# ANALYSES AND MEASURED SECTIONS OF WASHINGTON COALS

by

William M. Phillips,

Timothy J. Walsh,

and

Henry W. Schasse

Open File Report 82-5

Washington Division of Geology and Earth Resources

July 1982

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## INTRODUCTION

In 1975, the Washington Department of Natural Resources undertook to evaluate the occurrences of coal on Department-administered land. In 1978, this effort was expanded to include all coal lands within the State of Washington. Some results of the coal resource evaluation program are given in Vonheeder (1975, 1977a, 1977b, 1977c, 1978a, 1978b, 1979), Walker (1980), and Stoffel (1981). Additional work is under way on coal lands in King and Pierce counties.

An important part of the coal resource evaluation program has been the collection and analysis of coal samples. To date, 135 samples from nine Washington counties and one adjoining county in Oregon have been processed. Stratigraphic sections were measured and recorded at 37 of the 89 sampling localities. This report presents the coal analytical data and associated measured sections.

The coal analyses are presented in Appendix B. Measured sections of many of the sampled coal seams are contained in Appendix A. A detailed discussion of the structure, stratigraphy, previous coal analytical work, and coal resources of the sampled areas is desirable but beyond the scope of this report.

## PREVIOUS WORK

Previous analytical results are contained in Daniels and others (1958), Fieldner and others (1931), and Yancey and Geer (1941). Reports detailing the overall coal resources of Washington are Beikman and others (1961), Green (1947), and Smith (1911). The geology of Asotin County is discussed in Russell (1901) and in Stoffel (1981). Culver (1919), Henriksen (1956), Snavely and others (1958), and Roberts (1958) contain data on the general geology of Cowlitz, Thurston, and Lewis Counties. The geology of King County is discussed in Evans (1912), Livingston (1971), Vine (1969), and Warren and others (1945). Saunders (1914) and Walker (1980) detail the geology and coal resources of Kittitas County.

Pierce County geology is treated in Daniels (1914) and Gard (1968). Jenkins (1924) investigated the coalfields of Skagit County. Geological reports pertaining to Whatcom County are Jenkins (1923), Moen (1969), and Woodruff (1914).

## ACKNOWLEDGMENTS

Coal samples were collected by Ellis R. Vonheeder, Charles W. Walker, Curtis Cushman, William M. Phillips, Timothy J. Walsh, and Keith L. Stoffel of the Division of Geology and Earth Resources (DGER). Two analyses from samples collected by a private party are also included. The U.S. Geological Survey, U.S. Bureau of Mines, and the U.S. Department of Energy supported this work by performing the bulk of the coal analyses. William M. Phillips (DGER) wrote the computer programs which generated the analytical data sheets and performed the dry, mineral-matter-free (DMMF) and moist, mineral-matter-free (MMMF) calculations.

## GEOGRAPHIC AND GEOLOGIC SETTING OF COAL DEPOSITS

Most of the principal coal deposits in Washington occur in a discontinuous belt extending along the western edge of the Cascade Range from the Columbia River northward nearly to the Canadian border. Notable exceptions are the Kittitas County coalfields on the east flank of the Cascades in the central part of the state. In addition, coal occurs in many small, isolated areas throughout the state. The locations of the major coal-bearing areas and of the isolated occurrences of coal are shown in figure 1.

With the exception of several thin beds of semianthracite in rocks of pre-Tertiary age on Orcas Island in San Juan County, all coal in the state is of Tertiary age. The Chuckanut Formation in northwest Washington was formerly thought to contain rocks of Cretaceous age at its base. Recent evidence indicates however, that the Chuckanut may be comprised entirely of Tertiary age rocks (Reiswig, 1982; Frizzell, 1979.)

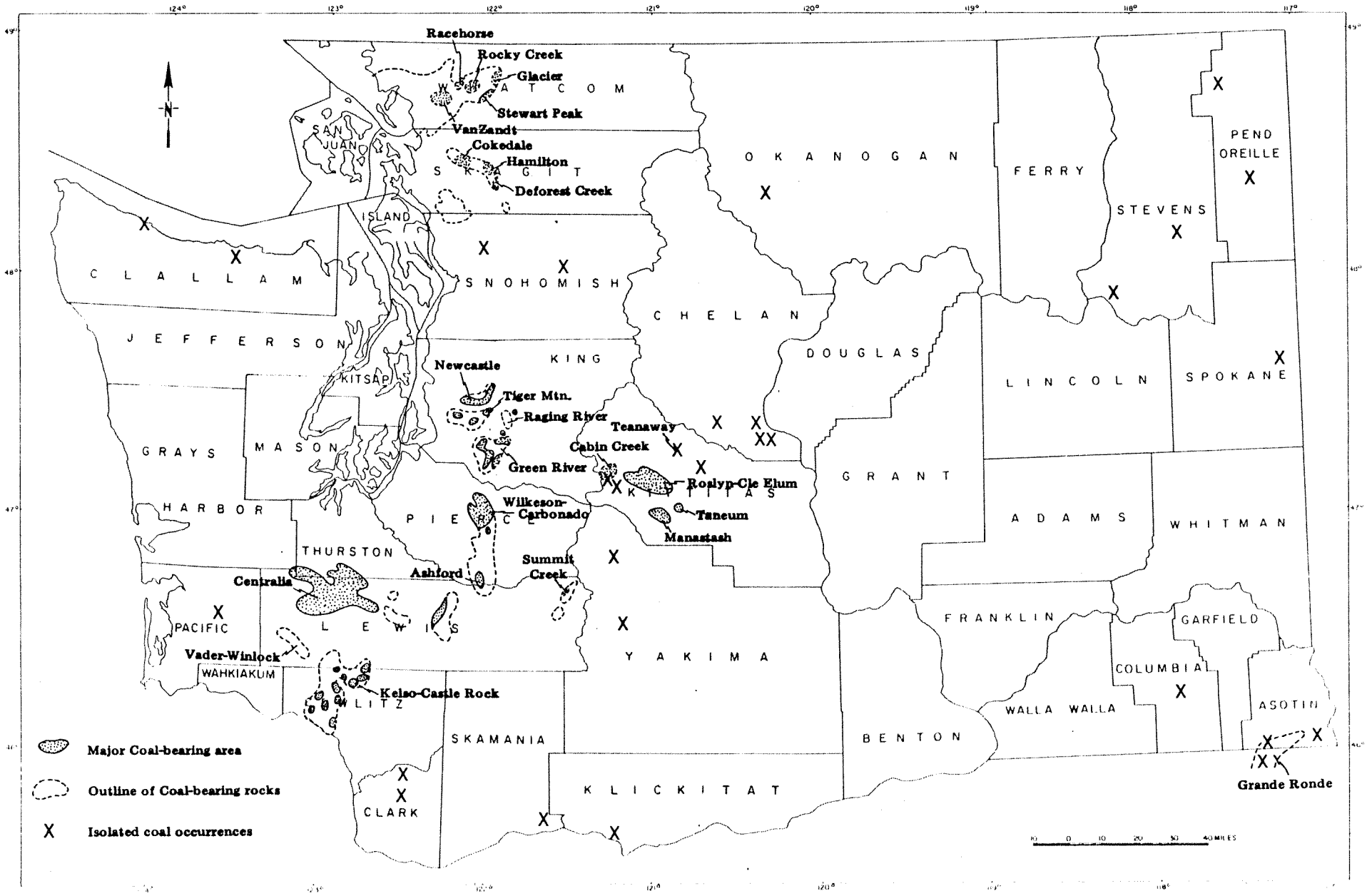



FIGURE 1. – Index map of Washington showing major coal-bearing areas and isolated coal occurrences.

In the eastern portion of the Puget Lowlands the coal-bearing rocks were principally deposited in Eocene to Oligocene delta systems, prograding into a northerly to northwesterly trending embayment (Buckovic, 1979). The coal-bearing rocks commonly interfinger with, and grade into, marine non-coal-bearing rocks to the west (Beikman and others, 1961). Contemporaneous local volcanism commonly contributed ash to many coal seams in the form of tuffaceous partings. East of the Puget Lowlands, coals of the Kittitas County fields were deposited in Eocene fluvial or lacustrine settings also characterized by local volcanism. Figure 2 shows the age and suggested correlations of the lower Tertiary rocks from which coal was sampled for this report. In addition, there are numerous isolated occurrences of lignite which formed as lacustrine interbeds between flows of the Miocene Columbia River Basalt Group. Samples from one such occurrence, the Grande Ronde field of Asotin County, are presented in this report.

## COAL SAMPLING METHODS

The purpose of the coal sampling program has been to characterize coal for which no published analyses are available. Limited exposure conditions sometimes precluded collecting channel samples as recommended by Swanson and Huffman (1976). In those cases, "grab" samples were collected. Because Washington coal has always had to be washed, partings greater than about 3/8 inches thick were excluded in order for the sample more accurately to represent washed coal.

Fresh exposures of coal seams are very limited in Washington; therefore many samples consist of weathered coals. The condition of each sample is noted on the analytical data sheets. The effect of weathering upon analytical results has not been fully documented for Washington coals; therefore, the data contained in this report should be regarded as preliminary. Possible results of weathering include a loss of volatile matter, a degradation of heating value, and an anomalously high apparent rank.

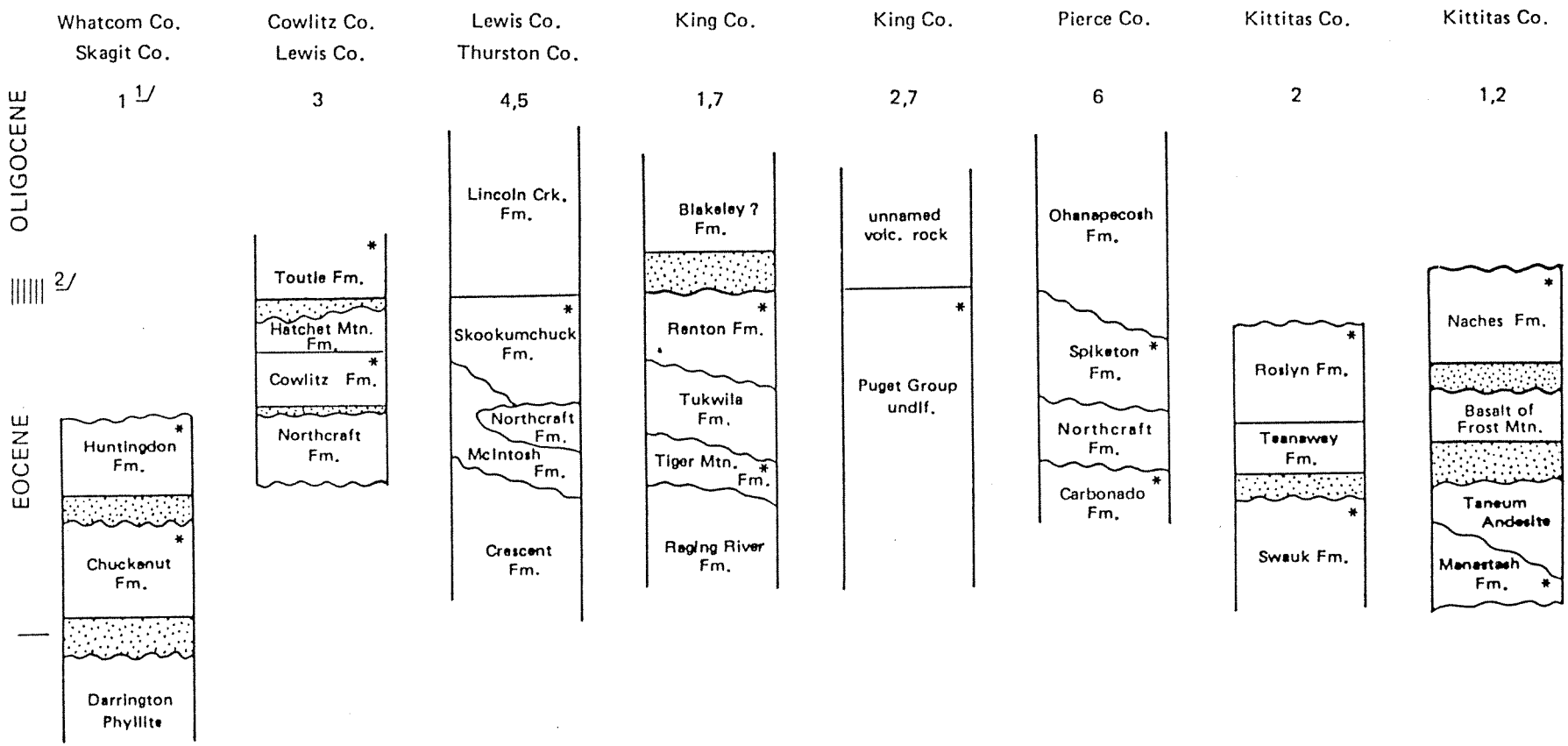



FIGURE 2. – Age and suggested correlations of some lower Tertiary rock units in Washington (asterisks indicate coal-bearing formations; stippled areas represent unconformities).

1/ Each column is modified from the following sources: 1 - Frizzell (1979); 2 - Newman (1981); 3 - Roberts (1958); 4 - Rau (1981); 5 - Snavely and others (1958); 6 - Gard (1968); 7 - Vine (1969).

2/ The broad Eocene-Oligocene boundary represents the evolving views of its placement by the various authors whose conventions are followed in this table.

## METHOD OF CALCULATING AND REPORTING ANALYSES

All analyses were performed using standard procedures as described in U.S. Bureau of Mines (1967). Three methods of calculating and reporting the analyses are used in this report. The first is "as-received," abbreviated on data sheets as "AR." For most samples, laboratory procedures were carried out on air-dried samples. As-received data are calculated using the following formulas:

$$\text{Moisture} \times \frac{(100 - \text{air-dry loss})}{100} + \text{air-dry loss} = \text{Moisture (AR)}$$

$$A \times \frac{(100 - \text{air dry loss})}{100} = A \text{ (AR)}$$

where A = Volatile matter, fixed carbon, ash, sulfur, carbon, nitrogen, or heating value.

$$\text{Hydrogen} \times \frac{(100 - \text{air-dry loss})}{100} + 1/9 \text{ air-dry loss} = \text{Hydrogen (AR)}$$

$$\text{Oxygen} \times \frac{(100 - \text{air-dry loss})}{100} + 8/9 \text{ air-dry loss} = \text{Oxygen (AR)}$$

All calculated numbers except heating value are given in percent. The unit of heating value is British Thermal Units per pound (BTU/LB). For samples for which air-dry loss was not recorded, the above as-received quantities were measured directly.

The second and third methods of calculating and reporting analyses are the moist, mineral-matter-free and the dry, mineral-matter-free bases (Parr, 1928). These are abbreviated "MMMF" and "DMMF" on the data sheets, respectively. The DMMF and MMMF data permit convenient and accurate comparisons of relative coal rank (American Society for Testing Materials, 1951). Heating value on a MMMF basis is generally the better rank indicator for coals in the range lignite to high-volatile bituminous. For coals in the range medium-volatile bituminous to anthracite, DMMF fixed carbon is the better rank indicator.

The MMMF basis is calculated using the following formulas:

$$\frac{\text{Heating value} - 50 \times \text{sulfur}}{100 - (1.08 \times \text{ash} + 0.55 \times \text{sulfur}} \times 100 = \text{Heating value (MMMF)}$$

$$\frac{A - 0.15 \times \text{sulfur}}{100 - (1.08 \times \text{ash} + 0.55 \times \text{sulfur}} \times 100 = A \text{ (MMMF)}$$

where A = Volatile matter, fixed carbon, moisture, carbon, nitrogen, oxygen, or hydrogen.

The DMMF basis is calculated as follows:

$$\frac{\text{Heating Value} - 50 \times \text{sulfur}}{100 - (\text{Moisture} + (1.08 \times \text{Ash} + 0.55 \times \text{sulfur}))} \times 100 = \text{Heating value (DMMF)}$$

$$\frac{A - 0.15 \times \text{Sulfur}}{100 - (\text{Moisture} + (1.08 \times \text{ash} + 0.55 \times \text{sulfur}))} \times 100 = A \text{ (DMMF)}$$

where A = Fixed carbon, volatile matter, nitrogen, and carbon.

$$\frac{(\text{Hydrogen} - (1/9 \times \text{Moisture})) - 0.15 \times \text{sulfur}}{100 - (\text{Moisture} - (1.08 \times \text{ash} + 0.55 \times \text{sulfur}))} \times 100 = \text{Hydrogen (DMMF)}$$

$$\frac{(\text{Oxygen} - (8/9 \times \text{Moisture})) - 0.15 \times \text{sulfur}}{100 - (\text{Moisture} + (1.08 \times \text{ash} + 0.55 \times \text{sulfur}))} \times 100 = \text{Oxygen (DMMF)}$$

All calculated numbers except heating value are given in percent.

It has been traditional in coal literature to report coal on a moisture-free and moisture-and ash-free basis. There is little justification for continuing this convention for Washington State coals. The moisture-free basis is an inferior rank indicator and does not represent a realistic mine product. The DMMF basis is preferred for rank comparisons (American Society for Testing Materials, 1951, p. 75). Because of these factors, this report does not include moisture-free and moisture-and ash-free data.

## EXPLANATION OF ANALYTICAL DATA SHEETS

Coal analytical data for 135 samples from nine counties are presented on computer-generated analytical report sheets in Appendix B. The analytical print-outs are organized by county. Within each county group, the report sheets are sorted by sample number in ascending numerical order. Sample location maps for each county are shown in figures 3-18. Measured sections for many of the analyses are contained in Appendix A.

A detailed explanation of the analytical report sheets is given below.

County: Name of county in which sampling site is located.

Sample number: A 7-digit identifying number assigned to each sample by Division of Geology and Earth Resources (DGER) staff.

Coal name: Name of sampled coal seam, as reported in literature or known from unpublished mine maps or reports. If unknown or not named, then the word "unnamed" is printed on the data sheet; queried where correlation is uncertain.

Mine name: Name of mine from which sample was taken, as reported in literature or unpublished mine maps or reports. If sample was not taken from a mine, or if mine name is unknown, then the word "none" is printed.

Coal area: An informal name referring to the geographic region in which the sampling site is located. Coal area designations were assigned by DGER staff. The locations of the coal areas are shown in figure 1.

Sample site elevation: Elevation of sampling site, in feet above mean sea level, taken from U.S. Geological Survey topographic maps. If elevation was not recorded, then an "N" is printed.

Quarter section, section, township, range: Standard Government Land Office coordinates for sampling site location. If quarter section is unknown, then an "N/A" is printed. If the sample was collected from the center of the section, then a "CE" is printed for quarter section.

Quadrangle: Name of the U.S. Geological Survey topographic map containing the sampling site. The scale of the map is indicated by "15" for a 15-minute quadrangle (scale 1:62,500), and by "7.5" for a 7.5-minute quadrangle (scale 1:24,000).

Geologic formation: Name of the formation or group containing sampled coal seam; queried where uncertain.

Age: Geologic Epoch assigned to the formation or group containing the sample.

Strike: Strike of the coal seam or associated rocks at the sampling site. I strike was not determined, an "N/A" is printed.

Dip: Dip of the coal seam or associated rocks at the sampling site. If the dip was not determined, an "N/A" is printed.

Major joints in coal: Strike and dip of joints or cleats in sampled coal seam. If not determined, then an "N/A" is printed.

Exposure type: Nature of the coal seam exposure. Typical exposure types are roadcut, streamcut, outcrop, prospect, and strip pit.

Sample type: Method of sampling the coal seam. Channel samples are collected by continuously sampling the exposed coal face, excluding noncoal partings greater than 3/8 of an inch thick. Grab samples are noncontinuous samples and therefore do not represent the bulk properties of the coal seam. Grab samples were taken in areas of poor exposure where channel sampling was not feasible. Some grab samples were taken from mine tipples or tailings; a few consist of float found in streams.

Sample conditions: Condition of the sampled coal, as judged by the collector. Fresh samples are from newly exposed seams. Weathered samples were collected at outcrops, streamcuts, or roadcuts several years old or older, and in abandoned mine workings, prospects, or strip pits.

Total section measured: Thickness in feet of the stratigraphic section measured by the collector at the time of sampling. Measured sections include both coal and associated noncoal lithologies. If no section was measured, then an "N" is printed.

Coal thickness: Thickness in feet of the coal seam at sampling location. In general, the reported coal thickness is that observed in the field by the collector. However, in a number of instances, the coal seam thickness was known to exceed that observed in the field. In these cases, the coal thickness reported is that documented in the literature or in unpublished mine maps and reports. If coal thickness is unknown, then an "N" is printed.

Sample thickness: The total thickness in feet of that portion of the seam sampled. If sample thickness is equal to coal thickness, then the entire seam was sampled. If sample thickness is unknown or not relevant, as in the case of some grab samples, then an "N" is printed.

Overburden thickness: Thickness in feet of overburden above the coal exposure (noncoal earth materials). In the case of outcrops and many stream and roadcuts, the overburden thickness is zero or negligible. If overburden thickness was not determined, then an "N" is printed.

Sample collector: Name of sample collector followed by agency abbreviation in parentheses. Note: DGER is the abbreviation for the Division of Geology and Earth Resources.

Date of sampling: Date (month-day-year) the sample was collected.

Date of analysis: Date (month-day-year) the sample was analyzed.

Laboratory: Name or agency abbreviation for the laboratory performing the analysis. The following abbreviations are used:

USBM - U.S. Bureau of Mines
USGS - U.S. Geological Survey, Denver
DOE - U.S. Dept. of Energy, Pittsburgh, PA
C.T. & E. Co. - Commercial Testing & Evaluation Company

Lab Number: Laboratory number assigned by the analytical laboratory to each sample.

If any of the following variables were not determined or were not recorded, then an "N" is printed. N/A: indicates that a variable is not applicable.

Air dry loss: Percent loss in weight of sample after drying at 30-35$^{o}$C. The purpose of air drying is to reduce the moisture in the sample to approximate equilibrium with the air of the laboratory. The total moisture of the sample is equal to air dry loss plus moisture on an as-received basis.

Moisture: Percent moisture in sample following air drying, or for samples that were not air-dried, total percent moisture. Moisture content (as-received) is determined by heating the sample for 1-1.5 hours at 105$^{o}\pm5^{o}$C.

Volatile matter: Percent weight loss of sample following heating at 950$^{o}\pm20^{o}$C. for 7 minutes, minus the percent moisture weight loss. Volatile matter does not represent any definite compound in coal.

Ash: Mineral matter remaining after combustible substances in the coal sample are burned. Determined by gradual heating of the sample to a maximum temperature of 750$^{o}$C.

Hydrogen: Percent hydrogen in the sample.

Carbon: Percent carbon in the sample.

Nitrogen: Percent nitrogen in the sample.

Sulfur: Percent sulfur in the sample.

Oxygen: Estimated percent oxygen in the coal sample as estimated by subtracting the sum of Hydrogen, Carbon, Nitrogen, Sulfur, and Ash from 100. Reported percent oxygen contains the summation of all errors incurred in the other determinations.

Heating Value (British Thermal Units (BTU) Per Pound (LB)): A measure of the heating value of the coal sample. One BTU is the amount of heat required to raise the temperature of one pound of water from 63$^{o}$F to 64$^{o}$F. BTU's are converted to calories by multiplying by 0.556.

Fusibility of coal ash: Ash is prepared from the coal sample and formed into small triangular pyramids or cones. The cones are then heated to high temperatures, and the change in shapes due to melting, and the temperatures at which the shape changes occur are noted.

Ash-initial deformation: The temperature (degrees F) at which the apex of the cone has rounded or melted.

Ash-softening temperature: The temperature (degrees F) at which the cone has fused down to a spherical lump.

Ash-fluid temperature: The temperature (degrees F) at which the cone has spread out into a flat layer.

