

Carson River Mercury Superfund Site

Operable Unit 2 Update

Feasibility Study Overview

Carson Water Subconservancy District
November 30, 2018
Carson City, NV



Carson River Mercury Site Team

- U.S. Environmental Protection Agency (EPA)
- Nevada Division of Environmental Protection (NDEP)
- Fallon Paiute Shoshone Tribe (FPST)



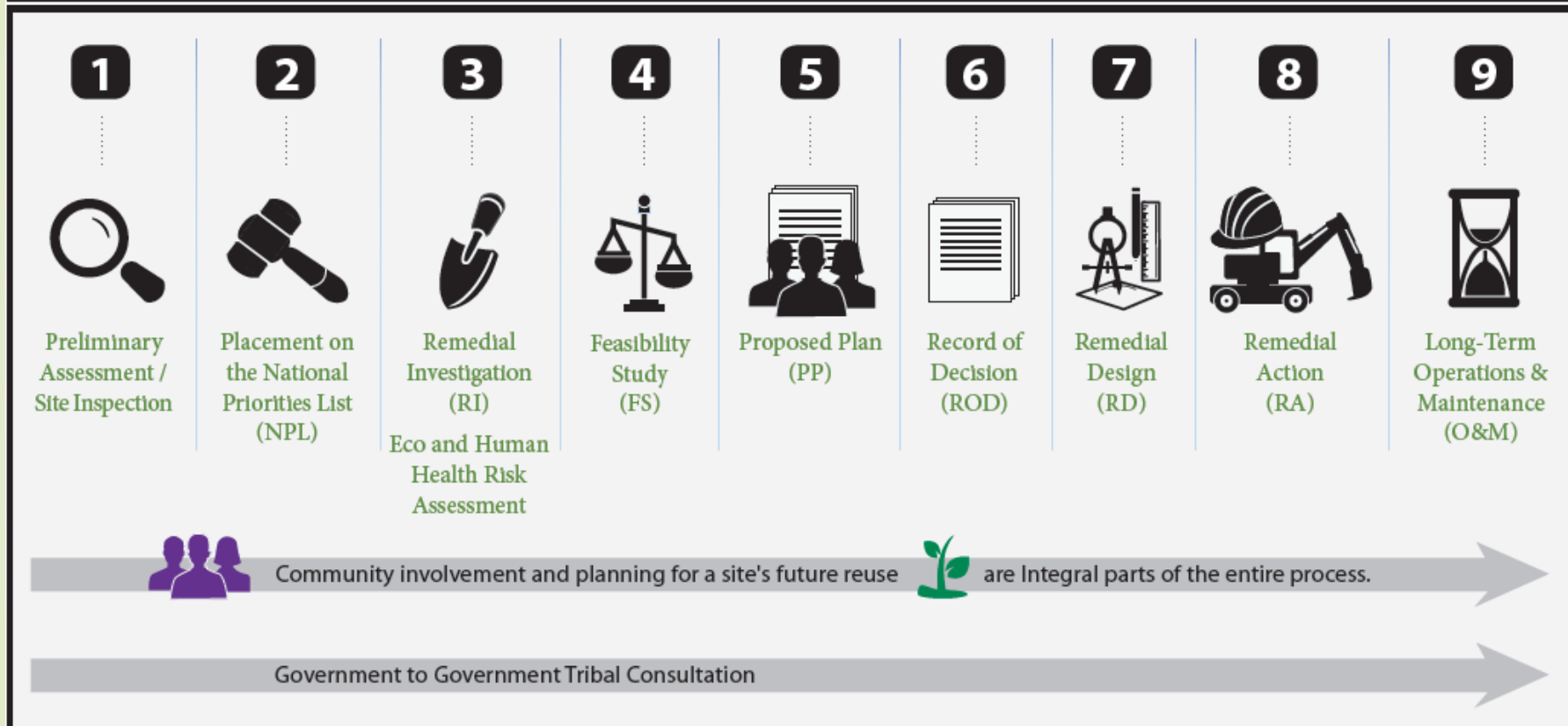
Topics

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- Superfund Process
- Contamination at the Carson River Mercury Site (CRMS)
- Feasibility Study
 - Update Human Health risk assessment
 - Technology Review
 - Develop Remedial Alternatives
- Next steps
 - Proposed Plan, Administrative Record and Public Comment
 - Record of Decision



