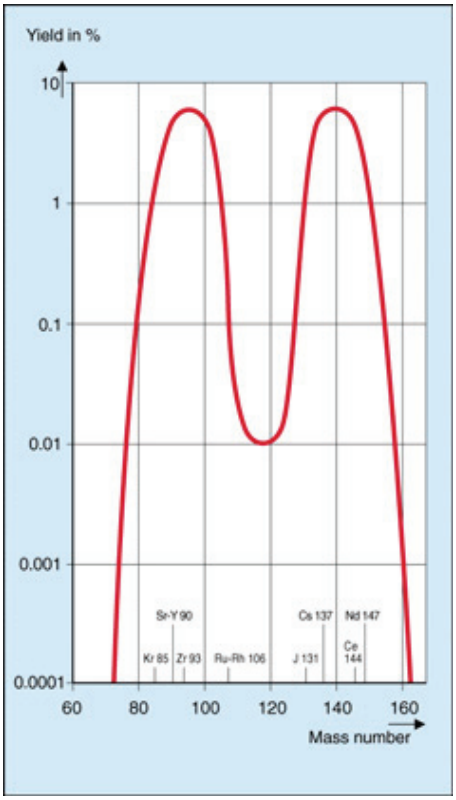

Figure 1. Fission yields vary by radionuclide in a predictable way

Table 5. U-235 Fission Products with Half-Lives Greater Than One Year

Radionuclide	$t_{1/2}$ (years)	Fission Yield[a] (%)	Relative Activity Yield	Activity Yield (%)	Relative Activity at 29 Years	Activity % at 29 Years
Se-79	6.50E+04	0.044	4.69E-07	0.0000	3.77E-05	0.0003
Kr-85	10.73	1.317	8.51E-02	6.8337	0.00E+00	0.0000
Sr-90	29.1	5.8	1.38E-01	11.0970	6.88E+00	47.9597
Zr-93	1.50E+06	6.37	2.94E-06	0.0002	2.36E-04	0.0016
Tc-99	2.13E+05	6.1	1.99E-05	0.0016	1.59E-03	0.0111
Ru-106	1.02E+00	0.401	2.73E-01	21.8884	2.56E-05	0.0002
Pd-107	6.50E+06	0.145	1.55E-08	0.0000	1.24E-06	0.0000
Cd-113	9.00E+15	0.015	1.16E-18	0.0000	9.28E-17	0.0000
Sb-125	2.76E+00	0.031	7.79E-03	0.6258	4.01E-03	0.0280
Sn-126	1.00E+05	0.059	4.09E-07	0.0000	3.28E-05	0.0002
I-129	1.57E+07	0.75	3.31E-08	0.0000	2.66E-06	0.0000
Cs-134	2.07E+00	7.66E-06	2.57E-06	0.0002	2.43E-07	0.0000
Cs-135	2.30E+06	6.54	1.97E-06	0.0002	1.58E-04	0.0011
Cs-137	3.02E+01	6.19	1.42E-01	11.4231	7.20E+00	50.2146
Sm-146	1.03E+08	3	2.02E-08	0.0000	1.62E-06	0.0000
Pm-147	2.62E+00	2.25	5.94E-01	47.7515	2.36E-01	1.6461
Eu-152	1.35E+01	1.79E-10	9.20E-12	0.0000	2.63E-10	0.0000
Eu-154	8.59E+00	1.91E-07	1.54E-08	0.0000	2.45E-07	0.0000
Eu-155	4.71E+00	0.032	4.71E-03	0.3783	1.96E-02	0.1371
		Highlighted		99		100

[a]All fission yields taken from *Nuclides and Isotopes*, Fourteenth Edition, General Electric Company, 1989, except for Cs-134, Eu-152, and Eu-154 which came from *Fission Product Yields,* WIMS Library Update Project, NAPC Nuclear Data Section, IAEA, since these isotopes are shielded from other fission products in the same mass fission decay chain.
$t_{1/2}$ = half-life

Table 6. U-233 Fission Products with Half-Lives Greater Than One Year

Radionuclide	$t_{1/2}$ (years)	Fission Yield[a] (%)	Relative Activity Yield	Activity Yield (%)	Relative Activity at 29 Years	Activity % at 29 Years
Se-79	6.50E+04	0.14	1.49E-06	0.0001	1.32E-04	0.0007
Kr-85	10.73	2.25	1.45E-01	12.8995	0.00E+00	0.0000
Sr-90	29.1	6.8	1.62E-01	14.3750	8.91E+00	49.7785
Zr-93	1.50E+06	6.37	2.94E-06	0.0003	2.61E-04	0.0015
Tc-99	2.13E+05	4.9	1.59E-05	0.0014	1.42E-03	0.0079
Ru-106	1.02E+00	0.25	1.70E-01	15.0775	1.77E-05	0.0001
Pd-107	6.50E+06	0.114	1.22E-08	0.0000	1.08E-06	0.0000
Cd-113	9.00E+15	0.019	1.46E-18	0.0000	1.30E-16	0.0000
Sb-125	2.76E+00	0.12	3.02E-02	2.6766	1.71E-02	0.0958
Sn-126	1.00E+05	0.22	1.52E-06	0.0001	1.35E-04	0.0008
I-129	1.57E+07	1.6	7.06E-08	0.0000	6.27E-06	0.0000
Cs-134	2.07E+00	2.69E-04	9.02E-05	0.0080	9.41E-06	0.0001
Cs-135	2.30E+06	6.3	1.90E-06	0.0002	1.69E-04	0.0009
Cs-137	3.02E+01	6.81	1.56E-01	13.8855	8.75E+00	48.9070
Sm-146	1.03E+08	2.56	1.72E-08	0.0000	1.53E-06	0.0000
Pm-147	2.62E+00	1.74	4.60E-01	40.8014	2.02E-01	1.1270
Eu-152	1.35E+01	7.70E-09	3.96E-10	0.0000	1.25E-08	0.0000
Eu-154	8.59E+00	2.10E-06	1.69E-07	0.0000	2.97E-06	0.0000
Eu-155	4.71E+00	0.021	3.09E-03	0.2743	1.42E-02	0.0796
		Highlighted		100		100

[a]All fission yields taken from *Nuclides and Isotopes*, Fourteenth Edition, General Electric Company, 1989, except for Cs-134, Eu-152, and Eu-154 which came from *Fission Product Yields,* WIMS Library Update Project, NAPC Nuclear Data Section, IAEA, since these isotopes are shielded from other fission products in the same mass fission decay chain.
$t_{1/2}$ = half-life

The fission yield is the fraction of fissions resulting in the specified isotope and is shown in the table in percentages. Since the radioactive decay of an isotope is proportional to $\ln(2)/t_{½}$ (where $t_{½}$ is the radionuclide half-life), the relative activity of each of the fission products produced in a reactor is the product of the fission yield and that factor. This product is shown in Tables 5 and 6 as the "Relative Activity Yield" which is the relative amount of each fission product isotope produced. The percentage of total fission product activity is also shown in Tables 5 and 6. These figures were decay-corrected for the 29 years that have elapsed since the last reactor was shut down on the SSFL Area IV, resulting in the activity percentage at 29 years shown in the tables. It should be noted that it is assumed that all Kr-85 has dissipated into the atmosphere and is no longer onsite since it is a noble (non-reactive) gas. It can be seen from Tables 5 and 6 that greater than 98 percent of the remaining fission product activity is composed of Sr-90 and Cs-137, with most of the remaining percentage being from Pm-147 for both uranium fuels.

Till and Meyer[18] quantified the potentially significant fission products found in spent reactor fuels. Table 7 contains this list of fission products also decay-corrected for the 29 years that have elapsed since the last reactor was shut down on the SSFL Area IV. It can be observed from the Table 7 that greater than 98-percent of the remaining fission product activity is composed of the same radionuclides as identified above, Sr-90, Cs-137, and Pm-147, with most of the rest being from Eu-155.

[18] J. E. Till and H. R. Meyer, *Radiological Assessment, A Textbook on Environmental Dose Analysis,* U.S. Nuclear Regulatory Commission, NUREG/CR-3332, 1983, pp.1-49.

Table 7. Representative Quantities of Potentially Significant Fission Products in Spent Reactor Fuels

Radionuclide	$t_{1/2}$ (years)	Activity Ci/tonne[a]	Activity (%)	Relative Activity at 29 Years	Activity % at 29 Years
H-3	12.3	800	0.0592	1.91E-02	0.2397
Kr-85	10.73	1.05E+04	0.7776	0.00E+00	0.0000
Sr-90	29.1	6.00E+04	4.4434	2.75E+00	34.5752
Zr-93	1.50E+06	2.00E+00	0.0001	1.48E-04	0.0019
Tc-99	2.13E+05	1.50E+01	0.0011	1.11E-03	0.0139
Ru-106	1.02E+00	8.20E+05	60.7264	7.12E-05	0.0009
Sb-125	2.76E+00	1.30E+04	0.9627	6.17E-03	0.0774
I-129	1.57E+07	4.00E-02	0.0000	2.96E-06	0.0000
Cs-134	2.07E+00	1.00E+05	7.4057	8.71E-03	0.1094
Cs-135	2.30E+06	1.20E+00	0.0001	8.89E-05	0.0011
Cs-137	3.02E+01	1.06E+05	7.8500	4.95E+00	62.1287
Pm-147	2.62E+00	2.00E+05	14.8113	7.32E-02	0.9193
Eu-155	4.71E+00	4.00E+04	2.9623	1.54E-01	1.9325
	Highlighted		99		100

[a]Ci/tonne = curies per metric ton; $t_{1/2}$ = half-life

To identify and quantify the major dose contributors from the identified fission products, the calculated activity percentage at 29 years has been multiplied by the USEPA inhalation,[19] ingestion,[20] and external[21] dose conversion factors. The resulting percentages of the total effective dose equivalents are shown in Table 8. It can be seen from Table 8 that Sr-90 and Cs-137 comprise greater than 99 percent of the dose potential from fission products. Likewise, to identify and quantify the major risk contributors from the identified fission products, the calculated activity percentage at 29 years has been divided by the USEPA Preliminary Remediation Goals (PRGs) for both Residential and Agricultural land use scenarios. The resulting percentages of the relative risk are shown in Table 9. It can be seen from Table 9 that Sr-90 and Cs-137 comprise greater than 99 percent of the risk from fission products.

5.1.3 Activation Product Radionuclides

Some of the neutrons that are released by fuel fissions are captured by the fuel cladding or the other materials in the reactor, and others escape from the reactor and are captured in the shielding around the reactor; far fewer escape the shielding and are captured in the reactor building or the ground. When a neutron is captured by an atom other than the fuel, such as in the fuel cladding or the reactor structure or shield, it creates a new isotope called an "activation product". The term activation product is reserved for products of neutron capture by materials other than the fuel, such as structural components of the nuclear reactor, the reactor coolant, control rods or other neutron poisons, or materials in the environment of the reactor. Most of these activation products are also radioactive, emitting beta and gamma radiation.

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[19] Federal Guidance Report No.11, *Limiting Values of Radionuclide Intake And Air Concentration and Dose Conversion Factors For Inhalation, Submersion, And Ingestion*; Environmental Protection Agency, EPA-520/1-88-020, September 1988.
[20] *Ibid.*
[21] Federal Guidance Report No.12, *External Exposure To Radionuclides In Air, Water, And Soil; Environmental* Protection Agency, EPA-520/1-88-020, September 1988.

Table 8. Potential Dose from Representative Quantities of Potentially Significant Fission Products in Spent Reactor Fuels

Radionuclide	Activity % at 29 Years	Inhalation DCF	Relative Inhalation Dose at 29 Years	Inhalation Dose % at 29 Years	Ingestion DCF	Relative Ingestion Dose at 29 Years	Ingestion Dose % at 29 Years	External DCF[a]	Relative External Dose at 29 Years	External Dose % at 29 Years
H-3	0.2397	1.73E-11	4.15E-12	0.0000	1.73E-11	4.15E-12	0.0002	0	0.00E+00	0.0000
Kr-85	0.0000	0	0.00E+00	0.0000	0	0.00E+00	0.0000	4.58E-20	0.00E+00	0.0000
Sr-90	34.5752	3.51E-07	1.21E-05	95.5177	3.85E-08	1.33E-06	61.2531	2.95E-21	1.02E-19	0.0149
Zr-93	0.0019	8.67E-08	1.61E-10	0.0013	4.48E-10	8.33E-13	0.0000	0.00E+00	0.00E+00	0.0000
Tc-99	0.0139	2.25E-09	3.14E-11	0.0002	3.95E-10	5.51E-12	0.0003	5.74E-22	8.01E-24	0.0000
Ru-106	0.0009	1.29E-07	1.15E-10	0.0009	7.40E-09	6.61E-12	0.0003	3.93E-18	3.51E-21	0.0005
Sb-125	0.0774	3.30E-09	2.56E-10	0.0020	7.59E-10	5.88E-11	0.0027	7.66E-18	5.93E-19	0.0869
I-129	0.0000	4.69E-08	1.74E-12	0.0000	7.46E-08	2.78E-12	0.0001	6.92E-20	2.57E-24	0.0000
Cs-134	0.1094	1.25E-08	1.37E-09	0.0108	1.98E-08	2.17E-09	0.0996	2.83E-17	3.09E-18	0.4534
Cs-135	0.0011	1.23E-09	1.37E-12	0.0000	1.91E-09	2.13E-12	0.0001	1.85E-22	2.06E-25	0.0000
Cs-137	62.1287	8.63E-09	5.36E-07	4.2200	1.35E-08	8.39E-07	38.5948	1.09E-17	6.77E-16	99.2194
Pm-147	0.9193	1.06E-08	9.74E-09	0.0767	2.83E-10	2.60E-10	0.0120	2.29E-22	2.11E-22	0.0000
Eu-155	1.9325	1.12E-08	2.16E-08	0.1703	4.13E-10	7.98E-10	0.0367	7.94E-19	1.53E-18	0.2248
Highlighted	100			100			100			100

[a]Based on 5 cm contamination depth.
DCF = Dose Conversion Factor

Table 9. Potential Risk from Representative Quantities of Potentially Significant Fission Products in Spent Reactor Fuels

Nuclide	Activity % at 29 Years	Residential PRG	Relative Residential Risk at 29 Years	Residential Risk % at 29 Years	Agricultural PRG	Relative Agricultural Risk at 29 Years	Agricultural Risk % at 29 Years
H-3	0.2397	2.28E+00	1.05E-01	0.0088	1.60E-01	1.50E+00	0.0020
Kr-85	0.0000	2.41E+01	0.00E+00	0.0000	2.23E+01	0.00E+00	0.0000
Sr-90	34.5752	2.31E-01	1.50E+02	12.5578	1.39E-03	2.49E+04	32.4436
Zr-93	0.0019	3.38E+02	5.50E-06	0.0000	2.00E+02	9.30E-06	0.0000
Tc-99	0.0139	2.50E-01	5.58E-02	0.0047	5.57E-03	2.50E+00	0.0033
Ru-106	0.0009	2.25E+00	3.97E-04	0.0000	1.72E-01	5.20E-03	0.0000
Sb-125	0.0774	4.62E-01	1.68E-01	0.0141	4.60E-01	1.68E-01	0.0002
I-129	0.0000	5.96E-01	6.24E-05	0.0000	2.76E-05	1.35E+00	0.0018
Cs-134	0.1094	1.57E-01	6.97E-01	0.0584	7.47E-03	1.46E+01	0.0191
Cs-135	0.0011	1.78E+01	6.27E-05	0.0000	5.09E-03	2.19E-01	0.0003
Cs-137	62.1287	5.97E-02	1.04E+03	87.3134	1.20E-03	5.18E+04	67.5291
Pm-147	0.9193	1.03E+03	8.93E-04	0.0001	6.69E+02	1.37E-03	0.0000
Eu-155	1.9325	3.80E+00	5.09E-01	0.0427	3.74E+00	5.17E-01	0.0007
Highlighted	100			100			100

The probability of an activation product being produced in a reactor is the product of a number of factors, including the concentration of the element being activated in the environment of the reactor, the abundance of the isotope in the element being activated, and the ability of a given material to capture neutrons (i.e., neutron cross section) for the isotope being activated. The International Atomic Energy Agency (IAEA) *Handbook on Nuclear Activation Cross Sections*[22] provides a list of elements and their isotopes with their abundance and their thermal neutron cross sections. A list of some example long-lived activation product radionuclides and the materials they may be produced from are shown in Table 10.[23] Since not only beryllium and cadmium but also europium are common neutron absorbers used in reactor control rods, Eu-152, and Eu-154 were added to the list and will be considered to be potentially present for purposes of developing a process related radionuclide list. In addition, since Th-232 was used as a fertile material in some reactor fuel, U-233 as an activation product will also be considered as potentially present for purposes of developing a process related radionuclide list. However, activation products will not be present unless the parent material was present in the environment of the reactor. Therefore, some of these activation products are not likely present at SSFL Area IV given that the parent material was not likely present in significant concentration in the environment of the reactor. These low probability activation products include Cl-36, Ar-39, Mo-93, Nb-93m, Nb-94, Tc-99 (except as a fission product), Ag-108m, Sn-121m, Pb-205, andPo-210.Table 11 presents a list of activation products that are typically present in nuclear power reactor coolants along with their relative concentrations for both boiling water reactor (BWR) and pressurized water reactor (PWR) coolants.[24] Although many of the reactors at SSFL Area IV were sodium-cooled reactors, this list provides an indication of additional activation products that may have been produced onsite. Many of the activation products listed in both Tables 9 and 10 have short half-lives relative to the 29 years time elapsed since any reactor was operational at SSFL Area IV and could have possibly produced them. Table 12 provides a summary list of long lived ($t_{½}$ > 1 year) activation products potentially present at SSFL Area IV.

