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From: Dave Dilks, Scott Wade **Date:** ~~October 11~~November 15, 2022
Project: SRRTTF10
To: Spokane River Regional Toxics Task Force **CC:**

SUBJECT: DRAFT: Spokane River Historical PCB Source Review

Summary

This memorandum describes: 1) a review of historical information relevant to identifying sites ~~potentially contributing legacy sources of PCBs to the Spokane River~~that had either known PCB~~C~~ contamination (as designated by Ecology) or historical activities that are associated with PCBs, and 2) subsequent prioritization of those sites in terms of their likelihood to currently contribute PCBs to the Spokane River ~~providing a continuing PCB contribution to the river~~. The results of this review and prioritization are intended to help guide future Task Force activities.

A total of 130 sites were identified in the study area (Mission Reach and Spokane Industrial Park) via review of historical fire insurance maps, Washington State Department of Ecology (Ecology) and U.S. EPA data bases, and prior Ecology review of contaminated sites. Sites were reviewed and prioritized with respect to characteristics relevant to their being a contributor of PCBs to the Spokane River. These characteristics consisted of:

- the likelihood that PCBs located at the site would be delivered to the Spokane River,
- the proximity of the site to observed Spokane River PCB hot spots,
- the initial level of PCB contamination at the site,
- the present-day level of PCB contamination at the site, and
- presence of known PCB migration off of the site.

The outcome of this effort was a prioritized list of historical sites ranked in terms of their likelihood of delivering PCBs to the Spokane River, presented in the appendix to this memorandum. This prioritized list is intended to support future efforts to: 1) investigate~~confirm~~ whether PCBs are ~~still~~ being delivered from high priority sites, and 2) ~~encourage~~ provide a basis for implementing controls of the PCB loading at those sites confirmed to ~~still~~ be contributing PCBs, recognizing that these controls may need to be directed by agencies other than the Task Force.

Introduction

The purpose of the Spokane River Regional Toxics Task Force is to identify and remove sources of PCBs to the Spokane River. While the Task Force has been successful in identifying and beginning to remediate many PCB sources, yet-unidentified sources of PCBs are believed to exist. The known sources have been quantified via their delivery from point source discharges, while unknown sources are likely delivered in a diffuse manner via contaminated groundwater, atmospheric deposition and/or overland surface runoff.

PCB fingerprinting analyses (Rodenburg, 2022) have demonstrated that most PCBs present in the Spokane River system originate from legacy PCB production. As such, it is reasonable to conclude

Commented [OM1]: Some of the sites identified with the Sanborn maps have never been 'known' to contribute any PCBs to the Spokane River

Commented [DD2R1]: I think the original wording was acceptable (i.e. no mention of "known" contributions, just "sites potentially contributing"), but have no problem accepting your suggested edit.

Commented [OM3]: Perhaps this should be a stronger word but essentially it does not seem possible for the SRRTTF to control PCB loading from these sites, so putting it as a goal may be unattainable. (same comment below and I know we talked about this at the last TTWG meeting)

Commented [DD4R3]: Good point. See if my proposed edit works.

Commented [OM5]: Should atmospheric deposition be listed here?

Commented [DD6R5]: Added.

that most unidentified sources of PCBs also come from legacy sources ~~production~~. Because of the difficulty in accurately measuring diffuse delivery mechanisms, un-identified sources may be identified by examining historical information related to activities in the watershed that might have been responsible for releasing PCBs into the environment.

The purpose of this project is to conduct a review of historical information relevant to identifying sites potentially contributing legacy sources of PCBs to the Spokane River, with a focus on the Spokane Industrial Park and areas contributing to the Mission Reach. The outcome of the review is a prioritization of identified sites with respect to their potential for contributing PCBs to the river.

This memorandum describes the results of that review, and is divided into sections of:

- Review and assessment of Sanborn fire insurance maps,
- Review of site reports and monitoring data, and
- Prioritization of identified sites.

Review and Assessment of Sanborn Fire Insurance Maps

Sanborn maps are commercially produced fire insurance maps of U.S. cities providing information about individual properties during the 1800's and 1900's. Sanborn maps provide sufficient detail to identify which properties are associated with activities that were historically associated with PCB use ~~and potential for environmental contamination~~.

The spatial and temporal domain of Sanborn map review was based on a consensus decision of the Task Force's Technical Track Work Group (TTWG):

- The spatial domain of the maps reviewed covers a ¼ mile buffer north of the Mission Reach and a ½ mile buffer south of the Mission Reach. This range was selected because it covers the majority of industrial area contributing to the Mission Reach as well as covering areas most likely to have PCBs delivered to the Mission Reach. The longitudinal extent of the Mission Reach was defined as extending from approximately ¼ mile upstream of E. Mission Avenue bridge downstream to the Division St. bridge (Figure 1).
- The temporal domain of the maps reviewed covered the years 1950, 1960, 1970, and 1980.

Public domain maps covering the defined spatial domain were obtained from Fire Insurance Maps On-line for the years 1950 and 1960. Maps for the years 1970 and 1980 were purchased from LightBox Environmental Data Resources.

~~These maps were reviewed to identify the locations of industrial facilities and other features that were potential sources of PCB releases~~ likely used or housed PCBs. ~~Facilities were categorized as having "High potential", "Medium potential", or "Lower potential"~~ of PCB use ~~based upon a literature review of PCB source potential across a range of industries (Electric Power Research Institute, 1999; Consolidated Edison Company of New York, 2012; Consolidated Edison Company of New York, 2013 and 2014; U.S. Environmental Protection Agency, 1976a, 1976b, 1987, and 2014; Panero, et al, 2005; and Press, 2007).~~ LimnoTech reviewed the historical maps and recorded the locations of sites that included the types of industry or land use that possibly used or involved PCBs, and therefore were sites of potential release. Sites were categorized as having "High potential", "Medium potential", or "Lower potential" of PCB use and release based upon a literature review of PCB use across a range of industries (Eastman, 2016; Erickson and Kaley, 2011; Michigan Technological University, 2016; Panero, et al., 2005; Paratherm, 2022; Pfafflin

Commented [OM7]: Does this mean processes that produced PCBs as a byproduct? Would it be more accurate to say "legacy sources" since some PCBs were in products that were used historically but not actually produced at that site.

Commented [DD8R7]: Agree that "legacy sources" is less confusing.

Commented [OM9]: The potential for environmental contamination would be a deduction made after locating these sites and learning about the activities that took place, not something the Sanborn maps can provide.

Commented [DD10R9]: I think Sanborn maps can provide information on "potential" for PCB contamination, but not an absolute determination. Nonetheless, I have no problem with the proposed edit.

Commented [OM11]: The facilities were categorized as having a high, low or medium potential for PCB use? Or for having released PCBs. Those two are very different.

Commented [DD12R11]: Paragraph re-written to make it clearer that potential for both use and release were considered.

