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STATE OF WASHINGTON

DEPARTMENT OF ECOLOGY

4601 N. Monroe, Suite 202 • Spokane, Washington 99205-1295 • (509) 456-2926

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

In the Matter of Remedial Action at the: L-BAR SITE	AGREED ORDER
	No. DE 94TC-E104

TO: Northwest Alloys, Inc.
L-Bar Products, Inc.
Reserve Industries Corporation

Collectively referred to herein as the Potentially Liable Persons (the PLPs)

I.
Jurisdiction

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

II.

Findings of Fact

Ecology makes the following Findings of Fact, without admission of such facts by the PLPs.

1. The L-Bar Site is located approximately two miles south of Chewelah, Washington on the west side of U.S. Highway 395 in the eastern half of the SE¼ of Section 23, Township 32 North, Range 40 E.W.M. in Stevens County. The location of the site is shown in Exhibit A of this Order.

2. A magnesite pile about 30 feet deep and covering about five (5) acres is found west of the site. Two drainage ditches, Ditch A and Ditch B, collect storm water run-off from the site and empty into the Colville River. (See Exhibit B).

3. Most of the site is owned by L-Bar Products, Inc., (L-Bar), a wholly owned subsidiary of Reserve Industries Corporation (Reserve). L-Bar operated a magnesium recovery plant at the site from approximately March 1986 to December 1991. Prior to L-Bar, Phoenix Resource Recovery, Inc., owned and operated the facility from 1975 to 1986.

4. The major operation at the plant was to recover magnesium trapped in granular form. The sludge bars, a by-product of magnesium production facilities, were mostly supplied by Northwest Alloys, Inc. (NWA) from the magnesium metal plant in Addy, Washington.

5. Recovery was made by crushing and grinding the sludge bars to a powder and screening out the magnesium granules. The remaining ground material was called sludge bar residue (SBR), some of which was processed and sold as fertilizer or de-icer.

6. Sludge bars and SBRs consist mainly of spent flux of metal chlorides and some nitride compounds. They are very reactive with water, causing ammonia to be released. The reaction of sludge bars and SBRs with water also generates heat. As a result, several fires accompanied by releases of smoke, dust, and ammonia to the air occurred at this facility during its operation.

7. Sludge bars and SBRs in this facility are classified as state dangerous wastes, based on toxicity to fish.

8. Past operating practices and inadequate storage of the sludge bars and SBRs have resulted in known contamination of ground water and surface water. Past data collected for ground water show a maximum value of about 60,000 mg/L chloride and 120,000 mg/L total dissolved solids concentrations in the local shallow water table aquifer.

These concentrations greatly exceed EPA's secondary maximum contaminant levels (MCLs) of 250 mg/L for chloride and 500 mg/L for total dissolved solids. In 1988, chloride concentration measurements along Ditch A ranged from 6,690 to 18,000 mg/L.

9. The Department of Ecology (Ecology) has issued several Enforcement Orders and Penalties to L-Bar during its operation from 1986 to 1991 for violations of air, water quality and dangerous waste regulations. In August 1988, Ecology filed a civil suit against L-Bar, Reserve (parent

company of L-Bar), NWA, and Aluminum Company of America (Alcoa, the parent company of NWA) in the Superior Court of Stevens County for violation of environmental laws.

10. Due to operating losses, L-Bar closed down operations in December 1991 and is currently undergoing reorganization under Chapter 11 in the United States Bankruptcy Court in the Eastern District Court in Washington. Approximately 90,000 tons of materials, including sludge bars and SBRs, are still stored at the site in buildings, under a covered pile, and on top of the magnesite pile.

11. At the time of closure, L-Bar was in the process of upgrading and rehabilitating the site as part of a proposed settlement of the civil suit filed by Ecology. Part of the rehabilitation was a water management system which was to collect surface runoff and ground water for treatment before discharging to the Colville River. This system was never completed, but as a result of the work, two collection ponds are in place and waters have accumulated in these ponds (see Exhibit B). Water in these two ponds is primarily surface runoff and direct precipitation, which overflows to Ditch A when full.

12. In the winter of 1992-93, the snow load caused some of the buildings where sludge bars, SBRs, and other hazardous substances are stored, to collapse. Damages to the storm water collection system and to the cover of a dangerous waste pile also occurred. These damages posed significant human health and environmental risks.

13. In October 1993, under the authority of RCW 70.105D.030, Ecology conducted an emergency action at the L-Bar site to reduce those risks. This emergency action included: retrieving, sampling, overpacking, labeling, and storing in a locked and covered structurally sound building those acid drums that were under collapsed buildings or buildings about to collapse; patching a large hole in the dangerous waste pile cover; repairing broken pavings and curbs of the storm water collection system; posting hazard signs; and limiting site access by installing gates across transportation routes.

14. Beginning in January 1994, NWA voluntarily initiated independent interim remedial action. The objective of the work was to perform further environmental and engineering stabilization activities at the site. This included: relocation of hazardous substances from unsecured

areas to protected on-site storage areas; dismantling of structurally unsound buildings; cleaning and repair of roofing and windows in buildings which would remain as interim storage facilities; increasing the capacities of holding ponds; and, sweeping of paved areas to improve the quality of storm water leaving the facility.

15. On January 13, 1994, Ecology issued final determinations of Potentially Liable Person (PLP) status to:

a. L-Bar Products, Inc., as owner/operator.
b. Reserve Industries Corporation, as owner/operator;
c. Northwest Alloys, Inc., as generator.

16. Ecology has received information concerning additional parties which may be PLPs at the Site. The agency will continue to consider additional information concerning other PLPs as it becomes available and may name more PLPs at a later date.

17. Analytical samples from three locations along Ditch A taken in October, 1993 by NWA contained chloride at concentrations ranging from 6800 to 7200 mg/L and ammonia as nitrogen (NH3-N) concentrations ranging from 160 to 190 mg/L. In December 1993, an analytical sample taken from Ditch A near the river showed a NH3-N concentration of 470 mg/L. These concentrations exceed state and federal surface water standards.

18. Ditch A, which collects the storm water runoff from the facility and pond overflows, also serves as a natural discharge of contaminated ground water. Water in Ditch A is partially contained from entering the river by an earthen dam blocked by hay bales and erosion control fabric and drained by a culvert. The water level in Ditch A is approaching an elevation that will result in overflow or cause erosion of the dam, thus posing a significant risk of a catastrophic release of contaminated water into the Colville River which may be toxic to fish and other aquatic life.

19. Ecology issued Emergency Enforcement Order No. DE 94TC-E102 effective March 17, 1994 to the PLPs. This Order requires the PLPs to apply for a National Pollutant Discharge Elimination System (NPDES) permit for a surface water discharge to the Colville River. In addition, the Order requires the PLPs to immediately conduct controlled and monitored releases of the water from the ditch into the

river under conditions specified by Ecology in order to prevent a potential catastrophic release of the water.

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

a. In-Situ, Inc., 1988. Hydrologic Report L-Bar Products, Inc. Facility Near Chewelah, Washington.

b. Dames and Moore, 1991. Environmental Assessment of Sites Operated by L-Bar Products, Inc., Chewelah, Washington.

c. Wright Engineers, Ltd., 1988. Magnesium Recovery and By-Product Production Plant Rehabilitation.

d. Wright Engineers, Ltd., 1989. Water Management Chewelah Site.

III.

Ecology Determinations

1. L-Bar and Reserve are "owners or operators" as defined in RCW 70.105D.020(6) of a "facility" as defined in RCW 70.105D.020(3).

2. NWA was a "generator" of hazardous substances found at the facility under RCW 70.105D.040(1).

3. The facility is known as the L-Bar Site and is located on the west side of U. S. Highway 395 approximately two miles south of Chewelah, Washington.

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

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

6. By letters dated January 13, 1994, Ecology notified each of the PLPs of its status as a "potentially liable person" under RCW 70.105D.040 after notice and opportunity for comment.

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

8. 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 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 phased Remedial Investigation/Feasibility Study (RI/FS). Attached hereto are the Scopes of Work for an Interim Action as Exhibit C, and for a phased RI/FS as Exhibit D.

2. The PLPs shall submit Work Plans to implement the attached Scopes of Work and will proceed with implementation of scopes in accordance with the schedules attached to Exhibits C and D and/or as specified in the approved work plans.

3. These Work Plans shall consist of a detailed description of the work to be performed, personnel requirements 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 and Monitoring Plan (for Interim Action only)
e. Operations and Maintenance Plan (for Interim Action only)

These 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.

4. After receipt of the work plans Ecology shall notify the PLPs, in writing, of Ecology's approval or disapproval of the work plan. In the event of disapproval, Ecology shall specify in writing both the deficiencies and any Ecology-recommended modifications regarding the Work Plans.

5. Following receipt of Ecology's notification of the Work Plan disapproval or recommended modifications, the PLPs shall amend and submit to Ecology a revised Work Plan incorporating the modifications required by Ecology as provided in the schedules attached to Exhibits C and D. Prior to submission of the revised Work Plan, the PLPs may submit comments to Ecology for review regarding the Work Plan disapproval or recommended modifications.

6. As provided in the schedules attached to Exhibits C and D, the PLPs shall commence work and thereafter complete all tasks by the dates indicated in the approved schedule. The Work Plans and Schedules, when approved by Ecology, shall be immediately attached to and incorporated into this Order and shall thereafter be an integral and enforceable part of this Order.

7. Progress reports shall be completed on a bimonthly (i.e., every other month) basis and shall be submitted by the tenth day of the month in which they are due after the effective date of this Order. 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.

8. In accordance with WAC 173-340-840(5), sampling data shall be submitted according to Exhibit E: GROUND WATER SAMPLING DATA SUBMITTAL REQUIREMENTS. These submittals shall be provided to Ecology in accordance with the schedules specified in the approved work plans.

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 Notices

WAC 173-340-600(10)(c) requires a 30-day public comment period before this Agreed Order becomes effective. 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. Should such revisions be made, PLPs reserve the right to agree to the revisions prior to the order becoming effective. If the parties cannot reach agreement on any revision, Ecology reserves all rights to issue a unilateral enforcement order.

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 and support costs of direct activities as defined in WAC 173-340-550(2). The PLPs shall pay the required amount within 90 days of receiving from Ecology an itemized statement of costs that includes a summary of costs incurred, an identification of involved staff, and the amount of time spent by involved staff members on the project. A general description of work performed will be provided upon request. For work commencing on July 1, 1994, itemized statements shall be prepared quarterly. Failure to pay Ecology's costs within 90 days of receipt of the itemized statement of costs will result in interest charges.

For work performed from July 1, 1993 to June 30, 1994, the PLPs shall pay to Ecology the amount of $80,576.98, plus applicable accrued interests, within 30 days of signing the

reorganization plan. This work performed includes: order preparation, oversight and administration in the amount of $52,432.26 for July 1, 1993 to June 30, 1994 billed to PLPs in unpaid invoices #1T000145-01-AA, -AB, -AC and #1T000145-02-AA, -AB, -AC under Emergency Order No. DE 94TC-E102, and $4,400.50 for July 1, 1994 to July 31, 1994 which still has to be billed for the next quarter; and, the costs of Ecology contractor-conducted emergency remedial measures at the L-Bar facility in the amount of $23,744.22.

4. Designated Project Coordinators

The project coordinator for Ecology is:

Teresita Bala
Toxics Cleanup Program
4601 N. Monroe, Suite 100
Spokane, WA 99205-1295
Telephone: (509) 456-6337

The project coordinator for the PLPs is:

Ozzie Wilkinson
Northwest Alloys, Inc.
P. O. Box 115
Addy, WA 99101-0115
Telephone: (509) 935-3369

The project coordinator(s) shall be responsible for overseeing the implementation of this Order. To the maximum extent possible, communication 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), each shall make best efforts to provide written notification to the other 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 of 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 the 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 where necessary to abate an emergency situation, the PLPs shall not perform any remedial actions at the L-Bar site outside that required by this Order unless Ecology concurs, in writing, with such additional remedial actions. This provision shall not affect the PLP's ability to process site materials either on or off site and transport such materials for recycling/reuse (e.g. processing SBR as a fertilizer) during the course of the RI/FS in accordance with State and Federal regulations and all required permits, provided that the PLPs submit to Ecology a detailed report of any such actions at least ten (10) working days before taking such actions. Ecology shall review and approve or deny such request within five (5) working days of receipt of the report.

6. Access

Ecology or any Ecology authorized representative shall have the authority to enter and freely move about the Site at all reasonable times for the purposes of, inter alia: inspecting records, operation logs, contracts, and other documents 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 Ecology 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. By signing this Agreed Order, the PLPs agree that this Order constitutes reasonable notice of access, and agree to allow access to the Site at all reasonable times for purposes of overseeing work performed under this Order.

The PLPs shall notify Ecology in writing if they determine that access to any property not owned or operated by the PLPs is necessary to perform any remedial action required by this Order. The PLPs also shall make best efforts to submit to Ecology prior to performing such remedial action fully-executed access agreements between the PLPs and the owners of such property. If, after all

reasonable efforts, PLPs are unable to achieve access, Ecology will assist in gaining access.

Ecology will make best efforts to provide a minimum of five (5) working days' advance notice to PLPs of any sampling. Ecology shall allow split or replicate samples to be taken by the PLPs during an inspection unless doing so interferes with Ecology's sampling. The PLPs shall similarly allow split or replicate samples to be taken by Ecology with Ecology's sample containers and shall make their best efforts to provide at least ten (10) working days' notice before any sampling activity. Should Ecology desire to split samples during the PLPs' sampling activity, Ecology will make its very best effort to provide at least five (5) working days' advance notice.

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 their possession which are relevant to this Order. Should any portion of the work performed hereunder be undertaken through agents, contractors or subcontractors for the PLPs, then the PLPs agree to include in their contract with such contractors or agents a record retention requirement meeting the terms of this paragraph.

9. Dispute Resolution

The PLPs may request Ecology to resolve disputes which may arise during the implementation of this Order. In the event the PLPs dispute an approval, disapproval, proposed modification or other decision or action by Ecology's project coordinator, the PLPs shall utilize the following dispute resolution:

> Upon receipt in writing of the Ecology project coordinator's decision, PLPs have seven (7) working days within which to notify Ecology's

project coordinator in writing of their objection to the decision.

Ecology's project coordinator and the PLP's project coordinator and/or representative of the PLPs shall then confer in an effort to resolve the dispute. If Ecology's project coordinator and the PLP's project coordinator and/or representative of the PLPs cannot resolve the dispute within seven (7) working days, Ecology's project coordinator shall issue a written decision within five (5) working days from such date.

The PLPs may then request that Ecology management review the decision made by the Ecology project coordinator. Such request shall be in writing and directed to the signatory or his/her successor(s) to this Order. Ecology resolution of the dispute shall be binding and final. The project coordinators will make all reasonable efforts to comply with the project schedule in the event of a dispute. However, if requested and necessary, Ecology may consider adjustments to the project schedule.

Ecology and the PLPs agree to utilize the dispute resolution process in good faith and agree to expedite, to the extent possible, the dispute resolution process whenever it is used.

The PLPs are not relieved of any requirement of this Order during the pendency of the dispute and remain responsible for timely compliance with the terms of the Order unless otherwise provided by Ecology in writing.

10. Reservation of Rights/No Settlement

This Agreed Order is not a settlement under Chapter 70.105D RCW. Ecology's signature on this Order in no way constitutes a covenant not to sue or a compromise of any Ecology rights or authority. Ecology will not, however, bring an action against the PLPs to recover remedial action costs paid to and received by Ecology under this Agreed Order. In addition, Ecology will not take additional enforcement actions against the PLPs to require those remedial actions required by this Agreed Order, provided the PLPs comply with this Agreed Order.

Ecology reserves the right, however, to require additional remedial actions at the Site should it deem such actions necessary.

Ecology also reserves all rights regarding the injury to, destruction of, or loss of natural resources resulting from the releases or threatened releases of hazardous substances from the L-Bar 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 take certain actions or 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 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 Agreed Order have been complied with. With respect to the Interim Action, Ecology will provide written confirmation of construction completion, signalling the initiation of the operation & maintenance/ monitoring phase of Interim Action. Completion of the RI/FS portion of this Order will coincide with Ecology's acceptance of the Final FS Report. Ecology's acceptance of the Final FS Report will be confirmed in writing within forty five (45) days of receipt.

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 Section 6 of Chapter 70.105D RCW.

2. Each PLP named in this Agreed Order is individually responsible for compliance with the terms and conditions of this Order. Compliance with this Agreed Order by any PLP is not conditioned on the performance of any other PLP or group of PLPs. Similarly, the right of Ecology to enforce this Order against any PLP is not conditioned on the performance of or enforcement against any PLP or group of PLPs.

Effective date of this Order: 1/5/95

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
By Gina J. Hildebrand
Position Section Manager
Date 1/5/95

NORTHWEST ALLOYS, INC.

EDWARD L. SANDMAN, JR.

By Edward L. Sandman Jr.

Position PRESIDENT

Date 11/15/94

L-BAR, PRODUCTS, INC.

By _____
Position President
Date November 15, 1994

(Subject to Bankruptcy Court Approval)

NORTHWEST ALLOYS, INC.

EDWARD L. SANDMAN, JR.

By Edward L. Sandman Jr.

