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Agency

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EPA

Superfund At Work

Hazardous Waste Cleanup Efforts Nationwide

Western Processing Company, Inc. Site Profile

Site Description: Former waste processing facility

Site Size: 13 acres

Primary Contaminants: Volatile organic compounds (VOCs), polychlorinated biphenyls (PCBs), and heavy metals including lead, cadmium, and zinc

Potential Range of Health Risks: Central nervous system disorders and a variety of cancers

Nearby Population: 10,000 people within 3 miles

Ecological Concerns: Surface water and sediments in Mill Creek

Year Listed on NPL: 1983

EPA Region: 10

State: Washington

Congressional District: 8

Success in Brief

Private Parties Use Innovation In Cleaning Up Reclaimer's Wastes

The Western Processing plant in Kent, Washington once served an industrial purpose reclaiming and disposing of hazardous wastes. The company recycled hazardous substances such as spent solvents, pesticides, and paints to produce reprocessed products such as fire retardants, fertilizers, and pigments. But careless storage and handling practices took an enormous toll on the environment: acids, heavy metals, and other toxic substances seeped into the soil and polluted ground and surface water.

Using Superfund authority, the U.S. Environmental Protection Agency (EPA) reduced immediate risks by stabilizing the site and removing almost a million gallons of hazardous liquid wastes. Based on a series of negotiations, cooperative cleanup efforts are now estimated to cost over $100 million when complete. Projects were undertaken by the parties responsible for the hazardous waste, led by The Boeing Company, and included some notable features:

- Use of a new technology to treat dioxin-tainted waste; and
- Design of a state-of-the-art ground water extraction system to remove a complex mix of subsurface contaminants.

Last spring, scientists began piloting two innovative technology studies, bioremediation and metals-fixation, to reduce chlorinated solvent and heavy metal concentrations in ground water.

Worker sprays gravel to cover a "hot spot" in Mill Creek.

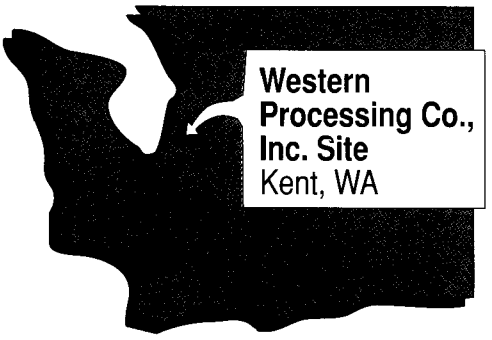
The Site Today

Cleanup crews have taken most of the steps necessary to achieve cleanup standards at the Western Processing site. A pump-and-treat system for contaminated ground water is operational and includes 10 new wells installed last summer to speed extraction of VOCs. Reclamation of heavily contaminated surface water and soil enables the site to support plants, birds, animals, and aquatic life in the Mill Creek ecosystem.

A Site Snapshot

The Western Processing Company, Inc. site is located in King County, about 20 miles south of Seattle. The company originally reprocessed animal byproducts and brewer's yeast.

In the 1960s, the company expanded into reclaiming, recycling, and disposing of hazardous materials, including electroplating solutions, flue dust from steel mills, waste oils, paints, spent solvents, pesticides, zinc dross, and battery acids. As one of few such approved facilities in the region, Western Processing did a brisk business until pollution problems closed the doors in 1983.



Over a 20-year period, the company operated as a permitted hazardous waste facility receiving industrial wastes from several hundred businesses. The operators accepted almost 6,000 drums, 72 bulk tanks, and numerous transformers and other containers; untrained workers mixed chemicals in open waste piles and lagoons. Spills and accidents contaminated a shallow underground aquifer and Mill Creek, one of a series of tributaries that empty into Puget Sound.

Although contaminated ground water from the site is not being used by area residents, approximately 10,000 people live within three miles of the site; 2,000 depend on ground water for household use. More than 90 of EPA's 126 priority pollutants were found in the ground water, soil, and surface water, including volatile organic compounds (VOCs), polychlorinated biphenyls (PCBs), and heavy metals such as lead, cadmium, and zinc.

EPA Directs Pioneering Cleanup Effort

Poor Waste Handling Practices

Over the years, the Kent Fire Department had noted conditions at the site because of the fire and explosion potential. In addition, the Washington State Department of Ecology (Ecology) had attempted to control wastewater discharges from the site, with little success. In March 1981, EPA inspected the site to determine compliance with the Resource Conservation and Recovery Act (RCRA). This law enables EPA and state authorities to track hazardous wastes from "cradle" (point of production) to "grave" (final disposal).

