



Third Periodic Review L-Bar Site

**Hwy 395, Chewelah, WA 99109, Stevens County
Facility Site ID: 762, Cleanup Site ID: 88**

Toxics Cleanup Program, Eastern Region

Washington State Department of Ecology
Spokane, Washington

August 2025

Document Information

This document is available on the Department of Ecology's [L-Bar Site cleanup site page](#).¹

Related Information

- Facility Site ID: 762
- Cleanup Site ID: 88

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[Toxics Cleanup Program](#)²

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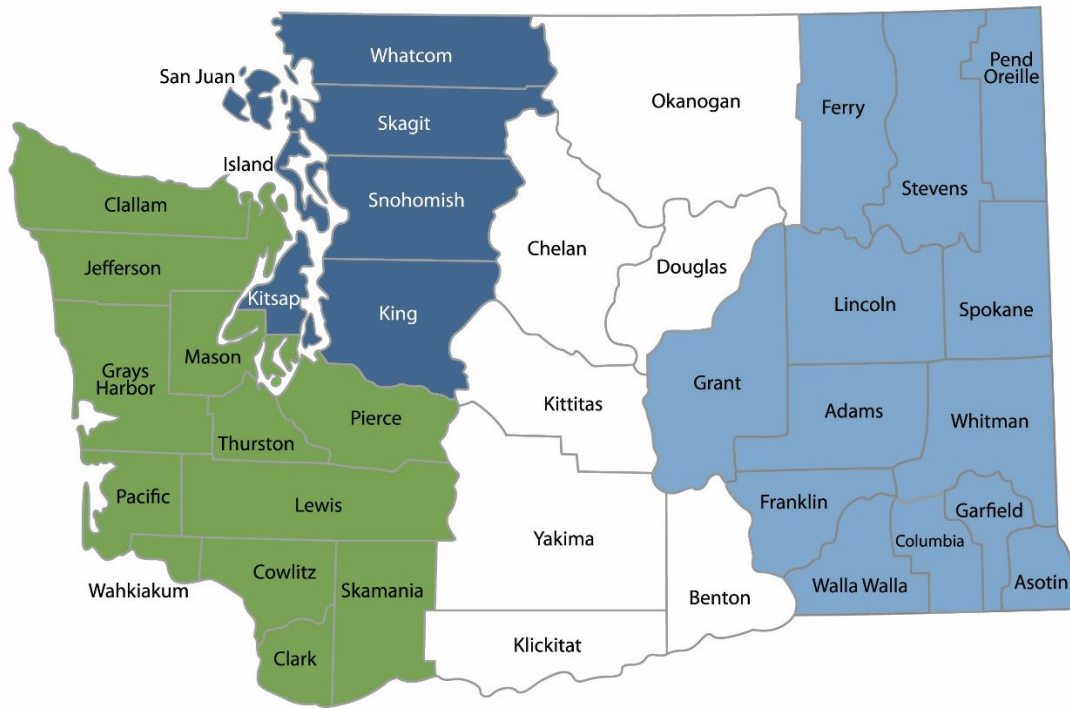
¹ <https://apps.ecology.wa.gov/cleanupsearch/site/88>

² <https://ecology.wa.gov/About-us/Who-we-are/Our-Programs/Toxics-Cleanup>

³ <https://ecology.wa.gov/ADA>

Department of Ecology's Region Offices

Map of Counties Served



Southwest Region 360-407-6300	Northwest Region 206-594-0000	Central Region 509-575-2490	Eastern Region 509-329-3400
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Region	Counties served	Mailing Address	Phone
Southwest	Clallam, Clark, Cowlitz, Grays Harbor, Jefferson, Mason, Lewis, Pacific, Pierce, Skamania, Thurston, Wahkiakum	PO Box 47775 Olympia, WA 98504	360-407-6300
Northwest	Island, King, Kitsap, San Juan, Skagit, Snohomish, Whatcom	PO Box 330316 Shoreline, WA 98133	206-594-0000
Central	Benton, Chelan, Douglas, Kittitas, Klickitat, Okanogan, Yakima	1250 W Alder St Union Gap, WA 98903	509-575-2490
Eastern	Adams, Asotin, Columbia, Ferry, Franklin, Garfield, Grant, Lincoln, Pend Oreille, Spokane, Stevens, Walla Walla, Whitman	4601 N Monroe Spokane, WA 99205	509-329-3400
Headquarters	Across Washington	PO Box 47600 Olympia, WA 98504	360-407-6000

