

GEOLOGIC REPORT

Proposed Mineral Resource Overlay Kitsap Reclamation and Materials, Inc.

Prepared for:

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February 2018

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1.0 INTRODUCTION

This report summarizes the results of a geological evaluation to assess the presence and extent of commercial quality mineral deposits within the proposed Kitsap Reclamation and Materials, Inc. (KRMI) mineral resource overlay area (Figure 1, attached). The study is intended to meet the requirements of the Kitsap County Comprehensive Plan for geologic assessments of proposed mineral resource lands. The proposed mineral resource overlay area is two parcels, approximately 69 acres, presently zoned Rural Protection. These parcels are collectively referred to as the Site. Zoning and land-uses at and adjacent to the Site, which includes an active basalt quarry, are shown in Figure 2 (attached).

2.0 METHODOLOGY

This geologic assessment was performed using previously published literature and physical inspection at and adjacent to the Site. No intrusive testing, remote sensing (e.g., geophysical studies), or sampling of geologic materials was performed. The information reviewed is considered sufficient, valid and accurate for the scale it depicts and the needs of this assessment.

3.0 REGIONAL GEOLOGIC CONDITIONS

Generally, there are few mineral resource basalt reserves of significant commercial quality in economically suitable locations on the Kitsap Peninsula. Glacial deposits of sand and gravel that are found throughout the peninsula have typically been the most common mineral resource in Kitsap County. Basalt rock has historically been mined as a mineral resource in few locations on the Kitsap Peninsula, and is currently actively mined at only one other location in Kitsap County in addition to the KRMI quarry.

The oldest surficial geologic deposits in Kitsap County are the Tertiary basalt flows west of Bremerton that underlie Green and Gold Mountains (Figure 3). These flows consist of dark, fine-grained basalt with zones of vesicular texture. Individual flows can be identified and can measure up to 30 feet. The total thickness of the basalt units is unknown but are believed to be 3,000 to 5,000 feet. Groundwater flow in the basalt units is very small and what does occur is through fracture flow.

During the Late Pliocene and the Pleistocene epochs, there were multiple glaciations in the Puget Sound lowland. Streams and glacial ice sheets deposited sediments. The two recognizable glaciations observed on the Kitsap Peninsula are the Salmon Springs and the Frazier glaciations. The older deposits of the Salmon Springs Drift typically appear on the southern end of the peninsula, mainly as a coarse gravel with lenses of finer sand and till. These unstratified deposits are often differentiated from the younger Vashon Drift by rusty orange oxidation and lenses of pumice.

The Salmon Springs drift is overlain by the Kitsap Formation, which is predominantly clays and silts with minor amounts of sand and gravel. The unit is well stratified with distinguishing beds of peat and lignite occurring at intervals throughout.

The Vashon Drift overlays the Kitsap Formation and includes till, outwash sand and gravel deposits, and clay. Outwash material deposited near the front of the glacier is poorly sorted sand and gravel while further away there are stratified sands, silts and clay. Groundwater is present locally in the sand and gravel units. The Site is not within a major groundwater production area for Kitsap County (Hansen and Bloke 1980). Regional geologic conditions are depicted in attached Figure 3. Local area geologic conditions are shown in Figure 4.

4.0 SITE RECONNAISSANCE

Basalt rock outcroppings are present on the Site and are visible throughout the adjacent KRMI quarry. The Site was recently logged, and vegetation consists of a mixture of shrubs, small trees and grasses. Electric transmission lines cross the site. Extensive basalt outcroppings are present in the quarry area to the east of the Site. Basalt on the Site is overlain with typically 2 to 5-ft of topsoil and overburden.

The basalt has been extensively mined in the existing KRMI Quarry located immediately adjacent to the Site. Basalt consists of competent material of high quality for aggregate and mineral applications. To the south are lowland areas that appear to be dominated by glacial outwash and fluvial/alluvial deposits of the Gorst Creek flood plain. To the north and west are forest lands underlain by basalt.

5.0 MINERAL RESOURCE ASSESSMENT

Mineral resources at the Site were evaluated using Site information, geologic maps (Garling, Molenaar, Sceva et al) and geologic information derived from a previously published reports (Parametrix 2003). Figure 4 depicts geologic maps of the area prepared by Kitsap County and indicates basalt occurs at the surface over the entire Site, with glacial deposits occurring to the south. The basalt unit extends to adjacent areas to north, east and west of the Site, which is consistent with field observations and other available geologic reports.

