Bainbridge LF
FS 260Z

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

In the Matter of Remedial Action by:	)	Enforcement Order No. 94TC - N399
Kitsap County, a political subdivision of the State of Washington 614 Division Street Port Orchard, WA 98366	)	

To: Kitsap County Commissioners

I.

Jurisdiction

This Order is issued pursuant to the authority of RCW 70.105D.050(1).

II.

Statement of Facts

1. Kitsap County owns the property currently known as the Bainbridge Island Landfill.

2. The Site was used as a landfill from the 1940's until 1976. Mixed municipal (i.e. residential, commercial, industrial) solid waste and septage were disposed at the landfill. In 1976, a transfer station was situated at the site.

3. Pacific Sound Resources, formerly known as Wyckoff Company, generated and arranged for the transport and disposal of hazardous substances at the Site from the late 1960's to the early 1970's.

4. Hazardous substances were identified at the Site by the Environmental Protection Agency (EPA), through their contractor, Ecology and

Environment, Inc., during a 1986 and 1987 site inspection and sampling program. The results are presented in the Site Inspection Report for Kitsap County Bainbridge Island Dump, Bainbridge Island, Washington, prepared by Ecology and Environment, Inc., dated October 1987.

5. In 1990 Kitsap County and Wyckoff Company were named by Ecology as Potentially Liable Persons for Trench 3 at the Bainbridge Island Landfill. Trench 3 is part of the landfill. In May 1993, Kitsap County and Pacific Sound Resources (aka Wyckoff Company) were named by Ecology as potentially liable persons for the entire Bainbridge Island Landfill.

6. Kitsap County undertook an independent remedial action regarding Trench 3 and excavated and disposed of extremely hazardous wastes (EHW) and dangerous waste (DW) in 1992 and 1993. EHW and DW are hazardous substances. The excavated wastes were transported to and disposed at the Arlington, Oregon hazardous waste landfill. Kitsap County has submitted a report of its completed independent remedial action to Ecology. At this time, Ecology has not determined the adequacy of the independent remedial action.

7. Based on information contained in the Site Inspection Report for Kitsap County Bainbridge Island Dump, additional hazardous substances remain in the landfill that pose a potential threat to human health and the environment.

8. The land surrounding the Site is used primarily for residential purposes. Private domestic water supply wells are used by the residents.

9. In 1988 tests revealed low levels of dichlorobenzene in a nearby water supply well. Dichlorobenzene is a volatile organic compound that may be associated with landfills.

III.

Ecology Determinations

1. Kitsap County is an "owner" as defined in RCW 70.105D.020(6) of a "facility" as defined in RCW 70.105D.020(3).

2. The facility is known as the Bainbridge Island Landfill and is located on Vincent Road, Bainbridge Island, Washington 98110. The facility is located in Section 33, Township 25 North, Range 2 East.

3. The substances found at the facility as described above are "hazardous substances" as defined in RCW 70.105D.020(5).

4. Based on the presence of these hazardous substances at the facility and all factors known to Ecology, there is a release or threatened release of hazardous substances from the facility, as defined at RCW 70.105D.020(10).

5. By letter dated May 4, 1993, Ecology notified Kitsap County of its status as a "potentially liable person" under RCW 70.105D.040 after notice and opportunity for comment.

6. Pursuant to RCW 70.105D.030(1) and 70.105D.050, Ecology may require potentially liable persons to investigate or conduct other remedial actions with respect to the release or threatened release of hazardous substances, whenever it believes such action to be in the public interest.

7. Based on the foregoing facts, Ecology believes the remedial action required by this Order is in the public interest.

IV.

Work to be Performed

Based on the foregoing Facts and Determinations, it is hereby ordered that Kitsap County take the following remedial actions and that these actions be conducted in accordance with Chapter 173-340 WAC unless otherwise specifically provided for herein.

1. Kitsap County shall conduct a Remedial Investigation and Feasibility Study (RI/FS) of the Bainbridge Island Landfill. The RI/FS shall be conducted in accordance with the WAC 173-340-350.

2. The scope of work for the Remedial Investigation and Feasibility Study (RI/FS) is attached as Exhibit A. The scope of work is incorporated by this reference and is an integral and enforceable part of this Enforcement Order.

3. Ecology may require interim actions at the site if the action is technically necessary to reduce a threat to human health or the environment by eliminating or substantially reducing one or more pathways for exposure to a hazardous substance or the action corrects a problem that may become substantially worse or cost substantially more to address if the action is delayed or an action is needed to provide for the completion of the RI/FS or design of a cleanup action. Such interim actions shall not require amendment of this Enforcement Order.