Commented [OM13]: Can this be described a bit in the text? What was the objective, how was it conducted, etc…

Commented [DD14R13]: Paragraph re-written.

and Ziegler, 2016; Stockholm Convention, 2001; U.S. EPA, 1976; U.S. EPA, 1983; U.S. EPA, 2004; Washington State Department of Ecology, 2014; Woodyard, 2005). The categorization included consideration of the prevalence of PCB uses in that industry type and potential for release (i.e., whether PCBs were likely in closed systems or in open-ended applications). -The resulting categorization scheme is provided in Table 1.

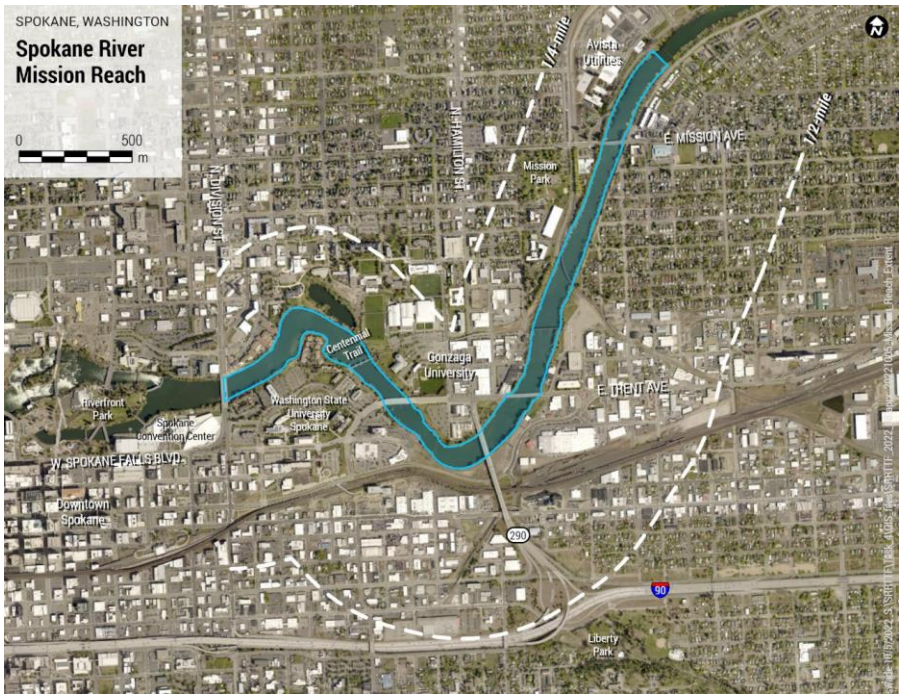

Figure 1. Spatial Domain of Mission Reach Study Area

Table 1. Qualitative Categorization of Potential Historical PCB ~~Generation~~ ~~Potential~~ Use and Release by Industry Types

PCB Use and Release~~Generation~~ Potential	**Industries Associated with Category**
High potential	Electrical transformers, foundry, incinerator, dump, natural gas, plastics manufacturing, scrap metal, silicone glazing.
Medium potential	Auto body repair, auto wrecking, dyeing, junk yard, machine shop, metal working, paint manufacturing, railroad car manufacturing.

Commented [OM15]: The word generation sounds like PCBs were produced at these sites which I don't believe is the case. Perhaps "Use" is a better word. All we know from the maps is that PCBs were used, not released.

Commented [DD16R15]: Agreed that the word "Generation" is misleading. Wording Changed to "Use and Release".

Lower potential	Animal feed manufacturing, asphalt manufacturing, battery manufacturing, bottling works, concrete block and brick factory, industrial laundry, inks, railroad switches, welding supplies.

The locations, the industrial types, and the approximate tenure of the facilities were recorded in a geographic information system, along with information determined to be relevant to the prioritization task (i.e., distance to river, distance to observed biofilm hot spot) as discussed below.

Figure 2 shows the result of combining all years of data and categorizing each site by PCB generation potential. The appendix to this memorandum shows each site identified by industry type and year. It is noted that no Sanborn maps were available south of the river for 1960 and 1970.

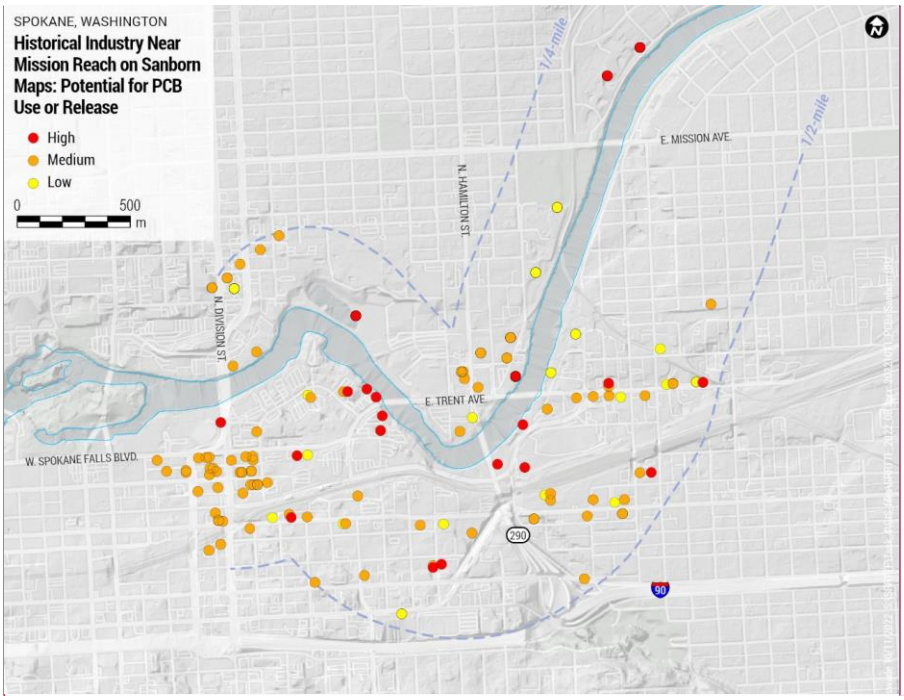

Figure 2. Industrial Sites Identified from Sanborn Map Review, Categorized by PCB Use and Release ~~Generation~~ Potential

It is noted that all Sanborn map review findings are based the upon assumption that historical industry-specific PCB uses in Spokane are consistent with PCB use in industries described in the national data sources described above. The findings are admittedly speculative as they are based on historical land use characterization and not on site-specific observation of PCB use and/or release. For this reason, the word "potential" is always used when describing the results of Sanborn characterization of PCB use or release. The speculative nature of these results is

Commented [OM17]: Maps title should remove the word 'release'

If we want to assume that all sites that had PCBs onsite had the same potential for release I think that is fair, if no other information is known about containment on that site.

It is probably a good idea to add a paragraph outlining assumptions that were made during this review.

Commented [DD18R17]: Text has been edited above to discuss that review did consider potential for release. Map title changed but legend has not.

Paragraph added outlining key assumptions and speculative nature of findings.

Commented [OM19]: Thanks for adding this paragraph on study assumptions. We would recommend adding a sentence about study limitations not including historic buildings within the study area that could potentially contain PCB laden paint and caulk.

accounted for in the recommendations for future actions described below. High priority Sanborn sites are not automatically assumed to be contributing PCBs; rather, they are prioritized for further investigation towards confirming whether site-specific PCB and use and/or release occurred.