The Superfund Process

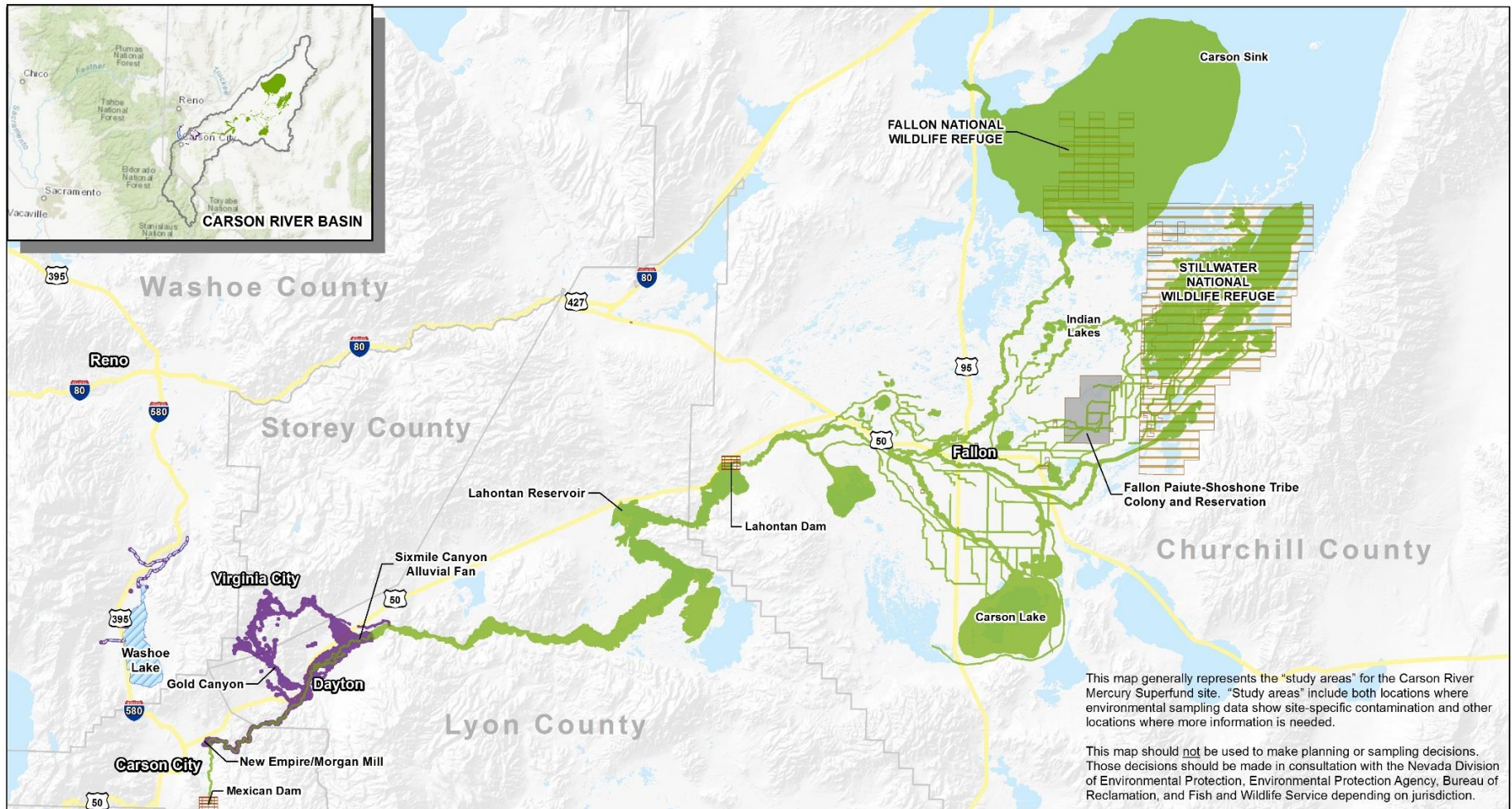


Operable Units

Superfund sites are large and complex. Often, we divide sites into smaller, more manageable projects called operable units (OUs). CRMS Site has two OUs:

1. Upland/Source Areas
2. River channel including floodplain, sediments, and biota (divided into four subareas)





Draft

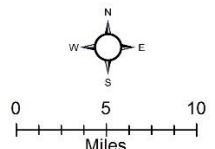


Carson River Mercury Superfund Site

U.S. Environmental Protection Agency

Fallon Paiute-Shoshone Lands
 Operable Unit 1 (OU1) Study Area
 Operable Unit 2 (OU2) Study Area
 Dam
 Wildlife Refuge*
 Study Area

*Fallon National Wildlife Refuge and Stillwater National Wildlife Refuge are part of the Stillwater Wildlife Refuge Complex.



Superfund Milestones - Carson River Site

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1860's – mercury contamination from Comstock-era mills

1990 – Superfund National Priorities List, initial removals

1992 – EPA studies begin on Operable Unit 1 (source) and OU2 (river/lakes)

1995 – OU1 Record Of Decision (ROD) signed

1999 – cleanup of five yards in Dayton and one in Silver City

2000-2013 surface water, banks & sediment studies

2014 – bilingual health advisory signs at Lahontan Reservoir, Washoe Lake and access points along the river.

2015 – additional OU2 fieldwork

2017 – Remedial Investigation and risk assessment released

2018 – updated the Long-Term Sampling and Response Plan (LTSRP)

11/30/2018

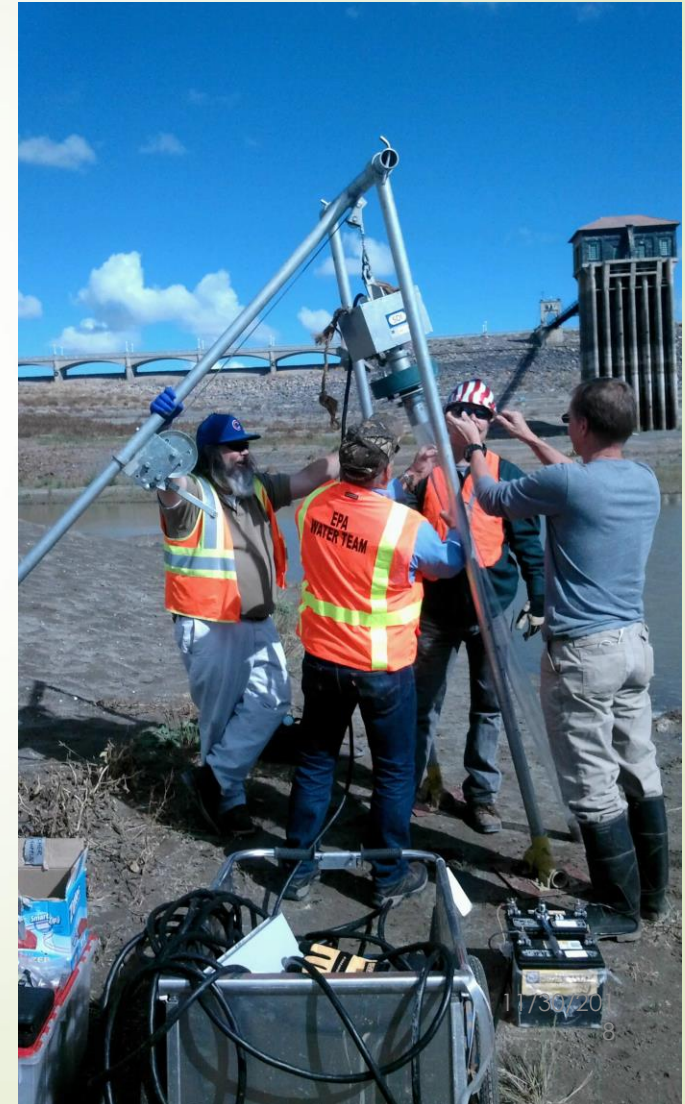


Carson River OU2 Process

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The final remedial investigation report issued April 2017:

- wealth of existing data – informed the risk assessment
- completed map coverage
- identified obvious datagaps
- coordinated with State, Tribes, local and Federal government experts throughout process
- informed the community