All interim actions shall require Ecology review and approval. Any interim actions required at the site must be conducted in accordance with WAC 173-340-430, Interim Actions.

4. Kitsap County shall submit to Ecology written monthly progress reports which describe the actions taken during the previous month to implement the requirements of this Order. The progress shall include the following:

A. A list of on-site activities that have taken place during the month;

B. Detailed description of any deviations from required tasks not otherwise documented in project plans or amendment requests;

C. Description of all deviations from the schedule during the current month and any planned deviations in the upcoming month;

D. For any deviations in schedule, a plan for recovering lost time and maintaining compliance with the schedule;

E. All validated data (including laboratory analysis) received by the Defendant during the past month and an identification of the source of the samples; and

F. A list of deliverables for the upcoming month if different from the schedule.

All progress reports shall be submitted by the fifteenth day of the month in which they are due after the effective date of this Order. Unless otherwise specified, progress reports and any other documents submitted pursuant to this Order shall be sent to Ecology's project coordinator.

V.

Terms and Conditions of Order

1. Definitions

Unless otherwise specified, the definitions set forth in Chapter 70.105D RCW and Chapter 173-340 WAC shall control the meanings of the terms used in this Order.

2. Public Notice

RCW 70.105D.030(2)(a) requires that, at a minimum, this Order be subject to concurrent public notice. Ecology shall be responsible for providing such public notice and reserves the right to modify or withdraw any provisions of this Order should public comment disclose facts or considerations which indicate to Ecology that the Order is inadequate or improper in any respect.

3. Remedial Action Costs.

Kitsap County shall pay to Ecology costs incurred by Ecology pursuant to this Order. These costs shall include work performed by Ecology or its contractors for investigations, remedial actions, and Order preparation, oversight and administration. Ecology costs shall include costs of direct activities and support costs of direct activities as defined in WAC 173-340-550(2). Kitsap County shall pay the required amount within 90 days of receiving from Ecology an itemized statement of costs that includes a summary of costs incurred, an identification of involved staff, and the amount of time spent by involved staff members on the project. A general description of work performed will be provided upon request. Itemized statements shall be prepared quarterly. Failure to pay Ecology's costs within 90 days of receipt of the itemized statement of costs will result in interest charges.

4. Designated Project Coordinators.

The project coordinator for Ecology is:

Name: Barbara J. Trejo

Address: 3190 - 160th Avenue SE, Bellevue, WA 98008-5452

The project coordinator for Kitsap County is:

Name: Jeff Frettingham

Address: Kitsap County Public Works, Solid Waste Division

614 Division Street, Port Orchard, WA 98366

The project coordinators shall be responsible for overseeing the implementation of this Order. To the maximum extent possible, communications between Ecology and Kitsap County, and all documents, including reports, approvals, and other correspondence concerning the activities performed pursuant to the terms and conditions of this Order, shall be directed through the project coordinators. Should Ecology or Kitsap County change project coordinators, written notification shall be provided to Ecology or Kitsap County at least ten (10) calendar days prior to the change.

5. Performance. All work performed pursuant to this Order shall be under the direction and supervision, as necessary, of a professional engineer or hydrogeologist, or similar expert, with appropriate training, experience and expertise in hazardous waste site investigation and cleanup. Kitsap County shall notify Ecology as to the identity of such engineer(s) or hydrogeologist(s), and of any contractors and subcontractors to be used in carrying out the terms of this Order, in advance of their involvement at the Site. Kitsap County shall provide a copy of this Order to all agents, contractors and subcontractors retained to perform work required by this Order

and shall ensure that all work undertaken by such agents, contractors and subcontractors will be in compliance with this Order.

Except when necessary to abate an emergency situation, Kitsap County shall not perform any remedial actions at Bainbridge Island Landfill outside that required by this Order unless Ecology concurs, in writing, with such additional remedial actions.

WAC 173-340-400(7)(b)(i) requires that "construction" performed on the Site must be under the supervision of a professional engineer registered in Washington.