Till and Meyer[25] quantified the corrosion products (a major subset of activation products) present in spent reactor fuels. Table 13 contains this list of corrosion products also decay corrected for the 29 years that have elapsed since the last reactor was shut down on the SSFL Area IV. It can be seen from the Table 13 that greater than 99 percent of the remaining corrosion product activity remaining is composed of Fe-55 and Co-60.

5.1.4 Transuranic Radionuclides

Some of the neutrons that are released by fuel fissions are captured by fuel element atoms that do not split, but instead form new isotopes, called “transuranics.” Although these radionuclides are created by “activation” in the reactor, they are generally considered to be a separate category than activation products. Transuranics are elements heavier than uranium, all of which are essentially man-made and do not naturally occur in significant quantities in nature. All of the transuranic radionuclides are radioactive, emitting alpha, beta, and/or gamma radiation.

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[22] *Handbook on Nuclear Activation Cross Sections,* Technical Reports Series No.156, International Atomic Energy Agency, Vienna, 1974.
[23] This table is licensed under the GNU Free Documentation License. It uses material from the Wikipedia article “Activation Products".
[24] Chien C. Lin, *Radiochemistry in Nuclear Power Reactors,* Nuclear Science Series, NAS-NS-3119, National Research Council, National Academy Press, Washington, D.C. 1996.
[25] J. E. Till and H. R. Meyer, pp.1-50.

Table 10. Example Activation Products

Radionuclide	Half-life	Activation Parent
Tritium	12.3 y	Lithium-6,7 Boron-10
Beryllium-10	1.53 my	Boron-10
Carbon-14	5,730 y	Nitrogen-14 Carbon-13
Sodium-24	15.0 h	Sodium-23
Chlorine-36	301 ky	Chlorine-35
Argon-39	269 y	Argon-38
Iron-55	2.73 y	Iron-54
Nickel-59	76 ky	Nickel-58
Cobalt-60	5.27 y	Cobalt-59
Nickel-63	100 y	Nickel-62
Molybdenum-93	3.5 ky	Molybdenum-92
Niobium-93m	16.1 y	Niobium-93
Niobium-94	20.3 ky	Niobium-93
Technetium-99	211 ky	Molybdenum-98
Silver-108m	108 y	Silver-107
Cadmium-113m	12.2 y	Cadmium-112
Tin-121m	56 y	Tin-120
Europium-152	13.5 y	Europium-151
Europium-154	8.59 y	Europium-153
Lead-205	15.3 my	Lead-204
Polonium-210	138 d	Bismuth-209
Uranium-233	159 ky	Thorium-232

h= hours; d = days; y = years; k = thousand; m = million; b = billion

Table 11. Selected ANS Standard Radionuclide Concentrations in Reactor Coolants Activation Products (mCi/kg)

Radionuclide	Half-Life	BWR[a]	PWR[b]
H-3	12.3 y	10	1,000
N-16	7.1s	60,000	60,000
F-18	1.8h	1.0	—
Na-24	15h	10	47
P-32	14d	0.2	—
Cr-51	27d	6.0	3.1
Mn-54	312d	0.07	1.6
Mn-56	2.6h	50	—
Fe-55	2.7y	1.0	1.2
Fe-59	45d	0.03	0.3
Co-58	71d	0.2	4.6
Co-60	5.3y	0.4	0.53
Ni-63	100y	0.001	—
Cu-64	12.7h	30	—
Zn-65	244d	0.2	0.51
Ag-110m	250d	0.001	1.3
W-187	24h	0.3	2.5

[a] A reference BWR is a 3,400 MW BWR/5.
[b] A reference PWR is a 3,400 MW PWR with U-tube steam generators.
mCi/kg = millicuries per kilogram
s = seconds; h = hours; d = days; y = years
k = thousand; m = million; b = billion

Table 12. Summary of Potential Long-Lived Activation Products

Radionuclide	Half-life
Tritium	12.3 y
Beryllium-10	1.53 my
Carbon-14	5,730 y
Iron-55	2.73 y
Nickel-59	76 ky
Cobalt-60	5.27 y
Nickel-63	100 y
Cadmium-113m	13 y
Europium-152	13.5 y
Europium-154	8.59 y
Uranium-233	159 ky

y = years; k = thousand; m = million; b = billion

Table 13. Representative Quantities of Corrosion Products in Spent Reactor Fuels

Radionuclide	$t_{1/2}$ (years)	Activity Ci/tonne[a]	Activity (%)	Relative Activity at 29 Years	Activity % at 29 Years
Mn-54	0.86	30,000	36.3636	3.36E-06	0.0011
Fe-55	2.7	20,000	24.2424	1.39E-01	44.8079
Fe-59	0.12	500	0.6061	2.33E-51	0.0000
Co-58	0.2	30,000	36.3636	2.05E-29	0.0000
Co-60	5.26	2000	2.4242	1.72E-01	55.1911
	Highlighted		99		100

[a]Ci/tonne = curies per metric ton; $t_{1/2}$ = half-life

To identify and quantify the major dose and related potential risk contributors from the identified corrosion products, the calculated activity percentage at 29 years has been multiplied by the USEPA inhalation,[26] ingestion,[27] and external[28] dose conversion factors. The resulting dose percentages are shown in Table 14.

It can be seen from Table 14 that Fe-55 and Co-60 comprise greater than 99 percent of the dose potential from corrosion products. Likewise, to identify and quantify the major risk contributors from the identified corrosion products, the calculated activity percentage at 29 years has been divided by the USEPA PRGs for both Residential and Agricultural land use scenarios. The resulting percentages of the relative risk are shown in Table 15. It can be seen from Table 15 that Co-60 contributes greater than 99 percent of the risk from corrosion products. The other potentially significant activation products not reflected in Tables 14 and 15 would include H-3, Be-10, C-14, Cd-113m, Eu-152, Eu-154, and U-233.

Till and Meyer[29] quantified the transuranics present in spent reactor fuels. Table 16 contains this list of transuranics also decay corrected for the 29 years that have elapsed since the last reactor was shut down on the SSFL Area IV. It can be seen from the Table 16 that greater than 99 percent of the remaining transuranics activity remaining is composed of Pu-238, Pu-239, Pu-240, Pu-241, Am-241, and Cm-244.

To identify and quantify the major dose and related potential risk contributors from the identified transuranics, the calculated activity percentage at 29 years has been multiplied by the USEPA inhalation,[30] ingestion,[31] and external[32] dose conversion factors. The resulting dose percentages are shown in Table 17. It can be seen from Table 17 that all of the listed transuranics except Pu-242 and Cm-242 combine to contribute greater than 99 percent of the dose potential from transuranics for at least one of the exposure pathways.

[26] Federal Guidance Report No.11.
[27] *Ibid.*
[28] Federal Guidance Report No.12.
[29] J. E. Till and H. R. Meyer, pp.1-50.
[30] Federal Guidance Report No.11.
[31] *Ibid.*
[32] Federal Guidance Report No.12.

Table 14. Potential Dose from Representative Quantities of Corrosion Products in Spent Reactor Fuels

Radionuclide	Activity % at 29 Years	Inhalation DCF	Relative Inhalation Dose at 29 Years	Inhalation Dose % at 29 Years	Ingestion DCF	Relative Ingestion Dose at 29 Years	Ingestion Dose % at 29 Years	External DCF[a]	Relative External Dose at 29 Years	External Dose % at 29 Years
Mn-54	0.0011	1.81E-09	1.95E-12	0.0001	7.48E-10	8.08E-13	0.0002	1.51E-17	1.63E-20	0.0007
Fe-55	44.8079	7.26E-10	3.25E-08	0.9875	1.64E-10	7.35E-09	1.7961	0	0.00E+00	0.0000
Fe-59	0.0000	4.00E-09	3.00E-57	0.0000	1.81E-09	1.36E-57	0.0000	2.12E-17	1.59E-65	0.0000
Co-58	0.0000	2.94E-09	1.94E-35	0.0000	9.68E-10	6.38E-36	0.0000	1.77E-17	1.17E-43	0.0000
Co-60	55.1911	5.91E-08	3.26E-06	99.0125	7.28E-09	4.02E-07	98.2037	4.45E-17	2.46E-15	99.9993
Highlighted	100			100			100			100

[a]Based on 5 cm contamination depth.
DCF = Dose Conversion Factor

Table 15. Potential Risk from Representative Quantities of Corrosion Products in Spent Reactor Fuels

Radionuclide	Activity % at 29 Years	Residential PRG	Relative Residential Risk at 29 Years	Residential Risk % at 29 Years	Agricultural PRG	Relative Agricultural Risk at 29 Years	Agricultural Risk % at 29 Years
Mn-54	0.0011	6.92E-01	1.56E-03	0.0001	3.69E-01	2.93E-03	0.0000
Fe-55	44.8079	2.69E+03	1.67E-02	0.0011	8.21E-01	5.46E+01	0.0890
Fe-59	0.0000	3.26E+00	2.30E-49	0.0000	1.20E+00	6.25E-49	0.0000
Co-58	0.0000	2.66E+00	2.48E-27	0.0000	1.27E-01	5.19E-26	0.0000
Co-60	55.1911	3.61E-02	1.53E+03	99.9988	9.01E-04	6.13E+04	99.9110
Highlighted	100			100			100

Table 16. Representative Quantities of Transuranics in Spent Reactor Fuels

Radionuclide	$t_{1/2}$ (years)	Activity Ci/tonne[a]	Activity (%)	Relative Activity at 29 Years	Activity % at 29 Years
Np-237	2.14E+06	1	0.0005	5.18E-04	0.0016
Pu-238	87.7	4,000	2.0734	1.77E+00	5.3954
Pu-239	2.41E+04	500	0.2592	2.59E-01	0.7901
Pu-240	6.56E+03	650	0.3369	3.36E-01	1.0255
Pu-241	1.44E+01	150,000	77.7512	2.96E+01	90.1398
Pu-242	3.75E+05	2	0.0010	1.04E-03	0.0032
Am-241	4.33E+02	750	0.3888	3.76E-01	1.1482
Am-243	7.37E+03	20	0.0104	1.03E-02	0.0316
Cm-242	4.50E-01	35,000	18.1420	6.53E-13	0.0000
Cm-244	1.81E+01	2,000	1.0367	4.80E-01	1.4647
	Highlighted		99		100

[a]Ci/tonne = curies per metric ton; $t_{1/2}$ = half-life

Likewise, to identify and quantify the major risk contributors from the identified transuranics, the calculated activity percentage at 29 years has been divided by the USEPA PRGs for both Residential and Agricultural land use scenarios. The resulting percentages of the relative risk are shown in Table 18. It can be seen from Table 18 that Pu-238, Pu-239, Pu-240, Pu-241, Am-241, and Cm-244 comprise greater than 99 percent of the risk from transuranics.

5.1.5 Combined Activity Dose and Risk

To identify and quantify the major dose and related potential risk contributors from all radionuclides produced by a reactor (excluding those associated with fuel) based on the quantities present in spent reactor fuels provided by Till and Meyer, the calculated activity percentage at 29 years has been multiplied by the USEPA inhalation,[33] ingestion,[34] and external[35] dose conversion factors for the combined sum of the fission products, activation products and transuranics. Both the radionuclides with the potential to contribute more than one percent of the total activity and the radionuclides with the potential to contribute more than one percent of the total dose and associated risk are reflected in Table 19. It can be seen from Table 19 that Sr-90, Cs-137, Co-60, Pu-238, Pu-239, Pu-240, Pu-241, Am-241, and Cm-244 comprise greater than 99 percent of the pathway dose potential and that Sr-90 and Cs-137 comprise greater than 99 percent of the risk potential from reactor produced contaminants excluding H-3, C-14. The other potentially significant radionuclides associated with reactors would include the fuel element radionuclides Th-228, Th-232, U-234, U-235, and U-238. Another radionuclide comprising at least 0.5 % of the radioactivity potentially present onsite but that contributes less than 1 percent of the dose and risk potential is Eu-155.

[33] Federal Guidance Report No.11.
[34] *Ibid.*
[35] Federal Guidance Report No.12.

Table 17. Potential Dose from Representative Quantities of Transuranics in Spent Reactor Fuels

Radionuclide	Activity % at 29 Years	Inhalation DCF	Relative Inhalation Dose at 29 Years	Inhalation Dose % at 29 Years	Ingestion DCF	Relative Ingestion Dose at 29 Years	Ingestion Dose % at 29 Years	External DCF[a]	Relative External Dose at 29 Years	External Dose % at 29 Years
Np-237	0.0016	1.46E-04	2.31E-07	0.0189	1.20E-06	1.90E-09	0.0189	3.51E-18	5.55E-21	1.9429
Pu-238	5.3954	1.06E-04	5.72E-04	46.7331	8.65E-07	4.67E-06	46.5119	7.60E-22	4.10E-21	1.4356
Pu-239	0.7901	1.16E-04	9.16E-05	7.4889	9.56E-07	7.55E-07	7.5274	1.15E-21	9.09E-22	0.3181
Pu-240	1.0255	1.16E-04	1.19E-04	9.7205	9.56E-07	9.80E-07	9.7706	7.44E-22	7.63E-22	0.2671
Pu-241	90.1398	2.23E-06	2.01E-04	16.4253	1.85E-08	1.67E-06	16.6192	2.44E-23	2.20E-21	0.7700
Pu-242	0.0032	1.11E-04	3.51E-07	0.0287	9.08E-07	2.87E-09	0.0286	6.43E-22	2.03E-24	0.0007
Am-241	1.1482	1.20E-04	1.38E-04	11.2591	9.84E-07	1.13E-06	11.2602	2.18E-19	2.50E-19	87.6378
Am-243	0.0316	1.19E-04	3.76E-06	0.3069	9.79E-07	3.09E-08	0.3079	6.59E-19	2.08E-20	7.2820
Cm-242	0.0000	4.67E-06	9.30E-18	0.0000	3.10E-08	6.17E-20	0.0000	8.60E-22	1.71E-33	0.0000
Cm-244	1.4647	6.70E-05	9.81E-05	8.0187	5.45E-07	7.98E-07	7.9553	6.74E-22	9.87E-22	0.3456
Highlighted	100			100			100			99

[a]Based on 5 cm contamination depth.
DCF = Dose Conversion Factor

Table 18. Potential Risk from Representative Quantities of Transuranics in Spent Reactor Fuels

Nuclide	Activity % at 29 Years	Residential PRG	Relative Residential Risk at 29 Years	Residential Risk % at 29 Years	Agricultural PRG	Relative Agricultural Risk at 29 Years	Agricultural Risk % at 29 Years
Np-237	0.0016	1.30E-01	1.22E-02	0.3222	4.48E-04	3.53E+00	0.2892
Pu-238	5.3954	2.97E+00	1.82E+00	48.1288	7.31E-03	7.38E+02	60.4765
Pu-239	0.7901	2.59E+00	3.05E-01	8.0817	6.09E-03	1.30E+02	10.6299
Pu-240	1.0255	2.60E+00	3.94E-01	10.4497	6.10E-03	1.68E+02	13.7749
Pu-241	90.1398	4.06E+02	2.22E-01	5.8820	1.05E+00	8.58E+01	7.0340
Pu-242	0.0032	2.73E+00	1.16E-03	0.0307	6.42E-03	4.93E-01	0.0404
Am-241	1.1482	1.87E+00	6.14E-01	16.2676	1.32E-02	8.70E+01	7.1274
Am-243	0.0316	1.66E-01	1.90E-01	5.0372	1.11E-02	2.84E+00	0.2330
Cm-242	0.0000	3.22E+02	6.18E-15	0.0000	1.89E+01	1.05E-13	0.0000
Cm-244	1.4647	6.69E+00	2.19E-01	5.8002	3.04E-01	4.82E+00	0.3948
Highlighted	100			100			99

Table 19. Potential Dose and Risk from Representative Quantities of Produced Radionuclides in Spent Reactor Fuels

Radionuclide	Activity % at 29 Years	Inhalation Dose % at 29 Years	Ingestion Dose % at 29 Years	External Dose % at 29 Years[a]	Residential Risk % at 29 Years	Agricultural Risk % at 29 Years
H-3	0.1507	0.0000	0.0001	0.0000	0.0088	0.0019
Kr-85	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Sr-90	21.7367	1.6565	1.6286	0.0148	12.4963	32.0820
Zr-93	0.0012	0.0000	0.0000	0.0000	0.0000	0.0000
Tc-99	0.0088	0.0000	0.0001	0.0000	0.0047	0.0032
Ru-106	0.0006	0.0000	0.0001	0.0005	0.0000	0.0000
Sb-125	0.0487	0.0000	0.0009	0.0861	0.0140	0.0002
I-129	0.0000	0.0000	0.0000	0.0000	0.0000	0.0017
Cs-134	0.0687	0.0002	0.0316	0.4494	0.0582	0.0189
Cs-135	0.0007	0.0000	0.0000	0.0000	0.0000	0.0003
Cs-137	39.0591	0.0732	12.2314	98.3511	86.8857	66.7764
Pm-147	0.5779	0.0013	0.0038	0.0000	0.0001	0.0000
Eu-155	1.2149	0.0030	0.0116	0.2228	0.0425	0.0007
Mn-54	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Fe-55	0.0672	0.0000	0.0003	0.0000	0.0000	0.0002
Fe-59	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Co-58	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Co-60	0.0828	0.0011	0.0140	0.8508	0.3044	0.1884
Np-237	0.0006	0.0185	0.0163	0.0005	0.0006	0.0027
Pu-238	1.9953	45.9221	40.0363	0.0004	0.0892	0.5600
Pu-239	0.2922	7.3589	6.4794	0.0001	0.0150	0.0984
Pu-240	0.3793	9.5519	8.4103	0.0001	0.0194	0.1276
Pu-241	33.3355	16.1402	14.3054	0.0002	0.0109	0.0651
Pu-242	0.0012	0.0282	0.0246	0.0000	0.0001	0.0004
Am-241	0.4246	11.0637	9.6925	0.0214	0.0302	0.0660
Am-243	0.0117	0.3016	0.2651	0.0018	0.0093	0.0022
Cm-242	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Cm-244	0.5417	7.8795	6.8477	0.0001	0.0108	0.0037
Highlighted	99	100	100	100	99	99

[a]Based on 5 cm contamination depth.