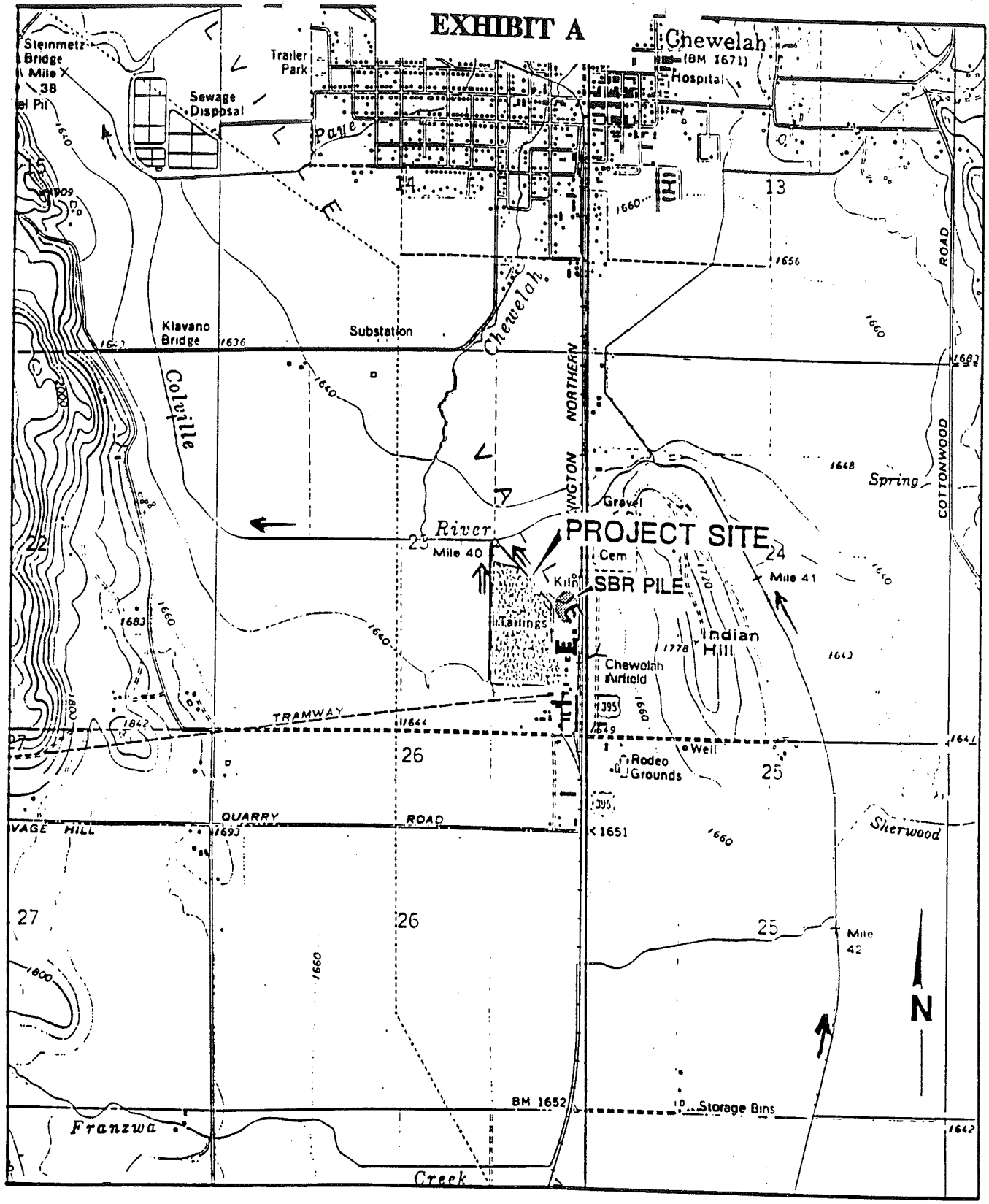
Position PRESIDENT

Date 11/15/94

RESERVE INDUSTRIES CORPORATION

By_____
Position_____
Date_____

EXHIBIT A



Base map USGS "Chewelah, Wash." quadrangle, 7.5 min. series, 1964 P.R.1986, and "Valley, Wash." 1965 P.R. 1986.

← **RIVER FLOW DIRECTION**

⇐ **DISCHARGE DITCH**

L-BAR PRODUCTS, INC.
Chewelah, Wash.

VICINITY MAP

MAR 1990 E-1126-01

GIFFORD CONSULTANTS, INC.
GEOTECHNICAL ENGINEERING

Drawn By TPS Drwg. Date 3-16-90 Checked By ECL Field Rep.

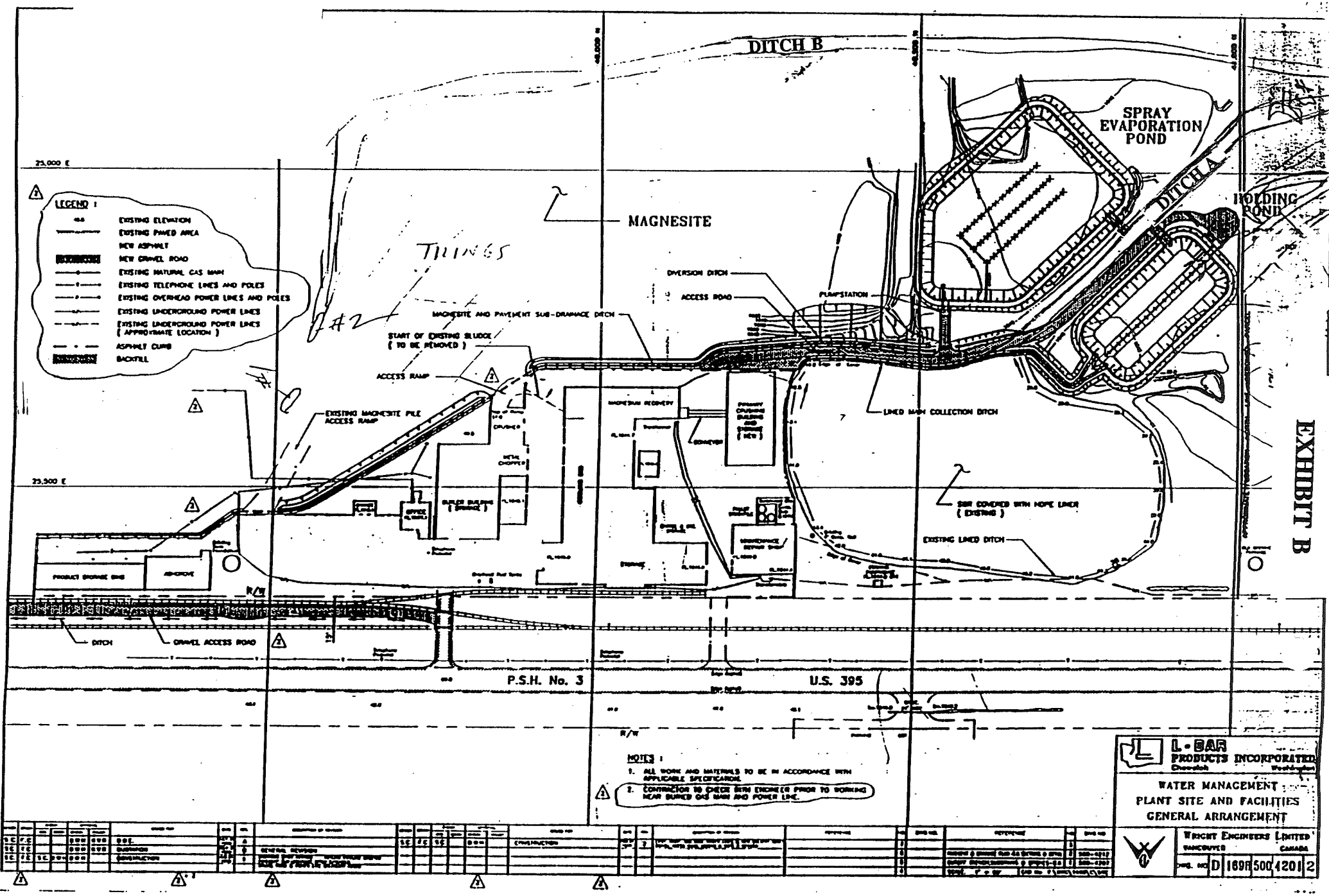


EXHIBIT B

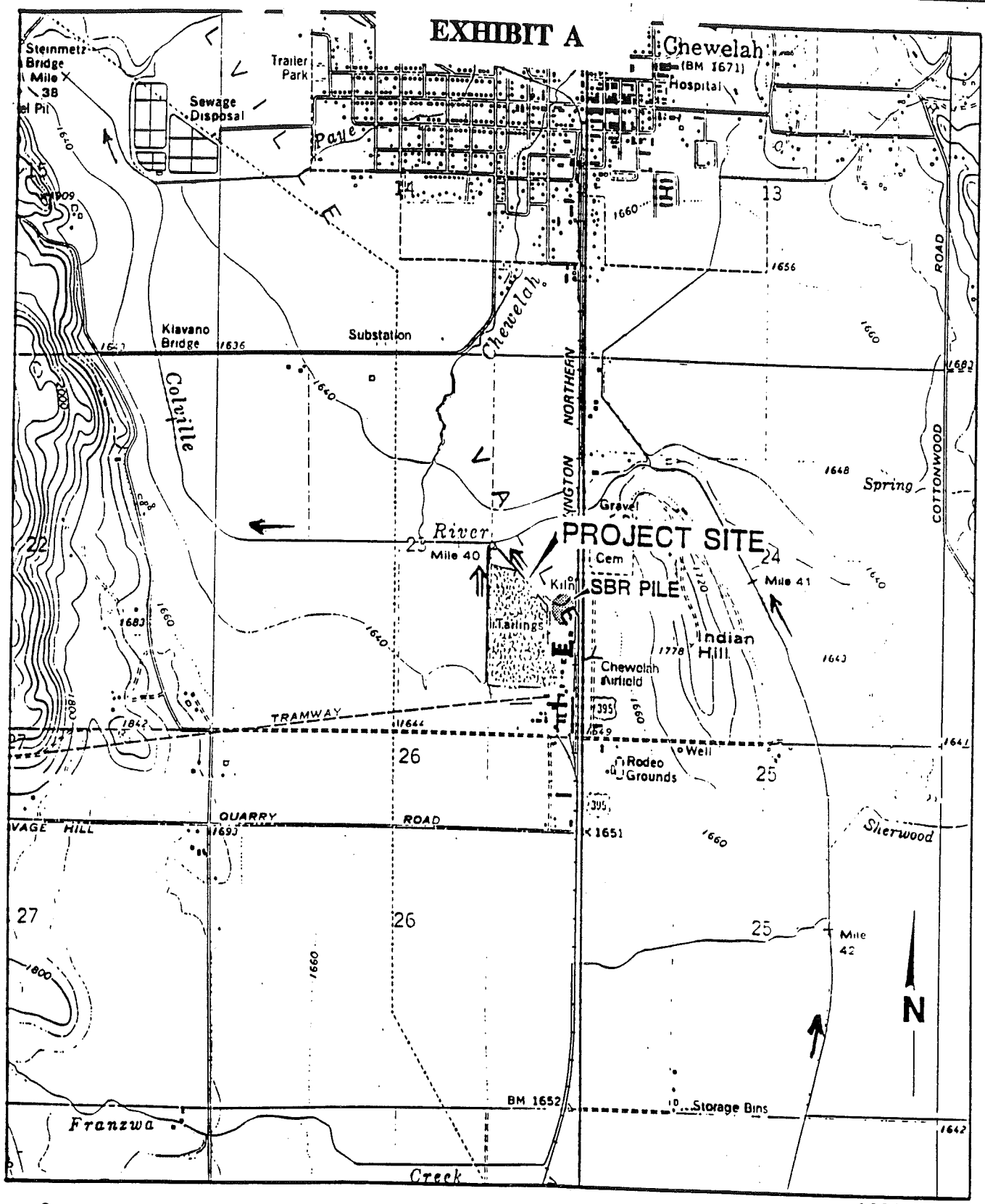
L-BAR PRODUCTS INCORPORATED
Chewelah Washington

WATER MANAGEMENT
PLANT SITE AND FACILITIES
GENERAL ARRANGEMENT

WRIGHT ENGINEERS LIMITED
VANCOUVER CANADA

DWG. NO. D 169R 500 4201 2

EXHIBIT A



Base map USGS "Chewelah, Wash." quadrangle, 7.5 min. series, 1964 P.R.1986, and "Valley, Wash." 1965 P.R. 1986.

← **RIVER FLOW DIRECTION**

⇐ **DISCHARGE DITCH**

L-BAR PRODUCTS, INC.
Chewelah, Wash.

VICINITY MAP

MAR 1990 E-1126-01

GCI GIFFORD CONSULTANTS, INC.
GEOTECHNICAL ENGINEERING

Drawn By TPB Drwg. Date 3-16-90 Checked By ECL Field Rep.

EXHIBIT C

SCOPE OF WORK

INTERIM ACTION

This Scope of Work is to be used by the PLPs or their contractors to develop Work Plans for an Interim Action which will intercept, abate, manage, and treat water from the site and potentially discharge water into the Colville River. The Interim Action will also include the characterization and potential removal or processing of on-site materials. This Scope of Work will be included as an enforceable attachment to the Agreed Order.

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. Permit or permit modifications for water discharges into the Colville River will be done in conjunction with the requirements of Emergency Enforcement Order No. DE 94TC-E102 issued March 17, 1994. The schedule for tasks required by the permit under the Emergency Order will override any schedule proposed for the same tasks under the interim action.

TASK I. INTERIM ACTION WORK PLAN

This work plan shall include the following:

1. Treatment alternatives for site surface water(s). All alternatives must meet the discharge limits specified in the permit or permit modifications for water discharges into the Colville River and other applicable state and federal laws for discharge.

    a. Evaluation of the design, construction, and feasibility of implementing the partially completed water management system as a potential means of treating surface waters and/or extracted ground water. This should include the holding pond/evaporation pond system and the ground water extraction gallery system.

b. Identification of other applicable alternatives and technologies for surface water treatment in combination with or in lieu of the partially completed water management system.

c. Analysis/evaluation of alternatives.

2. Pilot study of ground water extraction within the barrier wall system.

a. Design plan for field pilot scale extraction, storage and disposal, as appropriate, of contaminated ground water.

b. Management/treatment of water generated from pilot studies.

c. Design of bench scale study treatability evaluation for extracted ground water in conjunction with evaluation of alternatives for surface water treatment (Item 1b above).

3. Proposed Surface Water Treatment System Alternative.

a. Explanation as to why the proposed alternative was selected.

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

c. Applications and approvals for necessary permits.

i. NPDES permit

ii. Other permits.

4. Characterization and/or management of on-site materials.

a. Inventory of all materials stored and/or stockpiled on site including materials on top of the magnesite pile.

b. Plan for characterization of materials as necessary for management.

c. Rationale for recommendations regarding management of characterized materials.

DELIVERABLES: INTERIM ACTION WORK PLAN - DRAFT
INTERIM ACTION WORK PLAN - FINAL

TASK II. SEPA CHECKLIST

The SEPA checklist shall include the information needed to fulfill the applicable requirement of the State Environmental Policy Act.

DELIVERABLE: SEPA CHECKLIST

TASK III. CONSTRUCTION PLANS AND ENGINEERING SPECIFICATIONS

These plans and specifications shall include the following:

1. Required permits and approvals.
   a. NPDES Permit
   b. Other permits.
2. Construction plans and specifications.
3. Schedule of implementation.

DELIVERABLES: CONSTRUCTION PLANS AND SPECIFICATIONS - DRAFT
CONSTRUCTION PLANS AND SPECIFICATIONS - FINAL

TASK IV. MATERIALS MANAGEMENT PLAN(S)

Management of on-site materials may include processing site materials either on or off site and transporting site materials for recycling/reuse (e.g., processing SBR as fertilizer) in accordance with state regulations and any required permits. Management plans for the materials may be submitted on a product by product basis. The plan(s) shall include the following:

1. Description of management of on-site materials.
2. Required permits and approvals.
3. Construction Plan and Specifications, as appropriate.
4. Schedule of Implementation.

DELIVERABLES: MATERIALS MANAGEMENT PLAN(S) - DRAFT
MATERIALS MANAGEMENT PLAN(S) - FINAL

TASK V. OTHER REQUIRED WORK PLANS

The other required work plans include the following:

1. Health and Safety Plan.

2. Compliance and Monitoring Plan.

3. Operations and Maintenance Plan.

DELIVERABLES: HEALTH AND SAFETY PLAN - DRAFT
HEALTH AND SAFETY PLAN - FINAL

COMPLIANCE AND MONITORING PLAN - DRAFT
COMPLIANCE AND MONITORING PLAN - FINAL

OPERATIONS AND MAINTENANCE PLAN - DRAFT
OPERATIONS AND MAINTENANCE PLAN - FINAL

TASK VI. IMPLEMENTATION/CONSTRUCTION

This task shall include implementation of all activities defined under Tasks I, III, and IV. An Interim Action Report shall be prepared after completion of construction and start up.

DELIVERABLES: INTERIM ACTION REPORT - DRAFT
INTERIM ACTION REPORT - FINAL

SCHEDULE OF DELIVERABLE ITEMS

INTERIM ACTION

DELIVERABLE	DATE DUE
Effective Date of Order	Start
Interim Action status report	Bimonthly
Interim Action Plan (Draft) SEPA Checklist (Draft)	30 days after start
Interim Action Plan (Final) SEPA Checklist (Final)	30 days after receipt of Ecology's comments on draft
Construction Plans and Specifications (Draft) Health and Safety Plan (Draft) Compliance and Monitoring Plan (Draft) Operations and Maintenance Plan (Draft)	As specified in Final Interim Action Plan
Construction Plans and Specifications (Final) Health and Safety Plan (Final) Compliance and Monitoring Plan (Final) Operations and Maintenance Plan (Final)	As specified in Final Interim Action Plan
Materials Management Plan(s) (Draft) Materials Management Plan(s) (Final)	As needed As agreed with Ecology

Implementation of Interim Action	As specified in Final Interim Action Plan
Interim Action Report (Draft)	90 days after completion of construction and start up
Interim Action Report (Final)	30 days after receipt of Ecology's comments

EXHIBIT D

L-BAR SITE

SCOPE OF WORK

REMEDIAL INVESTIGATION/FEASIBILITY STUDY

This Scope of Work is to be implemented by the PLPs or their consultant through the development of planning documents for performing a site Remedial Investigation and Feasibility Study (RI/FS). This Scope of Work will be included as an enforceable attachment to the Agreed Order.

The purpose of this RI/FS is to collect, develop, and evaluate sufficient information at the L-Bar Site to enable the selection of a cleanup action under WAC 173-340-360.

WAC 173-340-350 lists a description of the contents of the required work. This RI/FS must conform with the MTCA regulations, modified as appropriate to the site.

The PLPs shall furnish all personnel, materials, and services necessary for, or incidental to, executing the Scope of Work at the Site.