6. Access

Ecology or any Ecology authorized representative shall have the authority to enter and freely move about all property at the Site at all reasonable times for the purposes of, inter alia: inspecting records, operation logs, and contracts related to the work being performed pursuant to this Order; reviewing the progress in carrying out the terms of this Order; conducting such tests or collecting samples as Ecology or the project coordinator may deem necessary; using a camera, sound recording, or other documentary type equipment to record work done pursuant to this Order; and verifying the data submitted to Ecology by Kitsap County. When entering the Site under Chapter 70.105D RCW, Ecology shall provide reasonable notice prior to entering the Site unless an emergency prevents notice. Ecology shall allow split or replicate samples to be taken by Kitsap County during an inspection unless doing so would interfere with Ecology's sampling. Kitsap County shall allow split or replicate samples to be taken by Ecology and shall provide Ecology seven (7) days notice before any sampling activity.

7. Public Participation

Public participation shall be accomplished by implementing the Bainbridge Island Public Participation Plan. Ecology shall maintain the responsibility for public participation at the Site. Kitsap County shall help coordinate and implement public participation for the Site.

8. Retention of Records

Kitsap County shall preserve in a readily retrievable fashion, during the pendency of this Order and for ten (10) years from the date of completion of the work performed pursuant to this Order, all records, reports, documents, and underlying data in its possession relevant to this Order. Should any portion of the work performed hereunder be undertaken through contractors or agents of Kitsap County, a record retention requirement meeting the terms of this paragraph shall be required of such contractors and/or agents.

9. Dispute Resolution

Kitsap County may request Ecology to resolve factual or technical disputes which may arise during the implementation of this Order. Such request shall be in writing and directed to the signatory, or his/her successor(s), of this Order. Ecology resolution of the dispute shall be binding and final. Kitsap County is not relieved of any requirement of this Order during the pendency of the dispute and remains responsible for timely compliance with the terms of the Order unless otherwise provided by Ecology in writing.

10. Reservation of Rights

Ecology reserves all rights to issue additional orders or take any action authorized by law in the event or upon the discovery of a release or threatened release of hazardous substances not addressed by this Order, upon discovery of any factors not known at the time of issuance of this Order, in order to abate an emergency, or under any other circumstances deemed appropriate by Ecology.

Ecology also reserves all rights regarding the injury to, destruction of, or loss of natural resources resulting from the release or threatened release of hazardous substances from the Bainbridge Island Landfill.

In the event Ecology determines that conditions at the Site are creating or have the potential to create a danger to the health or welfare of the people on the Site or in the surrounding area or to the environment, Ecology may order Kitsap County to stop further implementation of this Order for such period of time as needed to abate the danger.

11. Transference of Property

No voluntary or involuntary conveyance or relinquishment of title, easement, leasehold, or other interest in any portion of the Site shall be consummated by Kitsap County without provision for continued implementation of all requirements of this Order and implementation of any remedial actions found to be necessary as a result of this Order.

Prior to transfer of any legal or equitable interest Kitsap County may have in the Site or any portions thereof, Kitsap County shall serve a copy of this Order upon any prospective purchaser, lessee, transferee, assignee, or other successor in such interest. At least thirty (30) days prior to

finalization of any transfer, Kitsap County shall notify Ecology of the contemplated transfer.

12. Compliance With Other Applicable Laws

All actions carried out by Kitsap County pursuant to this Order shall be done in accordance with all applicable federal, state, and local requirements.

VI.

Satisfaction of this Order

The provisions of this Order shall be deemed satisfied upon Kitsap County's receipt of written notification from Ecology that Kitsap County has completed the remedial activity required by this Order, as amended by any modifications, and that all other provisions of this Order have been complied with.

VII.

Enforcement

1. Pursuant to RCW 70.105D.050, this Order may be enforced as follows:

A. The Attorney General may bring an action to enforce this Order in a state or federal court.

B. The Attorney General may seek, by filing an action, if necessary, to recover amounts spent by Ecology for investigative and remedial actions and orders related to the Site.

C. In the event Kitsap County refuses, without sufficient cause, to comply with any term of this Order, Kitsap County will be liable for:

(1) up to three times the amount of any costs incurred by the

state of Washington as a result of its refusal to comply; and

(2) civil penalties of up to $25,000 per day for each day it refuses to comply.

D. This Order is not appealable to the Washington Pollution Control Hearings Board. This Order may be reviewed only as provided under RCW 70.105D.060.