5.2 RADIONUCLIDES ASSOCIATED WITH ACCELERATOR OPERATIONS

The radionuclides produced by accelerator operations depend on the composition of the targets that were irradiated and the types of particles that were accelerated. It appears that the Van de Graaff generators were primarily used to bombard tritium targets with deuterons to produce neutrons. The activation products produced are likely to have been similar to the activation products produced in reactors. This similarity would be due to the construction materials for both reactors and accelerators (e.g., hydrogenous concrete and steal) and the long-lived activation products would be comprised of some of the radionuclides listed in Table 10. Estimation of quantities is not possible at this time but would likely be small compared to activation products produced by the reactors.

5.3 RADIONUCLIDES ASSOCIATED WITH RESEARCH AND FABRICATION, USE, AND STORAGE OF RADIOACTIVE SOURCES

The primary radionuclides produced as a result of research include isotopes of uranium, plutonium, and neptunium (the same isotopes as those listed under the reactor operations discussed above), stored onsite in conjunction with the TRUMP-S program. Radionuclides Mn-54 and Co-60 were produced as a result of operations associated with the Corrosion Testing Laboratory. It is likely that the contamination onsite from these operations was relatively small compared to that from reactor operations given that the sources were either sealed or in storage rather than in active operations. The primary radionuclide associated with fabrication and use of radioactive sources was Pm-147, but may have also included Co-60 and Cs-137.

5.4 SUMMARY OF OPERATIONAL RELATED RADIONUCLIDES

Table 20 provides a summary of the SSFL Area IV historical operations-related radionuclides with half-lives greater than one year. The table also shows which radionuclides are expected to contribute more than 1 percent of the current activity, potential dose, and potential risk. The actual calculation of relative activity, dose, and risk could only be performed for radionuclides in spent reactor fuel. Radionuclides associated with fuel elements are assumed to have the potential to contribute more than 1 percent of the current activity, dose, and risk. For some radionuclides from reactors and other processes, no relative activity information is available and therefore the potential for contamination is unknown. In the absence of specific concentration or process knowledge information, they were not eliminated from the list of radionuclides that could have the potential to contribute greater than 1 percent of the total activity, dose, and risk.

6.0 CONCLUSION

From this evaluation, those radionuclides that have the potential to contribute significantly to human or environmental dose and risk after 29 years since operations were suspended in Area IV of SSFL have been identified. The list of major contributors may be used to prioritize analytical requirements for new samples to be collected for site characterization and risk assessment. The actual concentrations present in Area IV of SSFL and resulting risk to the public depend on the quantities of radionuclides that were released to the environment and the residual persistence in the environs after 29 years of decay and prior remediation efforts. That will be the focus of the radiological survey and sampling efforts currently in planning by USEPA and the dose/risk assessment aspect of the Environmental Impact Statement currently being developed.

Table 20. Summary of the SSFL Area IV Historical Operations Related Radionuclides with Half-Lives Greater Than One Year

Radionuclide	$t_{1/2}$ (years)	Process Relationship	Potential to Contribute > 1% of Activity	Potential to Contribute > 1% of Pathway Dose	Potential to Contribute > 1% of Risk
Th-228	1.90E+00	Reactor Fuel Element	Th-228	Th-228	Th-228
Th-232	1.40E+10	Reactor Fuel Element	Th-232	Th-232	Th-232
U-234	2.46E+05	Reactor Fuel Element	U-234	U-234	U-234
U-235	7.04E+08	Reactor Fuel Element	U-235	U-235	U-235
U-238	4.50E+09	Reactor Fuel Element	U-238	U-238	U-238
Pu-238	8.77E+01	Reactor Fuel Element	Pu-238	Pu-238	Pu-238
Pu-239	2.40E+04	Reactor Fuel Element	Pu-239	Pu-239	Pu-239
Pu-240	6.60E+03	Reactor Fuel Element	Pu-240	Pu-240	Pu-240
Pu-241	1.44E+01	Reactor Fuel Element	Pu-241	Pu-241	Pu-241
H-3	1.23E+01	Reactor Fission Product	H-3[a]	H-3[a]	H-3[a]
Se-79	6.50E+04	Reactor Fission Product			
Kr-85	10.73	Reactor Fission Product			
Sr-90	29.1	Reactor Fission Product	Sr-90	Sr-90	Sr-90
Zr-93	1.50E+06	Reactor Fission Product			
Tc-99	2.13E+05	Reactor Fission Product			
Ru-106	1.02E+00	Reactor Fission Product			
Pd-107	6.50E+06	Reactor Fission Product			
Cd-113	1.41E+01	Reactor Fission Product			
Sb-125	2.76E+00	Reactor Fission Product			
Sn-126	1.00E+05	Reactor Fission Product			
I-129	1.57E+07	Reactor Fission Product			
Cs-134	2.07E+00	Reactor Fission Product			
Cs-135	2.30E+06	Reactor Fission Product			
Cs-137	3.02E+01	Reactor Fission Product	Cs-137	Cs-137	Cs-137
Sm-146	1.03E+08	Reactor Fission Product			
Pm-147	2.62E+00	Reactor Fission Product	Pm-147		
Eu-152	1.35E+01	Reactor Fission Product			
Eu-154	8.59E+00	Reactor Fission Product			
Eu-155	4.71E+00	Reactor Fission Product	Eu-155		
H-3	1.23E+01	Reactor Activation Product			
Be-10	1.53E+06	Reactor Activation Product	Be-10[a]	Be-10[a]	Be-10[a]
C-14	5.73E+03	Reactor Activation Product			
Fe-55	2.73E+00	Reactor Activation Product			
Ni-59	7.60E+03	Reactor Activation Product			
Co-60	5.27E+00	Reactor Activation Product		Co-60	
Ni-63	1.00E+02	Reactor Activation Product			
Cd-113m	1.41E+01	Reactor Activation Product	Cd-113m[a]	Cd-113m[a]	Cd-113m[a]
Eu-152	1.35E+01	Reactor Activation Product	Eu-152[a]	Eu-152[a]	Eu-152[a]
Eu-154	8.59E+00	Reactor Activation Product	Eu-154[a]	Eu-154[a]	Eu-154[a]
U-233	1.59E+05	Reactor Activation Product	U-233[a]	U-233[a]	U-233[a]
Np-237	2.14E+06	Reactor Transuranic			
Pu-238	87.7	Reactor Transuranic	Pu-238	Pu-238	
Pu-239	2.41E+04	Reactor Transuranic	Pu-239	Pu-239	
Pu-240	6.56E+03	Reactor Transuranic	Pu-240	Pu-240	
Pu-241	1.44E+01	Reactor Transuranic	Pu-241	Pu-241	
Pu-242	3.75E+05	Reactor Transuranic			
Am-241	4.33E+02	Reactor Transuranic	Am-241	Am-241	
Am-243	7.37E+03	Reactor Transuranic			

Table 20. Summary of the SSFL Area IV Historical Operations Related Radionuclides with Half-Lives Greater Than One Year (continued)

Radionuclide	$t_{1/2}$ (years)	Process Relationship	Potential to Contribute > 1% of Activity	Potential to Contribute > 1% of Dose	Potential to Contribute > 1% of Risk
Cm-242	4.50E-01	Reactor Transuranic			
Cm-244	1.81E+01	Reactor Transuranic	Cm-244	Cm-244	
H-3	1.23E+01	Accelerator Activation Product	H-3 [a]	H-3 [a]	H-3 [a]
Be-10	1.53E+06	Accelerator Activation Product			
C-14	5.60E+03	Accelerator Activation Product			
Cl-36	3.01E+05	Accelerator Activation Product			
Ar-39	2.69E+02	Accelerator Activation Product			
Fe-55	2.73E+00	Accelerator Activation Product			
Ni-59	7.60E+04	Accelerator Activation Product			
Co-60	5.27E+00	Accelerator Activation Product			
Ni-63	1.00E+02	Accelerator Activation Product			
Mo-93	4.00E+03	Accelerator Activation Product			
Nb-93m	1.60E+01	Accelerator Activation Product			
Nb-94	2.03E+04	Accelerator Activation Product			
Tc-99	2.13E+05	Accelerator Activation Product			
Ag-108m	1.08E+02	Accelerator Activation Product			
Cd-113m	1.30E+01	Accelerator Activation Product			
Sn-121m	5.60E+01	Accelerator Activation Product			
Pb-205	1.53E+07	Accelerator Activation Product			
U-234	2.46E+05	Research Radionuclide	U-234 [a]	U-234 [a]	U-234 [a]
U-235	7.04E+08	Research Radionuclide	U-235 [a]	U-235 [a]	U-235 [a]
U-238	4.50E+09	Research Radionuclide	U-238 [a]	U-238 [a]	U-238 [a]
Np-237	2.14E+06	Research Radionuclide	Np-237 [a]	Np-237 [a]	Np-237 [a]
Pu-238	87.7	Research Radionuclide	Pu-238 [a]	Pu-238 [a]	Pu-238 [a]
Pu-239	2.41E+04	Research Radionuclide	Pu-239 [a]	Pu-239 [a]	Pu-239 [a]
Pu-240	6.56E+03	Research Radionuclide	Pu-240 [a]	Pu-240 [a]	Pu-240 [a]
Pu-241	1.44E+01	Research Radionuclide	Pu-241 [a]	Pu-241 [a]	Pu-241 [a]
Co-60	5.27E+00	Research Radionuclide	Co-60 [a]	Co-60 [a]	Co-60 [a]
Cs-137	3.02E+01	Research Radionuclide	Cs-137 [a]	Cs-137 [a]	Cs-137 [a]
Pm-147	2.62E+00	Research Radionuclide	Pm-147 [a]	Pm-147 [a]	Pm-147 [a]

[a]No relative activity information is available for these radionuclides from these processes and therefore the potential for contamination is unknown. In the absence of specific concentration information, they were not eliminated from the list to have the potential to contribute greater than 1 percent of the total activity, dose, and risk.
$t_{1/2}$ = half life

7.0 REFERENCES

Centers for Disease Control and Prevention (CDC). 2004. *Glossary of Radiological Terms*. Department of Health and Human Services. August.

General Electric Company. 1989. *Nuclides and Isotopes.* Fourteenth Edition.

Idaho National Engineering Laboratory. 1988. *Health Physics Manual of Good Practices for Uranium Facilities,* EGG-2530 UC-41. June.

International Atomic Energy Agency (IAEA) 1974. *Handbook on Nuclear Activation Cross Sections.*Technical Reports Series No.156. Vienna, Austria.

IAEA. 2008. *Fission Product Yields*, WIMS Library Update Project, NAPC Nuclear Data Section. http://www-nds.iaea.org/wimsd/index.html

Lin, Chien C. 1996. *Radiochemistry in Nuclear Power Reactors.* Nuclear Science Series, NAS-NS-3119, National Research Council, National Academy Press, Washington, DC.

National Environmental Policy Act (NEPA). 1998. *Glossary of Terms Used in DOE NEPA Documents*. U.S. Department of Energy, Environment, Safety and Health, Office of NEPA Policy and Assistance. September.

National Nuclear Security Administration (NNSA). 2008. *Final Site-Wide Environmental Impact Statement for Continued Operation of Los Alamos National Laboratory, Los Alamos, New Mexico*. Vol. 1. DOE/EIS-0380. May.

Rockwell International. 1990. "Nuclear Operations at Rockwell's Santa Susana Field Laboratory – A Factual Perspective". Facility Report N001E1R000017, Revision B. October 2. http://www.etec.energy.gov/library/Reading-Room/N001ER000017_Nuclear_Operations_SSFL_ Factual_Perspective.pdf.

Sapere Consulting, Inc. and The Boeing Company. 2005. *Historical Site Assessment of Area IV Santa Susana Field Laboratory,* U.S. Department of Energy, Ventura County, CA, Contract DE-AC03-99SF21530. May

Till, J. E. and H. R. Meyer. 1983. *Radiological Assessment, A Textbook on Environmental Dose Analysis,* U.S. Nuclear Regulatory Commission, NUREG/CR-3332.

U.S. Department of Energy (DOE). 2003. *Environmental Assessment for Cleanup and Closure of the Energy Technology and Engineering Center, Final.* NNSA Service Center, Oakland, CA. (March)

U.S. Department of Energy. 2004. *Guide of Good Practices for Occupational Radiological Protection in Uranium Facilities.* DOE-STD-1136-2000. Washington, DC. August.

U.S. Environmental Protection Agency (USEPA). 1988a. *Limiting Values of Radionuclide Intake And Air Concentration and Dose Conversion Factors For Inhalation, Submersion, And Ingestion.* Federal Guidance Report No.11, EPA-520/1-88-020. September.

USEPA. 1988b. *External Exposure to Radionuclides in Air, Water, and Soil.* Federal Guidance Report No.12, EPA-520/1-88-020, September

Wikipedia. 2008. “Activation Products". http://en.wikipedia.org/wiki/Activation_products.

Radionuclides Related to Historical Operations at the Santa Susana Field Laboratory Area IV

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ACRONYMS

AETR	Advanced Epithermal Thorium Reactor
BWR	boiling water reactor
CDPH	California Department of Public Health
DOE	U.S. Department of Energy
ETEC	Energy Technology Engineering Center
IAEA	International Atomic Energy Agency
KEWB	Kinetics Experiment Water Boiler
kW	kilowatts
NMDF	Nuclear Materials Development Facility
PRG	Preliminary Remediation Goal
PWR	pressurized water reactor
SRE	Sodium Reactor Experiment
SSFL	Santa Susana Field Laboratory
USEPA	U.S. Environmental Protection Agency

GLOSSARY

activation product – A nuclide, usually radioactive, formed by the bombardment and adsorption in material with neutrons, protons, or other nuclear particles.

AEC – U.S. Atomic Energy Commission

corrosion product – An activation product formed by the activation and oxidation of metals

criticality – The condition in which a system is capable of sustaining a nuclear chain reaction.

DOE – U.S. Department of Energy

EIS – Environmental Impact Statement –

Environmental Assessment – A written environmental analysis which is prepared pursuant to the National Environmental Policy Act to determine whether a federal action would significantly affect the environment and thus require the preparation of a more detailed environmental impact statement.

EPA – U. S. Environmental Protection Agency

ETEC – Energy Technology Engineering Center

fertile material – Substance capable of becoming fissile, by capturing neutrons, possibly followed by radioactive decay; e.g., Th-232, U-238, Pu-240.

fission product – A nuclide resulting either from the fission of heavy elements such as uranium. Usually radioactive.

fission yield – The fraction of fissions resulting in a specified fission product.

fuel assembly – Structured collection of fuel rods or elements, the unit of fuel in a reactor.

fuel cladding – The outer metal jacket of a nuclear fuel element or target. It prevents fuel corrosion and retains fission products during reactor operation and subsequent storage, as well as providing structural support. Zirconium alloys, stainless steel, and aluminum are common cladding materials.

fuel element – Arrangement of a number of fuel rods into which the nuclear fuel is inserted in the reactor.

half-life – The time in which one-half of the atoms of a particular radioactive isotope disintegrate to another nuclear form. Half-lives vary from millionths of a second to billions of years.

high enriched uranium – Uranium enriched to at least 20% U-235.

kW – Kilowatt – A unit of electrical power equal to a thousand watts (joules per second)

low enriched uranium – Uranium enriched to less than 20% U-235. (That in power reactors is usually 3.5 - 5.0% U-235.)

MW – Megawatt – A unit of electrical power equal to a million watts (joules per second).

noble gas – Any of the chemically inert gaseous elements of the helium group in the periodic table

nuclear activation (neutron) cross section – Cross section: a measure of the probability of an interaction between a particle and a target nucleus, expressed in barns (1 barn = 10^{-24} cm^2).

nuclear reactor – A device in which a fission chain reaction can be initiated, maintained, and controlled. It's essential components are fissionable fuel, moderator, shielding, control rods, and coolant.

nuclide – Elemental matter made up of atoms with identical nuclei, therefore with the same atomic number and the same mass number (equal to the sum of the number of protons and neutrons). Also referred to as an isotope of an element.

Particle Accelerator – A scientific instrument that increases the kinetic energy of charged particles

PRG – Preliminary remediation goal

radioactive decay – The change of one radioactive nuclide into a different nuclide by the spontaneous emission of alpha, beta, or gamma rays, or by electron capture. The end product is a less energetic, more stable nucleus. Each decay process has a definite half-life.

radionuclide – An unstable nuclide that undergoes spontaneous transformation, emitting radiation.

Risk – The probability of a detrimental effect of exposure to a hazard.

risk assessment – The science of studying the amount of risk associated with doing something.

site characterization – A general term applied to the investigation activities at a specific location that examine natural phenomena and human-induced conditions

spent fuel – Used fuel assemblies removed from a reactor after several years use and treated as waste.

spontaneously fissionable (fissile) material – Substance in which fission occurs spontaneously, not induced by an incident particle.

