COLSF 1415

FACT SHEET

PROPOSED COLBERT LANDFILL CLEANUP

Washington State Department of Ecology Contact : Fred Gardner (206) 438-3046

Washington State's Department of Ecology (Ecology) and the U.S. Environmental Protection Agency (EPA) are responsible for protecting the environment and public health. Together the agencies are working to clean up hazardous waste sites across the state, including Colbert Landfill.

This fact sheet describes the feasibility study which was carried out to determine the cleanup alternatives for Colbert Landfill. The study describes the alternatives and costs, and their impacts to public health and the environment. It then recommends a preferred cleanup alternative.

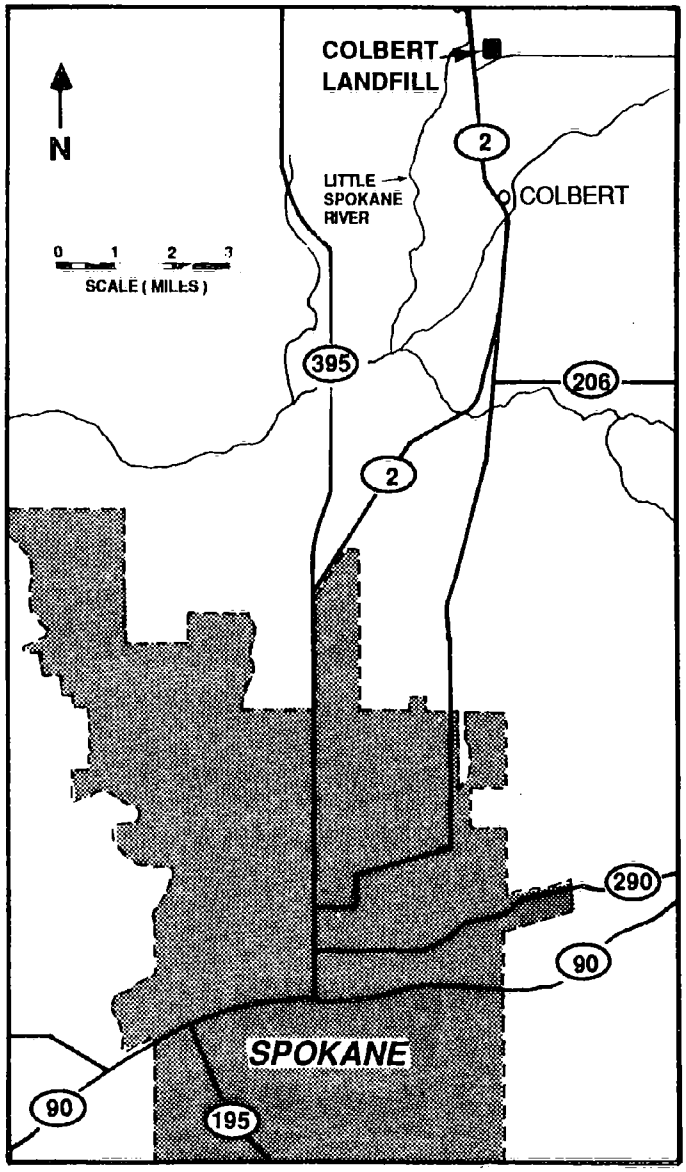
Ecology is currently evaluating the alternatives and wants to receive public comment on them. Consider each of the alternatives and send written comments to Fred Gardner of Ecology by June 5, 1987 (see page 7 of this fact sheet for phone number). A public meeting will be held on May 28, 1987, where comments can be expressed directly.

CONSULTANTS PROPOSE METHODS TO CLEAN UP COLBERT LANDFILL AREA

Ecology is preparing to select and recommend to EPA a preferred alternative for cleaning up ground water contamination at Colbert Landfill, a 40-acre sanitary landfill located about 15 miles north of Spokane, Washington. Alternatives have been developed for the site as a result of two years of study by Golder Associates Inc. and Envirosphere Company, Ecology's technical consultants. The consultants completed a remedial investigation (investigation) which determined the location and extent of the contamination. They recently completed a feasibility study (study) which evaluated a number of potential cleanup alternatives and ranked them. This newsletter summarizes the results of the study.

