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STATE NATURAL RESOURCES
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**PHASE II REMEDIAL INVESTIGATION/FEASIBILITY STUDY
RELIANCE REFINERY FACILITY**

Kalispell, Montana

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TABLE OF CONTENTS

<u>Section</u>	<u>Page</u>
1.0 INTRODUCTION.....	1
1.1 Background Information.....	1
1.2 Purpose and Scope of Additional Remedial Investigations and Interim Actions	5
1.3 Purpose and Scope of Additional Feasibility Study	5
1.4 Summary of the Proposed Phased Groundwater and Soil Remedy.....	7
2.0 SITE DESCRIPTION.....	8
2.1 Site Location	8
2.2 Geology and Hydrogeology.....	8
2.3 Previous Investigations	9
3.0 REMEDIAL INVESTIGATION ACTIVITIES	11
3.1 Soil Sampling and Investigation	11
3.2 Soil Investigation Results	15
3.2.1 Petroleum Hydrocarbon Results	15
3.2.2 Dioxins/Furans Results	27
3.3 Implications for Soil Cleanup	32
3.4 Groundwater Monitoring Investigation	33
3.5 Groundwater Investigation Results.....	37
4.0 INTERIM REMEDIAL ACTION ACTIVITIES.....	43
4.1 Recovery System Installation	43
4.2 Recovery System Operation and Performance	44
5.0 EVALUATION OF SOIL REMEDIAL ALTERNATIVES.....	45
5.1 Soil Remedial Action Objectives	46
5.2 Anticipated Future Site Uses	47
5.3 Compatibility of Soil Alternatives with Anticipated Future Site Uses.....	47
5.4 Appropriateness of Soil Alternatives for Dioxins/Furans.....	50
5.5 Proposed Soil Remedial Alternative	51
6.0 EVALUATION OF GROUNDWATER REMEDIAL ALTERNATIVES	53
6.1 Groundwater Remedial Action Goals and Objectives.....	54
6.2 Groundwater Contaminant Assessment.....	55
6.3 Nature and Extent of Contamination and Conceptual Hydrogeologic Model	56
6.4 Identification and Screening of Potential Remedial Technologies.....	58

7.0	PROPOSED PHASED GROUNDWATER AND SOIL REMEDY.....	64
7.1	Phase 1 – Institutional Controls and Product Recovery.....	68
7.2	Phase 2 – Soil Removal and Capping.....	69
7.3	Phase 3 – Alluvial Aquifer Initial Treatment.....	71
7.4	Phase 4 – Alluvial Aquifer Final Treatment.....	71
7.5	Phase 5 – Facility Closure, Operation, and Maintenance.....	72
7.6	Compatibility of Proposed Groundwater Alternatives with Preferred Soil Alternative.....	72
8.0	REFERENCES.....	73

List of Appendices

- Appendix A. Soil Dioxins/Furans Laboratory Reports and Field Notes
- Appendix B. October 2002 Groundwater Analytical Reports and Field Notes

LIST OF TABLES AND FIGURES

<u>List of Tables</u>	<u>Page</u>
Table 3-1. Summary of Soil Samples and Analyses - Interim Limited Work Plan	13
Table 3-2. Soil Analytical Schedule - Interim Limited Work Plan.....	14
Table 3-3. Soil VPH Analysis Data Summary	19
Table 3-4. Soil EPH Analysis Data Summary	21
Table 3-5. Diesel Range Organics Analysis Data Summary.....	24
Table 3-6. Summary of 2002 Soil Dioxins/Furans Analytical Data	29
Table 3-7. PCP and Dioxins/Furans Analysis Results Data Summary	31
Table 3-8. Soil Remedy Excavation Volume Estimates	32
Table 3-9. Groundwater Monitoring Network - Interim Limited Work Plan	35
Table 3-10. Groundwater Analytical Schedule - Interim Limited Work Plan	36
Table 3-11. Groundwater Elevations and Free Product Thickness	37
Table 3-12. Groundwater Petroleum Hydrocarbon and PCP Results	40
Table 3-13. Groundwater Dioxins/Furans Results	41
Table 5-1. Comparison of Previously Proposed Soil Remedial Alternatives	46
Table 5-2. Proposed Refined Soil Remedial Alternative	52
Table 6-1. Initial Screening of Groundwater Remedial Technologies	61
Table 6-2. Final Groundwater Remedial Technology Screening.....	63
Table 7-1. Phased Groundwater and Soil Remedial Alternative – Description, Purpose, and Scope of Phases	65
Table 7-2. Phased Groundwater and Soil Remedial Technology Implementation Schedule	67