SSFL - Santa Susana Field Laboratory

transuranic –Refers to any element whose atomic number is higher than that of uranium (atomic number 92), including neptunium, plutonium, americium, and curium. All transuranic elements are produced artificially and are radioactive.

unirradiated – Not having been exposed to radiation

Van de Graaff Generator – Electrical device that produces a high voltage by building up a charge of static electricity

EXECUTIVE SUMMARY

This paper summarizes the history of nuclear operations at Area IV of the Santa Susana Field Laboratory (SSFL) and identifies the radionuclides that would result from documented processes. It also presents the results of calculations estimating which radionuclides could still be present in 2009 in significant concentrations. These calculations are based on the initial production amounts of each radionuclide and the radioactive decay that has occurred since last production. The calculations also evaluate the proportion each radionuclide would contribute to the overall potential dose and associated risk in SSFL Area IV.

The U.S. Department of Energy (DOE) commissioned this research because the California Department of Public Health (CDPH), other regulators, and stakeholders asked, in various ways based on a 2008 analysis of existing data, the question: Based on existing knowledge of SSFL Area IV nuclear operations and documented radioactive decay rates, what radionuclides might still be present in significant quantities today? In response, this paper was prepared using the best available references describing the history of radiological operations, processes, and uses. As the research progressed, DOE recognized that this paper could be used as a reference point not only to respond to the various questions CDPH and others had asked, but also to meet two additional objectives: 1) to ensure that all significant contributors to risk are included in the planned Risk Assessment, and 2) to help prioritize analytical requirements for new samples to be collected for pending studies.

This paper does not evaluate the actual concentrations remaining in the environment in Area IV of the SSFL or the actual dose. The actual concentrations present in Area IV of SSFL and resulting risk to the public depend on the quantities of radionuclides that were released to the environment and the residual persistence in the environs after previous remediation efforts. These questions will be the focus of the radiological survey and sampling efforts currently in planning by the U.S. Environmental Protection Agency (USEPA). Rather, this paper documents the potential that each identified radionuclide could be present in significant quantities today, and in what proportion, relative to the other radionuclides identified based on the initial production rates and the rate at which each radionuclide decays. In other words, this paper provides a list of "suspects" – radionuclides that both were in the area and are known to have relatively long half-lives. DOE offers this list so the teams of scientists investigating contamination can prioritize their sampling and analyses toward these radionuclides. Following completion of the EPA's radiological survey and a chemical survey being conducted by the California Department of Toxic Substances Control, DOE will prepare human health and ecological risk assessments to support of the Environmental Impact Statement currently being developed.

The majority of process related radionuclides at the SSFL Area IV resulted from the following activities:

- operation of ten nuclear reactors,
- operation of seven criticality test facilities,
- manufacture of reactor fuel assemblies,
- disassembly and inspection of reactors and used reactor fuel assemblies,
- preparation of radioactive materia1 for disposal, and
- on-site storage of nuclear materia1.

In addition to those operations, smaller quantities of radionuclides were associated with small-scale laboratory work that included the following activities:

- fabrication, use, and storage of radioactive sources;

- research focused on reprocessing spent nuclear fuel;
- operation of particle accelerators;
- research using radioisotopes; and
- miscellaneous operations and commercial items that used radioactive materials.

In compiling the list of radionuclides that would have been produced as a result of the documented reactor processes, radionuclides with half-lives of less than one year were not considered. The rationale for this is that only 0.0000002 percent or less of the original radioactivity would remain after the 29 years (the time that has elapsed since the last reactor was shut down on the SSFL Area IV, in 1979 and the production of radionuclides ceased). Standard references were used to calculate the relative quantities of fission products, activation products, and transuranic radionuclides in spent reactor fuel that were produced in reactors. These quantities were then adjusted to account for radioactive decay since cessation of reactor operations. The identity and amounts of accelerator and research related radionuclides were also qualitatively evaluated.

This evaluation has resulted in a list of radionuclides that are expected to have the potential to contribute more than 1 percent of the current activity. They are:

Reactor fuel-related radionuclides:

- Two isotopes of thorium – Th-228, Th-232;
- Three isotopes of uranium – U-234, U-235, U-238;
- Four isotopes of plutonium – Pu-238, Pu-239, Pu-240, Pu-241;

Reactor fission products:

- tritium (H-3, an isotope of hydrogen,),
- strontium-90 (Sr-90),
- cesium-137 (Cs-137),
- promethium-147 (Pm-147), and
- europium-155 (Eu-155);

Reactor activation products:

- beryllium-10 (Be-10),
- cadmium-113m (Cd-113m),
- two isotopes of europium – Eu-152 and Eu-154, and
- uranium-233 (U-233);

Reactor-produced transuranics:

- Four isotopes of plutonium – Pu-238, Pu-239, Pu-240, Pu-241;
- Americium-241 – Am-241; and
- Curium-244 – Cm-244;

Accelerator activation product:

- tritium (H-3); and

Research-related radionuclides:

- Three isotopes of uranium – U-234, U-235, U-238;
- Neptunium-237 (Np-237);
- Four isotopes of plutonium – Pu-238, Pu-239, Pu-240, Pu-241;
- Cobalt-60 (Co-60);
- Cesium-137 (Cs-137); and
- Promethium-147 (Pm-147).

This paper also presents the results of calculations to evaluate the risk these radionuclides could present. The radionuclides that contribute greater than 1 percent of the risk potential are the same as those listed above, except that reactor produced fission products Pm-147 and Eu-155, reactor produced activation product Co-60, and all reactor produced transuranics are not included in the list that produce 99% of the risk. However, some of these are still included as fuel or research related risk contributors. A combined priority list based on the potential to contribute to greater than 1% of the risk include: Th-228, Th-232, U-234, U-235, U-238, Pu-238, Pu-239, Pu-240, Pu-241, H-3, Sr-90, Cs-137; Be-10, Cd-113m, Eu-152, Eu-154, U-233, Np-237, Co-60, Cs-137, and Pm-147.

The calculation of relative activity, dose and risk percentage could be quantitatively performed only for radionuclides in spent reactor fuel, based on the available references for relative production amounts. However, radionuclides associated with fuel elements, used in the manufacture of fuel assemblies, are assumed to have the potential to contribute more than 1 percent of the current activity, dose, and risk. Based on this review, radionuclides in spent nuclear fuel and fuel elements are expected to be responsible for the majority of SSFL Area IV contamination. Information about specific concentrations, quantities, and processes for radionuclides from research was not available. Thus, no relative activity information is available and therefore the relative potential for contamination is unknown. As a conservative precaution, these radionuclides were included in the list above, for further investigation.

1.0 BACKGROUND AND PURPOSE

The U.S. Department of Energy (DOE) commissioned this paper to summarize the history of nuclear operations at Area IV of the Santa Susana Field Laboratory (SSFL) and identify the radionuclides that would result from those operations. DOE asked that the author also present the results of calculations to estimate which radionuclides could still be present in 2009 in significant concentrations. This paper provides these calculations based on the initial production amounts of each radionuclide relative to all others and the radioactive decay that would have occurred since production. The calculations also evaluate how much each radionuclide would contribute to the overall potential dose and associated risk that might exist at SSFL Area IV.

DOE initiated this paper after receiving comments on the *Draft Gap Analysis Report*, submitted for regulatory and public review on June 1, 2008. That analysis was conducted to determine whether existing data for Area IV of the SSFL are adequate for the purpose of developing and evaluating risk-based cleanup alternatives in an Environmental Impact Statement. Section 3.2.5.3 and Table 3-11 of the report included a list of radionuclide contaminants of interest developed from the radionuclide lists contained in the *Historical Site Assessment*[1] and the *Environmental Assessment*[2], supplemented by additional radionuclides based on process knowledge from other reactor and fuel separation facilities, and filtered on the basis of half-life considerations.

In his review comments, Jerry Hensley of the California Department of Public Health requested that a new listing of all radionuclides generated during reactor operations be provided and pared down using industry acceptable methods (i.e., radiological half-life). A number of other reviewers from both regulatory agencies and the public also requested more information about radionuclides related to all processes and their current significance, while taking into consideration half-life and health affects. This information is needed not only to make sure that all significant contributors to risk are included in the Risk Assessment, but also to aid in prioritization of target analytes for new sampling and analysis efforts. This paper has been drafted to respond to these comments and requests and to meet these needs.

2.0 SCOPE AND APPROACH

This paper provides a review and an evaluation of the best available references describing the historical radiological operations related to nuclear reactor research conducted by DOE and its predecessor, the Atomic Energy Commission. This review also includes other nuclear research operations conducted in Area IV of the SSFL. While it is understood that the process descriptions in these references may not be exhaustive, it is believed that they represent the types of radiological processes that were performed in Area IV of the SSFL and include all significant radionuclides that were used or produced. DOE plans to compile further records and information related to all activities at the Energy Technology Engineering Center (ETEC). As part of that effort, former workers and all stakeholders will be asked to provide any

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[1] *Historical Site Assessment of Area IV Santa Susana Field Laboratory,* Sapere Consulting, Inc. and The Boeing Company for the Department of Energy Under Contract DE-AC03-99SF21530 (May 2005). http://etec.energy.gov/Cleanup/Historical-Site-Assessment.html

[2] *Environmental Assessment for Cleanup and Closure of the Energy Technology and Engineering Center, Final.* U.S. Department of Energy, NNSA Service Center, Oakland, CA (March 2003). http://etec.energy.gov/Regulation/RegDocs/ETECEA.pdf

information that they may have on the history of the site. If additional information is collected that changes the conclusions of this paper, it will be revised accordingly.

This paper provides a summary of the historical nuclear operations and a list of the associated process-related radionuclides produced at Area IV of the SSFL. It also includes an evaluation of the probability for each radionuclide to be present at the current time in significant concentrations. The potential for these radionuclides to be present today has been evaluated based on the initial relative production amounts and radioactive decay since their production. The significance of each radionuclide's contribution to the potential dose and associated risk is also evaluated.

This paper does not evaluate the actual concentrations remaining in the environment in Area IV of the SSFL or the actual dose, but only the potential for the current likely presence of each radionuclide relative to all others. The actual concentrations present in Area IV of SSFL and resulting risk to the public depend on the quantities of radionuclides that were released to the environment and the residual persistence in the environs after previous remediation efforts. That subject will be the focus of the radiological survey and sampling efforts currently in planning by the U.S. Environmental Protection Agency (USEPA) and the dose/risk assessment aspect of the EIS that DOE will complete following the USEPA's radiological survey and a chemical survey being conducted by the California Department of Toxic Substances Control.

3.0 SUMMARY OF NUCLEAR OPERATIONS AT SSFL AREA IV

Process-related radionuclides at the SSFL Area IV were primarily the result of the following activities:

- Operation of ten nuclear reactors
- Operation of seven criticality test facilities
- Manufacture of reactor fuel assemblies
- Disassembly and inspection of reactors and used reactor fuel assemblies
- Preparation of radioactive material for disposal
- On-site storage of nuclear materia1.

Small-scale laboratory work, including the activities below, may have involved smaller amounts of radionuclides:

- Fabrication, use, and storage of radioactive sources
- Research on reprocessing used reactor fuel
- Operation of particle accelerators
- Research using radioisotopes
- Miscellaneous operations
- Commercial items which use radioactive materials.

4.0 SSFL AREA IV NUCLEAR OPERATIONAL HISTORY

4.1 REACTOR OPERATIONAL HISTORY[3]

The majority of man-made radioactivity at the SSFL Area IV is the result of the operation of ten nuclear reactors. The amount of radioactivity generated by a nuclear reactor depends largely on the amount of heat it generates, called its "power level" and the period of operation. The reactors operated at the SSFL Area IV all had very low power levels: six had power levels of less than 100 kilowatts (kW), three had power levels of 600 to 1,000 kW, and one (the Sodium Reactor Experiment, or SRE) was a 20-MW test reactor. By comparison, reactors used for commercial electric power generation have thermal power levels of 3,000 MW or more. The reactors were operated in seven different facilities. Table 1 lists the name, facility number, facility name, nominal power level, and operating period for each reactor.

Table 1. Reactor Operations at the SSFL Area IV

Operation Name	Bld. No.	Facility Name	Power Level (kW)	Operating Period
KEWB	4073	Kinetics Experiment Water Boiler	1	7/56 - 11/66
L-85/AE-6	4093	L-85 Nuclear Experiment Reactor	3	11/56 - 2/80
SRE	4143	Sodium Reactor Experiment	20,000	4/57 - 2/64
SER	4010	S8ER Test Facility	50	9/59 - 12/60
S2DR	4024	SNAP Environmental Test Facility	65	4/61 - 12/62
STR	4028	Shield Test Irradiation Facility	50	12/61 - 7/64
S8ER	4010	S8ER Test Facility	600	5/63 - 4/65
STIR	4028	Shield Test Irradiation Facility	1,000	8/64 - 6/73
Sl0FS3	4024	SNAP Environmental Test Facility	37	1/65 - 3/66
S8DR	4059	SNAP Ground Prototype Test Facility	619	5/68 - 12/69

A nuclear reactor contains nuclear fuel, usually in the form of fuel assemblies, composed of spontaneously fissionable (fissile) radioactive material (e.g., uranium-235 or plutonium-239) plus other materials that may be added for various purposes (e.g., thorium as a fertile material for breeding fissile uranium-233), contained within a cladding material (usually steel, aluminum, or zirconium). The fuel assemblies are arranged in a "core", and surrounded by reflectors, shields, and containment vessels. Two reactors that operated at the SSFL Area IV, the Kinetics Experiment Water Boiler (KEWB) and the L-85 Nuclear Experimentation Reactor, had fuel in the form of liquid solutions of uranyl sulfate.

Several incidents occurred during the operating history of the SRE reactor that resulted or may have resulted in the releases of radionuclides to the environment.[4] On June 4, 1959, an explosion resulting from an unexpected hydrogen-oxygen reaction blew a fuel element (which was undergoing sodium cleaning) out of the wash cell. On July 12, 1959, depletion in coolant flow due to blockage resulted in overheating and damage to 13 of 43 fuel elements in the reactor core. During this event, the damage to these assemblies caused failure of cladding on all seven fuel rod elements, and some iron uranium

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[3] Largely abstracted from *Nuclear Operations at Rockwell's Santa Susana Field Laboratory – A Factual Perspective,* Rockwell International, Report N001E1R000017, October 2, 1990, Revision B. http://www.etec.energy.gov/library/Reading-Room/N001ER000017_Nuclear_Operations_SSFL_Factual_Perspective.pdf.

4 Historical Site Assessment of Area IV Santa Susana Field Laboratory, Sapere Consulting, Inc. and The Boeing Company, for the U.S. Department of Energy, Ventura County, CA, Contract DE-AC03-99SF21530, May 2005.

eutectic was molten for a short period of time in the reactor. Between 5,000 and 10,000 curies of mixed fission product were released and contained in the primary sodium cooling system. It was calculated that approximately 28 curies of Kr-85 were released to the environment. The Kr-85, a non-reactive noble gas, quickly dispersed in the atmosphere. On March 12, 1960, a contaminated sodium fire broke out in the sodium service vault. Personnel were unable to extinguish the fire with standard suppression equipment, so the vault was sealed and purged with argon gas. Accidents such as these and others likely resulted in accidental release of radionuclides to the environment likely contributed to the overall amount of contamination that may be present. However, they in general do not impact the identity or relative ratios of radionuclides to each other that may currently be present in the environment, which is the subject of this paper.

4.2 CRITICALITY TEST FACILITY OPERATIONAL HISTORY[5]

A controlled nuclear chain reaction can be sustained only when neutrons generated by fission of reactor fuel balance the neutrons used up and lost. When the reactor is adjusted so that this balance is achieved, it is said to be "critical". Criticality can be achieved in several ways: for example, by bringing parts of a core of fissionable material together (to reduce the number of neutrons that escape); by removing control rods (to reduce the number of neutrons captured in the control rods); or by increasing the number of neutrons reflected back into the core. Criticality Test Facilities were built to conduct tests to aid in developing new types of reactors by determining exactly which reactor configurations are critical, and how criticality is affected by changes in reactor design parameters. The criticality tests were operated at a very low power level (up to a few hundred watts), and neutron levels were correspondingly very low. Thus, a large number of criticality tests could be performed in the same test facility without generating much by-product radioactivity.

There were dozens of criticality tests performed at the SSFL Area IV, in seven different test facilities. Table 2 lists these facilities, their facility number, and operating periods.

Table 2. Criticality Test Facilities at the SSFL Area IV

Facility Name	Bldg. No.	Operating Period	Notes
SNAP Critical Test	4373	1957-63	First SNAP-2 Criticality Tests
Organic Moderated Reactor	4009	1958-67	Basic Tests of Reactor Concept
Sodium Graphite Reactor	4009	1958-67	Basic Tests of Reactor Concept
SNAP Critical Equipment Lab.	4012	1961-71	Later SNAP Criticality Tests
Fast Critical Experiment Lab.	4100	1961-74	Started as AETR
SNAP Flight System	4019	1962	SNAP Flight System Criticality
SNAP Transient Test	4024	1967-69	SNAP Transient Response Tests

4.3 MANUFACTURE OF REACTOR FUEL ASSEMBLY OPERATIONAL HISTORY[6]

As part of the nuclear reactor development work performed for the government, three different reactor fuel manufacturing operations were performed at the SSFL Area IV. The first operation was the assembly of fuel elements for the SRE. The second operation was manufacture of plutonium fuel, and the third was

[5] *Nuclear Operations at Rockwell's Santa Susana Field Laboratory - A Factual Perspective.*
[6] *Ibid.*

manufacture of uranium carbide fuel. There was also a Fuel Storage Facility, which stored the special nuclear materials (enriched uranium and plutonium) used to make reactor fuel.

