De Soto Avenue Facility
SEC-00246

Lara Hughes, PhD, CHP
Health Physicist
Division of Compensation Analysis and Support
Advisory Board on Radiation and Worker Health, 124th meeting
Providence, RI
August 23, 2018
## Previous related SEC classes

<table>
<thead>
<tr>
<th>Petition</th>
<th>NIOSH recommended SEC class</th>
</tr>
</thead>
<tbody>
<tr>
<td>SEC-00093</td>
<td>All covered employees, all areas of Area IV SSFL, Jan. 1, 1955 - Dec. 31, 1958 - based on lack of internal monitoring pre-1959</td>
</tr>
<tr>
<td>SEC-00156</td>
<td>All covered employees, all areas of Area IV SSFL, Jan. 1, 1959 – Dec. 31, 1964 - based incomplete bioassay data available to NIOSH pre-1965</td>
</tr>
<tr>
<td>SEC-00168</td>
<td>All covered employees, all areas of the DeSoto Avenue Facility from January 1, 1959 through December 31, 1964 - Based on incomplete bioassay data available to NIOSH pre-1964</td>
</tr>
<tr>
<td>SEC-00234</td>
<td>All covered employees, all areas of Area IV, SSFL, Jan. 1, 1965 – Dec. 31, 1988 - based on insufficient data to assess intakes from thorium and americium</td>
</tr>
<tr>
<td>SEC-00235</td>
<td>None (NIOSH evaluated Area IV, 1992-1994 for SSFL Area IV)</td>
</tr>
<tr>
<td>SEC-00246</td>
<td>None (Current De Soto evaluation)</td>
</tr>
</tbody>
</table>
SEC-00246 Petition

• Petition received December 13, 2017
  • Additional supporting documents received February 27 and March 29, 2018
  • Requested class: All workers who worked at the De Soto Avenue Facility in Los Angeles County, CA during the period from January 1, 1965 through December 31, 1995.

• Petition qualified on March 1, 2018
  • No modification to petitioner requested class

• Evaluation Report sent to ABRWH: July 5, 2018 (within 180 day timeframe)

• NIOSH recommended class to be added to SEC: None
De Soto Facility - Petition Concerns

- SEC-00234: Th and Am exposures cannot be reconstructed at Area IV
- Area IV and De Soto Avenue operated under the same H&S oversight
- Petition states americium and thorium were used at De Soto
  - SRE
  - TRUMP-S
  - SNAP
- Thorium fabrication work
- Controls for Environmental Pollution bioassay contractor (1992-1994)
De Soto Facility Claims, July 2018

Total Number of claims submitted for DR 292
Total number of claims for workers who worked during the period from January 1, 1965 through December 31, 1995 255
Number of DRs completed for the evaluated period (submitted to DOL) 210
Number of claims with internal dosimetry records for the evaluated period 64
Number of claims with external dosimetry records for the evaluated period 104
De Soto Facility - Site Description

• Located at 8900 De Soto Avenue, Canoga Park, CA
• Covered Period
  • DOE 1959-1995
  • Remediation 1998
• Two buildings involved in radiological work.
  • Bldg. 001 - Fuel fabrication
  • Bldg. 004 – R&D
    • Gamma Irradiation Facility (GIF)
    • Helium Mass Spectrometry Lab
De Soto Facility - Site Description – cont’d
De Soto Facility - Site History

• Facility constructed in 1959
  • Headquarters of Atomics International (AI)

• DOE operations 1959-1995
  • Engineering design and construction
  • Nuclear fuel fabrication 1959 – 1983
  • L-77 research reactor 1959 – October 1974 (fuel removed 1976)
  • Gamma Irradiation Facility (operated 1966 – 1994)
  • Helium Mass Spectrometer Lab
  • Radiochemistry Support
  • Space Nuclear Auxiliary Power (SNAP) program R&D 1955 - 1973
De Soto - End of Operations Timeline

• 1983 – Nuclear activities terminated except GIF and Mass Spec
• 1984 – Nuclear areas decontaminated and released for unrestricted use (except GIF and Mass Spec Lab)
• 1994 – GIF ceases operations
• 1995 – Mass Spec Lab operations end in May
• 1998 – DOE remediation period, D&D of Mass Spec Lab and GIF
De Soto Facility-Information Resources