REMEDIAL INVESTIGATION (RI)

The purpose of the RI is to supplement existing data to completely determine the nature and extent of contamination by hazardous substances [as defined by RCW 70.105D.020(5)] at the L-Bar Site, to gather all necessary data to support the FS and to assess the potential risk to public health and the environment.

The general objectives of the RI are to:

* Review and compile existing data from available sources and assess the quality and useability of these data;

* Define site conditions, including existing and historic facilities, production processes, and management of raw materials and waste streams;

* Characterize site specific ground-water flow directions, rates and other relevant hydrogeologic conditions,

including physiographic conditions in the site vicinity, existing and historic surface water drainage patterns, and interaction between surface water and ground water;

* Characterize the nature and extent (both horizontally and vertically) of soils, ground water, surface water, and ambient air contamination migration pathways;

* Determine contaminants of concern, contaminant characteristics, chemistry, and sources;

* Assess relative contributions of contamination at the site attributable to various existing source materials; as well as past production activities, and/or waste management practices;

* Assess human health and environmental risk;

* Determine Model Toxics Control Act (MTCA) cleanup levels, applicable requirements and remedial action requirements; and

* Identify remedial action objectives and requirements to conduct the FS.

The RI will be performed in a phased manner that will enable the PLPs to better focus the site investigation.

FEASIBILITY STUDY

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

The overall purpose of the FS is to identify, screen, and evaluate remedial actions that could be applied at the site to meet the remedial action objectives and cleanup standards. The objectives of the FS are to:

* Identify, screen, and evaluate remedial technologies and alternatives that could be applied to the site to mitigate risk to human health and the environment while meeting MTCA cleanup standards;

* Identify Cleanup Action Alternatives capable of meeting Applicable or Relevant and Appropriate Requirements (ARARs), perform comparative analysis of the identified alternatives, and establish both short-term and long-term effectiveness and performance of alternatives;

* Assess the effectiveness of the alternatives to reduce toxicity, mobility and volume;

* Screen alternatives according to effectiveness, restoration time frame, implementability, performance, and cost along with other criteria defined under WAC 173-340-360;

* Complete a detailed analysis of selected alternatives that will assess the overall protection of human health, effectiveness, permanent reduction of toxicity, mobility and volume, implementability, cost, and community concerns. Based on the detailed analysis, the FS will include recommendations as to the alternative(s) to be implemented.

PROJECT PLANNING

The following planning documents will be developed in accordance with MTCA regulatory requirements. The plans to be developed are as follows:

A. PHASE I RI WORK PLAN

The Phase I RI will focus on data necessary to complete the Conceptual Site Model in an effort to understand potential sources, contaminant migration pathways, and exposure routes of potential concern as a means of focusing more intensive site investigations in Phase II. Phase I may include limited intrusive sampling; however, the emphasis will be on confirming contaminant migration and potential exposure pathways through non-intrusive investigations (e.g., geophysics) and field screening techniques.

Based on a compilation of information relative to current site conditions, which will include a definition of potential source areas and contaminants of interest, a Phase I RI will be undertaken to address the following objectives:

* Identification of potential contaminant migration pathways and potential exposure pathways that may present a potential risk to human health or the environment;

* Identification of potential contaminants of concern;

* Development of a Conceptual Site Model relating potential sources, migration pathways, and exposure routes;

* Development of a preliminary assessment of remedial action objectives including reference to MTCA

cleanup levels, applicable requirements and remedial action requirements.

This Work Plan will include the following:

* Current Conditions Report
* Conceptual Site Model
* Preliminary Risk Assessment
* Preliminary Identification of Site Remedial Action Objectives
* Pre-Investigation Evaluation of Cleanup Action Alternatives
* Description of Phase I Work Tasks

B. PHASE II RI/FS WORK PLAN

The Phase II RI/FS Work Plan will include the following:

* Definition of Data Gaps for RI/FS
* Description and schedule of Phase II Work Tasks

C. SAMPLING AND ANALYSIS PLAN(S)

Sampling and Analysis Plans (SAPs) will be prepared for use during all site characterization studies. Separate SAPs will be prepared for each phase of the RI/FS. SAPs shall contain:

1. Field Sampling and Testing Plans

This plan will describe in detail the sampling, testing, and data-gathering methods, locations, frequency and other field study procedures that will be used for obtaining data required to complete the RI/FS. Sufficient sampling of background levels for each investigated media will be included. Sampling and Testing Plans will include the following:

- Tasks and schedules;
- Specific sampling/testing protocols and procedures;
- Sampling/testing types, locations, designations, and frequency;
- Field screening and analyses;
- Physical parameter measurements;
- Equipment and procedures;
- Sample handling and analysis;
- Access considerations;
- Decontamination procedures;
- Subcontractors; and,
- Investigation-derived waste handling, storage, and disposal.

2. Quality Assurance Project Plans (QAPPs)

The QAPPs will describe the project objectives and organization, functional activities, and quality control protocols that will be used. This will contain the following:

- Sample custody procedures, including holding times, container requirements, treatment and preservation;
- Calibration procedures for field and laboratory testing;
- Analytical procedures, methods, and detection limits;
- Internal quality control;
- Data reduction, validation, and reporting;
- Performance and system audits;
- Preventive maintenance;
- Procedures and project goals for precision, accuracy, representation, completeness, and comparability parameters;
- Corrective Actions.

D. HEALTH AND SAFETY PLAN

1. This site-specific Health and Safety Plan shall be 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.

PHASE I RI - TASKS I THROUGH III

TASK I. PHASE I RI PROJECT PLANNING

A. PHASE I RI WORK PLAN
The Phase I RI Work Plan shall include the following information:

cleanup levels, applicable requirements and remedial action requirements.

This Work Plan will include the following:

* Current Conditions Report
* Conceptual Site Model
* Preliminary Risk Assessment
* Preliminary Identification of Site Remedial Action Objectives
* Pre-Investigation Evaluation of Cleanup Action Alternatives
* Description of Phase I Work Tasks

B. PHASE II RI/FS WORK PLAN

The Phase II RI/FS Work Plan will include the following:

* Definition of Data Gaps for RI/FS
* Description and schedule of Phase II Work Tasks

C. SAMPLING AND ANALYSIS PLAN(S)

Sampling and Analysis Plans (SAPs) will be prepared for use during all site characterization studies. Separate SAPs will be prepared for each phase of the RI/FS. SAPs shall contain:

1. Field Sampling and Testing Plans

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- Tasks and schedules;
- Specific sampling/testing protocols and procedures;
- Sampling/testing types, locations, designations, and frequency;
- Field screening and analyses;
- Physical parameter measurements;
- Equipment and procedures;
- Sample handling and analysis;
- Access considerations;
- Decontamination procedures;
- Subcontractors; and,
- Investigation-derived waste handling, storage, and disposal.

1. Current Conditions, Background Summary and Physical Setting

Critical baseline information will be included in the work plan. Summaries of the regional location, pertinent boundary features, general site physiography, hydrogeology, and historical use of the site will be required. This shall include:

a. Written descriptions and discussions, including supporting maps, of the following:

i. General geographic location;

ii. Property lines, with the owners of all adjacent property clearly indicated;

iii. Topography and surface drainage depicting all waterways, wetlands, floodplains, water features, drainage patterns, and surface water containment areas.

iv. All past and present above and underground tanks, buildings, utilities, engineered structures and improvements, paved areas, easements, rights-of-way, and other features;

v. Past/present waste management operations and inventory controls relevant to the investigation;

vi. Past spills/source areas and control measures;

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

viii. All aerial photographs that may be obtained from public sources;

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

x. The location of all ground water supply and monitoring wells within a one-mile radius. These wells shall be clearly labeled.

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 be 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 and ditches including flow rates.

c. A history and description of ownership and operation, past and present site activities, waste generation, treatment, storage and disposal activities at the Site;

d. Description of past interim or emergency actions undertaken by local, state, federal, or private parties;

e. Other pertinent information including spill histories;

2. Initial Evaluation/Preliminary Conceptual Site Model.

Compile and evaluate existing information and present a preliminary conceptual site model on the following:

a. Hydrogeology

i. Description of the area and site specific geologic and hydrogeologic characteristics affecting ground water flow at the site;

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

iii. Available construction details, locations, and elevations of existing supply and monitoring wells within a 1-mile radius of the site. Available ground and top-of-casing elevations and construction details shall be included in the discussion. 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;

iv. Compile existing ground water and surface water data and chemical analyses and assess quality and useability.

b. Surface Water Hydrology

i. Identification of surface drainage characteristics including all significant surface water features in the site vicinity and their respective classifications;

ii. Discussion of potential surface water/ ground water interaction;

iii. Discussion of surface water sediments as a potentially impacted medium/source of contaminant release.

c. Nature and Extent of Contamination

i. Summary of all possible source areas of contamination related to the L-Bar Site. This at a minimum should include all waste disposal areas and other suspected source areas of contamination;

ii. Assessment and description of the existing degree and extent of contamination.

d. Description of historic air releases and pollution caused by the facility.

e. Summary, description, chemistry, and inventory of marketable products, by-products, and raw materials stored at the facility.

3. Preliminary Cleanup Levels Analysis and Risk Assessment

a. Preliminary identification of contaminants of concern and potential cleanup levels or criteria;

b. Preliminary assessment of exposure pathways of potential concern based on the conceptual site model;

c. Assessment of data gaps and data quality requirements for site investigations.

4. Preliminary Identification of Site Remedial Action Objectives (RAOs)

   Develop and present a preliminary list of RAOs. This should specify contaminants and media of general concern, potential exposure pathways and remediation goals.

5. Pre-investigation Evaluation of Cleanup Action Alternatives

   Conduct a preliminary identification of 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 field information, if any, that needs to be collected in the Phase I RI to facilitate further evaluation of potential cleanup action alternatives.

6. Phase I RI Work Tasks Identification

   Major tasks to be performed during the Phase I RI shall be presented. Included will be the planning documents and schedules for Tasks II and III identified in this Scope of Work.

B. SAMPLING AND ANALYSIS PLAN

   This SAP shall be prepared in accordance with item C under Project Planning.

C. HEALTH AND SAFETY PLAN

   This Health and Safety Plan shall be in accordance with item D under Project Planning.

DELIVERABLES: PHASE I RI WORK PLAN - DRAFT
SAMPLING AND ANALYSIS PLAN - DRAFT
HEALTH AND SAFETY PLAN - DRAFT

PHASE I RI WORK PLAN - FINAL
SAMPLING AND ANALYSIS PLAN - FINAL
HEALTH AND SAFETY PLAN - FINAL

TASK II. CONDUCT PHASE I RI FIELD INVESTIGATIONS

Conduct Phase I RI investigations necessary to begin characterization of the site, including: Environmental Setting; Source Characterization; Contaminant Characterization; and, the identification of actual or

potential receptors. The Phase I investigations shall result in data consistent with the SAP Quality Assurance/Quality Control Project Plan and of adequate technical quality to support the development and evaluation of the cleanup measure alternative or alternatives during the Phase II RI and FS. U. S. EPA Data Quality Objectives (DQO) Guidances will be used as references in defining data quality requirements for specified purposes (e.g., risk assessment, engineering design).

The Phase I RI activities shall follow the respective Work Plan. Sampling and analysis shall be conducted in accordance with the appropriate Sampling and Analysis Plans. All sampling locations shall be documented and identified on a detailed site map.

A. ENVIRONMENTAL SETTING

Collect information to supplement and verify existing information on the environmental setting at the site. The following shall be included:

1. Geophysical Survey

   a. Conduct a soil electromagnetic survey (conductivity survey) of the shallow subsurface to estimate the lateral extent of contaminant plume migration exhibited by ground water conductivity anomalies. Use survey results to refine the selection of monitoring well locations. Integrate data into the hydrogeologic investigative and reporting requirements.

   b. Conduct cone penetrometer testing (CPT), focused with data from conductivity survey of shallow zone.

   c. Under Phase I, the PLPs may elect to perform downhole natural gamma and electromagnetic (conductivity) surveys of selected intermediate depth monitoring wells to be installed to evaluate soil stratigraphic characteristics and the vertical extent of ground water contamination caused by releases of soluble, conductive ground water pollutants.

2. Hydrogeologic Investigation

   a. Inventory and evaluation of existing and historic ground water wells and data located on site and within a one (1) mile radius.

b. Shallow soil borings, piezometers and monitoring well installations. This will include the installation of piezometers in CPT borings, installation of 3 stratigraphic borings into the intermediate zone in conjunction with CPT investigation; collection of subsurface soil samples for calibration of CPT logs, and conversion of borings to monitoring wells.

The Phase I drilling program will include the installation of a limited number (e.g., 2 to 4) of shallow, and possibly intermediate, background monitoring wells. Shallow monitoring wells and piezometers will be installed at selected locations to evaluate site gradient conditions, river interaction, and water quality.

c. Two or three intermediate-depth monitoring wells (i.e., above the artesian system) will be installed to evaluate water quality and the potential for vertical contaminant migration at depths greater than approximately 25 feet below ground surface.

d. Lithologic sampling and logging. Detailed lithologic descriptions and classifications will be obtained by a qualified professional. Split spoon core samples or equivalent will be collected continuously for the first 30 feet below ground surface and at a minimum of every three (3) feet of drilled depth thereafter. Unless site information indicates otherwise, analysis of selected soil will include but not be limited to:

i. Grain-size Analyses and Laboratory Hydraulic Conductivity Testing Requirements. Selected samples will be collected from various non-clay lithologic units to determine particle size distributions following an appropriate ASTM-approved method. Vertical hydraulic conductivity will be measured according to ASTM method from selected samples of fine-grained layers collected by shelby tube.

ii. Cation Exchange Capacities. Selected lithologic units will be evaluated to assist in contaminant transport characteristics assessment.

e. Monitoring of river levels and ground water levels for evaluation of horizontal and vertical gradients.

f. Interpretation and presentation of flow system characteristics, including but not limited to:

i. Gradient or potentiometric mapping;

ii. Vertical gradient conditions;

iii. Temporal variations;

iv. Surface water influences;

v. Hydraulic parameters;

vi. Geochemistry.

g. Conduct comprehensive hydrogeologic interpretation and presentation of data acquired to describe site and area hydrogeologic conditions. Data presentation will be supported by the presentation of gradient/potentiometric maps, isopach maps, cross-sections, geochemical maps, etc., as appropriate. Information to be presented will include but is not limited to:

i. Site and Area Geology - Stratigraphy, depositional modeling, structure and lithologic units.

ii. Hydrogeology - aquifers, gradients, yields, conductivities, velocities, permeabilities, and perched systems.

3. Soils

Characterize the soil and fill units generally found above the water table in the vicinity of the past and present release(s). Such characterization may include but not be limited to the following information as necessary:

a. SCS soil classification;
b. Surface soil distribution;
c. ASTM soil profile classification;
d. Hydraulic conductivity (saturated and unsaturated);
e. Bulk density;
f. Porosity;
g. Soil organic content;
h. Soil pH;

i. Particle size distribution;
j. Moisture content, field capacity, infiltration rate;
k. Soil surface area;
l. Cation exchange capacity.

4. Surface Water and Sediment

Characterize all surface water bodies in the vicinity of the site that are considered significant as either migration pathways for, or potential receptors of, site-related contamination. Characterization will include surface drainage ditches, including the ditch located west of the magnesite pile and the Colville River. Such characterization shall include but not be limited to the following sampling activities and information:

a. 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, and specific contaminant concentrations limited to contaminants of interest/concern identified in the preliminary RAOs.

b. Stream and ditch flow data.

5. Air

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

a. 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).

B. SOURCE CHARACTERIZATION

1. Complete a full inventory, mapping, and chemical evaluation of all products, byproducts, raw materials, waste materials, and dangerous waste at the facility and on the magnesite stockpile. Development of the initial inventory is included as Item 4 of the Interim Action Work Plan (See Exhibit

C). Based on inventory of wastes on site and characterization done in the Interim Action, determine the need to address additional data gaps to characterize the sources. This should include the following waste characteristics:

a. Type, quantity and chemical composition of materials and corresponding locations;

b. Physical and chemical characteristics of the materials;

c. Migration and dispersal characteristics of the materials including sorption, biodegradability, hydrolysis rates and chemical transformations.

2. Conduct a comprehensive evaluation of the HDPE covered pile and associated ground water barrier-wall system. The pile, the area beneath the pile, and groundwater beneath the pile are suspected as major sources of ground water contamination. The investigation should include:

a. Type, quantities and chemical composition of materials.

b. Physical characteristics.

c. Migration/dispersion characteristics.

C. CONTAMINATION CHARACTERIZATION

1. Laboratory analytical data and field data acquisition, validation, interpretation and presentation. The ground water, surface water, sediments, site soils, and raw materials/products/byproducts will be analyzed for a range of inorganic and conventional analytical and field parameters. In addition, limited ground water, surface water, and sediments will be analyzed for the presence of PCBs, and dioxins and furans. Limited samples of materials on site will also be analyzed for dioxins and furans. The specific analytical and testing programs and associated quality assurance requirements will be defined in the appropriate documents.

2. The extent, origins, directions, and rate of movement of contaminants shall be defined. At a minimum, contaminant discussions shall address the following media:

a. Ground Water Quality Conditions and Contamination. The following conditions will be

reported:

i. Contaminants of concern;

ii. Spill characteristics including: sources, approximate horizontal and vertical extent, directions, velocities, pathways, etc.;

iii. Contaminant fate and transport including: release mechanisms, soil/water/contaminant interactions (inter-media transfer), chemical transformations, etc.

b. Soil contamination including: approximate vertical and horizontal extent of contamination, contaminant concentrations, contaminant movement, and a description of the contaminant and soil chemical properties and interaction.

c. Surface water and sediment contamination including: the horizontal and vertical extent of contamination including contaminant concentrations, direction of contaminant movement, velocity of contaminant movement, evaluation of factors affecting contaminant movement, description of the chemistry of the contaminant and surface water or sediment properties and interaction, and extrapolation of future contaminant movement.

d. Potential airborne contaminants assessment using a conceptual model. If appropriate, actual airborne particulate monitoring may be performed to evaluate site condition.