List of Figures

Figure 1-1. Vicinity Map	3
Figure 1-2. Property Ownership Map.....	4
Figure 3-1. Soil Sampling Locations	12
Figure 3-2. Extent of Surface Soil PRG Exceedances	17
Figure 3-3. Extent of Subsurface Soil PRG Exceedances	18
Figure 3-4. Monitoring Well Locations and July 2002 Groundwater Elevations	34
Figure 3-5. Monitoring Well Locations and October 2002 Groundwater Elevations	38
Figure 5-1. Typical Foundations Compatible with Soil Caps	49
Figure 6-1. Aerial Extent of Groundwater Contamination.....	57
Figure 6-2. Conceptual Hydrogeologic Model	59
Figure 7-1. Estimated Extents of Soil Excavation/Capping & Location of Perched Aquifer	70

1.0 INTRODUCTION

This Phase II Remedial Investigation/Feasibility Study Report describes and provides the rationale for the selection of a preferred remedial action alternative to address soil and groundwater contamination at the Reliance Refinery Facility (Facility). The report describes:

1. The Facility and previous investigations at the site (Section 2);
2. The methods and results of additional remedial investigation activities at the Facility during 2002, and the implications of the results for selection of a proposed soil and groundwater remedy (Section 3);
3. Interim remedial actions conducted at the Facility during 2002 (Section 4);
4. Evaluation of soil remedial alternatives for the Facility, updated from previous reports based on the additional data collected in 2002 (Section 5);
5. Evaluation of groundwater remedial technologies for the Facility (Section 6); and
6. The proposed phased groundwater and soil remedy (Section 7).

✓ All remedial investigation work conducted in 2002 was in accordance with the Interim Limited Work Plan for Reliance Refinery (Work Plan) (LWC, 2001). The Work Plan was prepared in response to a request by the Department of Environmental Quality (DEQ) for supplemental remedial information (DEQ Memorandum dated December 5, 2000).

✓ Soil and groundwater investigations of the McElroy & Wilken property were also conducted in 2002 (LWC, 2002). Although these investigations were not part of the Work Plan, the results of these investigations assist in defining the extent of contamination at the Facility and therefore are described in this report as appropriate.