The alternative which the consultants ranked highest consists of extracting the contaminated water, treating the water by air stripping, and discharging the clean water into surface waters. The discharged water would meet EPA's drinking water standards.

SITE MAP



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BACKGROUND AND OVERVIEW

HISTORY

Colbert Landfill was operated as a sanitary landfill by the Spokane County Utilities Department from 1968 to 1986. Between 1975 and 1980, a local manufacturing company, Key Tronic Corporation, used the landfill to dispose of organic solvents at an average monthly rate of several hundred gallons. During the same period, Fairchild Air Force Base also shipped solvent wastes to the site. Others may have sent similar materials there.

In 1980, local residents complained to Ecology about these disposal practices. State and local officials responded by sampling private wells, some of which showed contamination with trichloroethane. Since then, additional studies were conducted to investigate ground water contamination, including the installation of monitoring wells and extensive water quality sampling.

In 1983, EPA placed Colbert Landfill on the National Priorities List. This designation meant that the site was a "top priority" for cleanup under the federal Superfund program. Spokane County and Key Tronic Corporation were both listed as potentially responsible parties, or "PRPs." They continued to have well water analyzed, and in 1984 began distributing bottled water to some households that had wells with high contamination levels. This same year Ecology and EPA signed a cooperative agreement to do an investigation and study. Spokane, Key Tronic, and state water supply referendum funds paid for constructing the Colbert Extension of Whitworth Water District No. 2 and hooking up affected residences.

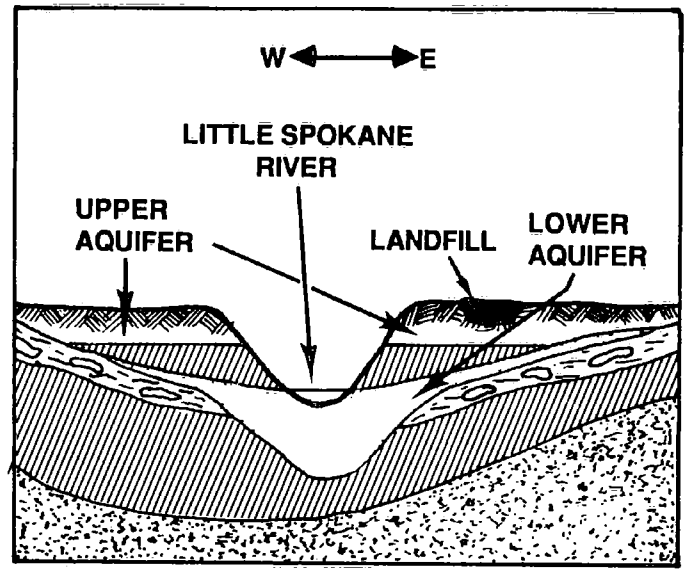
In March 1985, a full investigation and study began that would eventually lead to the recommendation of a cleanup plan. This fact sheet describes the recommendations for cleanup alternatives.

EXTENT OF CONTAMINATION

The geology of the site, as known and understood by Ecology's technical consultants, is important for estimating the flow in the aquifers and the direction of flow and extent of the ground water contamination. As illustrated in the contamination distribution map on page 3, contaminated ground water has spread into two aquifers.

These two aquifers are in the same general area, with one situated above the other as shown below.

AQUIFER CROSS SECTION



The upper aquifer is located about 90 feet below the ground surface. The contamination within this aquifer has spread much further than in the lower aquifer. The upper aquifer contamination extends south of the landfill toward the town of Colbert and is estimated to cover about 740 acres. This contamination also appears to extend northeast of the landfill where it connects with the lower aquifer (see Aquifer Cross Section diagram).

The lower aquifer begins at a depth of approximately 180 feet and extends down from this, varying in thickness from a few feet to over 150 feet. Contamination apparently entered the lower aquifer northeast of the landfill where the two aquifers are interconnected. The contamination proceeded generally to the west, toward the Little Spokane River and is estimated to cover 500 acres. If the spread of the contamination is unchecked it will likely enter the river.