It is also noted that the Sanborn review does not identify historic buildings in the study area that could potentially contain PCB-laden paint and caulk. The large number of older buildings in central Spokane could represent a significant cumulative amount of PCB use, but these buildings likely contain fewer PCBs on a per-site basis than the historical facilities identified during the Sanborn map review. Further, the PCBs distributed in the older buildings are expected to be released into the environment at a slower rate (or offsite at a landfill) than the PCBs at most of the priority Sanborn sites identified here.

Review of Historical Reports and Associated Monitoring Data

This study also reviewed historical reports and associated monitoring data for sites known to have been associated with PCB use. The sites considered included those identified in:

- Ecology's "What's in My Neighborhood: Toxics Cleanup" web site (https://apps.ecology.wa.gov/neighborhood/):
- The Ecology memorandum "Assessment of PCBs in Spokane Valley Groundwater" (Marti and Maggi, 2015).
- EPA notification data base of companies or people storing, transporting or disposing of PCBs or conducting PCB research and development (https://www.epa.gov/pcbs/notifications-polychlorinated-biphenyl-pcb-activities).

Thirty-one additional sites were identified in the Spokane area; this number was reduced to eleven after filtering for sites that were located in the Mission Reach or Spokane Industrial Park. Figure 3 maps all sites considered, indicating whether the site was identified via Sanborn map review, Ecology's Toxic Cleanup web site, Marti and Maggi (2015), or the EPA database.

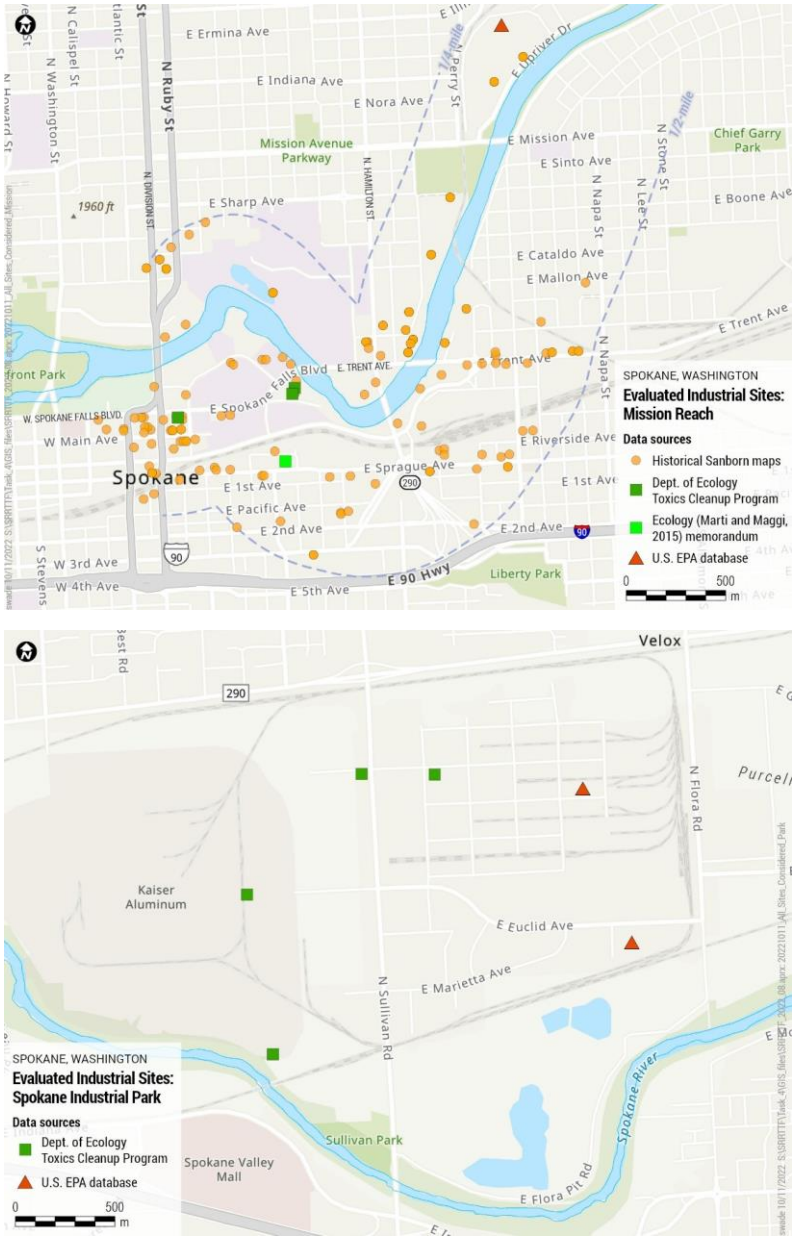

Figure 3. Map of All Sites Considered for Prioritization and the Sources Used to Identify Them

Prioritization of Identified Sites

All sites identified above were prioritized as to their potential for providing an ongoing source of PCBs to the Spokane River. This section begins by describing the factors considered in prioritization, then describes the prioritization process and its results, then concludes with a discussion of potential next steps.

Prioritization Factors

The prioritization process applied here built off the approach of Marti and Maggi (2015), which ranked sites based upon several factors, such as whether PCB use at the site was confirmed and status of remediation efforts. Based upon consultation with the Task Force's Technical Track Work Group, some of these factors were included in adjusted form and additional factors were added. The resulting factors considered were:

- Initial level of PCB contamination: This was a surrogate for "confirmed release of PCBs" as considered by Marti and Maggi (2015), expanded to allow consideration of the magnitude of the release as represented by the highest observed soil PCB concentration.
- Current level of PCB contamination: This was a surrogate for remediation status as considered by Marti and Maggi (2015), expanded to allow consideration of the extent of cleanup efforts.
- PCB delivery potential: This factor was added to consider the likelihood that PCBs present at a site could be delivered to the Spokane River in the area of interest.
- Distance to hot spots: This factor was added to consider the proximity to sites to locations in the Mission Reach where elevated levels of PCBs were identified in 2018 and 2019 biofilm samples collected by Ecology.
- Off-site contamination: This factor was added to consider whether PCBs had been detected outside the boundaries of the site and migrating towards the Spokane River.

Prioritization Process

The above factors were evaluated for each site and the results combined as part of a "weight of evidence" approach to prioritization. This process consisted of: 1) Assigning a sub-score for each factor based upon available data, and 2) Adding sub-scores together for all factors, and ranking sites for prioritization based on this combined score. The sub-scores for each parameter are shown in Table 2 and discussed below.

