Bet of Pasco

COPY

STATE OF WASHINGTON

DEPARTMENT OF ECOLOGY

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STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

In the Matter of Remedial Action at:	)	Enforcement Order
THE PORT OF PASCO SITE	)	No. DE 92TC-E106

To: Port of Pasco
Crowley Maritime Corporation
Tidewater Bargelines, Inc.
Piute Energy and Transportation Co.
Doyle Brothers, Inc.
Conoco, Inc.
U. S. Army Corps of Engineers

Collectively referred to herein as the Potentially Liable Parties ("PLPs").

I.

Jurisdiction

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

II.

Statement of Facts

The Site is located in Section 31, Township 9 North, Range 30 East, Willamette Meridian, on the north bank of the Columbia River in Pasco, Washington. Much of the Site is owned or controlled by the Port of Pasco. The location of the Site is depicted by the diagram that is Exhibit A to this Order. The Site consists of the area that extends laterally and vertically as far as the plume of contamination in soil and ground water resulting from releases at the Site.

2. The Site has been a petroleum storage facility since the 1940s and has consisted of a main tank farm, several smaller tank farms, and several operating areas which have been leased to several tenants. Current operations in the tank farms include the storage and distribution of gasoline, diesel, and agricultural chemicals in over thirty (30) storage tanks. Petroleum products are transferred to and from the tank farms by railcars, trucks, barges and via pipelines.

3. The Port has leased the main tank farm to four different companies, beginning with the River Terminals Company in 1941. This company merged with Pacific Inland Navigation Company in 1959, which operated the tank farm until 1975. Columbia Marine Lines operated the tank farm from 1976 to 1987. Crowley Maritime Company, Columbia Marine Lines' parent company, presently holds the lease but currently subleases to Tidewater Barge Lines, Inc., who has operated the tank farm since 1987 to the present.

4. The normal surface elevation of Lake Wallula (Columbia River) is generally about five (5) feet higher than the elevation of the ground water table beneath adjacent areas of the southern portion of the Site. The difference in elevation creates a potential for the flow (seepage) of water from Lake Wallula to inland areas. The U. S. Army Corps of Engineers has constructed and maintained several structures and facilities which are intended to control ground water seepage inflow in the southern portion of the Site. These structures and facilities include: a dike constructed along the shoreline of the Columbia River; two dewatering wells; a ground water barrier to stabilize a grain elevator foundation; and a perforated interceptor drain line. The two dewatering wells discharge to the interceptor drain. Ground water and surface water from local storm water systems flow from the interceptor drain to an outlet located about 1500 feet west of the main tank farm. The water from the outlet flows through an oil/water separation device, and then through an unlined ditch to the Juvenile Pond, which serves as a collection reservoir. Water from the Juvenile Pond is periodically pumped over the dike and into the Columbia River.

5. Results of investigations to date indicate that a release of hazardous substances to the environment has occurred at the Site. These results include, but are not limited to, the following:

i. Various petroleum products, referred to as "free product" has been detected floating on the water table in seventeen (17) of the thirty (30) monitoring wells installed at the Site. Free product thicknesses have ranged from 0.02 feet to about 2.13 feet. This free product has been determined to be a mixture of diesel and gasoline.

ii. Free product consisting of pure diesel has been detected in the two dewatering wells.

iii. Free product has been found at the outlet of the interceptor drain. The Port of Pasco has installed an oil/water separator at this outlet.

iv. Volatile Organic Compounds have been detected in ground water samples. For example, benzene was detected at a maximum concentration of 2800 parts per billion (ppb) which is 560 times the Federal Maximum Contaminant Level; and, 1,2-dichloropropane was detected at a maximum concentration level of 26 ppb which is 5.2 times the Federal Maximum Contaminant Level.

v. Volatile Organic Compounds have also been detected in surface water samples taken immediately below the oil/water separator. For example, 1,2-dichloropropane was detected at a concentration of 66 ppb.

6. On September 4, 1990, Ecology published a hazard ranking of 1 (on a scale of 1 to 5, 1 being of highest risk) for the Port of Pasco Site based on the Washington Ranking Method.

7. Studies germane to the site investigations include, but are not limited to:

i. Russell, Robert, 1973: Geo-Hydrologic Evaluation of Pacific Inland Navigation Company Tank Farm Oil Spill Problem;

ii. GeoEngineers, Inc., 1987: Report of Geotechnical Services Evaluation of Free Fuel Contamination, Pasco Bulk Terminal (Phase 1 and Phase 2);

iii. Johnson, Art, 1987: Screening Survey for Contaminants in Ground Water and Surface Drainage at the Port of Pasco;

iv. GeoEngineers, Inc., 1988: Report of Phase 3 Geotechnical Services Evaluation of Free Fuel Contamination, Pasco Bulk Terminal; and

v. Chern, Laura, 1989: Investigation of Hydrocarbon Contamination in Ground Water and Soil, Port of Pasco.

III.

Ecology Determinations

1. The facility is known as the Port of Pasco Site and is located in Section 1., Township 9 North, Range 30 East, Willamette Meridian, on the North bank of the Columbia River in Pasco, Washington.

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

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

4. By letters pursuant to WAC 173-340-500(4), Ecology notified each of the parties listed below of its status as a "potentially liable person" under RCW 70.105D.040 after notice and opportunity for comment:

i. Port of Pasco, as current owner/operator, on May 21, 1991;

ii. Crowley Maritime Corporation, as current owner/operator, on May 21, 1991;

iii. Tidewater Barge Lines, Inc., as current owner/operator, on May 21, 1991;

iv. Doyle Brothers, Inc., as current owner/operator, on July 11, 1991;

v. U. S. Army Corps of Engineers, as current owner/operator, on February 13, 1992;

vi. Piute Energy and Transportation Company (formerly Pacific Inland Navigation Company or PAC), as past owner/operator, on February 14, 1992; and,

vii. Conoco, Inc., as past owner/operator, on February 14, 1992.

5. Pursuant to RCW 70.105D.030(1) and .050, the Department 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.

6. 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 the Port of Pasco; Crowley Maritime Corporation; Tidewater Bargelines, Inc.; Piute Energy and Transportation Company; Doyle Brothers, Inc.; Conoco, Inc.; and the U. S. Army Corps of Engineers (herein referred to as the PLPs) 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. The work to be performed includes an Interim Action, and a Remedial Investigation and Feasibility Study (RI/FS). The Remedial Investigation (RI) may be conducted in two Phases.

2. The purpose of the Interim Action will be to remove free petroleum product from the ground water at the Site in order to minimize continued releases to the environment of both floating and dissolved petroleum constituents and to eliminate risks posed by migrating gas vapors in the Delaney residence and other confined spaces in the Site.

3. The purpose of Phase I of the RI is to completely characterize the Site, and to define the degree and extent of contamination. Data gaps identified after completion of Phase I, the RI, as well as other data needed to supplement the Feasibility Study, will be addressed in Phase II of the RI.

4. The Feasibility Study (FS) shall develop and evaluate remedial measures which reduce risks to public health and the environment and meet local, state, and federal standards.

5. Attached hereto are the Scopes of Work for an Interim Action as Exhibit B, for RI (Phase I) as Exhibit C, and for RI (Phase II) and FS as Exhibit D.

6. The PLPs shall submit Work Plans to implement the attached Scope of Work according to the following schedule:

Submit Work Plan for Interim Action and RI (Phase I), and a Public Participation Plan to Ecology for review and approval.	By November 15, 1992
Implement the Interim Action	As per schedule in approved Interim Action Work Plan
Implement and Complete RI (Phase I)	As per schedule in approved work plan.
Submit Work Plan for RI (Phase II) and Feasibility Study	Within 45 days of Ecology approval of the RI (Phase I) Final Report
Complete Remedial Investigation and Feasibility Study	As per schedule in the approved Work Plan

7. These Work Plans shall consist of a detailed breakdown of the work to be performed, personnel requirements, estimated project costs, and schedules for implementation including the following elements thereof:

a. Health and Safety Plan
b. Sampling and Analysis Plan
c. Public Participation Plan
d. Compliance Monitoring Plan (for Interim Action only)

The Work Plans and each element thereof shall be designed, implemented and completed in accordance with the Model Toxics Control Act (Chapter 70.105D RCW) and its implementing regulations (Chapter 173-340 WAC) as amended, and all applicable, federal, state and local laws and regulations.

8. Within forty five (45) days after receipt of each Work Plan, Ecology shall notify the PLPs, in writing, of Ecology's approval or disapproval of the Work Plan. In the event of any disapproval, Ecology shall specify, in writing, both the deficiencies and any Ecology recommended modifications regarding the Work Plans.

9. Within fifteen (15) days of receipt of Ecology's notification of the Work Plan disapproval or recommended modification, the PLPs shall amend and submit to Ecology a revised Work Plan incorporating the modifications required by Ecology.

10. Within fifteen (15) days of Ecology's approval of the Work Plan, the PLPs shall commence work and thereafter complete all tasks by the dates indicated in the approved schedule. The approved Work Plan and schedule shall be attached to and incorporated into this Order, and shall thereafter be an integral and enforceable part of this Order.

11. Progress reports shall be completed on a monthly basis. The reports shall address progress made during the period, work in progress, problem areas, key activities, deliverables submitted, field work and data generated, subcontracting, analytical services performed, and key staff changes.

12. In accordance with WAC 173-340-840(5), sampling data shall be submitted according to Appendix E: GROUNDWATER SAMPLING DATA SUBMITTAL REQUIREMENTS. These submittals shall be provided to Ecology as required under the schedule established in Provision 10, above.

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

The PLPs 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 (e.g., employee salary, laboratory costs, travel costs, contractor fees, and employee benefit packages) and agency indirect costs of direct activities. The PLPs shall pay the required amount within ninety (90) days of receipt 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 may result in interest charges.

4. Designated Project Coordinators

The project coordinator for Ecology is:

Teresita F. Bala
Toxics Cleanup Program
State of Washington
Department of Ecology
N. 4601 Monroe, Suite 100
Spokane, WA 99205-1295

The PLPs shall designate one individual to act as a project coordinator for the PLPs, and shall inform Ecology of this individual's identity, telephone number and mailing address within fifteen (15) days of receipt of this Order.

The project coordinator(s) shall be responsible for overseeing the implementation of this Order. To the maximum extent possible, communications between Ecology and the PLPs, 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 coordinator(s). Should Ecology or the PLPs change project coordinator(s), written notification shall be provided to Ecology or the PLPs 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. The PLPs 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. The PLPs 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, the PLPs shall not perform any remedial actions at the Port of Pasco Site outside that required by this Order unless Ecology concurs, in writing, with such additional remedial actions.

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 the PLPs. When entering the Site under Chapter 70.105D RCW, Ecology shall provide reasonable notice before entering property unless an emergency prevents notice. Ecology shall allow split or replicate samples to be taken by the PLPs during an inspection unless doing so would interfere with Ecology's sampling. The PLPs 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

The PLPs shall prepare and/or update a public participation plan for the Site. Ecology shall maintain the responsibility for public participation at the Site. The PLPs shall help coordinate and implement public participation for the Site.

8. Retention of Records

The PLPs 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 the PLPs, a record retention requirement meeting the terms of this paragraph shall be required of such contractors and/or agents.

9. Dispute Resolution

The PLPs 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 of this Order. Ecology resolution of the dispute shall be binding and final. The PLPs are 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 Port of Pasco Site.

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 the PLPs 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 the PLPs 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 any of the PLPs may have in the Site or any portions thereof, the PLPs 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, the PLPs shall notify Ecology of the contemplated transfer.

12. Compliance With Other Applicable Laws

All actions carried out by the PLPs 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 the PLPs receipt of written notification from Ecology that the PLPs have 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 the PLPs refuse, without sufficient cause, to comply with any term of this Order, the PLPs 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

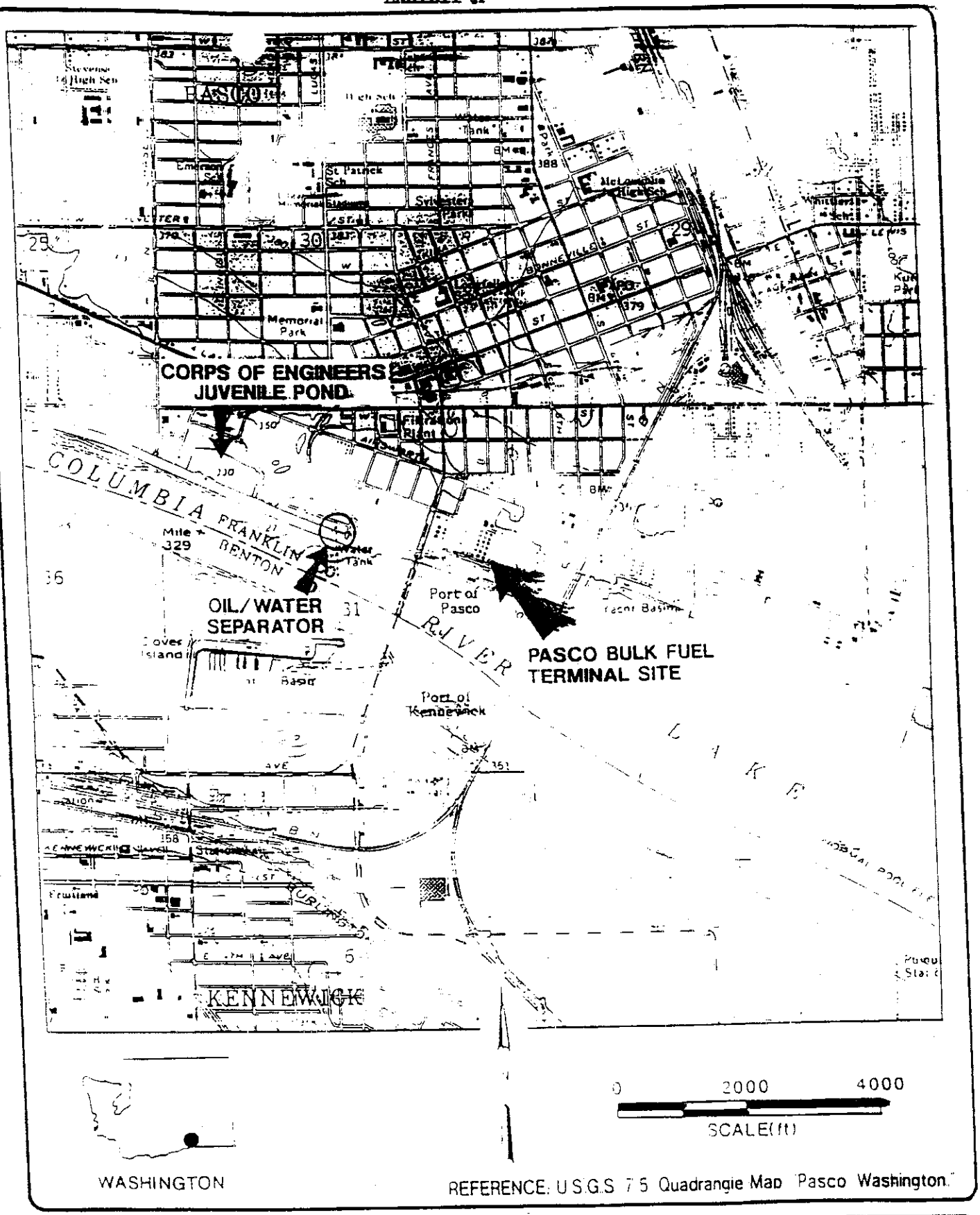
      (2) civil penalties of up to $25,000 per day for each day it refuses to comply

   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: October 15, 1992

Flora J. Goldstein
Section Manager
Toxics Cleanup Program

EXHIBIT A



REFERENCE: U.S.G.S. 7.5 Quadrangle Map "Pasco Washington."

EMCON
Northwest Inc

DATE	9-92
DWN	MDC
APPR	JLS
REVIS	
PROJECT NO.	0759-001.01

Figure 1-1
PASCO BULK FUEL TERMINAL SITE
PASCO, WASHINGTON

SITE LOCATION MAP

EXHIBIT B

SCOPE OF WORK

INTERIM ACTION

INTRODUCTION

This Scope of Work is to be used by the PLPs or their contractors to develop a Work Plan for an Interim Action which will intercept, abate the discharge to the environment of and recover free petroleum product by using proper hydraulic techniques; and to monitor and reduce risks at the Delaney residence due to migration of petroleum contamination. The interim action Work Plan shall be prepared and interim action will be conducted in accordance with the Model Toxics Control Act and WAC 173-340-430.

TASK I. PROJECT PLANNING

A. INTERIM ACTION WORK PLAN

The Interim Action Work Plan shall consist of the following:

1. Background Summary

   a. Description of existing Site conditions.

   b. Compilation, analysis and interpretation of all previous environmental, geologic, and hydrogeologic investigations that are related to the Interim Action, including the known extent of free petroleum product.