Private wells have tapped both aquifers. As of 1986, 26 residences with contaminated wells had been connected to the alternate water supply. Also, 16 additional homeowners elected to join the water system at their own

expense. Continued monitoring is being carried out to assure that no residents are drinking water which is contaminated beyond public health guidelines.

CONTAMINANTS

During the investigation, six contaminants were found in these two aquifers. The contaminants belong to the class of chemicals known as chlorinated aliphatic hydrocarbons and include:

1,1,1-Trichloroethane (TCA)
1,1-Dichloroethylene (DCE)
1,1-Dichloroethane (DCA)
Tetrachloroethylene (PCE)
Trichloroethylene (TCE)
Methylene Chloride (MC)

These chemicals are often found in products used for degreasing, dry cleaning, and other industrial cleaning processes. In general, the contaminants evaporate quickly in air, do not degrade easily into other chemical compounds, and do not mix well in water, but rather sink down through the water. Some of them are suspected carcinogens.

The present levels of contamination in the areas shown on the contamination distribution map indicate a public health risk.

PURPOSE OF THE FEASIBILITY STUDY

A feasibility study assesses the alternatives available to clean up a hazardous waste site. Those alternatives best suited to deal with the contaminated ground water at the Colbert Landfill site were developed to meet the following objectives:

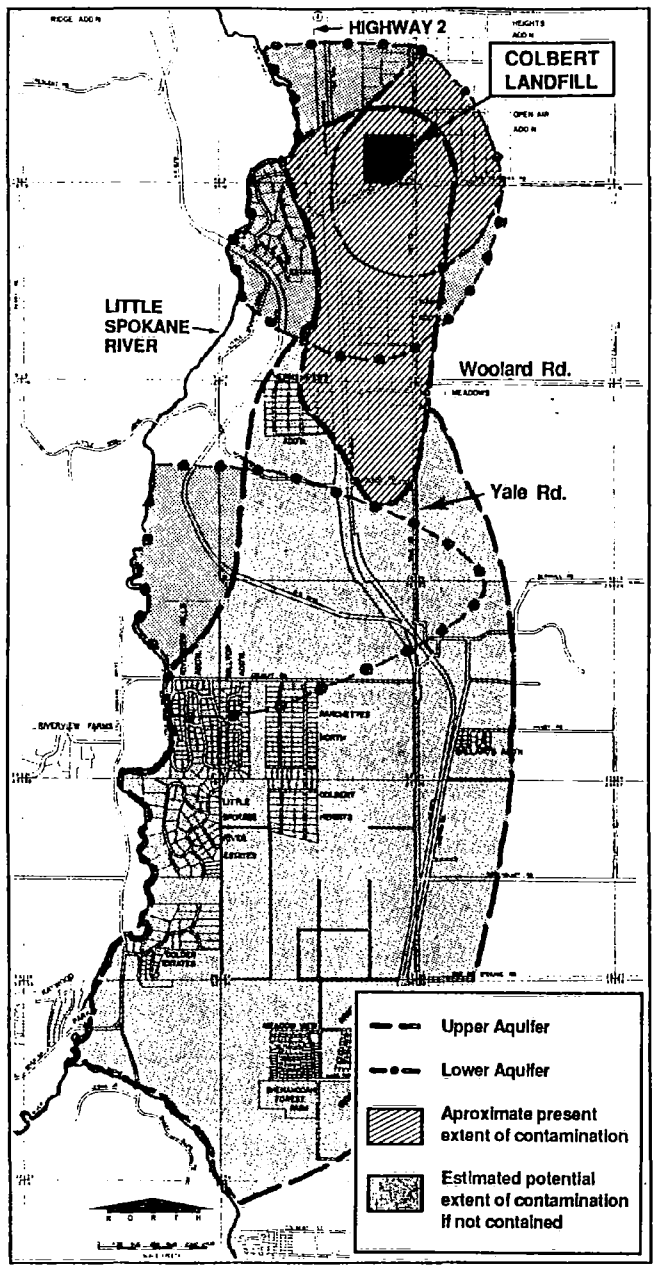
1. Protect the public from exposure to dangerous levels of contamination in water supplies.