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Introduction

The Washington Department of Ecology (Ecology) reviewed post-cleanup site conditions and monitoring data to ensure human health, and the environment are being protected at the L-Bar cleanup site (Site). Site cleanup was implemented under the Model Toxics Control Act (MTCA) regulations, Chapter 173-340 Washington Administrative Code (WAC). This is the third periodic review conducted for this Site. Ecology completed the first and second periodic review(s) in 2012 and 2019.

Cleanup activities at this Site were completed under an agreed order. Residual concentrations of contaminants in groundwater and surface water that exceeded MTCA cleanup levels remain on the property. The MTCA cleanup levels for air, soil, sediment, surface water, and groundwater are established under [WAC 173-340-750](https://app.leg.wa.gov/WAC/default.aspx?cite=173-340-750),⁴ [WAC 173-340-740](https://app.leg.wa.gov/WAC/default.aspx?cite=173-340-740),⁵ [WAC 173-340-760](https://app.leg.wa.gov/WAC/default.aspx?cite=173-340-760),⁶ [WAC 173-340-730](https://app.leg.wa.gov/WAC/default.aspx?cite=173-340-730),⁷ and [WAC 173-340-720](https://app.leg.wa.gov/WAC/default.aspx?cite=173-340-720),⁸ respectively.

Ecology determined institutional controls in the form of a restrictive covenant would be required as part of the cleanup action for the Site. [WAC 173-340-420\(2\)](https://app.leg.wa.gov/WAC/default.aspx?cite=173-340-420(2))⁹ requires Ecology to conduct a periodic review of certain sites every five years. For this Site, a periodic review is required because the department shall conduct periodic reviews of a site whenever the department conducts a cleanup action; whenever the department approves a cleanup action under an order, agreed order or consent decree; or, as resources permit, whenever the department issues a no further action opinion; and where an institutional control is required as part of the cleanup action.

When evaluating whether human health and the environment are being protected, Ecology must consider the following factors (WAC 173-340-420(4)):

- a) The effectiveness of ongoing or completed cleanup actions, including the effectiveness of engineered controls and institutional controls in limiting exposure to hazardous substances remaining at the site
- b) New scientific information for individual hazardous substances or mixtures present at the site
- c) New applicable state and federal laws for hazardous substances present at the site
- d) Current and projected site and resource uses
- e) The availability and practicability of more permanent remedies

⁴ <https://app.leg.wa.gov/WAC/default.aspx?cite=173-340-750>

⁵ <https://app.leg.wa.gov/WAC/default.aspx?cite=173-340-740>

⁶ <https://app.leg.wa.gov/WAC/default.aspx?cite=173-340-760>

⁷ <https://app.leg.wa.gov/WAC/default.aspx?cite=173-340-730>

⁸ <https://app.leg.wa.gov/WAC/default.aspx?cite=173-340-720>

⁹ <https://app.leg.wa.gov/wac/default.aspx?cite=173-340-420>

- f) The availability of improved analytical techniques to evaluate compliance with cleanup levels

Ecology publishes a notice of all periodic reviews for Ecology-supervised and -conducted cleanups in the *Contaminated Site Register* and provides an opportunity for public comment.

Summary of Site Conditions

Site description and history

The Site is located on the west side of Highway 395 two miles south of Chewelah in the Colville River Valley of Stevens County (Appendix A).

The Site occupies approximately 67 acres of industrial and agricultural land. The industrial area covers approximately 50 acres. An adjoining 17-acre agricultural field (the north field) lies between the industrial area and the Colville River.