The basalt is described as a series of continuous flow that cover the Gold Mountain area of southwestern Kitsap County. Figures 3 and 4 indicates that the entire Site consists of basalt with minimal topsoil and overburden. Figure 5 shows that basalt occurs to depths of at least 400-ft below the entire site.

6.0 RESOURCE EVALUATION

Cross-section A-A' (Figure 5) depicts the interpreted subsurface stratigraphy, which indicates a significant amount of viable basalt mineral resource on the Site. Basalt is present throughout the proposed Mineral Resource area to depths of at least 400-ft below the ground surface. Depending on final reclamation grades, basalt quantities could be expected to be in the range of 1.5 to more than 2.5 million cubic yards.

Based on basalt characteristics from the adjacent KRMI quarry, which is within the same geologic formation, the mineral resource provides commercial quality aggregate materials including

gravel base, quarry spalls, and a wide range of landscaping and structural rock. Some minor quantities of topsoil, sand and gravel may also be recovered from the shallow layer of glacial outwash overburden that overlies the Site.

7.0 REFERENCES

Garling, M.E., Molenaar, Dee, and others. 1965. Water Resources and Geology of the Kitsap Peninsula and Certain Adjacent Islands, Water Supply Bulletin No. 18.

Hansen, A. J. and Bloke, E.L. 1980. Groundwater availability on the Kitsap Peninsula, Washington. Open-file report USGS; 80-1186

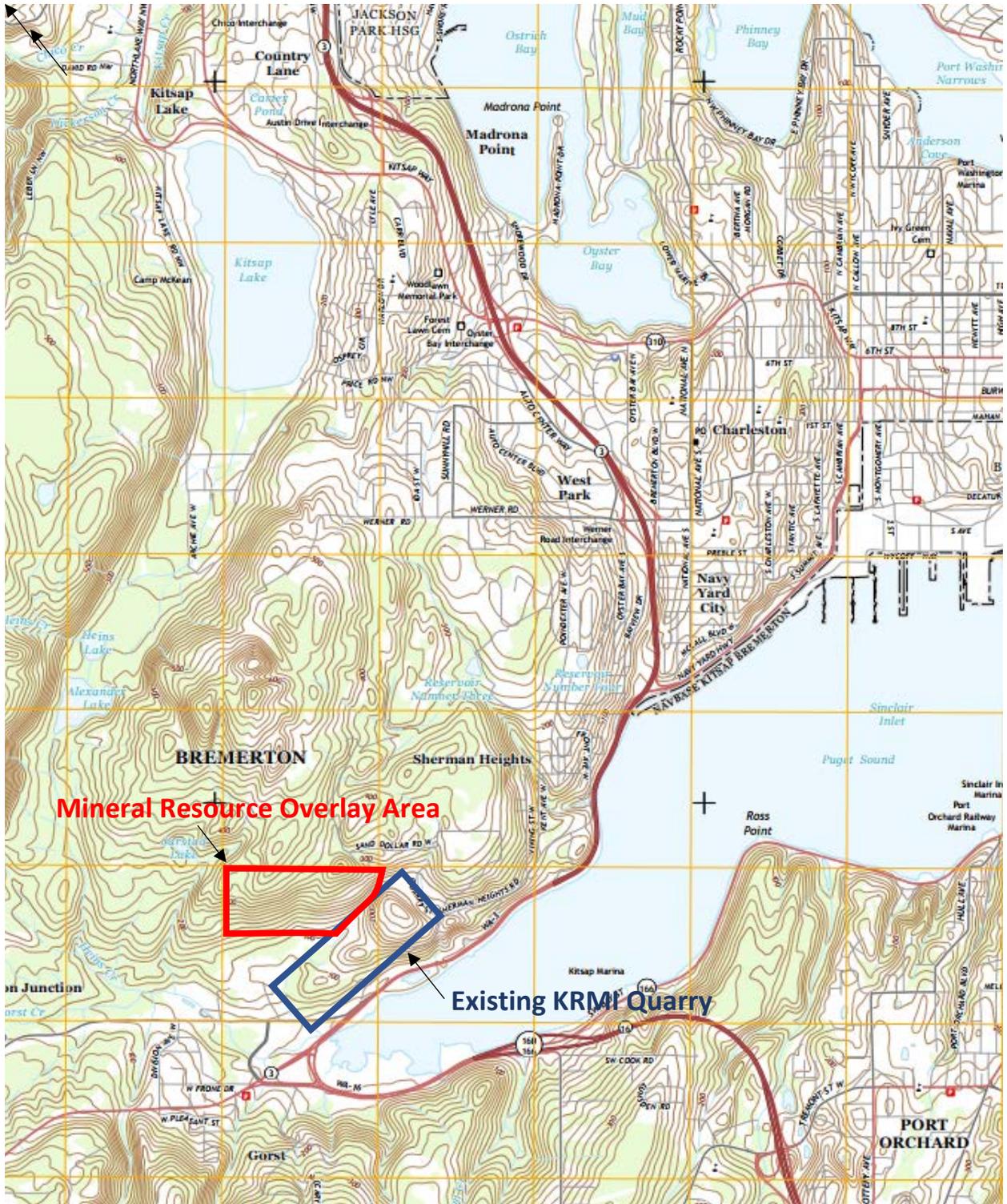
HWA Geosciences. 2000. Geotechnical Report SR 3 Improvements Project Gorst RR Bridge to SR 304 Interchange Kitsap County, Washington. Prepared for Parametrix, Inc. February 17, 2000.