2. Prevent the deterioration of ground water presently not contaminated.

3. Protect the Little Spokane River and other surface waters from contamination.

4. Improve the quality of ground water already contaminated.

CONTAMINATION DISTRIBUTION MAP



WHAT CLEANUP ALTERNATIVES ARE THERE?

Ecology's technical consultants developed four alternatives:

NO ACTION

A no action plan serves as a baseline against which various action plans can be evaluated. "No action," as considered in the study, provides for the continuation of the existing water system and the current water quality monitoring program. New hookups to the Colbert Extension would not be available and no effort would be made to provide a safe water supply to residences in areas where the

contamination may migrate. The contamination would continue to move at its present rate, affecting adjacent ground water and surface water. No removal of the contamination would be attempted.

ALTERNATE WATER SUPPLY

This alternate proposes to supply clean water to residences and restrict the use of private well water. Whitworth Water District 2 would be improved and expanded to be capable of serving all existing and future residences in the area. Ground water monitoring would continue and hookups would occur as the contamination spread. In-house use of contaminated ground water would be discouraged, while outside uses for gardens and livestock would be allowed. A public information program would provide residents with information on water restrictions and hookup schedules. This alternative would provide safe drinking water to residents, but no effort would be made to contain or treat the contaminated ground water.

HOME TREATMENT SYSTEMS

This plan provides for a home-sized treatment unit in each house. The treatment unit would decontaminate well water before use in the home. All in-home uses of the private well water would then be acceptable. Water use restrictions would be imposed to prohibit human ingestion of and skin contact with contaminated well water. This alternative would provide safe drinking water if the home treatment units were properly maintained. Contamination of adjacent ground and surface waters would occur. Use of the Little Spokane River water for human consumption would be prohibited unless treated.

EXTRACTION/TREATMENT/DISCHARGE

This alternative treats the contaminated water, limits the spread of contamination, and provides clean drinking water.

The contaminated ground water would be pumped from the aquifer, treated by air stripping or some other process, and then discharged into the Little Deep Creek from the southern area and the Little Spokane River from the western and eastern areas. Residences would continue to use water supplied by an improved Whitworth water system, or be connected to the system if their water became contaminated. This alternative would intercept the contamination at various locations to prevent further migration and contamination. It would supply the public with safe drinking water, prevent further contamination of ground and surface waters, and in some areas improve the quality of the ground water.

SCREENING AND EVALUATING THE CLEANUP ALTERNATIVES

Screening and evaluation considered both geographic and technical aspects of the Colbert Landfill site. Because of the extent of the contamination, the overall site was divided into three areas: southern, western, and eastern. Each cleanup alternative was considered for all geographic areas.

Technical factors, including environmental, public health, and cost, were also evaluated. The home treatment system alternative was dropped from consideration because it did not meet the cleanup objectives. Although home treatment systems could assure residents of a safe water supply, the systems could not stop the migration of the contamination into adjacent ground and surface waters. Regular maintenance of the systems would be required to ensure protection of public health.

Except for home treatment systems, the remaining alternatives were further evaluated by:

- Technical feasibility (e.g., is technology available and proven?);
- Institutional requirements (e.g., is permission to locate the required systems in the area obtainable?);
- Public health requirements (e.g., will public health standards be met?);
- Environmental impacts; and
- Cost.

During this evaluation phase, the alternate water supply alternative did not meet the four cleanup objectives as well as other options did. The no-action alternative was retained as a "base case" while the extraction, treatment, and discharge alternative appeared to offer the best solution because it most closely met the cleanup objectives.

The alternative of extraction, treatment, and discharge was expanded to consider the many different technologies available. These technologies are described in the following section.

TECHNOLOGIES FOR THE PROPOSED CLEANUP PROCESS

The three steps within the cleanup process are extraction, treatment, and discharge. Extraction involves removing the water from the aquifers via deep wells. Once the water has been extracted, it is treated to remove the contaminants.