Effective date of this Order: November 18, 1994

Michael J. Gallagher

Michael J. Gallagher

Exhibit A

Scope of Work

EXHIBIT A

BAINBRIDGE ISLAND LANDFILL
SCOPE OF WORK

I. Introduction.

A. Pursuant to the Model Toxics Control Act (MTCA), RCW 70.105D, Kitsap County shall conduct a Remedial Investigation (RI) and Feasibility Study (FS) to determine the nature and extent of releases and potential releases of hazardous substances (as defined by RCW 70.105D.020(5)) at and from the Bainbridge Island Landfill, determine current or potential future risk posed by the landfill to human health and the environment, and conduct a Feasibility Study (FS) for selection of a cleanup action. The RI/FS shall be conducted in accordance with the MTCA Cleanup Regulation, Chapter 173-340 WAC. The purpose of the RI/FS is to collect, develop, and evaluate sufficient information, as described in WAC 173-340-350, to enable the selection of a cleanup action under WAC 173-340-360.

B. This scope of work shall be incorporated into the RI/FS work plan. The RI/FS work plan shall not be limited to this scope of work if additional data gaps are identified in the project planning document, described below, or during the RI/FS.

C. Additional RI\FS phases may be necessary to adequately characterize the landfill and to select a cleanup action under WAC 173-340-360. Such additional phases shall not require amendment of this Enforcement Order, but shall require amendment of the project planning document. Proposed amendments to the document shall be submitted to Ecology for review and approval. Such amendments shall only be made part of the work plan with prior Ecology approval.

II. Project Planning.

A. Kitsap County shall prepare a comprehensive project planning document that includes the following:

1. Quality evaluation (QA/QC), summary, and analysis of existing data;

2. Data gap identification;

3. Initial regulatory analysis;

4. Work plan which shall include an outline for the RI/FS report and a schedule of deliverable items. Deliverable items shall include but not be limited to draft and final RI/FS reports; task reports; monthly reports; technical memoranda; and outlines;

5. Sampling and analysis plan;

6. Quality assurance plan;

7. Data management plan; and

8. Health and safety plan.

B. The existing data for the site includes but is not limited to the following:

1. Site Inspection Report For Kitsap County Bainbridge Island Dump, Bainbridge Island, Washington, Ecology and Environment, Inc. (October, 1987) (hereinafter EPA Report);

2. Report of Independent Remedial Action, Bainbridge Island Landfill Trench 3, Golder Associates, Inc. (June 16, 1993) (hereinafter Golder Report);

3. Memoranda from Bremerton-Kitsap County Health District dated January 11, 1987, and March 15, 1988, regarding pathogen testing in septage lagoon; and

4. Data from sampling of offsite wells by Bremerton-Kitsap County Health District in 1988, 1989, 1990, 1992 and 1994.

Copies of the existing data shall be included in the project planning document.

C. A draft of the project planning document shall be submitted to Ecology for review and comment within 60 days of the effective date of the Enforcement Order. The draft shall be revised based on Ecology's comments and submitted as a final document to Ecology for review and approval within 30 days of receipt of Ecology's comments.

III. Remedial Investigation.

A. Mapping.

1. Kitsap County shall conduct a topographic and boundary survey of the site and shall analyze available aerial photographs within one mile of the site. If existing aerial photographs are not available within the last two years, an aerial photograph within

1/4 mile of the site shall be prepared by Kitsap County. Following this work County shall produce site and vicinity topographic maps.

B. Well Survey.

1. Kitsap County shall conduct a water supply well survey for wells located within one mile of the site. The survey shall include well location, surface elevation, total depth, depth of water, geologic logs and other pertinent information.

2. Kitsap County shall prepare a list of those wells, identified during the survey, which are potentially affected by the landfill. The list and supporting rationale for inclusion or exclusion of each well shall be submitted to Ecology for review and approval. Kitsap County shall survey the ground surface and well measuring point for determining depth to water for each well included on the approved list. Kitsap County shall use its best efforts to obtain access agreements or easements over such property for the purposes of accomplishing this task. If Kitsap County is unable to obtain access agreements or easements, Kitsap County shall notify Ecology within a reasonable period of time. Ecology agrees to use its best efforts, consistent with its authority, to assist Kitsap County in obtaining access agreements or easements.

C. Waste Source Investigation.

1. The objective of the waste source investigation is to determine the nature and extent of contamination at each waste source and to identify the potential routes of exposure and receptors from each waste source.

2. The EPA Report, Golder Report, Health District memoranda, and other available documents shall be evaluated as part of this task to determine whether the nature and extent of contamination at each waste source and the potential routes of exposure and receptors are adequately characterized. Data gaps shall be identified in the project planning document.

Sampling and analysis or other required information to fill data gaps for each waste source shall be identified in the project planning document.

3. If possible, site visits shall be arranged with past site operators to estimate the limits of each waste source and to obtain information on the sources of waste and its onsite handling.

