

King County Department of Development and Environmental Services 900 Oakesdale Avenue Southwest Renton, WA 98055-1219

July 30, 2006 William Kombol, Manager Palmer Coking Coal P.O. Box 10 Black Diamond, WA 98010-0010

RE: Coal mine hazard on PCCC Enumclaw-Franklin Road Properties Inquiry Number L06SA435

Dear Mr. Kombol:

At your request, we have reviewed the coal mine hazard assessment dated May 2, 2006 by Icicle Creek Engineers (project no. 0102-010). Based on our field work, review of the report and phone conferences with Brian Beamon of Icicle Creek Engineers, we accept the report and its conclusions as a good representation of the coal mine hazards that exist on these properties.

Please reference inquiry number L06SA435 with any future permit applications on the subject parcels.

Thank you for your inquiry, and please contact me directly at 206.296.7267 or by e-mail at todd.hurley@metrokc.gov if you have any additional questions.

Sincerely,

whi M. Ashuly

Todd Hurley Environmental Scientist III^r/Engineering Geologist King County DDES

Following Recording Return To:

Palmer Coking Coal Company P.O. Box 10/31407 Highway 169 Black Diamond, WA 98010



SENSITIVE AREA NOTICE

GRANTOR:

Palmer Coking Coal Company, a Washington Partnership

GRANTEE:

King County department of development and environmental services (D.D.E.S.)

LEGAL DESCRIPTIONS:

Portions of Sections 19 and 30; Township 21 North, Range 7 East, W.M., King County, Washington (see page 4)

KING COUNTY ASSESSOR PROPERTY TAX PARCEL ACCOUNT NUMBERS:

192107-9024; 192107-9033; 192107-9036; 192107-9049; 192107-9050; 192107-9051; 192107-9052; 192107-9053; 192107-9054; 192107-9055; 192107-9056; 292107-9051; 292107-9052; 292107-9075; 292107-9076; 292107-9088; 292107-9099; 292107-9100; 292107-9101; 302107-9023; 302107-9056; 302107-9057; 302107-9058; 302107-9059; 302107-9060; 302107-9061; 302107-9062; 302107-9063; 302107-9064; 302107-9065; 302107-9066; 302107-9067; 302107-9068 (see pages 4 and 5)

REP

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COMMONWEALTH LAND TITL

MAP EXHIBIT: (see page

(see page 6)

SENSITIVE AREA NOTICE

The following lots (and associated King County Assessor Tax Parcel Number) are legally described herein and located within Sections 19 and 30; Township 21 North, Range 7 East, W.M. King County, Washington as follows:

Legal Descriptions: see page 4.

<u>Classification by Tax Parcel Numbers</u>: see page 5: Coal Mine Hazard Assessment Report by Icicle Creek Engineers dated May 2, 2006 - Classification by Tax Parcel Numbers (Tax Parcels Numbers as of August 2006).

Map Exhibit: see page 6.

King County D.D.E.S. letter dated July 30, 2006 regarding file number L06SA435: see page 7.

The above referenced property contains sensitive areas, as defined by the King County Sensitive Areas Ordinance, KCC 21A.24 and identified in the report cited below. The provisions of the Sensitive Areas Ordinance apply to the property. Limitation may exist on actions in or affecting the sensitive areas present on this property. The following notice shall run with the land but may be modified or removed upon specific written authorization recorded herein by King County, Grantee, or its successor agency.

<u>"NOTICE"</u>

"This property is located in an area of historic coal mine activity. A coal mine hazard assessment report has been prepared to characterize the potential hazards contained on this property. The report is dated May 2, 2006, was prepared by Brian R. Beaman, P.E., P.G. (License Number 24010) at the direction of Palmer Coking Coal Company and was reviewed by the King County department of development and environmental services (D.D.E.S.) under file number L06SA435, as evidenced by D.D.E.S. letter dated July 30, 2006. A review of the report is advised prior to undertaking unregulated or exempt land use activities and is required prior to undertaking regulated land use activities."

I, William Kombol, am the Manager of Palmer Coking Coal Company, who is the owner of the above referenced property and I hereby sign this "Notice" on this <u>4</u> day of August 2006.

William Kombol, Manager Palmer Coking Coal Company

State of Washington)

) ss

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County of King

On this 4 day of August 2006, before me, the undersigned, a Notary Public in and for the State of Washington duly commissioned and sworn, personally appeared WILLIAM J. KOMBOL to me known to be the Manager of Palmer Coking Coal Company, the partnership that executed the foregoing instrument, and acknowledged the said instrument to be the free and voluntary act and deed of said partnership for the uses and purposes therein mentioned, and on oath stated that he is authorized to execute the said instrument.

WITNESS my hand and official seal hereto affixed the day and year in this certificate above written.

Shelly Wilhilky

Notary Public in and for the State of Washington, residing at East m. Commission expires 5-1-10

LEGAL DESCRIPTIONS:

The South 330 feet of the East 132 feet of the Northeast quarter of the Northeast quarter of the Southwest quarter of Section 19, Township 21 North, Range 7 East, W.M., King County Washington.

