



Bringing the Area IV studies to a close

As comprehensive studies spanning more than five years at the Santa Susana Field Laboratory (SSFL) wrap up and the findings are analyzed, the U.S. Department of Energy (DOE) can now say with confidence where contamination exists at Area IV, and to what extent. This effort included the collection of more than 11,000 soil samples for chemical and radiological analysis, the completion of background and characterization studies, and the active involvement of DOE, the U.S. Environmental Protection Agency (EPA) and the California Department of Toxic Substances Control (DTSC). This issue of the *CleanUpdate* summarizes those studies, and looks toward release of the *Draft Environmental Impact Statement for Remediation of Area IV and the Northern Buffer Zone of the Santa Susana Field Laboratory* (Draft EIS).

Chemical soil studies overview

In 2012, DTSC conducted a soil chemical background study that identified what chemicals exist in soils not impacted by past activities at the SSFL, and at what levels. The DTSC chemical background study results were used to identify clean-up targets for site-related chemical concentrations resulting from operations in Area IV, in accordance with the 2010 Administrative Order on Consent (AOC). DOE performed the following chemical contamination sampling and analysis, under the oversight of DTSC:

- Three phases of soil sampling throughout Area IV and the Northern Buffer Zone (NBZ), including “go-back” sampling to fill data gaps – resulting in 5,854 surface and subsurface samples:
 - Phase One:** chemical soil sampling included co-located sampling with EPA’s radiological sampling program to determine whether chemicals and radionuclides occurred in the same locations.
 - Phase Two:** random soil sampling in the NBZ, also performed in coordination with EPA.
 - Phase Three:** data gap sampling involved analysis of samples for chemicals only (EPA conducted an independent data gap analysis and radiological soil sampling).
- Additionally, DOE considered the 2,259 soil samples it had collected and analyzed for chemical constituents in Area IV and the NBZ in studies performed previously under the Resource Conservation and Recovery Act.



Radiological soil studies overview

In the December 2012 *Final Radiological Characterization of Soils, Area IV and the Northern Buffer Zone*, a comprehensive study reporting the findings of surface and subsurface soil sampling, EPA indicated that radiological contamination was primarily limited to five locations in Area IV.

Specifically, about 70 percent of the soil samples from Area IV that had radionuclide concentrations exceeding EPA’s Field Action Levels (FALs) are located within five “Radiological Areas of Interest” at Area IV: the Radioactive Materials Handling Facility complex, the Sodium Reactor Experiment complex, the Former Fuel Element Storage Facility, the 17th Street Drainage area, and the New Conservation Yard Drainage Area. (For a description of the FALs, see page 3, and for a map of these five Radiological Areas of Interest, see map, page 4.) EPA’s studies involved extensive sampling and an evaluation of past investigations for radiological contamination of Area IV and NBZ soils, including:

- A background study** designed to determine what radionuclides existed in soils not impacted by past activities at SSFL and at what levels. The study was used to help determine radiological clean-up targets, which DOE and DTSC agreed, in the 2010 AOC, would govern the cleanup.
- An independent **Historical Site Assessment** of past operations involving radiological materials at Area IV, and analysis of historical aerial photographs to support identification of soil sampling locations.
- Gamma radiation scanning** of all the accessible surfaces in Area IV and the NBZ, performed by passing sensitive instruments over the ground to identify potential hot spots for detailed follow-up analysis.

The results of all these years of chemical sampling, study, and analysis are to be summarized in a *Chemical Data Summary Report*, due out in conjunction with the Draft EIS.

(CONTINUED ON PAGE 4)

Greetings, fellow residents and interested parties

After numerous studies and extensive analyses by EPA and by DOE with DTSC oversight, we have concluded that the majority of our cleanup will focus on chemicals in the soils, rather than radionuclides. Why? EPA identified specific areas of localized radiological contamination – smaller than for chemicals, for which the contamination is more spread out. In addition, ninety percent of the areas of radiological contamination are located in the same places as the chemical contaminants, so cleaning up the chemicals will also address most of the radionuclides.

In May 2012, near the end of its sampling activity, EPA stated in a public newsletter that these studies were a part “of the most robust technical investigations ever undertaken for low-level radioactive contamination.” In the end, we have concluded the combined radiological and chemical data collected in these studies provide an unambiguous understanding of the true nature and extent of contamination at the site. They also document that the contamination is based on-site, and has not migrated to the surrounding communities. Further, workers and escorted guests can walk around Area IV and the NBZ without fear of harm from contaminants.

This newsletter provides a high-level summary of the results from the characterization studies conducted by EPA and DOE. EPA’s final report can be found at the following link: http://etec.energy.gov/Library/Cleanup_and_Characterization/Soil/Co-Located/Final%20Radiological%20Characterization%20of%20Soils%20122112.pdf. DOE’s sampling results can be found at: ____.