EPA found numerous RCRA violations at the site, including evidence of frequent spills, large uncontained piles of waste, and storage of hazardous by-products in unlined impoundments. Surface water, soil, and ground water were polluted to various degrees.

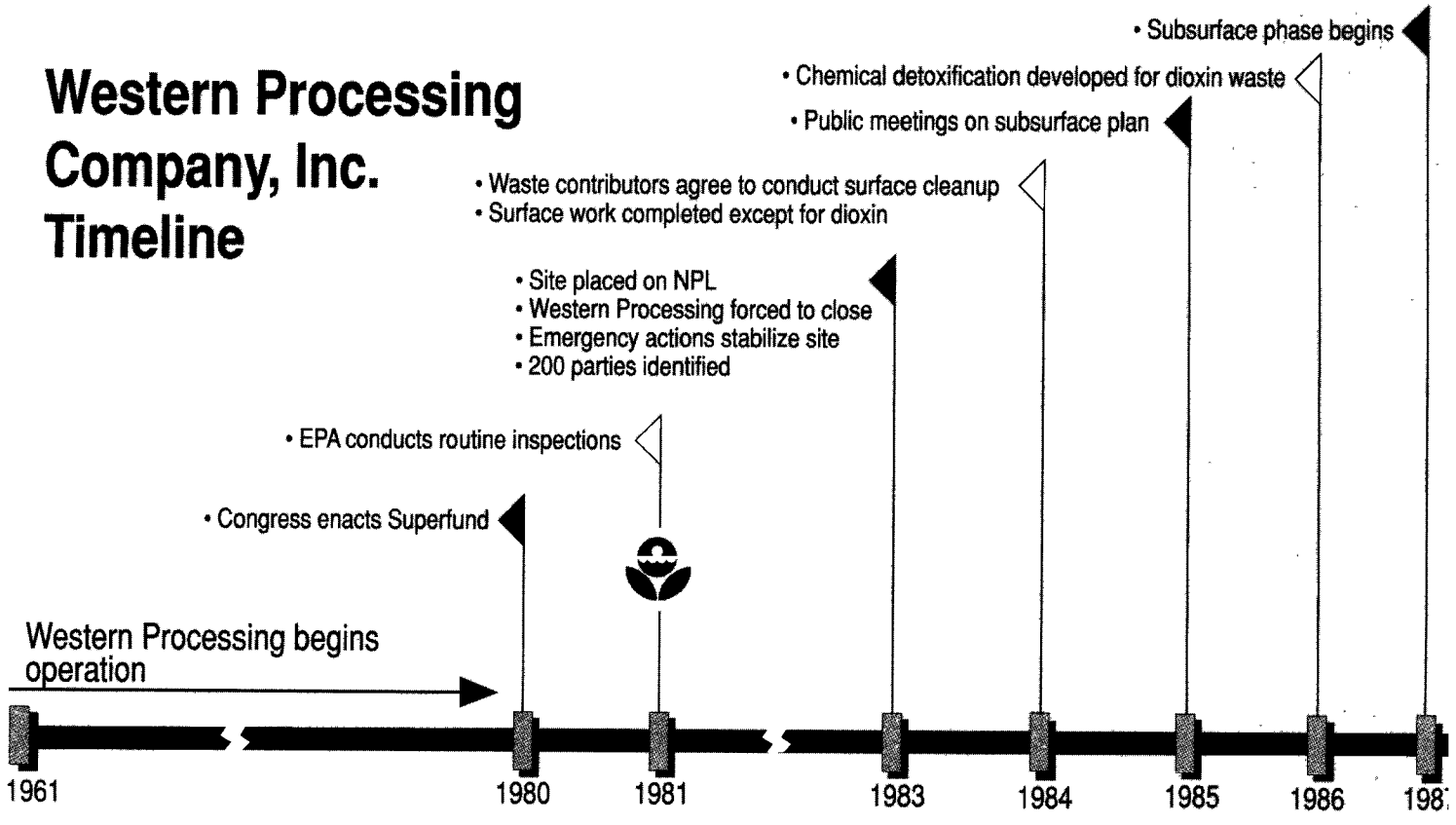
Superfund Takes the Lead

Western Processing was one of thousands of problem industrial sites that brought about passage of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA). This law established a federal program to clean up the myriad problems associated with improper hazardous waste disposal. Instead of using taxpayer dollars, EPA uses a "Superfund" derived from environmental taxes on crude oil and chemical feedstocks.

Because of the severity and extent of pollution, EPA proposed to add Western Processing to the National Priorities List (NPL), EPA's roster of serious uncontrolled or abandoned hazardous waste sites requiring comprehensive cleanup.