(Note: above legal description consist of the following King County Assessor Tax Parcel Numbers: 192107-9033)

Lots A, B, C, D, E and F of King County Boundary Line Adjustment L05L0021 filed in Volume 195 of Plats at Page 264, 265, 266 under King County recording number 20051123900038.

(Note: above legal descriptions consist of the following King County Assessor Tax Parcel Numbers: 192107-9036; 192107-9052; 192107-9053; 192107-9054; 192107-9055; 192107-9056)

* * *

Lots 1, 2, 3, 4, 5, 6, 7, 8, 9 and 10 of King County Boundary Line Adjustment L05L0062 as recorded in Volume 204, Page 82, 83 under King County recording number 20060509900014. (Note: above legal descriptions consist of the following King County Assessor Tax Parcel Numbers: 292107-9051; 292107-9052; 292107-9075; 292107-9076; 292107-9088; 292107-9099; 292107-9100; 292107-9101; 302107-9061; 302107-9062)

* * *

Lots 7, 8, 9, 10, 11, 12, 13, 14, 15, 18, 19, 20, 21, 22, 23 and 24 of "20 Acre Segregation" filed in Volume 131 of Surveys at Page 203, 203-A under King County recording number 19990817900015.

(Note: above legal descriptions consist of the following King County Assessor Tax Parcel Numbers: 192107-9024; 192107-9049; 192107-9050; 192107-9051; 302107-9023; 302107-9056; 302107-9057; 302107-9058; 302107-9059; 302107-9060; 302107-9063; 302107-9064; 302107-9065; 302107-9066; 302107-9067; 302107-9068)

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Coal Mine Hazard Assessment Report by Icicle Creek Engineers dated May 2, 2006 -Classification by Tax Parcel Number (as of August 2006) - DDES File No. L06SA435

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Lot #	Tax Parcel No.	<u>Acreage</u>		Coal Mine Hazard Classification
8	192107-9024	23.60		Part Severe; Part Declassifed
N.A.	192107-9033	1.00		Declassified
A+	192107-9036	7,97	· · · .	Part Severe; Part Declassifed
7	192107-9049	21.40	1	Part Severe; Part Declassifed
9	192107-9050	20.60	7	Part Severe; Part Declassifed
10	192107-9051	21.70	÷.,	Declassified
B+	192107-9052	8.03		Declassified
C+	192107-9053	8.07		Part Severe; Part Declassifed
D+	192107-9054	7.66		Declassified
E+	192107-9055	7.80	/	Declassified
F+	192107-9056	51.51		Part Severe; Part Declassifed
3*	292107-9051	6.68		No Underground Coal Mining / Declassified
1*	292107-9052	10.15		No Underground Coal Mining / Declassified
4*	292107-9075	6.48		No Underground Coal Mining / Declassified
5*	292107-9076	11.02		No Underground Coal Mining / Declassified
2*	292107-9088	10.29		No Underground Coal Mining / Declassified
6 *	292107-9099	6.53		No Underground Coal Mining / Declassified
7*	292107-9100	6.50		No Underground Coal Mining / Declassified
8*	292107-9101	10.34		No Underground Coal Mining / Declassified
	and the second			
11	302107-9023	28.30		Declassified
12	302107-9056	19. <u>37</u>	ببنا	Declassified
13	302107-9057	19.40		Declassified
14	302107-9058	19.41		Declassified
15	302107-9059	19.47		No Underground Coal Mining / Declassified
9*	302107-9060	20.34		No Underground Coal Mining / Declassified
10 *	302107-9061	31.56		No Underground Coal Mining / Declassified
18	302107-9062	19.74	Ľ	No Underground Coal Mining / Declassified
19	302107-9063	19.76		No Underground Coal Mining / Declassified
20	302107-9064	19.81		No Underground Coal Mining / Declassified
21	302107-9065	19.56		No Underground Coal Mining / Declassified
22	302107-9066	19.56		No Underground Coal Mining / Declassified
23	302107-9067	19.55		No Underground Coal Mining / Declassified
24	302107-9068	23.22		No Underground Coal Mining / Declassified
	TOTAL ACRES	546.38		
* BLA		LA L05L00	2	1 All other lots see: ROS # 19990817900015

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King County

Department of Development and Environmental Services 900 Oakesdale Avenue Southwest Renton, WA 98055-1219

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Please reference inquiry number L06SA435 with any future permit applications on the subject parcels.

Thank you for your inquiry, and please contact me directly at 206.296.7267 or by e-mail at todd.hurley@metrokc.gov if you have any additional questions.

Sincerely,

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Todd Hurley Environmental Scientist III / Engineering Geologist King County DDES

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Report

Geological Engineering Services Preliminary Assessment of Coal Mine Hazards, Landslide/Steep Slope Hazards and Landslide Hazard Drainage Areas PCCC Enumclaw-Franklin Road Properties Section 19-T21N-R7E and Section 30-T21N-R7E Black Diamond (King County), Washington

> May 2, 2006 Project No. 0102-010

Prepared For: Palmer Coking Coal Company

Prepared By: Icicle Creek Engineers, Inc.