Table 2. Sub-Score Rating System

Delivery Potential		Distance to Hot Spot		Initial Site Contamination	
Attribute	**Score**	**Attribute**	**Score**	**Attribute**	**Score**
GW flow towards river, <300 m away	+2	<100 m	+2	>10,000 ug/kg	+6
GW flow towards river, >300 m away	+1	100 - 250 m	+1	Qualitatively high	+6
GW flow away from river, <100 m	0	250 – 500 m	0	1,000 - 10,000 ug/kg	+3
GW flow away from river, >100 m	-1	>500 m	-1	Qualitatively medium	+3
				Qualitatively low	0
				<1,000 ug/kg	-3

Current Site Contamination		Offsite Contamination	
Attribute	**Score**	**Attribute**	**Score**
>10,000 ug/kg	+2	Observed	+5
1,000 - 10,000 ug/kg	+1	No data	0
No data	0	Confirmed absent	-5
<1,000 ug/kg	-2		

The scoring for Delivery Potential considers two factors: 1) whether groundwater at the site is flowing immediately towards or away from the river, and 2) the distance from the site to the river. A site located where the direction of groundwater flow is towards the river receives a +2 score if it is less than 300 m from the river and a +1 score if it is more than 300 m from the river. A site located where the direction of groundwater flow is away from the river receives a zero score if it is less than 300 m from the river and a -1 score if it is more than 300 m from the river.

The scoring for Distance from Hot Spot depends solely upon the shortest distance from the site to one of the Ecology (Era-Miller and Wong, 2022) biofilm sampling sites showing PCB concentrations greater than 5000 pg/g. A site located within 100 m of a hot spot receives a +2 score, a site located between 100 and 250 m of a hot spot receives a +1 score, a site located between 250 and 500 m of a hot spot receives a zero score, and a site located more than 500 m from a hot spot receives a score of -1.

The scoring for Initial Contamination depends upon the highest soil PCB concentration observed prior to remediation for sites where data exist, and a qualitative assessment of PCB release potential for sites without data (i.e., Sanborn sites). For sites where observed PCB concentration data are available, ~~A~~a site with a peak concentration greater than 10,000 ug/kg receives a +6 score, a site with a peak concentration between 1000 and 10,000 ug/kg receives a +3 score, and a site with a peak concentration less than 1000 ug/kg receives a score of -3. For ~~a~~ sites without observed PCB concentration data (e.g., Sanborn sites), ones falling in the Table 1 category of High Potential receives a +6 score, a site falling in the Table 1 category of Medium Potential receives a +3 score, and a site falling in the category of Lower Potential receives a score of zero.

The scoring for Current Contamination depends upon the highest observed present-day soil PCB concentration. A site with a peak concentration greater than 10,000 ug/kg receives a +2 score, a site with a peak concentration between 1000 and 10,000 ug/kg receives a +1 score, and a site with a peak concentration less than 1000 ug/kg receives a score of -2. A site without data receives a score of zero.

The scoring for Offsite Contamination depends upon whether PCB contamination from a site has been observed off-site migrating towards the Spokane River. A site where offsite contamination has been observed receives a score of +5. A where off-site monitoring exists but shows no presence of contamination receives a score of -5. A site without data receives a score of zero.

Commented [OM20]: Unclear on what this is, how this assessment was conducted

Commented [DD21R20]: Text added to clarify.

Commented [OM22]: I don't think these can be evaluated together. One has data and one does not. The method used for the factor "Current Contamination" seems less presumptive.

Commented [DD23R22]: Agreed that current scoring of Sanborn sites is presumptive; the flip side is that we throw out valuable information if we ignore the fact that certain activities had a much higher potential for PCB use than others.

I suggest that we address this by categorizing prioritization results based upon whether the current score is based upon observed data or presumed from Sanborn maps, stating that the first action for priority Sanborn sites is investigation of available site-specific information rather than directly moving to field monitoring.

Results of Prioritization

The prioritization scheme described above was applied to all sites. The results for the highest ranked are shown in Table 3 and plotted in Figure 4. A complete listing of site results in provided in the appendix. Sites where observed PCB concentration data exist are shown in bold and have their cleanup status listed, as these may merit different follow-up actions than the non-bolded sites that are based on Sanborn maps.

Table 3. Results of Prioritization Process – Highest Ranked Sites

Rank	Site	~~Delivery~~ Potential Sub-score	~~Distance to~~ Hot Spot Sub-score	~~Initial~~ Contamination Sub-score	~~Current~~ Contamination Sub-score	Offsite Contamination Sub-score	Total Score
1	Inland Metals Inc	2	1	6	1	5	15
2	Kaiser Aluminum & Chemical Corporation	1	-1	6	2	5	13
3	City of Spokane Incinerator Department	2	2	6	0	0	10
3	Dump	2	2	6	0	0	10
3	Dump	2	2	6	0	0	10
6	The Spokane Gas & Fuel Co. storage plant	2	1	6	0	0	9
6	24-28 E Spokane Falls Boulevard	2	-1	6	2	0	9
8	Truck body shop, truck body repairing, mach	0	2	6	0	0	8
8	Brass and iron works	2	0	6	0	0	8
8	Truck wrecking and blacksmith	2	0	6	0	0	8
8	Western Light Metals	2	0	6	0	0	8

Rank	Site	Delivery Potential Sub-score	Distance to Hot Spot Sub-score	Initial Contamination Sub-score	Current Contamination Sub-score	Offsite Contamination Sub-score	Total Score	Site Status
1	***Inland Metals Inc***	***2***	***1***	***6***	***1***	***5***	***15***	**No Further Action**
2	***Kaiser Aluminum & Chemical Corporation***	***1***	***-1***	***6***	***2***	***5***	***13***	**Cleanup Started**
3	City of Spokane Incinerator Department	2	2	6	0	0	10	N/A - Sanborn
3	Dump	2	2	6	0	0	10	N/A - Sanborn
3	Dump	2	2	6	0	0	10	N/A - Sanborn
6	The Spokane Gas & Fuel Co. storage plant	2	1	6	0	0	9	N/A - Sanborn
6	***24-28 E Spokane Falls Boulevard***	***2***	***-1***	***6***	***2***	***0***	***9***	**Cleanup Started**
8	Truck body shop, truck body repairing, mach	0	2	6	0	0	8	N/A - Sanborn
8	Brass and iron works	2	0	6	0	0	8	N/A - Sanborn
8	Truck wrecking and blacksmith	2	0	6	0	0	8	N/A - Sanborn
8	Western Light Metals	2	0	6	0	0	8	N/A - Sanborn

It is recognized that the scoring system used to prioritize sites is subjective in nature, because there is insufficient knowledge to objectively gauge the importance of each factor and assign a sub-score to it. To test the sensitivity of prioritization results to this subjectivity, several alternate prioritization schemes were tested. The same top 10-20 sites emerged as the highest priority across a range of scoring systems, indicating that prioritization results are not overly sensitive to the subjectivity of the scoring system used.

Next Steps

The objective of this project was to identify and prioritize sites potentially contributing legacy sources of PCBs to the Spokane River. The prioritized list is intended to support future efforts to: 1) ~~confirm~~ identify whether PCBs are ~~still~~ being delivered from high priority sites, and 2) ~~encourage~~ provide a basis for implementing controls of the PCB loading at those sites confirmed to ~~still~~ be contributing PCBs, recognizing that these controls may need to be directed by agencies other than the Task Force. This requires future discussion at the Technical Track Work Group level regarding:

- How many of the prioritized sites merit more detailed investigation.