Kitsap County, 2017. Geologic Map Units. Map Created April 2017.

Parametrix, Inc. 2003. Geologic Assessment of Proposed Mineral Resource Area, Gorst Vicinity Kitsap County, Washington. Prepared for Kitsap Reclamation and Materials, Inc. February 2003.

Sceva, Jack E. (1957), Geology and Groundwater Resources of Kitsap County, Washington. Water-Supply Paper 1413, U.S. Geological Survey.

FIGURES



Source: USGS Bremerton West Quadrangle. NTS

FIGURE 1. LOCATION MAP.
Kitsap Reclamation and Materials, Inc. Quarry
Proposed Mineral Resource Overlay

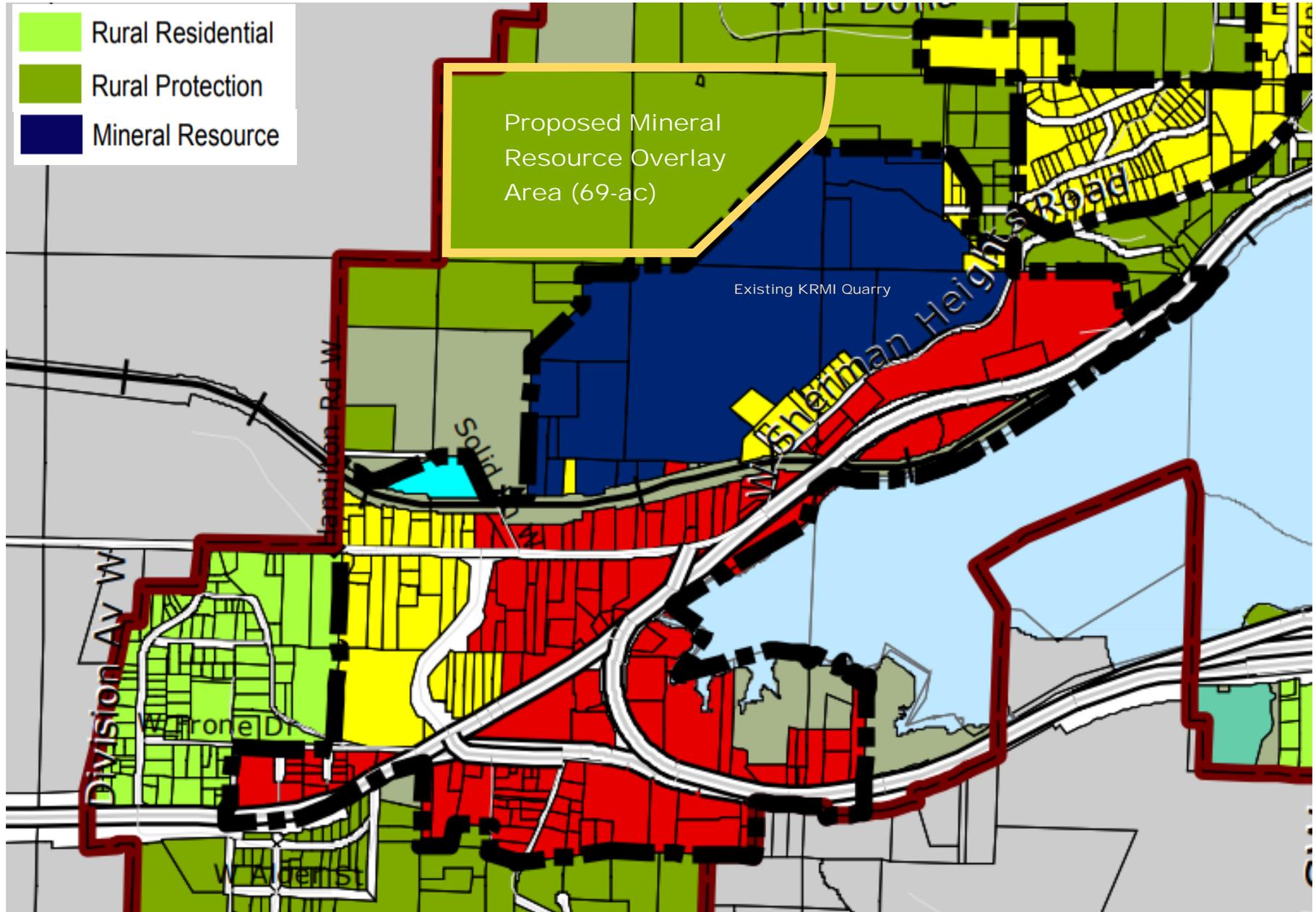
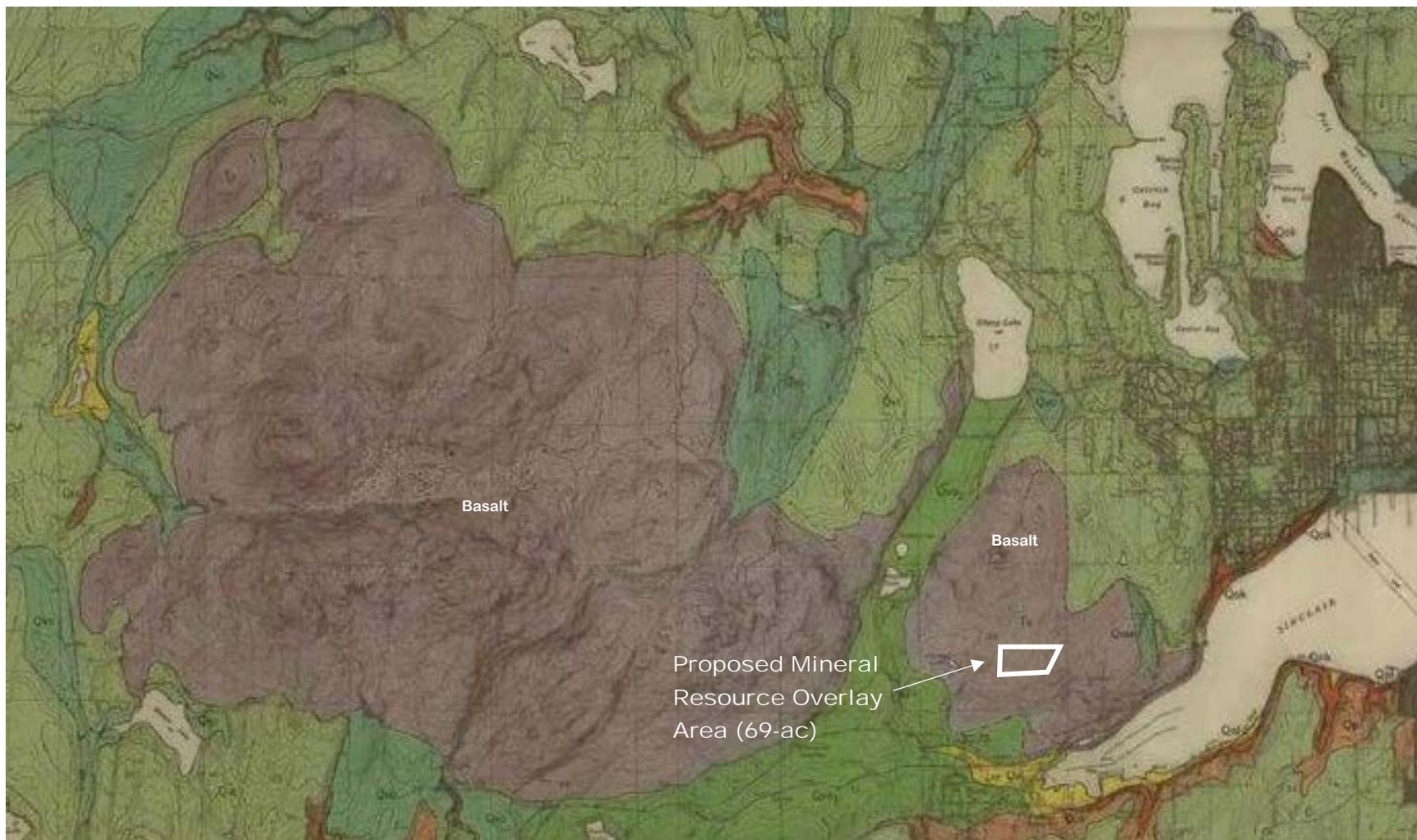
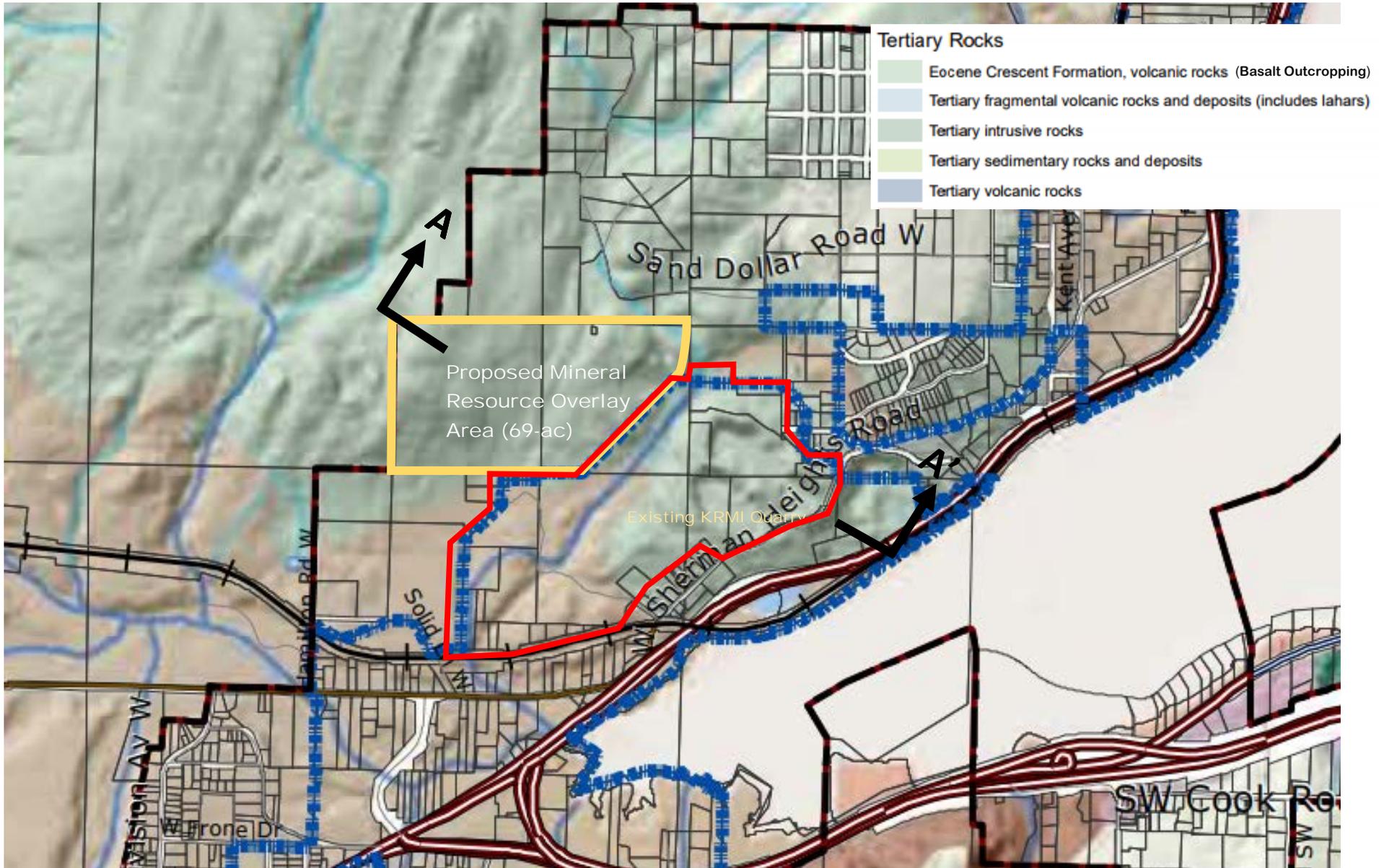