2. Alternative Interim Actions for Free Product Recovery

   a. Description of applicable alternatives used to intercept and recover free petroleum product releases.

   b. Analysis of alternatives.

3. Proposed Free Petroleum Product Recovery System

   a. Explanation of why the proposed alternative as selected.

   b. Additional data to be collected, as necessary.

   c. Methods for management or disposal of any treatment residual and other waste materials containing hazardous substances generated as a result of the interim action.

   d. Necessary permits and approvals.

4. Delaney Residence and Manhole Monitoring

   a. Monitor at the basement of the Delaney residence and other confined spaces for volatile and explosive gases.

   b. Evaluation of risks.

   c. Alternatives to reduce risks.

   d. Proposed action.

5. CONSTRUCTION PLANS AND SPECIFICATIONS

   a. Construction Specification
   b. Required Permits and Approvals
   c. Operation and Maintenance Plan
   d. Schedule of Implementation

6. Other Required Work Plans

   a. Sampling and Analysis Plan
   b. Health and Safety Plan
   c. Compliance Monitoring Plan

DELIVERABLES: Interim Action Plan - Draft
Interim Action Plan - Final

B. SEPA Checklist

Information needed to fulfill the applicable requirements of the State Environmental Policy Act.

DELIVERABLE: SEPA Checklist

TASK II. IMPLEMENTATION OF THE INTERIM ACTION

DELIVERABLES: Monthly Reports

Interim Action Report - Draft
Interim Action Report - Final

TABLE I

SCHEDULE OF DELIVERABLE ITEMS

INTERIM ACTION

DELIVERABLE	**DATE DUE**
Effective Date of Order	Start
Task I Deliverables	
Interim Action Plan (Draft)	November 15, 1992
SEPA Checklist (Draft)	November 15, 1992
Interim Action Plan (Final)	15 days after receipt of Ecology's comments on draft.
SEPA Checklist (Final)	15 days after receipt of Ecology's comments on draft.
Implementation of Interim Action	15 days after approval of Final Plans.
Task II Deliverables	
Interim Action Status Report	Monthly.
Interim Action Report (Draft)	30 days after completion of interim action.
Interim Action Report (Final)	15 days after receipt of Ecology's comments.

iv. All past and present above and under ground tanks, buildings, utilities, paved areas, easements, rights-of-way, and other features; including the Corps of Engineers interceptor drains, storm drains, and dewatering wells.

v. All past and present known or suspected hazardous substance treatment, storage or disposal areas;

vi. All past or present product and waste underground tanks and piping;

vii. A series of all aerial photographs that may be obtained from public sources;

viii. Surrounding land uses (residential, commercial, agricultural, recreational); and

ix. The location of all ground water supply and monitoring wells within a one mile radius. These wells shall be clearly labeled and ground and top of casing elevations and construction details included. Older wells may not have been reported to state agencies so oral interviews with local residents and business owners to identify such wells will be necessary.

All maps shall be consistent with the requirement set forth in WAC 173-340-840(4) and be of sufficient detail and accuracy to locate and report all current and future work performed at the Site;

b. Description of the surface water bodies in the vicinity of the Site which shall include but not limited to the following information:

i. For streams and rivers: location, elevation, flow, velocity, depth, width, seasonal fluctuations, and flooding tendencies; and

ii. Drainage patterns.

c. A history and description of ownership and operation, waste generation, treatment, storage and disposal activities at the Site, including interviews with former employees and local residents;

d. Approximate dates or periods of past product and waste spills, identification of the materials spilled, the amount spilled, the location where spilled, and a description of the response actions conducted including any inspection reports or technical reports generated as a result of the response.

2. Evaluation of Existing Data

Compile and evaluate existing information on the following:

a. Hydrogeology

i. Description of the regional and Site specific geologic and hydrogeologic characteristics affecting ground water flow at the Site, including:

* Regional and Site stratigraphy;

* Structural geology;

* Depositional history;

* Identification and characterization of areas and amounts of recharge and discharge;

* Regional and Site specific ground water flow patterns; and

* Characterization of seasonal variations in the ground water flow regime.

ii. Analysis of any topographic features that might influence the ground water flow system.

b. Nature and Extent of Contamination

i. Summary of all possible source areas of CONtamination. This at a minimum should include all waste disposal areas, spill areas, and other suspected source areas of contamination. For each area, the Defendants shall identify the following:

* Location of area (which shall be depicted on a Site map);

* Quantities of hazardous substances released;

* Hazardous substances, to the extent known; and
* Identification of areas where additional information is necessary.

ii. Assessment and description of the existing degree and extent of contamination. This should include:

* Available monitoring data and qualitative information on locations and levels of contamination at the Site;

* All potential migration pathways including information on geology, hydrogeology, pedology, physiography, hydrology, water quality, meteorology, air quality; and

* The potential impact(s) on human health and the environment, including demography, ground water and surface water use, and land use.

3. Preinvestigation Evaluation of Cleanup Action Alternatives

Identify the potential cleanup action technologies, prior to starting Site investigation, that may be used on-site or off-site for the containment, treatment, remediation, and/or disposal of contamination. This task shall also identify any field data that needs to be collected in the Remedial Investigation to facilitate the evaluation and selection of the final Cleanup measure or measures.

4. Work Plans and Schedules for Tasks II and III

Based on the elements described for Tasks II and III, the following shall be included:

a. Determination of additional activities and data needed to supplement and verify existing data in order to complete the RI/FS.

b. Detailed Work Plan and schedules for Tasks II and III.

DELIVERABLES: RI (PHASE I) WORK PLAN - DRAFT

B. Sampling and Analysis Plan

Prepare a Sampling and Analysis Plan for use during all Site characterization studies. The Sampling and Analysis Plan shall include:

1. Objectives;
2. Schedules and task assignments;
3. Site access;
4. Quality Assurance Project Plan (QAPP), including:

   a. Field Quality assurance/quality control (QA/QC) methods:

      i. Standard operating procedure for field sampling methods (reference SOP and describe briefly);

      ii. Field documentation methods;

      iii. Frequency of QA/QC samples:

         * duplicates;
         * rinsate;
         * blank.

      iv. Field instrument calibration;

   b. Chain of custody procedures;

   c. Decontamination procedures, including:

      i. entry and exit controls;
      ii. disposal of wastes from sampling effort; and
      iii. equipment and personnel decontamination.

   d. Laboratory QA/QC program:

      i. laboratory identification;
      ii. sample custody;
      iii. analytical turn-around time;
      iv. calibration procedures and frequency;
      v. data reduction, validation, and reporting;
      vi. internal quality control checks;
      vii. performance system and audits; and
      viii. specific procedures for routine assessment of data precision, accuracy and completeness.

5. Samples, including:

   a. Sampling methods;
   b. Locations and ID numbers (map);
   c. List order of samples collections;
   d. Sample media and objectives;

      i. samples to determine nature and extent of contamination; and

      ii. samples to develop possible remedial actions.

   e. QA/QC samples;
   f. Shipping and handling arrangements;
   g. Split sampling opportunity; and
   h. Analytical parameters, including:

      i. justifications for choice of analyses;

      ii. laboratory and analytical method identification, including detection limits;

      iii. sample containers preservation and holding times; and

      iv. laboratory-generated QA/QC samples.

6. List of supplies and equipment; and

7. Monitoring well construction and development standards.

DELIVERABLES: Sampling and Analysis Plan - Draft
Sampling and Analysis Plan - Final

C. Health and Safety Plan

1 Prepare and follow a Site-specific Health and Safety Plan in accordance with all applicable Occupational Safety and Health Administration (OSHA) and Washington Department of Labor and Industries, Division of Industrial Safety and Health (WISHA) worker protection requirements. The Health and Safety Plan shall address the following:

   a. Level of protection;
   b. Hazard evaluation;
   c. Waste characteristics;
   d. Special Site considerations; and
   e. Emergency information.

DELIVERABLE: Health and Safety Plan

TASK II. Remedial Investigation (Phase I)

Conduct investigations necessary to characterize the Site (Environmental Setting); define the source (Source Characterization); define the degree and extent of contamination (Contaminant Characterization); and identify actual or potential receptors. The investigations shall result in data consistent with the Quality Assurance/Quality Control Plan and of adequate technical quality to support the development and evaluation of the cleanup measure alternative or alternatives during the Feasibility Study.

The Remedial Investigation (Phase I) activities shall follow the Work Plan. All sampling and analysis shall be conducted in accordance with the Sampling and Analysis Plan. All sampling locations shall be documented in a log and identified on a detailed Site map.

Collect information to supplement and verify existing information on the environmental setting at the Site as follows. Reference is made to "Figure E-2" of the Geoengineers "Work Plan, Interim Remedial Action, Pasco Bulk Terminal, Pasco WA" dated August 30, 1991.

A. Hydrogeology

1. Install, in accordance with WAC 173-160, monitoring wells, with the purpose of ascertaining phreatic surface elevation and floating petroleum product occurrence as follows:

   a. 1 well, located equidistant between existing well MW-14 and COE-2. Exact location is allowed to vary to avoid interference with utilities;

   b. 1 well, located near the intersection of River Street and Eighth Street, between the COE interceptor drain and the Columbia River.

   c. 4 wells as close as practicable to Tenth Street, one located near the junction of Tenth Street and Washington Street, one located approximately equidistant between the parallel lines formed by Washington Street and River Street, one located near the junction of the projected western extent of River Street and Tenth Street, and one located as close as practicable to the northern side of the COE interceptor drain;

d. 1 well, installed south of MW-7 between the COE interceptor drain and the Columbia River;

e. 1 well, south of MW 20, between well and the COE interceptor drain;

f. 1 well, south of MW-16, between the COE interceptor drain and the dike center line.

g. 1 "upgradient" well, located near the junction of Ainsworth Avenue and Sixth Street.

h. 2 wells, installed to replace the currently unlocatable wells MW-24 and MW-26.

2. Install, in accordance with WAC 173-160, monitoring wells, with the purpose of ascertaining phreatic surface elevation, vertical gradients, and dissolved fuel constituents as follows:

Four well nests, consisting of one well screened across the phreatic surface and one well screened at the base of the uppermost aquifer in the following locations: 1, in an upgradient location near Sixth Street and Ainsworth Avenue, 1, near MW-9, 1 near MW-24 or the junction of Tenth and Washington Streets, and one near the junction of Tenth Street and the COE interceptor drain, in (d) above. Such wells will be located as close together as practicable.

3. Analysis

a. In all wells installed above, the following shall be determined based on field data, tests and cores. The objective is a representative and accurate classification and description of the hydrogeologic units which may be part of the migration pathways at the Site (in both saturated and unsaturated units), including:

i Hydraulic conductivity and porosity;

ii. Lithology, grain size, sorting, degree of cementation;

iii. An interpretation of the degree of interconnections between saturated zones; and

iv. The contaminant solute attenuation capacity and mechanisms of the natural earth materials.

b. In all wells, including those installed and all wells existing on the effective date of this order, the following shall be conducted:

i. Monthly measurements for one year of water levels, and free product thicknesses.

ii. Quarterly sampling for 1 year to to characterize the chemistry of the Site for the following parameters:

* Volatile Organic Compounds (VOCs)
* Polynuclear Aromatic Hydrocarbons (PAHs)
* Total Petroleum Hydrocarbons (TPH)
* Total Metals
* Pesticides
* PCBs
* Specific conductance, pH, and temperature.
* Free product identification.

B. Soils

1. Installation of test pits or soil borings, hereinafter referred to as holes, as follows. All holes will be advanced to the phreatic surface.

a. 3 holes, arrayed as appropriate within the area bounded by MW-20, MW-7, Tenth Street, MW-8, and MW-19;

b. 5 holes along Eighth Street between River and Washington Streets;

c. 5 holes between Ainsworth Avenue and Washington Street,1 west of the existing storage tanks and east of Eighth Street;

d. 5 holes, along Ninth Street, between River Street and Washington Street;

e. 5 holes, along River Street between MW-15 and the Eastern edge of the Doyle Brothers property;

f. 7 holes, along Washington Street, between Tenth Street and MW-2;

g. 3 holes between MW-14 and MW-2.

h. Sufficient additional holes, used as necessary to completely characterize other potential source areas, i.e. loading racks, past spill locations, etc.

2. Soil Analysis

a. Analysis of samples (from soil borings and all new wells), to characterize the soil and rock units above the water table, at a minimum of 3 samples per area identified in 2.a.i though viii above, for the following:

i. SCS soil classification;

ii. Surface soil distribution;

iii. ASTM soil profile classification;

iv. Hydraulic conductivity (saturated and unsaturated);

v. Bulk density;

vi. Porosity;

vii. Soil organic content;

viii. Soil pH;

ix. Particle size distribution;

x. Moisture content, field capacity, infiltration rate;

xi. Soil surface area;

xii. Cation exchange capacity;

xiii. Field screening results for organic vapors.

b. Analysis of samples, to be taken at the ground surface, the phreatic surface, and at the midpoint between the ground surface and the phreatic surface, at each sampling point, for the following chemical constituents:

* Volatile Organic Compounds (VOCs)
* Polynuclear Aromatic Hydrocarbons (PAHs)
* Total Petroleum Hydrocarbons (TPH)
* Total Metals
* Pesticides
* PCBs

C. Surface Water and Sediment

Characterize the surface water bodies in the vicinity of the Site. Such characterization shall include but not be limited to the following activities and information:

1. Description of the chemistry of the natural surface water and sediments. This includes determining the pH, total dissolved solids, total suspended solids, BOD, COD, alkalinity, conductivity, dissolved oxygen profiles, nutrients, total organic carbon, specific contaminant concentrations.

2. Characterize the performance of the oil water separator by chemically sampling the influent and effluent:

   a. Monthly for Total Petroleum Hydrocarbons;

   b. Quarterly for Volatile Organic Compounds (EPA Method 8240) and Fuel Type;

   c. Monthly for flow volume and free product recovered.

3. Characterize the surface water chemistry by sampling the collection pond at three locations;

4. Description of the sediment characteristics including:

   a. Deposition area;

   b. Thickness profile;

   c. Physical and chemical parameters (e.g., grain size, density, organic content, pH, contaminant concentration, etc.).

   d. Chemical parameters (e.g. TPH, VOCs, and total Lead) at three locations in the collection pond and three locations near the loading dock on the Columbia River.

D. Air

Gather information characterizing the climate and meteorology in the vicinity of the Site. Such information shall include but not be limited to:

1. General meteorological data including: annual and monthly rainfall averages, monthly temperature averages, wind speed and direction, relative humidity and dew point, pressure variations, evaporation rates, development of inversions, and climatic extremes that have occurred in the vicinity of the Site (including frequency of occurrence).

2. A description of topographic and manmade features which affect air flow and emission patterns.

DELIVERABLES: RI Status Monthly Reports

TASK III. Investigative Analysis

Prepare an RI (Phase I) Report that presents an analysis and summary of all Task II Site investigations and their results.

A. Data Analysis

1. Analyze all Site investigation data outlined in Task II and prepare a report on the type and extent of contamination at the Site including sources and migration pathways.

2. Identify data gaps to completely define contamination in all media.

B. Appendices to the report containing full documentation of investigative activities and analytical results. These appendices shall include:

1. General field observations, including:

   a. Ground water characterization, including flow (maps);
   b. Location of nearby wells and well log information;
   c. Soil conditions;
   d. Surface water characterization; and
   e. Well driller logs and observations.

2. Changes in sample collections from sample plan, including:

   a. Opportunity samples; and
   b. Other changes.

3. Sample location map, including:

   a. Approximate distances;
   b. Sample media; and
   c. Sample numbers.

4. Table of results;

5. Maps identifying contaminant concentrations, including field sampling results;

6. Discussion of results, including:

   a. Nature of the contamination;

b. Extent of the contamination, including volume of material needing remediation;

c. The pathways by which contamination reached or can reach the media; and

7. Quality assurance, data validation, which includes detailed evaluation of data according to approved QA/QC plan;

8. Full data package as appendix including QA/QC information and field logs with date, time and activity information;

9. Recommendations for further study, if necessary.

DELIVERABLES: Phase I RI Report - Draft
Phase I RI Report - Final

TABLE II

SCHEDULE OF DELIVERABLES
RI (PHASE I)

DELIVERABLE	DATE DUE
Effective Date of Order	Start
Draft RI (PhaseI) Work Plan	November 15, 1992
Sampling and Analysis Plan	November 15, 1992
Health & Safety Plan,	November 15, 1902
Final RI (Phase I) Work Plan	15 days after receipt of Ecology's comments.
Sampling and Analysis Plan	15 days after receipt of Ecology's comments.
Health & Safety Plan	15 days after receipt of Ecology's comments.
Implementation of Phase I of the RI	15 days after approval
RI (Phase I) Status Reports	Monthly
Draft RI (Phase I) Report	As per schedule in the approved Work Plan.
Final RI (Phase I) Report	15 days after receipt of Ecology's comments.