4. The estimated edge of each waste source area shall be verified in

accordance with the work plan. The boundaries of each waste source shall be mapped and surveyed.

D. Soil/Sediment Investigation.

1. The objective of the soil/sediment investigation is to determine the nature and extent of soil/sediment contamination at the site and to characterize the site geology and hydrogeology.

2. The EPA Report, Golder Report, Health District memoranda, and other available documents shall be evaluated as part of this task to determine whether the site geology and hydrogeology and the nature and extent of soil/sediment contamination and the potential routes of exposure and receptors are adequately characterized.

3. Sampling and analysis or other required information to fill data gaps shall be identified in the project planning document. Analytes and testing methods including method detection limits (MDLs) and practical quantitation limits (PQLs) along with the supporting rationale shall be presented in the RI/FS sampling and analysis plan.

4. As part of the groundwater investigation a groundwater monitoring well shall be installed through the floor of trench 3. During well construction discrete soil/sediment samples shall be sampled and tested for TPH, VOCs, SVOCs, pesticides, herbicides, PCBS, inorganics, TOC, and, if appropriate, biological parameters.

The rationale for the number of samples shall be presented in the project planning document.

E. Leachate/Groundwater Investigation.

1. The objectives of the leachate/groundwater investigation are to characterize site hydrogeology and to determine the nature and extent of leachate/groundwater contamination.

2. Published and unpublished hydrogeologic information including the EPA Report, Golder Report, and the Health Department Memoranda shall be reviewed and summarized in the project planning document. This information shall be used to assist in locating leachate/groundwater monitoring wells at the site.

3. Based on preliminary information, the initial groundwater investigation shall focus on the upper aquifer since this aquifer, at this time, appears to have the greatest potential for impacts from the site.

Additional groundwater monitoring wells shall be required in other

aquifers if the published and unpublished hydrogeologic information indicates that the aquifers are potential receptors for contamination from the site.

4. All wells installed during the initial leachate/groundwater investigation shall be installed within the site boundaries unless the site boundary corresponds with a waste source boundary. If the site and waste source(s) boundaries are the same, wells shall be installed outside the site boundary to meet the objectives of the groundwater investigation. If wells are installed outside the site boundary, Kitsap County shall use its best efforts to obtain access agreements or easements over such property. If Kitsap County is unable to obtain access agreements or easements, Kitsap County shall notify Ecology within a reasonable period of time. Ecology agrees to use its best efforts, consistent with its authority, to assist Kitsap County in obtaining access agreements or easements.

   A minimum of six wells shall be installed in the upper aquifer during the initial investigation: one upgradient well, four downgradient wells, and one well within Trench 3. A minimum of one leachate well shall be installed in the landfill. The rationale for the location of each well shall be provided in the project planning document.

   If the installation of the first six wells does not result in one upgradient and four downgradient wells, additional wells shall be installed to achieve that objective.

5. Well construction specifications shall be provided in the project planning documents. Wells shall be developed and tested for aquifer characteristics as described in the planning documents. Slug tests shall be conducted in each completed monitoring well to estimate horizontal hydraulic conductivity and other aquifer properties. Laboratory permeability tests shall be conducted to determine vertical hydraulic conductivity.

6. During drilling soil samples shall be collected to characterize stratigraphy and aquifer and aquitard characteristics. Soil sampling locations, frequencies, and testing procedures and analytical parameters shall be presented in the RI/FS work plan.

7. The groundwater and leachate from each installed monitoring well shall be sampled and tested during four quarters of groundwater sampling. During the first two rounds of sampling and analysis, samples shall be tested for TPH, VOCs, SVOCs, pesticides, herbicides, PCBS, inorganics, conventional parameters, and appropriate biological parameters.

Sampling and analysis or other required information to fill data gaps shall be identified in the project planning document. Analytes and testing methods including method detection limits (MDLs) and practical quantitation limits (PQLs) along with the supporting rationale shall be presented in the RI/FS sampling and analysis plan.

8. Water levels shall be measured in both monitoring wells and off-site water supply wells during each sampling round to establish groundwater gradients and flow direction.

9. A task report including data tables, maps, graphs, and data analysis results for the first two rounds of leachate/groundwater sampling shall be submitted to Ecology for review and approval. Electronic copies of data results shall also be submitted. The third and fourth rounds of leachate/groundwater monitoring well sampling and analysis shall be determined after the data from the first two groundwater sampling rounds and waste source, soil, and sediment investigation have been analyzed by Kitsap County and submitted to Ecology for review and approval. The third and fourth groundwater sampling rounds shall include water wells near the site, if appropriate. The third and fourth round of sampling and analysis shall require Ecology review and approval.