FIGURE 2. LAND USE MAP
Kitsap Reclamation & Materials, Inc.
Mineral Resource Overlay



Source: Seva 1957. NTS

FIGURE 3. REGIONAL GEOLOGIC MAP.
Kitsap Reclamation & Materials, Inc.
Mineral Resource Overlay



Source: Kitsap County GIS Database. NTS

FIGURE 4. LOCAL AREA GEOLOGIC MAP.

Kitsap Reclamation & Materials, Inc.
Mineral Resource Overlay

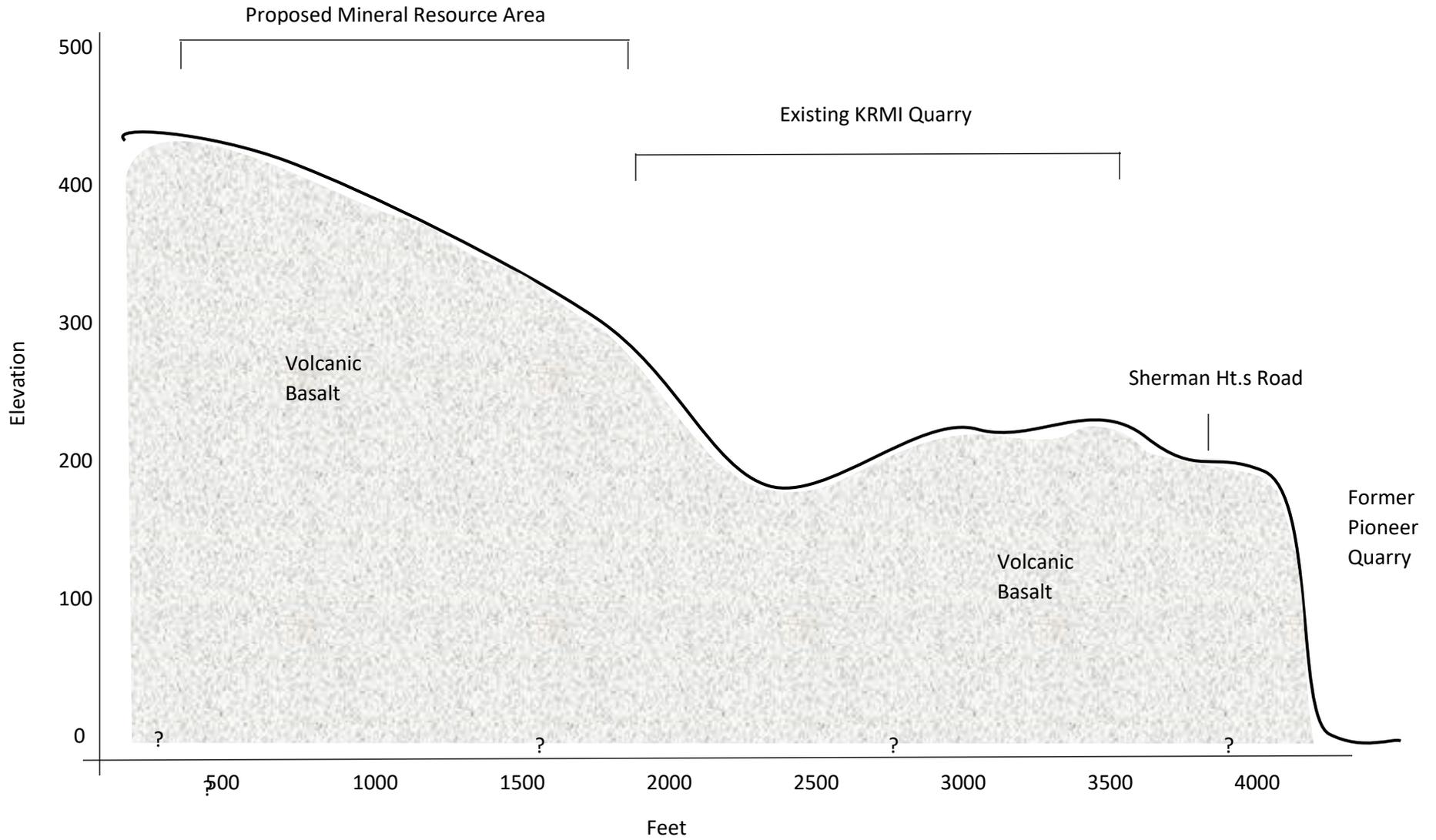


FIGURE 5. GEOLOGIC CROSS SECTION A-A'
Kitsap Reclamation and Materials, Inc.
Mineral Resource Overlay