Sulfur forms (sulfate, pyritic, organic): Three forms of sulfur are recognized in coal: sulfur combined with iron as pyrite or marcasite and known as pyritic sulfur; sulfur combined with the coal substance as organic sulfur; and, sulfate compounds such as calcium or iron sulfate. All sulfur forms are reported on an as-received basis as percent sulfur in the sample.

## EXPLANATION OF STRATIGRAPHIC SECTIONS

The stratigraphic sections are contained in Appendix A. The sections are grouped by county. Within each county group, sections are sorted by an identifying sample number in approximate ascending order. In some cases, more than one sample number is associated with a stratigraphic section. This occurs when benches are analyzed separately or when a coal seam is too thick to be represented by a single sample.

The sampled stratigraphic intervals are marked with an asterisk on each section. Where multiple samples were collected in a single section, brackets are used to identify individual sample intervals. A legend identifying all lithologic symbols is presented on the first page of Appendix A. The location of each stratigraphic section is indicated on the sample location maps.

## SAMPLE LOCATION MAPS EXPLANATION

Sample location maps are presented for each county. Sample locations are identified by the 7-digit number assigned to each sample. Two sample symbols are used: a solid circle for analyses without a measured section, and, a triangle

for analyses with an associated stratigraphic column. In some instances, there will be several numbers next to a single location symbol. This indicates that several samples were collected at the same locality. Overlapping symbols indicate sample sites so close together that the scale of the location map does not permit separation of the symbols.

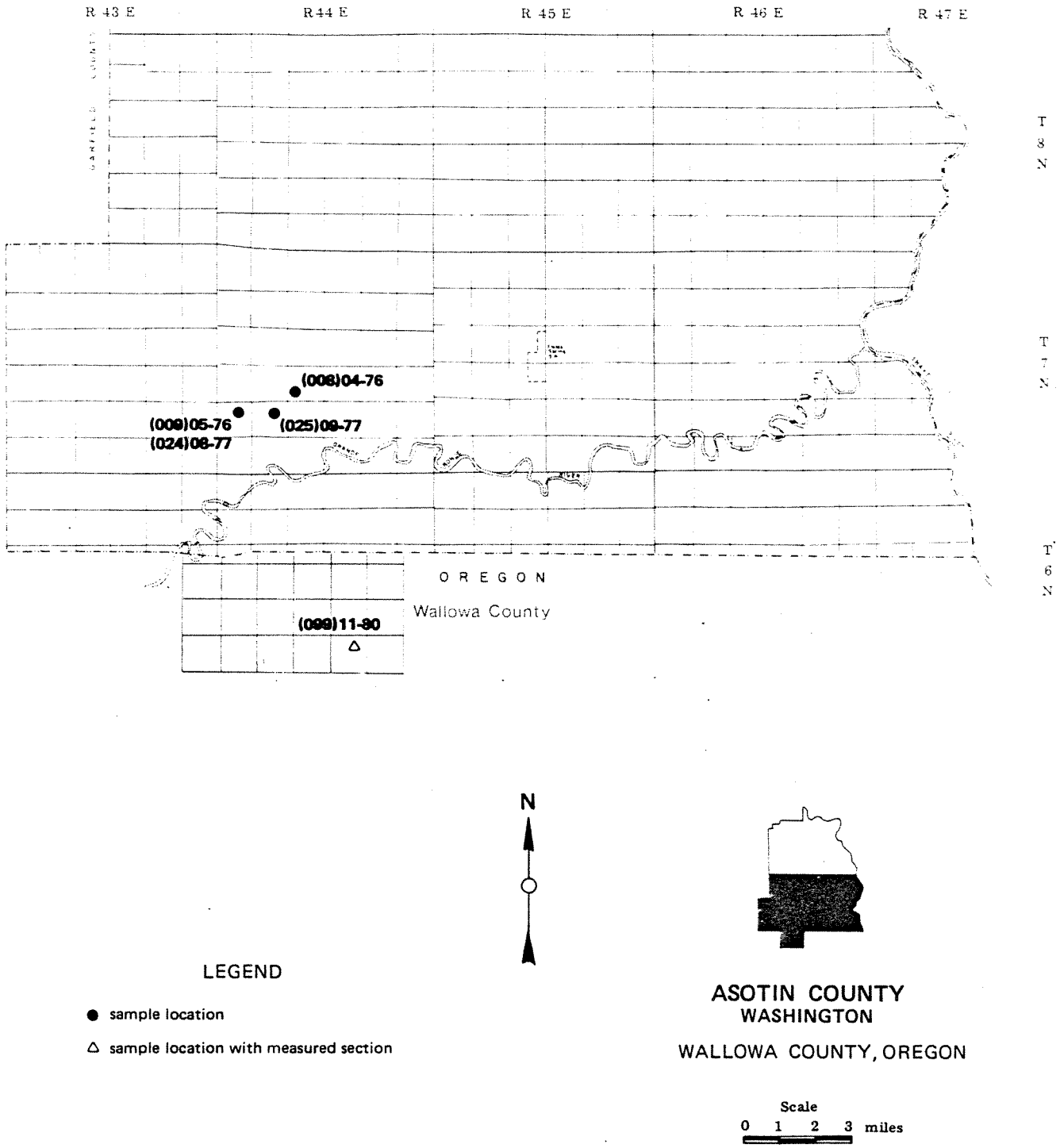



FIGURE 3. – Sample location map for southern Asotin County and northern Wallowa County, Oregon.

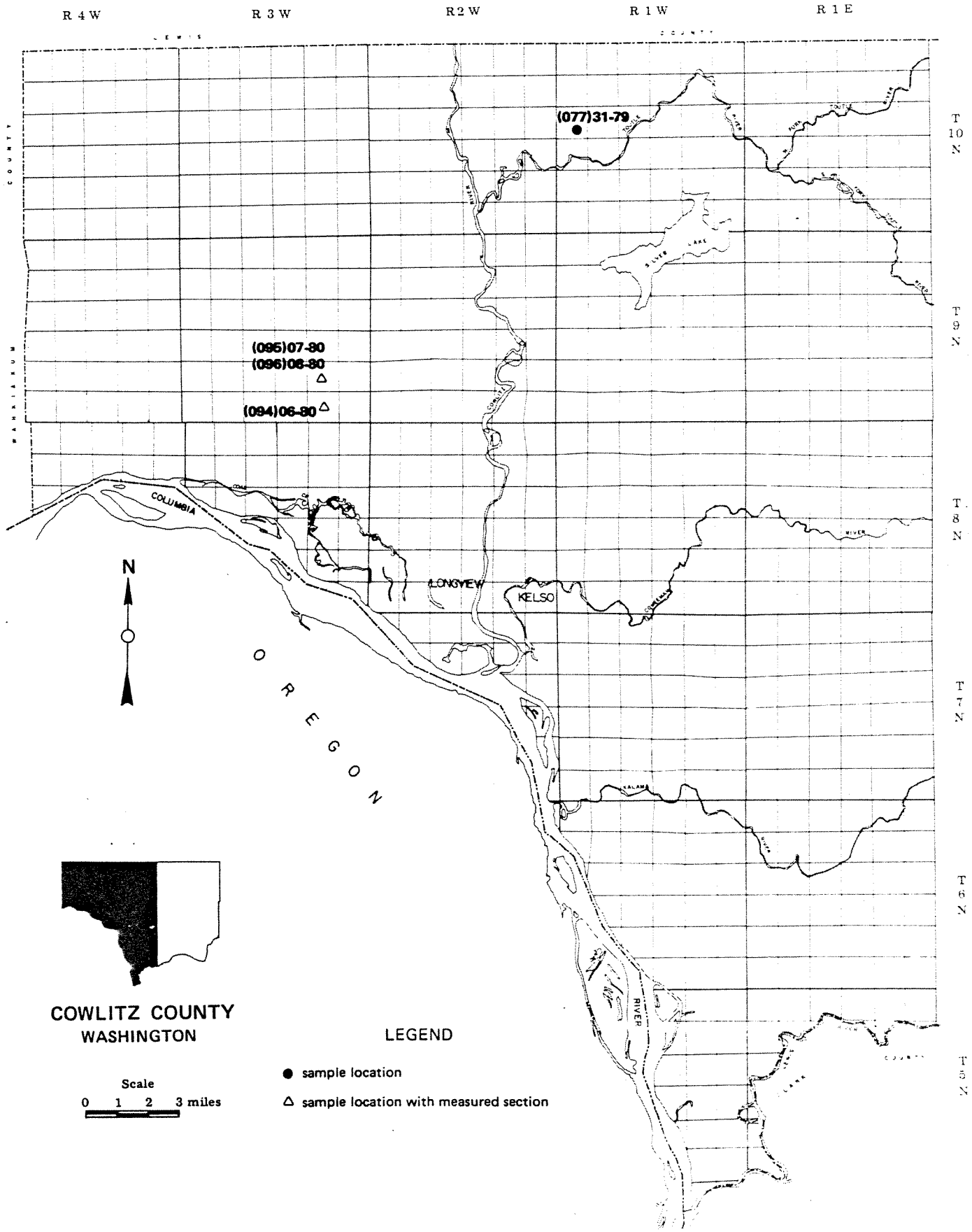



FIGURE 4. – Sample location map for western Cowlitz County.

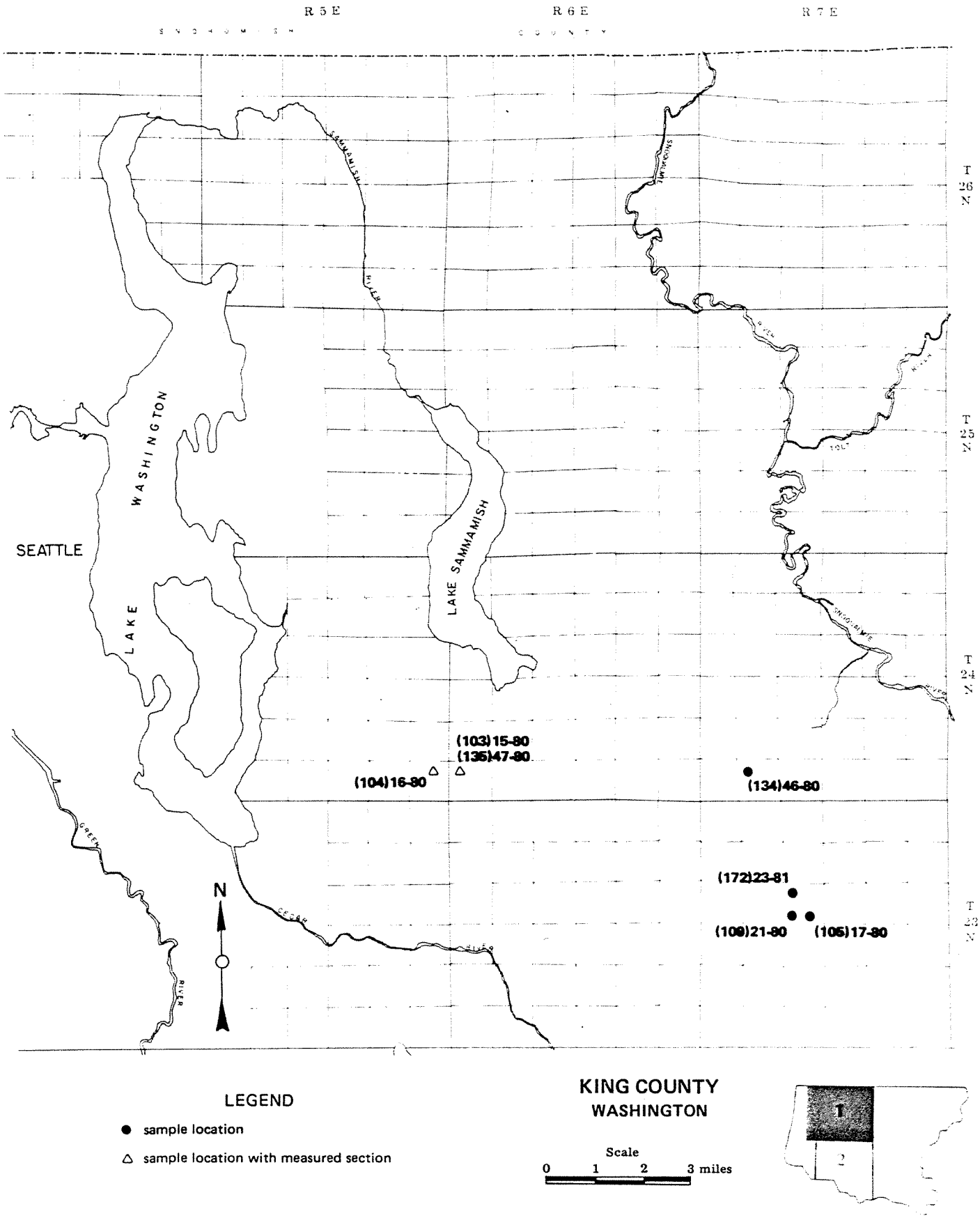



FIGURE 5. — Sample location map for northwestern King County.

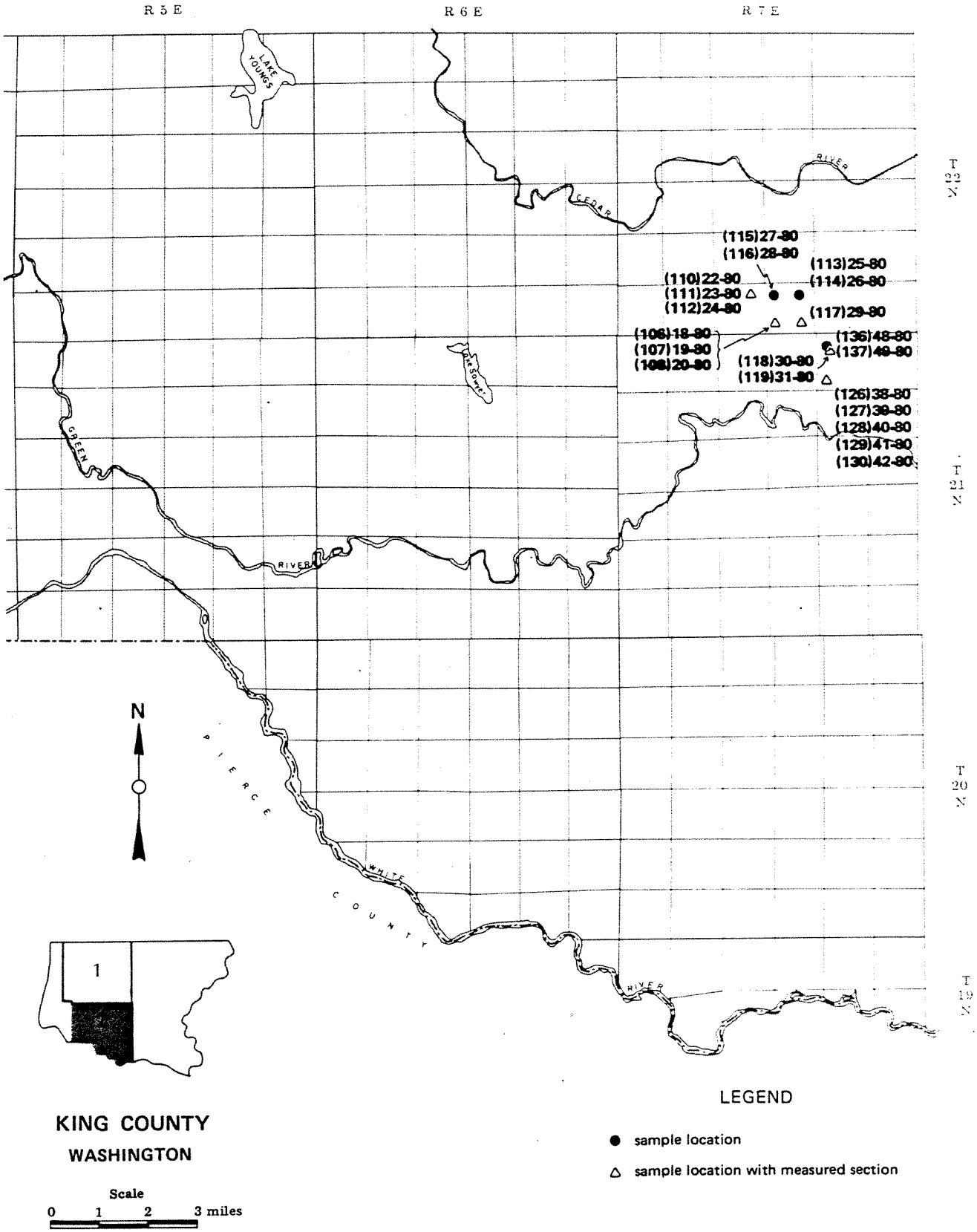



FIGURE 6. – Sample location map for southwestern King County.

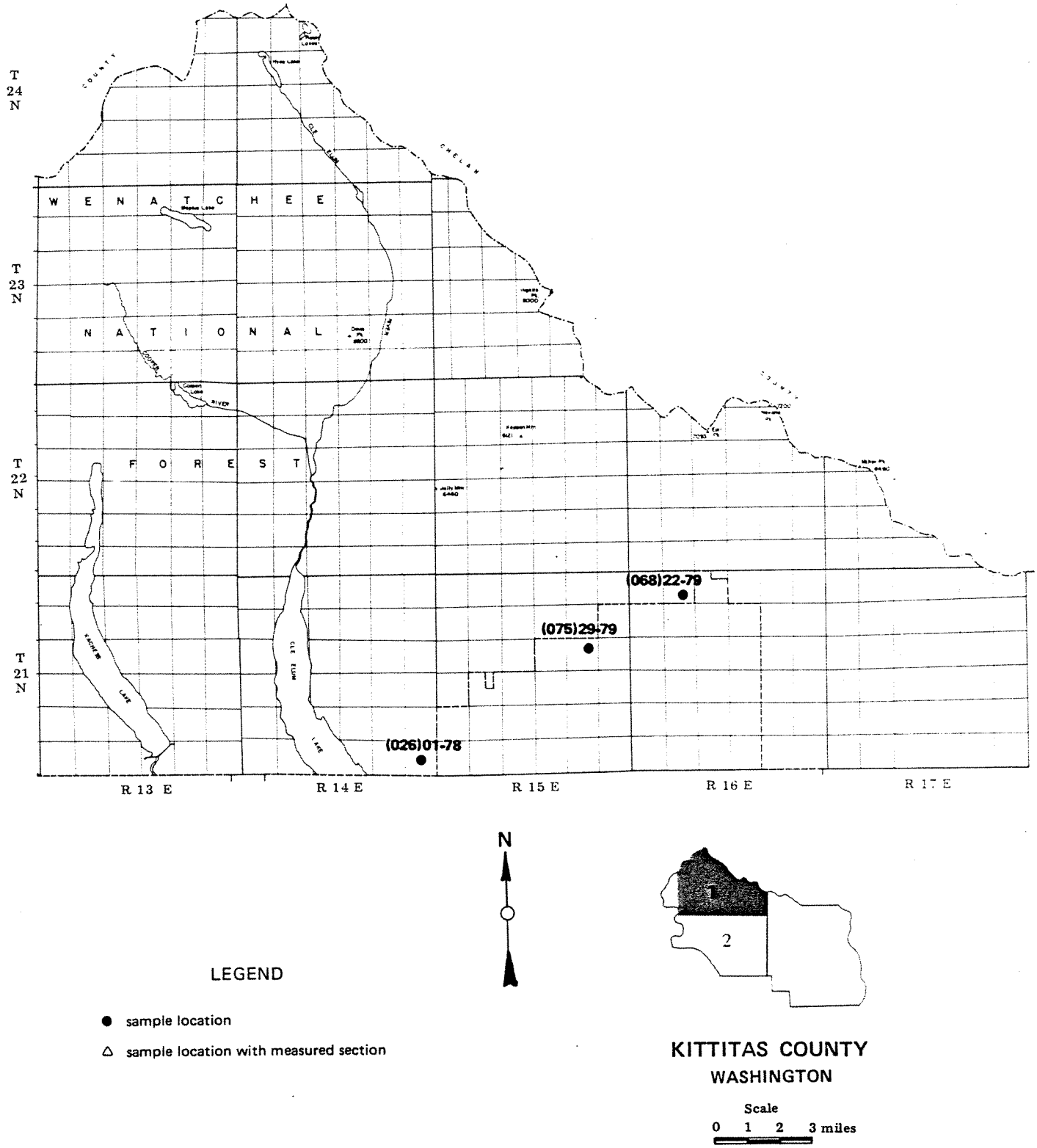
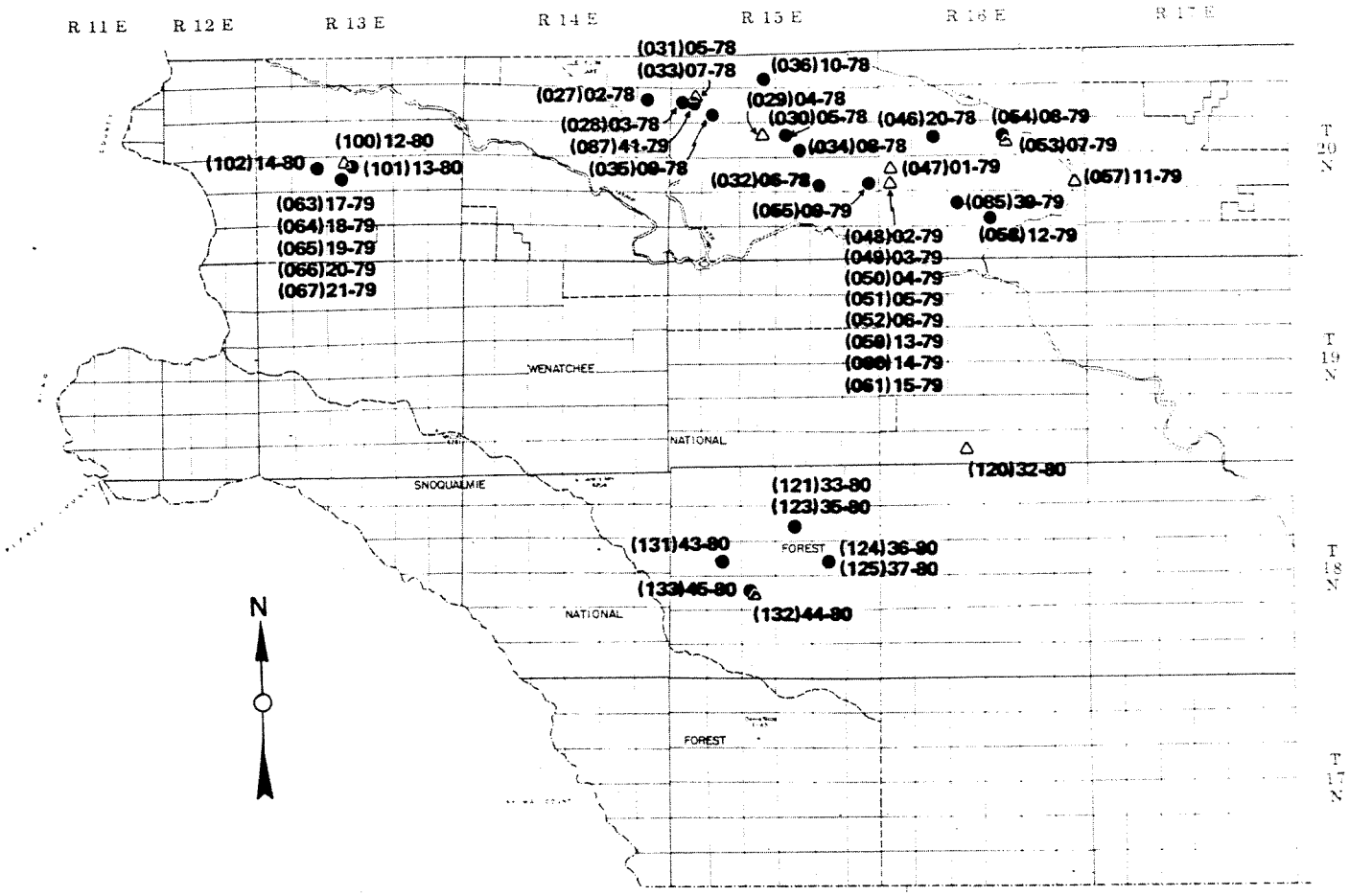


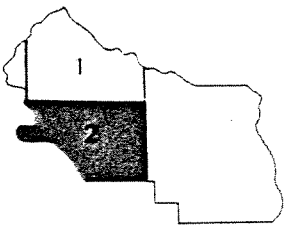

FIGURE 7. – Sample location map for northwestern Kittitas County.