Treatment may involve any of the following technologies:

1) adsorption onto activated carbon;

2) air stripping;

3) chemical oxidation; or

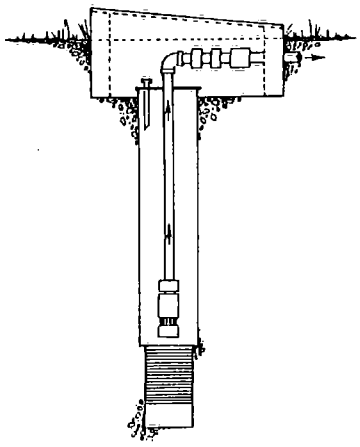
4) a combination of these technologies.

Following treatment, the clean water may be discharged into a river, a drainfield, or a system of recharge wells.

These technology options may be used in a variety of combinations. For example, extraction may be combined with any one of the four treatment processes, and then combined with any one of the three discharge systems.

STEP 1: EXTRACTION

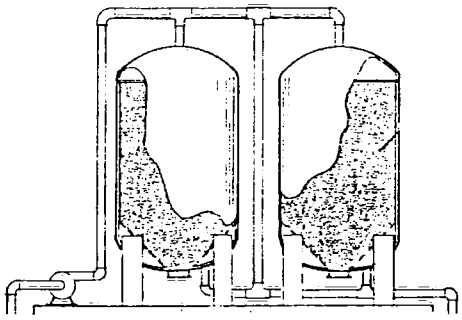
Extraction Wells - A well 100 to 200 feet deep would collect and pump the contaminated ground water and deliver it to a treatment facility via an underground pipe.



STEP 2: TREATMENT

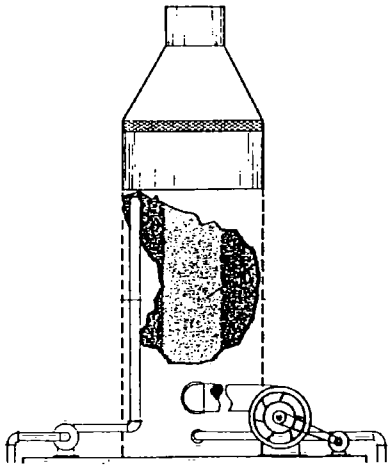
Activated Carbon Adsorption - Contaminated ground water would be pumped through two 10 to 15 foot high tanks filled with specially treated carbon which would collect the contaminants. When the carbon is used up, fresh carbon would be added to the tanks, and the used carbon transported off site where the contaminants would be burned.

- Advantages: Effective, very reliable.
- Disadvantages: Potential frequent and costly replacement of carbon.



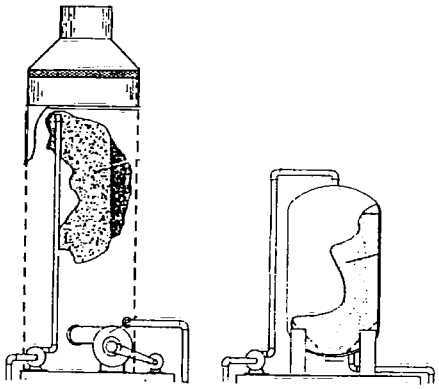
Air Stripping - Contaminated ground water would be pumped to the top of a 20 to 48 foot tower. As ground water flowed down through the tower, the air would be forced upward and evaporate the contaminants out of the water and into the air.

- Advantages: Effective treatment of water, low cost.
- Disadvantages: Emissions of contaminants into air.



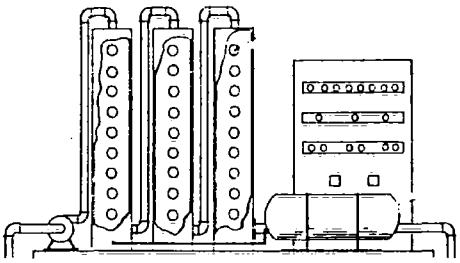
Air Stripping/Carbon Adsorption - A combination of the treatments discussed above.

- Advantages: Effective, reliable treatment.
- Disadvantages: Some emission of contaminants into air; potential frequent replacement of carbon.