ICICLE CREEK ENGINEERS

Geotechnical, Geologic and Environmental Services

May 2, 2006

William J. Kombol Palmer Coking Coal Company P.O. Box 10 Black Diamond, Washington 98010

Report

Geological Engineering Services Preliminary Assessment of Coal Mine Hazards, Landslide/Steep Slope Hazards and Landslide Hazard Drainage Areas PCCC Enumclaw-Franklin Road Properties Sections 19 and 30, Township 21 North, Range 7 East Black Diamond (King County), Washington File No. 0102-010

INTRODUCTION

This report summarizes the results of Icicle Creek Engineers' (ICE's) preliminary assessment of Coal Mine Hazards and Landslide/Steep Slope Hazards of the Palmer Coking Coal Company (PCCC) Enumclaw-Franklin Road properties in King County, Washington. ICE's services were conducted in general accordance with our Scope of Services and Fee Estimate dated February 13, 2006 and were authorized in writing by William J. Kombol of PCCC on February 14, 2006. The subject properties are located in Section 19 and 30, Township 21 North (T2N), Range 7 East (R7E), Willamette Meridian along Enumclaw-Franklin Road east of the City of Black Diamond. The locations of the PCCC Enumclaw-Franklin Road properties are shown on the Vicinity Map, Figure 1.

A portion of these properties is referred to as the "Shangri La" area by PCCC. PCCC is considering building a house within the Shangri La area. The PCCC Enumclaw-Franklin Road properties, including the Shangri La area and proposed house site, are shown on the Site Plan, Figure 2.

Mr. Kombol requested that ICE complete a preliminary Coal Mine Hazard assessment of the PCCC Enumclaw-Franklin Road properties. In addition, Mr. Kombol requested a preliminary assessment of Landslide/Steep Slope Hazards and Landslide Hazard Drainage Areas, as regionally mapped by King County Department of Development and Environmental Services (DDES) of the Shangri La area (proposed house site) in general accordance with 2005 King County Zoning Code (Title 21A) and the 2005 Surface Water Design Manual standards.

SCOPE OF SERVICES

GENERAL

The purpose of our services was to conduct a preliminary assessment of Coal Mine Hazards within the PCCC Enumclaw-Franklin Road properties and a preliminary assessment of Landslide/Steep Slope Hazards and a Landslide Hazard Drainage Area within the Shangri La area. Specifically, our services included the following:

PRELIMINARY COAL MINE HAZARD ASSESSMENT

- Review available information concerning project site topography, geology, soil conditions and other relevant site characteristics. Published materials include geologic maps prepared by the U.S. Geological Survey (USGS), and a variety of maps published by the Washington State Department of Natural Resources.
- Review available mine records to evaluate the location of the mined-out areas, together with the depth of mining, thickness of zone(s) mined and mining methods. This information was reviewed in concert with ground surface topography to evaluate if there has been surface expression or collapse of underground openings. The historic mine records include mine maps, mine inspector reports (available from 1890-1962), published technical reports and historical literature regarding coal mining in King County and at the project site.
- Review historical photographs for evidence of ground subsidence (such as sinkholes) and the location of mining facilities on the surface.
- Complete a surface reconnaissance to identify mine openings such as adits or air shafts, together with stockpiles of mine rock fill (coal fines and broken rock) or other areas in which the original ground surface has been disturbed. In addition, we noted surface topographic anomalies that may indicate collapse of underground workings.
- Conduct interviews, as appropriate, with individuals familiar with historic coal mining activities in the project area.
- Prepare a map that included superimposing the identified mines onto a project site base map. This map was used to develop three geologic cross-sections showing the depth to mined-out areas and a preliminary interpretation of mine overburden conditions.
- Evaluate the potential for regional ground subsidence in Severe and Moderate Coal Mine Hazard Areas (vertical ground subsidence, ground tilt and ground strain).
- Classify the mine hazards as either: 1) Severe Coal Mine Hazards, 2) Moderate Coal Mine Hazards, or 3) Declassified Coal Mine Areas based on the findings of the Preliminary Coal Mine Hazard Assessment.
- Develop recommendations for mitigation for development within Severe and Moderate Coal Mine Hazard areas, as appropriate.

PRELIMINARY LANDSLIDE/STEEP SLOPE HAZARD AND LANDSLIDE HAZARD DRAINAGE AREA ASSESSMENT

- Review readily available information concerning project site topography, geology, soil conditions and other relevant site characteristics.
- Perform a geologic reconnaissance of the Shangri La area, with particular emphasis in the proposed house site and adjacent steep slope areas (areas that are inclined steeper than a 40 percent grade), and the King County DDES regionally-mapped Landslide Hazards and Landslide Hazard Drainage Areas.
- Provide preliminary recommendations for buffer and building setback criteria adjacent to Steep Slope Hazard areas.
- Provide preliminary recommendations for development in Landslide and Landslide Drainage Hazard areas, if appropriate.