LEGEND

● sample location

△ sample location with measured section




KITTITAS COUNTY
WASHINGTON

Scale
0 1 2 3 miles

FIGURE 8. – Sample location map for southwestern Kittitas County.

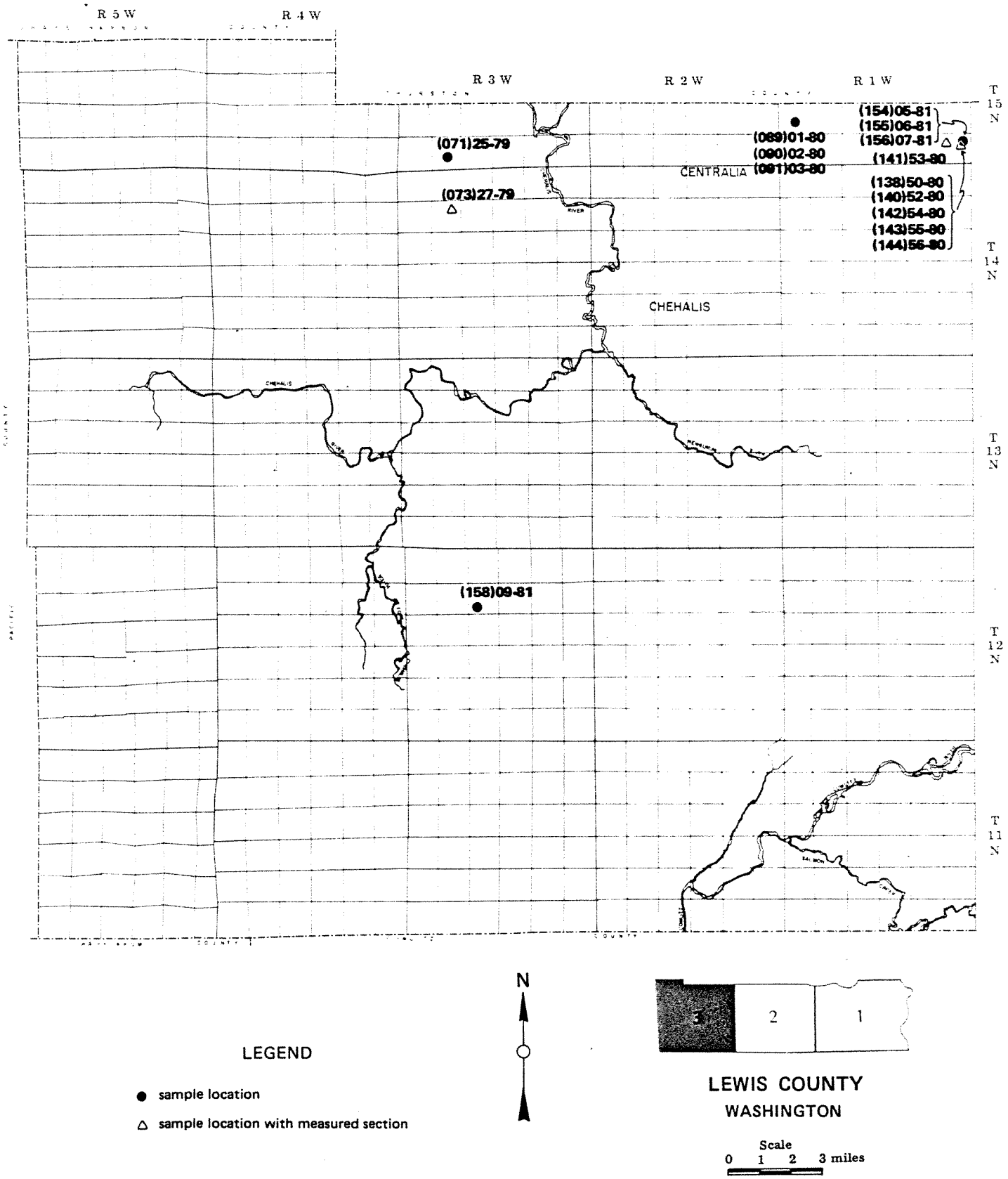



FIGURE 9. – Sample location map for western Lewis County.

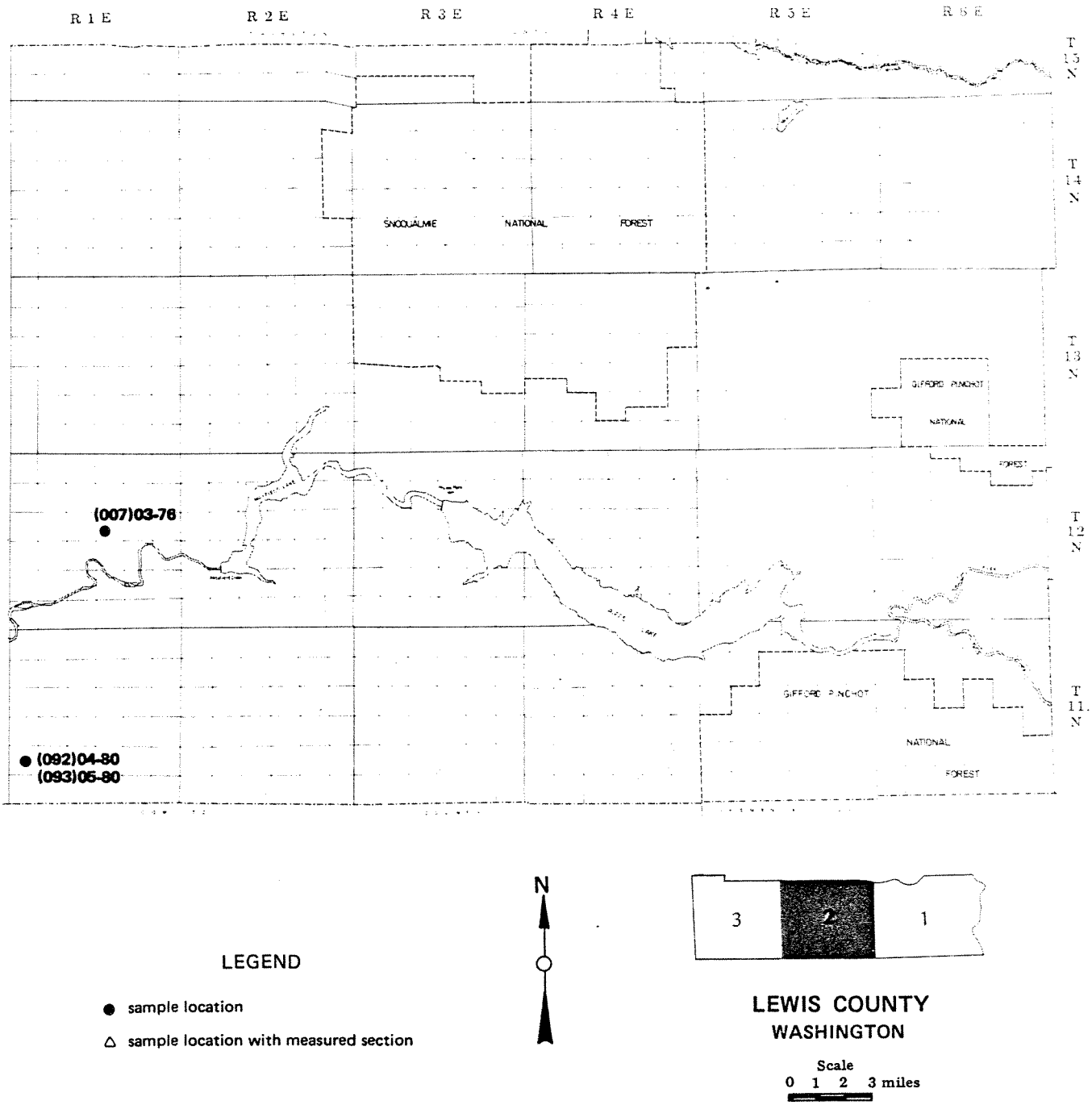



FIGURE 10. – Sample location map for central Lewis County.

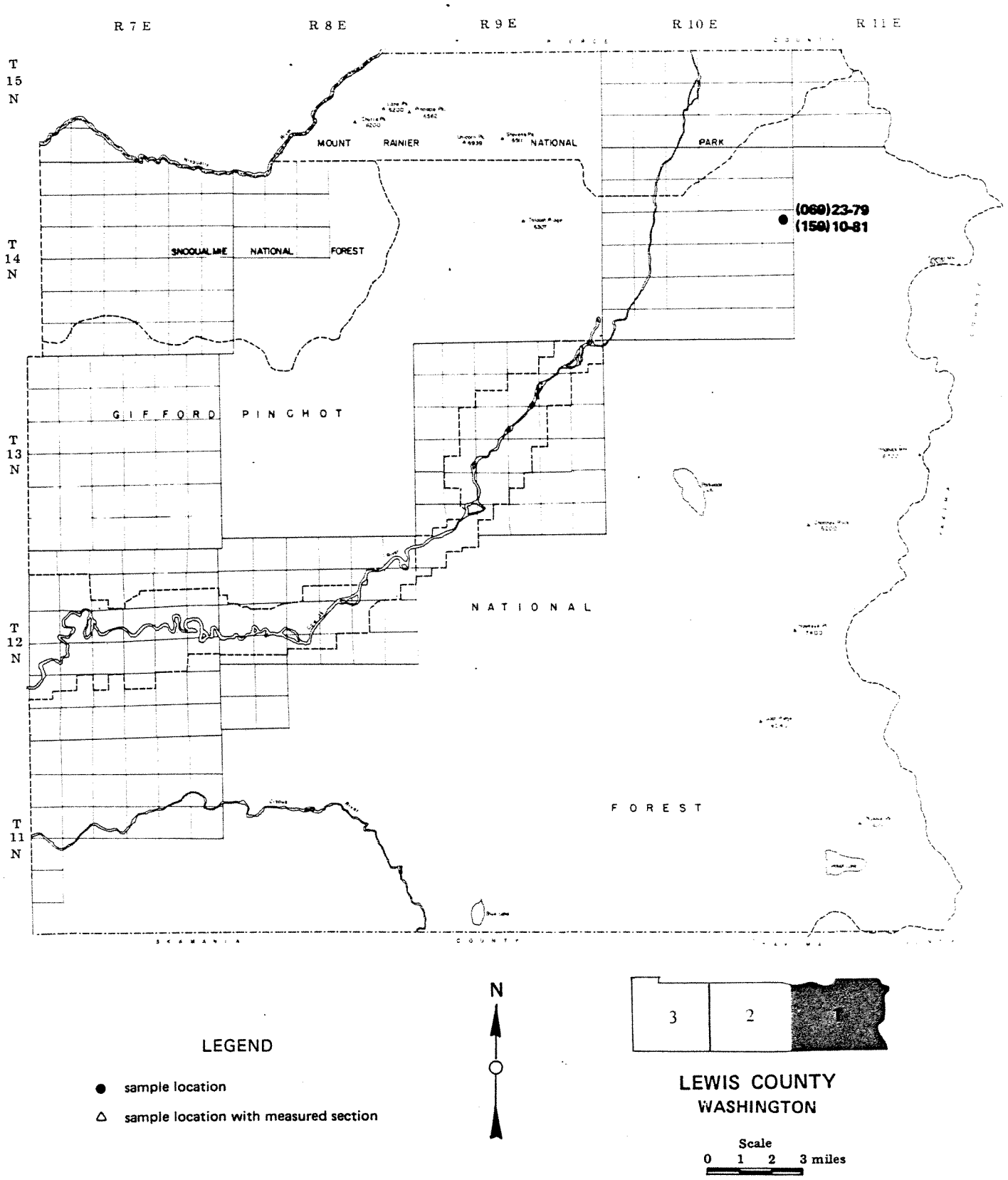



FIGURE 11. – Sample location map for eastern Lewis County.

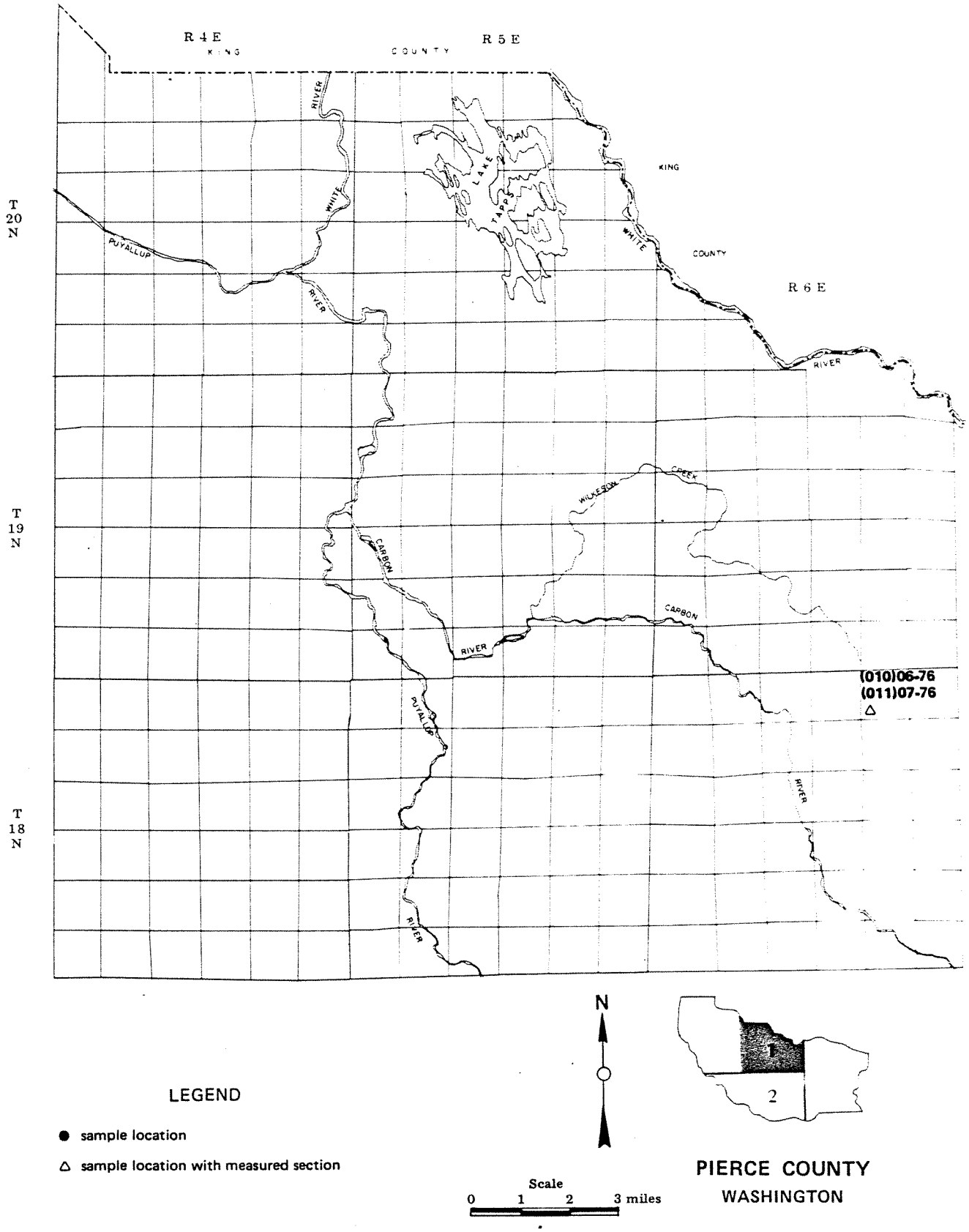



FIGURE 12. – Sample location map for north-central Pierce County.

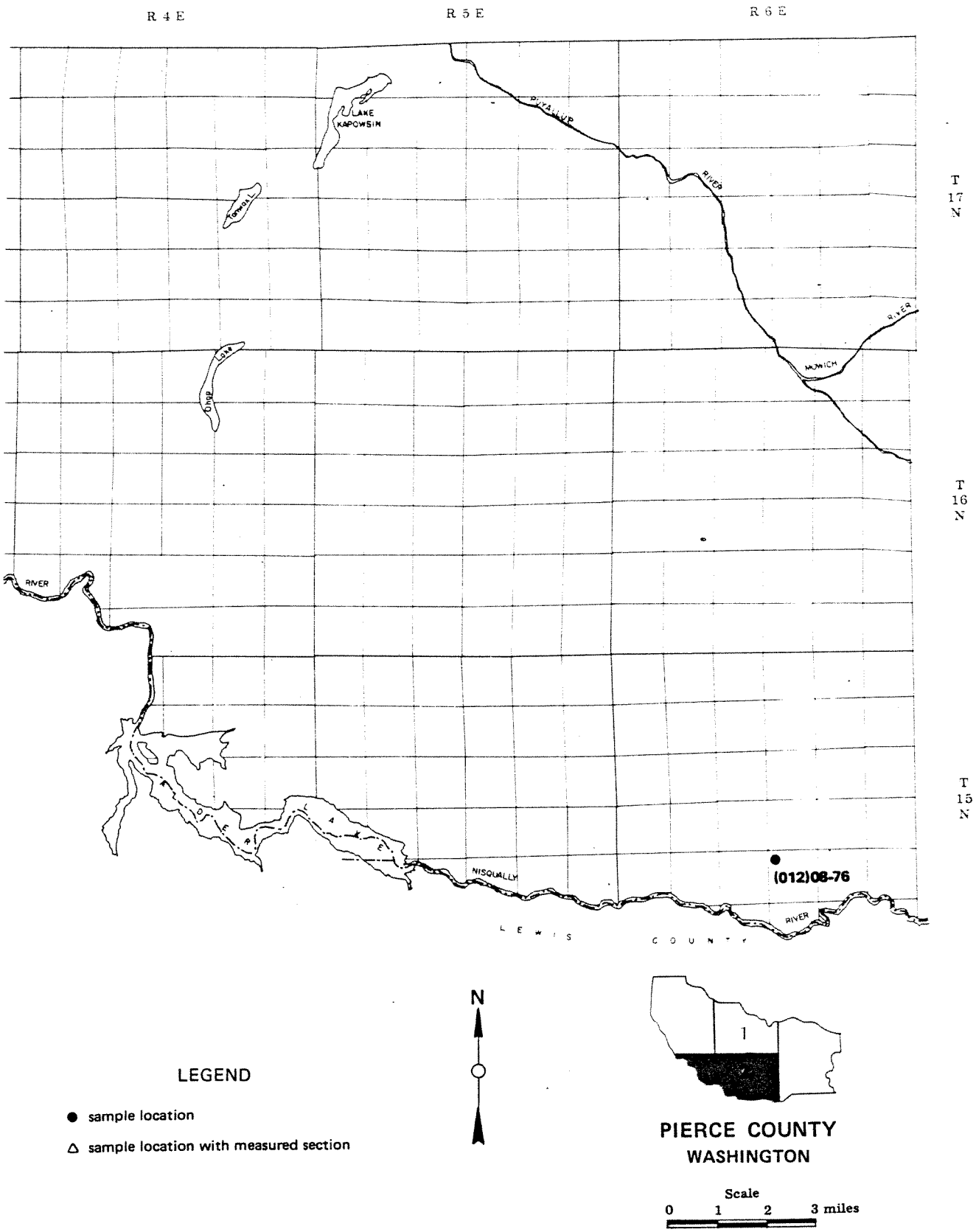
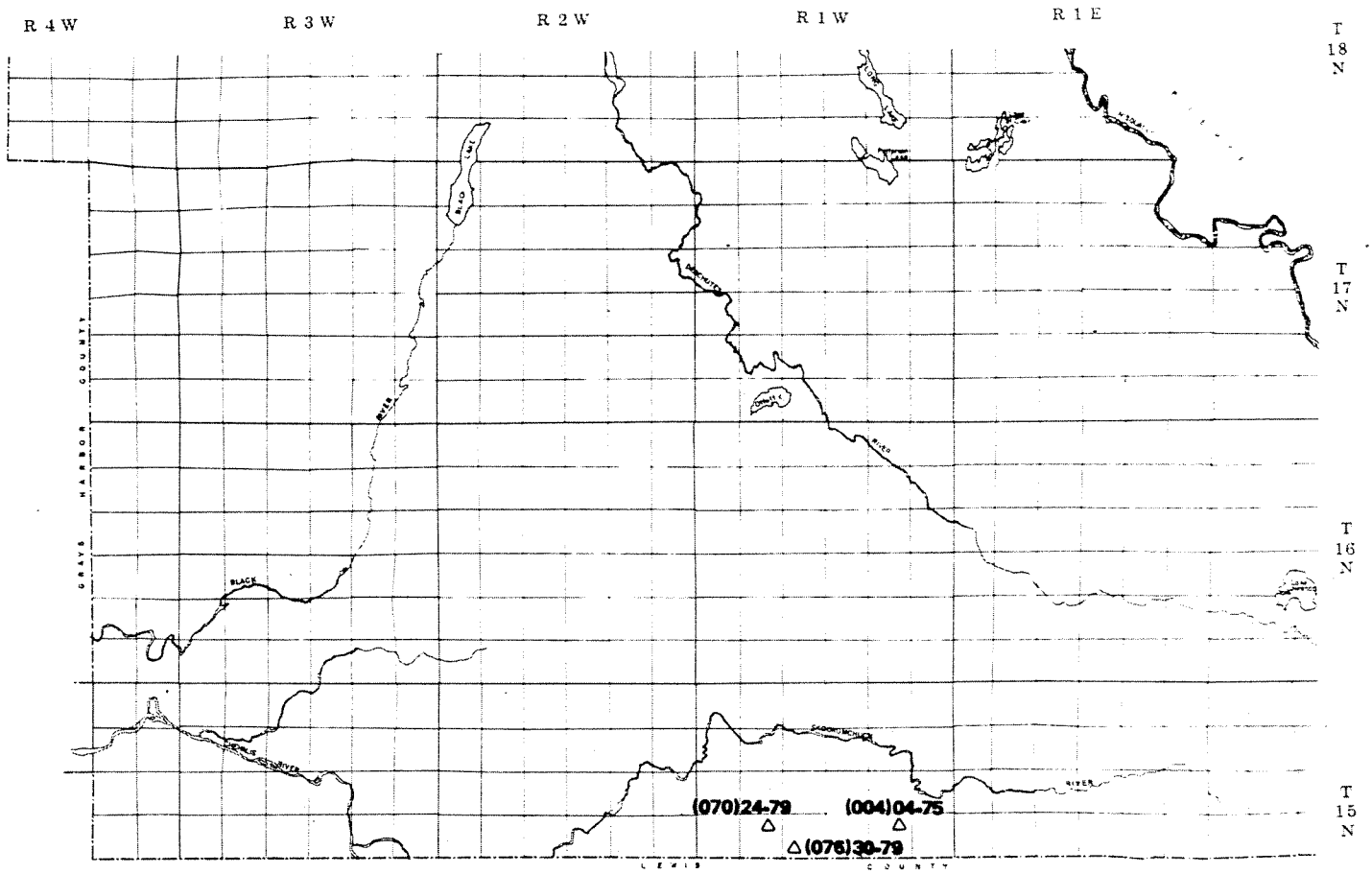
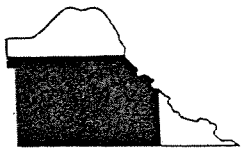



FIGURE 13. – Sample location map for south-central Pierce County.