A magnesite residue pile covers nearly 17 acres within the southwest quadrant of the Site. The magnesite residue materials represent mining/milling byproducts from an earlier era of Site industrial operations (Northwest Magnesite) and are not subject to cleanup due to L-Bar's past on-Site operations. The magnesite residue pile is not vegetated, is currently uncovered, and has steep side slopes.

To the west the Site is bounded by a ditch that provides drainage for the western part of the Site and continues to discharge to the Colville River.

Two high-density polyethylene-(HDPE) lined storage ponds, a stormwater holding pond, and additionally a stormwater evaporation pond that were part of the water management system during L-Bar's operating years. are still present at the northern part of the Site.

The former magnesite processing plant and later agricultural warehousing buildings are located along the east side of the Site. Even though these buildings are located inside the Site, these buildings were not affected by the former FB operations and are not considered any further in this report. Some of the buildings are used for hay storage while the remainder are abandoned and in a derelict state.

Finally, An inactive HDPE-lined Sanitary Lagoon formerly used for on-site sewage waste management is located at the southern end of the Site.

The Site has been associated with magnesium processing since 1917, and large quantities of magnesite ore for magnesium oxide production were processed and stockpiled at the Site until 1968. In the mid-1970s, the facility was converted to recover magnesium from flux bar (FB), a magnesium processing byproduct. FB was supplied primarily from a magnesium plant near Addy, Washington. The Site was owned and operated by Phoenix Resources Recovery, Inc. from

1977 to 1986. L-Bar Products, Inc. operated the Site from 1986 to 1991 when it closed down due to insolvency.

The magnesium recovery process involved crushing raw FB and screening the crushed materials to recover metallic magnesium granules. The remaining material was called flux bar residue (FBR). FB and FBR constituents are very reactive with water; the reactions generate heat and had caused several fires at the Site during the plant's operating years. The reaction of one of the constituent, magnesium nitride reacts with water and releases ammonia. Other FB and FBR constituents: magnesium and potassium chloride salts are highly soluble in water and easily leached from these materials into groundwater.

When the plant closed in December 1991, predominantly raw FB with some FBR was stored on top of the southern half of the Magnesite Residue pile in several separate uncovered piles. Processed FBR was stockpiled in a large HDPE-covered pile to the north of the plant's main processing area at the northeast side of the Site. Additionally, FB and FBR was also stored in some of the buildings on-Site.

Past Site operating practices and inadequate storage of FB and FBR resulted in soluble components leaching from the materials into soil, groundwater, and surface water.

After L-Bar's operations stopped in 1991, the Site has been used for various agricultural operations. Presently the Site is only used for hay storage in some of the buildings at the east side of the Site.

A vicinity map is in Appendix A, and a Site plan is in Appendix B.

Site investigations

Ecology issued several enforcement orders and penalties to L-Bar for violations of air quality, water quality, and dangerous waste regulations while the plant was in operation before 1991. Some emergency actions and plant rehabilitations were undertaken to address the orders. However, when the plant closed, an estimated more than 100,000 tons of FB and FBR materials under the covered pile, on top of the magnesite pile, and in buildings were left on Site.

The formal MTCA cleanup process began in 1994. NWA entered into an agreed order with Ecology in 1995 that included provisions for conducting interim actions, a remedial investigation (RI), and a feasibility study (FS). The RI/FS included further site investigations and sampling and evaluating cleanup alternatives for the Site. CH2M completed the RI in 1998 and the FS in 1999.

Cleanup actions

Interim actions under this agreed order performed from 1996 to 1999 included removing FB and FBR from the top of the Magnesite Residue pile and removing additional FB and FBR from the plant's main processing area (CH2M, 2001).

Ecology issued a draft CAP in April 2000; after public review and comment, the final CAP was issued in June 2000 as part of Agreed Order No. DE 00TCPER-984. Cleanup actions included contaminant source removal activities including removing the covered FBR pile north of the processing area, removing FB/FBR materials in plant buildings, and removing FB/FBR stockpiles on top of the magnesite pile. Additionally, a ditch draining the central portion of the site into Colville River was filled in and closed..