EXHIBIT D

SCOPE OF WORK

RI (PHASE II) AND FS

The purpose of Phase II of the RI is to gather all data necesssary to fill gaps after Phase I of the RI to completely define the contaminant distribution in all media, and to gather all necessary data to support the Feasibility Study, to assess the potential risk to public health and the environment, and to analyze all ARAR's applicable to the Site. The Feasibility Study shall develop and evaluate remedial measures which reduce risks to public health and the environment and meet local, state and federal standards.

TASK I. Project Planning

A. Detailed RI (Phase II) and FS Work Plan

This work plan must conform with MTCA regulations, modified as appropriate to the Site.

1. Summary of RI (Phase I)

a. Hydrogeology
b. Nature and Extent of Contamination
c. Data Gaps

2. Work Plans and Schedules for Tasks II through VI.

DELIVERABLES: RI (PHASE II) AND FS WORK PLAN - DRAFT
RI (PHASE II) AND FS WORK PLAN - FINAL

B. Sampling and Analysis Plan Amendments

DELIVERABLES: As needed.

C Health and Safety Plan Amendment

DELIVERABLES: As needed.

D Applicable ARARs

This shall include an analysis of all applicable state and federal laws, criteria, and guidance that will help establish the cleanup requirements.

DELIVERABLES: ARARs Analysis - Draft
ARARs Analysis - Final

TASK II. Additional Site Investigations

A. Ground Water

1. Installation of devices to further characterize, if necessary, the chemistry of ground water, free product, and the physical flow system.

2. Sampling and Analysis

B. Soils

1. Install borings, pits, or other devices to:

a. Further define the limits of soil contamination.
b. Assess potential impacts of specific areas.

2. Sampling and Analysis

C. Gather other data necessary to support the Feasibility Study.

TASK III. Investigative Analysis

Prepare an RI (Phase II) Report that presents an analysis and summary of all Site investigations. The objective of this task shall be to ensure that the investigation data are sufficient in quality and quantity to describe the nature and extent of contamination, potential threat to public health and the environment and to support a Feasibility Study.

DELIVERABLES: Monthly Reports

RI (Phase II) Report - Draft
RI (Phase II) Report - Final

TASK IV. Risk Assessment

Prepare a Risk Assessment Report characterizing the current and potential threats to public health and the environment that may be posed by hazardous substances at the Site. The Risk Assessment shall include:

1. Hazardous substance identification;

2. Exposure assessment;

3. Toxicity assessment;

4. Risk characterization, to include discussion of applicable standards including those in WAC 173-340-700.

DELIVERABLES: Risk Assessment Report - Draft
Risk Assessment Report - Final

TASK V. Treatability Investigations

Conduct laboratory and/or bench scale studies, if necessary, to determine the applicability of a Cleanup Action technology or technologies to the Site conditions. This shall include: development of a testing plan identifying the type(s) and goal(s) of the study(ies), the procedures to be used for data management and interpretation, evaluation of the test results with respect to Site specific conditions, and preparation of a report summarizing the testing program and its results.

TASK VI. Feasibility Study

The Feasibility Study shall serve to evaluate the feasibility and effectiveness of implementing alternative cleanup actions (as required by WAC 173-340-360). It shall include:

A. Detailed identification of contamination to be remediated and physical hazards to be removed;

B. Identification of remedial alternatives that will:

1. Adequately protect public health, welfare, safety and the environment;

2. Reduce the toxicity, mobility, and volume through treatment;

3. Eliminate or remove all physical hazards;

4. Meet all federal, state and local laws and rules designated to be applicable or relevant and appropriate by Ecology; and

5. Be a permanent remedial action for the Site.

C. A requirement to conduct additional sampling and/or laboratory testing necessary to evaluate remedial alternatives.

D. An evaluation of alternatives based on cost, technical feasibility, environmental effects, and effectiveness in accomplishing the five requirements specified above [VI.B(1-5)].

DELIVERABLES: Feasibility Study Report - Draft
Feasibility Study Report - Final

TABLE III

SCHEDULE OF DELIVERABLES
PHASE II RI AND FS

DELIVERABLE	DATE DUE
Draft RI (Phase II) and FS Work Plan	45 days after receipt of Ecology's approval of RI (Phase I) Report
Sampling and Analysis Plan Amendments	45 days after receipt of Ecology's approval of RI (Phase I) Report
Health & Safety Plan Amendments	45 days after receipt of Ecology's approval of RI (Phase I) Report
ARARs Analysis	45 days after receipt of Ecology's approval of RI (Phase I) Report
Final RI (Phase II) and FS Work Plan, etc.	15 days after receipt of Ecology's comments.
Implementation of the RI (Phase II) and FS Work	15 days after approval.
Status Reports	Monthly.
Draft RI (Phase II) Report	As per schedule in the approved Work Plan.
Draft Risk Assessment Report	As per schedule in the approved Work Plan.
Final RI (Phase II) Report	15 days after receipt of Ecology's comments.
Final Risk Assessment Report	15 days after receipt of Ecology's comments.
Draft FS Report	As per schedule in the approved Work Plan.
Final FS Report	15 days after receipt of Ecology's comments.

EXHIBIT E
GROUND WATER SAMPLING DATA REQUIREMENTS

DRAFT 6/27/91

SITE DESCRIPTION AND SAMPLE DATA SUBMITTAL REQUIREMENTS

1. Media

Required data must be submitted on IBM[1] MS-DOS[2](version 2.1) or compatibly formatted diskettes. The diskettes may be either 5 1/4 inch double sided, double density; 5 1/4 inch double sided, high density; or 3 1/2 inch double sided, double density.

2. Data Formats

The SITE DESCRIPTION FILE and the SAMPLE ANALYSIS FILE are comma delimited ASCII files used as the standard format for transferring sample data to and from Ecology (LOTUS files and Ashton Tate DBF files may be substituted for ASCII files) The files will include the fields in the format and order listed.

The following information is available to standardize information entered into required files (see following appendices):

A. Chemical Data Dictionary (Standardizes Spelling, STORET P-codes., etc entered into the SAMPLE ANALYSIS FILE.

B. County Codes (FEDERAL INFORMATION PROCEDURES(FIPS) CODES)

C. State Plane Zones (N or S)
(NOTE: Copy of RCW 58.20 provided for reference)

D. Map of USGS Hydro Code Areas (US GEOLOGICAL SURVEY HYDROLOGIC UNIT MAP 1974-WASHINGTON)

E. Laboratory Qualifiers

3. Submittal

Computer diskettes containing the SITE DESCRIPTION FILE and/or the SAMPLE ANALYSIS FILE, shall be submitted in duplicate, along with a backup hardcopy of the diskette contents.

---

[1] Trademark of International Business Machines

[2] Trademark of the Microsoft Corporation

FIELD DEFINITIONS FOR SITE DESCRIPTION FILE

FIELD	TYPE	WIDTH	DEFINITION
REP_DATE	D	10	Reporting date (mm/dd/yyyy).
REP_NAME	C	48	Reporting entity, data submitted by.
PRJ_NAME	C	48	Project, site, or facility name.
STA_USE	C	1	Well use (USGS codes) O=observation, W=water withdrawal, X=waste disposal, D=drain, T=test hole, E=geothermal, P=oil/gas, U=unused, R=recharge, Z=destroyed.
WTR_USE	C	1	Water use (USGS codes) W=water quality/level monitoring, D=dewatering, N=industrial, S=stock supply, B=bottling, I=irrigation, Q=aquaculture, U=unused, C=commercial supply, H=domestic supply P=public supply, J=industrial cooling, F=fire protection, Z=other.
DATA_REL	C	1	Data Reliability (USGS codes) C=field checked, L=poor location, U=unchecked.
SIA_ID	C	12	Well ID number.
PRI_SIA	C	15	Ecology primary station code. To be obtained from Ecology TCP.
SEC_SIA1	C	12	Additional station code (previous well numbers, alternate or other well designations)
SEC_SIA2	C	12	Additional station code (if any)
SEC_SIA3	C	12	Additional station code (if any)
STATE_FIPS	C	2	State FIPS code (WA=53).

SIIE DESCRIPTION FILE CONTINUED

FIELD	TYPE	WIDTH	DEFINITION
COUNTYFIPS	C	3	County FIPS code (use state county code).
STATE_CHAR	C	2	State (WA).
COUNTYCHAR	C	16	County.
OWN_NAME	C	30	Monitoring well owner name.
OWN_DT	D	8	Date of ownership of well (mm/dd/yy).
OWN_ADD	C	60	Address of owner.
DRILLER	C	30	Name of Driller.
STA_DESC	C	48	Well location description (for example: "East of Bldg. 2" or "SE corner, intersection 6th & Seneca").
LOC_METHD	C	48	Method of determination of well location coordinates (Note: survey to known horizontal datum is required).
LAT	N	8	Latitude OPTIONAL (degrees-minutes-seconds-tenths).
LONG	N	9	Longitude OPTIONAL (degrees-minutes-seconds-tenths).
SIPCO_NORT	N	12	Northerly state plane coordinates REQUIRED (nearest ft).
SIPCO_EAST	N	12	Easterly state plane coordinates REQUIRED (nearest ft)
SIPCO_ZONE	C	1	State plane coordinates: state plane zone REQUIRED (N or S).
LAND_NET	C	20	Land net location of well (Township, Range, Section, 1/4-1/4 Sec.) Use USGS 1/4-1/4 section alphabetic designator A through R OPTIONAL.

SITE DESCRIPTION FILE CONTINUED...

FIELD	TYPE	WIDTH	DEFINITION
UTM_NORTH	N	9	UTM grid system coordinates: North (meters) OPTIONAL.
UTM_EAST	N	8	UTM grid system coordinates: East (meters) OPTIONAL.
MAP_NAME	C	24	Name of USGS map and scale covering the sampling location(e.g., Yakima 100K).
HOLE_DEP	N	8	Depth of original hole drilled (nearest 0.01 ft).
WELL_DEP	N	8	Well depth (nearest 0.01 ft).
WTR_ELEV1	N	8	Water level elevation at time of installation (nearest 0.01 ft).
WLEV_DAT1	D	10	Date of water level elevation measurement (mm/dd/yyyy).
MEAS_ELEV	N	8	Measuring point (reference point) elevation (nearest 0.01 ft).
MEAS_DESC	C	48	Measuring point description.
DATUM	C	48	Measuring point datum.
LEV_COMM	C	240	Comments, depth and water level data.
ALIIIUDE	N	8	Approximate land surface elevation XXXXX.XX (ft)
DEPTOWTR1	N	8	Water depth at time of install. (nearest 0.01 ft).
CONST_DT	D	10	Date of installation (mm/dd/yyyy).
MOREINT	C	1	More than one open interval (Y/N)
TOP_OPN1	N	8	Depth to top of open interval (ft below measuring point)
BOT_OPN1	N	8	Depth to bottom of open interval (ft below measuring point).
CONST_COMM	C	240	Comments, construction details

SITE DESCRIPTION FILE CONTINUED ..

FIELD	TYPE	WIDTH	DEFINITION
MTD_CON	C	1	Method of construction (USGS WATSTORE codes) A=air rotary, B=bored/augured, C=cable tool, D=dug, H=hydraulic rotary, J=jetted, P=air percussion, T=trenching, V=driven, W=drive wash, R=reverse rotary, X=mud rotary, Z=other.
FILT_LEN	N	5	Length of filter pack (nearest 0.01 ft).
FILT_MAT	C	48	Type of filter pack material and size of material (e.g., Sand 200 mesh).
DIA_BOR	N	8	Boring diameter (in).
DIA_CAS1	N	8	Casing diameter (in).
CAS_MAT1	C	1	Casing material (USGS WATSTORE codes) B=brick, C=concrete, D=copper, F=teflon/fluorocarbon, G=galvanized iron, I=wrought iron, M=other metal, P=pvc/plastics, R=rock/stone, S=steel, T=tile, W=wood, U=coated steel, Z=other.
DIA_OPN1	N	6	Diameter of open interval (in).
LEN_OPN1	N	6	Length of open interval (nearest 0.01 ft).
TYP_OPN1	C	1	Type of open interval (USGS WATSTORE codes) P=perforated/slotted screen, L=louvered/shuttered screen, S=screen (unknown type), F=fracture, R=wire wound, M=mesh, T=sand point, W=walled, X=open hole, Z=other.
TYP_OMT1	C	1	Material type, open interval (USGS WATSTORE codes) R=stainless steel, F=teflon/fluorocarbon, G=galvanized iron, P=pvc/plastic, B=brass/bronze, W=wrought iron, S=steel, T=tile, C=concrete, M=other metal, Z=other.
INT_COMM	C	240	Comments, open interval.
LOG_AVAIL	C	1	Well log data available? (Y/N).

SITE DESCRIPTION FILE CONTINUED.

FIELD	TYPE	WIDTH	DEFINITION
TYP_LOG	C	1	Type of well log (USGS WATSTORE codes) A-time, B-collar, C-caliper, D-driller, E-electric, F-fluid conduction, G-geologist, H-magnetic, I-induction, J-gamma ray, K-dip meter, L-lateral log, M-microlog, N-neutron, O-microlateral log, P-photo/video, Q-radioactive, S-sonic, T-temperature, U-gamma gamma, V-fluid velocity, X-core, Z-other.
LOG_DOC	C	240	Log data source documents (e.g. Remedial Investigation Report).
OTHER_DOC	C	240	Other data source documents.
LOG_LOC	C	60	Location of well log (e.g. Ecology Southwest Regional Office).
AQUI_TEST	C	1	Aquifer testing performed (Y/N).
PUMP_DATA	C	240	Pump data such as: Type, Manufacturer, Horsepower, and depth set.
ANDAT_AVAL	C	1	Analytical data available (Y/N).
PROGRAM	C	9	Ecology program (TCP, WQFA, WQ, other).
GEN_COMM	C	240	General comments.
HUCODE	C	8	USGS Hydrologic Unit Code from Appendix D.
STA_TYPE	C	12	Station type (Ground water, Surface wtr, Soil, or Air).
AGN_USE	C	1	Agency use (USGS codes) A-Active, I-inactive, O-inventory only

*** END OF SITE DESCRIPTION FILE ***

FIELD DEFINITIONS FOR SAMPLE ANALYSIS FILE

FIELD	TYPE	WIDTH	DEFINITION
PRI_STA	C	15	Ecology Monitoring Well No. will be assigned by Ecology ICP Program.
STA_ID	C	12	Site well ID no. or other designation.
X_LOCATION	C	12	Surveyed coordinates reported in the State Plane Coordinates (to the nearest foot).
Y_LOCATION	C	12	
LO_DAT_U	C	5	Year of Reference datum either 1929 or 1983 and which system L Lat Long or S for State Plane Coordinate System.
LOC_DATUM	C	48	Reference datum from Map or survey e.g., 1983 North American Datum (see RCW 58.20)
DEPT_WATER	N	8	Depth to water (in ft) at time of sampling.
WTR_ELEV	N	8	Water level elevation (in ft) at the time of sampling.
AGENCY	C	8	Agency requesting sampling data.
SAMPLE_DAT	D	8	Date of well sampling (mm/dd/yyyy)
ANALYZ_DAT	D	8	Date the sample was analyzed (mm/dd/yyyy)
SAMPLE_ID	C	8	Sample ID code or no.
CONSTITUEN	C	30	Chemical constituent names as defined in Ecology's Chemical Dictionary (see attached Appendix A).
CAS_ID	C	12	Chemical Abstract Systems ID (see Appendix A)
P_CODE	C	5	STORET Parameter Code (see Appendix A)
RESULT	N	12	Detected chemical concentration result.

SAMPLE ANALYSIS CONTINUED...

FIELD	TYPE	WIDTH	DEFINITION
UNITS	C	10	Units of measurement (e.g., ug/Kg).
QUAL	C	4	Contract Laboratory Program chemical data qualifiers (such as U, J, R, UJ, etc.). Non-Contract Lab Program qualifiers, such as less-than signs ("<") or asterisks, are not acceptable (see attached).
LIMIT	C	10	Lab instrument detection limit.
DILUTION	N	6	Amount the sample was reduced and diluted to accommodate analysis (i.e. 10X, 20X).
FILTERED	L	1	Was the sample filtered? Yes(Y) or No(N)
ANALYSIS_MTHOD	C	15	EPA Analysis method descriptions (i.e EPA Method 601)
LAB_ID	C	10	Laboratory performing analysis
MEAS_ELEV	N	8	Surveyed elevation of the measuring point used to determine water level depths and elevations (nearest 0.01 ft).
MEAS_DESC	C	48	Description of the well measuring point used (e.g., top of casing, file mark on casing, etc.).
DATUM	C	48	Vertical datum used to reference elevations (e.g., MSL and source/date of information).
MATRIX	C	2	Type of sample; water, sediment, soil, other (from matrix portion of Ecology Form ECY 040-115).
SOURCE_COD	C	2	Physical environment sampled (from source codes and descriptions ECY 040-115).