D. POTENTIAL RECEPTOR IDENTIFICATION

Collect, compile, and evaluate data describing the human populations and environmental systems that are susceptible to contaminant exposure from the site. The following characteristics shall be identified:

1. Local uses and possible future uses of ground water within one mile of the site.

2. Local uses and possible future uses of surface waters within one (1) mile of the site.

3. Public use of or access to the site and adjacent lands including: recreation, hunting, residential, commercial, zoning, and relationship between population locations and prevailing wind directions.

4. A description of the biota in surface water bodies adjacent to the site.

5. A demographic profile of the people who use or have access to the site or adjacent land.

TASK III. PHASE I RI TECHNICAL REPORT

The Phase I RI Results will be prepared in the form of a Technical Report. This Technical Report will include the following:

1. Phase I RI field investigation results. All applicable supporting records, raw data, analytical laboratory records, data validation reports, geologic logs, and similar documentation will be provided as appendices to the report.

2. Revised/updated: Conceptual Site Model; Preliminary Cleanup Levels Analysis and Risk Assessment; Preliminary Identification of Remedial Action Objectives; and Pre-Investigation Evaluation of Cleanup Action Alternatives presented in the Phase I RI Work Plan.

DELIVERABLES: PHASE I RI TECHNICAL REPORT - DRAFT
PHASE I RI TECHNICAL REPORT - FINAL

PHASE II RI AND FS - TASKS IV THROUGH VII

TASK IV. PHASE II RI AND FS PROJECT PLANNING

Task IV includes the preparation of a Phase II RI Work Plan, Sampling and Analysis Plan, and, if appropriate, a Health and Safety Plan.

The Phase II RI/FS Work Plan will be prepared to define the work tasks necessary to understand source delineation, nature and extent of contamination, migration pathways and exposure routes, and risk to public health or the environment associated with contaminants related to the L-Bar Site.

In addition, the Phase II RI will include collection of data necessary to complete the FS.

A. Phase II RI and FS Work Plan

The Phase II RI and FS Work Plan shall include the following:

1. Assessment of RI/FS Data Needs

Data needs for the Phase II RI and FS will be delineated based on the results of the Phase I RI. This assessment will include an evaluation of data needs and appropriate data quality requirements based on modifications to the Conceptual Site Model, Preliminary Risk Assessment, Preliminary Identification of Remedial Action Objectives, and Pre-Investigation Evaluation of Cleanup Action Alternatives presented in the Phase I RI Technical Report.

2. Phase II RI and FS Tasks Identification

Investigation tasks will be defined for the Phase II RI and FS as specified in Tasks V through VIII. The Phase II RI will include development of a baseline potential cleanup levels analysis and risk assessment (Task VI) as a basis for evaluation of appropriate cleanup levels in accordance with MTCA.

B. Sampling and Analysis Plan

The Phase II RI Sampling and Analysis Plan (SAP) will incorporate the Phase I Plan.

C. Health and Safety Plan

The Phase II Health and Safety Plan will incorporate the Phase I Plan.

DELIVERABLES: PHASE II RI AND FS WORK PLAN - DRAFT
SAMPLING AND ANALYSIS PLAN - DRAFT
HEALTH AND SAFETY PLAN (if necessary) - DRAFT

PHASE II RI AND FS WORK PLAN - FINAL
SAMPLING AND ANALYSIS PLAN - FINAL
HEALTH AND SAFETY PLAN (if necessary) - FINAL

TASK V. CONDUCT PHASE II RI FIELD INVESTIGATIONS

Field sampling, testing, measurements, and other data needs required to complete the RI will be obtained under activities defined according to the planning documents developed under Task IV.

Additional investigations to be performed during the Phase II RI will include but are not limited to:

A. Ground water

- If not previously collected, perform downhole natural gamma and electromagnetic (conductivity) surveys of selected monitoring wells to be installed to evaluate soil stratigraphic characteristics and the vertical extent of ground water contamination caused by releases of soluble, conductive ground water pollutants.

- Installation of additional borings and monitoring wells into the intermediate and deeper zones, based on results of CPT investigation, to determine vertical extent of contamination/gradients.

- Ground water sampling of monitoring well network to fully characterize nature and extent of ground water contamination in shallow, intermediate, and deeper zones.

- Other necessary data gaps.

B. Soils

- Installation of borings, test pits, or performance of other investigations to further define the limits of soil contamination and assess potential impacts to specific areas. This shall include the collection of soil samples at selected locations beneath the paved surface of the L-Bar facility.

- Other necessary data gaps.

C. Surface Water/Sediments

- Sampling and analysis to describe the physical and chemical characteristics of the sediments. Sediment sampling will be performed at selected locations within the river, both up and down stream of areas of concern.

- Identified data gaps from Phase I.

D. Fish Tissue

- Sampling for bioaccumulative contaminants, if indicated by results of other site sampling.

E. Air

- Air monitoring data, if appropriate.

F. Other data necessary to support the Feasibility Study.

TASK VI. BASELINE CLEANUP LEVELS ANALYSIS/ BASELINE RISK ASSESSMENT

This task shall include a baseline MTCA cleanup levels analysis/baseline risk assessment to characterize the current and potential threats to public health and the environment that may be posed by hazardous substances at the Site. The analysis shall include:

1. Hazardous substance identification;
2. Identification of preliminary cleanup levels under MTCA, including ARARs.
3. Exposure assessment;
4. Toxicity assessment;
5. Risk characterization, to include discussion of applicable standards or criteria.
6. Evaluation of risks posed by exposure scenarios not specifically regulated by MTCA.

TASK VII. PHASE II RI REPORT

The Phase II RI Report will encompass and further update the information presented in the Phase I RI Report and will include sections addressing the following topics:

* Environmental concerns;
* Site description;
* Previous investigations and spills summary;
* History summary;
* Purpose and objective of the RI;
* Site features and conditions;
* RI activities and results addressing all media investigated;
* Interpretation and discussion of results;
* Spill characteristics;
* Contaminant fate and transport;
* Contaminants of concern;
* Conceptual site model;
* Conclusions; and
* Recommendations.

All applicable supporting records, raw data, analytical laboratory records, data validation reports, geologic logs, and similar documentation will be provided as appendices to the report or be retained as required in the Agreed Order - Retention of Records.

DELIVERABLES: PHASE II RI REPORT - DRAFT
PHASE II RI REPORT - FINAL

TASK VIII. FEASIBILITY STUDY

The FS will be conducted by applying data from the RI and will be in accordance with the remedial action objectives identified. Ecology will consider and evaluate streamlining approaches to focus the FS, as appropriate.

A. General Response Actions and Technology/Process

Define response actions for each of the contaminated media. These will be grouped into those actions which address either source control, contaminant treatment and reduction, management of migration, institutional controls, or other actions to satisfy cleanup requirements.

B. Final Screening of Remedial Action and Technologies Process Options

Remedial action technologies will be identified in the context of the general response actions and specific site conditions. Appropriate technology and representative process option alternatives will be screened for implementation difficulty, applicability to the site conditions, reliability of technology, ability to meet the remedial action objectives and cleanup standards, timeliness, and general cost. The actual final alternatives screening will include evaluating each with respect to effectiveness, implementability, cost and other criteria required under WAC 173-340-360.

Actions determined not applicable or appropriate to the site conditions will not be evaluated. Actions which may have some marginal applicability will be evaluated to a limited degree to support a decision to either include or exclude the action from further consideration.

A Technical Memorandum will be developed prior to developing and evaluating final remedial action alternatives. The memorandum, to be reviewed and approved by Ecology, will propose the general response actions developed and will include the identification and screening of technology and process options.

C. Remedial Action Alternatives

Applicable existing technologies will be combined into remedial action alternatives. These alternatives will span the range of alternatives required to be considered under MTCA. This range may include the no action alternative. The alternatives will be screened as to potential effectiveness, implementability, and cost.

D. Pilot Test/Treatability Study Requirements

Conduct laboratory and/or bench scale studies, if appropriate, to determine the applicability of a Cleanup Action technology or technologies to the site conditions. This shall include: development of testing plans 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.

E. Detailed Comparative Analysis of Alternatives

A detailed analysis of alternatives will be prepared using criteria specified in WAC 173-340-360 which requires that preference be given to alternatives resulting in permanent solutions. The chapter also lists expectations for the cleanup actions evaluated and selected.

The selected range of alternatives will be evaluated with respect to the following factors:

- Overall protection of human health and the environment
- Compliance with remedial action objectives (RAOs) and ARARs
- Provision for compliance monitoring
- Short-term effectiveness
- Long-term effectiveness
- Permanent reduction of mobility, toxicity and volume
- Implementability
- Cost
- Community concerns
- Restoration time frame.

F. Feasibility Study Report

A draft final report will be prepared for public review and comment after any outstanding issues are resolved and the report is approved by Ecology.

DELIVERABLES: FS TECHNICAL MEMORANDUM - DRAFT
FS TECHNICAL MEMORANDUM - FINAL

FS REPORT - DRAFT
FS REPORT - FINAL

THE APPROVED RI AND FS REPORTS WILL THEN BE DISTRIBUTED FOR PUBLIC COMMENT, AS REQUIRED UNDER MTCA, PRIOR TO FINALIZATION.

SCHEDULE OF DELIVERABLES
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

DELIVERABLE	**DATE DUE**
Effective Date of Agreed Order	Start
RI/FS progress reports	Every 2 months
Draft Phase I RI Work Plan, Sampling and Analysis Plan, Health & Safety Plan	60 days after start
Final Phase I RI Work Plan, Sampling and Analysis Plan, Health and Safety Plan	30 days after receipt of Ecology's comments
Begin implementation of Phase I RI	15 days after approval of Phase I RI Work Plan, Sampling and Analysis Plan, Health and Safety Plan
Draft Phase I RI Technical Memorandum	45 days after completion of Phase I RI field activities, including receipt of all analytical data.
Final Phase I RI Technical Report	30 days after receipt of Ecology's comments
Draft Phase II RI/FS Work Plan, Sampling and Analysis Plan, Health and Safety Plan	45 days after approval of Phase I RI Technical Report
Final Phase II RI/FS Work Plan, Sampling and Analysis Plan, Health and Safety Plan	30 days after receipt of Ecology's comments

Begin implementation of Phase II RI/FS	30 days after approval of Phase II RI/FS Work Plan
Draft Phase II RI Report	60 days after completion of Phase I RI investigative activities, including receipt of all analytical data.
Final Phase II RI Report	30 days after receipt of Ecology's comments
Draft FS Technical Memorandum	60 days after approval of RI report
Final FS Technical Memorandum	20 days after receipt of Ecology's comments
Draft FS Report	As specified in Final Phase II RI/FS Work Plan
Final FS Report	30 days after receipt of Ecology's comments

EXHIBIT E

GROUNDWATER SAMPLING
DATA SUBMITTAL REQUIREMENTS

STATE OF WASHINGTON

DEPARTMENT OF ECOLOGY

P.O. BOX 47600 • Olympia, Washington 98504-7600 • (206) 459-6000

January 27, 1993

TO: Persons Collecting Ground Water and Other Data at MTCA Sites

FROM: Carol Fleskes, Program Manager
Toxics Cleanup Program

SUBJECT: Cleanup Information No. 91-1: Ground Water, Soil, Sludge, and Sediment Data (Environmental Data)

Purpose

The purpose of this memorandum is to establish consistency and procedures for organizing, reporting, transmitting, and storing and retrieving surface water, ground water, soil, sludge, and sediment data (environmental data). These procedures will improve Ecology's ability to clean up contaminated sites by making meaningful data readily available to the public, legislature, management, project managers, and site workers.

Applicability

These procedures apply to all environmental data collection activities required by the Model Toxics Control Act and Regulations. Exceptions may be made for low-risk sites as determined by the Ecology project manager.

Background

Currently, very little of the environmental data collected for the state at toxic cleanup sites is available in a readily usable form. With only a few exceptions, these data are submitted to the department in the form of voluminous paper reports. This form precludes the staff from performing rapid, accurate, and, many times, meaningful analysis of spatial and temporal trends of the data. In addition, the evaluation of environmental data cannot always be effective because of missing and/or improper pertinent information.

This procedure establishes appropriate methods to ensure that data submitted to Ecology are encoded, stored, and presented in a magnetic media format (diskette) so that data can be consistently used by our staff. This procedure will reduce data analysis time when compared to using laborious, time-consuming hand methods of the past. Today, at most of the larger sites and many of the smaller sites, these data are computer processed by the PLP's and consultants. This procedure will generally require the data be rearranged and in some cases, additional data items collected.

The results of receiving digital data in a consistent manner will allow exchange of environmental data with EPA and between Ecology programs. This format is a super set of that developed by EPA. It is being used by other Ecology Programs.

Standardization of the data will mean that a broad range of computational, statistical, graphical and modeling software will be readily available to summarize and analyze the data. Standardized reports will be available for the first time in the program.

Responsibilities

The attached procedures shall be required for all of the environmental data collection activities, as follows:

- Directly by TCP;
- By any contractors or consultants tasked by TCP;
- By "potentially liable parties" acting under terms of a consent decree or order.

Implementation of the procedures shall be by incorporation of the appropriate language into contracts, work plans, orders, consent decrees, or other appropriate documents by the site project manager or contract officer.

Data shall be entered into the Ecology data base by a data administrator. There is an inter-program team that established new parameters. At this time, Bill Myers at headquarters is acting in this capacity and as the TCP representative to the team.

Depending on the availability of a wide-area network, the data would be directly or indirectly available to staff and other data users. At this time, the Site Cleanup Section is developing links from the present data base program to other statistical, graphical, and analytical software packages.

Also attached is a model letter which is sent along with a diskette, to anyone using our format to submit environmental data. These diskettes are also available to staff. To obtain a copy, call Bill at the telephone number shown on the letter.

KC:cp
Attachments

SITE DESCRIPTION AND SAMPLE DATA SUBMITTAL REQUIREMENTS

1. Media

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

2. Data Formats

The SITE DESCRIPTION FILE, FIELD SAMPLE FILE and the LABORATORY SAMPLE FILE are quote, comma delimited ASCII files used as the standard format for transferring sample data to and from Ecology (LOTUS WK1 files and Ashton Tate DBF files may be substituted for ASCII files). The files will include the fields in the format and order listed (C=Character, N=Numeric, D=date[Character may be substituted in non DBF or WK1 format]).

The following Appendices are attached to standardize information entered into required files (see following appendices):

A. Matrix Codes

B. Sample Source Codes

C. Collection Method Codes

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

E. Laboratory Qualifiers

F. County Fips Codes

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

H. Hydrologic Unit Map

I. Model Letter RE: Toxics Cleanup Program Database Material

3. Submittal

Computer diskettes containing the SITE DESCRIPTION FILE, FIELD SAMPLE FILE and/or the LABORATORY SAMPLE FILE, clearly labeled for Project and Originator shall be submitted in duplicate, along with a backup hard copy of the diskette contents.

[1] Trademark of the Microsoft Corporation

FIELD DEFINITIONS FOR
SITE DESCRIPTION FILE

*Wells and Borings must include all Fields except as noted optional.
Underlined Fields are required for all stations.

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_TYPE	C	12	Station type (Ground water, Surface wtr, Sediment, Soil, Sludge, Biological or Air).
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.
STA_ID	C	12	Well ID number.
PRI_STA	C	15	Ecology primary station code. To be obtained from Ecology TCP.
SEC_STA1	C	12	Additional station code (previous well numbers, alternate or other well designations).
SEC_STA2	C	12	Additional station code (if any).
SEC_STA3	C	12	Additional station code (if any).
STATE_FIPS	C	2	State FIPS code (WA=53).

SITE DESCRIPTION FILE CONTINUED...

FIELD	TYPE	WIDTH	DEFINITION
COUNTYFIPS	C	3	County FIPS code (use state county code, Appendix F).
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/yyyy).
OWN_ADD	C	60	Address of owner.
DRILLER	C	30	Name of Driller.
STA_DESC	C	48	Activity Site, Sample location, or Well location description (for example: "East of Bldg. 2" or "SE corner, intersection 6th & Seneca").
LOC_METHD	C	48	Method of determination of station 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).
STPCO_NORT	N	12	Northerly state plane coordinates REQUIRED (nearest ft).
STPCO_EAST	N	12	Easterly state plane coordinates REQUIRED (nearest ft).
STPCO_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.
UTM_ZONE	C	2	UTM grid zone.
MAP_NAME	C	24	Name of USGS map and scale covering the sampling location(e.g., Yakima 100K, 1977).
BORE_DEP	N	8	Depth of original hole drilled if applicable (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 (The source of the altitude used to survey in the sampling location altitude i.e. City of Tacoma Sewer Survey 1921).
LEV_COMM	C	240	Comments, depth and water level data.
ALTITUDE	N	8	Approximate land surface elevation XXXXX.XX (ft) at the Station Location.
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).

SITE DESCRIPTION FILE CONTINUED...

FIELD	TYPE	WIDTH	DEFINITION
UP_DEPTH	N	8	Depth to top of open interval (ft below measuring point).
LOW_DEPTH	N	8	Depth to bottom of open interval (ft below measuring point).
CONST_COMM	C	240	Comments, construction details.
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_CAS	N	8	Casing diameter (in).
CAS_MAT	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_OPN	N	6	Diameter of open interval (in).
LEN_OPN	N	6	Length of open interval (nearest 0.01 ft).
TYP_OPN	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.

SITE DESCRIPTION FILE CONTINUED...

FIELD	TYPE	WIDTH	DEFINITION
TYP_OMT	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).
TYP_LOG	C	10	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 or Statistical data available (Y/N).
PROGRAM	C	9	Ecology program (TCP, WQFA, WQ, other).
GEN_COMM	C	240	General comments.
HUCODE	C	8	See US Geological Survey Hydrologic Unit Map 1974-Washington.
AGN_USE	C	1	Agency use (USGS codes) A=Active, I=inactive, O=inventory only.