The SRE fuel elements were assembled in the Engineering Test Building (Building 4003). Uranium and thorium metal slugs were brought into the SSFL Area IV for this purpose. In Building 4003, the slugs were loaded into metal tubes, the interstices were filled with sodium metal, and the tubes sealed. Although fuel elements for three cores for the SRE were prepared, only two cores were used. The third core was eventually shipped off-site. The first core did not contain thorium.

The plutonium fuel manufacturing facility, named the Nuclear Materials Development Facility (NMDF; Building 4055) was built specifically for development work involving plutonium. It was completed in 1967 and operated until 1979. Its operating history is summarized in Table 3.

Table 3. Operations at the Nuclear Materials Development Facility

Operating Period	Operation
1967 – 1968	Development of Analysis Technologies for uranium-plutonium oxide fuels
4/68 – 6/69	Recycle of scrap uranium-plutonium fuel
7/68 – 6/70	Development of technologies to mix tungsten into uranium-plutonium carbide fuel
4/70 – 9/70	Preparation of samples for uranium-plutonium oxide irradiation studies
9/70 – 3/74	Idle
1974 – 1975	Bench scale tests-recovery of plutonium from simulated waste
1975 – 5/77	Mixed uranium-plutonium carbide fuel fabrication
5/77 – 11/78	Partial decontamination and clean-up
11/78 – 11/79	Fabrication of depleted uranium carbide fuel
11/79 – 10/82	Idle
10/82 – 10/86	Decontamination and decommissioning
7/87	Released for unrestricted use

The uranium carbide fuel manufacturing pilot plant was located in Building 4005. It was a small scale production facility built to study the operations associated with manufacturing reactor fuel assemblies from uranium carbide. In the pilot plant, uranium oxide was reacted with graphite to convert it to uranium carbide, which was then cast into pellets, machined to the proper dimensions, and assembled into cladding tubes to make fuel assemblies. Initial operations were performed using depleted uranium to test the equipment, and then enriched uranium was used to make fuel assemblies for a critical assembly to be built at another AEC facility. Operations were completed in about nine months in 1967 and production was small.

The plutonium and uranium carbide materials were stored in the Fuel Storage Facility (Building 4064), a vault built to provide secure storage for fissile fuel material (enriched uranium and plutonium) used to make reactor fuel. The building was constructed above ground using concrete and concrete blocks, to comply with the AEC criteria for vaults for storage of fissionable materials.

4.4 DISASSEMBLY AND EXAMINATION OF REACTORS AND USED REACTOR FUEL ASSEMBLIES OPERATIONAL HISTORY[7]

A number of operations were performed remotely in the heavily-shielded Hot Laboratory (Building 4020, the "Hot Lab"), built in Area IV specifically to provide protection during processes that involved highly radioactive materials. These operations included:

- **Fuel assembly performance evaluation.** During reactor test operations, it was often necessary to examine reactor fuel assemblies and other test specimens to evaluate their performance, which involved the handling and examination of highly radioactive items.

- **Reactor disassembly.** When each reactor operation was completed and the reactor was no longer needed, it was removed from its operating location, disassembled, its fuel removed, its radioactive structure cut into pieces suitable for shipment. The radioactive material was shipped off-site for appropriate processing and disposal. Given the highly radioactive materials involved, the disassembly, fuel removal, and size reduction operations were also usually performed using the Hot Lab.

- **Used fuel disassembly.** The Hot Lab was also the location for work involving disassembly of used irradiated reactor fuel generated outside the SSFL. The fuel elements were shipped into the Hot Lab, disassembled or separated from their cladding material, and the separated materials then packaged and shipped back to other DOE facilities.

- **Manufacture of sealed sources.** The Hot Lab was also used to manufacture sealed radioactive sources (see below), for performing leak testing of sources, and for cutting and machining operations involving radioactive cobalt-60.

Construction of the Hot Lab facility was completed in 1959, and it was in use until 1989 when it underwent decontamination and decommissioning. The Hot Lab was used to examine fuel and/or components from the SRE, SER, S2DR, S8ER, S8DR, and S10FS3 reactors operated at the SSFL Area IV, the OMR and SGR criticality test facilities at SSFL, and the Piqua, Ohio, reactor. It was also used to declad fuel from the, EBR-I, EBR-11, Hallam, Fermi, and SEFOR reactors from other DOE sites.

4.5 FABRICATION, USE, AND STORAGE OF RADIOACTIVE SOURCES OPERATIONAL HISTORY[8]

A variety of radiation sources were used in the Hot Lab, including sources essential for the calibration of the many instruments required to detect and measure radioactivity at SSFL Area IV. These instruments were calibrated periodically, using known quantities and types of radioactivity. The calibration "sources" produced in the Hot Lab consisted of sealed containers that contained small measured quantities of radioisotopes. Other sources produced in the Hot Lab included those for radiography, irradiation testing, and other applications. The sources manufactured in the Hot Lab were used in various facilities at the SSFL Area IV and elsewhere. Only a small number of commercially-produced calibration sources are currently in use at SSFL today. Although approximately 140,000 curies of radioactive material (primarily promethium-147) were fabricated into sources at the Hot Lab, only a small fraction of this activity would remain today due to radioactive decay of the sources produced, especially for the promethium sources.

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[7] *Ibid.*
[8] *Ibid.*

4.6 RESEARCH ON REPROCESSING USED REACTOR FUEL OPERATIONAL HISTORY[9]

The used fuel assemblies from nuclear reactors contain unused fuel materials, and fission and activation products. Rockwell International developed a process to effect a partial separation of used fuel, removing part of the fission products so that the material could be used again as reactor fuel. Tests were performed in a well-shielded "Hot Cave" located in Building 4003, the Engineering Test Building. These experiments used up to one-kilogram quantities of un-irradiated uranium and thorium, and up to 100-gram quantities of highly irradiated materials.

4.7 PARTICLE ACCELERATORS OPERATIONAL HISTORY[10]

Another way to generate artificial (induced) radioactivity is to bombard a target material with atomic particles that have been accelerated to high speeds by means of a particle accelerator. A common form of particle accelerator is a "Van de Graaff generator", which uses a high-voltage electrostatic field to accelerate atomic particles to high speeds (high energy levels). Collisions of these particles with a target material (such as aluminum or tritium) can generate small amounts of radioactivity. Rockwell International operated a Van de Graaff generator in Building 4030, which bombarded tritium targets with deuterons to produce neutrons. The neutrons produced could then make other materials radioactive. A second Van de Graaff generator was operated at the SRE facility, generating neutrons for neutron activation analyses of materials. It was removed before the SRE facility was decontaminated and decommissioned.

4.8 RESEARCH USING RADIOISOTOPES OPERATIONAL HISTORY[11]

Some of the research done at the SSFL Area IV required the use of special radioisotopes. For these tests, small quantities of specially-prepared radioisotopes were brought to the SSFL Area IV, used in laboratories under controlled conditions, and then either transported off the facility or stored under controlled conditions if reuse was required.

One research program that required the use of radioisotopes was the TRUMP-S program. Although the original plan was to perform the TRUMP-S tests in the Hot Lab at the SSFL Area IV, the test program was transferred to the University of Missouri. Seventy-five grams of depleted uranium, five grams of plutonium, and four grams of neptunium, were received at SSFL Area IV and stored in Building 4064 before being shipped to the University of Missouri sometime after 1990.

Another research program that used a radioisotope was a corrosion test program carried out in the Corrosion Testing Laboratory (Building 4023). A pumped sodium corrosion test loop was built there, and used to study the deposition behavior of activation products (Mn-54 and Co-60) in flowing sodium so as to develop more effective traps for these isotopes. An activated piece of fuel cladding containing these isotopes was used in these tests.

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[9] *Ibid.*
[10] *Ibid.*
[11] *Ibid.*

5.0 RADIONUCLIDES ASSOCIATED WITH IDENTIFIED OPERATIONS AT SSFL AREA IV

5.1 RADIONUCLIDES ASSOCIATED WITH REACTOR OPERATIONS, CRITICALITY TEST OPERATIONS, MANUFACTURE OF NEW AND DISASSEMBLY OF USED FUEL ASSEMBLIES, AND WASTE OPERATIONS

Operation of a nuclear reactor not only involves the use of nuclear fuel but also creates three types of by-product radionuclides: fission products, transuranics, and activation products. When part of the fissionable material in the fuel element is used up, or when a reactor is decommissioned, the fuel elements are removed from the reactor. These "spent" fuel elements contain the fission products and transuranics generated by operation of the reactor, and the activation products in the cladding. The same radionuclides associated with reactor operations are also associated with criticality test operations, disassembly of used fuel assemblies, and waste operations since they all are related to nuclear reactor operations either as new fuel or fuel with the operational by-products.

5.1.1 Reactor Fuel Radionuclides

The radioactive material placed in a reactor includes the nuclear fuel made up of fissile radioactive material (e.g., uranium, plutonium) and other fuel elements (thorium). Although plutonium fuel was manufactured at SSFL Area IV, according to operational descriptions, none of the reactors or criticality experiments operated at SSFL Area IV used plutonium as a fuel. Many of the reactors, including the SRE, which produced the vast majority of the power generated, used a low-enriched uranium fuel (3-5 percent U-235 content by mass). However, according to operational descriptions, all reactors and criticality experiments associated with the SNAP program used high-enriched uranium fuel (~90 percent U-235 content by mass).[12]

The majority of the radioactivity in unirradiated low-enriched uranium fuel is from the isotope U-234 (75-85 percent) with lesser amounts from U-238 (10-20 percent) and only a few percent from U-235 (~5 percent).[13] In high-enriched unirradiated uranium fuel, even more of the radioactivity is from U-234 (~95 percent) while very little is from U-238 (less than 1 percent).[14] Sometimes thorium was added as a fertile material for breeding fissile U-233. According to operational descriptions, only two reactors, the Sodium Reactor Experiment (SRE) and the Advanced Epithermal Thorium Reactor (AETR), used fuel that contained thorium as a fertile material.[15] The thorium isotopes present in the fuel would have consisted mainly of Th-232 and its decay progeny Th-228 in partial equilibrium.

The manufactured plutonium fuel was actually a mixture of plutonium and uranium oxide pellets. The plutonium would have been comprised primarily of the isotope Pu-239, with lesser amounts of Pu-238, Pu-240, and Pu-241. There is no evidence that the plutonium fuel or plutonium-uranium mixed fuel was ever used as fuel for any onsite reactors.[16]

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[12] *Ibid.*
[13] *Health Physics Manual of Good Practices for Uranium Facilities*, Idaho National Engineering Laboratory, EGG-2530 UC-41, June 1988, pp 2-10 and *Guide of Good Practices for Occupational Radiological Protection In Uranium Facilities*, U.S Department of Energy, DOE-STD-1136-2000, August 2000, pp 2-10.
[14] *Ibid.*
[15] *Nuclear Operations at Rockwell's Santa Susana Field Laboratory - A Factual Perspective.*
[16] *Ibid.*

Table 4 provides a summary of fuel element radionuclides that were used or produced in SSFL Area IV and thus could be potentially present today.

Table 4. Summary of Fuel Element Radionuclides

Radionuclide	Half-life
Th-228	1.91 y
Th-232	14.0 by
U-234	246 ky
U-235	704 my
U-238	4.47 by
Pu-238	87.7 y
Pu-239	24.1 ky
Pu-240	6.56 ky
Pu-241	14.4 y

y = years; k = thousand; m = million; b = billion

5.1.2 Fission Product Radionuclides

When a reactor is operated, atoms of the fissionable material split, releasing neutrons and heat, and leaving behind fragments of the atom called fission products, which are made up of various isotopes of newly-formed elements. Some of the neutrons that are released are captured by other atoms of fissionable material, and these capture reactions cause some of these atoms to split, releasing more neutrons and heat and creating more fission products in a controlled "chain reaction."

Most of the fission products from a nuclear reactor are radioactive, emitting beta and gamma radiation. The fission products and fission yields can be identified by review of a Chart of the Nuclides.[17] Fission yields vary by radionuclide in a predictable way as demonstrated by Figure 1. The fission yields vary depending on the fuel used and are identified separately in the chart for U-235 fission products and U-233 fission products. All of the fissile fuel utilized at SSFL Area IV was U-235; however, since thorium was utilized as a fertile fuel element in some reactor experiments, some fission products from U-233 fission may have also been produced. Tables 5 and 6 list the fission product radionuclides with half-lives longer than one year along with their fission yields for U-235 and U-233 fuel, respectively.

A one-year cut-off was used since the decay of radionuclides is exponentially proportional to their half-life. After 10 half-lives, the fraction of original radioactivity remaining is reduced by decay to 0.1 percent. After 20 half-lives it is reduced to 0.0001 percent of the original amount and after 30 half-lives, it is reduced to 0.0000001 percent of the original amount. After 10 half-lives of any radionuclide, the radioactivity is usually considered to be insignificant. However, to be conservative, any radionuclide with a half-life greater than one year was included in the potential list. Any radionuclide with a half-life of less than one year will only have 0.0000002 percent or less of the original activity remaining after 29 years that have elapsed since the last reactor was shut down on the SSFL Area IV and the production of fission products ceased.

[17] *Nuclides and Isotopes,* Fourteenth Edition, General Electric Company, 1989.

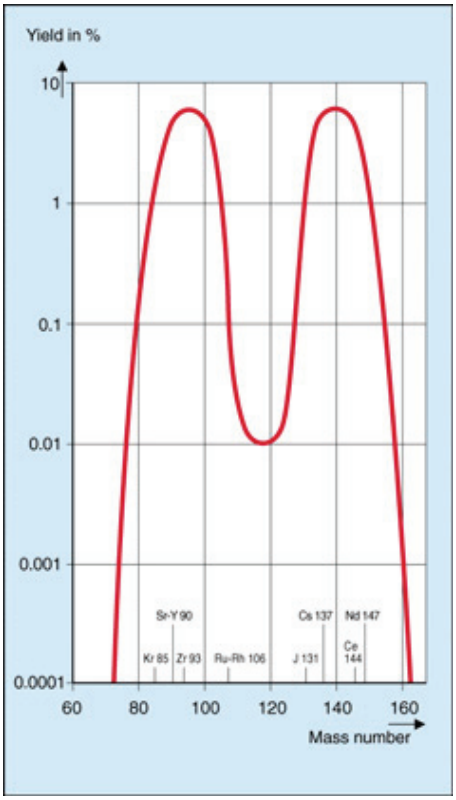

Figure 1. Fission yields vary by radionuclide in a predictable way

Table 5. U-235 Fission Products with Half-Lives Greater Than One Year

Radionuclide	$t_{1/2}$ (years)	Fission Yield[a] (%)	Relative Activity Yield	Activity Yield (%)	Relative Activity at 29 Years	Activity % at 29 Years
Se-79	6.50E+04	0.044	4.69E-07	0.0000	3.77E-05	0.0003
Kr-85	10.73	1.317	8.51E-02	6.8337	0.00E+00	0.0000
Sr-90	29.1	5.8	1.38E-01	11.0970	6.88E+00	47.9597
Zr-93	1.50E+06	6.37	2.94E-06	0.0002	2.36E-04	0.0016
Tc-99	2.13E+05	6.1	1.99E-05	0.0016	1.59E-03	0.0111
Ru-106	1.02E+00	0.401	2.73E-01	21.8884	2.56E-05	0.0002
Pd-107	6.50E+06	0.145	1.55E-08	0.0000	1.24E-06	0.0000
Cd-113	9.00E+15	0.015	1.16E-18	0.0000	9.28E-17	0.0000
Sb-125	2.76E+00	0.031	7.79E-03	0.6258	4.01E-03	0.0280
Sn-126	1.00E+05	0.059	4.09E-07	0.0000	3.28E-05	0.0002
I-129	1.57E+07	0.75	3.31E-08	0.0000	2.66E-06	0.0000
Cs-134	2.07E+00	7.66E-06	2.57E-06	0.0002	2.43E-07	0.0000
Cs-135	2.30E+06	6.54	1.97E-06	0.0002	1.58E-04	0.0011
Cs-137	3.02E+01	6.19	1.42E-01	11.4231	7.20E+00	50.2146
Sm-146	1.03E+08	3	2.02E-08	0.0000	1.62E-06	0.0000
Pm-147	2.62E+00	2.25	5.94E-01	47.7515	2.36E-01	1.6461
Eu-152	1.35E+01	1.79E-10	9.20E-12	0.0000	2.63E-10	0.0000
Eu-154	8.59E+00	1.91E-07	1.54E-08	0.0000	2.45E-07	0.0000
Eu-155	4.71E+00	0.032	4.71E-03	0.3783	1.96E-02	0.1371
		Highlighted		99		100

[a]All fission yields taken from *Nuclides and Isotopes*, Fourteenth Edition, General Electric Company, 1989, except for Cs-134, Eu-152, and Eu-154 which came from *Fission Product Yields,* WIMS Library Update Project, NAPC Nuclear Data Section, IAEA, since these isotopes are shielded from other fission products in the same mass fission decay chain.
$t_{1/2}$ = half-life