Chemical Oxidation - Contaminated ground water would be pumped through a tank where hydrogen peroxide or ozone, along with ultraviolet light, would break down the contaminants.

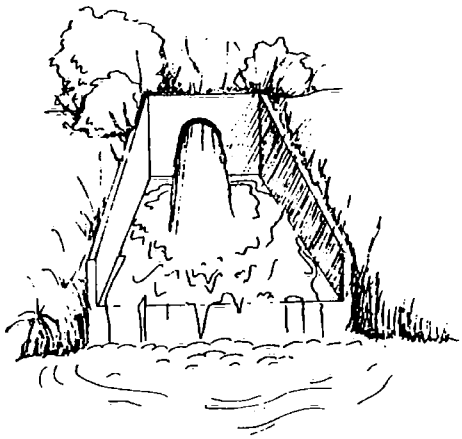
- Advantages: Contaminants destroyed on-site.
- Disadvantages: High cost.



STEP 3: DISCHARGE

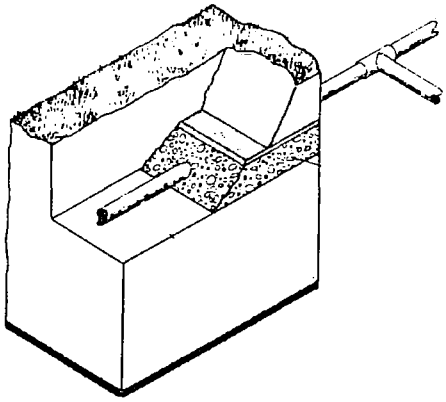
River Outfall - After treatment, clean water would be pumped through an underground pipe, spill onto a concrete surface, and empty into a river. The concrete would keep the outflow from eroding the river bottom.

- Advantages: Effective disposal, low cost.
- Disadvantages: Some easements needed.



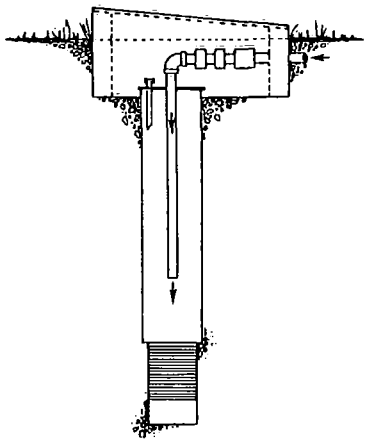
Drainfield - After treatment, the clean water would be pumped through an underground pipe with holes at the end that would allow the water to drain into the soil.

- Advantages: Effective disposal.
- Disadvantages: More ground water extraction needed, and thus higher treatment costs.



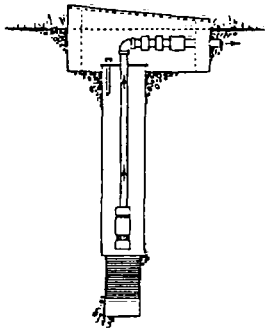
Recharge Wells - After treatment, the clean water would be piped to a 100 to 200 foot deep well where the water would be returned to the soil.

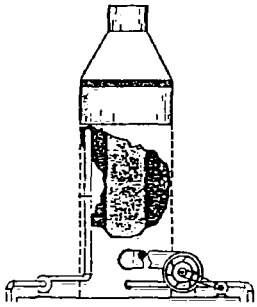
- Advantages: Effective disposal.
- Disadvantages: Regulatory restrictions; high cost.

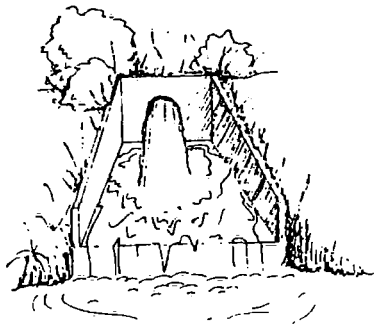


The consultants recommended the extraction, treatment, and discharge alternative, ranking highest the technology options of air stripping and discharge to surface waters. The diagram below illustrates this combination of technologies.