F. Landfill Gas Investigation.

1. The objective of the landfill gas investigation is to determine the nature and extent of landfill gas and potential migration pathways and receptors.

2. At each monitoring well a gas probe shall be installed in the annular space of the bore hole in the unsaturated zone if the gas probe installation does not act as a conduit for contaminant migration. If the gas probes could act as conduits, additional borings shall be drilled at locations adjacent to the monitoring wells approved by Ecology for installation. At least three gas probes, in addition to the monitoring well locations, shall be installed around the perimeter of the landfill to ensure an adequate gas probe monitoring network.

3. The gas probes shall be constructed with 1/2-inch diameter PVC casing and screen with surface seals and completed in accordance with the planning documents. The basis for the installation depths shall be presented in the project planning document.

4. The existing and new gas probes shall be sampled on a monthly basis and tested for pressure, combustible gas, oxygen and carbon dioxide. If combustible gas is detected above 1 percent of the lower explosive limit, the probes shall be sampled and tested for

VOCS. The VOCs to be tested and the detection limits shall be presented in the sampling and analysis plan.

5. The monitoring results and frequency shall be evaluated monthly by Kitsap County. The analytical data and evaluation results shall be submitted with the monthly report. If significant concentrations of landfill gas are not detected during the first year of sampling and testing or if VOCs are below cleanup levels when combustible gas is detected above 1 percent of the lower explosive limit, the monitoring frequency may be reduced with the concurrence of Ecology.

G. Surface Water

1. The objective of the surface water investigation is to determine the nature and extent of contamination, determine the groundwater/surface water relationship, and evaluate the surface water drainage system located at the site.

a) The purposes of the investigation regarding the surface water diversion pipe are to determine if the pipe contains sediments, if the pipe leaks, if the water entering and leaving the pipe is contaminated, and if sediments near the pipe are contaminated.

(1) The location of the surface water diversion system shall be mapped and evaluated.

(2) The surface water diversion pipe which runs west to east through the lower portion of the filled area shall be inspected by video camera. The video tape of the inspection shall be reviewed by County and Ecology to evaluate the integrity of the system. A copy of the video tape shall be forwarded to Ecology for its project files. The procedures for conducting the inspection shall be included in the project planning document.

b) Surface water quality shall be evaluated by sampling and analyzing surface water samples for the same parameters and at the same frequency as groundwater at the inlet, outlet and downstream of the diversion pipe. If surface water does not exist during groundwater sampling rounds than surface water samples should be collected during storm water events or at other times when surface water is available.

H. Leachate Seep Investigation.

1. The purpose of the leachate seep investigation is to determine if

there are leachate seeps and, if so, the composition.

2. During the rainy season the landfill area shall be inspected for leachate seeps. If seeps are located, two seeps shall be sampled twice for the same analytes and by the testing methods used for groundwater and surface water samples.

I. Air Quality Investigation.

1. The objective of the air quality investigation is to determine if the ambient air is contaminated as a consequence of the landfill.

2. Kitsap County shall conduct a records search to determine if there are any historical data or information available on landfill gas or surface emissions at the landfill.

3. Available site-specific data, information on the age of the landfill, and information on the rate of waste disposal that may be available or may be estimated shall be used to calculate an estimate of the possible emission rate of nonmethane organic compounds (NMOC). The methodologies used shall conform with the test methods and procedures of proposed federal regulation 40 CFR Part 60, Subpart WWW, Section 60.753. If the estimated NMOC emission rate exceeds the proposed federal standard of 167 tons per year, a site-specific investigation shall be implemented in accordance with Section 60.753(a)(3) of the proposed federal regulation.

IV. Feasibility Study.

A. The Feasibility Study (FS) shall be conducted in accordance with WAC 173-340-350.

B. The FS shall include all the elements of the attached FS outline, Appendix A. If a section of the outline is not applicable to the site, it should be noted in the report along with the supporting rationale.

C. Cleanup action alternatives shall be evaluated in accordance with the requirements of WAC 173-340-360. This evaluation may also include laboratory testing, pilot testing, modelling, and data analysis.

D. An initial screening of alternative actions shall be developed by Kitsap County and presented to Ecology as a technical memorandum for review and approval. The technical memorandum shall also include the cleanup standards and ARARS along with the supporting rationale. The final screening shall follow the FS outline.