No taxpayer dollars are in the "Superfund"

EPA ordered the owners to cease operations and to provide assurances of a timely cleanup. When the owners failed to take action, a court order closed the plant and EPA assumed responsibility for directing the cleanup.



EPA Stabilizes Site

In April 1983, EPA conducted an emergency removal of 920,000 gallons of hazardous wastes including PCB liquids, solidified paint sludges, recycled solvents, and mixed contaminated liquids.

In addition, EPA capped a solid waste pile with a flexible, impermeable cover and regraded portions of the site to ensure that contaminants did not spread further. Ecology also installed storm water controls to minimize the risk of contaminants entering Mill Creek.

Dioxin Dechlorination Aids Surface Cleanup

Early site investigations revealed multiple problems above and below ground, and so cleanup crews embarked on a two-phase plan. In July 1984, EPA and Ecology supervised a group of responsible parties who transported bulk liquids to a federally approved facility for disposal or incineration. This group also removed and disposed of transformers and substation equipment, demolished on-site buildings, and dismantled and removed bulk storage tanks.

More than 2,400 truckloads of chemical wastes, contaminated soil, and debris were removed from the surface, minimizing further contamination of soil, ground water, and surface water. Crews graded the site and installed a storm water collection and treatment system to discharge into the local wastewater treatment plant.

By the end of 1984, only one tank remained on site containing 7,400 gallons of a dioxin-contaminated oily liquid. A by-product of the manufacture of pesticides and herbicides, dioxin is a stable and highly toxic compound with limited disposal or treatment options.

Following a two-year search aided by EPA Research and Development laboratories, the Remedial Project Manager selected chemical dechlorination. The process featured an on-site mobile treatment unit that removed the chlorine from the dioxin with a low-temperature,

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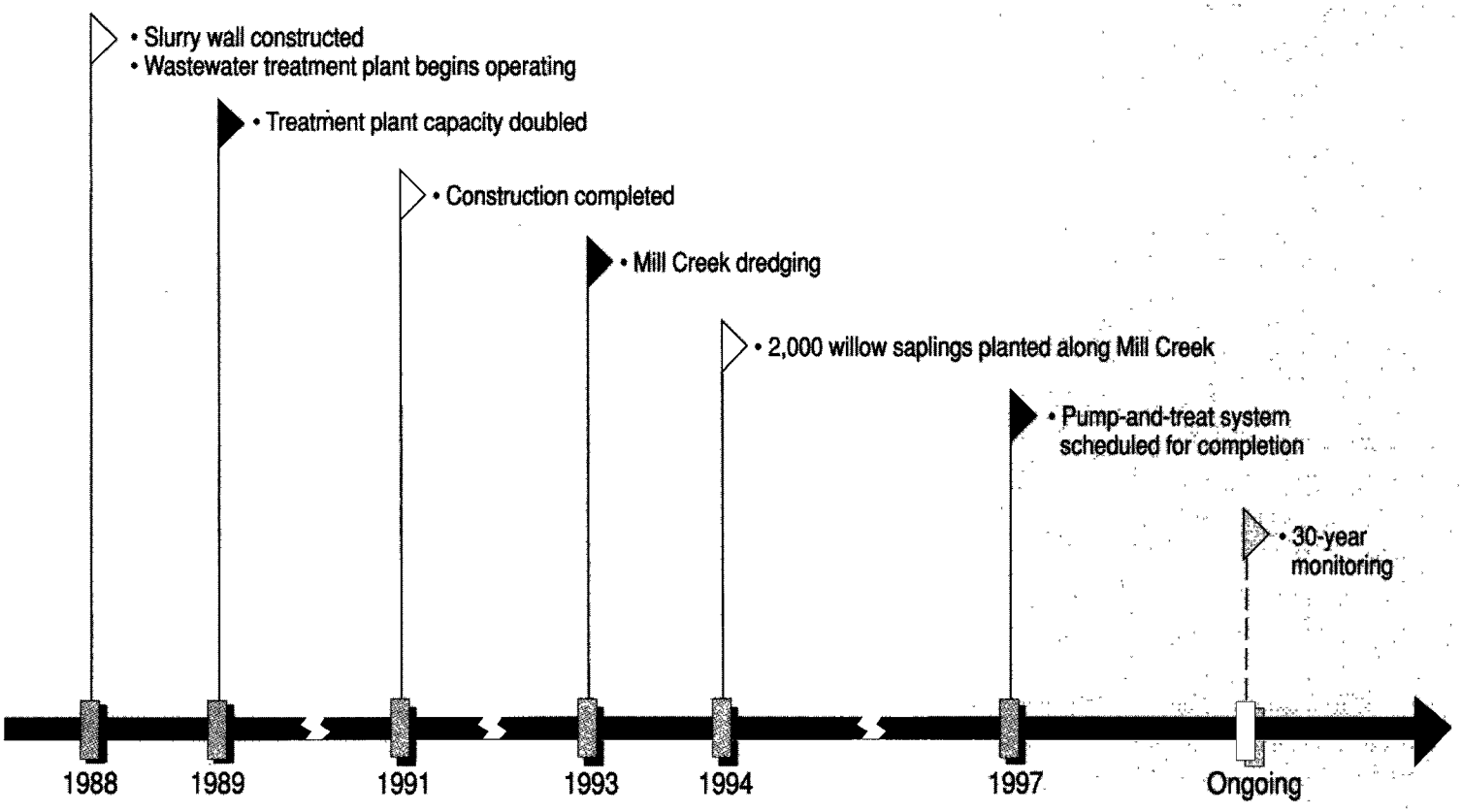