- Site Profile, Site Coworker Studies (Internal and External), and Procedures
- NIOSH Site Research Data Base: ~ 3143 documents for all SSFL/AI related sites
- Existing claimant files
- Data base entered from worker radiological file images
- Documentation provided by petitioner
- Interviews with former De Soto Avenue/SSFL employees
De Soto Facility - Americium

- Some instances of Am storage/shipping from vault
- Licensed for source fabrication
- No indication of americium fabrication or operational use
- Interviews confirmed no operational use of Am
- No occupational exposure data for Am
- Only Am use in commercial products (i.e. smoke detectors)
De Soto Facility - Thorium

- Fabrication ThO$_2$ fuel simulant discs for transit capsule testing, May 1970
- Post-test analysis transit capsule testing – Bldg. 001 Hot Shop, June 1970
- Application for Thorium Oxide Material Users Permit (3/11/71)
  - Aerospace Corporation (non-covered, off-site work)
- Machining thorium metal plates, Feb. 1979
- Bioassay and air data available for both operations
- Small scale process, names of involved personnel available
De Soto Facility - Petition Concerns

• SRE: only Th fuel for SRE was fabricated and stored at Area IV
• SNAP: De Soto did reactor/fuel R&D before reactor operations at Area IV, no used fuel handling
• TRUMP-S: no indication program was ever operational, received material in storage until shipped off site
• CEP primary vendor for urine sample analysis in 1992-1994
• Nuclear facilities D&D complete except GIF and Mass Spec Lab
• SEC-00235, for Area IV, found no impact on feasibility of DR due to discarding CEP associated data
De Soto Facility - Internal Exposure

- Inhalation and Ingestion of radioactive contamination from unsealed materials from fuel production and radiochemistry operations
- De Soto internal exposure potential different from Area IV
- Mostly uranium from fuel production
  - Uranium-Aluminide (UA1x) fuel production for ATR
  - Special DR methodology developed for UA1x workers
  - Well documented exposure issue
- Thorium from episodic work in 1970 and 1979
- No indication ofAmericium exposure potential
Internal Monitoring Data

• Radiation workers in high contamination areas
• Workers handling unencapsulated radiological materials
• Special samples triggered by air sample results
• *In vitro* and *in vivo* routine monitoring of rad workers by job assignment
• De Soto Avenue had radiation protection procedures and the *Rocketdyne Radiological Controls Manual*
• Event/condition driven special sampling program
Thorium Dose Reconstruction

- 1970: production and post test analysis of simulated Th fuel disks
- 1979: machining of Th metal discs (dose bounding operation)
  - Limited containment and larger quantity
  - 8 day operation
- Operational details and worker rosters available
  - Baseline and post-work analyses for main operator (<MDA)
  - Lapel air sample results
- Intakes can be calculated based on 8 day chronic intake for natural thorium using <0.99 µg/d urine sample result for machining operator
- Doses can be assigned for natural Thorium based on calculated intakes and solubility assumptions
De Soto - Feasibility Conclusion

- Fuel fabrication operations present no dose reconstruction infeasibility
- Bioassay is generally available after 1965
- ORAUT-OTIB-0080 coworker available for potential unmonitored internal exposures
- No operational americium exposures identified
- Thorium campaigns in 1970 and 1979 have thorium-specific personnel and workplace monitoring and doses can be bounded
- Lack of CEP data does not affect NIOSH’s ability to perform sufficiently accurate internal dose reconstructions
# De Soto Facility - Summary

**Feasibility Findings for De Soto SEC-00246 after January 1, 1965**

<table>
<thead>
<tr>
<th>Source of Exposure</th>
<th>Dose Reconstruction Feasible</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal</td>
<td></td>
</tr>
<tr>
<td>- all radionuclides</td>
<td>X</td>
</tr>
<tr>
<td>External</td>
<td></td>
</tr>
<tr>
<td>- Beta-Gamma</td>
<td>X</td>
</tr>
<tr>
<td>- Neutron</td>
<td>X</td>
</tr>
<tr>
<td>- Occupational Medical X-ray</td>
<td>X</td>
</tr>
</tbody>
</table>