CLEANUP ALTERNATIVE RANKED HIGHEST:
EXTRACTION WELLS, AIR STRIPPING, AND RIVER OUTFALL







WE WANT TO HEAR FROM YOU . . .

The public may review and comment on the feasibility study and recommended alternatives. The comment period runs from May 15 through June 5, 1987. The remedial investigation and feasibility study reports are available for your review at North Spokane Library, Colbert Elementary School, and Ecology's Eastern Regional Office in Spokane (for details, see last page).

Ecology will explain the results of the feasibility study and answer questions about the alternatives at a public meeting on May 28, 1987, at 7:00 p.m. at the Colbert Elementary School. Ecology will accept comments at this meeting.

Send written comments to:
Mr. Fred Gardner
Washington State Department of Ecology
Mail Stop PV-11, Olympia, WA 98504
(206) 438-3046

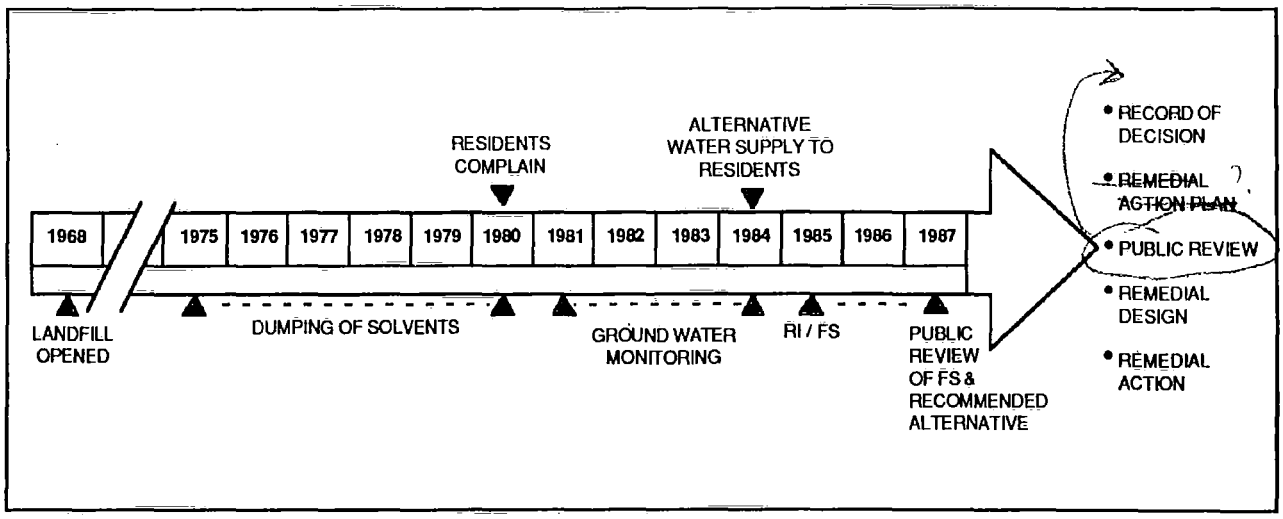
NEED MORE INFORMATION?

Call 1-800-458-0920

WHAT HAPPENS NEXT?

At the close of the public comment period Ecology will review the remedial investigation, feasibility study, and public comments, and recommend a preferred alternative to EPA. Following their own review, EPA will formally select an alternative and publish a record of their decision. The next steps are to prepare engineering plans and implement the selected alternative. EPA, by itself or under another cooperative agreement with Ecology, will make sure that cleanup efforts are performed according to the record of decision.

SCHEDULE OF ACTIVITIES



PUBLIC MEETING SCHEDULED FOR COLBERT LANDFILL CLEANUP ALTERNATIVES

Public Meeting

May 28, 1987
7 p.m.
Colbert Elementary School
E. 4526 Green Bluff Road

Feasibility Study may be reviewed at:

- North Spokane Library
  E. 44 Hawthorne Road
- Ecology's Eastern Regional Office
  N. 4601 Monroe Street, Suite 100
- Colbert Elementary School
  E. 4526 Green Bluff Road

Washington State
Department of Ecology
Mail Stop PV-11
Olympia, WA 98504

Address Label