** END OF SITE DESCRIPTION FILE ***

FIELD DEFINITIONS FOR
FIELD SAMPLE FILE

*All Fields Required

FIELD	TYPE	WIDTH	DEFINITION
PRI_STA	C	15	Ecology Monitoring Well No. will be assigned by Ecology TCP 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	
STPLNZONE	C	1	N = North; S = South.
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 Appendix F, RCW 58.20)
DEPT_WATER	N	8	Depth to water (in 0.01 ft) at time of sampling.
UP_DEPTH	N	7	Depth (nearest 0.01 ft) to the top of the interval sampled (e.g. Top of well screen or core interval).
LOW_DEPTH	N	7	Depth (nearest 0.01 ft) to the bottom of the interval sampled (e.g. Bottom of well screen or core interval).
WTR_ELEV	N	8	Water level elevation (in 0.01 ft) at the time of sampling.
AGENCY	C	8	Agency requesting sampling data.
SAMPLE_DAT	D	8	Date of well sampling (mm/dd/yyyy).
SAMP_TIME	C	4	Time of well sampling in military time.
SAMPLE_ID	C	8	Sample ID code or no.

FIELD SAMPLE FILE CONTINUED:

FIELD	TYPE	WIDTH	DEFINITION
FILTERED Yes(Y) or	L	1	Was the sample field filtered? No(N)
ANALYSIS_MTHOD	C	15	EPA Analysis method descriptions (i.e EPA Method 601).
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 Appendix A).
SOURCE_COD	C	2	Physical environment sampled (from Appendix B).
COLLECTMET	C	2	Collection method code (from Appendix C).
FIELD_PH	N	5	The pH value taken at time of sampling (e.g. 11.67)
FIELD_COND	N	7	The conductivity value in umhos.
FIELD_TEMP in	N	5	The field temperature of the sample degrees celsius.
PURGE_METH	C	1	Purging method: B = Bail, P= Pump
PURGE_VOL	C	2	Number of boring volumes removed prior to sampling (liquid).
PRJ_NAME	C	48	Project, site, or facility name.

** END OF FIELD SAMPLE FILE ***

FIELD DEFINITIONS FOR LABORATORY SAMPLE FILE

*All Fields Required

FIELD	TYPE	WIDTH	DEFINITION
PRI_STA	C	15	Ecology Monitoring Well No. will be assigned by Ecology TCP Program.
STA_ID	C	12	Site well ID no. or other designation.
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.
LAB_NAME	C	10	Laboratory performing analysis.
LABSAMP_ID	C	10	Sample number assigned by the laboratory.
CONSTITUEN	C	30	Chemical constituent names as defined in Ecology's Chemical Dictionary (see attached Appendix D)
CAS_ID	C	12	Chemical Abstract Systems ID (see Appendix D).
P_CODE	C	5	STORET Parameter Code (see Appendix D).
RESULT	N	12	Detected chemical concentration result.
UNITS	C	10	Units of measurement (e.g., µg/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 ("<") orasterisks, are not acceptable (see Appendix E).
QA_QUAL	C	4	Qualifier associated with QA Review of Lab report (See Appendix E).
LIMIT	C	10	Lab instrument detection limit.

LABORATORY SAMPLE FILE CONTINUED:

FIELD	TYPE	WIDTH	DEFINITION
DILUTION	N	6	Amount the sample was reduced and diluted to accommodate analysis (i.e. 10X,20X).
FILTERED	L	1	Was the sample lab filtered? Yes(Y) or No(N)
ANALYSIS_MTHOD	C	15	EPA Analysis method descriptions (i.e EPA Method 601).
MATRIX	C	2	Type of sample; water, sediment, soil, other (from Appendix A).
PRJ_NAME	C	48	Project, site, or facility name.

** END OF LABORATORY SAMPLE FILE ***

APPENDIX A: MATRIX CODES

10	Water-Total
11	Water-Dissolved
40	Sediment/Soil
45	Semi-Solid/Sludge
70	Sediment for EP Toxicity
80	Oil/Solvent
00	Other

APPENDIX B: SAMPLE SOURCE CODES AND DESCRIPTIONS

00	Unspecified source
01	Unknown liquid media (drum/tank)
02	Unknown liquid media (spill area)
03	Unknown liquid media (waste pond)
10	Water (general)
12	Ambient stream/river
13	Lake/reservoir
14	Estuary/ocean
15	Spring/seepage
16	Rain
17	Surface runoff/pond (general)
18	Irrigation canal/return flow
20	Well (general)
21	Well (industrial/agricultural)
22	Well (drinking water supply)
23	Well (test/observation/monitoring)
24	Drinking water intake
25	Drinking water (at tap)
30	Effluent wastewater (general)
31	Municipal effluent
32	Municipal inplant waters
33	Sewage runoff/leachate
34	Industrial effluent
35	Industrial inplant waters
36	Industrial surface runoff/pond
37	Industrial waste pond
38	Landfill runoff/pond/leachate
40	Sediment (general)
42	Bottom sediment of deposit
44	Sludge (general)
45	Sludge (waste pond)
46	Sludge (drum/tank)
48	Soil (general)
49	Soil (spill/contaminated area)
50	Bore hole material

Sample Source Codes and Descriptions
(continued)

60	Air (general)
61	Ambient air
62	Source of effluent air
63	Industrial or workroom air
64	Hi-vol filter
70	Tissue (general)
71	Fish tissue
72	Shellfish tissue
73	Bird tissue
74	Mammal tissue
75	Macroinvertebrate
76	Algae
77	Periphyton
78	Plant/vegetation
80	Oil/solvent (general)
81	Oil (transformer/capacitor)
82	Oil/solvent (drum/tank)
83	Oil/solvent (spill area)
84	Oil/solvent (waste pond)
90	Commercial product formulation
95	Well drill water
96	Well drill mud
97	Well sealing material
98	Gravel pack material

APPENDIX C: COLLECTION METHOD CODES

00	Unknown
10	Hand grab
11	Plastic bucket
12	Stainless steel bucket
13	Brass kemmerer
14	PVC kemmerer
15	D.O. dunker
16	DH 48/DH 49 Integrating sampler
17	Van Dorn bottle
18	Glass dip tube
19	Other
20	Automatic sampler (general)
21	ISCO auto sampler
22	Manning auto sampler
23	Hydrostar or similar pump
24	Submersible pump (electric)
25	Well point sampler (pump)
26	Stainless steel bailer (hand)
27	PVC bailer
28	Teflon bailer
29	Peristaltic pump
30	Dredge (unspecified)
31	Dredge (Peterson)
32	Dredge (Van Dorn)
33	Dredge (Van Veen)
34	Core
35	Freeze core
36	Bladder Pump
40	Macroinvertebrate (unspecified)
41	Picked by hand
42	Kick net
43	Surber
44	Modified Hess type sampler
45	Rock basket
46	Hester Dendy sampler
50	Fish (unspecified)
51	Fish (shocking)
52	Fish (netting)
53	Fish (hook & line)
54	Fish (poison)
60	Periphyton (unspecified)
61	Rock scraping
62	Glass slides

COMP_NAME	JHK_NO	STORET_NO	CAS_NO	UNITS
1,1,1,2-Tetrachloroethane	527.00	77562	630206	µg/L
1,1,1-Trichloroethane	1.00	34506	71556	µg/L
1,1,2,2-Tetrachloroethane	2.00	34516	79345	µg/L
1,1,2,2-Tetrachloroethene	75.05	34475	127184	µg/L
1,1,2-Trichloro2,2,1trifluoroethane	3.00	77652	76131	µg/L
1,1,2-Trichloroethane	4.00	34511	79005	µg/L
1,1-Dichloroethane	5.00	34496	75343	µg/L
1,1-Dichloroethene	6.00	34501	75354	µg/L
1,1-Dichloroethylene	6.01	34501	75354	µg/L
1,1-Dichloropropene	546.00	77168	563586	µg/L
1,2,3-Trichlorobenzene	534.00	77613	87616	µg/L
1,2,3-Trichloropropane	441.00	81610	96184	µg/L
1,2,3-Trinitrobenzene	85.00	73275	99354	µg/Kg
1,2,4-Trichlorobenzene	7.00	34551	120821	µg/L
1,2,4-Trimethylbenzene	536.00	77222	95636	µg/L
1,2,4-Trinitrobenzene	100.00			
1,2-Dibromoethane (EDB)	8.00	77651	106934	µg/L
1,2-Dichlorobenzene	9.00	34536	95501	µg/L
1,2-Dichloroethane	10.00	34531	107062	µg/L
1,2-Dichloromethane	68.01	34423	75092	µg/L
1,2-Dichloropropane	11.00	34541	78875	µg/L
1,2-Diethoxyethane	482.00	81527	629141	µg/L
1,2-Diethylbenzene	548.00	77340	135013	µg/L
1,2-Dimethylbenzene	77.02	77135	95476	µg/L
1,2-Dimethylhydrazine	582.00	73562	540738	µg/L
1,2-Diphenylhydrazine	84.00	34346	122667	µg/L
1,3,5-Trimethylbenzene	541.00	77226	108678	µg/L
1,3,5-Trinitrobenzene	156.00	73275	99354	µg/Kg
1,3-Dichlorobenzene	12.00	34566	541731	µg/L
1,3-Dichloropropene	544.00	34561	542756	µg/L
1,3-Diethylbenzene	549.00	77348	141935	µg/L
1,3-Dimethylbenzene	67.01	77134	108383	µg/L
1,4-Dichlorobenzene	13.00	34571	106467	µg/L
1,4-Diethylbenzene	550.00	77345	105055	µg/L
1,4-Dimethylbenzene	475.03	77133	106423	µg/L
1,4-Dioxane	583.00	82388	123911	mg/L
1-Methylethyl ester carbamic acid	574.00	73615	615532	µg/L
1-Methylnapthalene	211.00	77418	90120	µg/L
2 Methoxy-5-nitroaniline	584.00	73622	99558	µg/L
2 Methylaniline	585.00	77142	95534	µg/L
2 Methylaniline hydrochloride	586.00	73649	636215	µg/L
2,2,4-Trimethylpentane	545.00		5408401	
2,2-Dichloropropane	547.00	77170	594207	µg/L
2,3,4,5-Tetrachloropheno	I553.00	77767	4901513	µg/L
2,3,6-Trichloro benzeneacetic acid	575.00	85347		
2,3,7,8-TCDD	87.02	34675	1746016	µg/L

CAS NO should be read as follows. From Right: 1 digit, dash, 2 digits, dash (ie 1774-85-0).

APPENDIX D: CHEMICAL DICTIONARY
01/27/93

COMP_NAME	JHK_NO	STORET_NO	CAS_NO	UNITS
2,3,7,8-Tetrachlorodibenzo-p-dioxin	87.00	34675	1746016	µg/L
2,3-Dichloropropylene	88.00	77166	78886	µg/L
2,4,5-T Methyl Ester	89.00	39740	93765	µg/L
2,4,5-TB	554.00	82650	93801	µg/Kg
2,4,5-TP (Silvex)	91.00	39760	93721	µg/L
2,4,5-TP Methyl Ester	90.00			
2,4,5-Trichlorophenol	14.00	77687	95954	µg/L
2,4,5-Trichlorophenoxyacetic acid	319.00	39740	93765	µg/L
2,4,6-Trichlorophenol	15.00	34621	88062	µg/L
2,4,6-Trimethyl-1-1,3,5-Trioxane	92.00	77322	123637	µg/L
2,4-D	93.00	39730	94757	µg/L
2,4-D Methyl Ester	93.01	39730	94757	µg/L
2,4-DB (Water, Total)	555.00	38745	94826	µg/L
2,4-Dichlorophenol	16.00	34601	120832	µg/L
2,4-Dichlorophenoxy butyric acid	235.00		94826	µg/L
2,4-Dimethylphenol	17.00	34606	105679	µg/L
2,4-Dinitrophenol	18.00	34616	51285	µg/L
2,4-Dinitrotoluene	19.00	34611	121142	µg/L
2,4-Toluenediamine	587.00	78888	95807	µg/L
2,5-Dinitrotoluene	94.00	77637	619158	µg/L
2,6-Dinitrotoluene	20.00	34626	606202	µg/L
2-Butanone	376.03	81595	78933	µg/L
2-Chloroethyl vinyl ether	22.00	34576	110758	µg/L
2-Chloronaphthalene	23.00	34581	91587	µg/L
2-Chlorophenol	24.00	34586	95578	µg/L
2-Chlorotoluene	535.00	38680	95498	µg/L
2-Cyclohexene-1-one	488.00	930697		
2-Ethyl hexanoic acid	196.00	82114	149575	µg/L
2-Hexanone	25.00	77103	591786	µg/L
2-Methyl-2H-benzotriazole	576.00	85813	29385431	µg/L
2-Methyl-4,6-dinitrophenol	96.00	34657	534521	µg/L
2-Methyl-4-chlorophenoxyacetic acid	367.02	39151	94746	µg/L
2-Methyl-4-pentanone	95.00	78133	108101	µg/L
2-Methyl-p-cresol	17.01	34606	105679	µg/L
2-Methylnaphthalene	26.00	77416	91576	µg/L
2-Methylphenol	27.00	77152	95487	µg/L
2-Nitroaniline	28.00	30195	88744	µg/L
2-Nitrophenol	29.00	34591	88755	µg/L
2-Pentanone	97.00	77060	107879	µg/L
2-chloro-1-hydroxybenzene	24.02	34586	95978	µg/L
3,3'-Dichlorobenzidine	98.00	34631	91941	µg/L
3,3-Dimethoxybenzidine	588.00		199904	µg/L
3,3-Dimethylbenzidine	589.00	73560	119937	µg/L
3,4-Benzofluoranthene	99.00	34230	205992	µg/L
3,4-Dichlorobenzyl N-methylcarbama+	571.00		1966581	µg/L
3,5-Dichlorobenzoic acid	240.00		51365	µg/L
3-Chloro octane	528.00			

CAS NO should be read as follows. From Right: 1 digit, dash, 2 digits, dash (ie 1774-85-0).

APPENDIX D: CHEMICAL DICTIONARY
01/27/93

COMP_NAME	JHK_NO	STORET_NO	CAS_NO	UNITS
3-Nitroaniline	30.00	78300	99092	µg/L
4,4'-DDD	208.01	39360	72548	µg/L
4,4'-DDE	209.01	39365	72559	µg/L
4,4'-DDT	210.01	39370	50293	µg/L
4,4-Methylene bis(n,n-dimethyl) an +	592.00	101611		µg/L
4,6-Dinitro-2-methylphenol	96.01	34657	534521	µg/L
4,6-Dinitrophenol	101.00	82226	88857	µg/L
4,7-Methanoisobenzofuran-1(3H) -one +	570.00			µg/L
4-Bromophenoxybenzene	102.00			
4-Bromophenyl phenyl ether	103.00	34636	101553	µg/L
4-Chloro-2-methyl analine hydrochl +	590.00		3165933	µg/L
4-Chloro-2-methyl aniline	591.00		95692	µg/L
4-Chloro-3-methylphenol	31.00	34452	59507	µg/L
4-Chloro-m-cresol	31.01	34452	59507	µg/L
4-Chloroaniline	464.00	78303	106478	mg/Kg
4-Chlorophenyl phenyl ether	33.00	34641	7005723	µg/L
4-Chlorotoluene	540.00	77277	106434	µg/L
4-Methyl-2-pentanone	34.00	78133	108101	µg/L
4-Methyl-o-cresol	17.02	34606	105679	µg/L
4-Methylphenol	35.00	77146	106445	µg/L
4-Nitroaniline	36.00	73278	100016	µg/Kg
4-Nitrophenol	37.00	34646	100027	µg/L
5-Bromopyrimidine	104.00			
5-Hydroxy Dicamba	256.00			µg/L
AAtrex	281.01	39033	1912249	µg/L
Acenaphthene	38.00	34205	83329	µg/L
Acenaphthylene	39.00	34200	208968	µg/L
Acephate	385.02	81815	30560191	µg/L
Acetone	40.00	81552	67641	µg/L
Acifluorfen	215.00	79193	6247659	µg/L
Acrolein	105.00	34210	107028	µg/L
Acrylamide	593.00	38576	79061	µg/L
Acrylonitrile	106.00	34215	107131	µg/L
Alachlor	273.00	77825	15972608	µg/L
Alanex	273.01	77825	15972608	µg/L
Aldicarb	274.00	39053	116063	µg/L
Aldicarb sulfone	320.00	82587	1646884	µg/L
Aldicarb sulfoxide	318.00	82586	1646873	µg/L
Aldrin	107.00	39330	309002	µg/L
Alkalinity as CaCO3, Total	453.00	00410	471341	mg/L
Alkalinity, Total (CaCO3)	246.00	00410	471341	mg/l
Alpha Particle Activity, gross	611.00	01519	12587461	pCi/L
Aluminum, Dissolved	511.00	01106	7429905	µg/L
Aluminum, Total	510.00	01105	7429905	µg/L
Aluminum, Total Recoverable	108.00	01104	7429905	µg/L

CAS NO should be read as follows. From Right: 1 digit, dash, 2 digits, dash (ie 1774-85-0).

APPENDIX D: CHEMICAL DICTIONARY
01/27/93

COMP_NAME	JHK_NO	STORET_NO	CAS_NO	UNITS
Ametryn	275.00	82184	834128	µg/L
Amiben	276.00	82051	133904	µg/L
Aminocarb	277.00	38404	2032599	µg/L
Aminotriazole	278.00	73509	61825	µg/L
Amitrole	278.01	73509	61825	µg/L
Ammonia-N, Total as-N	109.00	00610	17778880	mg/L
Aniline	110.00	77089	62533	µg/L
Anion Balance	111.00			
Anthracene	112.00	34220	120127	µg/L
Antimony, Dissolved	524.00	01095	7440360	µg/L
Antimony, Total	113.00	01097	7440360	µg/L
Antimony, Total Recoverable	21.00	01268	7440360	µg/L
Aqualin	105.01	34210	107028	µg/L
Aramite	594.00		140578	µg/L
Aroclor 1016	114.00	34671	12674112	µg/L
Aroclor 1221	115.00	39488	1104282	µg/L
Aroclor 1232	116.00	39492	11141165	µg/L
Aroclor 1242	117.00	39496	53469219	µg/L
Aroclor 1248	118.00	39500	12672296	µg/L
Aroclor 1254	119.00	39504	11097691	µg/L
Aroclor 1260	120.00	39508	11096825	µg/L
Arsenic, Dissolved	322.00	01000	7440382	µg/L
Arsenic, Inorganic (dissolved)	121.00	01000	7440382	µg/L
Arsenic, Total	137.00	01002	7440382	µg/L
Arsenic, Total Recoverable	122.00	00978	7440382	µg/L
Asbestos	123.00	34225	1332214	µg/L
Atraton	280.00	82185	1610179	µg/L
Atrazine	281.00	39033	1912249	µg/L
Avadex	532.00	73386	2303164	mg/Kg
Avenge	330.01	78882	43222486	µg/L
Azinphos-Ethyl	282.00	81292	2642719	µg/L
Azinphos-Methyl (Guthion)	359.01	39580	86500	µg/L
Azobenzene	595.00	77625	103333	µg/L
Azodrin	383.01	81890	6923224	µg/L
BFB	459.00			%
BHC	132.00	81283	608731	µg/L
BOD	499.01	00310		mg/L
Balan	283.00	39002	1861401	µg/L
Banvel	284.00	82052	1918009	µg/L
Barium, Dissolved	508.00	01005	7440393	µg/L
Barium, Total	509.00	01007	7440393	µg/L
Barium, Total Recoverable	124.00	01009	7440393	µg/L
Basagran	286.01	38710	25057890	µg/L
Basalin	354.01	79194	3324539	µg/L
Basanite	337.01	81287	88857	µg/L
Baygon	424.01	38537	114261	µg/L
Baymix	307.02	81293	56724	µg/L

CAS NO should be read as follows. From Right: 1 digit, dash, 2 digits, dash (ie 1774-85-0).