Commented [OM24]: Same comment as above

Commented [DD25R24]: Same suggested edit made as above.

- Methods to confirm PCB use and release at priority Sanborn sites prior to further ~~inverstigations~~investigations.
- Appropriate next steps for assessing contributions from high priority sites. Options for these next steps include:
    - Comparison of PCB homolog patterns between the PCBs present at the site and those observed in Mission Reach biofilm PCB hot spots.
    - More detailed review of available groundwater elevation data to assess connectivity between the site and the Spokane River.

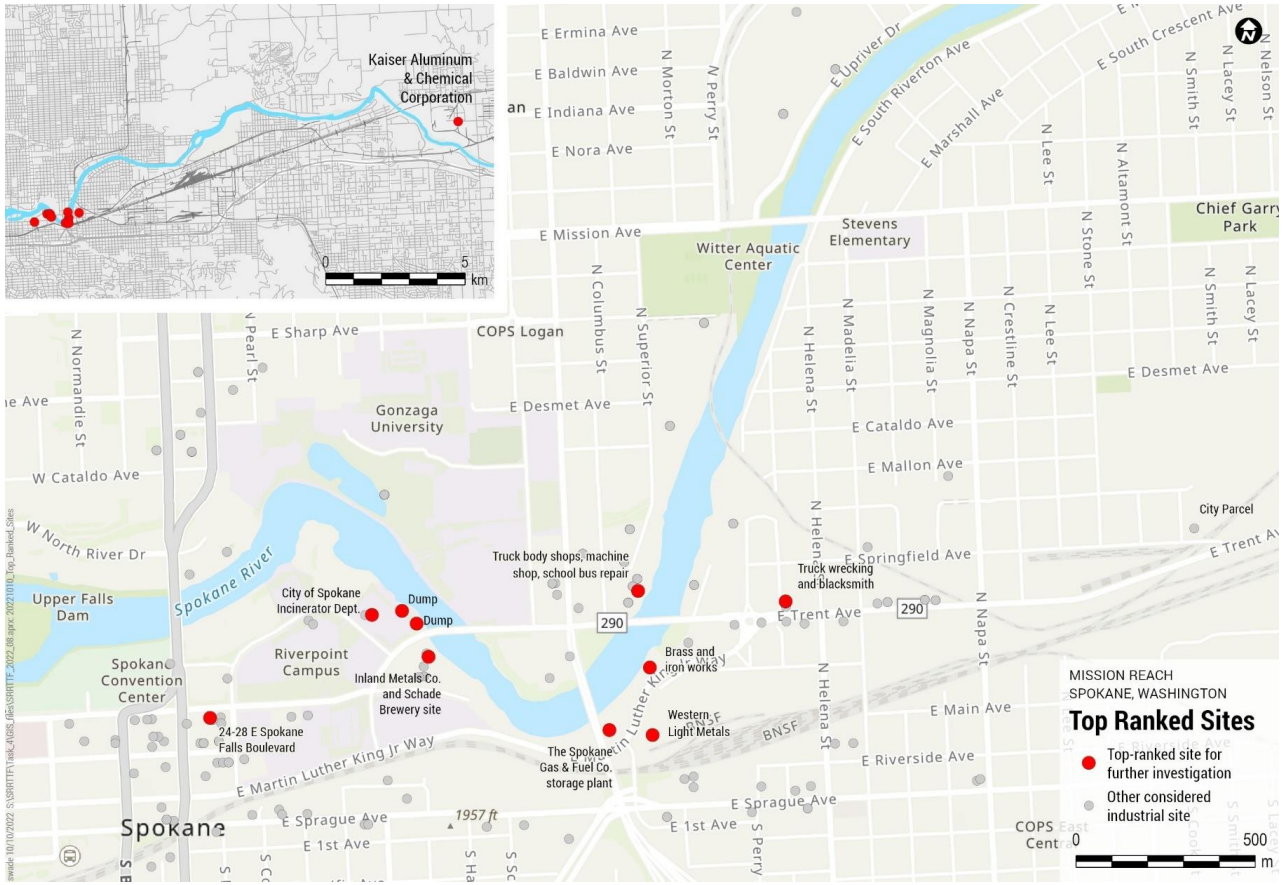

Figure 4.Map of 15 Highest Sites from Prioritization Process

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Appendix

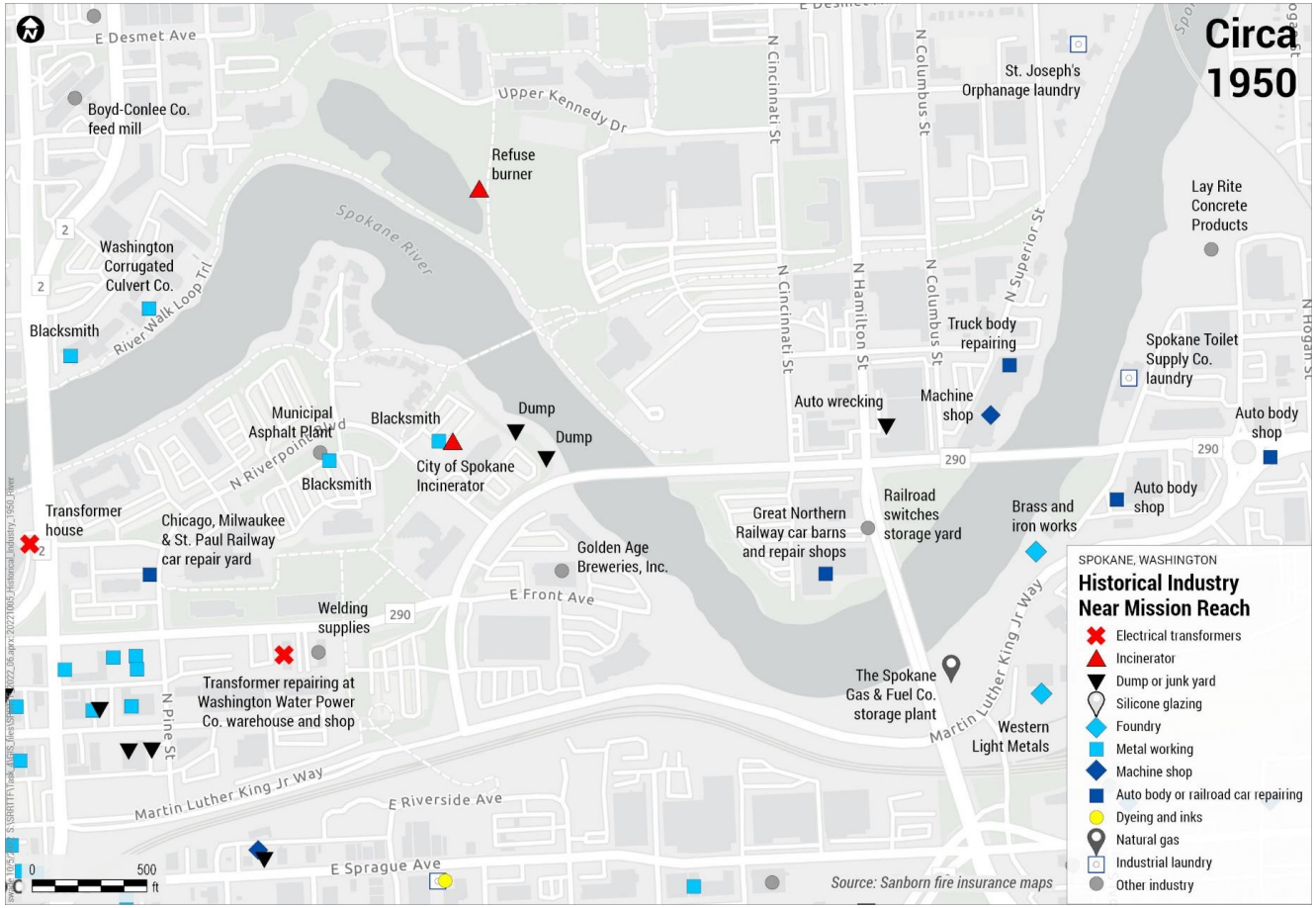

Figure A-1 Sites Identified from Review of 1950-Era Sanborn Maps

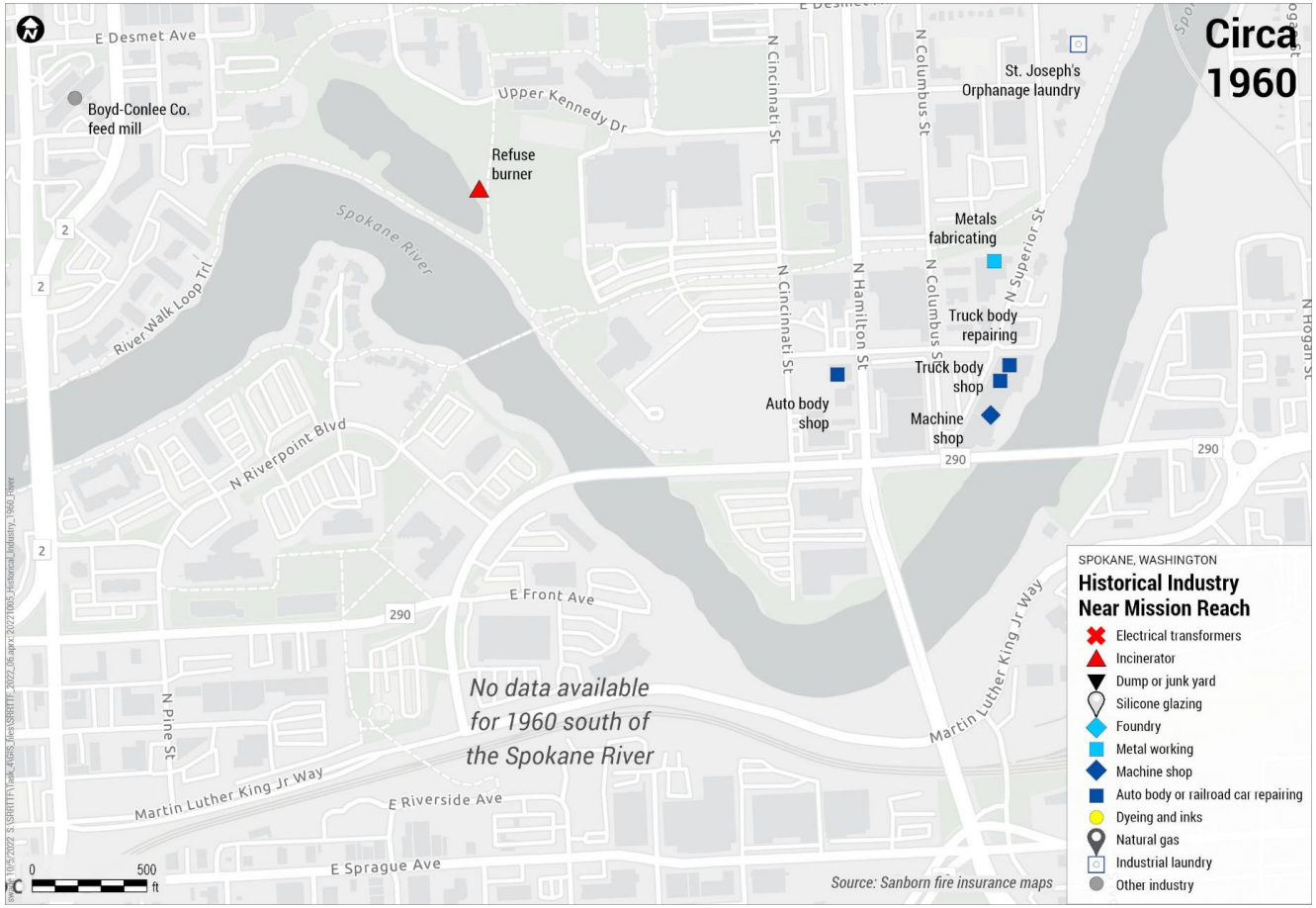

Figure A-2 Sites Identified from Review of 1960-Era Sanborn Maps

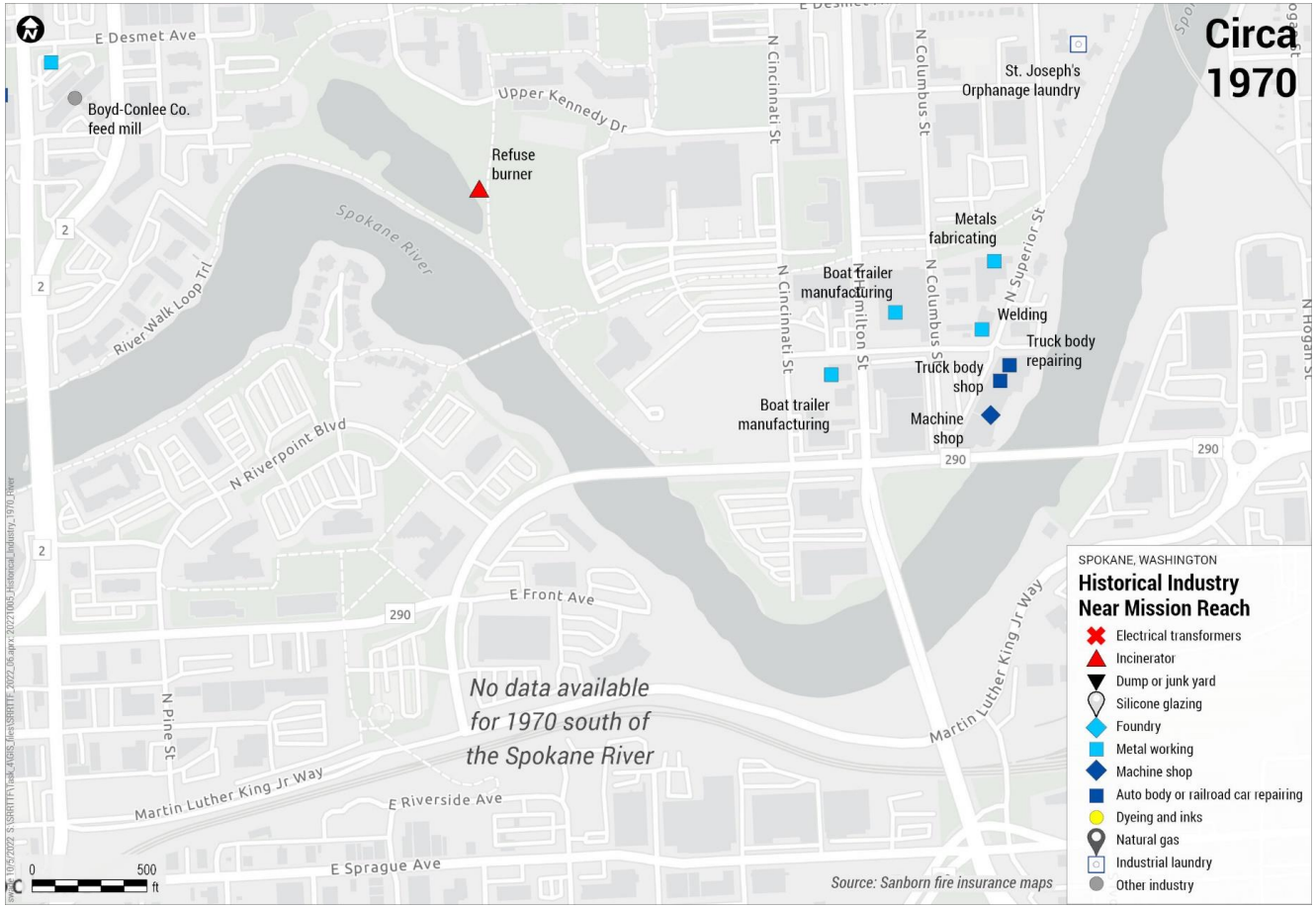

Figure A-3 Sites Identified from Review of 1970-Era Sanborn Maps

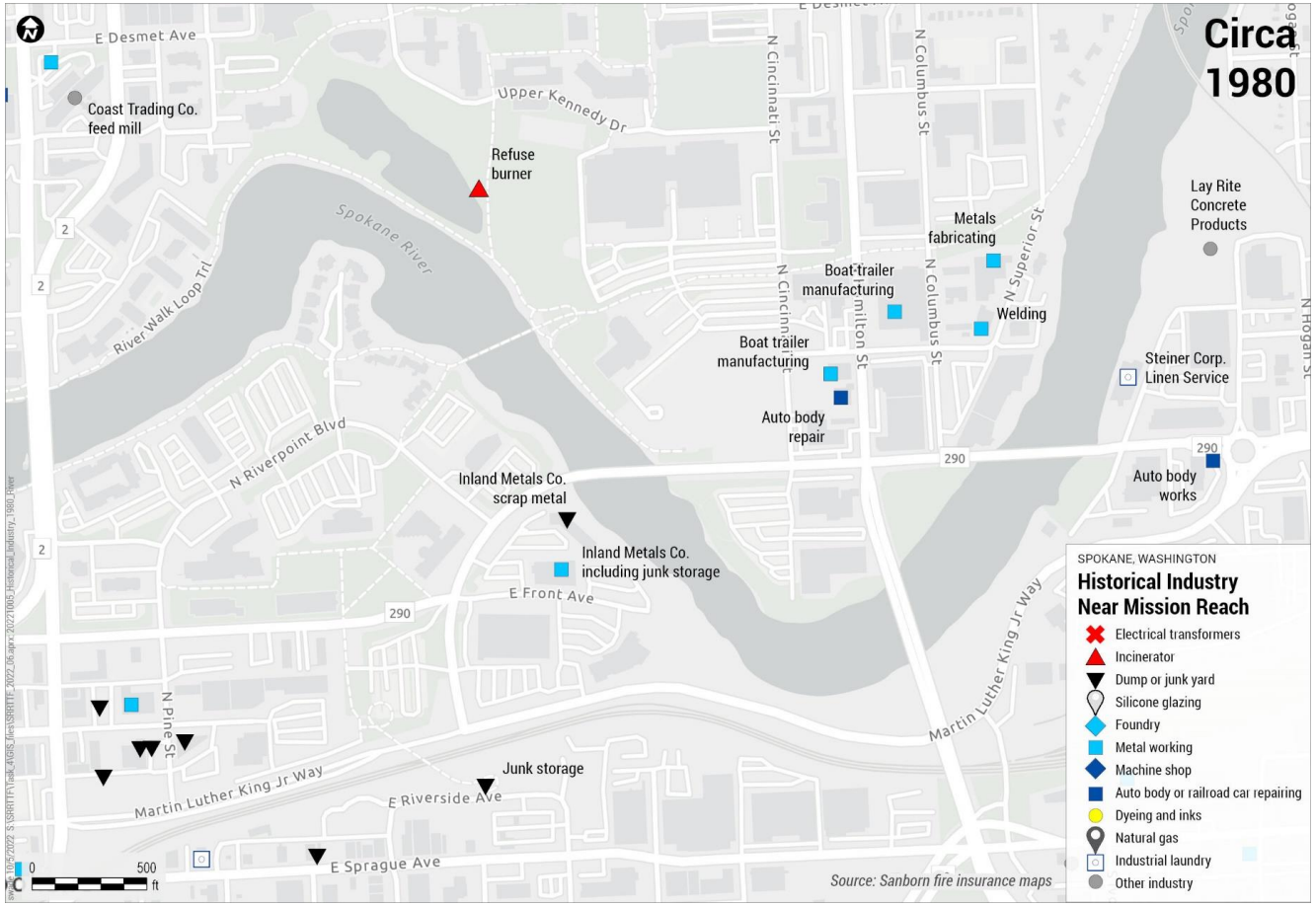

Figure A-4 Sites Identified from Review of 1980-Era Sanborn Maps

Table A-1. Complete Prioritization Results

Rank	Site	Delivery Potential Sub-score	Distance to Hot Spot Sub-score	Initial Contamination Sub-score	Current Contamination Sub-score	Offsite Contamination Sub-score	Total Score
1	Inland Metals Inc	2	1	6	1	5	15
2	Kaiser Aluminum & Chemical Corporation	1	-1	6	2	5	13