LEGEND

● sample location

△ sample location with measured section

THURSTON COUNTY
WASHINGTON

Scale
0 1 2 3 miles

FIGURE 14. – Sample location map for Thurston County.

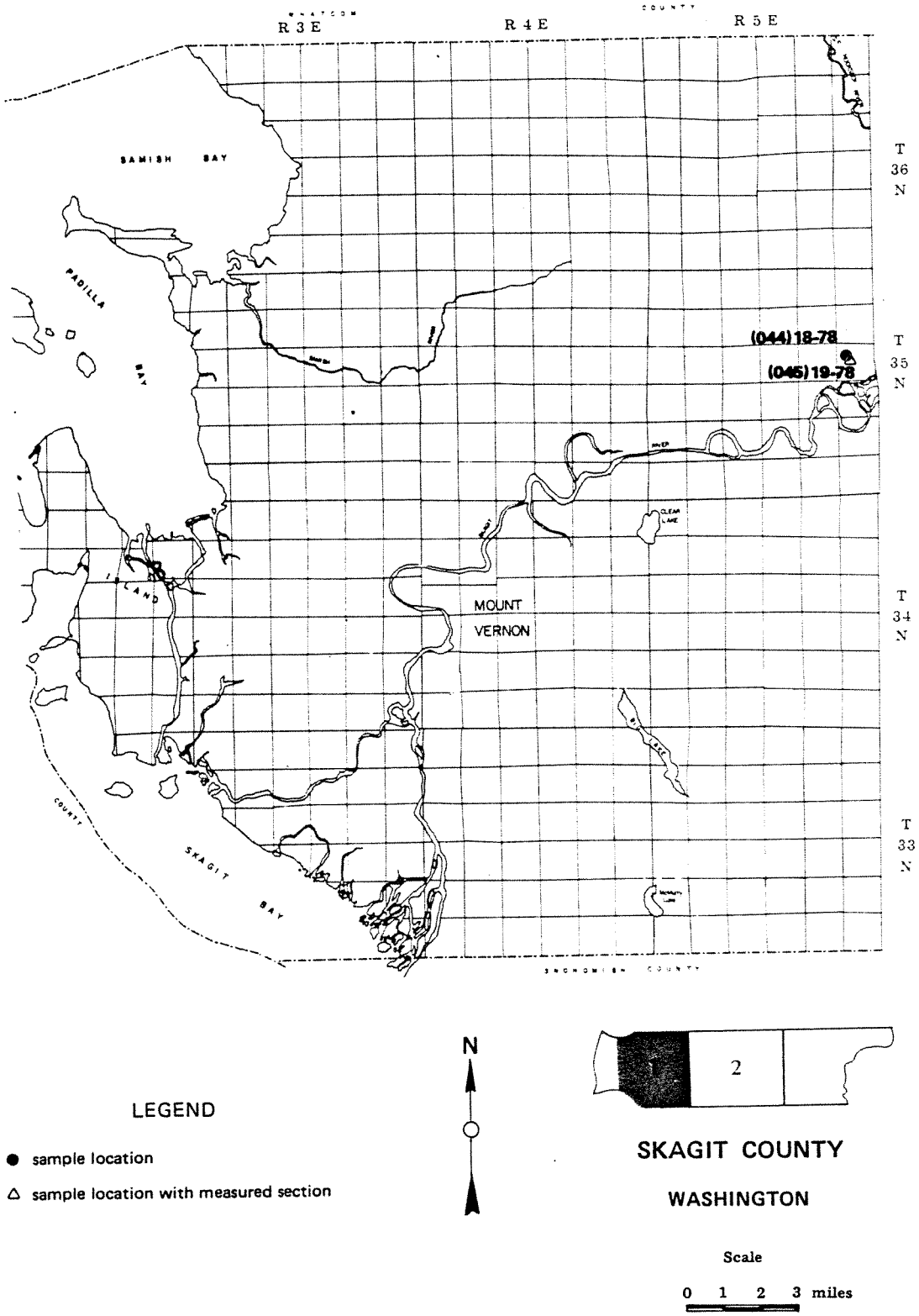



FIGURE 15. – Sample location map for western Skagit County.

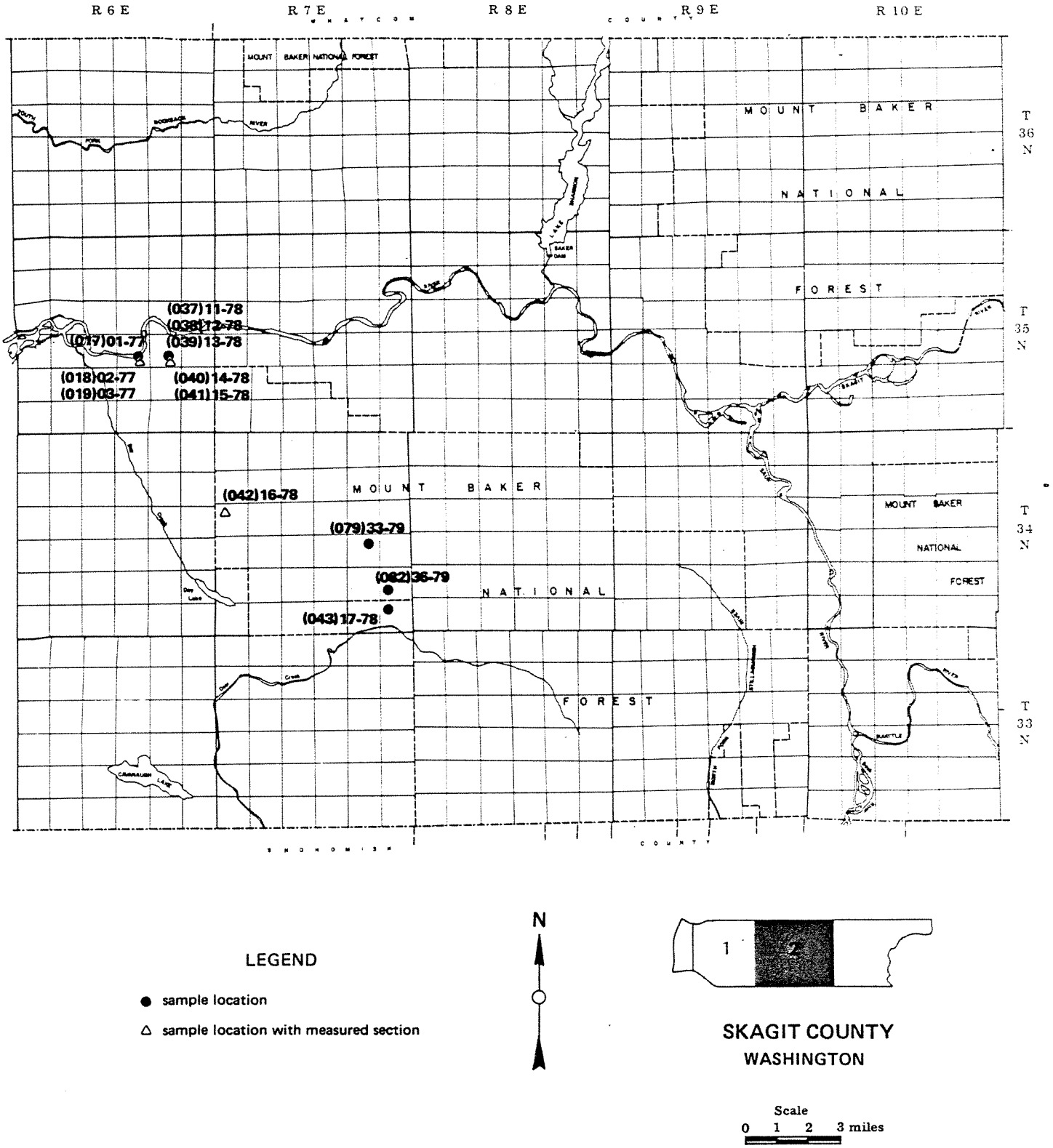



FIGURE 16. – Sample location map for central Skagit County.

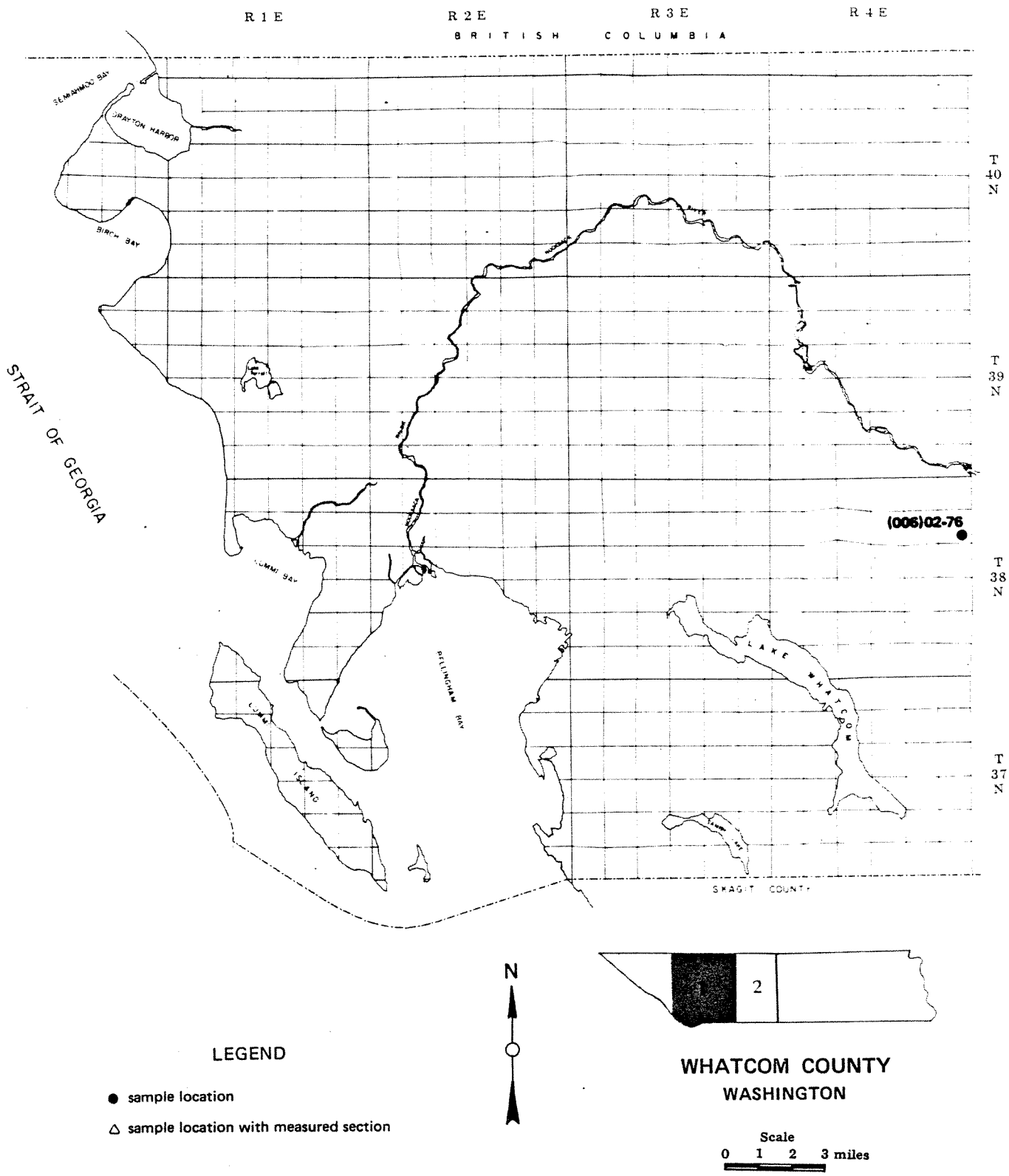



FIGURE 17. – Sample location map for western Whatcom County.

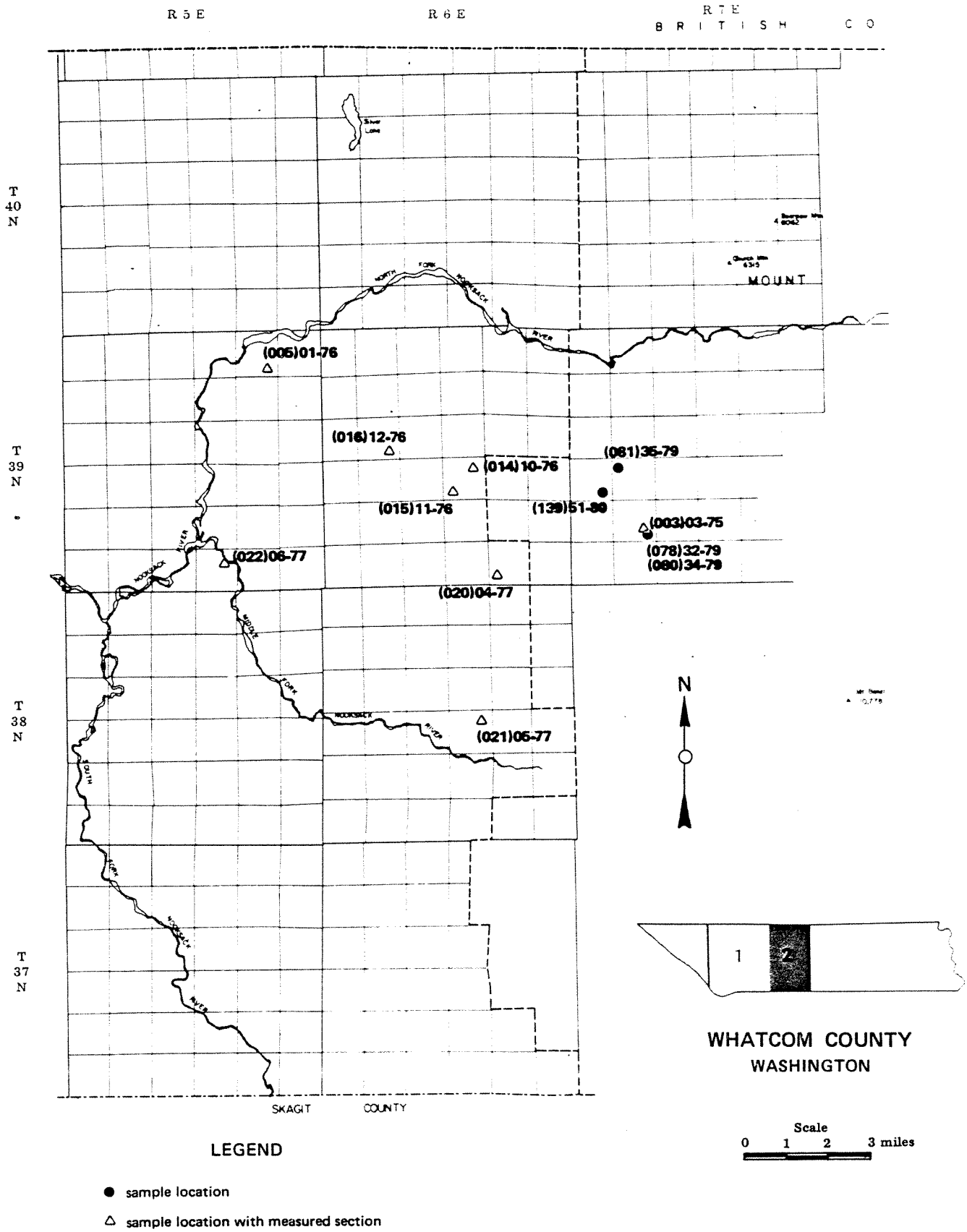



FIGURE 18. – Sample location map for central Whatcom County.

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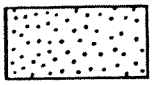
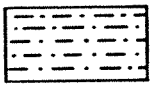
# Appendix A

## Stratigraphic Sections

# Legend for Stratigraphic Sections


sandstone

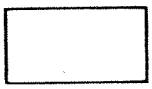

siltstone

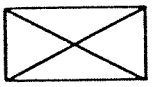
shale

carbonaceous shale

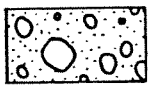
impure coal

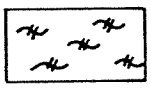
coal


claystone


covered interval

igneous rocks


conglomerate

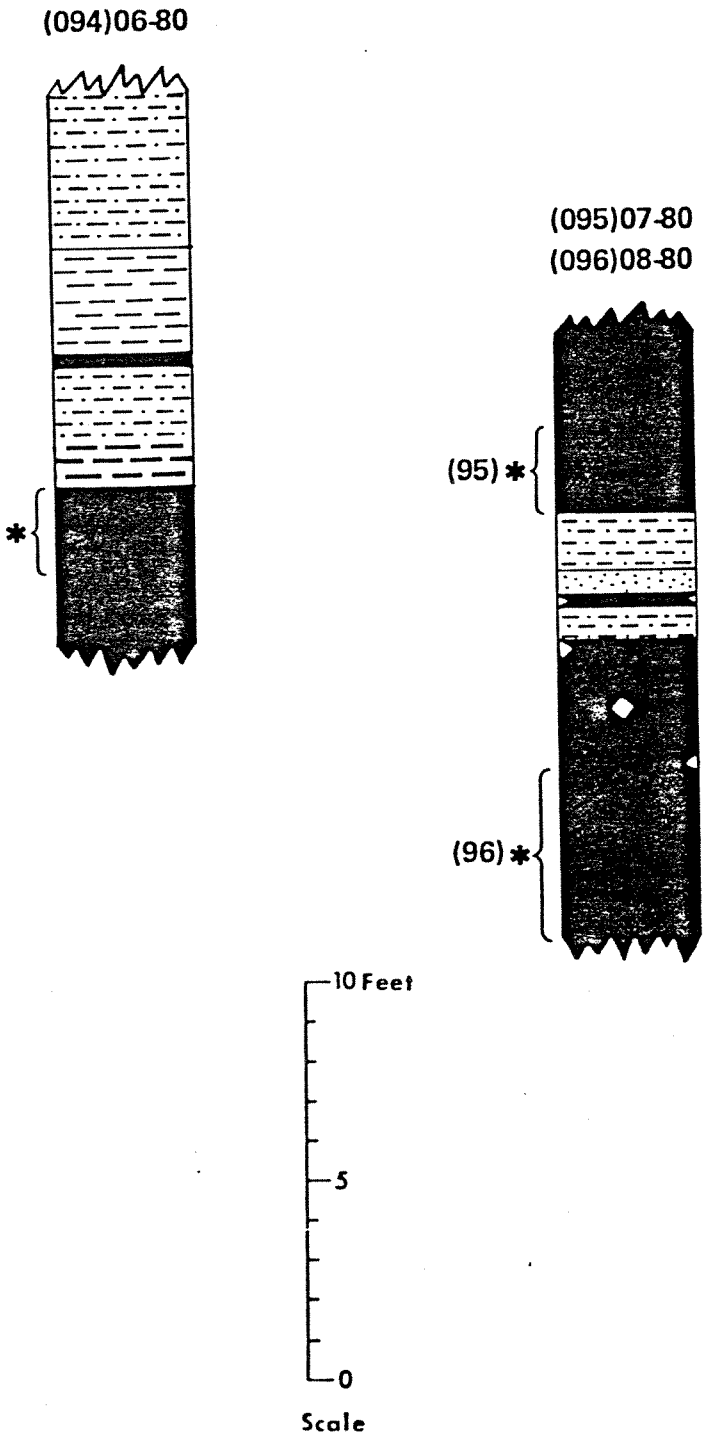

phyllite

jagged lines indicate limit of exposure

* coal/impure coal unit sampled for analysis

* { interval of coal/impure coal units sampled (includes non-coal partings in some instances)

(129) { interval of measured stratigraphic section containing sampled coal units combined together into a single coal sample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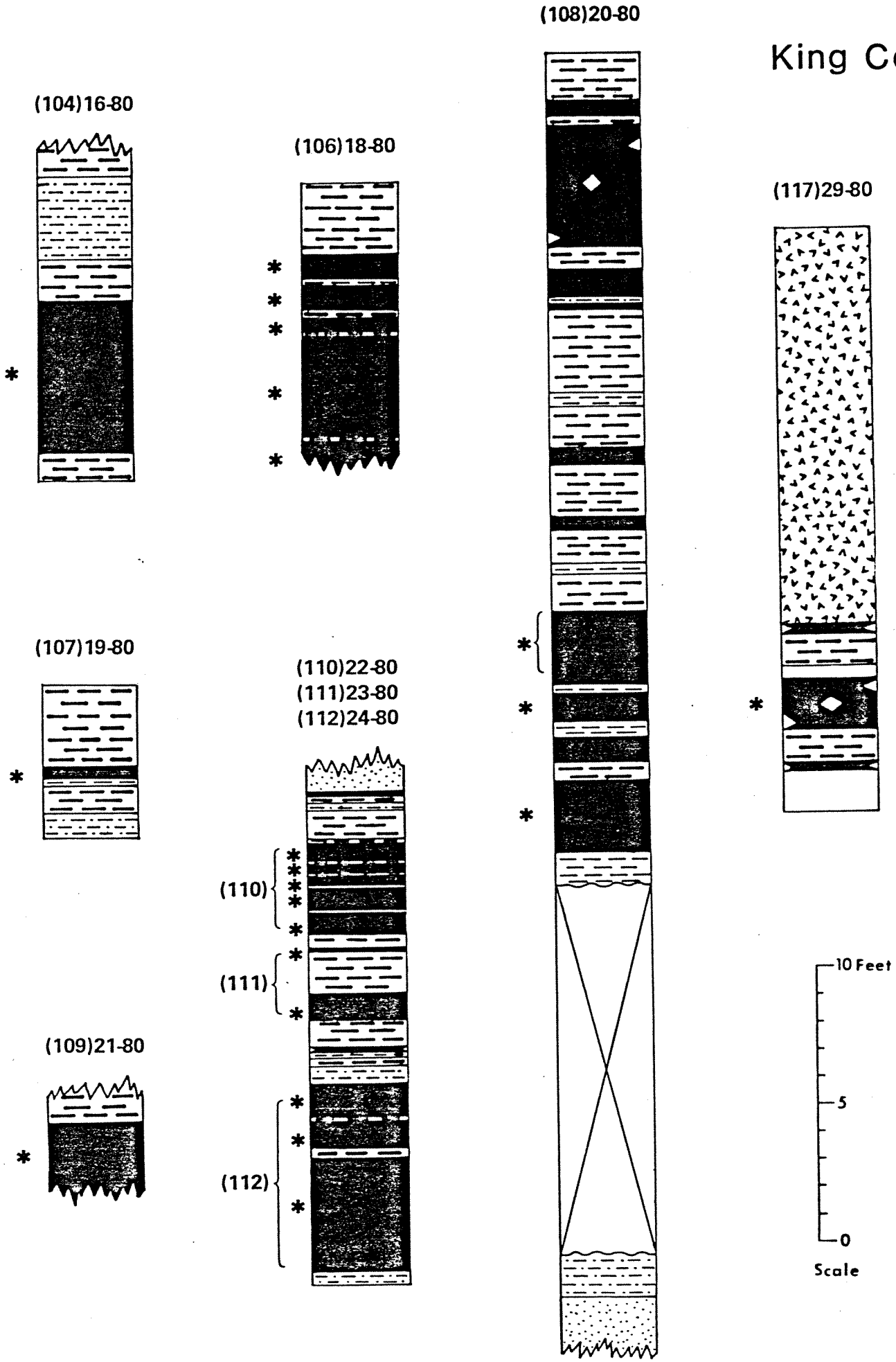
*
(095)07-80
(096)08-80
(95) *
(96) *
10 Feet
5
0
Scale