1.1 Background Information

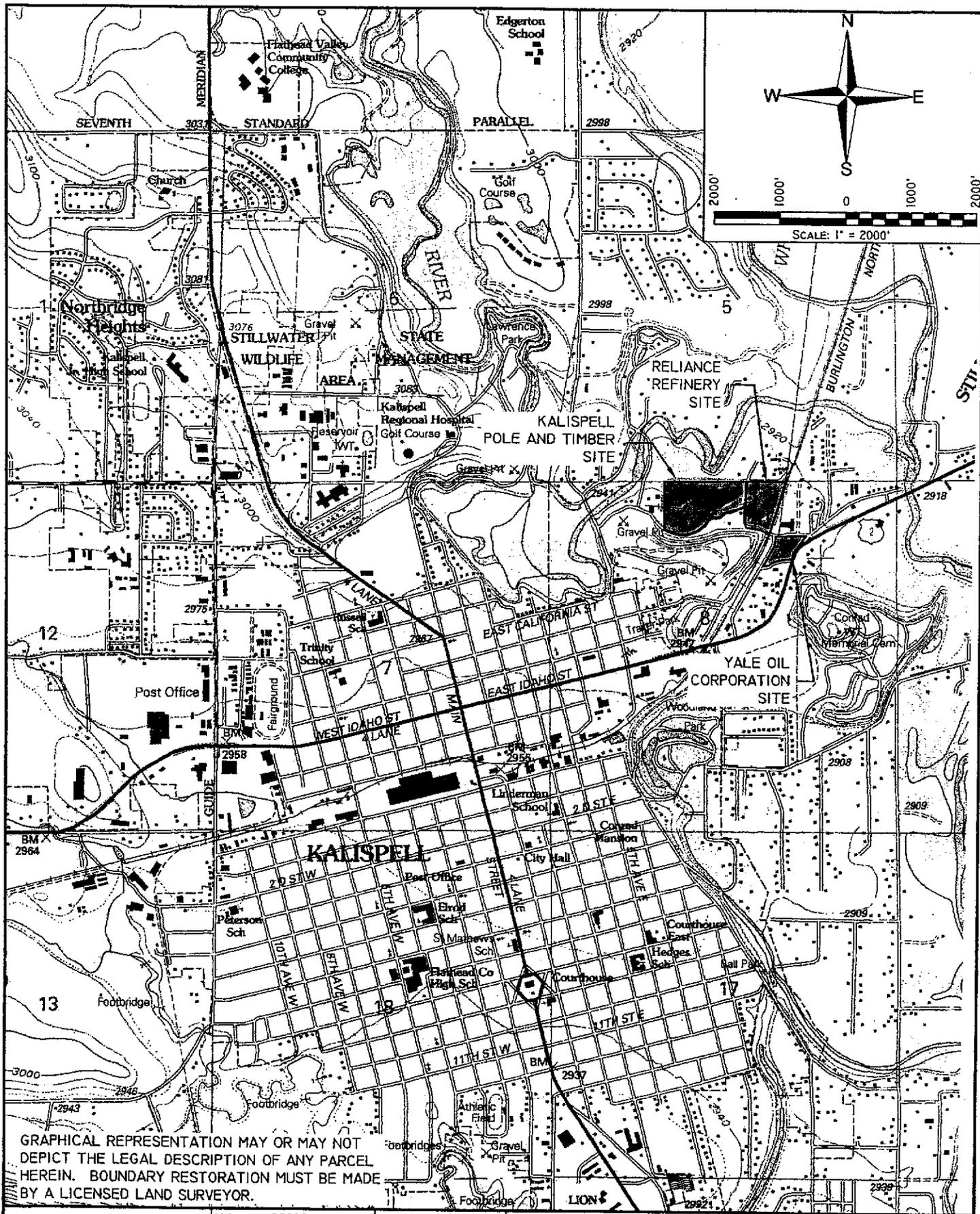
✓ The Facility is located in Kalispell, Montana and is adjacent to two other CECRA facilities (see Figure 1-1), Kalispell Pole & Timber (KPT) to the west and the Yale Refinery to the southeast. The Facility is crossed by a Burlington Northern Santa Fe (BNSF) rail line and previous investigations have divided the Facility into two geographic areas; north and south of the tracks. The northern portion of the site includes private property historically used for storage of refinery products (Swank property). The southern portion includes State-owned land historically used for the majority of refinery operations and the McElroy & Wilken property immediately south of the State-owned land. Although the McElroy & Wilken property was never used for refinery operations or storage, it is considered part of the Facility due to the presence of contaminated subsurface soils on the property. Figure 1-2 depicts current land ownership of the Facility and surrounding area.

The Reliance Refinery Company owned and operated a crude oil refinery near the City of Kalispell from approximately 1925 to 1930. The refinery produced gasoline, kerosene,

light and heavy fuel oils, and other petroleum distillate products. The refinery initially operated as a fractionating oil refinery, with a cracking plant being installed in 1929. The State obtained title to the property under a foreclosure of lien for delinquent taxes in September 1930 (final deed issued in December 1935). The property was leased to Boris Aronow, doing business as Unity Petroleum Corporation, from 1930 to 1935. Unity Petroleum subsequently leased the property from the State from 1935 to 1969. The refinery operated until 1957 or 1958, although other sources report the site being idle since 1946 or 1947 (Pioneer, 1997a). Bulk storage operations continued into the 1960's. The refinery was dismantled in approximately 1970. The property was leased by KPT for the period of August 1969 to January 1994, and was used by KPT to store poles treated with pentachlorophenol (PCP). In 1973, KPT reportedly buried a tank of waste oil on the Facility with the approval of MDHES (now MDEQ) however the location, size and contents of this tank are unknown (EPA 1986b).

Waste oils, sludges, and tar substances were disposed in pits and/or discharged onto the ground surface while the refinery was operational. These petroleum wastes have contaminated the soil and groundwater on and beneath the facility. Leaks or spill of PCP and diesel fuel on the KPT Facility have caused a contaminated groundwater plume that extends from the KPT Facility through and beyond the Reliance Facility. Storage of treated poles from KPT on the Reliance Facility has caused or contributed to PCP and dioxin contamination in soils on the Reliance Facility.

All aboveground structures, machinery, and equipment associated with the refinery have been removed from the Facility. All that currently remains are some random underground piping network, a 40-foot diameter tank bottom, an abandoned railroad car, some buried demolition debris, and possibly the buried waste oil tank from KPT. The State-owned land is currently fenced to preclude unauthorized access. The Swank and McElroy & Wilken properties are currently vacant with the exception of storage of construction-related materials on the Swank property.