Over 133,000 tons of FB-related materials were excavated or removed and disposed of at an approved waste disposal facility. The amount of source material removed from the covered pile area was approximately 129,000 tons. Clean, granular fill material was placed into the footprint of the former covered FBR pile area following excavation and removal of the source materials. The Site cleanup action took place between 2000 and 2004.

Cleanup performance monitoring

Upon completion of the Site cleanup action semi-annual performance compliance monitoring of surface water at four locations:

- Colville River upstream of the West Ditch discharge point.
- Colville River downstream of the West Ditch discharge point.
- Upper portion of the west ditch located at the southwestern side of the Site.
- Lower portion of the west ditch immediately above the discharge point into Colville River.

The compliance groundwater monitoring network consists of 13 sampling locations, including 12 shallow resource-protection groundwater monitoring wells and one deep production well in the intermediate aquifer (see Appendix B). Groundwater monitoring is conducted semi-annually. The 12 wells monitor the SWBU and the intermediate, confined, alluvial water-bearing zone. Wells in the Site groundwater-monitoring network are grouped into the following categories:

- Site Background: Represented by well P-12 and until this periodic review, the production well completed in the deeper intermediate and confined aquifer. The production well will be transferred to the Site Interior group of wells in the next periodic review period after detections of ammonia exceeding the Site cleanup level as discussed below.
- Source Removal Areas: Represented by well P-13, located immediately south of the magnesite residue pile, and wells SA-10, SA-11, and SA-14 located atop the magnesite residue pile and in locations where former source removal actions have been completed.
- Site Interior: Represented by well P-09, located within the former operations area east of the magnesite residue pile and south of the covered FBR pile. The L-bar production well will be included in this group of wells during the next periodic review period as discussed above.
- North Field: Represented by wells P-05, P-06, P-19, P-20B, P-25, and P-27.

Cleanup standards

Cleanup standards include cleanup levels, the location where these cleanup levels must be met (point of compliance), and any other regulatory requirements that apply to the Site.

[WAC 173-340-704](#)¹⁰ states MTCA Method A may be used to establish cleanup levels at sites that have few hazardous substances, are undergoing a routine cleanup action, and where numerical standards are available for all indicator hazardous substances in the media for which the Method A cleanup level is being used. Method B may be used at any site and is the most common method for setting cleanup levels when sites are contaminated with substances not listed under Method A. Method C cleanup levels may be used to set soil and air cleanup levels at industrial sites.

Site-specific MTCA Method B cleanup levels for unrestricted land use were determined to be appropriate for contaminants at this Site based on protection of surface water and groundwater. The Site cleanup levels are in Table 1.

Table 1. Cleanup levels for surface water and groundwater contaminants

Contaminant	Surface water cleanup level (mg/l)	Groundwater cleanup level (mg/l)
Chloride	230	230
Ammonia	0.13	0.13
TDS	500	1,092
Nitrate	NE	10
Nitrite	NE	1
Barium	NE	1
Manganese	NE	0.44
Selenium	NE	0.0082
Thallium	NE	0.00112
pH (dimensionless)	NE	8.5

TDS = Total dissolved solids

NE = not established

mg/kg = milligrams per kilogram

The cleanup actions conducted at the Site were determined to be routine, few hazardous substances were found at the Site, and numerical standards were available in the MTCA Method A table for each hazardous substance.

The point of compliance is the area where the cleanup levels must be attained.

For groundwater, the point of compliance is throughout the Site from the uppermost level of the saturated zone extending vertically to the lowest most depth which could potentially be

¹⁰ <https://app.leg.wa.gov/WAC/default.aspx?cite=173-340-704>

affected by the Site. This is the standard point of compliance. Where the affected groundwater flows into the Colville River, a conditional point of compliance is located within the surface water as close as technically possible to the point or points where groundwater flows into surface water may be approved under the requirements listed in WAC 173-340-720(6)(a).

Restrictive Covenant

Ecology determined institutional controls would be required as part of the cleanup action to document the remaining contamination, protect the cleanup action, and protect human health and the environment. On May 29, 2001, institutional controls in the form of a [restrictive covenant](#)¹¹ (Covenant) were recorded for the Site.