King Co.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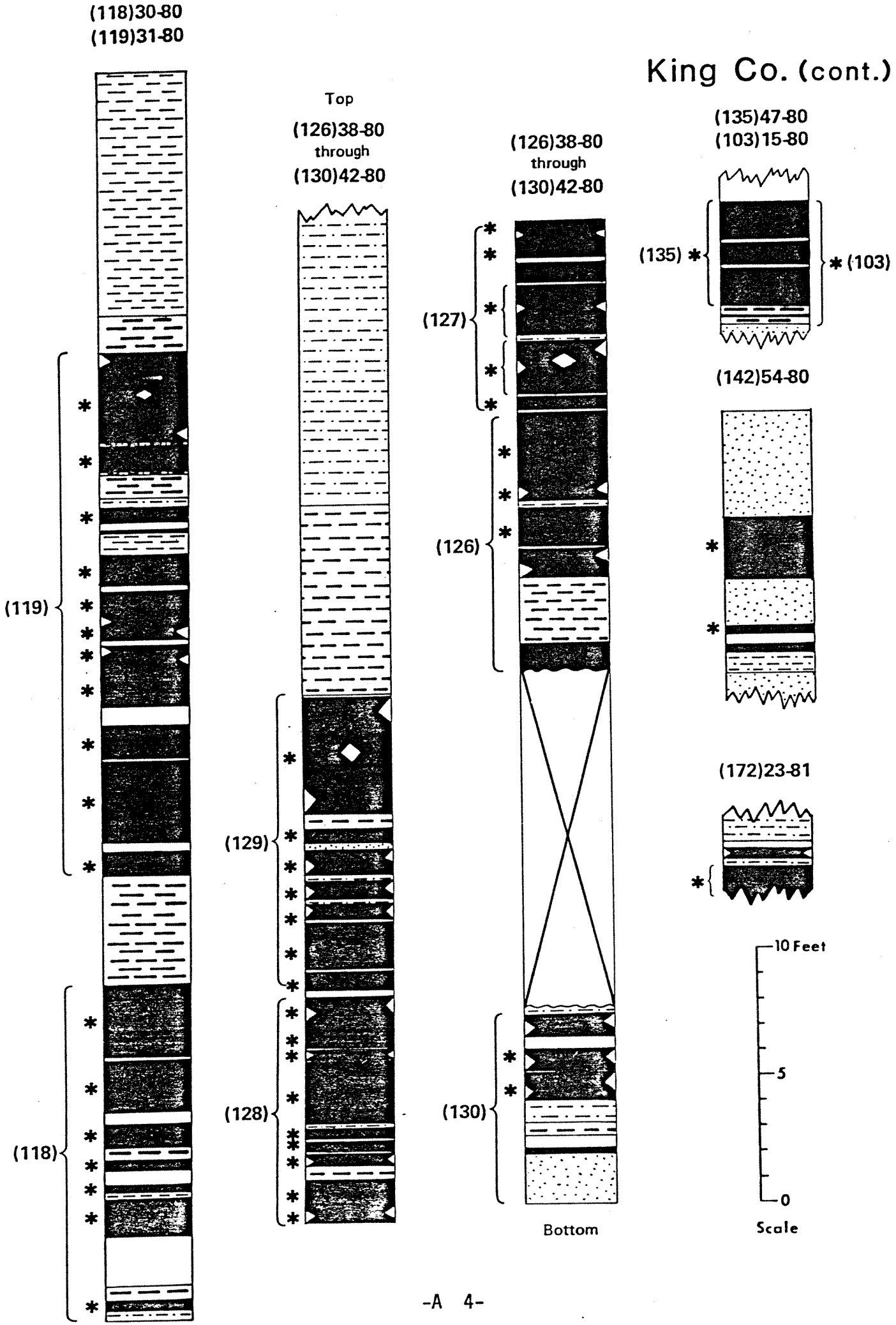
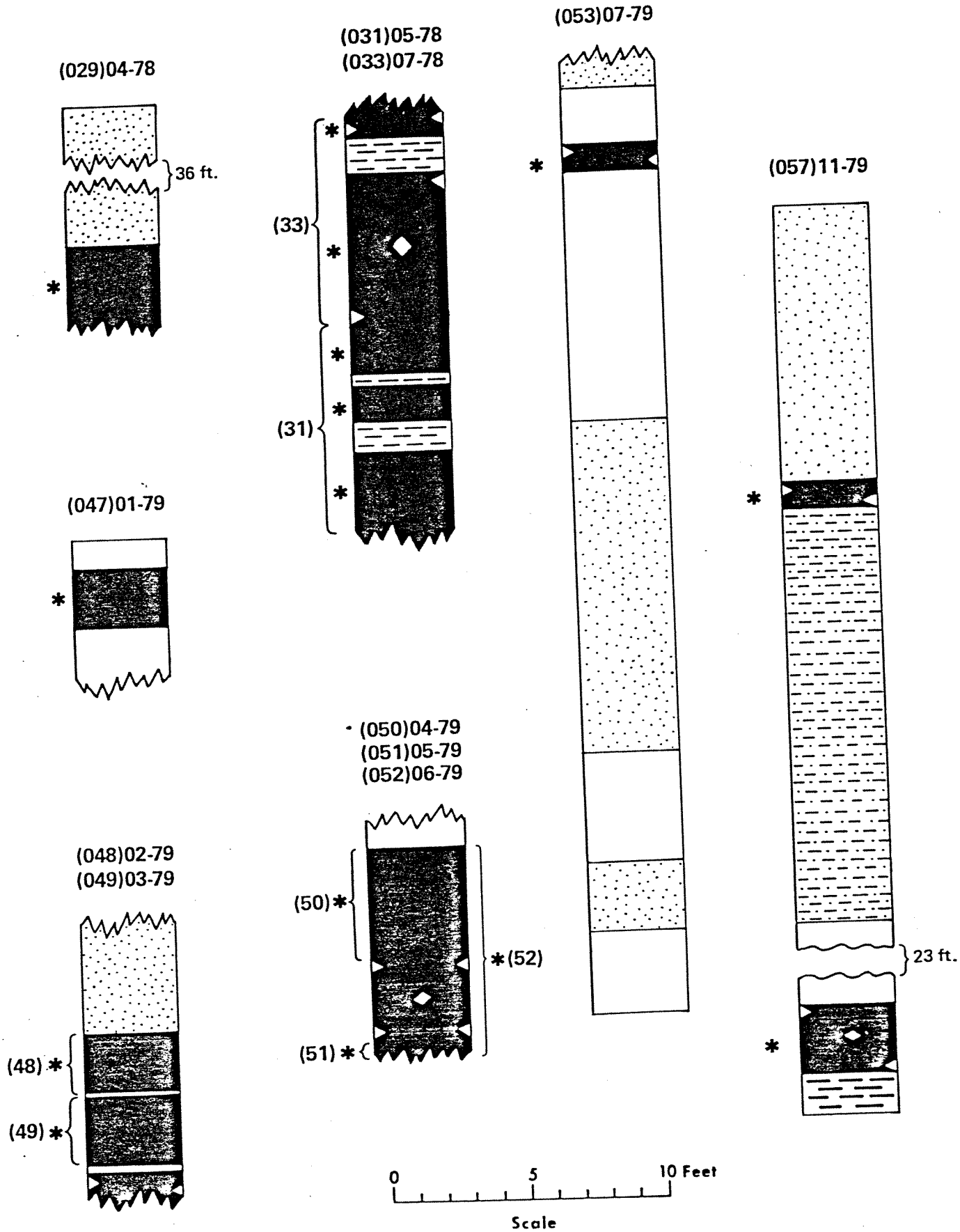
(106)18-80
(108)20-80
(117)29-80
(107)19-80
(110)22-80
(111)23-80
(112)24-80
(110)
(111)
(112)
(109)21-80
10 Feet
5
0
Scale

# King Co. (cont.)


(118)30-80
(119)31-80
(119)
(118)
Top
(126)38-80
through
(130)42-80
(129)
(128)
(126)38-80
through
(130)42-80
(127)
(126)
(130)
Bottom
(135)47-80
(103)15-80
(135)
(103)
(142)54-80
(172)23-81
10 Feet
5
0
Scale

# Kittitas Co.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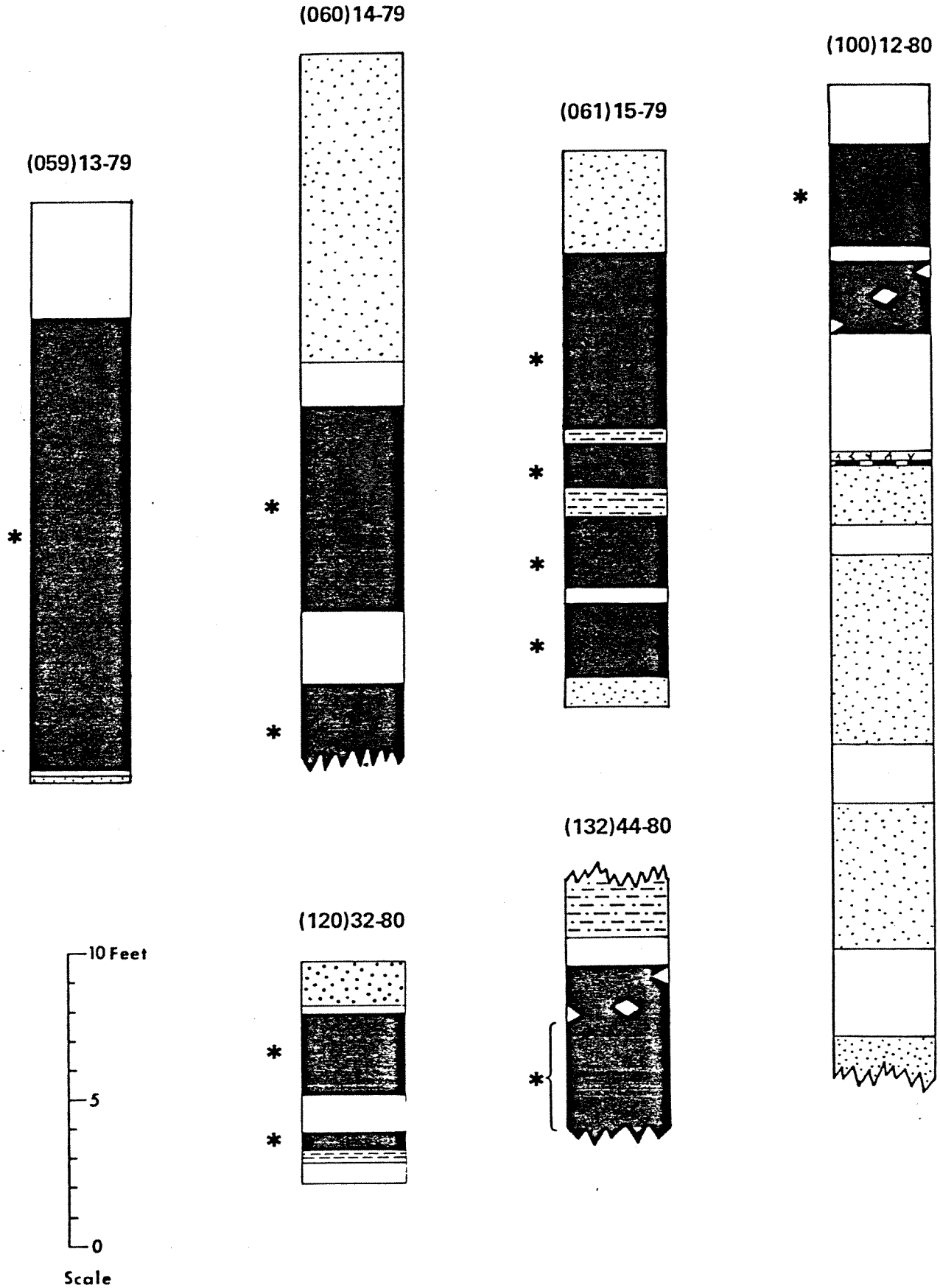
36 ft.
(031)05-78
(033)07-78
(33)
(31)
(053)07-79
(057)11-79
23 ft.
(047)01-79
(050)04-79
(051)05-79
(052)06-79
(50)
(52)
(51)
(048)02-79
(049)03-79
(48)
(49)
0
5
10 Feet
Scale


(059)13-79
(060)14-79
(061)15-79
(100)12-80
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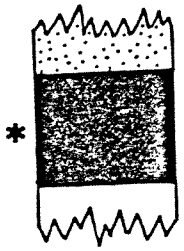
10 Feet
5
0
Scale

(040)14-78



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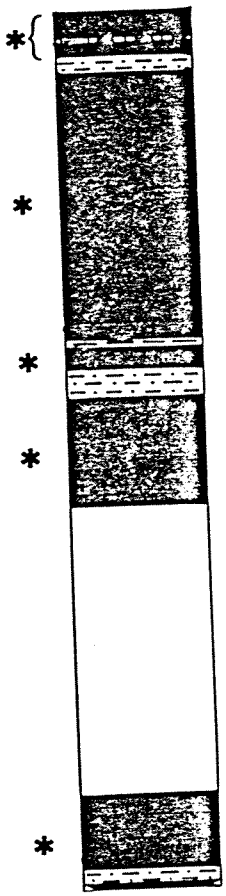

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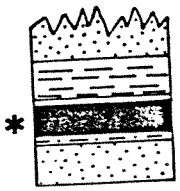

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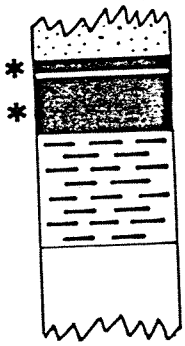

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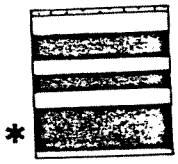

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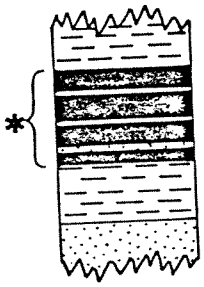

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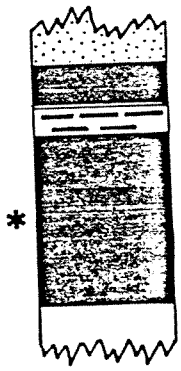

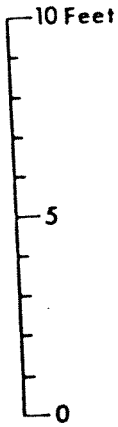

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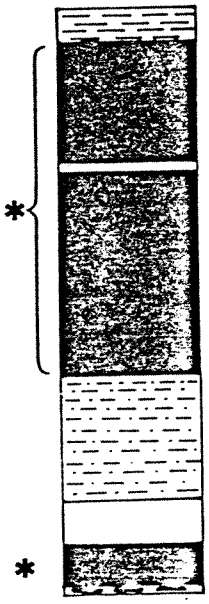


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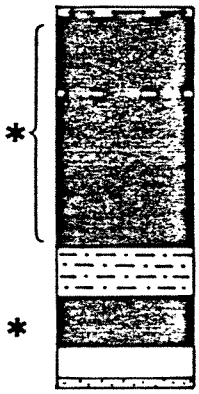


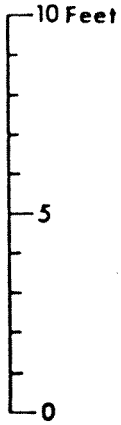


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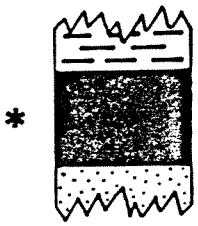

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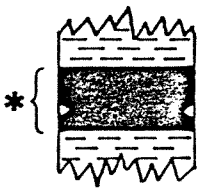

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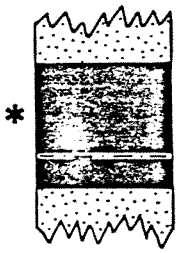

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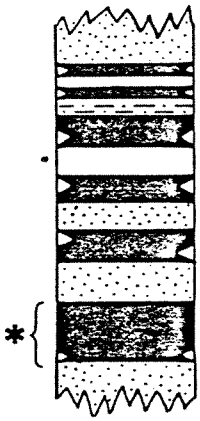

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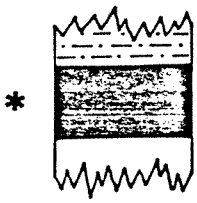

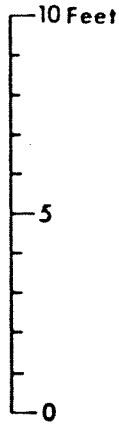

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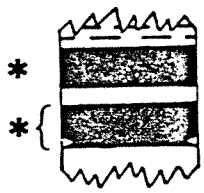

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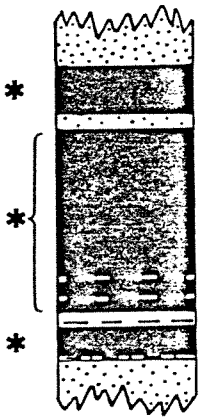

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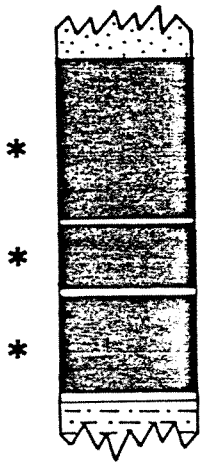

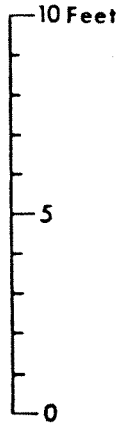

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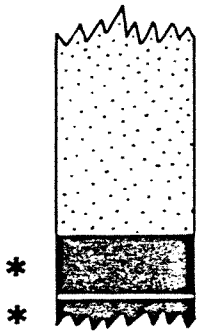


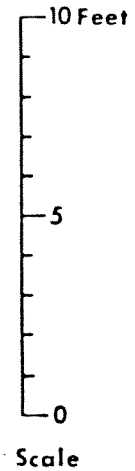

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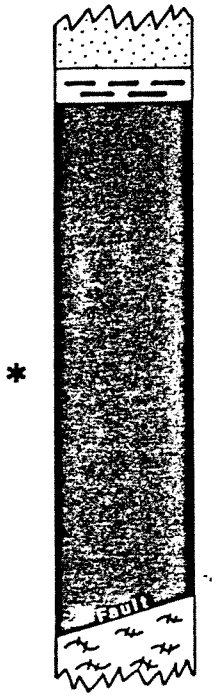


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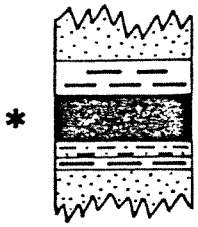

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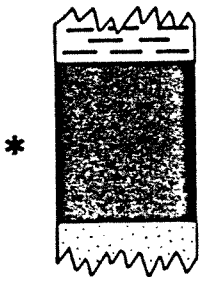

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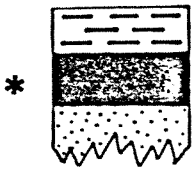
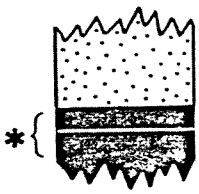
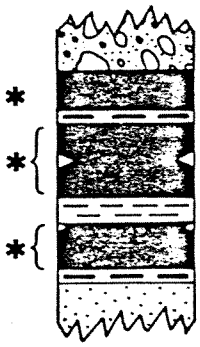


(021)05-77



(020)04-77



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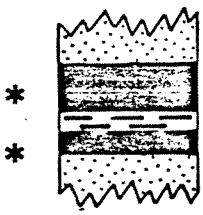

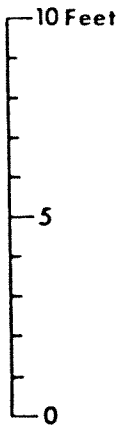


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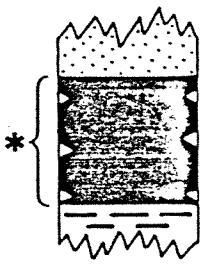

# Appendix B

## Coal Analytical Data

COUNTY: ASOTIN

SAMPLE NUMBER: (008)04-76 COAL NAME: GRANDE RONDE

MINE NAME: GRANDE RONDE #1 QUARTER SECTION: SW SECTION: 21
COAL AREA: GRANDE RONDE TOWNSHIP: 07N RANGE: 44E
SAMPLE SITE ELEVATION (FT): 2900 QUADRANGLE: MOUNTAIN VIEW 7.5

GEOLOGIC FORMATION: SADDLE MTN. STRIKE: N/A DIP: N/A
AGE: MIOCENE MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: MINE DUMP TOTAL SECTION MEASURED (FT): N
SAMPLE TYPE: GRAB COAL THICKNESS (FT): 30.0
SAMPLE CONDITION: WEATHERED SAMPLE THICKNESS (FT): N

OVERBURDEN THICKNESS (FT): 0 DATE OF SAMPLING: 07-27-76
SAMPLE COLLECTOR: VONHEEDER (DGER) DATE OF ANALYSIS: 01-21-77

LABORATORY: USBM LAB. NUMBER: K69673

| AIR DRY LOSS: 6.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 15.8 | 18.3 | N/A |
| VOLATILE MATTER | 31.8 | 36.9 | 45.2 |
| FIXED CARBON | 35.6 | 46.0 | 56.3 |
| ASH | 12.8 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 4.4 | 3.7 | 3.7 |
| CARBON | 49.6 | 57.6 | 70.6 |
| NITROGEN | 0.6 | 0.6 | 0.8 |
| SULFUR | 0.3 | N/A | N/A |
| OXYGEN(IND) | 32.2 | 37.4 | 25.8 |
| HEATING VALUE (BTU/LB) | 7815 | 9069 | 11109 |

ASH - INITIAL DEFORMATION ..... 2205 F
SOFTENING TEMP. ..... 2285 F
FLUID TEMP. ..... 2365 F

SULFUR FORMS
SULFATE ..... 0.01
PYRITIC ..... 0.03
ORGANIC ..... 0.23

MISCELLANEOUS COMMENTS: MINE ACTIVE 1910-20. ADIT INACCESSIBLE. NO MINE MAP AVAILABLE. COAL OCCURS IN INTERFLOW DEPOSITS. 2 FT. OF MINE DUMP MATERIAL EXCAVATED BEFORE TAKING SAMPLE.

COUNTY: ASOTIN

SAMPLE NUMBER: (009)05-76

COAL NAME: UNNAMED

MINE NAME: NONE
COAL AREA: GRANDE RONDE
SAMPLE SITE ELEVATION (FT): 2980

QUARTER SECTION: NE SECTION: 30
TOWNSHIP: 07N RANGE: 44E
QUADRANGLE: MOUNTAIN VIEW 7.5

GEOLOGIC FORMATION: SADDLE MTN.
AGE: MIOCENE

STRIKE: N/A DIP: N/A
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: STREAMCUT
SAMPLE TYPE: GRAB
SAMPLE CONDITION: WEATHERED

TOTAL SECTION MEASURED (FT): N
COAL THICKNESS (FT): N
SAMPLE THICKNESS (FT): N

OVERBURDEN THICKNESS (FT): 45
SAMPLE COLLECTOR: VONHEEDER (DGER)

DATE OF SAMPLING: 06-27-76
DATE OF ANALYSIS: 01-21-77

LABORATORY: USGS-DENVER

LAB. NUMBER: D18312

| AIR DRY LOSS: 6.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 15.8 | 18.3 | N/A |
| VOLATILE MATTER | 31.8 | 36.9 | 45.2 |
| FIXED CARBON | 39.6 | 46.0 | 56.3 |
| ASH | 12.8 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 4.4 | 3.7 | 3.7 |
| CARBON | 49.6 | 57.6 | 70.6 |
| NITROGEN | 0.6 | 0.6 | 0.8 |
| SULFUR | 0.3 | N/A | N/A |
| OXYGEN(IND) | 32.2 | 37.4 | 25.8 |
| HEATING VALUE (BTU/LB) | 7815 | 9069 | 11109 |

| | | |
|---|---|---|
| ASH - INITIAL DEFORMATION | 2205 | F |
| SOFTENING TEMP. | 2285 | F |
| FLUID TEMP. | 2365 | F |

| SULFUR FORMS | |
|---|---|
| SULFATE | 0.01 |
| PYRITIC | 0.07 |
| ORGANIC | 0.23 |

MISCELLANEOUS COMMENTS: SAMPLE FROM MEDICINE CREEK. ONLY TOP 2-3 IN. OF COAL SEAM EXPOSED AND SAMPLED. THIS SEAM APPEARS TC CORRELATE WITH SEAM SAMPLED IN (008)05-76.