3	City of Spokane Incinerator Department	2	2	6	0	0	10
3	Dump	2	2	6	0	0	10
3	Dump	2	2	6	0	0	10
6	The Spokane Gas & Fuel Co. storage plant	2	1	6	0	0	9
6	24-28 E Spokane Falls Boulevard	2	-1	6	2	0	9
8	Truck body shop, truck body repairing, mach	0	2	6	0	0	8
8	Brass and iron works	2	0	6	0	0	8
8	Truck wrecking and blacksmith	2	0	6	0	0	8
8	Western Light Metals	2	0	6	0	0	8
12	Transformer house	2	-1	6	0	0	7
12	Transformer repairing	1	0	6	0	0	7
14	Refuse burner	0	0	6	0	0	6
14	EZ Loader boat trailer manufacturing	-1	1	6	0	0	6
14	Transformer yard	1	-1	6	0	0	6
14	Auto body shop	2	1	3	0	0	6
14	Auto body shop	2	1	3	0	0	6
14	Used machinery and junk	1	-1	6	0	0	6
14	Brass foundry	1	-1	6	0	0	6
14	Auto body works	2	1	3	0	0	6
14	Scrap metal yard	1	-1	6	0	0	6
14	Plastic fabricating	1	-1	6	0	0	6
14	Wrecked auto parking	1	-1	6	0	0	6
14	Silicone glazing, blacksmith, and machine sh	1	-1	6	0	0	6
26	Washington Water Power Co. Ross Park Stat	0	-1	6	0	0	5
26	Great Northern Railway Car Barns and Repai	0	2	3	0	0	5
26	Washington Water Power Co. Central Opera	0	-1	6	0	0	5
26	Welding	0	2	3	0	0	5
26	Municipal Asphalt Plant	2	0	3	0	0	5
26	Welding and blacksmith	2	0	3	0	0	5
26	Sheet metal shop	2	0	3	0	0	5
26	Junk storage	2	0	3	0	0	5
26	Centennial Mills	2	0	3	0	0	5
26	Pentzer WWTP Demolition	2	-1	6	-2	0	5
36	Metals fabricating	0	1	3	0	0	4
36	Chicago, Milwaukee & St. Paul Railway car r	2	-1	3	0	0	4
36	Spokane Toilet Supply Co. laundry	2	2	0	0	0	4
36	Blacksmith and repairing	1	0	3	0	0	4
36	Tin shop	2	-1	3	0	0	4
36	Junk	2	-1	3	0	0	4
36	Junk yard	2	-1	3	0	0	4