Contamination - Carson River OU2

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Remedial investigation (RI) findings:

- Estimated 7,500 tons of mercury was lost to the environment during Comstock era
- Mercury is deep in the old channels, but released during river bank erosion or construction from meander scars (1997)
- 1997 flood transferred contaminated sediments from the OU2a to OU2b area, with little impact to the river reaches beyond the Lahontan Reservoir
- Estimate that 80-90% Hg is trapped in Lahontan Reservoir
- Elemental mercury trapped in river and Reservoir sediments converts to methylmercury (bacteria) through the food chain, reaching extreme levels in sport fish, such as walleye and wiper



Results of risk assessment fish, waterfowl and wild plants

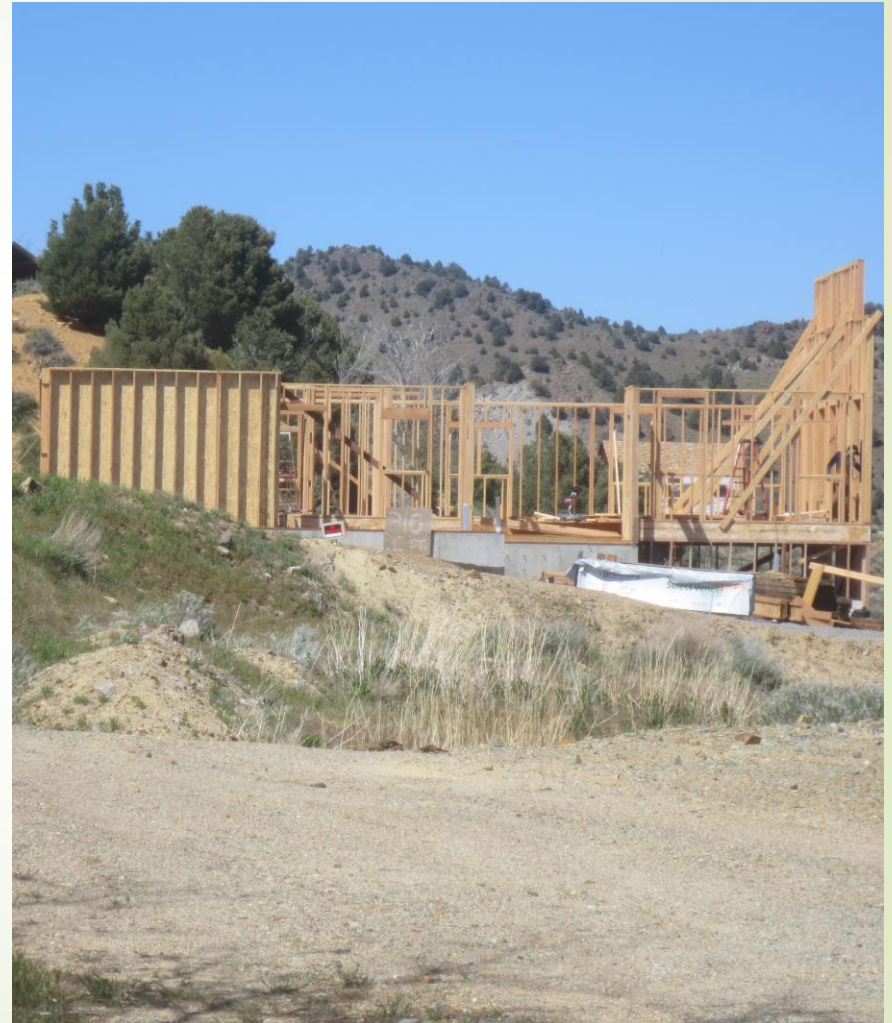
Studied mercury exposure
from the food-chain

- Eating **fish** is a serious health risk:
 - Sacramento blackfish commercially harvested and sold at Asian markets
 - child consuming fish from Lahontan Reservoir and up river
 - Tribal lifestyles - eating large amounts of fish caught throughout OU2 (although not actually on the Fallon Paiute Shoshone Reservation)
- Eating **wild plants and waterfowl** is only a human health risk to traditional **tribal lifestyles beyond the FPST reservation.**