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low-pressure reaction that emitted no pollutants or contaminated air. The success of this process paved the way for use at other hazardous waste sites.

Subsurface Cleanup Poses New Challenges

While conducting the surface cleanup, EPA tried to locate waste generators, but many had moved, gone out of business, or were operating under new management. The Boeing Company, the largest single contributor, organized a coordinating committee which allocated cleanup costs based on the amount of hazardous waste each had contributed (the "volumetric share").

EPA, Ecology, and the responsible parties then began organizing a complex subsurface cleanup. A wide range of "toxic soups" had accumulated in underground pockets of the site's irregular geology. Specialists in hydrogeology, engineering, chemistry, and other fields helped to develop an effective cleanup plan.

In March 1985, EPA held the first of four public meetings at Kent City Hall. EPA representatives fielded questions from community groups and city officials who expressed satisfaction to be involved in the decision-making process. In addition, community involvement coordinators issued regular fact sheets about cleanup progress, set up convenient information repositories, and encouraged local residents to watch the work from a viewing tower built at the site.

Subsurface Cleanup Begins

In September, 1985 EPA selected a plan that included excavation of highly contaminated materials, selective excavation of off-site soils, and a pump-and-treat system for polluted ground water. Specific water quality standards were imposed for surface water in Mill Creek and for a plume of contaminated ground water that was migrating from the site. The plan also included excavation of contaminated sediments from Mill Creek.

Following a second public comment period and a series of negotiations, the waste contributors signed a settlement agreement that went into effect in April, 1987. In three short months, construction crews excavated and hauled away approximately 25,000 cubic yards of contaminated soil to an approved hazardous waste landfill. Their elaborate trucking operation including building temporary roads and setting up staging, lining, covering, and vehicle decontamination areas. EPA scheduled and coordinated these operations in consultation with local officials and residents.

Innovation Marks Ground Water Cleanup

The large number of variable concentrations and distribution patterns of pollutants in the irregular geology required a ground water cleanup strategy that was both innovative and flexible. Cleanup engineers designed a customized pump-and-treat system that required installation of more than 200 extraction wells and three vacuum pumps to withdraw contaminated water for treatment.

A slurry wall, a deep, vertical barrier that surrounds the site to a depth of 45 feet, confined the contaminated ground water, increased pumping efficiency, and prevented pollutants from spreading.

An on-site wastewater treatment plant began operations in October 1988. Modifications installed in 1989 increased the treatment capacity from 100 to 200 million gallons per minute and reversed the process so that metals treatment precedes air stripping. Treated water enters the city sewer system under a state permit. The Pacific Northwest International Section of the Air Pollution Control Association recognized the air strippers, the part of the water treatment system that removed VOCs,with an award for the carbon regeneration unit.

Mill Creek Restored

Workers completed major construction activities at Western Processing in December, 1991. Final cleanup requirements for the site included dredging portions of Mill Creek and replanting the banks. Removal of creek

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Cleanup Effort

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bottom sediments started in July, 1993 after installation of fish barriers in the stream. Rocks and anchored logs later installed in the streambed enhanced fish habitat. Some 2,000 willow cuttings were planted on the restored banks in March, 1994.

Eighty new extraction wells began operating in November to intercept a shallow ground water plume between an east drain and the slurry cutoff wall. By reducing the concentration of heavy metals in ground water, sediments and water quality will be minimally affected in Mill Creek.

Success at Western Processing

Significant achievements at this Superfund site included immediate removal of thousands of gallons of chemical wastes and use of a new dioxin detoxification process. An award-winning ground water pump and treat system has enabled many species of fish and wildlife to return to rebuild the surrounding ecosystem.

In addition, waste contributors cooperated to complete major construction activities in four years and reimbursed EPA for costs of emergency activities. Communications with the public ensured that citizens were involved in the remedy selection process.

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