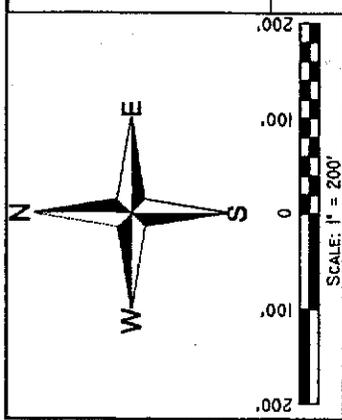
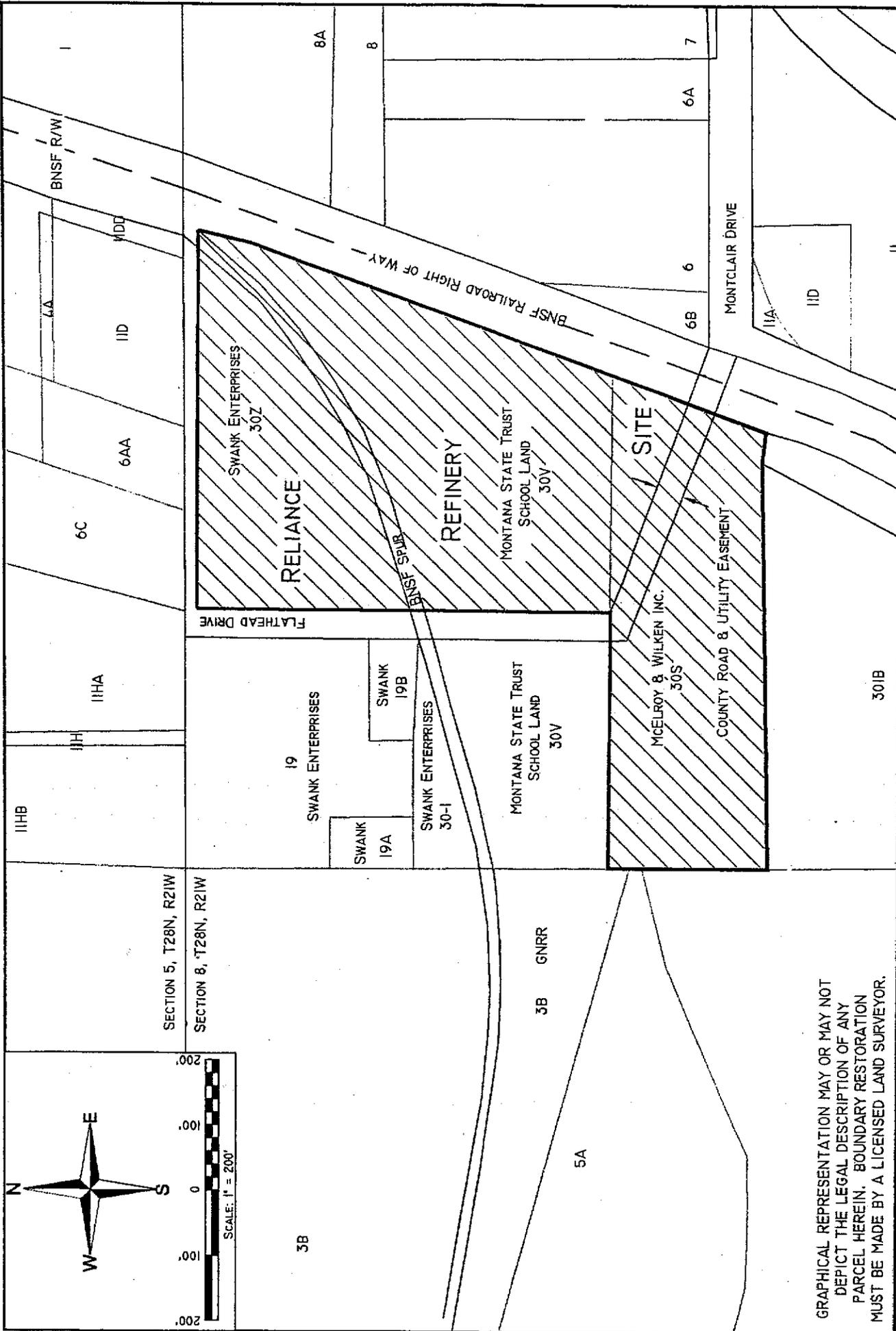
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RELIANCE REFINERY FACILITY
FIGURE 1-1. VICINITY MAP