COUNTY: ASOTIN

SAMPLE NUMBER: (024)08-77

COAL NAME: MEDICINE CREEK

MINE NAME: NONE
COAL AREA: GRANDE RONDE
SAMPLE SITE ELEVATION (FT): 2960

QUARTER SECTION: NE SECTION: 30
TOWNSHIP: 07N RANGE: 44E
QUADRANGLE: MOUNTAIN VIEW 7.5

GEOLOGIC FORMATION: SADDLE MTN.
AGE: MIOCENE

STRIKE: N/A DIP: N/A
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: STREAMCUT
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: WEATHERED

TOTAL SECTION MEASURED (FT): N
COAL THICKNESS (FT): 30.0
SAMPLE THICKNESS (FT): 2.5

OVERBURDEN THICKNESS (FT): 75
SAMPLE COLLECTOR: VONHEEDER (DGER)

DATE OF SAMPLING: 05-06-77
DATE OF ANALYSIS: 05-23-78

LABORATORY: USGS-DENVER

LAB. NUMBER: K82079

| AIR DRY LOSS: 30.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 36.8 | 44.9 | N/A |
| VOLATILE MATTER | 24.0 | 29.3 | 53.2 |
| FIXED CARBON | 22.5 | 27.5 | 49.8 |
| ASH | 16.7 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 6.0 | 4.2 | 4.2 |
| CARBON | 31.3 | 38.2 | 69.4 |
| NITROGEN | 0.4 | 0.5 | 0.9 |
| SULFUR | 0.1 | N/A | N/A |
| OXYGEN(IND) | 45.4 | 55.4 | 28.1 |
| HEATING VALUE (BTU/LB) | 5027 | 6131 | 11133 |

ASH - INITIAL DEFORMATION ..... 2155 F
SOFTENING TEMP. ..... 2255 F
FLUID TEMP. ..... 2355 F

SULFUR FORMS
SULFATE ..... 0.01
PYRITIC ..... 0.08
ORGANIC ..... 0.00

MISCELLANEOUS COMMENTS: BOTTOM OF SECTION NOT EXPOSED. 2.5 FT. OVERBURDEN AND WEATHERED SEAM EXCAVATED BEFORE SAMPLING.

COUNTY: ASOTIN

SAMPLE NUMBER: (025)09-77

COAL NAME: MACLOUGHLIN

MINE NAME: NONE
COAL AREA: GRANDE RONDE
SAMPLE SITE ELEVATION (FT): 2860

QUARTER SECTION: NE SECTION: 29
TOWNSHIP: 07N RANGE: 44E
QUADRANGLE: MTN. VIEW 7.5

GEOLOGIC FORMATION: SADDLE MTN.
AGE: MIOCENE

STRIKE: N20W DIP: 18SW
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: OUTCROP
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: WEATHERED

TOTAL SECTION MEASURED (FT): N
COAL THICKNESS (FT): 5.0
SAMPLE THICKNESS (FT): N

OVERBURDEN THICKNESS (FT): 15
SAMPLE COLLECTOR: VONHEEDER (DGER)

DATE OF SAMPLING: 05-06-77
DATE OF ANALYSIS: 05-23-78

LABORATORY: USGS-DENVER

LAB. NUMBER: K82080

| AIR DRY LOSS: 24.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 33.4 | 35.6 | N/A |
| VOLATILE MATTER | 35.0 | 37.3 | 58.0 |
| FIXED CARBON | 25.9 | 27.6 | 42.9 |
| ASH | 5.7 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 7.0 | 5.4 | 5.4 |
| CARBON | 40.5 | 43.2 | 67.1 |
| NITROGEN | 0.4 | 0.4 | 0.6 |
| SULFUR | 0.2 | N/A | N/A |
| OXYGEN(IND) | 46.2 | 49.3 | 27.3 |
| HEATING VALUE (BTU/LB) | 6697 | 7134 | 11083 |

ASH - INITIAL DEFORMATION ..... 2155 F
SOFTENING TEMP. ..... 2255 F
FLUID TEMP. ..... 2355 F

SULFUR FORMS
SULFATE ..... 0.02
PYRITIC ..... 0.05
ORGANIC ..... 0.13

MISCELLANEOUS COMMENTS: SAMPLE COLLECTED AFTER 1 FT. MATERIAL EXCAVATED FROM WEATHERED COAL FACE. OUTCROP AT ARTESIAN SPRING.

COUNTY: COWLITZ

SAMPLE NUMBER: (077)31-79 COAL NAME: UNNAMED

MINE NAME: NONE
COAL AREA: KELSO-CASTLE ROCK
SAMPLE SITE ELEVATION (FT): 500

QUARTER SECTION: SE SECTION: 18
TOWNSHIP: 10N RANGE: 01W
QUADRANGLE: CASTLE ROCK 15

GEOLOGIC FORMATION: TOUTLE
AGE: EOCENE/OLIGOCENE

STRIKE: N/A DIP: N/A
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: CLAY PIT
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: FRESH

TOTAL SECTION MEASURED (FT): N
COAL THICKNESS (FT): 9.9
SAMPLE THICKNESS (FT): 9.9

OVERBURDEN THICKNESS (FT): 0
SAMPLE COLLECTOR: VONHEEDER (DGER)

DATE OF SAMPLING: 08-31-79
DATE OF ANALYSIS: 12-06-79

LABORATORY: DOE-PITTSBURG LAB. NUMBER: K97350

| AIR DRY LOSS: 23.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 31.0 | 39.4 | N/A |
| VOLATILE MATTER | 28.7 | 36.4 | 60.2 |
| FIXED CARBON | 20.7 | 26.3 | 43.4 |
| ASH | 19.6 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 6.0 | 5.2 | 5.2 |
| CARBON | 31.4 | 39.9 | 65.9 |
| NITROGEN | 0.3 | 0.3 | 0.5 |
| SULFUR | 0.5 | N/A | N/A |
| OXYGEN(IND) | 42.2 | 53.6 | 30.6 |
| HEATING VALUE (BTU/LB) | 5293 | 6706 | 11077 |

ASH - INITIAL DEFORMATION ..... >2800 F
SOFTENING TEMP. ..... >2800 F
FLUID TEMP. ..... >2800 F

SULFUR FORMS
SULFATE ..... 0.00
PYRITIC ..... 0.03
ORGANIC ..... 0.49

MISCELLANEOUS COMMENTS:

COUNTY: COWLITZ

SAMPLE NUMBER: (094)06-80 COAL NAME: UNNAMED

MINE NAME: COAL CREEK QUARTER SECTION: N/A SECTION: 35
COAL AREA: KELSO-CASTLE ROCK TOWNSHIP: 09N RANGE: 03W
SAMPLE SITE ELEVATION (FT): 355 QUADRANGLE: CLATSKANIE 15

GEOLOGIC FORMATION: COWLITZ STRIKE: N60W DIP: 17SW
AGE: EOCENE MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: PORTAL TOTAL SECTION MEASURED (FT): 14.1
SAMPLE TYPE: CHANNEL COAL THICKNESS (FT): 4.0
SAMPLE CONDITION: FRESH SAMPLE THICKNESS (FT): 2.0

OVERBURDEN THICKNESS (FT): 10 DATE OF SAMPLING: 02-28-80
SAMPLE COLLECTOR: WALKER (DGER) DATE OF ANALYSIS: 04-15-80

LABORATORY: DOE-PITTSBURG LAB. NUMBER: L00660

| AIR DRY LOSS: N | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 12.8 | 19.4 | N/A |
| VOLATILE MATTER | 28.7 | 44.1 | 55.1 |
| FIXED CARBON | 26.5 | 40.7 | 50.8 |
| ASH | 32.0 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 4.1 | 4.6 | 4.6 |
| CARBON | 36.5 | 56.2 | 70.2 |
| NITROGEN | 0.7 | 0.6 | 0.8 |
| SULFUR | 1.9 | N/A | N/A |
| OXYGEN(IND) | 24.8 | 38.1 | 25.5 |
| HEATING VALUE (BTU/LB) | 6272 | 9592 | 11972 |

ASH - INITIAL DEFORMATION 2350 F
SOFTENING TEMP. 2490 F
FLUID TEMP. 2620 F

SULFUR FORMS
SULFATE N
PYRITIC N
ORGANIC N

MISCELLANEOUS COMMENTS: REWORKED OYSTER FRAGMENTS ASSOCIATED WITH COAL-BEARING ROCKS.

COUNTY: COWLITZ

SAMPLE NUMBER: (095)07-80 COAL NAME: UNNAMED

MINE NAME: NONE
COAL AREA: KELSO-CASTLE ROCK
SAMPLE SITE ELEVATION (FT): 355

QUARTER SECTION: N/A SECTION: 26
TOWNSHIP: 09N RANGE: 03W
QUADRANGLE: CLATSKANIE 15

GEOLOGIC FORMATION: COWLITZ
AGE: EOCENE

STRIKE: N35W DIP: 11SW
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: STREAMCUT
SAMPLE TYPE: GRAB
SAMPLE CONDITION: WEATHERED

TOTAL SECTION MEASURED (FT): 15.2
COAL THICKNESS (FT): 12.3
SAMPLE THICKNESS (FT): 2.0

OVERBURDEN THICKNESS (FT): 0
SAMPLE COLLECTOR: WALKER (DGER)

DATE OF SAMPLING: 03-25-80
DATE OF ANALYSIS: 04-15-80

LABORATORY: DOE-PITTSBURG LAB. NUMBER: L00661

| AIR DRY LOSS: N | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 9.7 | 18.6 | N/A |
| VOLATILE MATTER | 23.2 | 44.7 | 55.1 |
| FIXED CARBON | 22.7 | 43.8 | 53.9 |
| ASH | 44.4 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 3.7 | 6.0 | 6.0 |
| CARBON | 30.2 | 58.3 | 71.8 |
| NITROGEN | 0.6 | 0.9 | 1.1 |
| SULFUR | 0.8 | N/A | N/A |
| OXYGEN(IND) | 20.3 | 39.1 | 27.6 |
| HEATING VALUE (BTU/LB) | 5040 | 9688 | 11931 |

ASH - INITIAL DEFORMATION ..... 2730 F
SOFTENING TEMP. ..... 2800 F
FLUID TEMP. ..... 2800 F

SULFUR FORMS
SULFATE ..... N
PYRITIC ..... N
ORGANIC ..... N

MISCELLANEOUS COMMENTS: COLLECTED IN SMALL STREAM TRIBUTARY TO COAL CREEK. SEE (096)08-80 FOR ANALYSIS OF COAL 6-7 FT. STRATIGRAPHICALLY BELOW THIS SAMPLE.

COUNTY: COWLITZ

SAMPLE NUMBER: (096)08-80

COAL NAME: UNNAMED

MINE NAME: NONE
COAL AREA: KELSO-CASTLE ROCK
SAMPLE SITE ELEVATION (FT): 355

QUARTER SECTION: N/A SECTION: 26
TOWNSHIP: 09N RANGE: 03W
QUADRANGLE: CLATSKANIE 15

GEOLOGIC FORMATION: COWLITZ
AGE: EOCENE

STRIKE: N35W DIP: 11SW
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: STREAMCUT
SAMPLE TYPE: GRAB
SAMPLE CONDITION: WEATHERED

TOTAL SECTION MEASURED (FT): 15.2
COAL THICKNESS (FT): 12.3
SAMPLE THICKNESS (FT): 4.0

OVERBURDEN THICKNESS (FT): 0
SAMPLE COLLECTOR: WALKER (DGER)

DATE OF SAMPLING: 02-28-80
DATE OF ANALYSIS: 04-17-80

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: L00662

| AIR DRY LOSS: N | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 14.2 | 18.7 | N/A |
| VOLATILE MATTER | 30.6 | 41.0 | 50.9 |
| FIXED CARBON | 32.2 | 43.2 | 53.6 |
| ASH | 23.0 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 4.6 | 4.3 | 4.3 |
| CARBON | 43.6 | 58.7 | 72.8 |
| NITROGEN | 0.7 | 0.3 | 0.4 |
| SULFUR | 3.2 | N/A | N/A |
| OXYGEN(IND) | 24.9 | 33.3 | 19.9 |
| HEATING VALUE (BTU/LB) | 7636 | 10185 | 12628 |

ASH - INITIAL DEFORMATION ..... 1910 F
SOFTENING TEMP. ..... 2000 F
FLUID TEMP. ..... 2100 F

SULFUR FORMS
SULFATE ..... N
PYRITIC ..... N
ORGANIC ..... N

MISCELLANEOUS COMMENTS: SEE SAMPLE (095)07-80 FOR ANALYSIS FROM SAME LOCALITY.

COUNTY: KING

SAMPLE NUMBER: (103)15-80

COAL NAME: PRIMROSE

MINE NAME: SECTION 31 CLAY PIT
COAL AREA: NEWCASTLE
SAMPLE SITE ELEVATION (FT): 1375

QUARTER SECTION: NW SECTION: 31
TOWNSHIP: 24N RANGE: 06E
QUADRANGLE: ISSAQUAH 7.5

GEOLOGIC FORMATION: RENTON
AGE: EOCENE

STRIKE: N70W DIP: 47NE
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: CLAY PIT
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: FRESH

TOTAL SECTION MEASURED (FT): 173.0
COAL THICKNESS (FT): 5.0
SAMPLE THICKNESS (FT): 5.0

OVERBURDEN THICKNESS (FT): 0
SAMPLE COLLECTOR: WALSH (DGER)

DATE OF SAMPLING: 05-23-80
DATE OF ANALYSIS: 08-27-80

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: L03312

| | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| AIR DRY LOSS: 4.0 | | | |
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 13.8 | 17.5 | N/A |
| VOLATILE MATTER | 32.0 | 41.0 | 49.8 |
| FIXED CARBON | 34.0 | 43.5 | 53.0 |
| ASH | 20.0 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 5.7 | 6.2 | 6.2 |
| CARBON | 48.5 | 62.2 | 75.7 |
| NITROGEN | 1.0 | 1.0 | 1.2 |
| SULFUR | 1.5 | N/A | N/A |
| OXYGEN(IND) | 23.5 | 30.0 | 17.3 |
| HEATING VALUE (BTU/LB) | 8600 | 10989 | 13367 |

| | | |
|---|---|---|
| ASH - INITIAL DEFORMATION | 2540 | F |
| SOFTENING TEMP. | 2650 | F |
| FLUID TEMP. | 2760 | F |

| | |
|---|---|
| SULFUR FORMS | |
| SULFATE | N |
| PYRITIC | N |
| ORGANIC | N |

MISCELLANEOUS COMMENTS: COLLECTED DURING RAINSTORM WHICH WASHED MUD INTO SAMPLE.

COUNTY: KING

SAMPLE NUMBER: (104)16-80

COAL NAME: #3

MINE NAME: COAL CREEK
COAL AREA: NEWCASTLE
SAMPLE SITE ELEVATION (FT): 1200

QUARTER SECTION: NE SECTION: 36
TOWNSHIP: 24N RANGE: 05E
QUADRANGLE: ISSAQUAH 7.5

GEOLOGIC FORMATION: RENTON
AGE: EOCENE

STRIKE: N90E DIP: 45N
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: PORTAL
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: FRESH

TOTAL SECTION MEASURED (FT): 11.0
COAL THICKNESS (FT): 11.0
SAMPLE THICKNESS (FT): 5.5

OVERBURDEN THICKNESS (FT): 1
SAMPLE COLLECTOR: WALSH (DGER)

DATE OF SAMPLING: 05-22-80
DATE OF ANALYSIS: 08-27-80

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: L03313

| AIR DRY LOSS: 4.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 12.8 | 15.1 | N/A |
| VOLATILE MATTER | 34.2 | 40.5 | 47.7 |
| FIXED CARBON | 38.7 | 45.8 | 54.0 |
| ASH | 14.3 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 5.7 | 5.9 | 5.9 |
| CARBON | 54.5 | 64.6 | 76.1 |
| NITROGEN | 1.2 | 1.4 | 1.6 |
| SULFUR | 0.4 | N/A | N/A |
| OXYGEN(IND) | 24.0 | 28.4 | 17.6 |
| HEATING VALUE (BTU/LB) | 9626 | 11390 | 13428 |

ASH - INITIAL DEFORMATION ..... 2800 F
SOFTENING TEMP. ..... 2800 F
FLUID TEMP. ..... 2800 F

SULFUR FORMS
SULFATE ..... N
PYRITIC ..... N
ORGANIC ..... N

MISCELLANEOUS COMMENTS: LOWER SPLIT OF #3 SEAM.

COUNTY: KING

SAMPLE NUMBER: (105)17-80

COAL NAME: UNNAMED

MINE NAME: NONE
COAL AREA: TIGER MTN.
SAMPLE SITE ELEVATION (FT): 1460

QUARTER SECTION: SE SECTION: 16
TOWNSHIP: 23N RANGE: 07E
QUADRANGLE: HOBART 7.5

GEOLOGIC FORMATION: TIGER MTN.
AGE: EOCENE

STRIKE: N/A DIP: N/A
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: FLOAT
SAMPLE TYPE: GRAB
SAMPLE CONDITION: WEATHERED

TOTAL SECTION MEASURED (FT): N
COAL THICKNESS (FT): N
SAMPLE THICKNESS (FT): N

OVERBURDEN THICKNESS (FT): 0
SAMPLE COLLECTOR: WALSH (DGER)

DATE OF SAMPLING: 05-15-80
DATE OF ANALYSIS: 08-27-80

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: L03314

| AIR DRY LOSS: 0.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 1.7 | 4.1 | N/A |
| VOLATILE MATTER | 25.5 | 63.5 | 66.3 |
| FIXED CARBON | 17.5 | 43.5 | 45.5 |
| ASH | 55.3 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 2.8 | 6.7 | 6.7 |
| CARBON | 31.9 | 79.5 | 83.0 |
| NITROGEN | 0.6 | 1.3 | 1.4 |
| SULFUR | 0.4 | N/A | N/A |
| OXYGEN(IND) | 8.9 | 22.1 | 19.1 |
| HEATING VALUE (BTU/LB) | 5196 | 12922 | 13495 |

ASH - INITIAL DEFORMATION ..... 2000 F
SOFTENING TEMP. ..... 2080 F
FLUID TEMP. ..... 2170 F

SULFUR FORMS
SULFATE ..... N
PYRITIC ..... N
ORGANIC ..... N

MISCELLANEOUS COMMENTS: SAMPLE REPRESENTATIVE OF COAL TYPES FOUND IN FLOAT, THOUGH NOT NECESSARILY REPRESENTATIVE OF THE COAL SEAM.

COUNTY: KING

SAMPLE NUMBER: (106)18-80 COAL NAME: LOWER ELK

MINE NAME: L. ELK PROSPECT QUARTER SECTION: SW SECTION: 34
COAL AREA: GREEN RIVER TOWNSHIP: 22N RANGE: 07E
SAMPLE SITE ELEVATION (FT): 1090 QUADRANGLE: CUMBERLAND 7.5

GEOLOGIC FORMATION: PUGET GROUP STRIKE: N05W DIP: 15NE
AGE: EOCENE MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: PROSPECT TOTAL SECTION MEASURED (FT): 9.7
SAMPLE TYPE: CHANNEL COAL THICKNESS (FT): 6.4
SAMPLE CONDITION: WEATHERED SAMPLE THICKNESS (FT): 6.4

OVERBURDEN THICKNESS (FT): 0 DATE OF SAMPLING: 05-16-80
SAMPLE COLLECTOR: PHILLIPS (DGER) DATE OF ANALYSIS: 09-29-80

LABORATORY: DOE-PITTSBURG LAB. NUMBER: L03816

| AIR DRY LOSS: 1.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 5.1 | 7.4 | N/A |
| VOLATILE MATTER | 29.2 | 43.1 | 46.7 |
| FIXED CARBON | 35.9 | 53.1 | 57.4 |
| ASH | 29.8 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 4.9 | 6.8 | 6.8 |
| CARBON | 49.6 | 73.4 | 79.4 |
| NITROGEN | 0.9 | 1.2 | 1.3 |
| SULFUR | 0.6 | N/A | N/A |
| OXYGEN(IND) | 14.1 | 20.8 | 15.2 |
| HEATING VALUE (BTU/LB) | 8810 | 13010 | 14074 |

ASH - INITIAL DEFORMATION ..... 2800 F
SOFTENING TEMP. ..... 2800 F
FLUID TEMP. ..... 2800 F

SULFUR FORMS
SULFATE ..... N
PYRITIC ..... N
ORGANIC ..... N

MISCELLANEOUS COMMENTS: LOWER ELK COAL BED IS ALSO KNOWN AS ELK NO. 2 COAL BED.

COUNTY: KING

SAMPLE NUMBER: (107)19-80

COAL NAME: UNNAMED

MINE NAME: NONE
COAL AREA: GREEN RIVER
SAMPLE SITE ELEVATION (FT): 1130

QUARTER SECTION: SW SECTION: 34
TOWNSHIP: 22N RANGE: 07E
QUADRANGLE: CUMBERLAND 7.5

GEOLOGIC FORMATION: PUGET GROUP
AGE: EOCENE

STRIKE: N05E DIP: 15NE
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: OUTCROP
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: WEATHERED

TOTAL SECTION MEASURED (FT): 5.6
COAL THICKNESS (FT): 1.0
SAMPLE THICKNESS (FT): 1.0

OVERBURDEN THICKNESS (FT): 5
SAMPLE COLLECTOR: PHILLIPS (DGER)

DATE OF SAMPLING: 05-16-80
DATE OF ANALYSIS: 09-23-80

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: L03817

| AIR DRY LOSS: 2.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 6.0 | 6.8 | N/A |
| VOLATILE MATTER | 35.2 | 40.3 | 43.3 |
| FIXED CARBON | 47.1 | 54.0 | 58.0 |
| ASH | 11.7 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 5.7 | 6.1 | 6.1 |
| CARBON | 64.4 | 73.9 | 79.3 |
| NITROGEN | 1.3 | 1.4 | 1.5 |
| SULFUR | 0.5 | N/A | N/A |
| OXYGEN(IND) | 16.5 | 18.9 | 13.7 |
| HEATING VALUE (BTU/LB) | 11488 | 13162 | 14136 |

ASH - INITIAL DEFORMATION ..... 2800 F
SOFTENING TEMP. ..... 2800 F
FLUID TEMP. ..... 2800 F

SULFUR FORMS
SULFATE ..... N
PYRITIC ..... N
ORGANIC ..... N

MISCELLANEOUS COMMENTS: PREVICUSLY UNMAPPED COAL 60 FT. STRATIGRAPHICALLY ABOVE TOP OF LOWER ELK BED (SEE SAMPLE (106)18-80).