Other risk considerations

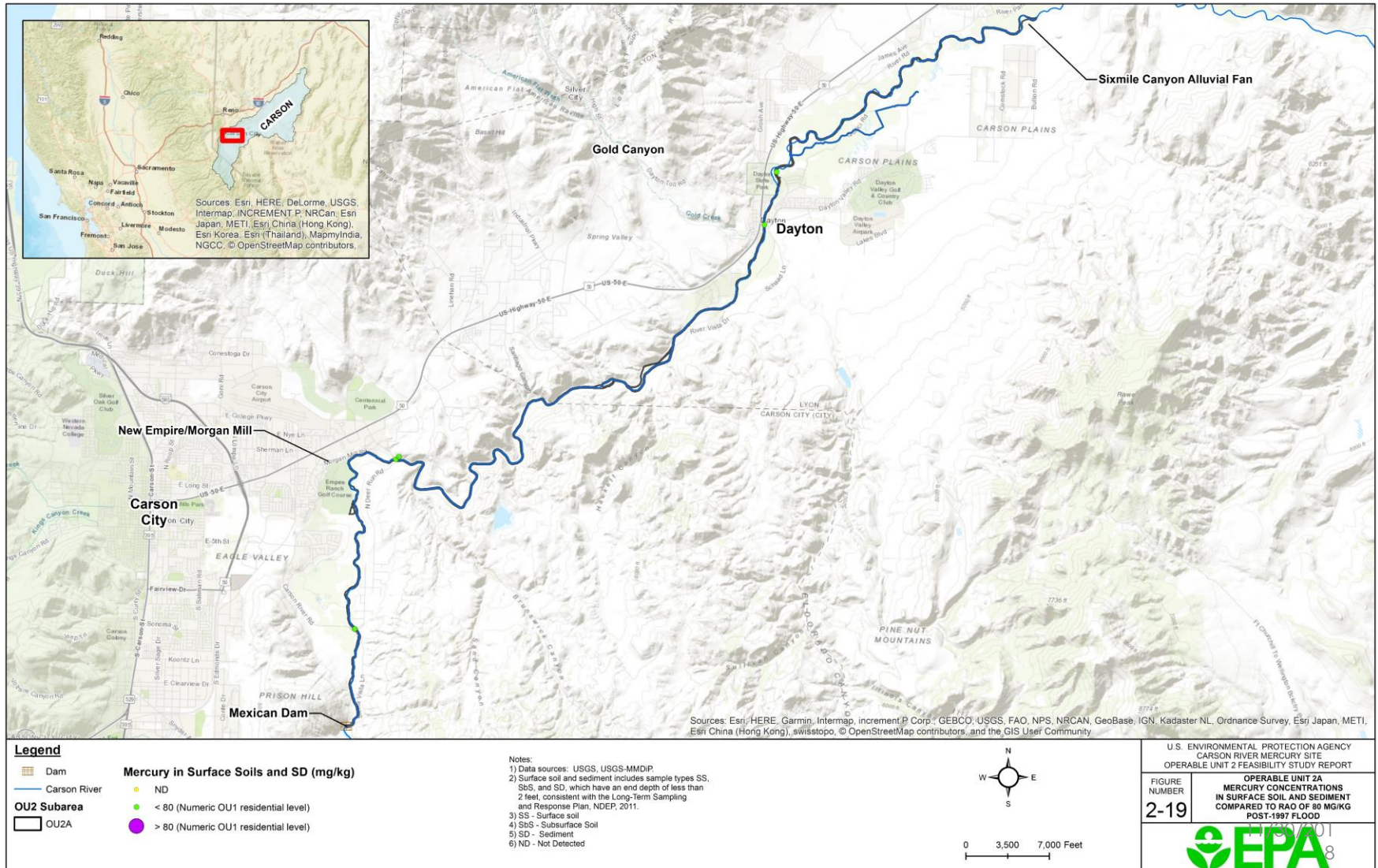
- Existing residences in the floodplain may be at risk in areas that have not been sampled
- Future development in the floodplain is a potential future risk in areas that have not been sampled