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SECTION 5, T28N, R21W
SECTION 8, T28N, R21W

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	LOCATION: Kalispell, MT	PROJ MGR: S. Mason	FIGURE 1-2. PROPERTY OWNERSHIP MAP

1.2 Purpose and Scope of Additional Remedial Investigations and Interim Actions

The purpose of the additional investigations and interim actions were to address specific data gaps and to initiate groundwater remediation. Additional work consisted of the following three tasks:

1. Additional Soil Characterization. Additional soil samples were collected and analyzed to further characterize the nature and extent of soil contamination. This information supports more accurate estimation of the extent of soil remediation that is needed. Specific sampling tasks were:
 - Collection of additional soil samples from the northern portion of the site where previous soil sampling had indicated "hotspots" (areas of higher than normal contaminant concentrations) or where data had not been previously collected. The purpose of this sampling was to provide a better estimate of the volume of contaminated soils in the northern area.
 - Collection of soil samples from the southern portion for dioxins/furans analysis. The purpose of this sampling was to provide a better estimate of the magnitude and extent of dioxin contamination at the facility.
 - Collection of soil samples from areas on BNSF property not previously sampled to define the complete extent of contamination associated with the Facility. As described in Section 3.1, this sampling effort was not conducted.
2. Additional Groundwater Monitoring. Semi-annual groundwater monitoring was conducted to monitor the magnitude and extent of groundwater contamination at the facility. In addition to providing updated information on the extent of petroleum hydrocarbon contamination, this monitoring included analyses for PCP and dioxins/furans to determine the magnitude and extent of PCP and dioxin contamination in groundwater at the Facility.
3. Interim Remedial Actions. Two free-phase product recovery systems were installed and operated to begin remediation of groundwater in the perched aquifer beneath the Facility.

1.3 Purpose and Scope of Additional Feasibility Study

The purpose and scope of this Phase II Feasibility Study is to provide the evaluations needed to develop and select an integrated remedy for soil and groundwater. Previous feasibility studies and evaluations of remedial alternatives for the Facility include a Feasibility Study Report (Pioneer, 1997) and the Screening of Remedial Soil Alternatives (LWC, 2000). Both of these studies identified preferred soil remedial alternatives (See Section 5) as interim actions that would be effective in protecting human health and the

environment from direct soil-related impacts in the short term and likely in the long term as well. However, neither of the preferred soil alternatives was approved by MDEQ. The primary reasons that the alternatives were not approved by MDEQ (see MDEQ June 14, 2000 letter to LWC) are:

1. There were identified data gaps regarding the nature and extent of contamination. These data gaps are addressed by the data in this report and the previously proposed soil remedy is refined based on the additional data.
2. The studies did not adequately demonstrate that the preferred interim soil actions would be consistent with future site uses. There was concern that interim remedial actions might be damaged or destroyed in order to allow future site development. A particular concern was that the proposed two-foot soil caps might be disrupted by site development or maintenance activities such as foundation construction or utility installation/repair.

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To resolve this uncertainty, evaluations of the proposed soil alternative are provided in Section 5 of this report. These evaluations address:

- Anticipated future site uses and impacts of institutional controls;
- The likely excavation depths needed to accommodate site development needs; and
- Potential mitigation methods if development requires installation of foundations or utilities beyond two feet deep.

The evaluations indicate that the proposed soil remedy is compatible with anticipated future site uses.

3. The studies did not adequately demonstrate that the preferred soil alternatives would be consistent with an overall remediation plan to address both soil and groundwater. There was concern that if the soil remedial alternatives were implemented as interim remedial actions, the soil remedies might need to be damaged or destroyed in order to complete the overall remediation. Damage to the interim soil remedies might make the interim actions not cost effective in the long term. A particular concern was that soil caps installed as part of interim soil actions could be disrupted by future actions that might be needed to remedy groundwater.

To resolve this uncertainty, evaluation of the compatibility of proposed soil remedial actions (surface soil cleanup and capping) with groundwater remedial actions is provided in Section 6.6 of this report. Moreover, an integrated groundwater and soil remedy is proposed that uses a phased implementation approach. In this phased approach, soil remediation is not initiated until the underlying groundwater is treated to the extent practicable, thus avoiding potential conflicts.