The Covenant recorded for the Site imposes the following limitations:

1. The Site shall only be used for industrial or commercial purposes.
2. No changes in land at the Site that may cause a release to the environment shall take place unless approved by Ecology in writing.
3. Shallow (< 70 feet in depth) groundwater cannot be used for drinking water unless approved by Ecology in writing.
4. Installation of new water supply wells in deeper (. 70 feet depth) must be approved by Ecology in writing.
5. Any Site activity that may cause a release of contaminants to the environment must be approved by Ecology in writing.
6. Any Site activity that may interfere with the integrity of the implemented Site cleanup is prohibited.
7. The Site owner must provide Ecology a written notice 30 days in advance of a Site property sale or any other type of transfer of the Site property to another party.
8. The Site property owner must restrict any property leasing agreements to be consistent with the Site Restrictive Covenant.
9. The Site property owner must obtain written approval from Ecology before implementing any Site property activities that are inconsistent with the terms and conditions of the restrictive covenant.
10. The Site property owner must grant Ecology access to be able to evaluate the progress of the Site cleanup action.

¹¹ <https://apps.ecology.wa.gov/cleanupsearch/document/82861>

Periodic Review

Effectiveness of completed cleanup actions

During the Site visit Ecology conducted on August 13, 2024. No changes in the Site appearance since the last periodic review in 2019 were noted. The Site is primarily abandoned. Some buildings on-site are used to store hay bales.

Direct contact

The cleanup actions were intended to eliminate exposure to contaminated groundwater and surface water at the Site. Exposure pathways to contaminated soils by ingestion and direct contact were reduced by contaminant source removal followed by monitored natural attenuation (MNA). MNA appears to be gradually reducing on-Site groundwater and surface water contaminant concentrations, and no repair, maintenance, or contingency actions are required at this time at the Site.

Protection of groundwater

FB piles, FBR piles, and FB and FBR materials stored inside buildings were removed during the cleanup action implemented between 2000 and 2004. Semi-annual groundwater and surface water compliance monitoring as part of the site MNA has been conducted at the site since 2004.

Institutional controls

Institutional controls in the form of a Covenant were implemented at the Site in 2001. The Covenant remains active and discoverable through Stevens County recording office. Ecology found no evidence that a new instrument has been recorded that limits the effectiveness or applicability of the Covenant. This Covenant prohibits activities that will result in the release of contaminants contained as part of the cleanup action and prohibits any use of the property that is inconsistent with the Covenant, unless approved by Ecology in advance. This Covenant ensures the long-term integrity of the cleanup action will be protected.

New scientific information for individual hazardous substances or mixtures present at the Site

There is no new relevant scientific information for the hazardous substances remaining at the Site.

New applicable state and federal laws for hazardous substances present at the Site

There are no new applicable or relevant state or federal laws for hazardous substances remaining at the Site.

Current and projected Site and resource uses

The Site is used for commercial purposes. There have been no changes in current or projected future Site or resource uses. The current Site use is not likely to have a negative impact on the protectiveness of the cleanup action.

Availability and practicability of more permanent remedies

The remedy implemented included containing hazardous substances, and it continues to be protective of human health and the environment. While more permanent remedies may be available, they are still not practicable at this Site.

Availability of improved analytical techniques to evaluate compliance with cleanup levels

The analytical methods used at the time of the cleanup action were capable of detection below the selected MTCA cleanup levels. The presence of improved analytical techniques would not affect decisions or recommendations made for the Site.