*** END OF SAMPLE ANALYSIS FILE ***

This is an example of a Site_des File.

```
19901210,"CITY OF SEATTLE BY AGI","MIDWAY
LANDFILL","O","W","U","MW-1","NOT ASSIGNED","N\A","N\A","N\A","53","033"
,"WA","KING","CITY OF SEATTLE",19850325,"SEATTLE ENGR, SOLID WASTE DIV,
750 DEXTER HORTON BLD, SEATTL","TACOMA PUMP","ABOUT 500 FEET NORTH OF
LANDFILL","SURVEY TO KNOWN
DATUM",,,12479,9771,"NO","",,,"",126.00,126.00,.  ,,365.99,"SURVEY TO
TOP OF PIPE (ESTIMATED NOT VERIFIED)","MEAN SEA LEVEL (USE OF BENCHMARK
NOT VERIFIED)","",366.36,.  ,19850325,"N",86,122,"","A",.
,"",,4,"P",4,36.00,"S","P","","","","","","","","NO
PUMP","","TCP","","17110019","GROUNDWATER","A"
```

The Date of the referenced Report is December 10,1990; This report was prepared for the City of Seattle by Applied Geosciences Inc; This is from the Midway Landfill; The station is an Observation well "O"; The use of this well is Water quality/level monitoring "W"; The data reliability is "U", unchecked; The local station identification is "MW-1"; No primary station code assigned; No secondary station codes assigned; The State FIPS code for WA is 53; The FIPS county code is 033; The State is WA; The site is in King County; The City of Seattle owns the well; The city has owned the well since March, 25, 1985; The address is for the Solid Waste Division; Tacoma Pump drilled the well; The well is located about 500 feet north of the landfill; The method used to locate the well was a survey to known datum (the Benchmark location should be included); Latitude and Longitude are not used in this case, hence the commas to mark the fields; The Northing State Plane Coordinate is 12479; The Easting State Plane Coordinate is 9771; This survey is in the North zone of the State Plane coordinate System; The State Land Net is not used if it were Township, Range, and Section would be added here; Northing and Easting Universal Transverse Mercader coordinates may be added here; The US Geological Survey Map covering the area where the well is installed and the scale of the map (7.5 minute maps are preferred) should go here; The depth the boring was extended in this case 126 feet; The depth of the completed well (This may be influenced by backfilling) in this case it is 126 feet, the same as drilled; There was no record of the water level when completed if there was, the altitude of the water level would go here (this can be a calculated field); There is no water level date; The altitude of the measuring point is 365.99 feet; The top of the inner casing is assumed to be the measuring point; The vertical datum used for this survey was not included, but there is room to include it; There is a place here to comment on the water levels a statement such as: "This well is dry from April through September" could go here; This is for the land surface altitude at the site, it is different from the altitude of the measuring point; This is the depth to water at the time the well was installed, This value and the altitude of the measuring point could be used to calculate the altitude of the water level; This is the date the well was installed, March 25, 1985; There is only one open interval or "n" for not more than one; The top of the open interval is 86 feet below the land surface; The bottom of the open interval is 122 feet below land surface; There is space here for construction comments, any special comments about this well; This well was constructed using "A" an Air

Example of SAMP_ANA FILE in ASCII Delimited format

"NOT AVAIL","LW-2"," 10218.00"," 10880.00","1929S","MIDWAY
LANDFILL SURVEY",110.00,279.70,"ECOLOGY",19870930,19090909,"CAS#8762","1
,1,1-Trichloroethane","71-55-6","34506",32,"<","99999","ug/l",99999"N",
,1,1-Trichloroethane","71-55-6","34506",32,"<","99999","ug/l",99999"N",
"EPA 601","ARI",389.70,"SURVEY TO TOP OF PIPE (ESTIMATED NOT VERIFIED)",
"MEAN SEA LEVEL (USE OF BENCHMARK NOT VERIFIED)","10","23"

The basic file is interpreted as follows:

The Primary I.D has not been established; The well identified here is "LW-2"; the Easting coordinate is 10218; The Northing is 10880; This is a 1929 geoid using State Plane Coordinates; the Survey is identified as "The Midway Landfill Survey" Depth to water is 110 feet; The altitude of the water level is 279.70 feet above the reference elevation (probably sea level); Ecology is the requesting agency for the information; The sample was collected September 30, 1987; No analysis date was provided so a dummy date of September 9, 1909 was used as a place holder; The Sample Number is "CAS#8762"; The Constituent reported here is 1,1,1-Trichloroethane; The Chemical Abstract System number for 1,1,1 TCE is 71-55-6; The Storet P-Code for our constituent is 34506; the concentration for this constituent is 32; The qualifier indicates less than (we would prefer only EPA contract laboratory qualifiers); The 99999 indicates we have no detection limit reported; The concentration reported is in parts per billion (ug/l); This sample was not diluted, sometimes very polluted samples must be diluted 5,10 or even 20 times their volume to allow them to be analyzed without saturating the instrument column; This sample was not filtered. The method used to analyze our sample follows the protocalls used in EPA Method 601; Analytical Resources Inc. analyzed this sample; The altitude of the Measuring Point is 389.7 feet; The Survey was to the top of the pipe (Probably the top of the inner casing for the monitoring well is described here); The datum used should include the Bench Mark and what vertical datum was used; The Matrix code is from the back of the Ecology Data Analysis/ Chain of Custody form ECY 040-115 "10" is for Water Total; The Source code is from form ECY 040-115, this source is "23" Well (Test\Observation)

APPENDIX A

COMP_NAME	JHK_NO	STORET_NO	CAS_NO	UNITS
1,1,1-Trichloroethane	1.00	34506	71-55-6	ug/L
1,1,2,2-Tetrachloroethane	2.00	34516	79-34-5	ug/L
1,1,2-Trichloro2,2,1trifluoroe	3.00	81611	76-13-1	ug/L
thane				
Freon 113	3.01	81611	76-13-1	ug/L
Trichlorotrifluoroethane	3.02	81611	76-13-1	ug/L
1,1,2-Trichloroethane	4.00	34511	79-00-5	ug/L
Vinyl trichloride	4.01	34511	79-00-5	ug/L
1,1-Dichloroethane	5.00	34496	75-34-3	ug/L
1,1-Dichloroethene	6.00	34501	75-35-4	ug/L
1,1-Dichloroethylene	6.01	34501	75-35-4	ug/L
1,2,4-Trichlorobenzene	7.00	34551	120-82-1	ug/L
1,2-Dibromoethane (EDB)	8.00	77651	106-93-4	ug/L
EDB	8.01	77651	106-93-4	ug/L
Ethylene dibromide	8.02	77651	106-93-4	ug/L
1,2-Dichlorobenzene	9.00	34536	95-50-1	ug/L
1,2-Dichloroethane	10.00	34531	107-06-2	ug/L
Ethylene dichloride	10.01	34531	107-06-2	ug/L
1,2-Dichloropropane	11.00	34541	78-87-5	ug/L
1,3-Dichlorobenzene	12.00	34566	541-73-1	ug/L
1,4-Dichlorobenzene	13.00	34571	106-46-7	ug/L
2,4,5-Trichlorophenol	14.00	77687	95-95-4	ug/L
2,4,6-Trichlorophenol	15.00	34621	88-06-2	ug/L
2,4-Dichlorophenol	16.00	34601	120-83-2	ug/L
2,4-Dimethylphenol	17.00	34606	105-67-9	ug/L
2-Methyl-p-cresol	17.01	34606	105-67-9	ug/L
4-Methyl-o-cresol	17.02	34606	105-67-9	ug/L
2,4-Dinitrophenol	18.00	34616	51-28-5	ug/L
2,4-Dinitrotoluene	19.00	34611	121-14-2	ug/L
2,6-Dinitrotoluene	20.00	34626	606-20-2	ug/L
Antimony, Total Recoverable	21.00	01268	7440360	ug/L
2-Chloroethyl vinyl ether	22.00	34576	110-75-8	ug/L
2-Chloronaphthalene	23.00	34581	91-58-7	ug/L
2-Chlorophenol	24.00	34586	95-57-8	ug/L
o-Chlorophenol	24.01	34586	95-57-8	ug/L
2-chloro-1-hydroxybenzene	24.02	34586	95-97-8	ug/L
2-Hexanone	25.00	77103	591-78-6	ug/L
Methyl n-butyl ketone	25.01	77103	591-78-6	ug/L
2-Methylnaphthalene	26.00	77416	91-57-6	ug/L
2-Methylphenol	27.00	77152	95-48-7	ug/L
2-Nitroaniline	28.00	30195	88-74-4	ug/L
2-Nitrophenol	29.00	34591	88-75-5	ug/L
3-Nitroaniline	30.00	78300	99-09-2	ug/L
4-Chloro-3-methylphenol	31.00	34452	59-50-7	ug/L
4-Chloro-m-cresol	31.01	34452	59-50-7	ug/L
p-Chloro-m-cresol	31.02	34452	59-50-7	ug/L
Xylene Isomers, O+P, Whole	32.00	80353	58-89-9	ug/L
Water				
4-Chlorophenyl phenyl ether	33.00	34641	7005-72-3	ug/L
4-Methyl-2-pentanone	34.00	81596	108-10-1	ug/L
Methyl Isobutyl ketone	34.01	81596	108-10-1	ug/L
MIBK	34.02	81596	108-10-1	ug/L
4-Methylphenol	35.00	77146	106-44-5	ug/L

COMP_NAME	JHK_NO	STORET_NO	CAS_NO	UNITS
p-Cresol	35.01	77146	106-44-5	ug/L
4-Nitroaniline	36.00	73278	100-01-6	ug/KG
p-Nitroaniline	36.01	73278	100-01-6	ug/KG
4-Nitrophenol	37.00	34646	100-02-7	ug/L
p-Nitrophenol	37.01	34646	100-02-7	ug/L
Acenaphthene	38.00	34205	83-32-9	ug/L
Acenaphthylene	39.00	34200	208-96-8	ug/L
Acetone	40.00	81550	67-64-1	ug/L
Propanone	40.01	81550	67-64-1	ug/L
Dimethyl ketone	40.02	81550	67-64-1	ug/L
Methyl ketone	40.03	81550	67-64-1	ug/L
Benzene	41.00	34030	71-43-2	ug/L
Benzol	41.01	34030	71-43-2	ug/L
Benzoic acid	42.00	77147	65-85-0	ug/L
Benzyl alcohol	43.00	77147	100-51-6	ug/L
Bis(2-chloroethoxy)methane	44.00	34278	111-91-1	ug/L
Bis(2-chloroethyl)ether	45.00	34273	111-44-4	ug/L
Bis(2-chloroisopropyl)ether	46.00	34283	108-60-1	ug/L
Bromodichloromethane	47.00	32101	75-27-4	ug/L
Dichlorobromomethane	47.01	34328	75-27-4	ug/L
Bromoform	48.00	32104	75-25-2	ug/L
Bromomethane	49.00	34413	74-83-9	ug/L
Methyl bromide	49.01	34413	74-83-9	ug/L
Carbon disulfide	50.00	77041	75-15-0	ug/L
Carbon tetrachloride	51.00	32102	56-23-5	ug/L
Tetrachloromethane	51.01	32102	56-23-5	ug/L
Chlorobenzene	52.00	34301	108-90-7	ug/L
Chloroethane	53.00	34311	75-00-3	ug/L
Chloroform	54.00	32106	67-66-3	ug/L
Trichloromethane	54.01	32106	67-66-3	ug/L
Chloromethane	55.00	34418	74-87-3	ug/L
Methyl chloride	55.01	34418	74-87-3	ug/L
cis-1,3-Dichloropropene	56.00	34704	10061-01-5	ug/L
cis-1,3-Dichloropropylene	56.01	34704	10061-01-5	ug/L
Dibenzofuran	57.00	81302	132-64-9	ug/L
Dibromochloromethane	58.00	32105	124-48-1	ug/L
Chlorodibromomethane	58.01	32105	124-48-1	ug/L
Diethylphthalate	59.00	34336	84-66-2	ug/L
Dimethylphthalate	60.00	34341	131-11-3	ug/L
Ethylbenzene	61.00	34371	100-41-4	ug/L
Fluorene	62.00	34381	86-73-7	ug/L
Hexachlorobutadiene	63.00	34391	87-68-3	ug/L
Hexachlorocyclopentadiene	64.00	34386	77-47-4	ug/L
Hexachloroethane	65.00	34396	67-72-1	ug/L
Isophorone	66.00	34408	78-59-1	ug/L
Xylene, m-	67.00	81710	108-38-3	ug/L
1,3-Dimethylbenzene	67.01	77134	108-38-3	ug/L
meta-Xylene	67.02	77134	108-38-3	ug/L
m-Xylene	67.03	77134	108-38-3	ug/L
m-Dimethylbenzene	67.04	77134	108-38-3	ug/L
Methylene chloride	68.00	34423	75-09-2	ug/L
1,2-Dichloromethane	68.01	34423	75-09-2	ug/L
Dichloromethane	68.02	34423	75-09-2	ug/L

COMP_NAME	JHK_NO	STORET_NO	CAS_NO	UNITS
N-Nitroso-di-n-propylamine	69.00	34428	621-64-7	ug/L
Naphthalene	70.00	34696	91-20-3	ug/L
Nitrobenzene	71.00	34447	98-95-3	ug/L
Total BTX	72.00	34103	n/a	ug/L
Phenol	73.00	34466	108-95-2	ug/L
Styrene	74.00	77128	100-42-5	ug/L
Vinylbenzene	74.01	77128	100-42-5	ug/L
Phenylethylene	74.02	77128	100-42-5	ug/L
Cinnamene	74.03	77128	100-42-5	ug/L
Ethenylbenzene	74.04	77128	100-42-5	ug/L
Tetrachloroethene	75.00	34475	127-18-4	ug/L
PCE	75.01	34475	127-18-4	ug/L
Perchloroethylene	75.02	34475	127-18-4	ug/L
Perchloroethene	75.03	34475	127-18-4	ug/L
Tetrachloroethylene	75.04	34475	127-18-4	ug/L
1,1,2,2-Tetrachloroethene	75.05	34475	127-18-4	ug/L
Toluene	76.00	34010	108-88-3	ug/L
Methylbenzene	76.01	34010	108-88-3	ug/L
Xylene, o-	77.00	81551	1330-20-7	ug/L
o-Xylene	77.01	81551	1330-20-7	ug/L
1,2-Dimethylbenzene	77.02	81551	1330-20-7	ug/L
o-Dimethylbenzene	77.03	81551	1330-20-7	ug/L
ortho-Xylene	77.04	81551	1330-20-7	ug/L
trans-1,2-Dichloroethene	78.00	34546	156-60-5	ug/L
trans-1,2-Dichloroethylene	78.01	34546	156-60-5	ug/L
trans-1,3-Dichloropropene	79.00	34699	10061-02-6	ug/L
trans-1,3-Dichloropropylene	79.01	34699	10061-02-6	ug/L
Trichloroethene	80.00	39180	79-01-6	ug/L
TCE	80.01	39180	79-01-6	ug/L
Trichloroethylene	80.02	39180	79-01-6	ug/L
Vinyl acetate	81.00	77057	108-05-4	ug/L
Vinyl chloride	82.00	39175	75-01-4	ug/L
Monochloroethylene	82.01	39175	75-01-4	ug/L
Chloroethylene	82.02	39175	75-01-4	ug/L
Chloroethene	82.03	39175	75-01-4	ug/L
Monochloroethene	82.04	38175	75-01-4	ug/L
Trichlorofluoromethane	83.00	34488	75-69-4	ug/L
1,2-Diphenylhydrazine	84.00	34346	122667	ug/L
1,2,3-Trinitrobenzene	85.00	73275	99-35-4	ug/Kg
Chlorocyclohexane	86.00	77217	542187	ug/L
2,3,7,8-Tetrachlorodibenzo-p-dioxin	87.00	34675	1746016	ug/L
Dioxin	87.01	34675	1746016	ug/L
2,3,7,8-TCDD	87.02	34675	1746016	ug/L
2,3-Dichloropropylene	88.00	77166	78886	ug/L
2,4,5-T Methyl Ester	89.00	39740	93765	ug/L
2,4,5-TP Methyl Ester	90.00			
2,4,5-TP (Silvex)	91.00	39045	93-72-1	ug/L
2,4,6-Trimethyl-1-1,3,5-Trioxane	92.00	77322	123-63-7	ug/L
2,4-D	93.00	39730	94-75-7	ug/L
2,4-D Methyl Ester	93.01	39730	94757	ug/L
2,5-Dinitrotoluene	94.00	77637	619158	ug/L