Table 6. U-233 Fission Products with Half-Lives Greater Than One Year

Radionuclide	$t_{1/2}$ (years)	Fission Yield[a] (%)	Relative Activity Yield	Activity Yield (%)	Relative Activity at 29 Years	Activity % at 29 Years
Se-79	6.50E+04	0.14	1.49E-06	0.0001	1.32E-04	0.0007
Kr-85	10.73	2.25	1.45E-01	12.8995	0.00E+00	0.0000
Sr-90	29.1	6.8	1.62E-01	14.3750	8.91E+00	49.7785
Zr-93	1.50E+06	6.37	2.94E-06	0.0003	2.61E-04	0.0015
Tc-99	2.13E+05	4.9	1.59E-05	0.0014	1.42E-03	0.0079
Ru-106	1.02E+00	0.25	1.70E-01	15.0775	1.77E-05	0.0001
Pd-107	6.50E+06	0.114	1.22E-08	0.0000	1.08E-06	0.0000
Cd-113	9.00E+15	0.019	1.46E-18	0.0000	1.30E-16	0.0000
Sb-125	2.76E+00	0.12	3.02E-02	2.6766	1.71E-02	0.0958
Sn-126	1.00E+05	0.22	1.52E-06	0.0001	1.35E-04	0.0008
I-129	1.57E+07	1.6	7.06E-08	0.0000	6.27E-06	0.0000
Cs-134	2.07E+00	2.69E-04	9.02E-05	0.0080	9.41E-06	0.0001
Cs-135	2.30E+06	6.3	1.90E-06	0.0002	1.69E-04	0.0009
Cs-137	3.02E+01	6.81	1.56E-01	13.8855	8.75E+00	48.9070
Sm-146	1.03E+08	2.56	1.72E-08	0.0000	1.53E-06	0.0000
Pm-147	2.62E+00	1.74	4.60E-01	40.8014	2.02E-01	1.1270
Eu-152	1.35E+01	7.70E-09	3.96E-10	0.0000	1.25E-08	0.0000
Eu-154	8.59E+00	2.10E-06	1.69E-07	0.0000	2.97E-06	0.0000
Eu-155	4.71E+00	0.021	3.09E-03	0.2743	1.42E-02	0.0796
		Highlighted		100		100

[a]All fission yields taken from *Nuclides and Isotopes*, Fourteenth Edition, General Electric Company, 1989, except for Cs-134, Eu-152, and Eu-154 which came from *Fission Product Yields,* WIMS Library Update Project, NAPC Nuclear Data Section, IAEA, since these isotopes are shielded from other fission products in the same mass fission decay chain.
$t_{1/2}$ = half-life

The fission yield is the fraction of fissions resulting in the specified isotope and is shown in the table in percentages. Since the radioactive decay of an isotope is proportional to $\ln(2)/t_{½}$ (where $t_{½}$ is the radionuclide half-life), the relative activity of each of the fission products produced in a reactor is the product of the fission yield and that factor. This product is shown in Tables 5 and 6 as the "Relative Activity Yield" which is the relative amount of each fission product isotope produced. The percentage of total fission product activity is also shown in Tables 5 and 6. These figures were decay-corrected for the 29 years that have elapsed since the last reactor was shut down on the SSFL Area IV, resulting in the activity percentage at 29 years shown in the tables. It should be noted that it is assumed that all Kr-85 has dissipated into the atmosphere and is no longer onsite since it is a noble (non-reactive) gas. It can be seen from Tables 5 and 6 that greater than 98 percent of the remaining fission product activity is composed of Sr-90 and Cs-137, with most of the remaining percentage being from Pm-147 for both uranium fuels.

Till and Meyer[18] quantified the potentially significant fission products found in spent reactor fuels. Table 7 contains this list of fission products also decay-corrected for the 29 years that have elapsed since the last reactor was shut down on the SSFL Area IV. It can be observed from the Table 7 that greater than 98-percent of the remaining fission product activity is composed of the same radionuclides as identified above, Sr-90, Cs-137, and Pm-147, with most of the rest being from Eu-155.

[18] J. E. Till and H. R. Meyer, *Radiological Assessment, A Textbook on Environmental Dose Analysis,* U.S. Nuclear Regulatory Commission, NUREG/CR-3332, 1983, pp.1-49.

Table 7. Representative Quantities of Potentially Significant Fission Products in Spent Reactor Fuels

Radionuclide	$t_{1/2}$ (years)	Activity Ci/tonne[a]	Activity (%)	Relative Activity at 29 Years	Activity % at 29 Years
H-3	12.3	800	0.0592	1.91E-02	0.2397
Kr-85	10.73	1.05E+04	0.7776	0.00E+00	0.0000
Sr-90	29.1	6.00E+04	4.4434	2.75E+00	34.5752
Zr-93	1.50E+06	2.00E+00	0.0001	1.48E-04	0.0019
Tc-99	2.13E+05	1.50E+01	0.0011	1.11E-03	0.0139
Ru-106	1.02E+00	8.20E+05	60.7264	7.12E-05	0.0009
Sb-125	2.76E+00	1.30E+04	0.9627	6.17E-03	0.0774
I-129	1.57E+07	4.00E-02	0.0000	2.96E-06	0.0000
Cs-134	2.07E+00	1.00E+05	7.4057	8.71E-03	0.1094
Cs-135	2.30E+06	1.20E+00	0.0001	8.89E-05	0.0011
Cs-137	3.02E+01	1.06E+05	7.8500	4.95E+00	62.1287
Pm-147	2.62E+00	2.00E+05	14.8113	7.32E-02	0.9193
Eu-155	4.71E+00	4.00E+04	2.9623	1.54E-01	1.9325
	Highlighted		99		100

[a]Ci/tonne = curies per metric ton; $t_{1/2}$ = half-life

To identify and quantify the major dose contributors from the identified fission products, the calculated activity percentage at 29 years has been multiplied by the USEPA inhalation,[19] ingestion,[20] and external[21] dose conversion factors. The resulting percentages of the total effective dose equivalents are shown in Table 8. It can be seen from Table 8 that Sr-90 and Cs-137 comprise greater than 99 percent of the dose potential from fission products. Likewise, to identify and quantify the major risk contributors from the identified fission products, the calculated activity percentage at 29 years has been divided by the USEPA Preliminary Remediation Goals (PRGs) for both Residential and Agricultural land use scenarios. The resulting percentages of the relative risk are shown in Table 9. It can be seen from Table 9 that Sr-90 and Cs-137 comprise greater than 99 percent of the risk from fission products.

5.1.3 Activation Product Radionuclides

Some of the neutrons that are released by fuel fissions are captured by the fuel cladding or the other materials in the reactor, and others escape from the reactor and are captured in the shielding around the reactor; far fewer escape the shielding and are captured in the reactor building or the ground. When a neutron is captured by an atom other than the fuel, such as in the fuel cladding or the reactor structure or shield, it creates a new isotope called an "activation product". The term activation product is reserved for products of neutron capture by materials other than the fuel, such as structural components of the nuclear reactor, the reactor coolant, control rods or other neutron poisons, or materials in the environment of the reactor. Most of these activation products are also radioactive, emitting beta and gamma radiation.

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[19] Federal Guidance Report No.11, *Limiting Values of Radionuclide Intake And Air Concentration and Dose Conversion Factors For Inhalation, Submersion, And Ingestion*; Environmental Protection Agency, EPA-520/1-88-020, September 1988.
[20] *Ibid.*
[21] Federal Guidance Report No.12, *External Exposure To Radionuclides In Air, Water, And Soil; Environmental* Protection Agency, EPA-520/1-88-020, September 1988.

Table 8. Potential Dose from Representative Quantities of Potentially Significant Fission Products in Spent Reactor Fuels

Radionuclide	Activity % at 29 Years	Inhalation DCF	Relative Inhalation Dose at 29 Years	Inhalation Dose % at 29 Years	Ingestion DCF	Relative Ingestion Dose at 29 Years	Ingestion Dose % at 29 Years	External DCF[a]	Relative External Dose at 29 Years	External Dose % at 29 Years
H-3	0.2397	1.73E-11	4.15E-12	0.0000	1.73E-11	4.15E-12	0.0002	0	0.00E+00	0.0000
Kr-85	0.0000	0	0.00E+00	0.0000	0	0.00E+00	0.0000	4.58E-20	0.00E+00	0.0000
Sr-90	34.5752	3.51E-07	1.21E-05	95.5177	3.85E-08	1.33E-06	61.2531	2.95E-21	1.02E-19	0.0149
Zr-93	0.0019	8.67E-08	1.61E-10	0.0013	4.48E-10	8.33E-13	0.0000	0.00E+00	0.00E+00	0.0000
Tc-99	0.0139	2.25E-09	3.14E-11	0.0002	3.95E-10	5.51E-12	0.0003	5.74E-22	8.01E-24	0.0000
Ru-106	0.0009	1.29E-07	1.15E-10	0.0009	7.40E-09	6.61E-12	0.0003	3.93E-18	3.51E-21	0.0005
Sb-125	0.0774	3.30E-09	2.56E-10	0.0020	7.59E-10	5.88E-11	0.0027	7.66E-18	5.93E-19	0.0869
I-129	0.0000	4.69E-08	1.74E-12	0.0000	7.46E-08	2.78E-12	0.0001	6.92E-20	2.57E-24	0.0000
Cs-134	0.1094	1.25E-08	1.37E-09	0.0108	1.98E-08	2.17E-09	0.0996	2.83E-17	3.09E-18	0.4534
Cs-135	0.0011	1.23E-09	1.37E-12	0.0000	1.91E-09	2.13E-12	0.0001	1.85E-22	2.06E-25	0.0000
Cs-137	62.1287	8.63E-09	5.36E-07	4.2200	1.35E-08	8.39E-07	38.5948	1.09E-17	6.77E-16	99.2194
Pm-147	0.9193	1.06E-08	9.74E-09	0.0767	2.83E-10	2.60E-10	0.0120	2.29E-22	2.11E-22	0.0000
Eu-155	1.9325	1.12E-08	2.16E-08	0.1703	4.13E-10	7.98E-10	0.0367	7.94E-19	1.53E-18	0.2248
Highlighted	100			100			100			100

[a]Based on 5 cm contamination depth.
DCF = Dose Conversion Factor

Table 9. Potential Risk from Representative Quantities of Potentially Significant Fission Products in Spent Reactor Fuels

Nuclide	Activity % at 29 Years	Residential PRG	Relative Residential Risk at 29 Years	Residential Risk % at 29 Years	Agricultural PRG	Relative Agricultural Risk at 29 Years	Agricultural Risk % at 29 Years
H-3	0.2397	2.28E+00	1.05E-01	0.0088	1.60E-01	1.50E+00	0.0020
Kr-85	0.0000	2.41E+01	0.00E+00	0.0000	2.23E+01	0.00E+00	0.0000
Sr-90	34.5752	2.31E-01	1.50E+02	12.5578	1.39E-03	2.49E+04	32.4436
Zr-93	0.0019	3.38E+02	5.50E-06	0.0000	2.00E+02	9.30E-06	0.0000
Tc-99	0.0139	2.50E-01	5.58E-02	0.0047	5.57E-03	2.50E+00	0.0033
Ru-106	0.0009	2.25E+00	3.97E-04	0.0000	1.72E-01	5.20E-03	0.0000
Sb-125	0.0774	4.62E-01	1.68E-01	0.0141	4.60E-01	1.68E-01	0.0002
I-129	0.0000	5.96E-01	6.24E-05	0.0000	2.76E-05	1.35E+00	0.0018
Cs-134	0.1094	1.57E-01	6.97E-01	0.0584	7.47E-03	1.46E+01	0.0191
Cs-135	0.0011	1.78E+01	6.27E-05	0.0000	5.09E-03	2.19E-01	0.0003
Cs-137	62.1287	5.97E-02	1.04E+03	87.3134	1.20E-03	5.18E+04	67.5291
Pm-147	0.9193	1.03E+03	8.93E-04	0.0001	6.69E+02	1.37E-03	0.0000
Eu-155	1.9325	3.80E+00	5.09E-01	0.0427	3.74E+00	5.17E-01	0.0007
Highlighted	100			100			100

The probability of an activation product being produced in a reactor is the product of a number of factors, including the concentration of the element being activated in the environment of the reactor, the abundance of the isotope in the element being activated, and the ability of a given material to capture neutrons (i.e., neutron cross section) for the isotope being activated. The International Atomic Energy Agency (IAEA) *Handbook on Nuclear Activation Cross Sections*[22] provides a list of elements and their isotopes with their abundance and their thermal neutron cross sections. A list of some example long-lived activation product radionuclides and the materials they may be produced from are shown in Table 10.[23] Since not only beryllium and cadmium but also europium are common neutron absorbers used in reactor control rods, Eu-152, and Eu-154 were added to the list and will be considered to be potentially present for purposes of developing a process related radionuclide list. In addition, since Th-232 was used as a fertile material in some reactor fuel, U-233 as an activation product will also be considered as potentially present for purposes of developing a process related radionuclide list. However, activation products will not be present unless the parent material was present in the environment of the reactor. Therefore, some of these activation products are not likely present at SSFL Area IV given that the parent material was not likely present in significant concentration in the environment of the reactor. These low probability activation products include Cl-36, Ar-39, Mo-93, Nb-93m, Nb-94, Tc-99 (except as a fission product), Ag-108m, Sn-121m, Pb-205, andPo-210.Table 11 presents a list of activation products that are typically present in nuclear power reactor coolants along with their relative concentrations for both boiling water reactor (BWR) and pressurized water reactor (PWR) coolants.[24] Although many of the reactors at SSFL Area IV were sodium-cooled reactors, this list provides an indication of additional activation products that may have been produced onsite. Many of the activation products listed in both Tables 9 and 10 have short half-lives relative to the 29 years time elapsed since any reactor was operational at SSFL Area IV and could have possibly produced them. Table 12 provides a summary list of long lived ($t_{½}$ > 1 year) activation products potentially present at SSFL Area IV.

Till and Meyer[25] quantified the corrosion products (a major subset of activation products) present in spent reactor fuels. Table 13 contains this list of corrosion products also decay corrected for the 29 years that have elapsed since the last reactor was shut down on the SSFL Area IV. It can be seen from the Table 13 that greater than 99 percent of the remaining corrosion product activity remaining is composed of Fe-55 and Co-60.

5.1.4 Transuranic Radionuclides

Some of the neutrons that are released by fuel fissions are captured by fuel element atoms that do not split, but instead form new isotopes, called “transuranics.” Although these radionuclides are created by “activation” in the reactor, they are generally considered to be a separate category than activation products. Transuranics are elements heavier than uranium, all of which are essentially man-made and do not naturally occur in significant quantities in nature. All of the transuranic radionuclides are radioactive, emitting alpha, beta, and/or gamma radiation.

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[22] *Handbook on Nuclear Activation Cross Sections,* Technical Reports Series No.156, International Atomic Energy Agency, Vienna, 1974.
[23] This table is licensed under the GNU Free Documentation License. It uses material from the Wikipedia article “Activation Products".
[24] Chien C. Lin, *Radiochemistry in Nuclear Power Reactors,* Nuclear Science Series, NAS-NS-3119, National Research Council, National Academy Press, Washington, D.C. 1996.
[25] J. E. Till and H. R. Meyer, pp.1-50.

Table 10. Example Activation Products

Radionuclide	Half-life	Activation Parent
Tritium	12.3 y	Lithium-6,7 Boron-10
Beryllium-10	1.53 my	Boron-10
Carbon-14	5,730 y	Nitrogen-14 Carbon-13
Sodium-24	15.0 h	Sodium-23
Chlorine-36	301 ky	Chlorine-35
Argon-39	269 y	Argon-38
Iron-55	2.73 y	Iron-54
Nickel-59	76 ky	Nickel-58
Cobalt-60	5.27 y	Cobalt-59
Nickel-63	100 y	Nickel-62
Molybdenum-93	3.5 ky	Molybdenum-92
Niobium-93m	16.1 y	Niobium-93
Niobium-94	20.3 ky	Niobium-93
Technetium-99	211 ky	Molybdenum-98
Silver-108m	108 y	Silver-107
Cadmium-113m	12.2 y	Cadmium-112
Tin-121m	56 y	Tin-120
Europium-152	13.5 y	Europium-151
Europium-154	8.59 y	Europium-153
Lead-205	15.3 my	Lead-204
Polonium-210	138 d	Bismuth-209
Uranium-233	159 ky	Thorium-232

h= hours; d = days; y = years; k = thousand; m = million; b = billion

Table 11. Selected ANS Standard Radionuclide Concentrations in Reactor Coolants Activation Products (mCi/kg)

Radionuclide	Half-Life	BWR[a]	PWR[b]
H-3	12.3 y	10	1,000
N-16	7.1s	60,000	60,000
F-18	1.8h	1.0	—
Na-24	15h	10	47
P-32	14d	0.2	—
Cr-51	27d	6.0	3.1
Mn-54	312d	0.07	1.6
Mn-56	2.6h	50	—
Fe-55	2.7y	1.0	1.2
Fe-59	45d	0.03	0.3
Co-58	71d	0.2	4.6
Co-60	5.3y	0.4	0.53
Ni-63	100y	0.001	—
Cu-64	12.7h	30	—
Zn-65	244d	0.2	0.51
Ag-110m	250d	0.001	1.3
W-187	24h	0.3	2.5

[a] A reference BWR is a 3,400 MW BWR/5.
[b] A reference PWR is a 3,400 MW PWR with U-tube steam generators.
mCi/kg = millicuries per kilogram
s = seconds; h = hours; d = days; y = years
k = thousand; m = million; b = billion

Table 12. Summary of Potential Long-Lived Activation Products

Radionuclide	Half-life
Tritium	12.3 y
Beryllium-10	1.53 my
Carbon-14	5,730 y
Iron-55	2.73 y
Nickel-59	76 ky
Cobalt-60	5.27 y
Nickel-63	100 y
Cadmium-113m	13 y
Europium-152	13.5 y
Europium-154	8.59 y
Uranium-233	159 ky

y = years; k = thousand; m = million; b = billion

Table 13. Representative Quantities of Corrosion Products in Spent Reactor Fuels

Radionuclide	$t_{1/2}$ (years)	Activity Ci/tonne[a]	Activity (%)	Relative Activity at 29 Years	Activity % at 29 Years
Mn-54	0.86	30,000	36.3636	3.36E-06	0.0011
Fe-55	2.7	20,000	24.2424	1.39E-01	44.8079
Fe-59	0.12	500	0.6061	2.33E-51	0.0000
Co-58	0.2	30,000	36.3636	2.05E-29	0.0000
Co-60	5.26	2000	2.4242	1.72E-01	55.1911
	Highlighted		99		100

[a]Ci/tonne = curies per metric ton; $t_{1/2}$ = half-life

To identify and quantify the major dose and related potential risk contributors from the identified corrosion products, the calculated activity percentage at 29 years has been multiplied by the USEPA inhalation,[26] ingestion,[27] and external[28] dose conversion factors. The resulting dose percentages are shown in Table 14.