V RI/FS Report.

A. The site investigation(s) and cleanup action alternatives screening and evaluation shall be incorporated into an RI/FS Report. The report shall follow the approved outline and shall include the following:

1. Description of the investigation(s) performed and the results of the investigation(s).

2. Identification of MTCA cleanup standards including ARARs.

3. Comparison of contaminant concentrations with cleanup standards.

4. Description of the cleanup action alternatives screening and results.

5. Description of the evaluations of cleanup action alternatives and a summary of the results.

B. RI Report

1. Draft RI Report - The results of the remedial investigation shall be incorporated into a draft RI report. The report shall be submitted to Ecology for review and comment. The report shall include:

a) Results of the survey of water supply wells.

b) The information included in the RI report outline, Appendix A. If a section of the outline is not applicable to the site, it should be noted in the report along with the supporting rationale.

c) Graphics including but not limited to:

(1) Vicinity and site topographic maps.

(2) Boring, test pit, monitoring well, and gas probe logs and as-builts.

(3) Geologic and hydrogeologic cross-sections.

(4) Contour maps of aquifer and aquitard thicknesses.

(5) Well hydrographs.

(6) Water table or potentiometric surface elevation contour maps.

(7) Bar graphs for each well/probe for each sampling round showing concentrations of chemical constituents compared to MTCA cleanup standards.

(8) Trends in each well/probe for each chemical constituent exceeding MTCA cleanup standards.

(9) Chemical concentration contour maps of the site.

d) Descriptions of sampling and testing methods.

e) A summary of test results and data analysis.

f) Results of the QA/QC evaluation

g) Identification of data gaps.

h) Other appropriate information.

2. Final RI Report - Kitsap County shall revise the draft RI Report to reflect comments and issues identified by Ecology during the draft RI report review. The final RI report shall require Ecology review. If, following review of the final RI report, Ecology determines that the remedial investigation is sufficiently complete to allow preparation of the feasibility study, Kitsap County shall then proceed with development of the FS. If the RI is not sufficiently complete, the parties shall follow the procedures outlined in Section I.B and I.C. of this scope of work.

C. FS Report

1. The FS shall include all the elements of the attached FS outline, Appendix A. If a section of the outline is not applicable to the site, it should be noted in the report along with the supporting rationale.

D. The draft RI/FS Report shall be submitted to Ecology for review and comment. The draft RI/FS Report shall be revised by Kitsap County in response to the changes and revisions required by Ecology, and the final RI/FS Report shall be prepared and submitted to Ecology for review and approval.

APPENDIX A

REMEDIAL INVESTIGATION AND FEASIBILITY STUDY OUTLINE

REMEDIAL INVESTIGATION

I. INTRODUCTION

A. General Facility Information
   1. Facility name and address
   2. Legal description of facility
   3. Location and size of facility
   4. Current owner/operator
   5. Past owners/operators
   6. Operational history
   7. Other pertinent information

II. CURRENT SITE CONDITIONS MAP

A. Property boundary

B. Facility boundary

C. Surface topography

D. Surface/subsurface structures

E. Utility lines/easements

F. Sample locations and elevations - borings, monitoring wells, test pits, and other sample types

III. FIELD INVESTIGATIONS

A. Surface Water/Sediments Characterization
   1. Surface drainage
      a) patterns
      b) quantities
      c) significant hydrologic features
   2. Erosional areas
   3. Areas of sediment deposition
   4. Surface water
      a) areal/vertical extent and distribution of contamination
      b) background concentration
   5. Sediments
      a) areal/vertical extent and distribution of contamination
      b) background concentration
      c) physical properties
   6. Floodplains

7. Migration routes
   a) actual
   b) potential
   c) contaminant partitioning

B. Soils Characterization
   1. Areal/vertical extent and distribution of contamination
   2. Background concentration
   3. Adsorption capacity and other factors which may affect contaminant migration
      a) organic content
      b) migration & retardation coefficient
   4. Physical properties
      a) grain size
      b) moisture content
      c) proctor (standard/ modified)
      d) hydraulic conductivity, permeability
      e) other properties

C. Ground Water System Characterization
   1. Areal/vertical extent and distribution of contamination
   2. Background concentration
   3. Geology and hydrogeology - description and distribution of units
      a) bedrock
      b) unconsolidated materials
      c) aquitard/aquiclude
      d) borings, monitoring wells, and other pertinent sampling locations
         (1) surveyed elevations
      e) boring logs, monitoring well as-builts, other logs
      f) cross sections
   4. Aquifers
      a) gradient(s)
      b) direction of flow in each identified aquifer
      c) seasonal fluctuations/ divides
      d) areas of recharge
      e) areas of discharge
      f) location of public/ private supply wells
      g) background water quality