36	Junk warehouse	2	-1	3	0	0	4
36	Radiator repairing	2	-1	3	0	0	4
36	Ornamental iron works	2	-1	3	0	0	4
36	Sheet metal shop	2	-1	3	0	0	4
36	Sheet metal shop and woodworking	2	-1	3	0	0	4
36	Machine shop	2	-1	3	0	0	4
36	Welding	2	-1	3	0	0	4
36	Welding	2	-1	3	0	0	4
36	Blacksmith	2	-1	3	0	0	4
36	Sheet metal shop	2	-1	3	0	0	4
36	City Dye Works	1	0	3	0	0	4
36	Paint factory	1	0	3	0	0	4
36	Junk storage	1	0	3	0	0	4
36	Sheet metal shop	2	-1	3	0	0	4
36	Sheet metal shop	2	-1	3	0	0	4
36	Schade Brewery	2	1	3	-2	0	4
36	Avista Waste and Asset Recovery Facility	-1	-1	6	0	0	4
60	Washington Corrugated Culvert Co.	0	0	3	0	0	3
60	Auto wrecking	-1	1	3	0	0	3
60	Auto body shop	1	-1	3	0	0	3
60	Sheet metal shop	1	-1	3	0	0	3
60	Sheet metal shop	1	-1	3	0	0	3
60	Welding shop	1	-1	3	0	0	3
60	Sheet metal works	1	-1	3	0	0	3
60	Metal boat manufacturing	1	-1	3	0	0	3
60	Spokane Metals Co.	1	-1	3	0	0	3
60	Junk yard	1	-1	3	0	0	3
60	Junk	1	-1	3	0	0	3
60	Sheet metal shop	1	-1	3	0	0	3
60	Machine shop	1	-1	3	0	0	3
60	Machine shop	1	-1	3	0	0	3
60	Sheet metal shop	1	-1	3	0	0	3
60	Machine shop	1	-1	3	0	0	3
60	Machine shop	1	-1	3	0	0	3
60	Machine shop	1	-1	3	0	0	3
60	Welding	1	-1	3	0	0	3
60	Cleaning and dyeing	1	-1	3	0	0	3
60	Elevator manufacturing	1	-1	3	0	0	3
60	Lay Rite Concrete Products	2	1	0	0	0	3
60	Tinsmith	1	-1	3	0	0	3
60	Junk warehouse	1	-1	3	0	0	3
60	Junk	1	-1	3	0	0	3
60	Junk yard	1	-1	3	0	0	3
60	Junk yard	1	-1	3	0	0	3
60	Auto service and machine shop	1	-1	3	0	0	3
60	Ornamental iron works	1	-1	3	0	0	3
60	Salvage warehouse	1	-1	3	0	0	3