COMP_NAME	JHK_NO	STORET_NO	CAS_NO	UNITS
Baytex	351.01	38685	55389	µg/L
Benefin	283.01	39002	1861401	µg/L
Benfluralin	283.02	39002	1861401	µg/L
Benlate	285.01	38705	17804352	µg/L
Benomyl	285.00	38705	17804352	µg/L
Bensulide	288.01	82197	741582	µg/L
Bentazon	286.00	38710	25057890	µg/L
Benz(a)anthracene	130.01	34526	56553	µg/L
Benzene	41.00	34030	71432	µg/L
Benzene, 1-chloro-4-(methylsulfony +	572.00			
Benzidine	125.00	39120	92875	µg/L
Benzo(a)anthracene	130.00	34526	56553	µg/L
Benzo(a)pyrene	126.00	34247	50328	µg/L
Benzo(b)fluoranthene	127.00	34230	205992	µg/L
Benzo(b/k)fluoranthene	531.00	34242	207089	µg/L
Benzo(g,h,i)perylene	128.00	34521	191242	µg/L
Benzo(ghi)perylene	128.01	34521	191242	µg/L
Benzo(k)fluoranthene	129.00	34242	207089	µg/L
Benzoic acid	42.00	77247	65850	µg/L
Benzol	41.01	34030	71432	µg/L
Benzotrichloride	596.00		98077	µg/L
Benzyl alcohol	43.00	77147	100516	µg/L
Benzyl chloride	597.00	73520	100447	µg/L
Beryllium, Dissolved	515.00	01010	7440417	µg/L
Beryllium, Total	514.00	01012	7440417	µg/L
Beryllium, Total Recoverable	131.00	00998	7440417	µg/L
Beta Particle Activity, gross	612.00	85817	12587472	pCi/L
Betasan	288.00	82197	741582	µg/L
Bicarbonate as CaCO3	454.00	00425	471341	mg/L
Bicarbonate as HCO3	133.00	00440	71523	mg/L
Bidrin	328.01	38454	141662	µg/L
Bifenox	382.01	78883	42576023	µg/L
Biochemical Oxygen Demand	499.00	00310		mg/L
Bis(2-chloroethoxy)methane	44.00	34278	111911	µg/L
Bis(2-chloroethyl)ether	45.00	34273	111444	µg/L
Bis(2-chloroisopropyl)ether	46.00	34283	108601	µg/L
Bis(2-ethylhexyl) ester hexanedioi +	577.00	103321		
Bis(2-ethylhexyl)phthalate	140.00	39100	117817	µg/L
Bis(chloromethyl)ether	598.00	34268	542881	µg/L
Bis(n-octyl)phthalate	465.01	34596	117840	µg/L
Boron	134.00	01020	7440428	µg/L
Bravo	313.02	70314	1897456	µg/L
Bromacil	289.00	82198	314409	µg/L
Bromex	386.01	38855	300765	µg/L
Bromide(dissolved)	135.00	82298	24959679	µg/L
Bromobenzene	542.00	81555	108861	µg/L

CAS NO should be read as follows. From Right: 1 digit, dash, 2 digits, dash (ie 1774-85-0).

APPENDIX D: CHEMICAL DICTIONARY
01/27/93

COMP_NAME	JHK_NO	STORET_NO	CAS_NO	UNITS
Bromochloromethane	533.00	32105	124481	µg/L
Bromodichloromethane	47.00	32101	75274	µg/L
Bromoform	48.00	32104	75252	µg/L
Bromomethane	49.00	34413	74839	µg/L
Bromoxynil (Water, Whole)	556.00	70979	1689845	µg/L
Butachlor, Water/Whole/Recoverable	633.00	30235	23184669	µg/L
Butanone	376.02	81595	78933	µg/L
Butyl benzyl phthalate	136.00	34292	85687	µg/L
Butylate	290.00	81410	2008415	µg/L
Butylbenzenes, Total	292.01	45049		µg/L
C3-Alkylbenzenes, Total	291.00	45046		µg/L
C4-Alkylbenzenes, Total	292.00	45049		µg/L
CEC	161.01	81356		meq/100G
CIPC	305.01	81322	101213	µg/L
COD	492.01	81319		mg/L
Cadmium, Dissolved	406.00	01025	7440439	µg/L
Cadmium, Total	407.00	01027	7440439	µg/L
Cadmium, Total Recoverable	138.00	01113	7440439	µg/L
Calcium	521.00	00910	7440702	mg/L as CaCO3
Calcium, Dissolved	520.00	00915	7440702	mg/L
Calcium, Total	141.00	00916	7440702	mg/L
Camphor (ACN)	287.00	81324	76222	µg/L
Captan	293.00	39640	133062	µg/L
Carbaryl	294.00	77700	63252	µg/L
Carbazole	329.00	77571	86748	µg/L
Carbendazim	295.00	38735	10605217	µg/L
Carbofuran	296.00	81405	1563662	µg/L
Carbon disulfide	50.00	77041	75150	µg/L
Carbon tetrachloride	51.00	32102	56235	µg/L
Carbon, Total Organic	250.00	00680	7440440	µg/L
Carbonate as CO3	142.00	00445	3812326	mg/L
Carbonate as CaCO3	455.00	00430	471341	mg/L
Carbophenothion	297.00	39786	786196	µg/L
Carboxin	139.00	70987	5234684	µg/L
Cation Balance	143.00			
Cation Exchange Capacity	161.00	81356		meq/100G
Chemical Oxygen Demand	492.00	81319		mg/L
Chloramben	276.01	82051	133904	µg/L
Chlordane	144.00	39350	57749	µg/L
Chlordecon	298.00	81281	143500	µg/L
Chlordimeform	299.00	77953	6164983	µg/L
Chloride, Total	145.00	00940	16887006	mg/L
Chlorine, Total Residual	146.00	50060	7782505	mg/L
Chlorobenzene	52.00	34301	108907	µg/L
Chlorobenzilate	300.00	39460	510156	µg/L
Chlorocyclohexane	86.00	77217	542187	µg/L
Chlorodibromomethane	58.01	32105	124481	µg/L
Chloroethane	53.00	34311	75003	µg/L

CAS NO should be read as follows. From Right: 1 digit, dash, 2 digits, dash (ie 1774-85-0).

APPENDIX D: CHEMICAL DICTIONARY
01/27/93

COMP_NAME	JHK_NO	STORET_NO	CAS_NO	UNITS
Chloroethene	82.03	39175	75014	µg/L
Chloroethylene	82.02	39175	75014	µg/L
Chloroform	54.00	32106	67663	µg/L
Chloromethane	55.00	34418	74873	µg/L
Chloroneb	301.00	38423	2675776	µg/L
Chloropicrin	303.00	77548	76062	µg/L
Chloropropham	305.00	81322	101213	µg/L
Chloropropylate	302.00	38429	5836102	µg/L
Chlorothalonil	313.01	70314	1897456	µg/L
Chlorpyrifos	304.00	77969	2921882	µg/L
Chlorthal	314.02	39770	1861321	µg/L
Chromium VI	506.01	01032	18540299	µg/L
Chromium, Dissolved	516.00	01030	7440473	µg/L
Chromium, Hexavalent	506.00	01032	18540299	µg/L
Chromium, Total	491.00	01034	7440473	µg/L
Chromium, Total Recoverable	147.00	01118	7440473	µg/L
Chrysene	148.00	34320	218019	µg/L
Cinnamene	74.03	77128	100425	µg/L
Ciodrin	306.00	82565	7700176	µg/L
Co-Ral	307.01	81293	56724	µg/L
Cobalt	149.00	01037	7440484	µg/L
Coliform, Fecal	505.01	31616		#/100ml
Coliform, Total	150.00	31628		#/100ml
Color	599.00		00080	std. units
Conductivity	449.02		00094	µmhos/cm
Copper, Dissolved	408.00	01040	7440508	µg/L
Copper, Total	442.00	01042	7440508	µg/L
Copper, Total Recoverable	152.00	01119	7440508	µg/L
Corrosivity	600.00			std. units
Coumaphos	307.00	81293	56724	µg/L
Creosote	308.00	39140	8801589	µg/L
Crotoxyphos	306.01	82565	7700176	µg/L
Cumene	309.00	77223	98828	µg/L
Cyanazine	310.00	81757	21725462	µg/L
Cyanide	153.00	78248	57125	µg/L
Cyanide, Dissolved Std Method	279.00	00723	57125	µg/L
Cycloate	311.00	81892	1134232	µg/L
Cyclohexane	254.00	81570	110827	µg/L
D-D Mix	441.01	81610	96184	µg/L
DBCP	315.00	38761	96128	µg/L
DCNA	316.00	38447	99309	µg/L
DCOD	168.01	80116		mg/L
DCPA	314.01	39770	1861321	µg/L
DDD	208.00	39360	72548	µg/L
DDE	209.00	39365	72559	µg/L
DDT	210.00	39370	50293	µg/L
DDVP	317.00	73071	62737	µg/L

CAS NO should be read as follows. From Right: 1 digit, dash, 2 digits, dash (ie 1774-85-0).

COMP_NAME	JHK_NO	STORET_NO	CAS_NO	UNITS
Dinoseb	337.02	81287	88857	µg/L
Dioxathion	332.00	38783	78342	µg/L
Dioxin	87.01	34675	1746016	µg/L
Diphenamide	333.00	78004	957517	µg/L
Diphenoloxide	167.00	77587	101848	µg/L
Diquat	334.00	78885	85007	µg/L
Direct Black 38	601.00			µg/L
Direct Blue 6	602.00		2602462	µg/L
Direct Brown 95	603.00		16071866	µg/L
Dissolved COD	168.00		80116	mg/L
Dissolved Oxygen	169.00	00299	7782447	mg/L
Dissolved TOC	170.00	00679	7440440	kg/100GAL
Disufoton sulfone	642.00			µg/L
Disulfoton (Di-Syston)	171.00	81888	298044	µg/L
Disulfoton sulfoxide	643.01	81030	2497076	µg/L
Dithane	365.01	38831	8018017	µg/L
Dithiocarbamate	446.01	38917	137304	µg/L
Diuron	335.00	39650	330541	µg/L
Dowpon	312.01	38432	75990	µg/L
Dursban	304.01	77969	2921882	µg/L
Dyfonate	339.00	81294	944229	µg/L
Dylox	340.00	39014	52686	µg/L
EC	449.01	00094		µmhos/cm
EDB	8.01	77651	106934	µg/L
EPN	344.00	81290	2104645	µg/L
EPTC	345.00	81894	759944	µg/L
Endosulfan	341.00	34361	959988	µg/L
Endosulfan I	341.01	34361	959988	µg/L
Endosulfan II	342.00	34356	33213659	µg/L
Endosulfan Sulfate	172.00	34351	1031078	µg/L
Endothall	343.00	38926	145733	µg/L
Endrin	174.00	39390	72208	µg/L
Endrin Aldehyde	173.00	34366	7421934	µg/L
Endrin Ketone	490.00	78008	53494705	µg/L
Enide	333.01	78004	957517	µg/L
Epichlorohydrin	604.00	106898		µg/L
Eptam	345.01	81894	759944	µg/L
Etazine	428.01	38542	26259450	µg/L
Ethanol	346.00	77004	64175	µg/L
Ethenylbenzene	74.04	77128	100425	µg/L
Ethion	175.00	39398	563122	µg/L
Ethoprop	634.00	81758	13194484	µg/L
Ethyl acetate	176.00	81585	141786	µg/L
Ethyl acrylate	605.00		140885	µg/L
Ethyl alcohol	346.01	77004	64175	µg/L
Ethyl isopropyl ketone	95.01	78133	108101	µg/L
Ethylan	411.01	39034	72560	µg/L

CAS NO should be read as follows. From Right: 1 digit, dash, 2 digits, dash (ie 1774-85-0).

APPENDIX D: CHEMICAL DICTIONARY
01/27/93

COMP_NAME	JHK_NO	STORET_NO	CAS_NO	UNITS
DEF	324.00	81295	78488	µg/L
DMPA	336.00	81285	299854	µg/L
DNBP	337.00	81287	88857	µg/L
DNOC	338.00	34657	534521	µg/L
DO	169.01	00299	7782447	mg/L
Daconil	313.00	70314	1897456	µg/L
Dacthal	314.00	39770	1861321	µg/L
Dalapon	312.00	38432	75990	µg/L
Dasanit	350.01	38684	115902	µg/L
Demeton	325.00	39560	8065483	µg/L
Devrinol	387.01	79195	1529999	µg/L
Di-n-butylphthalate	155.00	39110	84742	µg/L
Di-n-octylphthalate	465.00	34596	117840	µg/L
Diallate	532.01	73386	2303164	mg/Kg
Diazinon	158.00	39570	333415	µg/L
Dibenz(a,h)anthracene	159.01	34556	53703	µg/L
Dibenz(a,h)anthracene-d	14557.00	79040	53703	mg/Kg
Dibenzo(a,h)anthracene	159.00	34556	53703	µg/L
Dibenzofuran	57.00	81302	132649	µg/L
Dibromochloromethane	58.00	32105	124481	µg/L
Dibromochloropropane	315.01	38761	96128	µg/L
Dibromodichloromethane	489.00	77779	594183	µg/L
Dibromomethane	160.00	81522	106934	µg/L
Dicamba	284.01	82052	1918009	µg/L
Dichloran	316.01	38447	99309	µg/L
Dichlorobromomethane	47.01	32101	75274	µg/L
Dichlorodifluoromethane	162.00	34668	75718	µg/L
Dichloromethane	68.02	34423	75092	µg/L
Dichloroprop	244.00	30190	120365	µg/L
Dichlorvos (DDVP)	317.01	73071	62737	µg/L
Dicofol	327.00	39780	115322	µg/L
Dicrotophos	328.00	38454	141662	µg/L
Dicyclopropyl methanone	579.00			µg/L
Dieldrin	164.00	39380	60571	µg/L
Diesel	472.00	78939	68476346	µg/L
Diethyl ether	165.00	81576	60297	µg/L
Diethylphthalate	59.00	34336	84662	µg/L
Diethylphthalate-d4	558.00			
Difenson	397.01	39022	80331	µg/L
Difenzoquat	330.00	78882	43222486	µg/L
Diisopropyl ether	154.00	81577	108203	µg/L
Dimecron	414.01	78881	13171216	µg/L
Dimethoate	331.00	46314	60515	µg/L
Dimethyl ketone	40.02	81552	67641	µg/L
Dimethyldisulfide	166.00	81580	624920	µg/L
Dimethylphthalate	60.00	34341	131113	µg/L
Dimethyltetrachlorophthalate	314.03	39770	1861321	µg/L
Dinitro-o-cresol	338.01	34657	534521	µg/L

CAS NO should be read as follows. From Right: 1 digit, dash, 2 digits, dash (ie 1774-85-0).

APPENDIX D: CHEMICAL DICTIONARY
01/27/93

COMP_NAME	JHK_NO	STORET_NO	CAS_NO	UNITS
Bromochloromethane	533.00	32105	124481	µg/L
Bromodichloromethane	47.00	32101	75274	µg/L
Bromoform	48.00	32104	75252	µg/L
Bromomethane	49.00	34413	74839	µg/L
Bromoxynil (Water, Whole)	556.00	70979	1689845	µg/L
Butachlor, Water/Whole/Recoverable	633.00	30235	23184669	µg/L
Butanone	376.02	81595	78933	µg/L
Butyl benzyl phthalate	136.00	34292	85687	µg/L
Butylate	290.00	81410	2008415	µg/L
Butylbenzenes, Total	292.01	45049		µg/L
C3-Alkylbenzenes, Total	291.00	45046		µg/L
C4-Alkylbenzenes, Total	292.00	45049		µg/L
CEC	161.01	81356		meq/100G
CIPC	305.01	81322	101213	µg/L
COD	492.01	81319		mg/L
Cadmium, Dissolved	406.00	01025	7440439	µg/L
Cadmium, Total	407.00	01027	7440439	µg/L
Cadmium, Total Recoverable	138.00	01113	7440439	µg/L
Calcium	521.00	00910	7440702	mg/L as CaCO3
Calcium, Dissolved	520.00	00915	7440702	mg/L
Calcium, Total	141.00	00916	7440702	mg/L
Camphor (ACN)	287.00	81324	76222	µg/L
Captan	293.00	39640	133062	µg/L
Carbaryl	294.00	77700	63252	µg/L
Carbazole	329.00	77571	86748	µg/L
Carbendazim	295.00	38735	10605217	µg/L
Carbofuran	296.00	81405	1563662	µg/L
Carbon disulfide	50.00	77041	75150	µg/L
Carbon tetrachloride	51.00	32102	56235	µg/L
Carbon, Total Organic	250.00	00680	7440440	µg/L
Carbonate as CO3	142.00	00445	3812326	mg/L
Carbonate as CaCO3	455.00	00430	471341	mg/L
Carbophenothion	297.00	39786	786196	µg/L
Carboxin	139.00	70987	5234684	µg/L
Cation Balance	143.00			
Cation Exchange Capacity	161.00	81356		meq/100G
Chemical Oxygen Demand	492.00	81319		mg/L
Chloramben	276.01	82051	133904	µg/L
Chlordane	144.00	39350	57749	µg/L
Chlordecon	298.00	81281	143500	µg/L
Chlordimeform	299.00	77953	6164983	µg/L
Chloride, Total	145.00	00940	16887006	mg/L
Chlorine, Total Residual	146.00	50060	7782505	mg/L
Chlorobenzene	52.00	34301	108907	µg/L
Chlorobenzilate	300.00	39460	510156	µg/L
Chlorocyclohexane	86.00	77217	542187	µg/L
Chlorodibromomethane	58.01	32105	124481	µg/L
Chloroethane	53.00	34311	75003	µg/L

CAS NO should be read as follows. From Right: 1 digit, dash, 2 digits, dash (ie 1774-85-0).