D. Air Characterization
   1. Regional and local climate
      a) seasonal rainfall
      b) prevailing wind direction/velocity
      c) temperature

d) storm events
(1) magnitude
(2) frequency

2. Background air quality
3. Air quality impacts
a) modeling
b) sampling

E. Land Use
1. Population exposure
a) actual
b) potential
2. Present land use/zoning
3. Proposed land use/zoning

F. Natural Resource Damage Assessment
1. Known or potential sensitive environment damages
2. Known or potential habitat reduction
3. Known or potential wildlife damages

G. Sources of Hazardous substances
1. Location of sources
2. Quantity of wastes
3. Areal/vertical extent and distribution of sources
4. Concentration of sources
5. Source characterization
a) physical properties
b) chemical properties
c) biological effects
(1) human health
(2) environment

IV. REGULATORY CLASSIFICATIONS

A. CERCLA hazardous substance

B. RCRA waste

C. Dangerous waste
1. listed
2. characteristic

D. Extremely hazardous waste
1. listed
2. characteristic

E. Land banned substance

F. State-only wastes

G. Problem waste

H. Waste designation for each affected media

V. RISK ASSESSMENT

A. Not required because cleanup standards are obvious and undisputed and allow an adequate margin of safety for protection of human health and the environment

B. Required because cleanup standards are neither obvious nor allow ample margin of safety
   1. Actual/potential threats to human health/environment
   2. Actual/potential threats to environment
   3. Exposure pathways

FEASIBILITY STUDY

I. INTRODUCTION

II. CLEANUP STANDARDS AND ARARS

III. INITIAL SCREENING OF ALTERNATIVES

A. Identify technologies for each affected media

B. Availability of technologies

C. General suitability of technologies

D. Potential permits required

IV. FINAL SCREENING OF ALTERNATIVES

A. Overall Protection of Human Health and Environment
   1. Degree of reduction of existing risk
   2. Time required to reduce risk
   3. Time required to attain cleanup standards
   4. On-site/off-site risks due to cleanup implementation

B. Attainment of cleanup standards
   1. Compliance with applicable federal/state/local laws (ARARs)

C. Short-term effectiveness
   1. Protection of human health and environment during construction
   2. Degree of risk prior to attainment of cleanup standards

D. Long-term effectiveness
   1. Degree of certainty of cleanup success
   2. Long-term reliability
   3. Magnitude of residual risk
   4. Management of treatment wastes
   5. Management of wastes remaining untreated

E. Reduction of toxicity/mobility/volume through treatment
   1. Treatment-capability
   2. Reduction or elimination of releases
   3. Management of sources of releases
   4. Degree of irreversibility of treatment
   5. Quantity/quality of treatment wastes

F. Implementability
   1. Technical feasibility
      a. ability to meet standards

b. constructability

2. Availability of necessary off-site facilities
3. Availability of necessary services and materials
4. Administrative requirements
   a. regulatory and permitting requirements
   b. scheduling requirements
   c. monitoring requirements
   d. construction access
   e. operations and maintenance requirements
   f. integration with current site operations
   g. integration with other remedial actions

G. Cost
   1. Present capital costs
   2. Future capital costs
   3. Indirect costs
   4. Operation and maintenance costs

H. Community concerns

I. Degree to which recycling/reuse/waste minimization are used

V. TREATABILITY STUDIES

A. Work Plan
   1. Goal of study
      a. innovative technologies
      b. new applications of existing technologies
   2. Performance standard
   3. Description of process
      a. design parameters
      b. range of contaminant concentrations to be treated
      c. range of other design parameters to be treated
   4. Analytical methods
   5. Vendors
   6. Study schedule
   7. Permits required for on-site work
   8. Pretreatment requirements

B. Study Report
   1. Goal of study
   2. Brief description of study
      a. modifications to work plan
   3. Results
   4. Conclusions
   5. Recommendations
      a. additional study
      b. full scale implementation

VI. ADDITIONAL INFORMATION NECESSARY TO COMPLY WITH SEPA

A. SEPA checklist completed

B. Threshold determination made

C. Declaration of Nonsignificance (DNS)

D. Environmental Impact Statement (EIS)

VII. COMPARISON OF ALTERNATIVES