60	Auto body shop	1	-1	3	0	0	3
60	Auto body shop	1	-1	3	0	0	3
60	Machine shop	1	-1	3	0	0	3
60	Junk storage in yard	1	-1	3	0	0	3
60	Grinding works	1	-1	3	0	0	3
60	Grinding	1	-1	3	0	0	3
60	Carriage and auto body factory	1	-1	3	0	0	3
60	Radiator repairing	1	-1	3	0	0	3
60	Sheet metal shop	1	-1	3	0	0	3
99	Blacksmith	0	-1	3	0	0	2
99	Auto body shop	-1	0	3	0	0	2
99	Boat trailer manufacturing	-1	0	3	0	0	2
99	Auto body repair	-1	0	3	0	0	2
99	Western Bottling Co.	2	0	0	0	0	2
104	General Paint Corp. Spokane Factory	-1	-1	3	0	0	1
104	Yard full of terminal switches	0	1	0	0	0	1
104	Light metals fabricating	-1	-1	3	0	0	1
104	Light metal fabricating	-1	-1	3	0	0	1
104	Laundry	0	1	0	0	0	1
104	Auto body works	-1	-1	3	0	0	1
104	Trailer manufacturing	-1	-1	3	0	0	1
104	Rug cleaning	1	0	0	0	0	1
104	Welding supplies	1	0	0	0	0	1
104	Carpet cleaning and storage	1	0	0	0	0	1
114	Laundry	0	0	0	0	0	0
114	Bottling works	1	-1	0	0	0	0
114	Carpet cleaning	1	-1	0	0	0	0
114	Steam laundry	1	-1	0	0	0	0
114	Bottling works	1	-1	0	0	0	0
114	Rug cleaning	1	-1	0	0	0	0
114	Steam laundry	1	-1	0	0	0	0
114	Blending and sales printers inks	1	-1	0	0	0	0
114	Carpet service	1	-1	0	0	0	0
114	Steam cleaning	1	-1	0	0	0	0
114	Clothes cleaning	1	-1	0	0	0	0
114	Emerald Services	1	-1	0	0	0	0
114	James J. Williams Trucking Ltd.	1	-1	0	0	0	0
126	Ideal Laundry Co.	-1	-1	0	0	0	-2
126	Boyd-Conlee Co.	-1	-1	0	0	0	-2
126	Qwest Communications Inc. W00864	1	0	-3	0	0	-2
129	General Electric Co Spokane Sullivan	1	-1	-3	0	0	-3
129	Spokane Industrial Park G	1	-1	-3	0	0	-3