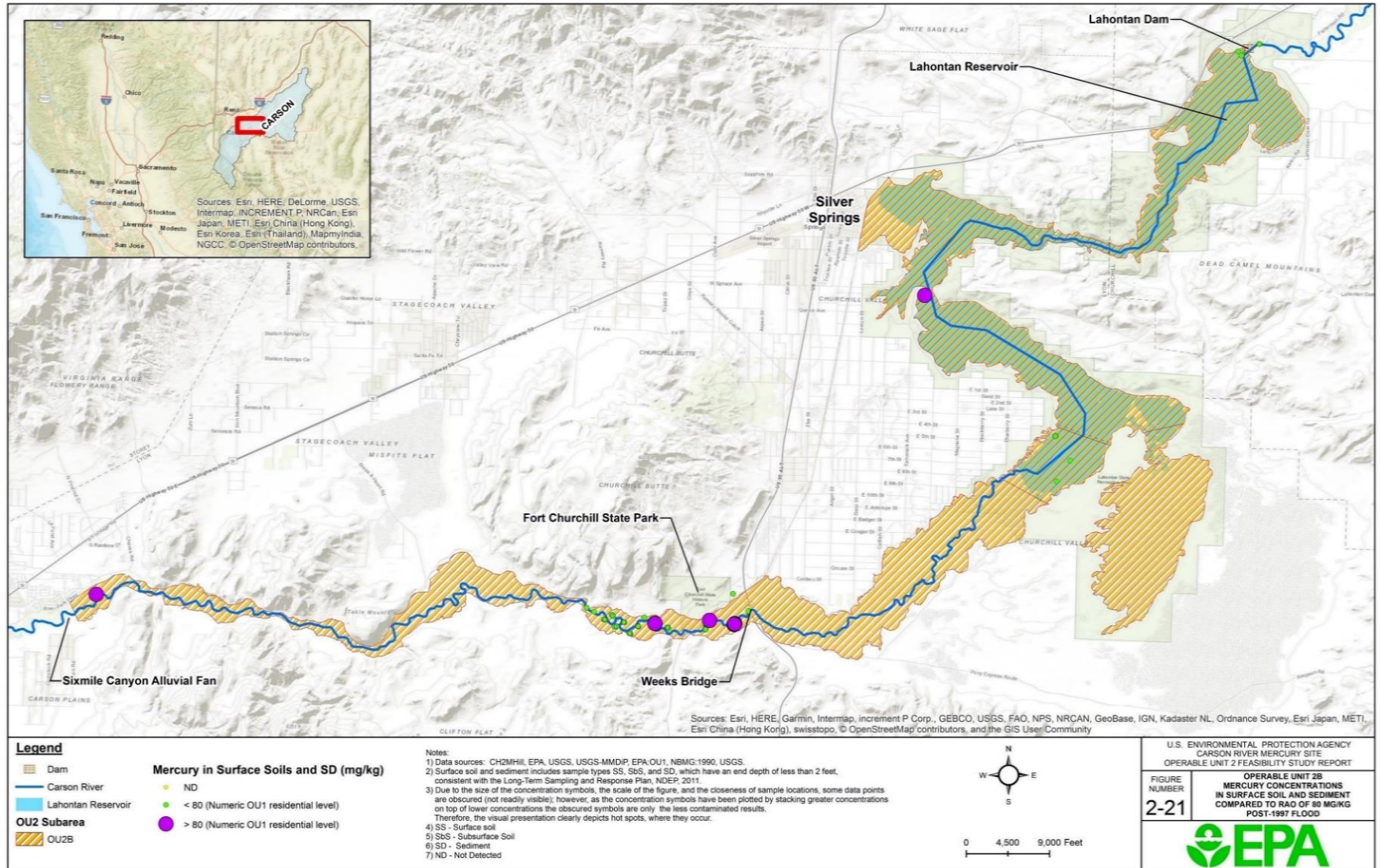
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OU2a: Mexican Dam to the eastern edge of Sixmile Canyon fan (river channel only)