COUNTY: KING

SAMPLE NUMBER: (108)20-80

COAL NAME: BIG ELK

MINE NAME: BIG ELK STRIP PIT
COAL AREA: GREEN RIVER
SAMPLE SITE ELEVATION (FT): 1240

QUARTER SECTION: SW SECTION: 34
TOWNSHIP: 22N RANGE: 07E
QUADRANGLE: CUMBERLAND 7.5

GEOLOGIC FORMATION: PUGET GROUP
AGE: EOCENE

STRIKE: N05W DIP: 25NE
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: STRIP PIT
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: WEATHERED

TOTAL SECTION MEASURED (FT): 47.3
COAL THICKNESS (FT): 10.5
SAMPLE THICKNESS (FT): 6.2

OVERBURDEN THICKNESS (FT): 0
SAMPLE COLLECTOR: PHILLIPS (DGER)

DATE OF SAMPLING: 05-20-80
DATE OF ANALYSIS: 09-23-80

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: L03818

| AIR DRY LOSS: 2.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 8.5 | 10.2 | N/A |
| VOLATILE MATTER | 40.0 | 48.9 | 54.6 |
| FIXED CARBON | 34.9 | 42.6 | 47.6 |
| ASH | 16.6 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 5.1 | 5.5 | 5.5 |
| CARBON | 56.0 | 68.5 | 76.5 |
| NITROGEN | 1.2 | 1.3 | 1.4 |
| SULFUR | 1.1 | N/A | N/A |
| OXYGEN(IND) | 20.0 | 24.3 | 16.8 |
| HEATING VALUE (BTU/LB) | 9750 | 11901 | 13287 |

ASH - INITIAL DEFORMATION ..... 2300 F
SOFTENING TEMP. ..... 2410 F
FLUID TEMP. ..... 2500 F

SULFUR FORMS
SULFATE ..... N
PYRITIC ..... N
ORGANIC ..... N

MISCELLANEOUS COMMENTS: STRIP PIT ABANDONED.

COUNTY: KING

SAMPLE NUMBER: (109)21-80

COAL NAME: UNNAMED

MINE NAME: RUFFNER
COAL AREA: TIGER MTN.
SAMPLE SITE ELEVATION (FT): 1540

QUARTER SECTION: SW SECTION: 16
TOWNSHIP: 23N RANGE: 07E
QUADRANGLE: HOBART 7.5

GEOLOGIC FORMATION: TIGER MTN.
AGE: EOCENE

STRIKE: N10W DIP: 55SW
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: PROSPECT
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: WEATHERED

TOTAL SECTION MEASURED (FT): 3.5
COAL THICKNESS (FT): 5.0
SAMPLE THICKNESS (FT): 2.5

OVERBURDEN THICKNESS (FT): 4
SAMPLE COLLECTOR: WALSH (DGER)

DATE OF SAMPLING: 06-05-80
DATE OF ANALYSIS: 09-29-80

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: L03824

| AIR DRY LOSS: 7.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 10.3 | 20.9 | N/A |
| VOLATILE MATTER | 25.4 | 51.8 | 65.7 |
| FIXED CARBON | 17.2 | 35.1 | 44.4 |
| ASH | 47.1 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 4.2 | 7.7 | 7.7 |
| CARBON | 31.8 | 64.9 | 82.3 |
| NITROGEN | 0.6 | 1.1 | 1.4 |
| SULFUR | 0.5 | N/A | N/A |
| OXYGEN(IND) | 15.9 | 32.4 | 17.3 |
| HEATING VALUE (BTU/LB) | 5487 | 11180 | 14166 |

ASH - INITIAL DEFORMATION ..... 2510 F
SOFTENING TEMP. ..... 2620 F
FLUID TEMP. ..... 2730 F

SULFUR FORMS
SULFATE ..... N
PYRITIC ..... N
ORGANIC ..... N

MISCELLANEOUS COMMENTS: PROSPECT PIT DUG BY WALSH AND PHILLIPS (DGER) ABOUT 4 FEET FROM RUFFNER TUNNEL. OLD STREAM CHANNEL CUT OUT LOWER PART OF SEAM ALTHOUGH FULL THICKNESS IS PRESENT IN TUNNEL. INTERMITTENT RAIN WASHED MUD INTO SAMPLE.

COUNTY: KING

SAMPLE NUMBER: (110)22-80

COAL NAME: CASHMAN

MINE NAME: CASHMAN
COAL AREA: GREEN RIVER
SAMPLE SITE ELEVATION (FT): 980

QUARTER SECTION: NE SECTION: 33
TOWNSHIP: 22N RANGE: 07E
QUADRANGLE: CUMBERLAND 7.5

GEOLOGIC FORMATION: PUGET GROUP
AGE: EOCENE

STRIKE: N60W DIP: 35NE
MAJOR JOINTS IN COAL: N70E 72S

EXPOSURE TYPE: PROSPECT
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: WEATHERED

TOTAL SECTION MEASURED (FT): 36.3
COAL THICKNESS (FT): 2.8
SAMPLE THICKNESS (FT): 2.7

OVERBURDEN THICKNESS (FT): 0
SAMPLE COLLECTOR: PHILLIPS (DGER)

DATE OF SAMPLING: 05-23-80
DATE OF ANALYSIS: 09-23-80

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: L03819

| AIR DRY LOSS: 2.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 6.7 | 7.5 | N/A |
| VOLATILE MATTER | 40.9 | 46.6 | 50.5 |
| FIXED CARBON | 41.2 | 46.9 | 50.8 |
| ASH | 11.2 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 5.7 | 6.0 | 6.0 |
| CARBON | 65.0 | 74.1 | 80.3 |
| NITROGEN | 1.4 | 1.5 | 1.6 |
| SULFUR | 0.6 | N/A | N/A |
| OXYGEN(IND) | 16.1 | 18.3 | 12.4 |
| HEATING VALUE (BTU/LB) | 11750 | 13383 | 14492 |

ASH - INITIAL DEFORMATION ..... 2800 F
SOFTENING TEMP. ..... 2800 F
FLUID TEMP. ..... 2800 F

SULFUR FORMS
SULFATE ..... N
PYRITIC ..... N
ORGANIC ..... N

MISCELLANEOUS COMMENTS: UPPER 2.8 FEET OF COAL IN CASHMAN SEAM. SEE SAMPLES (111)23-80 AND (112)24-80 FOR REMAINDER OF SEAM.

COUNTY: KING

SAMPLE NUMBER: (111)23-80 COAL NAME: CASHMAN

MINE NAME: CASHMAN
COAL AREA: GREEN RIVER
SAMPLE SITE ELEVATION (FT): 980

QUARTER SECTION: NE SECTION: 33
TOWNSHIP: 22N RANGE: 07E
QUADRANGLE: CUMBERLAND 7.5

GEOLOGIC FORMATION: PUGET GROUP
AGE: EOCENE

STRIKE: N60W DIP: 35NE
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: PROSPECT
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: WEATHERED

TOTAL SECTION MEASURED (FT): 36.3
COAL THICKNESS (FT): 1.1
SAMPLE THICKNESS (FT): 1.1

OVERBURDEN THICKNESS (FT): 0
SAMPLE COLLECTOR: PHILLIPS (DGER)

DATE OF SAMPLING: 05-23-80
DATE OF ANALYSIS: 09-23-80

LABORATORY: DOE-PITTSBURG LAB. NUMBER: L03820

| AIR DRY LOSS: 2.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 7.1 | 8.1 | N/A |
| VOLATILE MATTER | 40.6 | 47.0 | 51.2 |
| FIXED CARBON | 39.8 | 46.1 | 50.2 |
| ASH | 12.5 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 5.7 | 6.1 | 6.1 |
| CARBON | 62.7 | 72.7 | 79.2 |
| NITROGEN | 1.4 | 1.5 | 1.7 |
| SULFUR | 0.6 | N/A | N/A |
| OXYGEN(IND) | 17.0 | 19.6 | 13.4 |
| HEATING VALUE (BTU/LB) | 11303 | 13082 | 14257 |

ASH - INITIAL DEFORMATION ..... 2800 F
SOFTENING TEMP. ..... 2800 F
FLUID TEMP. ..... 2800 F

SULFUR FORMS
SULFATE ..... N
PYRITIC ..... N
ORGANIC ..... N

MISCELLANEOUS COMMENTS: 1.1 FT. OF COAL FROM MIDDLE PORTION OF CASHMAN SEAM. SEE SAMPLES (110)22-80 AND (112)24-80 FOR REMAINDER OF SEAM.

COUNTY: KING

SAMPLE NUMBER: (112)24-80

COAL NAME: CASHMAN

MINE NAME: CASHMAN
COAL AREA: GREEN RIVER
SAMPLE SITE ELEVATION (FT): 980

QUARTER SECTION: NE SECTION: 33
TOWNSHIP: 22N RANGE: 07E
QUADRANGLE: CUMBERLAND 7.5

GEOLOGIC FORMATION: PUGET GROUP
AGE: EOCENE

STRIKE: N60W DIP: 35NE
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: PROSPECT
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: WEATHERED

TOTAL SECTION MEASURED (FT): 36.3
COAL THICKNESS (FT): 6.7
SAMPLE THICKNESS (FT): 6.7

OVERBURDEN THICKNESS (FT): 0
SAMPLE COLLECTOR: PHILLIPS (DGER)

DATE OF SAMPLING: 06-03-80
DATE OF ANALYSIS: 09-23-80

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: L03821

| AIR DRY LOSS: 8.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 13.5 | 15.4 | N/A |
| VOLATILE MATTER | 32.5 | 37.3 | 44.1 |
| FIXED CARBON | 42.2 | 48.4 | 57.4 |
| ASH | 11.8 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 5.8 | 5.7 | 5.7 |
| CARBON | 58.5 | 67.2 | 79.5 |
| NITROGEN | 1.3 | 1.4 | 1.6 |
| SULFUR | 0.6 | N/A | N/A |
| OXYGEN(IND) | 22.0 | 25.2 | 13.5 |
| HEATING VALUE (BTU/LB) | 10531 | 12080 | 14301 |

ASH - INITIAL DEFORMATION ..... 2800 F
SOFTENING TEMP. ..... 2800 F
FLUID TEMP. ..... 2800 F

SULFUR FORMS
SULFATE ..... N
PYRITIC ..... N
ORGANIC ..... N

MISCELLANEOUS COMMENTS: LOWER 6.7 FEET OF CASHMAN SEAM. SEE SAMPLES (110)22-80 AND (111)23-80 FOR REMAINDER OF SEAM.

COUNTY: KING

SAMPLE NUMBER: (113)25-80 COAL NAME: UNNAMED

MINE NAME: UNNAMED PROSPECT
COAL AREA: GREEN RIVER
SAMPLE SITE ELEVATION (FT): 1050

QUARTER SECTION: NE SECTION: 34
TOWNSHIP: 22N RANGE: 07E
QUADRANGLE: CUMBERLAND 7.5

GEOLOGIC FORMATION: PUGET GROUP
AGE: EOCENE

STRIKE: N55W DIP: 06NE
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: PROSPECT
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: WEATHERED

TOTAL SECTION MEASURED (FT): 32.8
COAL THICKNESS (FT): 9.8
SAMPLE THICKNESS (FT): 6.5

OVERBURDEN THICKNESS (FT): 0
SAMPLE COLLECTOR: PHILLIPS (DGER)

DATE OF SAMPLING: 06-06-80
DATE OF ANALYSIS: 09-23-80

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: L03822

| AIR DRY LOSS: 19.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 28.0 | 44.0 | N/A |
| VOLATILE MATTER | 18.8 | 29.5 | 52.8 |
| FIXED CARBON | 19.6 | 30.8 | 55.0 |
| ASH | 33.6 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 4.9 | 4.9 | 4.9 |
| CARBON | 26.2 | 41.2 | 73.6 |
| NITROGEN | 0.6 | 0.9 | 1.6 |
| SULFUR | 0.3 | N/A | N/A |
| OXYGEN(IND) | 34.5 | 54.2 | 26.9 |
| HEATING VALUE (BTU/LB) | 4238 | 6645 | 11880 |

ASH - INITIAL DEFORMATION ..... 2500 F
SOFTENING TEMP. ..... 2610 F
FLUID TEMP. ..... 2700 F

SULFUR FORMS
SULFATE ..... N
PYRITIC ..... N
ORGANIC ..... N

MISCELLANEOUS COMMENTS: BASE OF COAL ZONE NOT EXPOSED. SEE SAMPLE (114)26-80 FOR ANALYSIS OF LOWER 3.3 FT. OF SEAM.

COUNTY: KING

SAMPLE NUMBER: (114)26-80

COAL NAME: UNNAMED

MINE NAME: UNNAMED PROSPECT
COAL AREA: GREEN RIVER
SAMPLE SITE ELEVATION (FT): 1050

QUARTER SECTION: NE SECTION: 34
TOWNSHIP: 22N RANGE: 07E
QUADRANGLE: CUMBERLAND 7.5

GEOLOGIC FORMATION: PUGET GROUP
AGE: EOCENE

STRIKE: N55W DIP: 06NE
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: PROSPECT
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: WEATHERED

TOTAL SECTION MEASURED (FT): 32.8
COAL THICKNESS (FT): 9.8
SAMPLE THICKNESS (FT): 3.3

OVERBURDEN THICKNESS (FT): 0
SAMPLE COLLECTOR: PHILLIPS (DGER)

DATE OF SAMPLING: 06-06-80
DATE OF ANALYSIS: 09-23-80

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: LC3823

| AIR DRY LOSS: 11.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 14.4 | 28.8 | N/A |
| VOLATILE MATTER | 31.5 | 63.4 | 89.6 |
| FIXED CARBON | 7.8 | 15.5 | 21.8 |
| ASH | 46.3 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 4.0 | 6.4 | 6.4 |
| CARBON | 27.3 | 54.9 | 77.5 |
| NITROGEN | 0.6 | 0.9 | 1.2 |
| SULFUR | 1.1 | N/A | N/A |
| OXYGEN(IND) | 20.7 | 41.6 | 22.1 |
| HEATING VALUE (BTU/LB) | 4701 | 9407 | 13278 |

ASH - INITIAL DEFORMATION ..... 2010 F
SOFTENING TEMP. ..... 2120 F
FLUID TEMP. ..... 2250 F

SULFUR FORMS
SULFATE ..... N
PYRITIC ..... N
ORGANIC ..... N

MISCELLANEOUS COMMENTS: BASE OF COAL ZONE NOT EXPOSED DURING SAMPLING. SAMPLE (113)25-80 FOR ANALYSIS OF UPPER 7.1 FT. OF THIS COAL SEAM.

COUNTY: KING

SAMPLE NUMBER: (115)27-80

COAL NAME: UNNAMED

MINE NAME: NONE
COAL AREA: GREEN RIVER
SAMPLE SITE ELEVATION (FT): 1100

QUARTER SECTION: NW SECTION: 34
TOWNSHIP: 22N RANGE: 07E
QUADRANGLE: CUMBERLAND 7.5

GEOLOGIC FORMATION: PUGET GROUP
AGE: EOCENE

STRIKE: N10W DIP: 22SW
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: STREAM
SAMPLE TYPE: FLOAT
SAMPLE CONDITION: WEATHERED

TOTAL SECTION MEASURED (FT): N
COAL THICKNESS (FT): N
SAMPLE THICKNESS (FT): N

OVERBURDEN THICKNESS (FT): 0
SAMPLE COLLECTOR: PHILLIPS (DGER)

DATE OF SAMPLING: 06-11-80
DATE OF ANALYSIS: 08-27-80

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: L03315

| AIR DRY LOSS: 1.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 5.7 | 10.6 | N/A |
| VOLATILE MATTER | 22.2 | 41.7 | 46.7 |
| FIXED CARBON | 29.1 | 54.7 | 61.3 |
| ASH | 43.2 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 4.1 | 7.1 | 7.1 |
| CARBON | 40.0 | 75.3 | 84.4 |
| NITROGEN | 1.0 | 1.7 | 1.9 |
| SULFUR | 0.6 | N/A | N/A |
| OXYGEN(IND) | 11.2 | 21.0 | 12.8 |
| HEATING VALUE (BTU/LB) | 7080 | 13298 | 14900 |

ASH - INITIAL DEFORMATION ..... 2800 F
SOFTENING TEMP. ..... 2800 F
FLUID TEMP. ..... 2800 F

SULFUR FORMS
SULFATE ..... N
PYRITIC ..... N
ORGANIC ..... N

MISCELLANEOUS COMMENTS: COAL FLOAT FOUND IN STREAM WITHIN 100 FT. OF UNNAMED CAVED-IN PROSPECT. VINE (1969) SHOWS APPROX. N10W 22SW STRIKE AND DIP AT LOCATION.

COUNTY: KING

SAMPLE NUMBER: (116)28-80 COAL NAME: UNNAMED

MINE NAME: NONE
COAL AREA: GREEN RIVER
SAMPLE SITE ELEVATION (FT): 1140

QUARTER SECTION: NW SECTION: 34
TOWNSHIP: 22N RANGE: 07E
QUADRANGLE: CUMBERLAND 7.5

GEOLOGIC FORMATION: PUGET GROUP
AGE: EOCENE

STRIKE: N/A DIP: N/A
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: STREAMCUT
SAMPLE TYPE: GRAB
SAMPLE CONDITION: WEATHERED

TOTAL SECTION MEASURED (FT): N
COAL THICKNESS (FT): N
SAMPLE THICKNESS (FT): N

OVERBURDEN THICKNESS (FT): 0
SAMPLE COLLECTOR: PHILLIPS (DGER)

DATE OF SAMPLING: 06-11-80
DATE OF ANALYSIS: 08-27-80

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: L03316

| AIR DRY LOSS: 0.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 4.7 | 7.1 | N/A |
| VOLATILE MATTER | 30.1 | 46.3 | 49.9 |
| FIXED CARBON | 32.9 | 50.6 | 54.6 |
| ASH | 32.3 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 4.7 | 6.8 | 6.8 |
| CARBON | 48.6 | 74.9 | 80.7 |
| NITROGEN | 1.2 | 1.7 | 1.8 |
| SULFUR | 0.6 | N/A | N/A |
| OXYGEN(IND) | 12.6 | 19.3 | 13.9 |
| HEATING VALUE (BTU/LB) | 8766 | 13484 | 14539 |

ASH - INITIAL DEFORMATION ..... 2790 F
SOFTENING TEMP. ..... 2800 F
FLUID TEMP. ..... 2800 F

SULFUR FORMS
SULFATE ..... N
PYRITIC ..... N
ORGANIC ..... N

MISCELLANEOUS COMMENTS: COAL SAMPLE FROM ABUNDANT FLOAT FOUND IN UNNAMED STREAM. THERE IS NO EVIDENCE OF OLD TIPPLE, MINE DUMP OR RAILROAD IN AREA. LOCATION IS CLOSE TO PROJECTED OUTCROP LINE OF UPPER UNNAMED COAL BED SHOWN ON VINE'S (1969) MAP.

COUNTY: KING

SAMPLE NUMBER: (117)29-80

COAL NAME: BIG ELK

MINE NAME: ELK CLAY PIT
COAL AREA: GREEN RIVER
SAMPLE SITE ELEVATION (FT): 1020

QUARTER SECTION: SE SECTION: 34
TOWNSHIP: 22N RANGE: 07E
QUADRANGLE: CUMBERLAND 7.5

GEOLOGIC FORMATION: PUGET GROUP
AGE: EOCENE

STRIKE: N45E DIP: 35NW
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: STRIP PIT
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: WEATHERED

TOTAL SECTION MEASURED (FT): 21.4
COAL THICKNESS (FT): 2.6
SAMPLE THICKNESS (FT): 1.9

OVERBURDEN THICKNESS (FT): 0
SAMPLE COLLECTOR: PHILLIPS (DGER)

DATE OF SAMPLING: 06-13-80
DATE OF ANALYSIS: 08-27-80

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: L03317

| AIR DRY LOSS: 4.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 7.9 | 16.5 | N/A |
| VOLATILE MATTER | 16.6 | 34.7 | 41.7 |
| FIXED CARBON | 27.2 | 57.0 | 68.4 |
| ASH | 48.3 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 3.7 | 6.9 | 6.9 |
| CARBON | 34.1 | 71.5 | 85.8 |
| NITROGEN | 0.8 | 1.5 | 1.8 |
| SULFUR | 0.5 | N/A | N/A |
| OXYGEN(IND) | 12.6 | 26.3 | 13.9 |
| HEATING VALUE (BTU/LB) | 5708 | 11949 | 14329 |

ASH - INITIAL DEFORMATION ..... 2740 F
SOFTENING TEMP. ..... 2800 F
FLUID TEMP. ..... 2800 F

SULFUR FORMS
SULFATE ..... N
PYRITIC ..... N
ORGANIC ..... N

MISCELLANEOUS COMMENTS: SAMPLE IS REPRESEENTATIVE OF UPPERMOST PORTION OF BIG ELK COAL SEAM ONLY. THE BULK OF BIG ELK COAL BED WAS NOT EXPOSED AT THIS LOCALITY.

COUNTY: KING

SAMPLE NUMBER: (118)30-80

COAL NAME: DURHAM NO. 1

MINE NAME: DURHAM NO. 1
COAL AREA: GREEN RIVER
SAMPLE SITE ELEVATION (FT): 1100

QUARTER SECTION: NW SECTION: 2
TOWNSHIP: 21N RANGE: 07E
QUADRANGLE: CUMBERLAND 7.5

GEOLOGIC FORMATION: PUGET GROUP
AGE: EOCENE

STRIKE: N30W DIP: 31NE
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: STRIP PIT
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: WEATHERED

TOTAL SECTION MEASURED (FT): 49.0
COAL THICKNESS (FT): 8.5
SAMPLE THICKNESS (FT): 8.5

OVERBURDEN THICKNESS (FT): 0
SAMPLE COLLECTOR: PHILLIPS (DGER)

DATE OF SAMPLING: 06-13-80
DATE OF ANALYSIS: 08-27-80

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: L03318

| AIR DRY LOSS: 8.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 15.9 | 20.3 | N/A |
| VOLATILE MATTER | 25.0 | 32.0 | 40.3 |
| FIXED CARBON | 38.8 | 49.8 | 62.5 |
| ASH | 20.3 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 5.0 | 5.1 | 5.1 |
| CARBON | 46.8 | 60.0 | 75.4 |
| NITROGEN | 0.8 | 1.0 | 1.2 |
| SULFUR | 0.4 | N/A | N/A |
| OXYGEN(IND) | 26.6 | 34.1 | 20.0 |
| HEATING VALUE (BTU/LB) | 7759 | 9940 | 12491 |

ASH - INITIAL DEFORMATION ..... 2800 F
SOFTENING TEMP. ..... 2800 F
FLUID TEMP. ..... 2800 F

SULFUR FORMS
SULFATE ..... N
PYRITIC ..... N
ORGANIC ..... N

MISCELLANEOUS COMMENTS: STRIP PIT ABANDONED.
LOWER 13.4 FT. OF 49.0 FT. MEASURED SECTION. SEE SAMPLE (119)31-80 FOR REMAINDER OF ANALYSED SECTION.

