

left at the plant site. Flooding in 1964 reportedly washed all traces of tailings that had been left on the sand and gravel bar into the Trinity River.

Acid runoff from the Site continued to leach the remaining tailings in the plant area. Elevated levels of metals in Site soils were identified in samples collected by the California Department of Health Services in July 1981. In August of the same year, EPA received a Notification of a Hazardous Waste Site under the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) from the State. The Site was placed on the California State Priority List in April 1982, then included on the National Priorities List (NPL) in September 1983.

#### *Initial Response*

In December, 1983, EPA completed a Removal Action (also called the initial remedial measure) in which all visibly contaminated material (tailings, non-concrete structures, and a portion of the adjacent pasture) were removed. Approximately 1,400 cubic yards of contaminated material were taken to the IT Corporation Class I hazardous landfill in Benicia, California.

#### *Remedial Investigation and Feasibility Study (RI/FS)*

The Remedial Investigation/Feasibility Study was completed on June 28, 1985, and a Record of Decision (ROD) was signed by the Regional Administrator on September 30, 1985, which selected excavation and off-site disposal of the remaining contaminated soils.

#### *Remedy Selection*

The ROD for the Celtor Chemical Works Site was signed on September 30, 1985. The primary human health threats posed at the Site were (1) direct contact with soils contaminated with arsenic, copper, cadmium and lead, and (2) consumption of surface water runoff from the Site or in the drainage ditch, which sometimes exceeded Maximum Contaminant Levels for copper, iron, lead and zinc. The remedial action objective was to prevent human exposure to soil and water contaminated with arsenic, copper, cadmium, zinc, mercury, selenium, cyanide and lead at concentrations that may pose a public health or environmental threat.

The remedial actions of the 1985 ROD were: demolition and removal of structures, excavation of soils contaminated above action levels from all Site areas, import clean fill as necessary, regrade and vegetate the Site, and install security fencing to protect new vegetation. No groundwater

treatment was necessary because the aquifer was not contaminated.

Following signature, the ROD was amended twice. The first amendment corrected an error in the copper action level and the second amendment added additional standards for mercury, selenium, and cyanide in soils. The additional cleanup standards were added as precautionary measures; subsequent sampling showed all three metals to be below action levels.

#### *Remedy Implementation*

In August 1986, EPA entered into an interagency agreement (IAG) with the U.S. Army Corps of Engineers for the remedial design. The Corps retained Aqua Resources, Inc. of Berkeley to plan the remedial action.

The remedial design was completed by Aqua Resources, and approved by EPA on June 9, 1987. The design plan was divided into six areas designated A–F to be excavated to various depths. After excavation, soil samples were to be taken at designated grid points for all the contaminants of concern. It was estimated that 3,220 yards of soil and 890 tons of concrete were to be removed and transported to the EnviroSAFE Services RCRA approved Class I Landfill in Grandview, Idaho. Environmental Health Research and Testing, Inc. (EHRT) was contracted to carry out the remedial action work. Shortly into the remediation, EHRT submitted a Value Engineering Change Proposal (VECP) to perform deeper and more thorough sampling to reduce the volume of soils excavated. This change was accepted and decreased the actual volume of soil excavated and transported to the Idaho Class I landfill to 1,163 cubic yards. Another post-design change was in the sampling depth of the concrete.

On December 9, 1987 the Site was closed down for the winter season, and activities resumed again on May 11, 1988. All backfilling and revegetation was completed on October 14, 1988, marking the beginning of a one year post-remedial maintenance period.

At any location where contaminants were detected above action levels, additional soil was excavated and removed to the approved off-site landfill. The removal of contaminated material and subsequent confirmatory sampling of remaining on-site soils ensured that all contamination was removed from the Site according to the guidelines set forth in the Quality Assurance Project Plan (QAPP). On February 20, 1989, the Corps sent the Final Technical Report to EPA describing all of the construction activities and the sampling data.

#### *Operation and Maintenance*

The operation and maintenance (O&M) was performed for a one-year period by the U.S. Army Corps of Engineers. O&M efforts included monthly site visits to inspect for evidence of erosion and problems with revegetation, and maintenance of the perimeter fence.

#### *Five-Year Review*

The initial Five Year Review conducted in 1993 found the Site to be in good condition, with a healthy cover of vegetation and no evidence of erosion. A wood-staked wire fence had been constructed around the pasture which had been remediated during the remedial action. The 1993 review concluded that the Site required little or no maintenance. However, the Hoopa Valley Indian Tribe subsequently raised concerns about residual contamination remaining at the Site. On September 20, 1995, EPA collected 14 biased samples from the Site at the request of the Hoopa Tribe. Samples were collected from three distinct areas of the Site, including the former facility hillside, the access road leading down to the river, and the gravel bar between the drainage ditch and the Trinity River where it was reported a large pile of mine tailings had once stood before they were washed away by the 1964 flood. Of the 14 samples, 4 samples had levels of contaminants above the ROD clean-up goals.

On April 22, 1996, EPA's Emergency Response Team performed additional, more extensive sampling at the Site to verify that the cleanup was complete. A total of 26 soil and sediment samples were collected and analyzed by screening with the x-ray fluorescence (XRF) spectrometer, and six soil samples were sent to a lab for confirmatory analysis. Soils were also analyzed for pH. Hillside soil samples from the former plant site contained minimal levels of copper, and traces of copper were also found in the river access road cut area and the drainage ditch but samples at both sites were well below action levels for the Site. No detectable contamination was found in samples collected from the borrow pit. However, analysis of samples collected from stained areas on the gravel bar indicated these sediments may have levels of copper, lead and arsenic in excess of the cleanup level.

Since 1996 no stained sediments have been observed on the gravel bar by EPA or the Tribe. The gravel bar, hillside, and gully that connects the Site to the Trinity River were sampled in 2002. No Contaminants of Concern (COCs) were