COMP_NAME	JHK_NO	STORET_NO	CAS_NO	UNITS
2-Methyl-4-pentanone	95.00	78133	108101	ug/L
Ethyl isopropyl ketone	95.01	78133	108101	ug/L
2-Methyl-4,6-dinitrophenol	96.00	30204	543521	ug/L
4,6-Dinitro-2-methylphenol	96.01	30204	543521	ug/L
2-Pentanone	97.00	77060	107879	ug/L
Methyl n-propyl ketone	97.01	77060	107879	ug/L
3,3'-Dichlorobenzidine	98.00	34631	91-94-1	ug/L
3,4-Benzofluoranthene	99.00	34230	205992	ug/L
1,2,4-Trinitrobenzene	100.00			
4,6-Dinitrophenol	101.00	82226	88857	ug/L
4-Bromophenoxybenzene	102.00			
4-Bromophenyl phenyl ether	103.00	34636	1010-55-3	ug/L
5-Bromopyrimidine	104.00			
Acrolein	105.00	34210	107-02-8	ug/L
Aquatin	105.01	34210	107028	ug/L
Acrylonitrile	106.00	34215	107131	ug/L
Aldrin	107.00	39330	309-00-2	ug/L
Aluminum, Total Recoverable	108.00	01104	7429905	ug/L
Ammonia-N, Total	109.00	00610	17778880	mg/L as N
NH3-N, Total	109.01	00610	17778880	mg/L as N
Aniline	110.00	77089	62533	ug/L
Anion Balance	111.00			
Anthracene	112.00	34220	120-12-7	ug/L
Antimony, Total	113.00	01097	7440360	ug/L
Aroclor 1016	114.00	34671	12674112	ug/L
PCB-1016	114.01	34671	12674112	ug/L
Aroclor 1221	115.00	39488	1104282	ug/L
PCB-1221	115.01	39488	1104282	ug/L
Aroclor 1232	116.00	39492	11141165	ug/L
PCB-1232	116.01	39492	11141165	ug/L
Aroclor 1242	117.00	39496	53469219	ug/L
PCB-1242	117.01	39496	53469219	ug/L
Aroclor 1248	118.00	39500	12672296	ug/L
PCB-1248	118.01	39500	12672296	ug/L
Aroclor 1254	119.00	39504	11097691	ug/L
PCB-1254	119.01	39504	11097691	ug/L
Aroclor 1260	120.00	39508	11096825	ug/L
PCB-1260	120.01	39508	11096825	ug/L
Arsenic, Inorganic	121.00	00995	7440382	ug/L
Arsenic, Total Recoverable	122.00	00978	7440382	ug/L
Asbestos	123.00	34225	1332214	ug/L
Barium, Total Recoverable	124.00	01009	7440393	ug/L
Benzidine	125.00	39120	92-87-5	ug/L
Benzo(a)pyrene	126.00	34247	50-32-8	ug/L
Benzo(b)fluoranthene	127.00	34230	205-99-2	ug/L
Benzo(g,h,i)perylene	128.00	34521	191-24-2	ug/L
Benzo(ghi)perylene	128.01	34521	191-24-2	ug/L
Benzo(k)fluoranthene	129.00	34242	207-08-9	ug/L
Benzo(a)anthracene	130.00	34526	56-55-3	ug/L
Benz(a)anthracene	130.01	34526	56-55-3	ug/L
Beryllium, Total Recoverable	131.00	00998	7440417	ug/L
BHC (all isomers)	132.00	81283	608731	ug/L
Bicarbonate as HCO3	133.00	00440	71523	mg/L

COMP_NAME	JHK_NO	STORET_NO	CAS_NO	UNITS
Boron	134.00	00999	7440428	ug/L
Bromide	135.00	82298	24959679	ug/L
Butyl benzyl phthalate	136.00	34292	85687	ug/L
Arsenic, Total	137.00	01002	7440382	ug/L
Cadmium, Total Recoverable	138.00	01113	7440439	ug/L
Carboxin	139.00	70987	5234-68-4	ug/L
Bis(2-ethylhexyl)phthalate	140.00	39100	117817	ug/L
Calcium, Total	141.00	00916	7440702	mg/L
Carbonate as CO3	142.00	00445	3812326	mg/L
Cation Balance	143.00			
Chlordane	144.00	39350	57749	ug/L
Chloride, Total	145.00	00940	16887006	mg/L
Chlorine, Total Residual	146.00	50060	7782505	mg/L
Chromium, Total Recoverable	147.00	01118	7440473	ug/L
Chrysene	148.00	34320	218-01-9	ug/L
Cobalt	149.00	01037	7440484	ug/L
Coliform, Total	150.00	31628		#/100ml
Specific Conductance @ 25C	151.00	00095		UMHOS/cm
Copper, Total Recoverable	152.00	01119	7440508	ug/L
Cyanide	153.00	78248	57125	ug/L
Diisopropyl ether	154.00	81577	108203	ug/L
Di-n-butylphthalate	155.00	39110	84-74-2	ug/L
1,3,5-Trinitrobenzene	156.00	73275	99354	ug/Kg
Surrogs 1-Bromo-2-floroethane	157.00			
Diazinon	158.00	39570	333-41-5	ug/L
Dibenzo(a,h)anthracene	159.00	34556	53-70-3	ug/L
Dibenz(a,h)anthracene	159.01	34556	53-70-3	ug/L
Dibromomethane	160.00	81522	106934	ug/L
Methylene bromide	160.01	81522	106934	ug/L
Cation Exchange Capacity	161.00	81356		meq/100G
CEC	161.01	81356		meq/100G
Dichlorodifluoromethane	162.00	34668	75-71-8	ug/L
Freon 12, Halon	162.01	34668	75718	ug/L
Metolachlor	163.00		51218-45-2	ug/L
Dieldrin	164.00	39380	60-57-1	ug/L
Diethyl ether	165.00	81576	60297	ug/L
Dimethyldisulfide	166.00	81580	624920	ug/L
Diphenoloxide	167.00	77587	101848	ug/L
Dissolved COD	168.00	80116		mg/L
DCOD	168.01	80116		mg/L
Dissolved Oxygen	169.00	00299	7782-44-7	mg/L
DO	169.01	00299	7782447	mg/L
Dissolved TOC	170.00	00679	7440-44-0	kg/100GAL
Disulfoton (Di-Syston)	171.00	81888	298-04-4	ug/L
Endosulfan Sulfate	172.00	34351	1031-07-8	ug/L
Endrin Aldehyde	173.00	34366	7421-93-4	ug/L
Endrin	174.00	39390	72-20-8	ug/L
Ethion	175.00	39398	563-12-2	ug/L
Ethyl acetate	176.00	81585	141786	ug/L
Fluoranthene	177.00	34376	206-44-0	ug/L
Fluorescein(Sodium)	178.00		518478	
Fluoride	179.00	00950	16984-48-8	mg/L
Heptachlor Epoxide	180.00	39420	1024-57-3	ug/L

COMP_NAME	JNK_NO	STORET_NO	CAS_NO	UNITS
Heptachlor	181.00	39410	76-44-8	ug/L
Heptene	182.00	81589	25339-56-4	ug/L
Hexachlorobenzene	183.00	39700	118-74-1	ug/L
Hydrazine	184.00	81313	302-01-2	mg/L
Hydroxide	185.00	71830	14280309	mg/L
Indeno(1,2,3-cd)pyrene	186.00	34403	193-39-5	ug/L
Surrog: 1,4-Bromofluorobenzene	187.00			
Iron, Total	188.00	01045	7439896	ug/L
Ferric(3+)	188.01	01045	7439896	ug/L
Ferrous(2+)	188.02	01045	7439896	ug/L
Lead, Total Recoverable	189.00	01114	7439921	ug/L
Tebuthiuron	190.00		34014-18-1	ug/L
Magnesium, Total	191.00	00927	7439954	mg/L
Malathion	192.00	39530	121-75-5	ug/L
Manganese, Total	193.00	01055	7439965	ug/L
Mercury, Total Recoverable	194.00	71901	7439976	ug/L
Methoxychlor	195.00	39480	72-43-5	ug/L
2-Ethyl hexanoic acid	196.00	82114	149575	ug/L
Methyl Trithion	197.00	39790	953173	ug/L
Methylcyclohexane	198.00	77100	108-87-2	ug/L
N-Nitrosodiphenylamine	199.00	34433	86-30-6	ug/L
Nickel, Total Recoverable	200.00	01074	7440020	ug/L
Nitrite-N	202.00	00615	17778880	mg/L as N
Nitroguanidine	203.00	79753	556887	ug/L
Terbacil	204.00		5902-15-2	ug/L
Phosphate-P, Ortho	205.00	00660	14265442	mg/L asPO4
OBPA	206.00		58366	
Oil & Grease	207.00	00556		mg/L
DDD	208.00	39360	72548	ug/L
4,4'-DDD	208.01	39360	72548	ug/L
P,P'-DDD	208.02	39315	53190	ug/L
DDE	209.00	39365	72559	ug/L
4,4'-DDE	209.01	39365	72559	ug/L
P,P'-DDE	209.02	39365	72559	ug/L
DDT	210.00	39370	50293	ug/L
4,4'-DDT	210.01	39370	50293	ug/L
P,P'-DDT	210.02	39370	50293	ug/L
1-Methylnapthalene	211.00	77418	90120	ug/L
Parathion	212.00	39540	56-38-2	ug/L
Pentachlorophenol	213.00	39032	87-86-5	ug/L
PCP	213.01	39032	87865	ug/L
Perchlorate	214.00			
Acifluorfen	215.00	79193	6247659	ug/L
Phenanthrene	216.00	34461	85-01-8	ug/L
[illegible]ol, 4-AAP	217.00		108952	
[illegible]te	218.00	38870	298-02-2	ug/L
Polychlorinated biphenyl	219.00	76012	1336363	ug/L
PCB	219.01	76012	1336363	ug/L
Potassium, Total	220.00	00937	7440097	mg/L
Prowl, Lechate	221.00	79190	40487421	ug/L
Penoxalin	222.00	82410	40487421	ug/L
Prowl	222.01	79190	40487421	ug/L
Pendimethalin	222.02	79190	40487421	ug/L

COMP_NAME	JHK_NO	STORET_NO	CAS_NO	UNITS	
Prowl, Soil	223.00	85793	40487421	ug/L	
Pyrene	224.00	34469	129-00-0	ug/L	
SCA	225.00				
Selenium, Total Recoverable	226.00	00981	7782492	ug/L	
Silica (SIO2)	227.00	00992	7631869	ug/L	
Silver, Total Recoverable	228.00	01079	7440224	ug/L	
Sodium Chlorate	229.00	00726	7775099	ug/L	
Sulfate, Total as SO4	230.00	00945	14808798	mg/L	
Sulfide, Total	231.00	00745	18496258	mg/L	
Sulfite, Total as SO3	232.00	00740	14265453	mg/L	
Surfactants	233.00	34790	7429905	mg/L	
MBAS	233.01	34790	7429905	mg/L	
Silver, Total	234.00	01077	7440224	ug/L	
2,4-Dichlorophenoxy butyric acid	235.00		94-82-6	ug/L	
T3	236.00	78166		ug/L	
T4	237.00		51489	ug/L	
Temperature, 0 C	238.00	00010		0 C	
Temperature, 0 F	239.00	00011		0 F	
3,5-Dichlorobenzoic acid	240.00		51-36-5	ug/L	
Tetrahydrofuran	241.00	81607	109999	ug/L	
Thallium, Total Recoverable	242.00	00982	7440280	ug/L	
Thiosulfate	243.00				
Dichloroprop	244.00	30190	120-36-5	ug/L	
TOS (Calculated)	245.00				
Alkalinity, Total (CaCO3)	246.00	00410	471341	mg/l	
Total Dissolved Solids (residue)	247.00	70300		ug/L	
TDS	247.01	70300		ug/L	
Total Filterable Residue	247.02	70300		ug/L	
Solids, Total Dissolved	247.03	70300		ug/L	
Hardness, Total	248.00	00900	471-34-1	mg/L	CaCO3
Kjeldahl-N, Total	249.00	00625	17778880	mg/L	as N
TKN	249.01	00625	17778880	mg/L	as N
Carbon, Total Organic	250.00	00680	7440440	ug/L	
TOC	250.01	00680	7440440	ug/L	
Phosphate-P, Total	251.00	00665	7723140	mg/L	as P
Total Solids (%)	252.00	70318		%	
Total Solids	253.00	70297		Kg/100Gal	
Cyclohexane	254.00	81570	110827	ug/L	
Toxaphene	255.00	39400	8001-35-2	ug/L	
5-Hydroxy Dicamba	256.00			ug/L	
Piclorem	257.00	39720	1918-02-1	ug/L	
Trichlorotrinitrobenzenes, Total	258.00				
Trinitrobenzenes, Total	259.00				
Turbidity	260.00	82079		NTU	
UDMH	261.00	81314	57147	mg/L	
Vanadium	262.00	10098	7440622		
Volatile Dissolved Solids	263.00				
Zinc, Total Recoverable	264.00	01094	7440666	ug/L	
a-BHC	265.00	39337	319846	ug/L	
alpha-Benzene hexachloride	265.01	39337	319846	ug/L	

COMP_NAME	UNK_NO	STORET_NO	CAS_NO	UNITS
alpha-Lindane	265.02	39337	319846	ug/L
alpha-BHC	265.03	39337	319846	ug/L
alpha-Endosulfan	266.00		959988	ug/L
a-Endosulfan	266.01	34361	959988	ug/L
b-BHC	267.00	39338	319857	ug/L
beta-Benzene hexachloride	267.01	39338	319857	ug/L
beta-Lindane	267.02	39338	319857	ug/L
beta-BHC	267.03	39338	319857	ug/L
b-Endosulfan	268.00	34356	33213659	ug/L
beta-Endosulfan	268.01	34356	33213659	ug/L
d-BHC	269.00	34259	319868	ug/L
delta-Benzene hexachloride	269.01	34259	319868	ug/L
delta-Lindane	269.02	34259	319868	ug/L
delta-BHC	269.03	34259	319868	ug/L
o,p'-DDT	270.00	39305	789026	ug/L
o,p'-TDE	271.00	39315	53190	ug/L
p,p'-TDE	272.00	39360	72548	ug/L
Alachlor	273.00	77825	15972608	ug/L
Alanex	273.01	77825	15972608	ug/L
Aldicarb	274.00	39053	116-06-3	ug/L
Temik	274.01	39053	116063	ug/L
Ametryn	275.00	82184	834128	ug/L
Evik	275.01	82184	834128	ug/L
Amiben	276.00	82051	133904	ug/L
Chloramben	276.01	82051	133904	ug/L
Aminocarb	277.00	38404	2032599	ug/L
Matacil	277.01	38404	2032599	ug/L
Aminotriazole	278.00	73509	61825	ug/L
Amitrole	278.01	73509	61-82-5	ug/L
Cyanide, Dissolved Std Method	279.00	00723	57125	ug/L
Atraton	280.00	82185	1610179	ug/L
Gesatamin	280.01	82185	1610179	ug/L
Atrazine	281.00	39033	1912-24-9	ug/L
AAtrex	281.01	39033	1912249	ug/L
Azinphos-Ethyl	282.00	81292	2642719	ug/L
Balan	283.00	39002	1861401	ug/L
Benefin	283.01	39002	1861401	ug/L
Benfluralin	283.02	39002	1861401	ug/L
Banvel	284.00	82052	1918009	ug/L
Dicamba	284.01	82052	1918009	ug/L
Benomyl	285.00	38705	17804352	ug/L
Benlate	285.01	38705	17804352	ug/L
Bentazon	286.00	38710	25057890	ug/L
Basagran	286.01	38710	25057890	ug/L
Camphor (ACN)	287.00	81324	76222	ug/L
Betasan	288.00	82197	741582	ug/L
Bensulide	288.01	82197	741582	ug/L
Bromacil	289.00	82198	314-40-9	ug/L
Hyvar	289.01	82198	314409	ug/L
Butylate	290.00	81410	2008-41-5	ug/L
Sutan	290.01	81410	2008415	ug/L
C3-Alkylbenzenes, Total	291.00	45046	103-65-1	ug/L
Propylbenzenes, Total	291.01	45046	103-65-1	ug/L