Conclusions

- The cleanup actions completed at the Site appear to be protective of human health and the environment.
- Previous source removal actions were effective at eliminating the primary contaminant release mechanisms that allowed source-related contaminants to migrate into soil, sediments, shallow groundwater, and surface water at the Site.
- The existing monitoring network for surface water and groundwater is adequate for evaluating changes (both temporal and spatial) in indicator hazardous substance concentrations.
- Site activities and operations have changed since the 2013-2017 review period. The agricultural on-Site operation observed during the 2013-2017 review period has been discontinued, and all live plants have been removed.
- The 2020 CMP update does not include pH as a Site primary indicator hazardous substance.
- Site cleanup levels have not been met, although some improvements to groundwater and surface water quality have been demonstrated since the last periodic review. Concentrations of primary indicator hazardous substance (chloride, ammonia, and TDS) in surface water and shallow groundwater are still elevated compared to their established cleanup levels. Concentrations of secondary indicator hazardous substance (trace metals, nitrate, nitrite, and pH) exceed cleanup levels at selected locations.

- Concentrations of chloride, ammonia, and TDS (primary indicator hazardous substance) are declining progressively in many areas of the Site.
- The primary environmental fate of chloride is mobilization and transport from solid phase media (soil and magnesite residue) to shallow groundwater and surface water, with eventual discharge to the Colville River.
- The primary environmental fate of nitrogenous compounds such as ammonia and nitrate is influenced in part by plant uptake that is occurring primarily within the north field (agricultural field), and likely to some degree by vegetation growing along or within the west ditch. Some ammonia and possibly nitrate currently discharge to the Colville River via surface water (West Ditch) and shallow groundwater.
- Surface water quality in the West Ditch sampling point near the outfall into Colville River (station D2) is showing progressive improvement since the previous 2018 periodic review was conducted. More specifically, the concentration and loading of indicator hazardous substances declined measurably between the first periodic review interval (2005-2011) and the second periodic review interval (2012-2017).
- Groundwater monitoring data analysis demonstrates declining concentration trends at several locations within the monitoring network. An increasing concentration trend is observed in one well (SA-11) located in the magnesite residue pile. This increasing trend may be caused by a migrating “slug” of impacted groundwater migrating from the southwest where past FB/FBR used to be stored before removal into the areas around wells SA-10 and SA-11 to the northeast as described in CH2M (2014). However, it is possible that contaminants may still be flushed from residual FB/FBR materials left behind within this large pile of legacy wastes associated with a former magnesite processing facility.
- Shallow groundwater in the north field discharges to the Colville River. Although primary indicator hazardous substance in north field groundwater and the West Ditch outfall exceed cleanup levels, continued monitoring of the Colville River upstream and downstream of the Site has shown that impacts from this groundwater discharge are negligible. Surface water standards have not been exceeded in the river.
- The specific sources or mechanisms that have caused elevated manganese, barium, selenium, and thallium concentrations in shallow groundwater do not appear to be clearly tied to a single source or geochemical factor.
- Trace metal concentrations in groundwater are expected to decline over time due to ongoing natural attenuation processes. The environmental fate of trace metals likely will include sorption to soil under favorable geochemical conditions, or gradual flushing, dispersion, and discharge to the Colville River via shallow groundwater.
- Groundwater levels or water pressure in the production well have not been measured and recorded during past groundwater monitoring events.
- Groundwater in the artesian L-bar production well shows an impact of Site contaminants with ammonia and pH sometimes exceeding the Site cleanup levels. The ammonia and pH

impacts in the water production well water may be caused by other factors such as ammonia cross- contaminated between samples during the sampling event or analysis.

- Reporting limits for thallium exceed the thallium Site cleanup level in most samples collected during the 2018-2023 review period.
- The existing Restrictive Covenants that contain certain omissions and inaccuracies are being replaced with new Restrictive Covenants that conform with the Uniform Covenants Act.
- However, the current restrictive Covenant for the property is still effective in protecting human health and the environment from exposure to hazardous substances and the integrity of the cleanup action.

Based on this periodic review, Ecology has determined the requirements of the Covenant are being followed. No additional cleanup actions are required by the property owner at this time. The owner is responsible for continuing to inspect the Site to ensure the integrity of the cleanup action is maintained and that on-Site groundwater and surface water is not disturbed by any on-Site activities.

Next review

Ecology will schedule the next review for the Site five years from the date of this periodic review. If additional cleanup actions or institutional controls are required, the next periodic review will be scheduled five years after those activities are completed.