We pay attention to these findings. We have chosen to live here, and raise our children and grandchildren here. We wouldn’t make this choice if we thought we were putting them at risk.

In the end, our agency and personal mission is to clean up the contamination and ensure the land is safe for future public use. With that in mind, we are now looking forward to the release of the Draft EIS, anticipated in summer 2016, which will evaluate options for cleaning up Area IV and the NBZ, a goal we all share.

Sincerely,

A handwritten signature in black ink, appearing to read "John Jones".

John Jones,
Federal Project Director,
DOE ETEC

A handwritten signature in black ink, appearing to read "Stephanie Jennings".

Stephanie Jennings,
Deputy Federal Project Director,
DOE ETEC

Sampling results provide roadmap for future action

Completion of Area IV studies has provided DOE the information needed to develop clean-up alternatives to be evaluated in the EIS. Radionuclides and chemicals identified in the studies are described below, along with key observations from the analyses.

EPA's radiological soil and sediment findings

- Of the 55 radionuclides analyzed for, EPA reported 11 radionuclides that could be attributed to prior site operations at Area IV:
 - Americium-241, cesium-137, cobalt-60, curium-243/244, europium-152, europium-154, nickel-59, plutonium-238, plutonium-239/240, strontium-90, and tritium (hydrogen-3).
- Looked at in another way, out of the 3,542 samples EPA collected in Area IV or the NBZ:
 - Radionuclides in 276 of the total (about 8 percent) exceeded the LUT values.
 - Radionuclides in nine locations (about 0.3 percent) exceeded risk assessment-based cleanup levels.

The background studies discussed on page 1 provided one basis for determining the LUT targets for both radionuclides and chemicals. In 2013, DTSC published LUT values for more than 116 chemicals and 16 radionuclides. The Chemical LUTs can be viewed at http://www.dtsc-ssfl.com/files/lib_look-uptables/chemical/66073_06112013lutandcover.pdf. And the Radiological LUTs can be viewed at: http://www.dtsc-ssfl.com/files/lib_look-uptables/radiological/66513_65861_Draft_Provisional_Radiological_Look-Up_Table_Values_1-30-13.pdf.

To respond to concerns about whether radionuclides in Area IV were contaminating nearby communities, EPA performed “step-out” sampling whenever it identified radionuclides exceeding the FALs.

The purpose of the step-out sampling was to determine whether the contamination had moved and if so, how far. After the step-out sampling was completed and analyzed, EPA presented its findings to DOE and DTSC scientists, who concluded independently that no contaminants were moving beyond the site perimeter.

DOE's chemical soil findings

- Of the 5,854 soil samples taken in Area IV and the NBZ, DOE found:
 - The most frequently observed chemicals in soils were polychlorinated biphenyls (from electrical components), polycyclic aromatic hydrocarbons (from fuels and burning of wastes), dioxins (from burning of wastes and brush fires), petroleum chemicals (mostly from diesel fuel), and metals (antimony, cadmium, chromium VI, mercury, selenium, and silver wastes).

FALS

What are Field Action Levels?