COMP_NAME	JHK_NO	STORET_NO	CAS_NO	UNITS
C4-Alkylbenzenes, Total	292.00	45049		ug/L
Butylbenzenes, Total	292.01	45049		ug/L
Captan	293.00	39640	133-06-2	ug/L
Carbaryl	294.00	77700	63-25-2	ug/L
Sevin	294.01	77700	63252	ug/L
Carbendazim	295.00	38735	10605217	ug/L
Carbofuran	296.00	81405	1563662	ug/L
Furadan	296.01	81405	1563662	ug/L
Carbophenothion	297.00	39786	786-19-6	ug/L
Trithion	297.01	39786	786196	ug/L
Chlordecon	298.00	81281	143500	ug/L
Kepone	298.01	81281	143-50-0	ug/L
Chlordimeform	299.00	77953	6164983	ug/L
Chlorobenzilate	300.00	39460	510-15-6	ug/L
Chloroneb	301.00	38423	2675776	ug/L
Chloropropylate	302.00	38429	5836102	ug/L
Chloropicrin	303.00	77548	76062	ug/L
Chlorpyrifos	304.00	77969	2921-88-2	ug/L
Dursban	304.01	77969	2921-88-2	ug/L
Lorsban	304.02	77969	2921882	ug/L
Chloropropham	305.00	81322	101213	ug/L
CIPC	305.01	81322	101213	ug/L
Clodrin	306.00	82565	7700176	ug/L
Crotoxyphos	306.01	82565	7700176	ug/L
Coumaphos	307.00	81293	56-72-4	ug/L
Co-Ral	307.01	81293	56724	ug/L
Baymix	307.02	81293	56724	ug/L
Creosote	308.00	39140	1319-77-3	ug/L
Cumene	309.00	77356	98-82-8	ug/L
Isopropylbenzene (Cumene)	309.01	77356	98-82-8	ug/L
Cyanazine	310.00	81757	21725462	ug/L
Cycloate	311.00	81892	1134232	ug/L
Ronnet	311.01	81892	1134232	ug/L
Dalapon .	312.00	38432	75-99-0	ug/L
Dowpon	312.01	38432	75990	ug/L
Daconil	313.00	70314	1897456	ug/L
Chlorothalonil	313.01	70314	1897456	ug/L
Bravo	313.02	70314	1897456	ug/L
Dacthal	314.00	39770	1861321	ug/L
DCPA	314.01	39770	1861321	ug/L
Chlorthal	314.02	39770	1861321	ug/L
Dimethyltetrachlorophthalate	314.03	39770	1861321	ug/L
DBCP	315.00	38761	96-12-8	ug/L
Dibromochloropropane	315.01	38761	96-12-8	ug/L
DCMA	316.00	38447	99309	ug/L
Dichloran	316.01	38447	99309	ug/L
DDVP	317.00	38775	62737	ug/L
Dichlorvos (DDVP)	317.01	38775	62-73-7	ug/L
Aldicarb sulfoxide	318.00	82586	1646873	ug/L
2,4,5-Trichlorophenoxyacetic acid	319.00	39740	93-76-5	ug/L
Aldicarb sulfone	320.00	82587	1646-88-4	ug/L
Nitrate+Nitrite-N, Total	321.00	00630	17778880	mg/L as N

COMP_NAME	JNK_NO	STORET_NO	CAS_NO	UNITS
NO3+NO2-N, Total	321.01	00630	17778880	mg/L as N
Arsenic, Dissolved	322.00	01000	7440382	ug/L
Iron, Dissolved	323.00	01046	7439896	ug/L
DEF	324.00	39040	78488	ug/L
Demeton	325.00	39560	8065-48-3	ug/L
System	325.01	39560	8065483	ug/L
cis-1,2-Dichloroethene	326.00	77093	156592	ug/L
cis-1,2-Dichloroethylene	326.01	77093	156592	ug/L
Dicofol	327.00	39780	115322	ug/L
Dicrotophos	328.00	38454	141662	ug/L
Bidrin	328.01	38454	141662	ug/L
Carbazole	329.00	77571	86748	ug/L
Difenzoquat	330.00	78882	43222486	ug/L
Avenge	330.01	78882	43222486	ug/L
Dimethoate	331.00	38458	60-51-5	ug/L
Phosphamide	331.01	38458	60515	ug/L
Dioxathion	332.00	38783	78342	ug/L
Diphenamide	333.00	78004	957517	ug/L
Enide	333.01	78004	957517	ug/L
Diquat	334.00	78885	85007	ug/L
Diuron	335.00	39650	330541	ug/L
Karmex	335.01	39650	330541	ug/L
DMPA	336.00	81285	299854	ug/L
Zytron	336.01	81285	299854	ug/L
DNBP	337.00	81287	88857	ug/L
Basanite	337.01	81287	88857	ug/L
Dinoseb	337.02	81287	88-85-7	ug/L
DNOC	338.00	39920	534521	ug/L
Dinitro-o-cresol	338.01	39920	534521	ug/L
Dyfonate	339.00	81294	944229	ug/L
Fonofos	339.01	81294	944-22-9	ug/L
Dylox	340.00	39014	52686	ug/L
Trichlorophon	340.01	39014	52686	ug/L
Endosulfan	341.00	34361	959-98-8	ug/L
Endosulfan I	341.01	34361	959-98-8	ug/L
Endosulfan II	342.00	34356	33213-65-9	ug/L
Endothall	343.00	38926	145-73-3	ug/L
EPN	344.00	81290	2104645	ug/L
EPTC	345.00	81894	759944	ug/L
Eptam	345.01	81894	759944	ug/L
Ethanol	346.00	77004.	64-17-5	ug/L
Ethyl alcohol	346.01	77004	64175	ug/L
Grain alcohol	346.02	77004	64175	ug/L
Ethylene glycol	347.00	77023	107-21-1	ug/L
Ethylidene thiourea	348.00	38928	96-45-7	ug/L
Fenamiphos	349.00	38929	22224-92-6	ug/L
Nemacure	349.01	38929	22224926	ug/L
Fensulfothion	350.00	38797	115-90-2	ug/L
Desanit	350.01	38797	115902	ug/L
Fenthion	351.00	38801	55-38-9	ug/L
Baytex	351.01	38801	55389	ug/L
Fenuron	352.00	38468	101-42-8	ug/L
Ferbam	353.00	38806	14484641	ug/L

COMP_NAME	JHK_NO	STORET_NO	CAS_NO	UNITS
Fluchloralin	354.00	79196	3324539	ug/L
Basalin	354.01	79196	3324539	ug/L
Fluormeturon	355.00	38811	2164172	ug/L
Formaldehyde	356.00	71880	50-00-0	ug/L
g-BHC	357.00	39340	58-89-9	ug/L
Lindane	357.01	39340	58-89-9	ug/L
gamma-Lindane	357.02	39340	58-89-9	ug/L
gamma-Benzene hexachloride	357.03	39340	58-89-9	ug/L
gamma-BHC (Lindane)	357.04	39340	58-89-9	ug/L
Glyphosate	358.00	79743	1071836	ug/L
Guthion	359.00	39580	86-50-0	ug/L
Azinphos-Methyl (Guthion)	359.01	39580	86-50-0	ug/L
Hexazinone	360.00	38815	51235-04-2	ug/L
Velpar	360.01	38815	51235042	ug/L
Imidan	361.00	39800	732116	ug/L
Phosmet	361.01	39800	732116	ug/L
Iron, Total Recoverable	362.00	00980	7439896	ug/L
Kerosene	363.00	78878	8008206	ug/L
Linuron	364.00	38478	330552	ug/L
Mancozeb	365.00	38831	8018017	ug/L
Dithane	365.01	38831	8018017	ug/L
Maneb	366.00	38835	12427382	ug/L
MCPA	367.00	39151	94746	ug/L
MCPA Dimethylamine Salt	367.01	39151	94746	ug/L
2-Methyl-4-chlorophenoxyacetic acid	367.02	39151	94746	ug/L
MCPB	368.00	38486	94815	ug/L
Merphos	369.00	39019	150505	ug/L
Folex	369.01	39019	150505	ug/L
Mesitylene	370.00	77226	108678	ug/L
Metasystox	371.00	39020	8022002	ug/L
Methomidophos	372.00	38927	10265926	ug/L
Monitor	372.01	38927	10265926	ug/L
Methiocarb	373.00	38500	2032-65-7	ug/L
Methidathion	374.00	78879	950378	ug/L
Supracide	374.01	78879	950378	ug/L
Methomyl	375.00	39051	16752775	ug/L
Methyl ethyl ketone	376.00	81595	78-93-3	ug/L
MEK	376.01	81595	78-93-3	ug/L
Butanone	376.02	81595	78-93-3	ug/L
2-Butanone	376.03	81595	78-93-3	ug/L
Surrog: Pyrene-d10 (spike)	377.00			
Methyl Phenols, Total	378.00	45058	1319773	ug/l
Metribuzin	379.00	81408	21087649	ug/l
Sencore	379.01	81408	21087649	ug/l
Mexacarbate	380.00	38507	315184	ug/L
Mirex	381.00	39755	2385855	ug/L
Nodown	382.00	78883	42576023	ug/L
Bifenox	382.01	78883	42576023	ug/L
Monocrotophos	383.00	81890	6923224	ug/L
Azodrin	383.01	81890	6923224	ug/L
Monuron	384.00	38512	150685	ug/L
NSMA	385.00	38935	2163806	ug/L

COMP_NAME	JHK_NO	STORET_NO	CAS_NO	UNITS
Nonsodium methyl arsonate	385.01	38935	2163806	ug/L
Acephate	385.02	81815	30560191	ug/L
Naled	386.00	38855	300-76-5	ug/L
Bromex	386.01	38855	300765	ug/L
Napropamide	387.00	79195	1529999	ug/L
Devrinol	387.01	79195	1529999	ug/L
Neburon	388.00	38522	555373	ug/L
Nitrofen	389.00	81303	1836755	ug/L
n-Octacosane	390.00	78116	630024	ug/L
Nonadecane	391.00	77822	629925	ug/L
N-Nitrosodimethylamine	392.00	34438	62-75-9	ug/L
n-Propylbenzene	393.00	77224	103651	ug/L
Ordram	394.00	82199	22[illegible]2671	ug/L
Molinate	394.01	82199	22[illegible]2671	ug/L
Hydram	394.02	82199	2212671	ug/L
Orthene	395.00	81815	30560191	ug/L
Oryzalin	396.00	78884	19044883	ug/L
Surflan	396.01	78884	19044883	ug/L
Ovex	397.00	39022	80331	ug/L
Difenzon	397.01	39022	80331	ug/L
Oxamyl	398.00	38865	23135220	ug/L
Paraquat	399.00	82416	4685147	ug/L
Parathion, Ethyl-	400.00	46315	56382	ug/L
Parathion, Methyl-	401.00	39600	298000	ug/L
Lead, Dissolved	402.00	01049	7439921	ug/L
Lead, Total	403.00	01051	7439921	ug/L
Manganese, Dissolved	404.00	01056	7439965	ug/L
Manganese, Total Recoverable	405.00	01123	7439965	ug/L
Cadmium, Dissolved	406.00	01025	7440439	ug/L
Cadmium, Total	407.00	01027	7440439	ug/L
Copper, Dissolved	408.00	01040	7440508	ug/L
PCNB	409.00	39029	82688	GCL
Pentachlorobenzene	410.00	77793	608-93-5	ug/L
Perthane	411.00	39034	72560	ug/L
Ethylan	411.01	39034	72560	ug/L
Phosalone	412.00	81291	2310170	ug/L
Zolone	412.01	81291	2310170	ug/L
Phosdrin	413.00	39610	7786347	ug/L
Mevinphos	413.01	39610	7786-34-7	ug/L
Phosphamidon	414.00	78881	13171216	ug/L
Dimecron	414.01	78881	13171216	ug/L
Profluralin	415.00	38872	26399360	ug/L
Prometon	416.00	39056	1610-18-0	ug/L
Prometryn	417.00	39057	7287-19-6	ug/L
Propachlor	418.00	38533	1918167	ug/L
Pronamide	419.00	39080	23950-58-5	mg/Kg
Carb	419.01	39080	23950-58-5	mg/Kg
propyzamide	419.02	39080	23950-58-5	mg/Kg
Propane	420.00	82358	74986	ug/L
Propargite	421.00	82065	2312358	mg/L
Propazine	422.00	39024	139-40-2	ug/L
Propham	423.00	39052	122429	ug/L
IPC	423.01	39052	122429	ug/L

COMP_NAME	JHK_NO	STORET_NO	CAS_NO	UNITS
Isopropyl carbanilate	423.02	39052	122429	ug/L
Propoxur	424.00	38537	114261	ug/L
Baygon	424.01	38537	114261	ug/L
Pyrethrins	425.00	39930	8003347	ug/L
Round-up	426.00	39961	1071836	ug/L
Ronnel	427.00	39357	299843	ug/L
Secbumeton	428.00	38542	26259450	ug/L
Etazine	428.01	38542	26259450	ug/L
Sumitol	428.02	38542	26259450	ug/L
Siduron	429.00	38548	1982496	ug/L
Simazine	430.00	39055	122-34-9	ug/L
Princep	430.01	39055	122349	ug/L
Simetryn	431.00	39054	1014-70-6	ug/L
Stirofos	432.00	38877	961115	ug/L
Swep	433.00	38555	918189	ug/L
Tedion	434.00	39808	116290	ug/L
Tetradifon	434.01	39808	116290	ug/L
TEPP	435.00	39620	107-49-3	ug/L
Tetraethyldiphosphate	435.01	39620	107493	ug/L
Terbuthylazine	436.00	38559	5915413	ug/L
Gardoprim	436.01	38559	5915413	ug/L
Terbutryn	437.00	38882	886500	ug/L
Tetrachlorophenol	438.00	81849	25167833	ug/L
Topsin-M	439.00	78880	23564069	ug/L
Thiophanate	439.01	78880	23564069	ug/L
Triadimefon	440.00	38892	43121433	ug/L
1,2,3-Trichloropropane	441.00	81610	96-18-4	ug/L
D-D Mix	441.01	81610	96-18-4	ug/L
Copper, Total	442.00	01042	7440508	ug/L
Trifluralin	443.00	81284	1582-09-8	ug/L
Treflan	443.01	81284	1582098	ug/L
Trimethyl Benzenes, Total	444.00	78136	25551137	ug/L
Methyl Xylenes, Total	444.01	78136	25551137	ug/L
Vernolate	445.00	82200	1929777	ug/L
Vernam	445.01	82200	1929777	ug/L
Ziram	446.00	38917	137304	ug/L
Dithiocarbamate	446.01	38917	137304	ug/L
Zineb	447.00	38912	12122677	ug/L
pH	448.00	00400		std. units
Specific Conductance	449.00	00095		umhos/cm
EC	449.01	00095		umhos/cm
Conductivity	449.02	00095		umhos/cm
Sodium, Total	450.00	00929	7440235	mg/L
Ion Balance	451.00			%
Nitrate-N	452.00	00620	17778880	mg/L as N
Alkalinity as CaCO3, Total	453.00	00410	471341	mg/L
Bicarbonate as CaCO3	454.00	00425	471341	mg/L
Carbonate as CaCO3	455.00	00430	471341	mg/L
Hydroxide as CaCO3	456.00			
Retene	457.00	73076	483658	ug/L
Surrog: Toluene-d8	458.00			%
BFB	459.00			%
Surrog: 1,2-Dichloroethane-d4	460.00			%

COMP_NAME	JHK_NO	STORET_NO	CAS_NO	UNITS
Hydrocarbons, Total Petroleum	461.00	46116	14280-30-9	mg/L
TPH	461.01	46116	14280-30-9	mg/L
Hydrocarbons, Total Fuel	462.00			
TFH	462.01			
Lead, Organic	463.00			
4-Chloroaniline	464.00	78303	106478	mg/Kg
Di-n-octyl phthalate	465.00	34596	117840	ug/L
Bis(n-octyl)phthalate	465.01	34596	117840	ug/L
Lithium	466.00	01134	7439932	ug/L
Molybdenum	467.00	01129	7439987	ug/L
Tin, Total Recoverable	468.00	00983	7440315	ug/L
Titanium	469.00	00984	7440326	ug/L
PID Reading	470.00			
Gasoline	471.00		6842596	
Diesel	472.00	78939	68476346	ug/L
Hydrocarbons, Total	473.00	81336		mg/L
Surrog: Nitrobenzene-d5	474.00			
Xylene, p-	475.00	77133	106445	ug/L
para-Xylene	475.01	77133	106445	ug/L
p-Xylene	475.02	77133	106423	ug/L
1,4-Dimethylbenzene	475.03	77133	106423	ug/L
p-Dimethylbenzene	475.04	77133	106423	ug/L
Mercury, Total	476.00	71890	7439976	ug/L
Mercury, Dissolved	477.00	71900	7439976	ug/L
Total BTEX	478.00	34103		ug/L
Surrog: 2-Fluorobiphenyl	479.00			
Surrog: 2-Fluorophenol	480.00			
Nickel, Dissolved	481.00	01065	7440020	ug/L
1,2-Diethoxyethane	482.00	81527	629141	ug/L
Nickel, Total	483.00	01067	7440020	ug/L
Selenium, Dissolved	484.00	01145	7782492	ug/L
Selenium, Total	485.00	01147	7782492	ug/L
Total Organics	486.00	81299		ug/L
Volatile Organic Compounds	487.00	78733		mg/L
2-Cyclohexene-1-one	488.00		930697	
Dibromodichloromethane	489.00	77779	594183	ug/L
Endrin Ketone	490.00	78008	72-20-8	ug/L
Chromium, Total	491.00	01034	7440473	ug/L
Chemical Oxygen Demand	492.00	00335		mg/L
COD	492.01	00335		mg/L
Methylene Blue Active	493.00	38260	61-73-4	
Substances	494.00	82080		ug/L
Total Trihalomethanes	495.00	01075	7440224	ug/L
Silver, Dissolved	496.00	82464		mg/L
TSS	496.01	82464		mg/L
Solids, Total Suspended	497.00	00958		mg/L
Silicate	498.00	00671	7723140	mg/L as P
Phosphate-P, Diss Ortho	499.00	00310		mg/L
Biochemical Oxygen Demand	499.01	00310		mg/L
BOD	500.00			
Langlier Index	501.00	00931	7440235	SAR
Sodium Absorption Ratio	502.00	00094		umhos/cm
Specific Conductance (Field)				