EXISTING INFORMATION

The following documents were reviewed regarding the geology, historic coal mining and Critical Areas status of the PCCC Enumclaw-Franklin Road properties area:

- King County DDES IMAP, March 2006, GIS inventory of Critical Areas published online at metrokc.gov/gis/mapportal/iMAP_main.htm.
- King County DDES, December 2005, King County Zoning Code, Title 21A.
- King County DDES, March 1999, "Coal Mine Hazard Assessment, Report and Mitigation Plan Guidelines & King County Ordinance No. 13319," 18 pages.
- King County Department of Natural Resources, Water and Land Resources Division, 2005, "Surface Water Design Manual."
- PCCC, 1936, 1959, 1965, 1970 and 1976 stereo pair aerial photographs of the PCCC Enumclaw-Franklin Road properties area.
- Warren, W.C., Norbisrath, H., Grivetti, R.M., and Brown, S.P., 1945, "Preliminary Geologic Map and Brief Description of the Coal Fields of King County, Washington," United States Geological Survey, 1 plate.
- Washington State Department of Natural Resources, Division of Geology and Earth Resources, May 1994, "The Washington State Coal Mine Map Collection," maps K77, Franklin-Gem Mine (1944, 1946, 1947, 1950), K78, BPD Coal Company Mine (1948) K79, Franklin Mine (1900, 1916, 1919, 1921, 1922), K80, Franklin Mines (1949, 1951, 1954, 1955, 1956, 1958), K81, Franklin Mines (no date), K82, Fulton No. 2 Mine (1958), K83, Franklin Mine, South Extension (1958, 1959, 1979), K84 (1922), K91, Hyde Mine (1952).

KING COUNTY DDES CRITICAL AREA DESCRIPTION

COAL MINE HAZARDS

The principal physical hazards associated with abandoned coal mines include 1) sinkholes (Severe Coal Mine Hazard Areas), 2) regional ground subsidence (Moderate Coal Mine Hazard Areas and Declassified Coal Mine Areas), and 3) mine rock fill (King County DDES, March 1999). Sinkholes form shallow depressions in the ground surface, or in extreme cases, a vertically-sided pit caused by collapse of poorly-backfilled mine openings or progressive failure of the mine roof. Regional ground subsidence occurs as regional plastic deformation of the ground surface as the mine collapses. Mine rock fill includes stockpiles of mining by-products consisting of broken rock and coal.

King County DDES 2005 Zoning Code Chapter 21A.24.205, defines "Coal Mine Hazard" as follows:

A. Declassified coal mine areas are those areas where the risk of catastrophic collapse is not significant and that the hazard assessment report has determined do not require special engineering or architectural recommendations to prevent significant risks of property damage. Declassified coal mine areas typically include, but are not limited to, areas underlain or directly affected by coal mines at depths of more than three hundred feet as measured from the surface;

B. Moderate coal mine hazard areas are those areas that pose significant risks of property damage that can be mitigated by implementing special engineering or architectural recommendations. Moderate coal mine hazard areas typically include, but are not limited to, areas underlain or directly affected by abandoned coal mine workings from a depth of zero, which is the surface of the land, to three hundred feet or with overburden-cover-to-seam thickness ratios of less than ten to one depending on the inclination of the seam; and

C. Severe coal mine hazard areas are those areas that pose a significant risk of catastrophic ground surface collapse. Severe coal mine hazard areas typically include, but are not limited to, areas characterized by unmitigated openings such as entries, portals, adits, mine shafts, air shafts, timber shafts, sinkholes, improperly filled sinkholes and other areas of past or significant probability for catastrophic ground surface collapse; or areas characterized by overland surfaces underlain or directly affected by abandoned coal mine workings from a depth of zero, which is the surface of the land, to one hundred fifty feet. (Ord. 15051 § 158, 2004).

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LANDSLIDE HAZARDS

King County DDES 2005 Zoning Code Chapter 21A.06.680 defines a "Landslide Hazard" as follows: an area subject to severe risk of landslide, such as:

A. An area with a combination of:

- 1. Slopes steeper than fifteen percent of inclination;
- 2. Impermeable soils, such as silt and clay, frequently interbedded with granular soils, such as sand and gravel; and
- 3. Springs or ground water seepage;
- B. An area that has shown movement during the Holocene epoch, which is from ten thousand years ago to the present, or that is underlain by mass wastage debris from that epoch;
- C. Any area potentially unstable as a result of rapid stream incision, stream bank erosion or undercutting by wave action;
- D. An area that shows evidence of or is at risk from snow avalanches; or
- E. An area located on an alluvial fan, presently or potentially subject to inundation by debris flows or deposition of stream-transported sediments.

King County DDES 2005 Zoning Code Chapter 21A.24.280 requires a buffer from all edges of the landslide hazard area. To eliminate or minimize the risk of property damage or injury resulting from landslides caused in whole or part by the development, the department shall determine the size of the buffer based upon a critical area report prepared by a geotechnical engineer or geologist. If a critical area report is not submitted to the department, the minimum buffer is fifty feet. If the landslide hazard area has a vertical rise of more than two-hundred feet, the department may increase the minimum building setback in K. C. C. 21A.24.200 to one-hundred feet.

STEEP SLOPE HAZARDS

King County DDES 2005 Zoning Code Chapter 21A.06.1230 defines a "Steep Slope Hazard" as follows: an area on a slope of forty percent inclination or more within a vertical elevation change of at least ten feet. For the purpose of this definition, a slope is delineated by establishing its toe and top and is measured by averaging the inclination over at least ten feet of vertical relief.