References

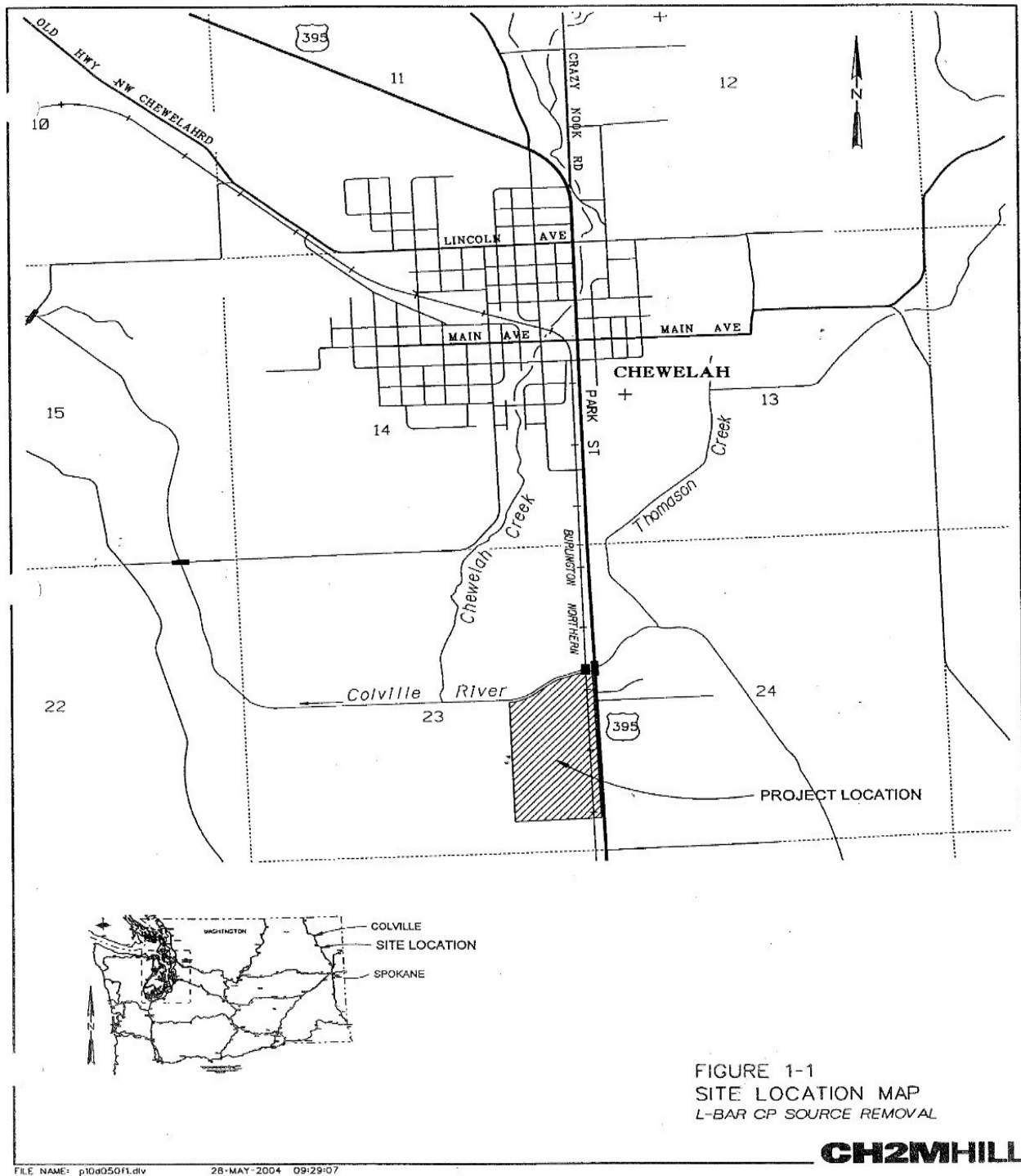
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Ecology. *Second Periodic Review*. August 2019.

Ecology. Site visit. August 13, 2024.

Appendix A. Vicinity Map



Appendix B. Site Plan