COMP_NAME	JHK_NO	STORET_NO	CAS_NO	UNITS
Total Organic Halides	503.00	70353		ug/L
Zinc, Dissolved	504.00	01090	7440666	ug/L
Fecal Coliform, MFM-FCBR #/100ML	505.00	31616		#/100ml
Coliform, Fecal	505.01	31616		#/100ml
Chromium, Hexavalent	506.00	01032	7440473	ug/L
Chromium-VI	506.01	01032	7440473	ug/L
Zinc, Total	507.00	01092	7440666	ug/L
Barium, Dissolved	508.00	01005	7440393	ug/L
Barium, Total	509.00	01007	7440393	ug/L
Aluminum, Total	510.00	01105	7429905	ug/L
Aluminum, Dissolved	511.00	01106	7429905	ug/L
Tin, Total	512.00	01102	7440315	ug/L
Tin, Dissolved	513.00	01100	7440315	ug/L
Beryllium, Total	514.00	01012	7440417	ug/L
Beryllium, Dissolved	515.00	01010	7440417	ug/L
Chromium, Dissolved	516.00	01030	7440473	ug/L
Potassium, Dissolved	517.00	00935	7440097	mg/L
Magnesium, Dissolved	518.00	00925	7439954	mg/L
Magnesium as CaCO3	519.00	00920	7439954	mg/L
Calcium, Dissolved	520.00	00915	7440702	mg/L
Calcium as CaCO3	521.00	00910	7440702	mg/L
Thallium, Dissolved	522.00	01057	7440280	ug/L
Thallium, Total	523.00	01059	7440280	ug/L
Antimony, Dissolved	524.00	01095	7440360	ug/L
Surrog: p-Terphenyl-d14	525.00			
Surrog: Phenol-d5	526.00			
1,1,1,2-Tetrachloroethane	527.00	77562	630206	ug/L
3-Chloro octane	528.00			
gamma-Chlordane	529.00	39065	5103742	ug/L
alpha-Chlordane	530.00	39348	5103719	ug/L
Benzo(b/k)fluoranthene	531.00	34242	207089	ug/L
Avadex	532.00	73386	2303-16-4	mg/Kg
Diallate	532.01	73386	2303-16-4	mg/Kg
Bromochloromethane	533.00	32105	124481	ug/L
1,2,3-Trichlorobenzene	534.00	77613	87616	ug/L
2-Chlorotoluene	535.00	38680	95498	ug/L
1,2,4-Trimethylbenzene	536.00	77222	95636	ug/L
tert-Butylbenzene	537.00	78448	98066	ug/Kg
p-Isopropyltoluene	538.00	77356	99876	ug/L
n-Butylbenzene	539.00	78483	104518	ug/Kg
4-Chlorotoluene	540.00	77277	106434	ug/L
1,3,5-Trimethylbenzene	541.00	77226	108678	ug/L
Bromobenzene	542.00	81555	108861	ug/L
sec-Butylbenzene	543.00	78485	135988	ug/Kg
1,3-Dichloropropene	544.00	34561	542756	ug/L
2,2,4-Trimethylpentane	545.00		5408401	
1,1-Dichloropropene	546.00	77168	563586	ug/L
2,2-Dichloropropane	547.00	77170	594207	ug/L
1,2-Diethylbenzene	548.00	77340	135013	ug/L
o-Diethylbenzene	548.01	77340	135013	ug/L
1,3-Diethylbenzene	549.00	77348	141935	ug/L
m-Diethylbenzene	549.01	77348	141935	ug/L

COMP_NAME	JHK_NO	STORET_NO	CAS_NO	UNITS
1,4-Diethylbenzene	550.00	77345	105055	ug/L
p-Diethylbenzene	550.01	77345	105055	ug/L
Trichlorobenzoic acid	551.00		50317	
Isobutylbenzene	552.00	77334	538932	ug/L
2,3,4,5-Tetrachlorophenol	553.00	77767	4901513	ug/L
2,4,5-TB	554.00	82650	93801	ug/Kg
2,4-DB (Water, Total)	555.00	38745	94826	ug/L
Bromoxynil (Water, Whole)	556.00	70979	1689845	ug/L
Dibenz(a,h)anthracene-d14	557.00	79040	53703	mg/Kg
Diethylphthalate-d4	558.00			
IntStd: 2,4,6-Tribromophenol	559.00	34719	118796	ug/L
IntStd: Hexabromobenzene	560.00			
Ioxynil	561.00		16898341	ug/L
MCPP (Water, Total)	562.00	38491	93652	ug/L
Octachloronaphthalene	563.00		2234131	ug/L
Phencapton (Water, Whole)	564.00	81289	2275141	ug/L
Surrog: 2-Chlorophenol-d4 (spike)	565.00		95-97-8	
Surrog: 4-Chloroaniline-d4	566.00			
Surrog: Dibutylchlorendate (spike)	567.00			
Surrog: Fluorene-d10 (spike)	568.00			
Triphenyl phosphate (Water, Whole)	569.00	77881	115866	ug/L
4,7-Methanoisobenzofuran-1(3H)-one	570.00			ug/L
3,4-Dichlorobenzyl N-methylcarbamate	571.00		1966581	ug/L
Benzene, 1-chloro-4-(methylsulfony	572.00			
Phosphorodithioic acid, O,O,S-trim	573.00	39580	86500	ug/L
1-Methylethyl ester carbamic acid	574.00	73615	615532	ug/L
2,3,6-Trichloro benzeneacetic acid	575.00		85347	
2-Methyl-2H-benzotriazole	576.00	85813	29385431	ug/L
Bis(2-ethylhexyl) ester hexanedioic	577.00		103321	
Xylene Isomers, M+P, Whole Water	578.00	85795		ug/L
Dicyclopropyl methanone	579.00			ug/L
Persulfate-N, Total	580.00		7727540	ug/L
Tetrachlorvinphos	581.00		961-11-5	
Gardona	581.01		961-11-5	
,2-Dimethylhydrazine	582.00	73562	540738	ug/L
,4-Dioxane	583.00	82388	123911	mg/L
2 Methoxy-5-nitroaniline	584.00	73622	99558	ug/L
2 Methylaniline	585.00	77142	95534	ug/L
2 Methylaniline hydrochloride	586.00	73649	636215	ug/L
2,4-Toluenediamine	587.00	78888	95807	ug/L
3,3-Dimethoxybenzidine	588.00		199-90-4	ug/L
3,3-Dimethylbenzidine	589.00	73560	119-93-7	ug/L

COMP_NAME	JHK_NO	STORET_NO	CAS_NO	UNITS
4-Chloro-2-methyl aniline hydrochl*	590.00		3165933	ug/L
4-Chloro-2-methyl aniline	591.00		95692	ug/L
4,4-Methylene bis(n,n-dimethyl) an*	592.00		101-61-1	ug/L
Acrylamide	593.00	38576	79-06-1	ug/L
Aramite	594.00		140-57-8	ug/L
Azobenzene	595.00	77625	103-33-3	ug/L
Benzotrichloride	596.00		98077	ug/L
Benzyl chloride	597.00		100447	ug/L
Bis(chloromethyl)ether	598.00	34268	542881	ug/L
Color	599.00	00082		std. units
Corrosivity	600.00			std. units
Direct Black 38	601.00			ug/L
Direct Blue 6	602.00		2602462	ug/L
Direct Brown 95	603.00		16071866	ug/L
Epichlorohydrin	604.00		106898	ug/L
Ethyl acrylate	605.00		140885	ug/L
Ethylene thiourea	348.01	38928	96-45-7	ug/L
Foaming Agents	606.00	01288		mg/L
Folpet	607.00	46351	133073	ug/L
Furazolidone	608.00		67458	ug/L
Furium	609.00			ug/L
Furmecyclox	610.00		60568050	ug/L
Alpha Particle Activity, gross	611.00	80045		pCi/L
Beta Particle Activity, gross	612.00	85817	12587472	pCi/L
Hexachlorocyclohexane (alpha)	265.04	39337	319846	ug/L
Hexachlorocyclohexane (technical)	132.01	81283	608731	ug/L
N-Nitroso-N-methylethylamine	613.00	73613	10595956	ug/L
N-Nitroso-di-n-butylamine	614.00	73609	924163	ug/L
N-Nitrosodiethanolamine	615.00	73610	1116547	ug/L
N-Nitrosodiethylamine	616.00	73611	55185	ug/L
N-Nitrosopyrrolidine	617.00	78206	930552	ug/L
Nitrofurazone	618.00		59870	ug/L
Odor	619.00			std. units
PAH (Polyaromatic hydrocarbons)	620.00			ug/L
PBB (Polybrominated Biphenyls)	621.00		59536651	ug/L
Propylene oxide	622.00	77011	75569	ug/L
Radium 226	623.00	09501	13982633	pCi/L
Radium 226 & 228	624.00	11503		pCi/L
Strontium-90	625.00	13501	10098972	pCi/L
Trimethyl phosphate	626.00		512561	ug/L
Tritium	627.00	07000	10028178	pCi/L
o-Chloronitrobenzene	628.00		88732	ug/L
o-Phenylenediamine	629.00	73628	106503	ug/L
o-Toluidine	630.00	45007	95534	ug/L
p-Chloronitobenzene	631.00		100005	ug/L
p,a,a,a-Tetrachlorotoluene	632.00			ug/L
	260896.38			

APPENDIX B

WASHINGTON

001 ADAMS
003 ASOTIN
005 BENTON
007 CHELAN
009 CLALLAM
011 CLARK
013 COLUMBIA
015 COWLITZ
017 DOUGLAS
019 FERRY
021 FRANKLIN
023 GARFIELD
025 GRANT
027 GRAYS HARBOR
029 ISLAND
031 JEFFERSON
033 KING
035 KITSAP
037 KITTITAS
039 KLICKITAT
041 LEWIS
043 LINCOLN
045 MASON
047 OKANOGAN
049 PACIFIC
051 PEND OREILLE
053 PIERCE
055 SAN JUAN
057 SKAGIT
059 SKAMANIA
061 SNOHOMISH
063 SPOKANE
065 STEVENS
067 THURSTON
069 WAHKIAKUM
071 WALLA WALLA
073 WHATCOM
075 WHITMAN
077 YAKIMA

APPENDIX C

CHAPTER 58.20

WASHINGTON COORDINATE SYSTEM

WESTLAW Electronic Research

See WESTLAW Electronic Research Guide following the Preface.

58.20.010. United States plane coordinate adopted—Zones

The system of plane coordinates which has been established by the United States coast and geodetic survey for defining and stating the positions or locations of points on the surface of the earth within the state of Washington is hereafter to be known and designated as the "Washington coordinate system of 1927".

For the purpose of the use of this system the state is divided into a "north zone" and a "south zone".

The area now included in the following counties shall constitute the north zone: Chelan, Clallam, Douglas, Ferry, Island, Jefferson, King, Kitsap, Lincoln, Okanogan, Pend Oreille, San Juan, Skagit, Snohomish, Spokane, Stevens, Whatcom, and that part of Grant lying north of parallel 47° 30' north latitude.

The area now included in the following counties shall constitute the south zone: Adams, Asotin, Benton, Clark, Columbia, Cowlitz, Franklin, Garfield, that part of Grant lying south of parallel 47° 30' north latitude, Grays Harbor, Kittitas, Klickitat, Lewis, Mason, Pacific, Pierce, Skamania, Thurston, Wahkiakum, Walla Walla, Whitman and Yakima.

Enacted by Laws 1945, ch. 168, § 1. Amended by Laws 1989, ch. 54, § 1

Repeal

This section is repealed July 1, 1990, by Laws 1989, ch. 54, § 22. See, then, § 58.20.130.

Historical and Statutory Notes

Laws 1989, ch. 54, § 1, in the first paragraph, inserted the date of the coordinate system. Source: RRS § 10726a.

Cross References

Recording co-ordinates, see § 58.20.060.
United States survey to prevail, see § 58.20.080.

Library References

Boundaries ⇐1.
WESTLAW Topic No. 59.
C.J.S. Boundaries § 1 et seq.

58.20.020. Designation of system by zones

As established for use in the north zone, the Washington coordinate system of 1927 shall be named, and in any land description in which it is used it shall be designated, the "Washington coordinate system of 1927, north zone".

As established for use in the south zone, the Washington coordinate system of 1927 shall be named, and in any land description in which it is used it shall be designated, the "Washington coordinate system of 1927, south zone".

Enacted by Laws 1945, ch. 168, § 20. Amended by Laws 1989, ch. 54, § 2

Repeal

This section is repealed July 1, 1990, by Laws 1989, ch. 54, § 22. See, then, § 58.20.140.

Historical and Statutory Notes

Laws 1989, ch. 54, § 2, throughout the section, inserted the date of the coordinate system. Source: RRS § 10726b.

Cross References

Definition of zones, see § 58.20.050.
Washington co-ordinate system defined, see § 58.20.070.

Library References

Boundaries ⇐1, 2.
WESTLAW Topic No. 59.
C.J.S. Boundaries § 1 et seq.

58.20.030. X and Y coordinates

The plane coordinates of a point on the earth's surface, to be used in expressing the position or location of such point in the appropriate zone of this system, shall consist of two distances, expressed in feet and decimals of a foot. One of these distances, to be known as the "x-coordinate", shall give the position in an east-and-west direction; the other, to be known as the "y-coordinate", shall give the position in a north-and-south direction. These coordinates shall be made to depend upon and conform to the coordinates, on the Washington coordinate system of 1927, of the triangulation and traverse stations of the United States coast and geodetic survey within the state of Washington, as those coordinates have been determined by the said survey.
Enacted by Laws 1945, ch. 168, § 3. Amended by Laws 1989, ch. 54, § 3.

Repeal

This section is repealed July 1, 1990, by Laws 1989, ch. 54, § 22. See, then, § 58.20.150.

Historical and Statutory Notes

Laws 1989, ch. 54, § 3, inserted the date of the coordinate system. Source: RRS § 10716c.

Library References

Boundaries ⇐1, 2.
WESTLAW Topic No. 59.
C.J.S. Boundaries § 1 et seq.

58.20.040. Tract in both zones, how described

When any tract of land to be defined by a single description extends from one into the other of the above coordinate zones, the positions of all points on its boundaries may be referred to either of said zones, the zone which is used being specifically named in the description.
Enacted by Laws 1945, ch. 168, § 4.

Repeal

This section is repealed July 1, 1990, by Laws 1989, ch. 54, § 22. See, then, § 58.20.160.

Historical and Statutory Notes

Source: RRS § 10726d.

Library References

Boundaries ⇐1, 10.
WESTLAW Topic No. 59.
C.J.S. Boundaries §§ 1 et seq., 24.

58.20.050. Zones defined

For purposes of more precisely defining the Washington coordinate system of 1927, the following definition by the United States coast and geodetic survey is adopted:

The Washington coordinate system of 1927, north zone, is a Lambert conformal projection of the Clarke spheroid of 1866, having standard parallels at north latitudes 47° 30' and 48° 44', along which parallels the scale shall be exact. The origin of coordinates is at the intersection of the meridian 120° 50' west of Greenwich and the parallel 47° 00' north latitude. This origin is given the coordinates: x = 2,000,000 feet and y = 0 feet.

The Washington coordinate system of 1927, south zone, is a Lambert conformal projection of the Clarke spheroid of 1866, having standard parallels at north latitudes 45° 50' and 47° 20', along which parallels the scale shall be exact. The origin of coordinates is at the intersection of the meridian 120° 30' west of Greenwich and the parallel 45° 20' north latitude. This origin is given the coordinates: x = 2,000,000 feet and y = 0 feet.

The position of the Washington coordinate system of 1927 shall be as marked on the ground by triangulation or traverse stations established in conformity with the standards adopted by the United States coast and geodetic survey for first-order and second-order work, whose geodetic positions have been rigidly adjusted on the North American datum of 1927, and whose coordinates have been computed on the system herein defined. Any such station may be used to establish a survey connection with the Washington coordinate system of 1927.
Enacted by Laws 1945, ch. 168, § 5. Amended by Laws 1989, ch. 54, § 4.