APPENDIX D: CHEMICAL DICTIONARY
01/27/93

COMP_NAME	JHK_NO	STORET_NO	CAS_NO	UNITS
Chloroethene	82.03	39175	75014	µg/L
Chloroethylene	82.02	39175	75014	µg/L
Chloroform	54.00	32106	67663	µg/L
Chloromethane	55.00	34418	74873	µg/L
Chloroneb	301.00	38423	2675776	µg/L
Chloropicrin	303.00	77548	76062	µg/L
Chloropropham	305.00	81322	101213	µg/L
Chloropropylate	302.00	38429	5836102	µg/L
Chlorothalonil	313.01	70314	1897456	µg/L
Chlorpyrifos	304.00	77969	2921882	µg/L
Chlorthal	314.02	39770	1861321	µg/L
Chromium VI	506.01	01032	18540299	µg/L
Chromium, Dissolved	516.00	01030	7440473	µg/L
Chromium, Hexavalent	506.00	01032	18540299	µg/L
Chromium, Total	491.00	01034	7440473	µg/L
Chromium, Total Recoverable	147.00	01118	7440473	µg/L
Chrysene	148.00	34320	218019	µg/L
Cinnamene	74.03	77128	100425	µg/L
Ciodrin	306.00	82565	7700176	µg/L
Co-Ral	307.01	81293	56724	µg/L
Cobalt	149.00	01037	7440484	µg/L
Coliform, Fecal	505.01	31616		#/100ml
Coliform, Total	150.00	31628		#/100ml
Color	599.00		00080	std. units
Conductivity	449.02		00094	µmhos/cm
Copper, Dissolved	408.00	01040	7440508	µg/L
Copper, Total	442.00	01042	7440508	µg/L
Copper, Total Recoverable	152.00	01119	7440508	µg/L
Corrosivity	600.00			std. units
Coumaphos	307.00	81293	56724	µg/L
Creosote	308.00	39140	8801589	µg/L
Crotoxyphos	306.01	82565	7700176	µg/L
Cumene	309.00	77223	98828	µg/L
Cyanazine	310.00	81757	21725462	µg/L
Cyanide	153.00	78248	57125	µg/L
Cyanide, Dissolved Std Method	279.00	00723	57125	µg/L
Cycloate	311.00	81892	1134232	µg/L
Cyclohexane	254.00	81570	110827	µg/L
D-D Mix	441.01	81610	96184	µg/L
DBCP	315.00	38761	96128	µg/L
DCNA	316.00	38447	99309	µg/L
DCOD	168.01	80116		mg/L
DCPA	314.01	39770	1861321	µg/L
DDD	208.00	39360	72548	µg/L
DDE	209.00	39365	72559	µg/L
DDT	210.00	39370	50293	µg/L
DDVP	317.00	73071	62737	µg/L

CAS NO should be read as followe. From Right: 1 digit, dash, 2 digits, dash (ie 1774-85-0).

APPENDIX D: CHEMICAL DICTIONARY
01/27/93

COMP_NAME	JHK_NO	STORET_NO	CAS_NO	UNITS
Ethylbenzene	61.00	34371	100414	µg/L
Ethylene dibromide	8.02	77651	106934	µg/L
Ethylene dichloride	10.01	34531	107062	µg/L
Ethylene glycol	347.00	77023	107211	µg/L
Ethylene thiourea	348.01	38928	96457	µg/L
Ethylidene thiourea	348.00	38928	96457	µg/L
Evik	275.01	82184	834128	µg/L
Fecal Coliform, MFM-FCBR	505.00	31616		#/100ml
Fenamiphos	349.00	38929	22224926	µg/L
Fenarimol	635.00			µg/L
Fensulfothion	350.00	38684	115902	µg/L
Fenthion	351.00	38685	55389	µg/L
Fenuron	352.00	38468	101428	µg/L
Ferbam	353.00	38806	14484641	µg/L
Ferric(3+)	188.01	01045	7439896	µg/L
Ferrous(2+)	188.02	01045	7439896	µg/L
Fluchloralin	354.00	79194	3324539	µg/L
Fluoranthene	177.00	34376	206440	µg/L
Fluorene	62.00	34381	86737	µg/L
Fluorescein(Sodium)	178.00		518478	
Fluoride	179.00	00950	16984488	mg/L
Fluormeturon	355.00	38811	2164172	µg/L
Fluridone	636.00		59756604	µg/L
Foaming Agents	606.00	01288		mg/L
Folex	369.01	39019	150505	µg/L
Folpet	607.00	46351	133073	µg/L
Fonofos	339.01	81294	944229	µg/L
Formaldehyde	356.00	71880	50000	mg/L
Freon 113	3.01	77652	76131	µg/L
Freon 12, Halon	162.01	34668	75718	µg/L
Furadan	296.01	81405	1563662	µg/L
Furazolidone	608.00	67458		µg/L
Furium	609.00			µg/L
Furmecyclox	610.00		60568050	µg/L
Gardona	581.01	38877	961115	
Gardoprim	436.01	38559	5915413	µg/L
Gasoline	471.00		6842596	
Gesatamin	280.01	82185	1610179	µg/L
Glyphosate	358.00	79743	1071836	µg/L
Grain alcohol	346.02	77004	64175	µg/L
Guthion	359.00	39580	86500	µg/L
Hardness, Total	248.00	00900	471341	mg/L CaCO3
Heptachlor	181.00	39410	76448	µg/L
Heptachlor Epoxide	180.00	39420	1024573	µg/L
Heptene	182.00	81589	25339564	µg/L
Hexachlorobenzene	183.00	39700	118741	µg/L
Hexachlorobutadiene	63.00	34391	87683	µg/L

CAS NO should be read as follows. From Right: 1 digit, dash, 2 digits, dash (ie 1774-85-0).

COMP_NAME	JHK_NO	STORET_NO	CAS_NO	UNITS
Hexachlorocyclohexane	132.01	81283	608731	µg/L
Hexachlorocyclohexane (alpha)	265.04	39337	319846	µg/L
Hexachlorocyclopentadiene	64.00	34386	77474	µg/L
Hexachloroethane	65.00	34396	67721	µg/L
Hexazinone	360.00	38815	51235042	µg/L
Hydram	394.02	82199	2212671	µg/L
Hydrazine	184.00	81313	302012	mg/L
Hydrocarbons, Total	473.00	81336		mg/L
Hydrocarbons, Total Fuel	462.00			
Hydrocarbons, Total Petroleum	461.00	46116	14280309	mg/L
Hydroxide	185.00	71830	14280309	mg/L
Hydroxide as CaCO3	456.00			
Hyvar	289.01	82198	314409	µg/L
IPC	423.01	39052	122429	µg/L
Imidan	361.00	39800	732116	µg/L
Indeno(1,2,3-cd)pyrene	186.00	34403	193395	µg/L
IntStd: 2,4,6-Tribromophenol	559.00	34719	118796	µg/L
IntStd: Hexabromobenzene	560.00			
Ion Balance	451.00			%
Ioxynil	561.00		16898341	µg/L
Iron, Dissolved	323.00	01046	7439896	µg/L
Iron, Total	188.00	01045	7439896	µg/L
Iron, Total Recoverable	362.00	00980	7439896	µg/L
Isobutylbenzene	552.00	77334	538932	µg/L
Isophorone	66.00	34408	78591	µg/L
Isopropyl carbanilate	423.02	39052	122429	µg/L
Isopropylbenzene (Cumene)	309.01	77223	98828	µg/L
Karmex	335.01	39650	330541	µg/L
Kepone	298.01	81281	143500	µg/L
Kerb	419.01	39080	23950585	mg/Kg
Kerosene	363.00	78878	8008206	µg/L
Kjeldahl-N, Total	249.00	00625	17778880	mg/L as N
Langlier Index	500.00			
Lead, Dissolved	402.00	01049	7439921	µg/L
Lead, Organic	463.00			
Lead, Total	403.00	01051	7439921	µg/L
Lead, Total Recoverable	189.00	01114	7439921	µg/L
Lindane	357.01	39340	58899	µg/L
Linuron	364.00	39530	330552	µg/L
Lithium	466.00	01130	7439932	µg/L
Lorsban	304.02	77969	2921882	µg/L
MBAS	233.01	34790	7429905	mg/L
MCPA	367.00	39151	94746	µg/L
MCPA Dimethylamine Salt	367.01	39151	94746	µg/L
MCPB	368.00	38486	94815	µg/L
MCPP (Water, Total)	562.00	38491	93652	µg/L
MEK	376.01	81595	78933	µg/L

CAS NO should be read as follows. From Right: 1 digit, dash, 2 digits, dash (ie 1774-85-0).

APPENDIX D: CHEMICAL DICTIONARY
01/27/93

COMP_NAME	JHK_NO	STORET_NO	CAS_NO	UNITS
MIBK	34.02	78133	108101	µg/L
MSMA	385.00	38935	2163806	µg/L
Magnesium as CaCO3	519.00	00920	7439954	mg/L
Magnesium, Dissolved	518.00	00925	7439954	mg/L
Magnesium, Total	191.00	00927	7439954	mg/L
Malathion	192.00	39530	121755	µg/L
Mancozeb	365.00	38831	8018017	µg/L
Maneb	366.00	38835	12427382	µg/L
Manganese, Dissolved	404.00	01056	7439965	µg/L
Manganese, Total	193.00	01055	7439965	µg/L
Manganese, Total Recoverable	405.00	01123	7439965	µg/L
Matacil	277.01	38404	2032599	µg/L
Mercury, Dissolved	477.00	71890	7439976	µg/L
Mercury, Total	476.00	71900	7439976	µg/L
Mercury, Total Recoverable	194.00	71901	7439976	µg/L
Merphos	369.00	39019	150505	µg/L
Mesitylene	370.00	77226	108678	µg/L
Metasystox	371.00	39020	8022002	µg/L
Methidathion	374.00	78879	950378	µg/L
Methiocarb	373.00	38500	2032657	µg/L
Methomidophos	372.00	38927	10265926	µg/L
Methomyl	375.00	39051	16752775	µg/L
Methoxychlor	195.00	39480	72435	µg/L
Methyl Phenols, Total	378.00	45058	1319773	µg/L
Methyl Trithion	197.00	39790	953173	µg/L
Methyl Xylenes, Total	444.01	78136	25551137	µg/L
Methyl bromide	49.01	34413	74839	µg/L
Methyl chloride	55.01	34418	74873	µg/L
Methyl ethyl ketone	376.00	81595	78933	µg/L
Methyl isobutyl ketone	34.01	78133	108101	µg/L
Methyl ketone	40.03	81552	67641	µg/L
Methyl n-butyl ketone	25.01	77103	591786	µg/L
Methyl n-propyl ketone	97.01	77060	107879	µg/L
Methyl paraoxon	637.00			µg/L
Methylbenzene	76.01	34010	108883	µg/L
Methylcyclohexane	198.00	77100	108872	µg/L
Methylene Blue Active Substances	493.00	38260	61734	
Methylene bromide	160.01	81522	106934	µg/L
Methylene chloride	68.00	34423	75092	µg/L
Metolachlor	163.00		51218452	µg/L
Metribuzin	379.00	81408	21087649	µg/L
Mevinphos	413.01	39610	7786347	µg/L
Mexacarbate	380.00	38507	315184	µg/L
Mirex	381.00	39755	2385855	µg/L
Modown	382.00	78883	42576023	µg/L
Molinate	394.01	82199	2212671	µg/L

CAS NO should be read as follows. From Right: 1 digit, dash, 2 digits, dash (ie 1774-85-0).

APPENDIX D: CHEMICAL DICTIONARY
01/27/93

COMP_NAME	JHK_NO	STORET_NO	CAS_NO	UNITS
Molybdenum	467.00	01060	7439987	µg/L
Monitor	372.01	38927	10265926	µg/L
Monochloroethene	82.04	38175	75014	µg/L
Monochloroethylene	82.01	39175	75014	µg/L
Monocrotophos	383.00	81890	6923224	µg/L
Monsodium methyl arsonate	385.01	38935	2163806	µg/L
Monuron	384.00	38511	150685	µg/L
N-Nitroso-N-methylethylamine	613.00	73613	10595956	µg/L
N-Nitroso-di-n-butylamine	614.00	73609	924163	µg/L
N-Nitroso-di-n-propylamine	69.00	34428	621647	µg/L
N-Nitrosodiethanolamine	615.00	73610	1116547	µg/L
N-Nitrosodiethylamine	616.00	73611	55185	µg/L
N-Nitrosodimethylamine	392.00	34438	62759	µg/L
N-Nitrosodiphenylamine	199.00	34433	86306	µg/L
N-Nitrosopyrrolidine	617.00	78206	930552	µg/L
NH3-N, Total	109.01	00610	17778880	mg/L as N
NO3+NO2-N, Total	321.01	00630	17778880	mg/L as N
Naled	386.00	38855	300765	µg/L
Naphthalene	70.00	34696	91203	µg/L
Napropamide	387.00	79195	1529999	µg/L
Neburon	388.00	38521	555373	µg/L
Nemacure	349.01	38929	22224926	µg/L
Nickel, Dissolved	481.00	01065	7440020	µg/L
Nickel, Total	483.00	01067	7440020	µg/L
Nickel, Total Recoverable	200.00	01074	7440020	µg/L
Nitrate+Nitrite-N, Total	321.00	00630	17778880	mg/L as N
Nitrate-N	452.00	00620	17778880	mg/L as N
Nitrite-N	202.00	00615	17778880	mg/L as N
Nitrobenzene	71.00	34447	98953	µg/L
Nitrofen	389.00	81303	1836755	µg/L
Nitrofurazone	618.00	59870		µg/L
Nitroguanidine	203.00	79753	556887	µg/L
Nonadecane	391.00	77822	629925	µg/L
Norflurazon, in Water	639.00	78064		µg/L
OBPA	206.00	58366		
Octachloronaphthalene	563.00		2234131	µg/L
Odor	619.00			std. units
Oil & Grease	207.00	03582		mg/L
Ordram	394.00	82199	2212671	µg/L
Orthene	395.00	81815	30560191	µg/L
Oryzalin	396.00	78884	19044883	µg/L
Ovex	397.00	39022	80331	µg/L
Oxamyl	398.00	38865	23135220	µg/L
Oxydisulfoton (Disyston Sulphoxide)	643.00	81030	2497076	µg/L
PAH (Polyaromatic hydrocarbons)	620.00			µg/L
PBB (Polybrominated Biphenyls)	621.00		59536651	µg/L
PCB	219.01	76012	1336363	µg/L

CAS NO should be read as follows. From Right: 1 digit, dash, 2 digits, dash (ie 1774-85-0).

APPENDIX D: CHEMICAL DICTIONARY
01/27/93

COMP_NAME	JHK_NO	STORET_NO	CAS_NO	UNITS
PCB-1016	114.01	34671	12674112	µg/L
PCB-1221	115.01	39488	1104282	µg/L
PCB-1232	116.01	39492	11141165	µg/L
PCB-1242	117.01	39496	53469219	µg/L
PCB-1248	118.01	39500	12672296	µg/L
PCB-1254	119.01	39504	11097691	µg/L
PCB-1260	120.01	39508	11096825	µg/L
PCE	75.01	34475	127184	µg/L
PCNB	409.00	39029	81316	µg/L
PCP	213.01	39032	87865	µg/L
PID Reading	470.00			
Paraquat	399.00	82416	4685147	µg/L
Parathion	212.00	39540	56382	µg/L
Parathion, Ethyl-	400.00	46315	56382	µg/L
Parathion, Methyl-	401.00	39600	298000	µg/L
Pebulate, Water, Whole	640.00	79192		µg/L
Pendimethalin	222.02	79190	40487421	µg/L
Penoxalin	222.00	82410	40487421	µg/L
Pentachlorobenzene	410.00	77793	608935	µg/L
Pentachlorophenol	213.00	39032	87865	µg/L
Perchlorate	214.00			
Perchloroethene	75.03	34475	127184	µg/L
Perchloroethylene	75.02	34475	127184	µg/L
Persulfate-N, Total	580.00		7727540	µg/L
Perthane	411.00	39034	72560	µg/L
Phenanthrene	216.00	34461	85018	µg/L
Phencapton (Water, Whole)	564.00	81289	2275141	µg/L
Phenol	73.00	34694	108952	µg/L
Phenol, 4-AAP	217.00		108952	
Phenylethylene	74.02	77128	100425	µg/L
Phorate	218.00	46313	298022	µg/L
Phosalone	412.00	81291	2310170	µg/L
Phosdrin	413.00	39610	7786347	µg/L
Phosmet	361.01	39800	732116	µg/L
Phosphamide	331.01	46314	60515	µg/L
Phosphamidon	414.00	78881	13171216	µg/L
Phosphate-P, Diss Ortho	498.00	00671	7723140	mg/L as P
Phosphate-P, Ortho	205.00	00660	14265442	mg/L as PO 4
Phosphorodithioic acid, O,O,S-trim +	573.00	39580	86500	µg/L
Phosphorous-P, Total	251.00	00665	7723140	mg/L as P
Picloram	257.00	39720	1918021	µg/L
Polychlorinated biphenyl	219.00	76012	1336363	µg/L
Potassium, Dissolved	517.00	00935	7440097	mg/L
Potassium, Total	220.00	00937	7440097	mg/L
Princep	430.01	39055	122349	µg/L
Profluralin	415.00	38872	26399360	µg/L

CAS NO should be read as follows. From Right: 1 digit, dash, 2 digits, dash (ie 1774-85-0).