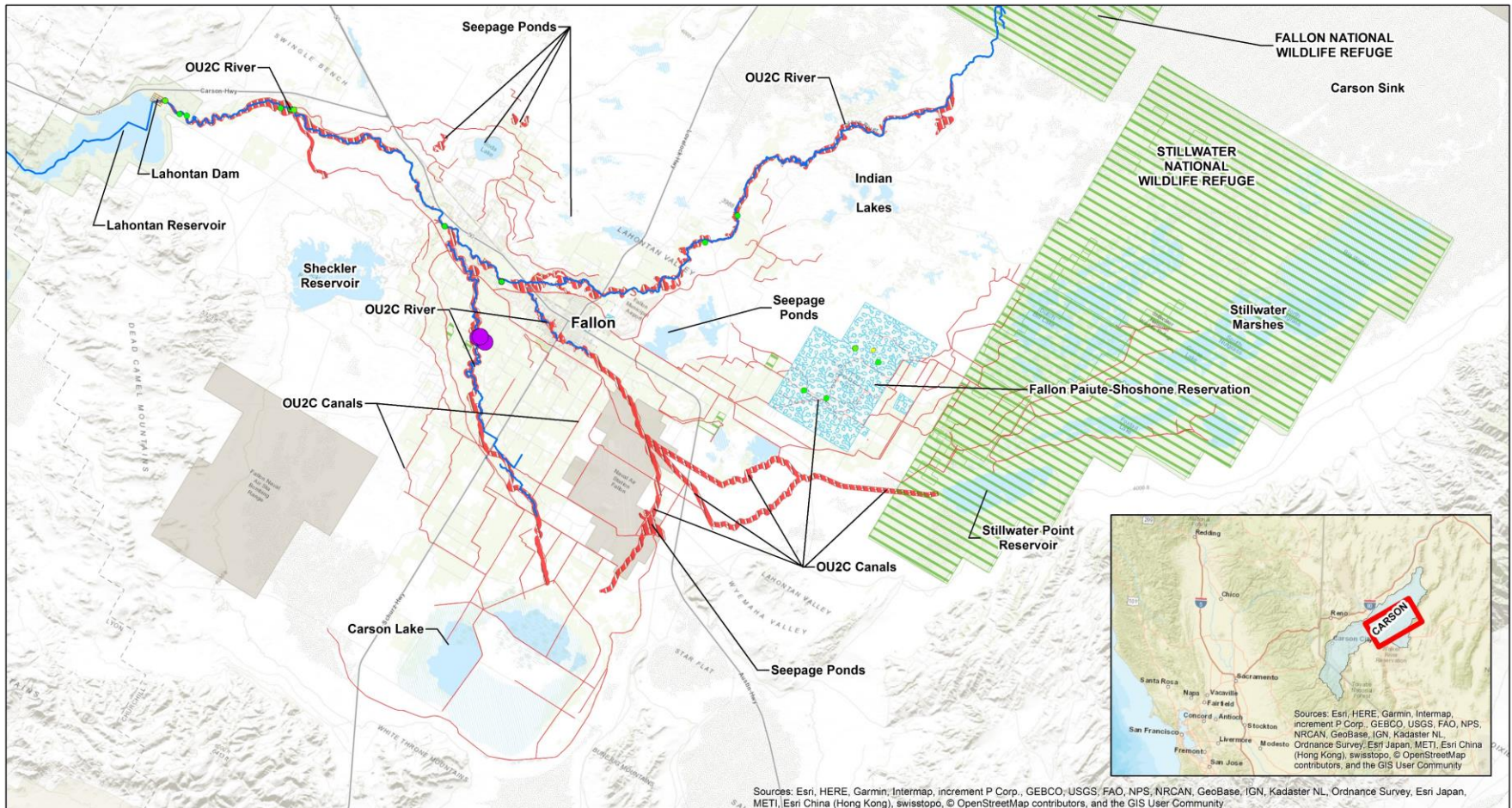


13 OU2b: Sixmile Canyon fan to Lahontan Dam



OU2c: Lahontan Dam to terminal wetlands, including canals and drains

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Legend

- Carson River
- Stillwater Wildlife Refuge Complex
- Fallon Paiute-Shoshone Lands
- OU2 Subarea
- OU2C

Mercury in Surface Soils and SD (mg/kg)

- ND
- < 80 (Numeric OU1 residential level)
- > 80 (Numeric OU1 residential level)

Notes:

- 1) SS and SD data: EPA, EPA/OU1, USGS, USGS-MMDIP
- 2) Surface soil and sediment includes sample types SS, SsS, and SD, which have an end depth of less than 2 feet, consistent with the Long-Term Sampling and Response Plan, NDEP, 2011.
- 3) Due to the size of the concentration symbols, the scale of the figure, and the closeness of sample locations, some data points are obscured (not readily visible); however, as the concentration symbols have been plotted by stacking greater concentrations on top of lower concentrations the obscured symbols are only the less contaminated results. Therefore, the visual presentation clearly depicts hot spots, where they occur.
- 4) SS - Surface soil
- 5) SsS - Subsurface Soil
- 6) SD - Sediment
- 7) ND - Not Detected



0 1.5 3 Miles

U.S. ENVIRONMENTAL PROTECTION AGENCY
CARSON RIVER MERCURY SITE
OPERABLE UNIT 2 FEASIBILITY STUDY REPORT

FIGURE
NUMBER
2-23

OPERABLE UNIT 2C
MERCURY CONCENTRATIONS
IN SURFACE SOIL AND SEDIMENT
COMPARED TO RAO OF 80 MG/KG
POST-1997 FLOOD



Feasibility Study

We evaluated cleanup technologies that could be used to treat contaminated soils/sediments and surface water, including:

- Land Use Controls
- Monitoring
- Containment (capping/barriers and bank stabilization)
- In-situ treatment
- Ex-situ treatment



Technology Review

- Removal
(dredging and excavation)
- Disposal
- Beneficial Reuse
- Sediment Management



Development of Alternatives

Remedial alternatives were developed from the technologies most suitable to address the site-specific conditions for CRMS OU2. Four remedial alternatives were developed to address risks:

- **Alternative No. 1** - No action
- **Alternative No. 2** - Land use controls (LUCs)/institutional controls (ICs) and Monitoring
- **Alternative No. 3** - Same as No. 2, plus limited areas of riverbank stabilization with sediment excavation and disposal
- **Alternative No. 4** - Same as No. 3, plus limited areas of riverbank and river bed removal and disposal



Alternative 1: No action

- No remedial action taken to address risks
- EPA required by law to consider



Alternative 2: Land use controls/institutional controls and monitoring



- No active remediation of the site
- Reduces exposure to risks by managing site activities
- Land use controls:
 - Fish and wild plant advisories
 - Stop commercial fishing
 - Stop stocking sport fish
 - Wild plant/waterfowl consumption advisories
- Soil sampling and management for construction activities
- monitoring of surface water and sediments
- Implementation will require the active involvement of principal stakeholders

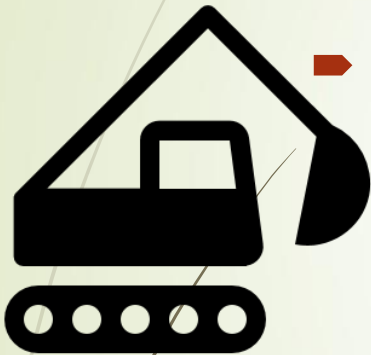


Alternative 3: Limited areas of riverbank stabilization with sediment excavation and disposal, LUCs and monitoring

- Everything in Alternative 2, plus:
 - annual inspections will be performed as part of the long-term monitoring program. The inspections will include identification of areas of new erosion from major flood events or high flow conditions
 - limited areas of riverbank stabilization with sediment excavation and disposal (or beneficial reuse such as road bed construction)
 - stabilization of the riverbank using rock, a vegetative cover, or a combination of rock and vegetative cover as appropriate for location



Alternative 4: Limited areas of riverbank and river bed removal and disposal, riverbank stabilization, LUCs and monitoring



- Everything in Alternative 2 and Alternative 3, plus:
- removing limited areas of **riverbed** to capture contaminated riverbed sediments for permanent removal from the Carson River drainage.

Note: Alternatives 3 and 4 do not apply to the terminal wetlands



What comes next?

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- complete the FS report (Dec 2018)
- additional outreach in the Spring
- using the nine CERCLA criteria, determine a preferred remedy plan (“alternative”)
- present the Proposed Plan to the public and hold a formal comment period (Fall 2019)
- EPA Record of Decision (remedy plan) and response to comments (2020)
- design the remedy (2021)
- implement remedy (2022)
- outreach, reuse and redevelopment (ongoing)



Teamwork and collaboration