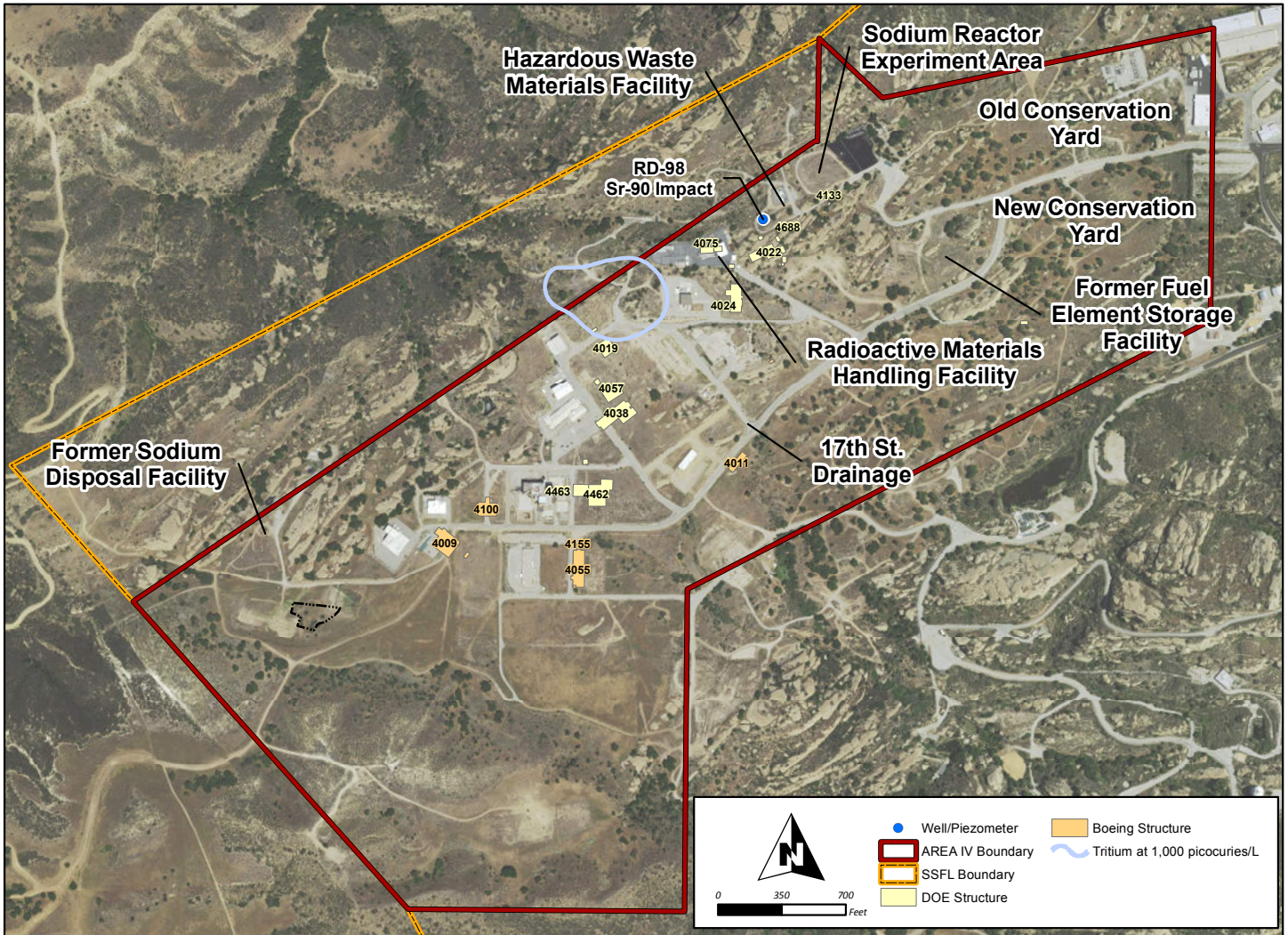
As sampling activities and other investigations (referred to as site characterization) proceeded at Area IV, scientists needed a uniform approach to identifying, for further study, the locations where radiological contamination potentially existed. At the time of this site characterization, however, DTSC had not established its Look-Up Table (LUT) values, which were clean-up targets required under the AOC. So, EPA developed Field Action Levels (FALs) as an initial field screening tool. FALs for radionuclides were set by recording whichever produced a stricter screening tool: a) the “background threshold value” [a value determined from offsite samples taken in areas not impacted by SSFL activities] or b) the lowest level at which radionuclide concentrations could be reliably detected by sensitive equipment. Then, scientists flagged locations that exceeded the FALs for further attention and sampling.

Although EPA refined and improved these first screening tools several times before the provisional LUT values were developed, the FALs served as a critical early building block in identifying areas of contamination. EPA instructed DTSC not to use the FALs as LUT values for remedial planning, however.

(CONTINUED ON PAGE 4)

Bringing the Area IV studies to a close (CONTINUED FROM PAGE 1)

- A **geophysical survey** to test for the presence of buried materials, steel, and concrete.
- **Three rounds of soil sampling** to determine what radionuclides exist in Area IV and NBZ soils, and in what concentrations. A total of 3,542 surface and subsurface soil and sediment samples were collected and compared to FALs developed by EPA for 55 selected radionuclides.



Area IV Radiological Areas of Interest, Structures, and Groundwater Tritium Plume

Sampling results provide roadmap for future action (CONTINUED FROM PAGE 3)

Groundwater studies and ongoing monitoring

- Beginning with the installation of the first monitoring well in 1984, DOE has had an ongoing monitoring program for both radiological and chemical contaminants in Area IV groundwater. In 1999, Boeing, on behalf of itself, DOE and NASA, commissioned a comprehensive site-wide groundwater study to predict the direction and rate contaminants move from introduction into the groundwater to where they may end up. In addition, two groundwater studies specific to Area IV have been undertaken:
 - **EPA:** investigated radionuclides in groundwater and seeps in 2012.
 - **DOE:** investigated a tritium plume (see map above). And chemical contaminants in groundwater, in the vicinity of the former Sodium Disposal Facility (FSDF) and the Radioactive Materials Handling Facility continue to be under investigation to determine a final remedy.