King County DDES 2005Zoning Code Chapter 21A.24.310 requires a minimum buffer of 50 feet from the top, toe and along all sides of any slope 40 percent or steeper. The buffer may be reduced to 10 feet, if based on special study King County determines that the reduction will adequately protect the proposed development and the critical area. In addition to the buffer, a building setback of 15 feet is required from the edge of the steep slope buffer. Landscaping, uncovered decks, building overhangs (provided the overhang does not extend more than 18 inches into the buffer), and driveways and patios are allowed within the building setback area.

LANDSLIDE HAZARD DRAINAGE AREA

The 2005 King County Surface Water Design Manual defines a "Landslide Hazard Drainage Area as follows: a specially mapped area where the County has determined that overland flow from new projects will pose a significant threat to health and safety because of their close proximity to a landslide hazard area that is on a slope steeper than 15%.

GEOLOGIC SETTING

Regional mapping by the USGS (Geologic Map of the Cumberland, Hobart and Maple Valley Quadrangles, King County, Washington, 1969) indicates that the PCCC Enumclaw-Franklin Road properties are mantled with Quaternary age glacial deposits (referred to as "glacial drift") that consist of

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silt, sand, gravel, cobbles and boulders. The glacial drift varies from a few feet to several tens of feet in thickness.

Bedrock referred to as "Puget Group," underlies the glacial drift and is present at the surface in the walls of the Green River gorge that borders the northeast side of the PCCC Enumclaw-Franklin Road properties. Puget Group bedrock consists of interbedded sandstone, siltstone, shale, claystone, carbonaceous shale and coal beds (sedimentary rock).

Structurally, the bedrock has been uplifted, folded and faulted over time. This structural deformation of the bedrock has caused the sedimentary layering of the bedrock to dip from 20 to 70 degrees down to the west.

MINING HISTORY

GENERAL contracts the Hyde Destructed

Some of the PCCC Enumclaw-Franklin Road properties are underlain by portions of six abandoned underground coal mines. Collectively, this group of mines is referred to as the "Franklin Mines." Also underlying a portion of the properties in Section 19 is a rock tunnel (referred to as the "Hyde Drainage Tunnel") that is connected to the Hyde Mine. The Hyde Mine is located east of the PCCC Enumclaw-Franklin Road properties in Sections 20 and 29. Individually, the mines were operated on the McKay seam, Gem seam, No. 10 seam (South Extension), No. 12 seam and No. 16 seam. The locations of the abandoned underground mines are shown on the Abandoned Underground Mine Map, Figure 3.

Based on our review of current topographic mapping and the historic mine maps that include underground elevations, the depth to the abandoned underground coal mines varies from about 20 feet to over 800 feet below the ground surface. The configuration of these underground coal mines with respect to the ground surface at specific locations is shown on the Geologic Cross-Sections, A-A' and B-B' and Geologic Cross-Section C-C', Figures 4 and 5, respectively.

These mines were intermittently active from about 1889 to 1964. Most of the active mining was in the early 1900s. However, considerable mining was conducted, primarily on the No. 10 and No. 12 seams in the northeast corner of the PCCC Enumclaw-Franklin Road properties, in the 1950s and early 1960s. Presently, there are no active coal mining operations within or adjacent to the PCCC Enumclaw-Franklin Road properties.

MINING METHODS

The mines that underlie the some of the PCCC Enumclaw-Franklin Road properties were all accessed from near the level of the Green River (called a "portal") by an access tunnel (haulageway) driven along the coal seam. The haulageway was inclined slightly upward (typically about 1 foot vertically over 100 feet) to facilitate drainage of ground water entering the mined-out areas. The McKay Seam mine and the Gem Seam were further developed by driving a "slope" down the dip (inclination) of the coal seam with subsequent deeper haulageways (referred to as "levels") which required mechanical pumping to keep the mine dry. Usually the main haulageways or slopes were shored with timber posts/beams or reinforced concrete to prevent collapse. Further development of the coal seams used "room-and-pillar" (also referred to as "chute-and-pillar") mining methods.

At specified intervals along the main haulageway, "chutes" were driven up the coal seam to a "chain-pillar." The chain pillar is coal left in place to protect the ground surface or upper level from caving into the next level below. The mines were typically developed from the top down, so the shallow levels were typically mined first. "Cross-cuts" were then driven between the chutes. The chutes and

cross-cuts were then widened until the coal left in place (pillars) and rooms comprised about a 1 to 1 ratio.

Most or all of the pillars were removed before abandonment of a level. This mining method is referred to as "full pillar extraction." Full pillar extraction is a normal underground mining process designed to maximize coal extraction and to promote short term collapse of the mined-out areas. As designed, the removal of the pillars causes the mined-out area to collapse within a few hours to days following retreat since backfilling was not intended.

Rock tunnels (underground tunneling across the bedrock layers) was a common practice in this area for connecting mines together or to access other coal seams while using a single access haulageway or slope. A rock tunnel (referred to above as the Hyde Drainage Tunnel) was driven in 1915 a distance of about 4,300 feet to facilitate drainage of the nearby Hyde Mine in Section 29, T21N, R7E. As previously mentioned, the Hyde Drainage Tunnel crosses under Section 19 as shown on Figure 3.