APPENDIX D: CHEMICAL DICTIONARY
01/27/93

COMP_NAME	JHK_NO	STORET_NO	CAS_NO	UNITS
Prometon	416.00	39056	1610180	µg/L
Prometryn	417.00	39057	7287196	µg/L
Pronamide	419.00	39080	23950585	µg/L
Propachlor	418.00	38533	1918167	µg/L
Propane	420.00	82358	74986	µg/L
Propanone	40.01	81552	67641	µg/L
Propargite	421.00	82065	2312358	mg/L
Propazine	422.00	39024	139402	µg/L
Propham	423.00	39052	122429	µg/L
Propoxur	424.00	38537	114261	µg/L
Propylbenzenes, Total	291.01	45046		µg/L
Propylene oxide	622.00	77011	75569	µg/L
Prowl	222.01	79190	40487421	µg/L
Prowl, Lechate	221.00	79190	40487421	µg/L
Prowl, Soil	223.00	85793	40487421	µg/L
Pyrene	224.00	34469	129000	µg/L
Pyrethrins	425.00	39930	8003347	µg/L
Radium 226	623.00	09501	13982633	pCi/L
Radium 226 & 228	624.00	11503		pCi/L
Retene	457.00	73076	483658	µg/L
Roneet	311.01	81892	1134232	µg/L
Ronnel	427.00	39357	299843	µg/L
Round-up	426.00	39941	1071836	µg/L
SCA	225.00			
Secbumeton	428.00	38542	26259450	µg/L
Selenium, Dissolved	484.00	01145	7782492	µg/L
Selenium, Total	485.00	01147	7782492	µg/L
Selenium, Total Recoverable	226.00	00981	7782492	µg/L
Sencore	379.01	81408	21087649	µg/L
Sevin	294.01	77700	63252	µg/L
Siduron	429.00	38548	1982496	µg/L
Silica (SIO2)	227.00	00992	7631869	µg/L
Silicate	497.00	00958		mg/L
Silver, Dissolved	495.00	01075	7440224	µg/L
Silver, Total	234.00	01077	7440224	µg/L
Silver, Total Recoverable	228.00	01079	7440224	µg/L
Simazine	430.00	39055	122349	µg/L
Simetryn	431.00	39054	1014706	µg/L
Sodium Absorption Ratio	501.00	00931	7440235	SAR
Sodium Chlorate	229.00	00726	7775099	µg/L
Sodium, Total	450.00	00929	7440235	mg/L
Solids, Total Dissolved	247.03	70300		µg/L
Solids, Total Suspended	496.01	74016		mg/L
Specific Conductance (Field)	502.00	00094		µmhos/cr
Specific Conductance @ 25C (LAB)	151.00	00095		µmhos/cr
Specific Conductance(fIELD)	449.00	00094		µmhos/cr

CAS NO should be read as follows. From Right: 1 digit, dash, 2 digits, dash (ie 1774-85-0).

APPENDIX D: CHEMICAL DICTIONARY
01/27/93

COMP_NAME	JHK_NO	STORET_NO	CAS_NO	UNITS
Stirofos	432.00	38877	961115	µg/L
Strontium-90	625.00	13501	10098972	pCi/L
Styrene	74.00	77128	100425	µg/L
Sulfate, Total	230.00	00945	14808798	mg/L as SO4
Sulfide, Total	231.00	00745	18496258	mg/L
Sulfite, Total	232.00	00740	14265453	mg/L as SO3
Sumitol	428.02	38542	26259450	µg/L
Supracide	374.01	78879	950378	µg/L
Surfactants	233.00	03581		mg/L
Surflan	396.01	78884	19044883	µg/L
Surrog: 1,2-Dichloroethane-d4	460.00			%
Surrog: 1,4-Bromofluorobenzene	187.00			
Surrog: 1-Bromo-2-floroethane	157.00			
Surrog: 2-Chlorophenol-d4 (spike)	565.00	95978		
Surrog: 2-Fluorobiphenyl	479.00			
Surrog: 2-Fluorophenol	480.00			
Surrog: 4-Chloroaniline-d4	566.00			
Surrog; Dibutylchlorendate (spike)	567.00			
Surrog: Fluorene-d10 (spike)	568.00			
Surrog: Nitrobenzene-d5	474.00			
Surrog: Phenol-d5	526.00			
Surrog: Pyrene-d10 (spike)	377.00			
Surrog: Toluene-d8	458.00			%
Surrog: p-Terphenyl-d14	525.00			
Sutan	290.01	81410	2008415	µg/L
Swep	433.00	38555	918189	µg/L
Systox	325.01	39560	8065483	µg/L
T3	236.00	78166		µg/L
T4	237.00	51489		µg/L
TCE	80.01	39180	79016	µg/L
TDS	247.01	70300		µg/L
TEPP	435.00	39620	107493	µg/L
TFH	462.01			
TKN	249.01	00625	17778880	mg/L as N
TOC	250.01	00680	7440440	µg/L
TOS (Calculated)	245.00			
TPH	461.01	46116	14280309	mg/L
TPN, Total Persulfate Nitrogen	580.01		7727540	µg/L
TSS	496.00		74016	mg/L
Tebuthiuron	190.00		34014181	µg/L
Tedion	434.00	39808	116290	µg/L
Temik	274.01	39053	116063	µg/L
Temperature, 0 C	238.00	00010	0	C
Temperature, 0 F	239.00	00011	0	F
Terbacil	204.00		5902152	µg/L
Terbuthylazine	436.00	38559	5915413	µg/L
Terbutryn	437.00	38887	886500	µg/L

CAS NO should be read as follows. From Right: 1 digit, dash, 2 digits, dash (ie 1774-85-0).

APPENDIX D: CHEMICAL DICTIONARY
01/27/93

COMP_NAME	JHK_NO	STORET_NO	CAS_NO	UNITS
Tetrachloroethene	75.00	34475	27184	µg/L
Tetrachloroethylene	75.04	34475	27184	µg/L
Tetrachloromethane	51.01	32102	56235	µg/L
Tetrachlorophenol	438.00	81849	25167833	µg/L
Tetrachlorvinphos	581.00	38877	961115	
Tetradifon	434.01	39808	116290	µg/L
Tetraethyldiphosphate	435.01	39620	107493	µg/L
Tetrahydrofuran	241.00	81607	109999	µg/L
Thallium, Dissolved	522.00	01057	7440280	µg/L
Thallium, Total	523.00	01059	7440280	µg/L
Thallium, Total Recoverable	242.00	00982	7440280	µg/L
Thiophanate	439.01	78880	23564069	µg/L
Thiosulfate	243.00			
Tin, Dissolved	513.00	01100	7440315	µg/L
Tin, Total	512.00	01102	7440315	µg/L
Tin, Total Recoverable	468.00	00983	7440315	µg/L
Titanium	469.00	01150	7440326	µg/L
Toluene	76.00	34010	108883	µg/L
Topsin-MR	439.00	78880	23564069	µg/L
Total BTEX	478.00	34103		µg/L
Total BTX	72.00	34103	n/a	µg/L
Total Dissolved Solids (residue)	247.00	70300		µg/L
Total Filterable Residue	247.02	70300		µg/L
Total Organic Halides	503.00	70353		µg/L
Total Organics	486.00	81299		µg/L
Total Solids	253.00	70297		Kg/100Gal
Total Solids	252.00	70318		%
Total Trihalomethanes	494.00	82080		µg/L
Toxaphene	255.00	39400	8001352	µg/L
Treflan	443.01	81284	1582098	µg/L
Triadimefon	440.00	38892	43121433	µg/L
Trichlorobenzoic acid	551.00	50317		
Trichloroethene	80.00	39180	79016	µg/L
Trichloroethylene	80.02	39180	79016	µg/L
Trichlorofluoromethane	83.00	34488	75694	µg/L
Trichloromethane	54.01	32106	67663	µg/L
Trichlorophon	340.01	39014	52686	µg/L
Trichlorotrifluoroethane	3.02	81611	26523648	µg/L
Trichlorotrinitrobenzenes,Total	258.00			
Tricyclazole, Water, Whole	641.00	38902	41814782	µg/L
Trifluralin	443.00	81284	1582098	µg/L
Trimethyl Benzenes, Total	444.00	78136	25551137	µg/L
Trimethyl phosphate	626.00		512561	µg/L
Trinitrobenzenes, Total	259.00			
Triphenyl phosphate (Water, Whole)	569.00	77881	115866	µg/L
Trithion	297.01	39786	786196	µg/L
Tritium	627.00	07000	10028178	pCi/L

CAS NO should be read as follows. From Right: 1 digit, dash, 2 digits, dash (ie 1774-85-0).

APPENDIX D: CHEMICAL DICTIONARY
01/27/93

COMP_NAME	JHK_NO	STORET_NO	CAS_NO	UNITS
Turbidity(Lab)	260.00	82079		NTU
UDMH	261.00	81314	57147	mg/L
Vanadium (Dissolved)	262.00	10085	7440622	
Velpar	360.01	38815	51235042	µg/L
Vernam	445.01	82200	1929777	µg/L
Vernolate	445.00	82200	1929777	µg/L
Vinyl acetate	81.00	77057	108054	µg/L
Vinyl chloride	82.00	39175	75014	µg/L
Vinyl trichloride	4.01	34511	79005	µg/L
Vinylbenzene	74.01	77128	100425	µg/L
Volatile Dissolved Solids	263.00			
Volatile Organic Compounds	487.00		78733	mg/L
Xylene Isomers, M+P, Whole Water	578.00		85795	µg/L
Xylene Isomers, O+P, Whole Water	32.00		80353	µg/L
Xylene, m-	67.00	77134	108383	µg/L
Xylene, o-	77.00	77135	95476	µg/L
Xylene, p-	475.00	77133	106423	µg/L
Xylenes, Total	201.00	34020	1330207	µg/L
Zinc, Dissolved	504.00	01090	7440666	µg/L
Zinc, Total	507.00	01092	7440666	µg/L
Zinc, Total Recoverable	264.00	01094	7440666	µg/L
Zineb	447.00	38912	12122677	µg/L
Ziram	446.00	38917	137304	µg/L
Zolone	412.01	81291	2310170	µg/L
Zytron	336.01	81285	299854	µg/L
a-BHC	265.00	39337	319846	µg/L
a-Endosulfan	266.01	34361	959988	µg/L
alpha-BHC	265.03	39337	319846	µg/L
alpha-Benzene hexachloride	265.01	39337	319846	µg/L
alpha-Chlordane	530.00	39348	5103719	µg/L
alpha-Endosulfan	266.00	34361	959988	µg/L
alpha-Lindane	265.02	39337	319846	µg/L
b-BHC	267.00	39338	319857	µg/L
b-Endosulfan	268.00	34356	33213659	µg/L
beta-BHC	267.03	39338	319857	µg/L
beta-Benzene hexachloride	267.01	39338	319857	µg/L
beta-Endosulfan	268.01	34356	33213659	µg/L
beta-Lindane	267.02	39338	319857	µg/L
cis-1,2-Dichloroethene	326.00	77093	156592	µg/L
cis-1,2-Dichloroethylene	326.01	77093	156592	µg/L
cis-1,3-Dichloropropene	56.00	34704	10061015	µg/L
cis-1,3-Dichloropropylene	56.01	34704	10061015	µg/L
d-BHC	269.00	34259	319868	µg/L
delta-BHC	269.03	34259	319868	µg/L
delta-Benzene hexachloride	269.01	34259	319868	µg/L

CAS NO should be read as follows. From Right: 1 digit, dash, 2 digits, dash (ie 1774-85-0).

APPENDIX D: CHEMICAL DICTIONARY
01/27/93

COMP_NAME	JHK_NO	STORET_NO	CAS_NO	UNITS
delta-Lindane	269.02	34259	319868	µg/L
g-BHC	357.00	39340	58899	µg/L
gamma-BHC (Lindane)	357.04	39340	58899	µg/L
gamma-Benzene hexachloride	357.03	39340	58899	µg/L
gamma-Chlordane	529.00	39065	5103742	µg/L
gamma-Lindane	357.02	39340	58899	µg/L
m-Diethylbenzene	549.01	77348	141935	µg/L
m-Dimethylbenzene	67.04	77134	108383	µg/L
m-Xylene	67.03	77134	108383	µg/L
meta-Xylene	67.02	77134	108383	µg/L
n-Butylbenzene	539.00	78483	104518	µg/Kg
n-Octacosane	390.00	78116	630024	µg/L
n-Propylbenzene	393.00	77224	103651	µg/L
o,p'-DDT	270.00	39305	789026	µg/L
o,p'-TDE	271.00	39315	53190	µg/L
o-Chloronitrobenzene	628.00		88732	µg/L
o-Chlorophenol	24.01	34586	95578	µg/L
o-Diethylbenzene	548.01	77340	135013	µg/L
o-Dimethylbenzene	77.03	77135	95476	µg/L
o-Phenylenediamine	629.00	73628	106503	µg/L
o-Toluidine	630.00	77142	95534	µg/L
o-Xylene	77.01	77135	95476	µg/L
ortho-Xylene	77.04	77135	95476	µg/L
p,a,a,a-Tetrachlorotoluene	632.00			µg/L
p,p'-DDD	208.02	39360	72548	µg/L
p,p'-DDE	209.02	39365	72559	µg/L
p,p'-DDT	210.02	39370	50293	µg/L
p,p'-TDE	272.00	39360	72548	µg/L
p-Chloro-m-cresol	31.02	34452	59507	µg/L
p-Chloronitobenzene	631.00		100005	µg/L
p-Cresol	35.01	77146	106445	µg/L
p-Diethylbenzene	550.01	77345	105055	µg/L
p-Dimethylbenzene	475.04	77133	106423	µg/L
p-Isopropyltoluene	538.00	77356	99876	µg/L
p-Nitroaniline	36.01	73278	100016	µg/Kg
p-Nitrophenol	37.01	34646	100027	µg/L
p-Xylene	475.02	77133	106423	µg/L
pH	448.00	00400		std. units
para-Xylene	475.01	77133	106423	µg/L
propyzamide	419.02	39080	23950585	mg/Kg
sec-Butylbenzene	543.00	78485	135988	µg/Kg
tert-Butylbenzene	537.00	78448	98066	µg/Kg
trans-1,2-Dichloroethene	78.00	34546	156605	µg/L
trans-1,2-Dichloroethylene	78.01	34546	156605	µg/L
trans-1,3-Dichloropropene	79.00	34699	10061026	µg/L
trans-1,3-Dichloropropylene	79.01	34699	10061026	µg/L
269	338.40			

CAS NO should be read as follows. From Right: 1 digit, dash, 2 digits, dash (ie 1774-85-0).

APPENDIX E: LABORATORY QUALIFIERS

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 but not detected. The associated numerical value is the sample quantitation detection limit.
UJ	Compound was analyzed for but 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.

APPENDIX E CONTINUED:

Data Qualifier Definitions

For the purpose 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, but 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 entity to thoroughly document/explain the qualifiers used and notify Ecology prior to submition of data packages.

APPENDIX F: COUNTY FIPS CODES

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

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,

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

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 § 10726c.

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

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,

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 § 10726e.

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 § 10726f.

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.

Historical and Statutory Notes

Laws 1989, ch. 54, § 6, inserted the date of the coordinate system in two places. Source: RRS § 10726g.

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 § 10726h.

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

Historical and Statutory Notes

Laws 1989, ch. 54, § 8, inserted the date of the coordinate system.

Source:
RRS § 10726i.

Library References

Boundaries ⇐1, 25.
WESTLAW Topic No. 59.
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 parallels the scale shall be exact. The origin of coordinates is at the [illegible] west of Greenwich and the

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 58.20.901. 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 Term—Limited use

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.

Repeal

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

Library References

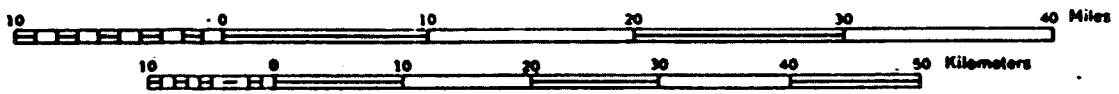
Statutes ⇐64(2).
WESTLAW Topic No. 361.
C.J.S. Statutes § 96 et seq.

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.

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 size of letters

COMPILED IN 1961
EDITION OF 1962

AVAILABLE UPON REQUEST FROM TOXICS CLEANUP PROGRAM

118°

INTERIOR—GEOLOGICAL SURVEY, RESTON, VIRGINIA—1976

W/

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

Please submit Quality Assurance/Quality Control (QA/QC) data, such as method blank and trip blank results, as part of your QA report rather than as part of this data set.

Good luck on your project. If you need help don't hesitate to call or write. My phone number is [Your Telephone Number SCAN and off-SCAN]

Sincerely,

[Your Name, Title]
Toxics Cleanup Program

[INITIALS:secretary's initials]
Enclosure

APPENDIX I

February 17, 1993

Addressee's Name
Address
City, State Zip

Dear Addressee:

Re: Toxics Cleanup Program Database Material

Thank you for implementing our format for your digital data submittals. By adopting some common formats, we can more easily and quickly review your data and so enhance the cleanup process for all of us.

I have enclosed a diskette which contains all the files you'll need to adopt our format. The environmental data storage files are designed for water, soil, and sediment data. These files are in a dBase format and have a DBF extension. You will also find a WordPerfect file on your diskette with a TCP extension. The table below describes the function of each of the files contained on the diskette.

FILE NAME	EXPLANATION
SITE_DES.DBF	The *Site Description File* contains location, construction, and other descriptive information about the sampling site.
FIELD_SA.DBF	The *Field Sample File* contains site-specific field sampling information. It is sample and site specific. Each sampling event is recorded individually.
LAB_SAMP.DBF	The *Laboratory Sample File* contains laboratory analysis information for all analytes.
DATAHDR.TCP	The *Data Header File* contains a narrative explanation of the Site Description File, Field Sample and the Laboratory Sample File.
CHEMDIC.DBF	The *Chemical Dictionary File* contains a alphabetical listing of chemicals with CAS numbers and Toxics Cleanup Program coding.