A continuing environment of community collaboration

DOE kicked off the SSFL Area IV EIS in 2008 against the backdrop of varying levels of community trust and confidence in DOE's management of the chemical and radioactive materials on site. In response, DOE initiated a multi-faceted program to inform the public and build trust by sponsoring vigorous public outreach and involvement, coupled with a transparent and rigorous scientific investigation of the potential contaminants at Area IV (see pages 1, 3 and 4). These communication and involvement activities have included:

- **Community interviews** – In 2008, DOE first interviewed a cross-section of area residents to plan public participation activities that would contribute to the EIS. Stakeholders were asked about their concerns regarding the site and about their preferences for communication and involvement going forward. Additional public outreach activities are described below. For more information, please visit http://www.etec.energy.gov/Library/Cleanup_and_Characterization/EIS/EIS_Community_Interviews.pdf.
- **Chemical Co-located Soil Sampling Meetings** – Throughout the sampling activities conducted from 2010 to 2014, DOE participated regularly in technical and community meetings with EPA and DTSC to share information, and to discuss the path forward. For more information about these meetings, please visit http://etec.energy.gov/Char_Cleanup/Co-located.html.



- **Groundwater U** – To help community members review highly technical studies and understand groundwater characterization, treatment, and remedies, DOE, NASA, and Boeing co-sponsored Groundwater U, from March through May 2011, in cooperation with DTSC. The lecture series included a site tour with scientists who had conducted the twelve-year-long SSFL Site-Wide Groundwater Remedial Investigation. For more information about Groundwater U, please visit http://www.etec.energy.gov/Community_Involvement/Public%20Meetings/Groundwater_U.html.

- **Former Worker Interviews** – In 2010-11, DOE and EPA interviewed former workers for their memories of SSFL construction, operations, incidents, work processes, and waste management. For the interview report, please visit http://www.etec.energy.gov/Environmental_and_Health/Documents/WorkerHealthFiles/Former_Worker_Interview_Final_Report.pdf.



- **Soil Treatability Study (STS) and Meetings** – To respond to stakeholder requests to consider alternative soil treatment technologies, DOE commissioned the STS in 2011 to identify, test, and discuss the implementation of such technologies.
- **Soil Treatability Investigation Group (STIG)** – DOE also hosted the STIG, a community group that met over four years (2011-2015) to provide input and ideas to the STS. At this group's suggestion, two California universities performed the studies and presented their results to DOE and the group. A summary of their findings was published in September 2015. For more information about the STS or the STIG, or to read their findings, please visit http://etec.energy.gov/Char_Cleanup/Soil_Treatability.html.
- **Pre-scoping Workshops** – To facilitate consideration of diverse views, DOE hosted, in May and June 2012, three workshops to help interested stakeholders prepare input to the alternatives to be analyzed in the EIS. For more information about the workshops, please visit http://www.etec.energy.gov/char_cleanup/EIS.html.

(CONTINUED ON PAGE 6)

A continuing environment of community collaboration (CONTINUED FROM PAGE 5)

- **Public Scoping Meetings** – After publication of the Amended Notice of Intent in the *Federal Register* on February 7, 2014, DOE held three scoping meetings in February and March 2014. Two of the meetings were for the general public; the third scoping meeting was held for Native American tribal members. For more information about these meetings, please visit http://www.etec.energy.gov/char_cleanup/EIS.html.
- **Stakeholder Funding** – Over the years, DOE has provided funding for the following stakeholder groups: Committee to Bridge the Gap (<http://committeetobridgethegap.org/>), Physicians for Social Responsibility (<http://www.psr.org/>), Santa Susana Field Laboratory Advisory Panel (<http://ssflpanel.org/>), and Santa Susana Field Laboratory Community Advisory Group (<http://ssflcag.net/>).



The Draft EIS is coming

DOE is now on track to release the *Draft Environmental Impact Statement for Remediation of Area IV and the Northern Buffer Zone of the SSFL* in summer of 2016. Once the date has been set, DOE will announce a schedule and encourage interested parties to submit comments during the public comment period. After responding to public comments received on the Draft EIS, DOE will prepare a Final EIS and a Record of Decision. The full Draft EIS will be available online. If you have not added your address to the EIS mailing list, it is not too late.

By putting your name on this list, you may request:

- An email notice when the Draft EIS is released
- A printed summary of the Draft EIS
- The full document on a compact disc (CD)
- All of the above

To add yourself to the mailing list, contact Debbie Kramer by phone: (805) 416-0990, or by email: debbie.kramer@emcbc.doe.gov

For more information: <http://www.etec.energy.gov>; Ms. Debbie Kramer, 805-416-0990, debbie.kramer@emcbc.doe.gov



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ETEC CleanUpDate | JUNE 2016 | PAGE 6