Based on engineering studies conducted at the time of mining, caving of the mined-out areas (rooms) was required upon retreat of production areas. Room caving was <u>required</u> to allow the overburden pressures in the mines to adjust. If mined-out rooms remained open, then "bumps" became a major concern. Bumps occur when a large room remains open for a long period of time followed by a catastrophic collapse sending an air blast through the mine that could injure the miners.

SURFACE CONDITIONS

GENERAL

The surface conditions within the project area were evaluated based on review of historical mine maps, stereo-matching and single, vertically-oriented aerial photographs, and detailed surface reconnaissance conducted on March 9 and 23, 2006 by Brian Beaman of ICE. The surface reconnaissance was focused on areas known to be underlain by abandoned coal mines (primarily in Section 19).

PCCC ENUMCLAW-FRANKLIN ROAD PROPERTIES

The PCCC Enumclaw-Franklin Road properties occupy about 505 acres located about 2 to 3 miles east of the City of Black Diamond. The Enumclaw-Franklin Road borders or crosses the properties from south to north with the properties being generally accessed by gated, single-lane, gravel-surfaced roads. The PCCC Enumclaw-Franklin Road properties are bordered by forest land on all sides with the Green River bordering the northwest property line. The City of Black Diamond water supply property (known as "Black Diamond Springs) is located adjacent to the west and south side of the PCCC Enumclaw-Franklin Road properties in Section 19.

The south portion of the PCCC Enumclaw-Franklin Road properties (within Section 30) is characterized by nearly level to gently undulating topography from about Elevation 660 to 740 feet and is vegetated with second-growth conifer trees and brush. The north portion of Fish Lake occurs in the southeast corner of Section 30 within the property.

The north portion of the PCCC Enumclaw-Franklin Road properties (within Section 19) is bordered to the northeast by the Green River gorge at a base (river level) of about Elevation 420 feet, with a high point on a hilltop west of Enumclaw-Franklin Road at about Elevation 930 feet. This area contains mixed vegetation including recent logged areas with second-growth conifer trees and a dense understory of brush east of Enumclaw-Franklin Road, and mature forest with a light to moderately dense understory of brush in the area west of Enumclaw-Franklin Road (containing the Shangri La and Green River gorge area).

No surface water, including springs and seepage, were observed on the property at the time of our site reconnaissance. However, a series of large springs (locally referred to as "Black Diamond Springs") occur near the base of the steep slope bordering the Shangri La area at about Elevation 550 feet.

COAL MINE-RELATED SURFACE FEATURES

Four abandoned (collapsed or backfilled) mine openings exist within the PCCC Enumclaw-Franklin Road properties near the level of the Green River along the northwest property line in Section 19 as shown on Figure 3. A fifth surface entry, referred to on the historic mine maps as a "timber chute" is located on the upland area in Section 19 just west of the PCCC property. These abandoned mine openings are relatively easy to identify in the field, but are currently inaccessible and do not appear to pose a significant safety risk.

Surface evidence of underground coal mine collapse exists in two areas; both of which are associated with the No. 12 Seam in Section 19. The northernmost collapse feature is locally referred to as the "Burning Field" located along the northwest side of Enumclaw-Franklin Road as shown on Figure 3. Mr. Kombol indicated that this area (and the historic mine maps agree) is underlain by an abandoned underground mine (the No. 12 seam) at a depth of less than 100 feet. The mine apparently caught fire some time after closure, resulting in steam emanating from vents caused by collapsed ground over the underground mine. The "vents" are characterized by shallow holes in the ground about 1- to 2-feet deep and less than 1 foot in diameter. We understand that this surface "heat" was high enough during the late 1960s that it caused a grass fire which resulted in the area being called the Burning Field. The area was subsequently cleared and roughly leveled with bulldozers. Over time, the "heat" has lessened to the extent that one can locate local areas of warm ground and an occasional stream vent that quickly dissipates. Currently, the Burning Field is vegetated with grass, brush and small trees.

The second surface collapse area is located southeast of Enumclaw-Franklin Road in an area referred to as the "Graded Area" on Figure 3. This area is currently nearly level and sparsely vegetated as a result of grading that occurred within the past 30 years. This area is underlain by the shallow (less than 100-feet deep) No. 12 mine workings.

A collapse-like feature is located between the two previously described collapse areas and is shaped like a sinkhole. However, based on our review of the historic mine maps, no abandoned underground mine exists at this location. Based on our site observations and review of historical aerial photographs, it is likely that this feature is a former gravel pit as shown on Figure 3.

No other mining-related surface features such as sinkholes, mine openings, undocumented coal mine workings or surface prospects were observed during our site reconnaissance within the PCCC Enunclaw-Franklin Road properties. No mine rock fill (waste by-product of coal mines consisting of coal fines and broken rock) was observed during our site reconnaissance.