It can be seen from Table 14 that Fe-55 and Co-60 comprise greater than 99 percent of the dose potential from corrosion products. Likewise, to identify and quantify the major risk contributors from the identified corrosion products, the calculated activity percentage at 29 years has been divided by the USEPA PRGs for both Residential and Agricultural land use scenarios. The resulting percentages of the relative risk are shown in Table 15. It can be seen from Table 15 that Co-60 contributes greater than 99 percent of the risk from corrosion products. The other potentially significant activation products not reflected in Tables 14 and 15 would include H-3, Be-10, C-14, Cd-113m, Eu-152, Eu-154, and U-233.

Till and Meyer[29] quantified the transuranics present in spent reactor fuels. Table 16 contains this list of transuranics also decay corrected for the 29 years that have elapsed since the last reactor was shut down on the SSFL Area IV. It can be seen from the Table 16 that greater than 99 percent of the remaining transuranics activity remaining is composed of Pu-238, Pu-239, Pu-240, Pu-241, Am-241, and Cm-244.

To identify and quantify the major dose and related potential risk contributors from the identified transuranics, the calculated activity percentage at 29 years has been multiplied by the USEPA inhalation,[30] ingestion,[31] and external[32] dose conversion factors. The resulting dose percentages are shown in Table 17. It can be seen from Table 17 that all of the listed transuranics except Pu-242 and Cm-242 combine to contribute greater than 99 percent of the dose potential from transuranics for at least one of the exposure pathways.

[26] Federal Guidance Report No.11.
[27] *Ibid.*
[28] Federal Guidance Report No.12.
[29] J. E. Till and H. R. Meyer, pp.1-50.
[30] Federal Guidance Report No.11.
[31] *Ibid.*
[32] Federal Guidance Report No.12.

Table 14. Potential Dose from Representative Quantities of Corrosion Products in Spent Reactor Fuels

Radionuclide	Activity % at 29 Years	Inhalation DCF	Relative Inhalation Dose at 29 Years	Inhalation Dose % at 29 Years	Ingestion DCF	Relative Ingestion Dose at 29 Years	Ingestion Dose % at 29 Years	External DCF[a]	Relative External Dose at 29 Years	External Dose % at 29 Years
Mn-54	0.0011	1.81E-09	1.95E-12	0.0001	7.48E-10	8.08E-13	0.0002	1.51E-17	1.63E-20	0.0007
Fe-55	44.8079	7.26E-10	3.25E-08	0.9875	1.64E-10	7.35E-09	1.7961	0	0.00E+00	0.0000
Fe-59	0.0000	4.00E-09	3.00E-57	0.0000	1.81E-09	1.36E-57	0.0000	2.12E-17	1.59E-65	0.0000
Co-58	0.0000	2.94E-09	1.94E-35	0.0000	9.68E-10	6.38E-36	0.0000	1.77E-17	1.17E-43	0.0000
Co-60	55.1911	5.91E-08	3.26E-06	99.0125	7.28E-09	4.02E-07	98.2037	4.45E-17	2.46E-15	99.9993
Highlighted	100			100			100			100

[a]Based on 5 cm contamination depth.
DCF = Dose Conversion Factor

Table 15. Potential Risk from Representative Quantities of Corrosion Products in Spent Reactor Fuels

Radionuclide	Activity % at 29 Years	Residential PRG	Relative Residential Risk at 29 Years	Residential Risk % at 29 Years	Agricultural PRG	Relative Agricultural Risk at 29 Years	Agricultural Risk % at 29 Years
Mn-54	0.0011	6.92E-01	1.56E-03	0.0001	3.69E-01	2.93E-03	0.0000
Fe-55	44.8079	2.69E+03	1.67E-02	0.0011	8.21E-01	5.46E+01	0.0890
Fe-59	0.0000	3.26E+00	2.30E-49	0.0000	1.20E+00	6.25E-49	0.0000
Co-58	0.0000	2.66E+00	2.48E-27	0.0000	1.27E-01	5.19E-26	0.0000
Co-60	55.1911	3.61E-02	1.53E+03	99.9988	9.01E-04	6.13E+04	99.9110
Highlighted	100			100			100

Table 16. Representative Quantities of Transuranics in Spent Reactor Fuels

Radionuclide	$t_{1/2}$ (years)	Activity Ci/tonne[a]	Activity (%)	Relative Activity at 29 Years	Activity % at 29 Years
Np-237	2.14E+06	1	0.0005	5.18E-04	0.0016
Pu-238	87.7	4,000	2.0734	1.77E+00	5.3954
Pu-239	2.41E+04	500	0.2592	2.59E-01	0.7901
Pu-240	6.56E+03	650	0.3369	3.36E-01	1.0255
Pu-241	1.44E+01	150,000	77.7512	2.96E+01	90.1398
Pu-242	3.75E+05	2	0.0010	1.04E-03	0.0032
Am-241	4.33E+02	750	0.3888	3.76E-01	1.1482
Am-243	7.37E+03	20	0.0104	1.03E-02	0.0316
Cm-242	4.50E-01	35,000	18.1420	6.53E-13	0.0000
Cm-244	1.81E+01	2,000	1.0367	4.80E-01	1.4647
	Highlighted		99		100

[a]Ci/tonne = curies per metric ton; $t_{1/2}$ = half-life

Likewise, to identify and quantify the major risk contributors from the identified transuranics, the calculated activity percentage at 29 years has been divided by the USEPA PRGs for both Residential and Agricultural land use scenarios. The resulting percentages of the relative risk are shown in Table 18. It can be seen from Table 18 that Pu-238, Pu-239, Pu-240, Pu-241, Am-241, and Cm-244 comprise greater than 99 percent of the risk from transuranics.

5.1.5 Combined Activity Dose and Risk

To identify and quantify the major dose and related potential risk contributors from all radionuclides produced by a reactor (excluding those associated with fuel) based on the quantities present in spent reactor fuels provided by Till and Meyer, the calculated activity percentage at 29 years has been multiplied by the USEPA inhalation,[33] ingestion,[34] and external[35] dose conversion factors for the combined sum of the fission products, activation products and transuranics. Both the radionuclides with the potential to contribute more than one percent of the total activity and the radionuclides with the potential to contribute more than one percent of the total dose and associated risk are reflected in Table 19. It can be seen from Table 19 that Sr-90, Cs-137, Co-60, Pu-238, Pu-239, Pu-240, Pu-241, Am-241, and Cm-244 comprise greater than 99 percent of the pathway dose potential and that Sr-90 and Cs-137 comprise greater than 99 percent of the risk potential from reactor produced contaminants excluding H-3, C-14. The other potentially significant radionuclides associated with reactors would include the fuel element radionuclides Th-228, Th-232, U-234, U-235, and U-238. Another radionuclide comprising at least 0.5 % of the radioactivity potentially present onsite but that contributes less than 1 percent of the dose and risk potential is Eu-155.

[33] Federal Guidance Report No.11.
[34] *Ibid.*
[35] Federal Guidance Report No.12.

Table 17. Potential Dose from Representative Quantities of Transuranics in Spent Reactor Fuels

Radionuclide	Activity % at 29 Years	Inhalation DCF	Relative Inhalation Dose at 29 Years	Inhalation Dose % at 29 Years	Ingestion DCF	Relative Ingestion Dose at 29 Years	Ingestion Dose % at 29 Years	External DCF[a]	Relative External Dose at 29 Years	External Dose % at 29 Years
Np-237	0.0016	1.46E-04	2.31E-07	0.0189	1.20E-06	1.90E-09	0.0189	3.51E-18	5.55E-21	1.9429
Pu-238	5.3954	1.06E-04	5.72E-04	46.7331	8.65E-07	4.67E-06	46.5119	7.60E-22	4.10E-21	1.4356
Pu-239	0.7901	1.16E-04	9.16E-05	7.4889	9.56E-07	7.55E-07	7.5274	1.15E-21	9.09E-22	0.3181
Pu-240	1.0255	1.16E-04	1.19E-04	9.7205	9.56E-07	9.80E-07	9.7706	7.44E-22	7.63E-22	0.2671
Pu-241	90.1398	2.23E-06	2.01E-04	16.4253	1.85E-08	1.67E-06	16.6192	2.44E-23	2.20E-21	0.7700
Pu-242	0.0032	1.11E-04	3.51E-07	0.0287	9.08E-07	2.87E-09	0.0286	6.43E-22	2.03E-24	0.0007
Am-241	1.1482	1.20E-04	1.38E-04	11.2591	9.84E-07	1.13E-06	11.2602	2.18E-19	2.50E-19	87.6378
Am-243	0.0316	1.19E-04	3.76E-06	0.3069	9.79E-07	3.09E-08	0.3079	6.59E-19	2.08E-20	7.2820
Cm-242	0.0000	4.67E-06	9.30E-18	0.0000	3.10E-08	6.17E-20	0.0000	8.60E-22	1.71E-33	0.0000
Cm-244	1.4647	6.70E-05	9.81E-05	8.0187	5.45E-07	7.98E-07	7.9553	6.74E-22	9.87E-22	0.3456
Highlighted	100			100			100			99

[a]Based on 5 cm contamination depth.
DCF = Dose Conversion Factor

Table 18. Potential Risk from Representative Quantities of Transuranics in Spent Reactor Fuels

Nuclide	Activity % at 29 Years	Residential PRG	Relative Residential Risk at 29 Years	Residential Risk % at 29 Years	Agricultural PRG	Relative Agricultural Risk at 29 Years	Agricultural Risk % at 29 Years
Np-237	0.0016	1.30E-01	1.22E-02	0.3222	4.48E-04	3.53E+00	0.2892
Pu-238	5.3954	2.97E+00	1.82E+00	48.1288	7.31E-03	7.38E+02	60.4765
Pu-239	0.7901	2.59E+00	3.05E-01	8.0817	6.09E-03	1.30E+02	10.6299
Pu-240	1.0255	2.60E+00	3.94E-01	10.4497	6.10E-03	1.68E+02	13.7749
Pu-241	90.1398	4.06E+02	2.22E-01	5.8820	1.05E+00	8.58E+01	7.0340
Pu-242	0.0032	2.73E+00	1.16E-03	0.0307	6.42E-03	4.93E-01	0.0404
Am-241	1.1482	1.87E+00	6.14E-01	16.2676	1.32E-02	8.70E+01	7.1274
Am-243	0.0316	1.66E-01	1.90E-01	5.0372	1.11E-02	2.84E+00	0.2330
Cm-242	0.0000	3.22E+02	6.18E-15	0.0000	1.89E+01	1.05E-13	0.0000
Cm-244	1.4647	6.69E+00	2.19E-01	5.8002	3.04E-01	4.82E+00	0.3948
Highlighted	100			100			99

Table 19. Potential Dose and Risk from Representative Quantities of Produced Radionuclides in Spent Reactor Fuels

Radionuclide	Activity % at 29 Years	Inhalation Dose % at 29 Years	Ingestion Dose % at 29 Years	External Dose % at 29 Years[a]	Residential Risk % at 29 Years	Agricultural Risk % at 29 Years
H-3	0.1507	0.0000	0.0001	0.0000	0.0088	0.0019
Kr-85	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Sr-90	21.7367	1.6565	1.6286	0.0148	12.4963	32.0820
Zr-93	0.0012	0.0000	0.0000	0.0000	0.0000	0.0000
Tc-99	0.0088	0.0000	0.0001	0.0000	0.0047	0.0032
Ru-106	0.0006	0.0000	0.0001	0.0005	0.0000	0.0000
Sb-125	0.0487	0.0000	0.0009	0.0861	0.0140	0.0002
I-129	0.0000	0.0000	0.0000	0.0000	0.0000	0.0017
Cs-134	0.0687	0.0002	0.0316	0.4494	0.0582	0.0189
Cs-135	0.0007	0.0000	0.0000	0.0000	0.0000	0.0003
Cs-137	39.0591	0.0732	12.2314	98.3511	86.8857	66.7764
Pm-147	0.5779	0.0013	0.0038	0.0000	0.0001	0.0000
Eu-155	1.2149	0.0030	0.0116	0.2228	0.0425	0.0007
Mn-54	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Fe-55	0.0672	0.0000	0.0003	0.0000	0.0000	0.0002
Fe-59	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Co-58	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Co-60	0.0828	0.0011	0.0140	0.8508	0.3044	0.1884
Np-237	0.0006	0.0185	0.0163	0.0005	0.0006	0.0027
Pu-238	1.9953	45.9221	40.0363	0.0004	0.0892	0.5600
Pu-239	0.2922	7.3589	6.4794	0.0001	0.0150	0.0984
Pu-240	0.3793	9.5519	8.4103	0.0001	0.0194	0.1276
Pu-241	33.3355	16.1402	14.3054	0.0002	0.0109	0.0651
Pu-242	0.0012	0.0282	0.0246	0.0000	0.0001	0.0004
Am-241	0.4246	11.0637	9.6925	0.0214	0.0302	0.0660
Am-243	0.0117	0.3016	0.2651	0.0018	0.0093	0.0022
Cm-242	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Cm-244	0.5417	7.8795	6.8477	0.0001	0.0108	0.0037
Highlighted	99	100	100	100	99	99

[a]Based on 5 cm contamination depth.

5.2 RADIONUCLIDES ASSOCIATED WITH ACCELERATOR OPERATIONS

The radionuclides produced by accelerator operations depend on the composition of the targets that were irradiated and the types of particles that were accelerated. It appears that the Van de Graaff generators were primarily used to bombard tritium targets with deuterons to produce neutrons. The activation products produced are likely to have been similar to the activation products produced in reactors. This similarity would be due to the construction materials for both reactors and accelerators (e.g., hydrogenous concrete and steal) and the long-lived activation products would be comprised of some of the radionuclides listed in Table 10. Estimation of quantities is not possible at this time but would likely be small compared to activation products produced by the reactors.

5.3 RADIONUCLIDES ASSOCIATED WITH RESEARCH AND FABRICATION, USE, AND STORAGE OF RADIOACTIVE SOURCES

The primary radionuclides produced as a result of research include isotopes of uranium, plutonium, and neptunium (the same isotopes as those listed under the reactor operations discussed above), stored onsite in conjunction with the TRUMP-S program. Radionuclides Mn-54 and Co-60 were produced as a result of operations associated with the Corrosion Testing Laboratory. It is likely that the contamination onsite from these operations was relatively small compared to that from reactor operations given that the sources were either sealed or in storage rather than in active operations. The primary radionuclide associated with fabrication and use of radioactive sources was Pm-147, but may have also included Co-60 and Cs-137.

5.4 SUMMARY OF OPERATIONAL RELATED RADIONUCLIDES

Table 20 provides a summary of the SSFL Area IV historical operations-related radionuclides with half-lives greater than one year. The table also shows which radionuclides are expected to contribute more than 1 percent of the current activity, potential dose, and potential risk. The actual calculation of relative activity, dose, and risk could only be performed for radionuclides in spent reactor fuel. Radionuclides associated with fuel elements are assumed to have the potential to contribute more than 1 percent of the current activity, dose, and risk. For some radionuclides from reactors and other processes, no relative activity information is available and therefore the potential for contamination is unknown. In the absence of specific concentration or process knowledge information, they were not eliminated from the list of radionuclides that could have the potential to contribute greater than 1 percent of the total activity, dose, and risk.

6.0 CONCLUSION

From this evaluation, those radionuclides that have the potential to contribute significantly to human or environmental dose and risk after 29 years since operations were suspended in Area IV of SSFL have been identified. The list of major contributors may be used to prioritize analytical requirements for new samples to be collected for site characterization and risk assessment. The actual concentrations present in Area IV of SSFL and resulting risk to the public depend on the quantities of radionuclides that were released to the environment and the residual persistence in the environs after 29 years of decay and prior remediation efforts. That will be the focus of the radiological survey and sampling efforts currently in planning by USEPA and the dose/risk assessment aspect of the Environmental Impact Statement currently being developed.