Repeal

This section is repealed July 1, 1990, by Laws 1989, ch. 54, § 22. See, then, §§ 58.20.170, 58.20.180.

Historical and Statutory Notes

Laws 1989, ch. 54, § 4, throughout the section, inserted the date of the coordinate system; and, in the second paragraph, in the second sentence, substituted "parallel" for "meridian".

Source: RRS § 10724c.

Library References

Boundaries ⇐25.
WESTLAW Topic No. 59.
C.J.S. Boundaries § 61.

58.20.060. Recording coordinates—Conditions

No coordinates based on the Washington coordinate system of 1927, purporting to define the position of a point on a land boundary, shall be presented to be recorded in any public land records or deed records unless such point is within one-half mile of a triangulation or traverse station established in conformity with the standards prescribed in RCW 58.20.050: *Provided*, That said one-half mile limitation may be modified by a duly authorized state agency to meet local conditions.

Enacted by Laws 1945, ch. 168, § 6. Amended by Laws 1989, ch. 54, § 5.

Repeal

This section is repealed July 1, 1990, by Laws 1989, ch. 54, § 22. See, then, § 58.20.180.

Historical and Statutory Notes

Laws 1989, ch. 54, § 5, inserted the date of the coordinate system.

Source: RRS § 10724d.

Library References

Boundaries ⇐25.
WESTLAW Topic No. 59.
C.J.S. Boundaries § 61.

58.20.070. Use of term limited

The use of the term "Washington coordinate system of 1927" on any map, report of survey, or other document, shall be limited to coordinates based on the Washington coordinate system of 1927 as defined in this chapter.

Enacted by Laws 1945, ch. 168, § 7. Amended by Laws 1989, ch. 54, § 6.

Repeal

This section is repealed July 1, 1990, by Laws 1989, ch. 54, § 22. See, then, § 58.20.200.

Historical and Statutory Notes

Laws 1989, ch. 54, § 6, inserted the date of the coordinate system in two places.

Source: RRS § 10724g.

Library References

Boundaries ⇐2.
WESTLAW Topic No. 59.
C.J.S. Boundaries § 4.

58.20.080. United States survey to prevail

Whenever coordinates based on the Washington coordinate system of 1927 are used to describe any tract of land which in the same document is also described by reference to any subdivision, line or corner of the United States public land surveys, the description by coordinates shall be construed as supplemental to the basic description of such subdivision, line, or corner contained in the official plats and field notes filed of record, and in the event of any conflict the description by reference to the subdivision, line, or corner of the United States public land surveys shall prevail over the description by coordinates.

Enacted by Laws 1945, ch. 168, § 8. Amended by Laws 1989, ch. 54, § 7.

Repeal

This section is repealed July 1, 1990, by Laws 1989, ch. 54, § 22. See, then, § 58.20.210.

Historical and Statutory Notes

Laws 1989, ch. 54, § 7, inserted the date of the coordinate system.

Source: RRS § 10724h.

Library References

Boundaries ⇐25.
WESTLAW Topic No. 59.
C.J.S. Boundaries § 61.

58.20.090. Construction of chapter

Nothing contained in this chapter shall require any purchaser or mortgagee to rely on a description, any part of which depends exclusively upon the Washington coordinate system of 1927.

Enacted by Laws 1945, ch. 168, § 9. Amended by Laws 1989, ch. 54, § 8.

Repeal

This section is repealed July 1, 1990, by Laws 1989, ch. 54, § 22. See, then, § 58.20.220.

Historical and Statutory Notes

Laws 1989, ch. 54, § 8, inserted the date of the coordinate system. Source: RRS § 10724d.

Library References

Boundaries ⇐1, 25.
WESTLAW Topic No. 39.
C.J.S. Boundaries §§ 1 et seq., 61.

58.20.110. Definitions

Unless the context clearly requires otherwise, the definitions in this section apply throughout RCW 58.20.110 through 58.20.220 and 58.20.901:

(1) "Committee" means the interagency federal geodetic control committee or its successor;

(2) "GRS 80" means the geodetic reference system of 1980 as adopted in 1979 by the international union of geodesy and geophysics defined on an equipotential ellipsoid;

(3) "National geodetic survey" means the national ocean service's national geodetic survey of the national oceanic and atmospheric administration, United States department of commerce, or its successor;

(4) "Washington coordinate system of 1927" means the system of plane coordinates in effect under this chapter until July 1, 1990, which is based on the North American datum of 1927 as determined by the national geodetic survey of the United States department of commerce;

(5) "Washington coordinate system of 1983" means the system of plane coordinates under this chapter based on the North American datum of 1983 as determined by the national geodetic survey of the United States department of commerce.

Enacted by Laws 1989, ch. 54, § 9.

58.20.120. System designation—Permitted uses

Until July 1, 1990, the Washington coordinate system of 1927, or its successor, the Washington coordinate system of 1983, may be used in Washington for expressing positions or locations of points on the surface of the earth. On and after that date, the Washington coordinate system of 1983 shall be the designated coordinate system in Washington. The Washington coordinate system of 1927 may be used only for purposes of reference after June 30, 1990.

Enacted by Laws 1989, ch. 54, § 10.

58.20.130. Plane coordinates adopted—Zones

The system of plane coordinates which has been established by the national geodetic survey for defining and stating the positions or locations of points on the surface of the earth within the state of Washington is designated as the "Washington coordinate system of 1983."

For the purposes of this system the state is divided into a "north zone" and a "south zone."

The area now included in the following counties shall constitute the north zone: Chelan, Clallam, Douglas, Ferry, Island, Jefferson, King, Kitsap, Lincoln, Okanogan, Pend Oreille, San Juan, Skagit, Snohomish, Spokane, Stevens, Whatcom, and that part of Grant lying north of parallel 47° 30' north latitude.

The area now included in the following counties shall constitute the south zone: Adams, Asotin, Benton, Clark, Columbia, Cowlitz, Franklin, Garfield, that part of Grant lying south of parallel 47° 30' north latitude, Grays Harbor, Kittitas, Klickitat, Lewis, Mason, Pacific, Pierce, Skamania, Thurston, Wahkiakum, Walla Walla, Whitman and Yakima.

Enacted by Laws 1989, ch. 54, § 11.

Historical and Statutory Notes

Source:
Former § 58.20.010.

58.20.140. Designation of system—Zones

As established for use in the north zone, the Washington coordinate system of 1983 shall be named, and in any land description in which it is used it shall be designated, the "Washington coordinate system of 1983, north zone."

As established for use in the south zone, the Washington coordinate system of 1983 shall be named, and in any land description in which it is used it shall be designated, the "Washington coordinate system of 1983, south zone."

Enacted by Laws 1989, ch. 54, § 12.

Historical and Statutory Notes

Source:
Former § 58.20.020.

58.20.150. Designation of coordinates—"N" and "E"

"N" and "E" shall be used in labeling coordinates of a point on the earth's surface and in expressing the position or location of such

point relative to the origin of the appropriate zone of this system, expressed in meters and decimals of a meter. These coordinates shall be made to depend upon and conform to the coordinates, on the Washington coordinate system of 1983, of the horizontal control stations of the national geodetic survey within the state of Washington, as those coordinates have been determined, accepted, or adjusted by the survey.
Enacted by Laws 1989, ch. 54, § 13

Historical and Statutory Notes

Source:
Former § 58.20.030.

58.20.160. Tract in both zones—Description

When any tract of land to be defined by a single description extends from one into the other of the coordinate zones under RCW 58.20.130, the positions of all points on its boundaries may be referred to either of the zones, the zone which is used being specifically named in the description.
Enacted by Laws 1989, ch. 54, § 14.

Historical and Statutory Notes

Source:
Former § 58.20.040.

58.20.170. Zones—Technical definitions

For purposes of more precisely defining the Washington coordinate system of 1983, the following definition by the national geodetic survey is adopted:

The Washington coordinate system of 1983, north zone, is a Lambert conformal conic projection of the GRS 80 spheroid, having standard parallels at north latitudes 47° 30′ and 48° 44′, along which parallels the scale shall be exact. The origin of coordinates is at the intersection of the meridian 120° 50′ west of Greenwich and the parallel 47° 00′ north latitude. This origin is given the coordinates: E = 500,000 meters and N = 0 meters.

The Washington coordinate system of 1983, south zone, is a Lambert conformal conic projection of the GRS 80 spheroid, having standard parallels at north latitudes 45° 50′ and 47° 20′, along which parallels the scale shall be exact. The origin of coordinates is at the intersection of the meridian 120° 30′ west of Greenwich and the parallel 45° 20′ north latitude. This origin is given the coordinates: E = 500,000 meters and N = 0 meters.
Enacted by Laws 1989, ch. 54, § 15.

Historical and Statutory Notes

Source:
Former § 58.20.050.

58.20.180. Recording coordinates—Control stations

Coordinates based on the Washington coordinate system of 1983, purporting to define the position of a point on a land boundary, may be presented to be recorded in any public land records or deed records if the survey method used for the determination of these coordinates is established in conformity with standards and specifications prescribed by the interagency federal geodetic control committee, or its successor. These surveys shall be connected to monumented control stations that are adjusted to and published in the national network of geodetic control by the national geodetic survey and such connected horizontal control stations shall be described in the land or deed record. Standards and specifications of the committee in force on the date of the survey shall apply. In all instances where reference has been made to such coordinates in land surveys or deeds, the scale and sea level factors shall be stated for the survey lines used in computing ground distances and areas.

The position of the Washington coordinate system of 1983 shall be marked on the ground by horizontal geodetic control stations which have been established in conformity with the survey standards adopted by the committee and whose geodetic positions have been rigorously adjusted on the North American datum of 1983 and whose coordinates have been computed and published on the system defined in RCW 58.20.110 through 58.20.220 and 58.20.900. Any such control station may be used to establish a survey connection with the Washington coordinate system of 1983.
Enacted by Laws 1989, ch. 54, § 16.

Historical and Statutory Notes

Source:
Former §§ 58.20.050, 58.20.060.

58.20.190. Conversion of coordinates—Metric

Any conversion of coordinates between the meter and the United States survey foot shall be based upon the length of the meter being equal to exactly 39.37 inches.
Enacted by Laws 1989, ch. 54, § 17.

58.20.200. Terms—Limited use

The use of the term "Washington coordinate system of 1983" on any map, report of survey, or other document, shall be limited

coordinates based on the Washington coordinate system of 1983 as defined in this chapter.
Enacted by Laws 1989, ch. 54, § 18.

Historical and Statutory Notes

Source:
Former § 58.20.070.

58.20.210. United States survey prevails—Conflict

Whenever coordinates based on the Washington coordinate system of 1983 are used to describe any tract of land which in the same document is also described by reference to any subdivision, line or corner of the United States public land surveys, the description by coordinates shall be construed as supplemental to the basic description of such subdivision, line, or corner contained in the official plats and field notes filed of record, and in the event of any conflict the description by reference to the subdivision, line, or corner of the United States public land surveys shall prevail over the description by coordinates.
Enacted by Laws 1989, ch. 54, § 19.

Historical and Statutory Notes

Source:
Former § 58.20.080.

58.20.220. Real estate transactions—Exemption

Nothing contained in this chapter shall require any purchaser or mortgagee to rely on a description, any part of which depends exclusively upon the Washington coordinate system of 1927 or 1983.
Enacted by Laws 1989, ch. 54, § 20.

Historical and Statutory Notes

Source:
Former § 58.20.090.

58.20.900. Severability—1945 c 168

If any provision of this chapter shall be declared invalid, such invalidity shall not affect any other portion of this chapter which can be given effect without the invalid provision, and to this end the provisions of this chapter are declared to be severable.
Enacted by Laws 1945, ch. 168, § 10.

Repeal

This section is repealed July 1, 1990, by Laws 1989, ch. 54, § 22. See, then, § 58.20.901.

Library References

Statutes ⇐64(2).
WESTLAW Topic No. 361.
C.J.S. Statutes § 96 et seq.

58.20.901. Severability—1989 c 54

If any provision of this act or its application to any person or circumstance is held invalid, the remainder of the act or the application of the provision to other persons or circumstances is not affected.
Enacted by Laws 1989, ch. 54, § 21.

coordinates based on the Washington coordinate system of 1983 as defined in this chapter.
Enacted by Laws 1989, ch. 54, § 18.

Historical and Statutory Notes

Source:
Former § 58.20.070

58.20.210. United States survey prevails—Conflict

Whenever coordinates based on the Washington coordinate system of 1983 are used to describe any tract of land which in the same document is also described by reference to any subdivision, line or corner of the United States public land surveys, the description by coordinates shall be construed as supplemental to the basic description of such subdivision, line, or corner contained in the official plats and field notes filed of record, and in the event of any conflict the description by reference to the subdivision, line, or corner of the United States public land surveys shall prevail over the description by coordinates.
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Historical and Statutory Notes

Source:
Former § 58.20.090

58.20.900. Severability—1945 c 168

If any provision of this chapter shall be declared invalid, such invalidity shall not affect any other portion of this chapter which can be given effect without the invalid provision, and to this end the provisions of this chapter are declared to be severable.
Enacted by Laws 1945, ch. 168, § 10.

Repeal

This section is repealed July 1, 1990, by Laws 1989, ch. 54, § 22. See, then, § 58.20.901.

Library References

Statutes ⇐64(2).
WESTLAW Topic No. 361.
C.J.S. Statutes § 96 et seq.

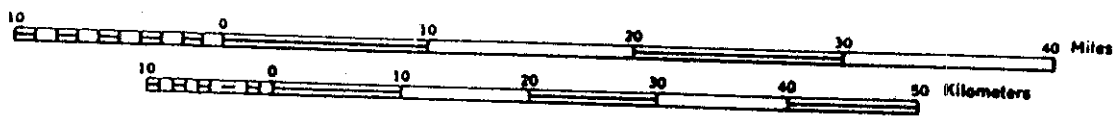
58.20.901. Severability—1989 c 54

If any provision of this act or its application to any person circumstance is held invalid, the remainder of the act or application of the provision to other persons or circumstances not affected.
Enacted by Laws 1989, ch. 54, § 21.

APPENDIX D

HYDROLOGIC UNIT MAP—1974
STATE OF WASHINGTON

Scale 1:500,000
1 inch equals approximately 8 miles



Datum is mean sea level

Compiled, edited, and published by the Geological Survey. 1927 North American datum
Lambert conformal conic projection based on standard parallels 33° and 45°

LEGEND

or village

oundary shown for towns over 5,000 population

SOURCE DATA

U. S. Dept. of the Interior—Geological Survey topographic maps

U. S. Dept. of the Army—A. M. S. 1:250,000 scale maps

BASE MAP
Drainage modified 1974

POPULATION KEY

SEATTLE	more than 100,000
YAKIMA	25,000 to 100,000
Olympia	5,000 to 25,000
Ritzville	1,000 to 5,000
Concrete	less than 1,000

Population indicated by use of letters

COMPILED IN 1961
EDITION OF 1962

AVAILABLE UPON REQUEST FROM TOXICS CLEANUP PROGRAM

118°

INTERIOR—GEOLOGICAL SURVEY, RESTON, VIRGINIA—1974

WA

For sale by U.S. Geological Survey
Denver, Colo. 80225 and Reston, Va. 22092. price $1.25

APPENDIX E

LIST OF QUALIFIERS FOR NUMERIC RESULTS

REMARK CODE	DEFINITION
B	Analyte is found in the blank as well as the sample, indicated possible/probable blank contamination.
J	Estimated value; not accurate.
M	Presence of material verified but not quantified
U or K	Compound was analyzed for bur not detected. The associated numerical values is the sample quantitation detection limit.
UJ	Compound was analyzed for bur not detected. The number is the estimated minimum detection limit.
C	The value is one of, or the sum of both, Benzo (b) Fluoranthene and Benzo (k) Fluoranthene.
X	Many background organisms.
H	Over holding time. Analysis run.
G	Improper container.
Z	Sample low due to interfering substance.
D	Sample high due to interfering substance.
IS	Interfering Substance.
P	Greater than (>).
A	Less than (<).
LMX	Lab Matrix Number.
LBK	Lab Blank Number.

Data Qualifier Definitions

For the purposes of this document the following code letters and associated definitions are provided:

dr	- dry weight
wt	- wet weight
R	- The data are unusable (compound may or may not be present). Resampling and reanalysis is necessary for verification.
N	- Presumptive evidence of presence of material.
NJ	- Presumptive evidence of the presence of the material at an estimated quantity.
UJ	- The material was analyzed for, bur was not detected. The sample quantitation limit is an estimated quantity.

The reviewer may determine that qualifiers other than those used in this document are necessary to describe or qualify the data. In these instances, it is the responsibility of each reporting enity to thoroughly document/explain the qualifiers used and notify Ecology Prior to submition of data packages.