SHANGRI LA AREA

The Shangri La area is accessed off of Enumclaw-Franklin Road by a gravel-surfaced, singlelane road that crosses a nearly level area (where the house is proposed) for a distance of about 600 feet, then becomes a paved, single-lane road where the road turns to the southwest and descends in a traverse of a steep slope.

The steep slope bordering the proposed house site is inclined at about a 50 to 60 percent grade and is about 100 feet high. The steep slope is vegetated with mature Douglas fir, hemlock and an occasional cedar tree with trunks ranging up to 4 feet in diameter. Some of these trees exhibit "butt-

bow" which is an indicator of active soil creep. Soil creep is a common ground movement process occurring on nearly all steep slope areas where the surficial soils (less then 5-feet deep) "creep" gradually downslope because of gravity, freeze-thaw, wetting-drying and animal burrowing (bioturbation), and is typically measured in millimeters (or less) per year.

The base of the steep slope is nearly level to gently sloping and is vegetated with a mix of second-growth conifer and deciduous trees. Landslide Hazards and a Landslide Hazard Drainage Area are regionally mapped by King County DDES in this area. In addition, based on site topography, a Steep Slope Hazard area (slopes inclined more than 40 percent grade) exists adjacent to the proposed house site. The proposed house site including the access road and King County DDES Critical Areas are shown on the Landslide/Steep Slope Hazards and Landslide Hazard Drainage Area Map, Figure 6.

A spring is located adjacent to the south boundary of the Shangri La area which is the northernmost spring of the group of four springs collectively known as the Black Diamond Springs. This spring is locally referred to as "Palmer Spring" as shown on Figure 6.

We did not observe evidence of slope instability (such as bare soil scarps, groups of leaning trees or hummocky topography) on the steep slope area bordering the proposed house site. We are aware of a large landslide that occurred in 1997 within the City of Black Diamond property to the south of the Section 19 PCCC properties. This landslide is located approximately 1/3 mile southwest of the proposed house site and did not affect the Shangri La area.

AERIAL PHOTOGRAPH REVIEW

Historical aerial photographs of the PCCC Enumclaw-Franklin Road properties and adjacent areas were reviewed for the years 1936, 1959, 1965, 1970 and 1976. Other than the three previously described surface features (Burning Field, Graded Area and gravel pit), no other anomalous surface features were observed on the photographs. The entire area has been utilized as forest land during this time period.

ANALYSIS OF COAL MINE HAZARDS

SEVERE COAL MINE HAZARD AREAS

The Severe Coal Mine Hazard areas are underlain by abandoned underground coal mines at a depth of less than 150 feet and are shown on the Coal-Mine Hazards Map, Figure 7. We added a 50-foot wide buffer to the updip side of the Severe Coal Mine Hazard area as a conservative means to compensate for possible funneling of caved materials along the longitudinal axis of the subcrop of the mined out area of the coal seam.

MODERATE COAL MINE HAZARD AREAS

Three areas of the site were evaluated for regional ground subsidence including the area underlain by the No. 12 Seam and the McKay Seam $(1^{st}, 2^{nd} \text{ and } 3^{rd} \text{ levels})$. These three areas were selected based on conditions that could create the maximum surface subsidence effects, and proximity of the proposed house within the Shangri La area. Based on our analysis, total potential regional ground subsidence is estimated to range from about 1 to 1.4 inches uniformly across the these general areas. No differential subsidence (tilt) that could cause property damage is expected (tilt is estimated to be less than 1V:350H - vertical to horizontal). No excessive ground strain that could cause property damage is expected (ground strain is estimated to be less than 0.0003 inches per inch).

Based on our analysis, no Moderate Coal Mine Hazards occur at the PCCC Enumclaw-Franklin Road properties.

DECLASSIFIED COAL MINE AREAS

Based on our evaluation, area classified as a "Coal Mine Hazard" by King County DDES that are outside of ICE classified Severe Coal Mine Hazard areas within the PCCC Enumclaw-Franklin Road properties should be designated as a Declassified Coal Mine Area as shown on Figure 7.

CONCLUSIONS AND RECOMMENDATIONS

PRELIMINARY COAL MINE HAZARD ASSESSMENT

Based on our review of available information and analysis of coal mine hazards at the PCCC Enumclaw-Franklin Road properties, we have developed the following conclusions:

- Some of the PCCC Enumclaw-Franklin Road properties are underlain by portions of six abandoned underground coal mines and the Hyde Drainage Tunnel as shown on Figure 3.
- The depth to the mine workings that underlie the PCCC Enumclaw-Franklin Road properties varies from about 20 feet to more than 800 feet below the ground surface as shown on Figures 4 and 5.
- Several abandoned (collapsed or backfilled) mine openings exist near the level of the Green River along the northwest property line in Section 19 as shown on Figure 3.
- Two subsidence areas referred to as the Burning Field and Graded Area were observed within the PCCC Enumclaw-Franklin Road properties as shown on Figure 3. Currently there are no open sinkholes within these areas. However, in the Burning Field area there are small vents (holes about 1 to 2 feet deep and less than a foot in diameter) where steam rises from underground. The Burning Field area is on an adjacent property currently owned by the State of Washington.
- No surface manifestation of regional ground subsidence was observed during our geologic reconnaissance.
- Portions of the PCCC Enumclaw-Franklin Road properties are underlain by abandoned underground mine workings that are less than 150 feet below the ground surface. These areas are Severe Coal Mine Hazard Areas as shown on Figure 7.
- An existing access road and portions of the Enumclaw-Franklin Road are located within the Severe Coal Mine Hazard area. Both roads have existed in their current locations for over 60 years. Given the lack of surface evidence of past subsidence of these road areas, these roads should be maintained in their present condition.
- The analysis of regional ground subsidence (ground strain and ground tilt associated with Moderate Coal Mine Hazard Areas) indicates the estimated values are less than the threshold values for damage to structures. For this reason, the previously identified coal mine hazard area should be designated as a Declassified Coal Mine Area (except those areas classified as Severe Coal Mine Hazard areas) as shown on Figure 7. No mitigation associated with coal mine hazards is required for development in Declassified Coal Mine areas.
- No mine rock fill, undocumented coal mine workings or prospects were observed within the PCCC Enumclaw-Franklin Road properties. No mitigation associated with mine rock fill, undocumented coal mine workings or prospects is required. ICE should be contacted to provide an evaluation if evidence of mine rock fill, undocumented coal mine workings or prospects is encountered during future grading on the site.

SHANGRI LA AREA – PRELIMINARY ASSESSMENT OF LANDSLIDE/STEEP SLOPE HAZARDS AND LANDSLIDE HAZARD DRAINAGE AREA Slope Stability

We did not observe surficial physical evidence of active deep-seated (more than 5 feet deep) landsliding within the Landslide and Steep Slope Hazard areas (shown on Figure 6) within or adjacent to

the Shangri La area. We observed evidence of soil creep which is a typically surficial soil geomorphic process in steep slope areas, and is not usually associated with slope instability.

However, the Landslide and Steep Slope Hazard area are at or near its natural angle of stability in its present condition. The presence of undisturbed vegetation on this slope area enhances the stability of the slope. Modification of the steep slope by grading, tree cutting, or point source discharge of surface water onto this slopes may destabilize this area.

Steep Slope Hazards

Based on our knowledge of the geologic and soil conditions at the site, and our geologic reconnaissance, we recommend that foundation elements of structures and new access driveways/roads should be set back at least 40 feet from the top of the Steep Slope Hazard Area. The 40-foot wide setback includes a 25-foot wide buffer (reduced from the King County DDES standard 50 feet) for a Steep Slope Hazard area. It is possible that the buffer width could be reduced to a King County DDES minimum of 10 feet provided that subsurface exploration was completed to further evaluate subsurface soil and ground water conditions on a site-specific basis.

Our recommendation for buffer reduction is contingent on the protective steep slope vegetation not being disturbed. It is our opinion that select trees in the steep slope area may be removed or limbed if it is considered that these trees pose a hazard to the proposed property improvements. ICE should be contacted to review tree removal plans if selected trees are to be cut from the steep slope area.

Landslide Hazards

According to King County DDES mapping, an area southwest of the proposed house site is within a regionally-mapped Landslide Hazard area as shown on Figure 6. We did not observe surface evidence of deep-seated (more than 5-feet deep) landsliding within the Landslide Hazard Area. Surficial (less than 5-feet deep) ground movement, referred to as soil creep is likely active, and is typical of most steep slope areas in the Puget Sound lowlands.

Areas mapped as a Landslide Hazard area that are less than 40 percent grade are potentially developable provided that appropriate foundation and drainage measures are designed and constructed. ICE can assist with these specific foundation and drainage design criteria, if necessary. At this time, no development is proposed within the Landslide Hazard area.

Landslide Hazard Drainage Area

A Landslide Hazard Drainage Area, according to King County DDES, exists in the area shown on Figure 6. Development in this area (none is proposed at this time) will require special drainage review by King County DDES. Mitigations for development within a Landslide Hazard Drainage Area are focused on controlling stormwater runoff from new impervious surfaces, and routing this stormwater in a tightline to the base of slope areas or other approved discharge point.

USE OF THIS REPORT

We have prepared this report for use by Palmer Coking Coal Company and their associates and engineers for their use in planning for the property subject to this report. The data and report should be provided to permitting agencies for their information, but our report conclusions and interpretations should not be construed as a warranty of the subsurface conditions.

Within the limitations of scope, schedule and budget, our services have been executed in accordance with generally accepted practices in this area at the time the report was prepared. No warranty or other conditions, express or implied, should be understood.

Icicle Creek Engineers

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We trust this information meets your present needs. If you have any questions or if we can be of further assistance to you, please call.



Kathy S. Killman, L.G. Principal Geologist

Document ID: 0102010.REP

Three copies submitted

Attachments: Figure 1 – Vicinity Map

Figure 2 – Site Plan

Figure 3 – Abandoned Underground Mine Map

Figure 4 – Geologic Cross-Sections A-A' and B-B'

Figure 5 - Geologic Cross-Section C-C'

Figure 6 - Landslide/Steep Slope Hazards and Landslide Hazard Drainage Area Map

Figure 7 - Coal Mine Hazards Map

FIGURES

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