Table 20. Summary of the SSFL Area IV Historical Operations Related Radionuclides with Half-Lives Greater Than One Year

Radionuclide	$t_{1/2}$ (years)	Process Relationship	Potential to Contribute > 1% of Activity	Potential to Contribute > 1% of Pathway Dose	Potential to Contribute > 1% of Risk
Th-228	1.90E+00	Reactor Fuel Element	Th-228	Th-228	Th-228
Th-232	1.40E+10	Reactor Fuel Element	Th-232	Th-232	Th-232
U-234	2.46E+05	Reactor Fuel Element	U-234	U-234	U-234
U-235	7.04E+08	Reactor Fuel Element	U-235	U-235	U-235
U-238	4.50E+09	Reactor Fuel Element	U-238	U-238	U-238
Pu-238	8.77E+01	Reactor Fuel Element	Pu-238	Pu-238	Pu-238
Pu-239	2.40E+04	Reactor Fuel Element	Pu-239	Pu-239	Pu-239
Pu-240	6.60E+03	Reactor Fuel Element	Pu-240	Pu-240	Pu-240
Pu-241	1.44E+01	Reactor Fuel Element	Pu-241	Pu-241	Pu-241
H-3	1.23E+01	Reactor Fission Product	H-3[a]	H-3[a]	H-3[a]
Se-79	6.50E+04	Reactor Fission Product			
Kr-85	10.73	Reactor Fission Product			
Sr-90	29.1	Reactor Fission Product	Sr-90	Sr-90	Sr-90
Zr-93	1.50E+06	Reactor Fission Product			
Tc-99	2.13E+05	Reactor Fission Product			
Ru-106	1.02E+00	Reactor Fission Product			
Pd-107	6.50E+06	Reactor Fission Product			
Cd-113	1.41E+01	Reactor Fission Product			
Sb-125	2.76E+00	Reactor Fission Product			
Sn-126	1.00E+05	Reactor Fission Product			
I-129	1.57E+07	Reactor Fission Product			
Cs-134	2.07E+00	Reactor Fission Product			
Cs-135	2.30E+06	Reactor Fission Product			
Cs-137	3.02E+01	Reactor Fission Product	Cs-137	Cs-137	Cs-137
Sm-146	1.03E+08	Reactor Fission Product			
Pm-147	2.62E+00	Reactor Fission Product	Pm-147		
Eu-152	1.35E+01	Reactor Fission Product			
Eu-154	8.59E+00	Reactor Fission Product			
Eu-155	4.71E+00	Reactor Fission Product	Eu-155		
H-3	1.23E+01	Reactor Activation Product			
Be-10	1.53E+06	Reactor Activation Product	Be-10[a]	Be-10[a]	Be-10[a]
C-14	5.73E+03	Reactor Activation Product			
Fe-55	2.73E+00	Reactor Activation Product			
Ni-59	7.60E+03	Reactor Activation Product			
Co-60	5.27E+00	Reactor Activation Product		Co-60	
Ni-63	1.00E+02	Reactor Activation Product			
Cd-113m	1.41E+01	Reactor Activation Product	Cd-113m[a]	Cd-113m[a]	Cd-113m[a]
Eu-152	1.35E+01	Reactor Activation Product	Eu-152[a]	Eu-152[a]	Eu-152[a]
Eu-154	8.59E+00	Reactor Activation Product	Eu-154[a]	Eu-154[a]	Eu-154[a]
U-233	1.59E+05	Reactor Activation Product	U-233[a]	U-233[a]	U-233[a]
Np-237	2.14E+06	Reactor Transuranic			
Pu-238	87.7	Reactor Transuranic	Pu-238	Pu-238	
Pu-239	2.41E+04	Reactor Transuranic	Pu-239	Pu-239	
Pu-240	6.56E+03	Reactor Transuranic	Pu-240	Pu-240	
Pu-241	1.44E+01	Reactor Transuranic	Pu-241	Pu-241	
Pu-242	3.75E+05	Reactor Transuranic			
Am-241	4.33E+02	Reactor Transuranic	Am-241	Am-241	
Am-243	7.37E+03	Reactor Transuranic			

Table 20. Summary of the SSFL Area IV Historical Operations Related Radionuclides with Half-Lives Greater Than One Year (continued)

Radionuclide	$t_{1/2}$ (years)	Process Relationship	Potential to Contribute > 1% of Activity	Potential to Contribute > 1% of Dose	Potential to Contribute > 1% of Risk
Cm-242	4.50E-01	Reactor Transuranic			
Cm-244	1.81E+01	Reactor Transuranic	Cm-244	Cm-244	
H-3	1.23E+01	Accelerator Activation Product	H-3 [a]	H-3 [a]	H-3 [a]
Be-10	1.53E+06	Accelerator Activation Product			
C-14	5.60E+03	Accelerator Activation Product			
Cl-36	3.01E+05	Accelerator Activation Product			
Ar-39	2.69E+02	Accelerator Activation Product			
Fe-55	2.73E+00	Accelerator Activation Product			
Ni-59	7.60E+04	Accelerator Activation Product			
Co-60	5.27E+00	Accelerator Activation Product			
Ni-63	1.00E+02	Accelerator Activation Product			
Mo-93	4.00E+03	Accelerator Activation Product			
Nb-93m	1.60E+01	Accelerator Activation Product			
Nb-94	2.03E+04	Accelerator Activation Product			
Tc-99	2.13E+05	Accelerator Activation Product			
Ag-108m	1.08E+02	Accelerator Activation Product			
Cd-113m	1.30E+01	Accelerator Activation Product			
Sn-121m	5.60E+01	Accelerator Activation Product			
Pb-205	1.53E+07	Accelerator Activation Product			
U-234	2.46E+05	Research Radionuclide	U-234 [a]	U-234 [a]	U-234 [a]
U-235	7.04E+08	Research Radionuclide	U-235 [a]	U-235 [a]	U-235 [a]
U-238	4.50E+09	Research Radionuclide	U-238 [a]	U-238 [a]	U-238 [a]
Np-237	2.14E+06	Research Radionuclide	Np-237 [a]	Np-237 [a]	Np-237 [a]
Pu-238	87.7	Research Radionuclide	Pu-238 [a]	Pu-238 [a]	Pu-238 [a]
Pu-239	2.41E+04	Research Radionuclide	Pu-239 [a]	Pu-239 [a]	Pu-239 [a]
Pu-240	6.56E+03	Research Radionuclide	Pu-240 [a]	Pu-240 [a]	Pu-240 [a]
Pu-241	1.44E+01	Research Radionuclide	Pu-241 [a]	Pu-241 [a]	Pu-241 [a]
Co-60	5.27E+00	Research Radionuclide	Co-60 [a]	Co-60 [a]	Co-60 [a]
Cs-137	3.02E+01	Research Radionuclide	Cs-137 [a]	Cs-137 [a]	Cs-137 [a]
Pm-147	2.62E+00	Research Radionuclide	Pm-147 [a]	Pm-147 [a]	Pm-147 [a]

[a]No relative activity information is available for these radionuclides from these processes and therefore the potential for contamination is unknown. In the absence of specific concentration information, they were not eliminated from the list to have the potential to contribute greater than 1 percent of the total activity, dose, and risk.
$t_{1/2}$ = half life

7.0 REFERENCES

Centers for Disease Control and Prevention (CDC). 2004. *Glossary of Radiological Terms*. Department of Health and Human Services. August.

General Electric Company. 1989. *Nuclides and Isotopes.* Fourteenth Edition.

Idaho National Engineering Laboratory. 1988. *Health Physics Manual of Good Practices for Uranium Facilities,* EGG-2530 UC-41. June.

International Atomic Energy Agency (IAEA) 1974. *Handbook on Nuclear Activation Cross Sections.*Technical Reports Series No.156. Vienna, Austria.

IAEA. 2008. *Fission Product Yields,* WIMS Library Update Project, NAPC Nuclear Data Section. http://www-nds.iaea.org/wimsd/index.html

Lin, Chien C. 1996. *Radiochemistry in Nuclear Power Reactors.* Nuclear Science Series, NAS-NS-3119, National Research Council, National Academy Press, Washington, DC.

National Environmental Policy Act (NEPA). 1998. *Glossary of Terms Used in DOE NEPA Documents*. U.S. Department of Energy, Environment, Safety and Health, Office of NEPA Policy and Assistance. September.

National Nuclear Security Administration (NNSA). 2008. *Final Site-Wide Environmental Impact Statement for Continued Operation of Los Alamos National Laboratory, Los Alamos, New Mexico*. Vol. 1. DOE/EIS-0380. May.

Rockwell International. 1990. "Nuclear Operations at Rockwell's Santa Susana Field Laboratory – A Factual Perspective". Facility Report N001E1R000017, Revision B. October 2. http://www.etec.energy.gov/library/Reading-Room/N001ER000017_Nuclear_Operations_SSFL_ Factual_Perspective.pdf.

Sapere Consulting, Inc. and The Boeing Company. 2005. *Historical Site Assessment of Area IV Santa Susana Field Laboratory,* U.S. Department of Energy, Ventura County, CA, Contract DE-AC03-99SF21530. May

Till, J. E. and H. R. Meyer. 1983. *Radiological Assessment, A Textbook on Environmental Dose Analysis,* U.S. Nuclear Regulatory Commission, NUREG/CR-3332.

U.S. Department of Energy (DOE). 2003. *Environmental Assessment for Cleanup and Closure of the Energy Technology and Engineering Center, Final.* NNSA Service Center, Oakland, CA. (March)

U.S. Department of Energy. 2004. *Guide of Good Practices for Occupational Radiological Protection in Uranium Facilities.* DOE-STD-1136-2000. Washington, DC. August.

U.S. Environmental Protection Agency (USEPA). 1988a. *Limiting Values of Radionuclide Intake And Air Concentration and Dose Conversion Factors For Inhalation, Submersion, And Ingestion.* Federal Guidance Report No.11, EPA-520/1-88-020. September.

USEPA. 1988b. *External Exposure to Radionuclides in Air, Water, and Soil.* Federal Guidance Report No.12, EPA-520/1-88-020, September

Wikipedia. 2008. “Activation Products". http://en.wikipedia.org/wiki/Activation_products.

APPENDIX A
ABOUT THE AUTHOR

ABOUT THE AUTHOR

Dr. Thomas L. Rucker received his Ph.D. from The University of Tennessee in Analytical Chemistry with an emphasis in Radiochemistry and a minor in Health Physics. He is currently Manager of Radiological Assessment and Protection for Science Applications International Corporation (SAIC), where he leads a team of health physicists and radiochemists in providing radiological characterization, assessment, and protection services. Dr. Rucker specializes in radionuclide measurement and dose assessment for health and environment protection and also provides expertise in other areas of analytical chemistry, environmental chemistry, and health physics, including environmental monitoring, waste management, radiological site characterization, and risk assessment. He has extensive experience in analytical chemistry, radiochemistry, radiological monitoring, dose and risk assessment, radiological site characterization, and environmental and waste management. His experience in analytical and radiochemistry includes laboratory management; laboratory automation; research and development; quality assurance/quality control (QA/QC) program management; document/procedure preparation and review; personnel training; method development; data interpretation; information management, and statistical analysis. He has expertise in the sampling, separation, and measurement of both radiological and nonradiological analytes. He has extensive experience in alpha and gamma spectroscopy, liquid scintillation counting, gas chromatography/mass spectrometry, and nuclear nondestructive and field analysis techniques. He also has extensive experience in analytical data evaluation, validation, and management.

His radiological monitoring, dose and risk assessment, and environmental and waste management experience includes evaluation and preparation of recommendations for radiological effluent and environmental monitoring programs; the interpretation and implementation of radiation protection regulations in technical basis documents for internal dosimetry, air monitoring, radiological survey, and contamination control; establishment of internal dosimetry bioassay programs; evaluation of nuclear accident dosimetry programs; development of site and facility characterization plans; development of analytical data summary reports; development and verification of characterization databases and dose calculation software; development of waste characterization plans; evaluation of waste characterization data; and preparation of waste minimization reports. He has participated in the development or review of environmental assessments (EAs), environmental impact statements (EISs), decontamination and decommissioning (D&D) plans and reports and D&D Funding Plans for NRC license termination, ALARA assessments, air and water quality studies, data management and validation studies, waste characterization plans; waste certification assessments, sampling and analysis plans (SAPs), data quality objectives, field sampling plans, quality assurance project plans (QAPPs), health and safety plans, remedial investigation reports, pathway analyses, dose assessments, and human health risk assessments.

Dr. Rucker's project experience in site characterization and risk assessment includes support to the Department of Energy (DOE) under subcontract to CDM Federal for the development of an Environmental Impact Statement (EIS) for the decommissioning of the Energy Technology Engineering Center at the Santa Susanna Field Laboratory. The project has involved the evaluation of historical processes and data and the development of a Data Gap Analysis Report identifying additional survey and sampling required to perform risk assessments required to evaluate the alternatives evaluated in the Environmental Impact Statement. Dr. Rucker serves as the lead radiological risk assessor and a radionuclide site characterization expert for the project.

He also provides support to the Department of Energy for radiological data collection, evaluation, dose assessment, and human health risk assessment under contract to Bechtel Jacobs Company, LLC, for the East Tennessee Technology Park Reindustrialization Program in Oak Ridge, Tennessee, and under contract to Restoration Services Incorporated for the Portsmouth Gaseous Diffusion Plant in Ohio. This

support has included determination of extent and isotopic distribution of residual contamination, development of technical basis for radiological survey and sampling plans based on Multi-Agency Radiation Survey and Site Investigation guidance, development of survey and sampling plans and summary reports, and dose and risk assessment using RESRAD and RESRAD BUILD computer modeling codes as well as the use of EPA-approved modeling and slope factors.

As project manager he led a task to document the existing knowledge base for radiological characterization of the areas and facilities at DOE's Y-12 Weapons Complex and the East Tennessee Technology Park in Tennessee that are managed by Bechtel Jacobs LLC (BJC). He also supported for a Supplemental Site-Wide Environmental Impact Statement for the Los Alamos National Laboratory Site. He helped evaluate historical characterization data and exposure scenarios for a number of Material Disposal Areas (MDAs) containing legacy radiological waste from the site. This information was used to develop the chemical and radiological source term for air release to the public, transportation accidents, and worker accident exposures resulting from possible excavation of the waste from the MDAs for disposal at permanent repositories.

Dr. Rucker provided support for radiological site characterization studies for several Formerly Utilized Sites Remedial Action Program (FUSRAP) sites and DOE's Hanford site in Washington, and he served as project manager to review the existing characterization data found in UCN-2109 files associated with containers of Oak Ridge Reservation Legacy Low-Level Waste (LLLW) for WESKEM. The review provided quantitative evaluation of the uncertainties' impact on the the ability of each waste population to meet the waste acceptance criteria for the available disposal facility options.

Dr. Rucker has also participated in international projects, including serving as a Citizen Ambassador and member of a Radiation Protection Delegation to Russia and Ukraine for professional exchanges with scientists in those countries and supporting the High Enriched Uranium (HEU) Transparency Monitoring Program from 1998 to 2007. He also staffed the Transparency Monitoring Office (TMO) at UEIP in Novouralsk, Russia, for 5 weeks in both 2003 and 2004.

Dr. Rucker is a member of the Health Physics Society and the American Chemical Society and is the author of numerous technical papers and publications, including several published in the Journal of Radioanalytical and Nuclear Chemistry. He has presented papers at national and international conferences, including the Annual Conference on Bioassay, Analytical and Environmental Radiochemistry, Third International Conference on Methods and Applications of Radioanalytical Chemistry, and the Southeastern Regional Meeting of the American Chemical Society.

APPENDIX B
ADVERTISING FOR SCOPING MEETINGS

In response to commentors' questions concerning public notification for the SSFL Area IV scoping meetings, DOE tabulated the notification efforts as follows:

- Ongoing – The website (http://www.etec.energy.gov/EIS/EIS.html) is continuously updated.
- May 16, 2008 – The *Federal Register* published an NOI to prepare an *Environmental Impact Statement for Remediation of Area IV of Santa Susana Field Laboratory* and conduct Public Scoping Meetings.
- May 16, 2008 – A press release on the *SSFL Area IV EIS* NOI was sent to 12 media outlets.
- May 16, 2008 – Federal, state, and local elected officials; federal and state regulators; and members of the SSFL Workgroup received a copy of the *SSFL Area IV EIS* NOI.
- May 18, 2008 – A news article on the scoping meetings was published in the *Los Angeles Daily News*.
- May 23, 2008 – An editorial with scoping meeting information was published in the *Simi Valley Acorn*.
- May 30, 2008 – A mailing announcing the Data Gap Analysis meetings and scoping was sent to 4,100 people on the project mailing list.
- June 10, 2008 – Scoping Meeting plans were announced at the Data Gap Analysis meeting.
- June 24, 2008 – Scoping Meeting plans were announced at the Data Gap Analysis meeting.
- Week of July 7, 2008 – Scoping meeting advertisements were published in the news sections of the following newspapers: *Los Angeles Times* (circulation ~900,000); *Los Angeles News* (circulation ~160,000); *Ventura County Star* (circulation ~100,000); *Simi Valley Acorn* (circulation ~35,000); *Ventura County Reporter* (circulation ~35,000); *Sacramento Bee* (circulation ~290,000); *Hoy* (circulation ~70,000); and *El Hispano* (circulation ~20,000).
- July 8, 2008 – A mailing announcing the project background, scoping meetings, and comment submission options was sent to 4,100 people on the project mailing list.
- July 9, 2007 – A briefing on scoping was held with congressional staff representatives of Waxman, Boxer, and Feinstein.
- July 10, 2007 – A briefing on scoping was held with state assembly staff representatives of Gallegly, McClintock, Brownley, and Kuehl.
- July 15, 2008 – A press release was sent to 46 area media outlets.
- July 15, 2008 – A Public Service Announcement was sent to 43 area media outlets.
- Week of July 18, 2008 – Scoping meeting advertisements were published in the news sections of the following newspapers: *Los Angeles Times*, *Los Angeles News*, *Ventura County Star*, *Simi Valley Acorn*, *Ventura County Reporter*, *Sacramento Bee*, *Hoy*, and *El Hispano*.

- July 21, 2008 – A calendar announcement was published in the *Ventura County Star*.
- August 1, 2008 – A news article with information on scoping was published in the *Simi Valley Acorn*.
- Multiple occasions – *Federal Register* notices, mailings, copies of advertisements, and meeting materials were sent to the DOE Reading Rooms at the Platt Branch Library, Simi Valley Library, and California State University – Northridge Library.