COUNTY: KING

SAMPLE NUMBER: (119)31-80

COAL NAME: DURHAM NO. 1

MINE NAME: DURHAM NO. 1
COAL AREA: GREEN RIVER
SAMPLE SITE ELEVATION (FT): 1100

QUARTER SECTION: NW SECTION: 2
TOWNSHIP: 21N RANGE: 07E
QUADRANGLE: CUMBERLAND 7.5

GEOLOGIC FORMATION: PUGET GROUP
AGE: EOCENE

STRIKE: N30W DIP: 31NE
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: STRIP PIT
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: WEATHERED

TOTAL SECTION MEASURED (FT): 49.0
COAL THICKNESS (FT): 16.5
SAMPLE THICKNESS (FT): 16.4

OVERBURDEN THICKNESS (FT): 0
SAMPLE COLLECTOR: PHILLIPS (DGER)

DATE OF SAMPLING: 06-13-80
DATE OF ANALYSIS: 08-27-80

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: L03319

| AIR DRY LOSS: 6.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 15.8 | 20.7 | N/A |
| VOLATILE MATTER | 25.5 | 33.5 | 42.3 |
| FIXED CARBON | 36.6 | 48.2 | 60.8 |
| ASH | 22.1 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 4.8 | 4.9 | 4.9 |
| CARBON | 44.9 | 59.1 | 74.7 |
| NITROGEN | 0.9 | 1.1 | 1.3 |
| SULFUR | 0.6 | N/A | N/A |
| OXYGEN(IND) | 26.7 | 35.1 | 20.9 |
| HEATING VALUE (BTU/LB) | 7458 | 9799 | 12380 |

ASH - INITIAL DEFORMATION ..... 2800 F
SOFTENING TEMP. ..... 2800 F
FLUID TEMP. ..... 2800 F

SULFUR FORMS
SULFATE ..... N
PYRITIC ..... N
ORGANIC ..... N

MISCELLANEOUS COMMENTS: STRIP PIT ABANDONED.
INTERVAL 13.4 OF 49.0 FT. MEASURED SECTION.
SEE SAMPLE (118)30-80 FOR LOWER PORTION OF ANALYSED SECTION.

COUNTY: KING

SAMPLE NUMBER: (126)38-80

COAL NAME: DURHAM NO. 1

MINE NAME: DURHAM NO. 1
COAL AREA: GREEN RIVER
SAMPLE SITE ELEVATION (FT): 1260

QUARTER SECTION: SW SECTION: 2
TOWNSHIP: 21N RANGE: 07E
QUADRANGLE: CUMBERLAND 7.5

GEOLOGIC FORMATION: PUGET GROUP
AGE: EOCENE

STRIKE: N10E DIP: 20SE
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: STRIP PIT
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: WEATHERED

TOTAL SECTION MEASURED (FT): 102.7
COAL THICKNESS (FT): 7.1
SAMPLE THICKNESS (FT): 4.9

OVERBURDEN THICKNESS (FT): 0
SAMPLE COLLECTOR: PHILLIPS (DGER)

DATE OF SAMPLING: 06-18-80
DATE OF ANALYSIS: 08-27-80

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: L03320

| AIR DRY LOSS: 0.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 3.2 | 4.1 | N/A |
| VOLATILE MATTER | 27.2 | 35.5 | 37.0 |
| FIXED CARBON | 48.1 | 62.8 | 65.5 |
| ASH | 21.5 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 4.7 | 5.8 | 5.8 |
| CARBON | 61.6 | 80.4 | 83.9 |
| NITROGEN | 1.1 | 1.3 | 1.4 |
| SULFUR | 0.5 | N/A | N/A |
| OXYGEN(IND) | 10.4 | 13.5 | 10.2 |
| HEATING VALUE (BTU/LB) | 10893 | 14206 | 14826 |

ASH - INITIAL DEFORMATION ..... 2800 F
SOFTENING TEMP. ..... 2800 F
FLUID TEMP. ..... 2800 F

SULFUR FORMS
SULFATE ..... N
PYRITIC ..... N
ORGANIC ..... N

MISCELLANEOUS COMMENTS: STRIP PIT ABANDONED.
INTERVAL 21.4 TO 31.5 OF 102.7 FT. MEASURED SECTION.
STRATIGRAPHICALLY ABOVE SAMPLE (130)42-80.

COUNTY: KING

SAMPLE NUMBER: (127)39-80

COAL NAME: DURHAM NO. 1

MINE NAME: DURHAM NO. 1
COAL AREA: GREEN RIVER
SAMPLE SITE ELEVATION (FT): 1260

QUARTER SECTION: SW SECTION: 2
TOWNSHIP: 21N RANGE: 07E
QUADRANGLE: CUMBERLAND 7.5

GEOLOGIC FORMATION: PUGET GROUP
AGE: EOCENE

STRIKE: N10E DIP: 20SE
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: STRIP PIT
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: WEATHERED

TOTAL SECTION MEASURED (FT): 102.7
COAL THICKNESS (FT): 6.6
SAMPLE THICKNESS (FT): 5.5

OVERBURDEN THICKNESS (FT): 0
SAMPLE COLLECTOR: PHILLIPS (DGER)

DATE OF SAMPLING: 06-18-80
DATE OF ANALYSIS: 08-27-80

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: L03321

| AIR DRY LOSS: 0.0 | COAL (AP) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 3.3 | 4.1 | N/A |
| VOLATILE MATTER | 28.0 | 36.2 | 37.8 |
| FIXED CARBON | 47.9 | 61.9 | 64.7 |
| ASH | 20.8 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 4.8 | 5.9 | 5.9 |
| CARBON | 62.1 | 80.4 | 83.9 |
| NITROGEN | 1.2 | 1.4 | 1.5 |
| SULFUR | 0.7 | N/A | N/A |
| OXYGEN(IND) | 10.5 | 13.5 | 10.1 |
| HEATING VALUE (BTU/LB) | 11149 | 14406 | 15049 |

ASH - INITIAL DEFORMATION ..... 2650 F
SOFTENING TEMP. ..... 2760 F
FLUID TEMP. ..... 2800 F

SULFUR FORMS
SULFATE ..... N
PYRITIC ..... N
ORGANIC ..... N

MISCELLANEOUS COMMENTS: STRIP PIT ABANDONED.
INTERVAL 31.5 TO 38.8 OF 102.7 FT. MEASURED SECTION.
STRATIGRAPHICALLY ABOVE SAMPLE (126)38-80.

COUNTY: KING

SAMPLE NUMBER: (128)40-80 COAL NAME: DURHAM NO. 1

MINE NAME: DURHAM NO. 1
COAL AREA: GREEN RIVER
SAMPLE SITE ELEVATION (FT): 1260

QUARTER SECTION: SW SECTION: 2
TOWNSHIP: 21N RANGE: 07E
QUADRANGLE: CUMBERLAND 7.5

GEOLOGIC FORMATION: PUGET GROUP
AGE: EOCENE

STRIKE: N10E DIP: 20SE
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: STRIP PIT
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: WEATHERED

TOTAL SECTION MEASURED (FT): 102.7
COAL THICKNESS (FT): 8.1
SAMPLE THICKNESS (FT): 8.1

OVERBURDEN THICKNESS (FT): 0
SAMPLE COLLECTOR: PHILLIPS (DGER)

DATE OF SAMPLING: 06-18-80
DATE OF ANALYSIS: 08-27-80

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: L03322

| AIR DRY LOSS: 1.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 3.4 | 4.2 | N/A |
| VOLATILE MATTER | 27.5 | 35.1 | 36.7 |
| FIXED CARBON | 49.2 | 62.8 | 65.7 |
| ASH | 19.9 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 4.8 | 5.8 | 5.8 |
| CARBON | 63.2 | 80.8 | 84.4 |
| NITROGEN | 1.1 | 1.3 | 1.3 |
| SULFUR | 0.7 | N/A | N/A |
| OXYGEN(IND) | 10.2 | 12.9 | 9.5 |
| HEATING VALUE (BTU/LB) | 11210 | 14304 | 14955 |

ASH - INITIAL DEFORMATION ..... 2660 F
SOFTENING TEMP. ..... 2780 F
FLUID TEMP. ..... 2780 F

SULFUR FORMS
SULFATE ..... N
PYRITIC ..... N
ORGANIC ..... N

MISCELLANEOUS COMMENTS: STRIP PIT ABANDONED.
COAL FROM INTERVAL 38.8 TO 47.2 OF 102.7 FT.
MEASURED SECTION. STRATIGRAPHICALLY ABOVE SAMPLE (127)39-80.

COUNTY: KING

SAMPLE NUMBER: (129)41-80

COAL NAME: DURHAM NO. 1

MINE NAME: DURHAM NO. 1
COAL AREA: GREEN RIVER
SAMPLE SITE ELEVATION (FT): 1260

QUARTER SECTION: SW SECTION: 2
TOWNSHIP: 21N RANGE: 07E
QUADRANGLE: CUMBERLAND 7.5

GEOLOGIC FORMATION: PUGET GROUP
AGE: EOCENE

STRIKE: N10E DIP: 20SE
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: STRIP PIT
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: WEATHERED

TOTAL SECTION MEASURED (FT): 102.7
COAL THICKNESS (FT): 9.9
SAMPLE THICKNESS (FT): 9.9

OVERBURDEN THICKNESS (FT): 0
SAMPLE COLLECTOR: PHILLIPS (DGER)

DATE OF SAMPLING: 06-18-80
DATE OF ANALYSIS: 08-27-80

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: L03323

| AIR DRY LOSS: 1.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 3.5 | 5.1 | N/A |
| VOLATILE MATTER | 25.1 | 38.0 | 40.1 |
| FIXED CARBON | 40.1 | 60.8 | 64.2 |
| ASH | 31.3 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 4.7 | 6.7 | 6.7 |
| CARBON | 52.6 | 79.8 | 84.3 |
| NITROGEN | 1.1 | 1.5 | 1.6 |
| SULFUR | 0.8 | N/A | N/A |
| OXYGEN(IND) | 9.5 | 14.3 | 10.1 |
| HEATING VALUE (BTU/LB) | 9317 | 14108 | 14901 |

ASH - INITIAL DEFORMATION ..... 2800 F
SOFTENING TEMP. ..... 2800 F
FLUID TEMP. ..... 2800 F

SULFUR FORMS
SULFATE ..... N
PYRITIC ..... N
ORGANIC ..... N

MISCELLANEOUS COMMENTS: STRIP PIT ABANDONED.
COAL FROM INTERVAL 47.2 TO 102.7 OF 102.7 FT.
MEASURED SECTION. STRATIGRAPHICALLY ABOVE SAMPLE (128)40-80.

COUNTY: KING

SAMPLE NUMBER: (13C)42-80 COAL NAME: DURHAM NO. 1

MINE NAME: DURHAM NO. 1 QUARTER SECTION: SW SECTION: 2
COAL AREA: GREEN RIVER TOWNSHIP: 21N RANGE: 07E
SAMPLE SITE ELEVATION (FT): 1240 QUADRANGLE: CUMBERLAND 7.5

GEOLOGIC FORMATION: PUGET GROUP STRIKE: N05W DIP: 20NE
AGE: EOCENE MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: STRIP PIT TOTAL SECTION MEASURED (FT): 102.7
SAMPLE TYPE: CHANNEL COAL THICKNESS (FT): 3.4
SAMPLE CONDITION: WEATHERED SAMPLE THICKNESS (FT): 2.2

OVERBURDEN THICKNESS (FT): 0 DATE OF SAMPLING: 06-19-80
SAMPLE COLLECTOR: PHILLIPS (DGER) DATE OF ANALYSIS: 08-27-80

LABORATORY: DOE-PITTBURGH LAB. NUMBER: L03324

| AIR DRY LOSS: 0.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 2.9 | 4.0 | N/A |
| VOLATILE MATTER | 26.1 | 36.6 | 38.2 |
| FIXED CARBON | 44.5 | 62.5 | 65.1 |
| ASH | 26.5 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 4.9 | 6.6 | 6.6 |
| CARBON | 57.8 | 81.2 | 84.6 |
| NITROGEN | 1.0 | 1.3 | 1.4 |
| SULFUR | 0.5 | N/A | N/A |
| OXYGEN(IND) | 9.2 | 12.8 | 9.6 |
| HEATING VALUE (BTU/LB) | 10382 | 14566 | 15185 |

ASH - INITIAL DEFORMATION ..... 2800 F
SOFTENING TEMP. ..... 2800 F
FLUID TEMP. ..... 2800 F

SULFUR FORMS
SULFATE ..... N
PYRITIC ..... N
ORGANIC ..... N

MISCELLANEOUS COMMENTS: STRIP PIT ABANDONED.
COAL FROM INTERVAL 0.0 TO 8.0 OF 102.7 FT.
MEASURED SECTION. BASE OF DURHAM NO. 1 COAL ZONE NOT EXPOSED.
INTERVAL 8.0 TO 21.4 FT. OF SECTION COVERED.

COUNTY: KING

SAMPLE NUMBER: (134)46-80

COAL NAME: UNNAMED

MINE NAME: PETERS
COAL AREA: TIGER MTN.
SAMPLE SITE ELEVATION (FT): 640

QUARTER SECTION: NW SECTION: 32
TOWNSHIP: 24N RANGE: 07E
QUADRANGLE: FALL CITY 7.5

GEOLOGIC FORMATION: TIGER MTN.
AGE: EOCENE

STRIKE: N/A DIP: N/A
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: MINE DUMP
SAMPLE TYPE: GRAB
SAMPLE CONDITION: WEATHERED

TOTAL SECTION MEASURED (FT): N
COAL THICKNESS (FT): N
SAMPLE THICKNESS (FT): N

OVERBURDEN THICKNESS (FT): 0
SAMPLE COLLECTOR: WALSH (DGER)

DATE OF SAMPLING: 07-09-80
DATE OF ANALYSIS: 09-24-80

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: L03834

| AIR DRY LOSS: 3.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 8.5 | 21.7 | N/A |
| VOLATILE MATTER | 11.2 | 28.7 | 36.8 |
| FIXED CARBON | 23.9 | 61.6 | 79.1 |
| ASH | 56.4 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 2.0 | 3.0 | 3.0 |
| CARBON | 28.4 | 73.3 | 94.0 |
| NITROGEN | 0.5 | 0.9 | 1.2 |
| SULFUR | 1.0 | N/A | N/A |
| OXYGEN(IND) | 11.7 | 30.0 | 13.3 |
| HEATING VALUE (BTU/LB) | 4091 | 10486 | 13453 |

ASH - INITIAL DEFORMATION ..... 2220 F
SOFTENING TEMP. ..... 2340 F
FLUID TEMP. ..... 2460 F

SULFUR FORMS
SULFATE ..... N
PYRITIC ..... N
ORGANIC ..... N

MISCELLANEOUS COMMENTS: MINE DUMP CONTAINS BONY COAL MIXED WITH PORPHYRITIC ANDESITE. ANDESITE HAS SURFACE COATING OF SULPHIDES.

COUNTY: KING

SAMPLE NUMBER: (135)47-80 COAL NAME: PRIMROSE

MINE NAME: SECTION 31 CLAY PIT
COAL AREA: NEWCASTLE
SAMPLE SITE ELEVATION (FT): 1375

QUARTER SECTION: NW SECTION: 31
TOWNSHIP: 24N RANGE: 06E
QUADRANGLE: ISSAQUAH 7.5

GEOLOGIC FORMATION: RENTON
AGE: EOCENE

STRIKE: N70W DIP: 47NE
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: CLAY PIT
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: FRESH

TOTAL SECTION MEASURED (FT): 173.0
COAL THICKNESS (FT): 5.0
SAMPLE THICKNESS (FT): 4.0

OVERBURDEN THICKNESS (FT): 0
SAMPLE COLLECTOR: WALSH (DGER)

DATE OF SAMPLING: 07-08-80
DATE OF ANALYSIS: 09-23-80

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: L03835

| AIR DRY LOSS: 5.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 14.5 | 16.6 | N/A |
| VOLATILE MATTER | 32.5 | 37.4 | 45.0 |
| FIXED CARBON | 41.0 | 47.2 | 56.8 |
| ASH | 12.0 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 5.6 | 5.3 | 5.3 |
| CARBON | 54.8 | 63.2 | 76.0 |
| NITROGEN | 1.0 | 1.0 | 1.2 |
| SULFUR | 1.1 | N/A | N/A |
| OXYGEN(IND) | 25.4 | 29.2 | 17.2 |
| HEATING VALUE (BTU/LB) | 9739 | 11204 | 13462 |

ASH - INITIAL DEFORMATION ..... 2600 F
SOFTENING TEMP. ..... 2690 F
FLUID TEMP. ..... 2780 F

SULFUR FORMS
SULFATE ..... N
PYRITIC ..... N
ORGANIC ..... N

MISCELLANEOUS COMMENTS: COLLECTED FROM A SITE 10 FT. WEST OF SAMPLE (103)15-80. DOES NOT INCLUDE LOWERMOST 1 FT. OF INTERBEDDED CARBONACEOUS SHALE AND COAL.

COUNTY: KING

SAMPLE NUMBER: (136)48-80

COAL NAME: UNNAMED

MINE NAME: NONE
COAL AREA: GREEN RIVER
SAMPLE SITE ELEVATION (FT): 1550

QUARTER SECTION: NW SECTION: 2
TOWNSHIP: 21N RANGE: 07E
QUADRANGLE: CUMBERLAND 7.5

GEOLOGIC FORMATION: PUGET GROUP
AGE:

STRIKE: N10W DIP: 60NE
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: ROADCUT
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: WEATHERED

TOTAL SECTION MEASURED (FT): 35.3
COAL THICKNESS (FT): 11.3
SAMPLE THICKNESS (FT): 9.1

OVERBURDEN THICKNESS (FT): 0
SAMPLE COLLECTOR: PHILLIPS (DGER)

DATE OF SAMPLING: 07-09-80
DATE OF ANALYSIS: 09-23-80

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: L03836

| AIR DRY LOSS: 3.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 13.1 | 18.9 | N/A |
| VOLATILE MATTER | 26.9 | 38.9 | 48.0 |
| FIXED CARBON | 31.5 | 45.6 | 56.3 |
| ASH | 28.5 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 4.0 | 4.4 | 4.4 |
| CARBON | 41.1 | 59.5 | 73.5 |
| NITROGEN | 0.7 | 0.9 | 1.1 |
| SULFUR | 0.5 | N/A | N/A |
| OXYGEN(IND) | 25.2 | 36.4 | 24.1 |
| HEATING VALUE (BTU/LB) | 6618 | 9563 | 11806 |

ASH - INITIAL DEFORMATION ..... 2800 F
SOFTENING TEMP. ..... 2800 F
FLUID TEMP. ..... 2800 F

SULFUR FORMS
SULFATE ..... N
PYRITIC ..... N
ORGANIC ..... N

MISCELLANEOUS COMMENTS: PREVICUSLY UNMAPPED COAL SEAM. SEE COMMENTS SAMPLE (137)49-80.

COUNTY: KING

SAMPLE NUMBER: (137)49-80

COAL NAME: UNNAMED

MINE NAME: NONE
COAL AREA: GREEN RIVER
SAMPLE SITE ELEVATION (FT): 1550

QUARTER SECTION: NW SECTION: 2
TOWNSHIP: 21N RANGE: 07E
QUADRANGLE: CUMBERLAND 7.5

GEOLOGIC FORMATION: PUGET GROUP
AGE: EOCENE

STRIKE: N10W DIP: 60NE
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: ROADCUT
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: WEATHERED

TOTAL SECTION MEASURED (FT): 35.3
COAL THICKNESS (FT): 6.4
SAMPLE THICKNESS (FT): 6.4

OVERBURDEN THICKNESS (FT): 0
SAMPLE COLLECTOR: PHILLIPS (DGER)

DATE OF SAMPLING: 07-07-80
DATE OF ANALYSIS: 09-23-80

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: L03837

| AIR DRY LOSS: 4.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 10.0 | 19.9 | N/A |
| VOLATILE MATTER | 28.3 | 56.6 | 70.7 |
| FIXED CARBON | 15.5 | 30.9 | 38.7 |
| ASH | 46.2 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 3.6 | 6.1 | 6.1 |
| CARBON | 30.0 | 60.0 | 75.0 |
| NITROGEN | 0.5 | 0.9 | 1.1 |
| SULFUR | 0.3 | N/A | N/A |
| OXYGEN(IND) | 19.3 | 38.6 | 26.0 |
| HEATING VALUE (BTU/LB) | 4767 | 9516 | 11898 |

ASH - INITIAL DEFORMATION ..... 2500 F
SOFTENING TEMP. ..... 2630 F
FLUID TEMP. ..... 2720 F

SULFUR FORMS
SULFATE ..... N
PYRITIC ..... N
ORGANIC ..... N

MISCELLANEOUS COMMENTS: IMPURE COAL (CLAY-INJECTED) STRATIGRAPHICALLY ABOVE SAMPLE (136)48-80. PREVIOUSLY UNMAPPED COAL SEAM.

COUNTY: KING

SAMPLE NUMBER: (172)23-81

COAL NAME: UNNAMED

MINE NAME: NONE
COAL AREA: RAGING RIVER
SAMPLE SITE ELEVATION (FT): 2210

QUARTER SECTION: NW SECTION: 16
TOWNSHIP: 23N RANGE: 07E
QUADRANGLE: HOBART 7.5

GEOLOGIC FORMATION: TIGER MTN.
AGE: EOCENE

STRIKE: N28W DIP: 44SW
MAJOR JOINTS IN COAL: N70E 60N

EXPOSURE TYPE: STREAMCUT
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: WEATHERED

TOTAL SECTION MEASURED (FT): 30.0
COAL THICKNESS (FT): 1.9
SAMPLE THICKNESS (FT): 1.4

OVERBURDEN THICKNESS (FT): 2
SAMPLE COLLECTOR: WALSH (DGER)

DATE OF SAMPLING: 08-04-81
DATE OF ANALYSIS: 08-19-81

LABORATORY: C.T. & E. CO.

LAB. NUMBER: 72-111

| AIR DRY LOSS: N | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 2.4 | 2.8 | N/A |
| VOLATILE MATTER | 35.1 | 41.8 | 43.0 |
| FIXED CARBON | 47.8 | 56.9 | 58.6 |
| ASH | 14.8 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 5.1 | 5.9 | 5.9 |
| CARBON | 67.7 | 80.6 | 83.0 |
| NITROGEN | 1.3 | 1.5 | 1.6 |
| SULFUR | 0.2 | N/A | N/A |
| OXYGEN(IND) | 8.9 | 10.6 | 8.3 |
| HEATING VALUE (BTU/LB) | 12321 | 14672 | 15104 |

ASH - INITIAL DEFORMATION ..... 2130 F
SOFTENING TEMP. ..... 2160 F
FLUID TEMP. ..... 2430 F

SULFUR FORMS
SULFATE ..... N
PYRITIC ..... N
ORGANIC ..... N

MISCELLANEOUS COMMENTS:

COUNTY: KITTITAS

SAMPLE NUMBER: (026)01-78

COAL NAME: NO. 8 SEAM

MINE NAME: NONE
COAL AREA: ROSLYN-CLE ELUM
SAMPLE SITE ELEVATION (FT): 3000

QUARTER SECTION: N/A SECTION: 36
TOWNSHIP: 21N RANGE: 14E
QUADRANGLE: KACHESS LAKE 15

GEOLOGIC FORMATION: ROSLYN
AGE: EOCENE

STRIKE: N90E DIP: 15S
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: ROADCUT
SAMPLE TYPE: GRAB
SAMPLE CONDITION: WEATHERED

TOTAL SECTION MEASURED (FT): N
COAL THICKNESS (FT): 2.5
SAMPLE THICKNESS (FT): 2.5

OVERBURDEN THICKNESS (FT): 2
SAMPLE COLLECTOR: WALKER (DGER)

DATE OF SAMPLING: 07-19-78
DATE OF ANALYSIS: 01-16-79

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: K88392

| AIR DRY LOSS: 10.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 14.7 | 20.0 | N/A |
| VOLATILE MATTER | 25.2 | 34.4 | 43.0 |
| FIXED CARBON | 35.4 | 48.3 | 60.5 |
| ASH | 24.7 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 5.1 | 5.9 | 5.9 |
| CARBON | 44.1 | 60.2 | 75.4 |
| NITROGEN | 1.0 | 1.3 | 1.6 |
| SULFUR | 0.3 | N/A | N/A |
| OXYGEN(IND) | 24.7 | 33.7 | 19.8 |
| HEATING VALUE (BTU/LB) | 7584 | 10346 | 12948 |

ASH - INITIAL DEFORMATION ..... >2910 F
SOFTENING TEMP. ..... >2910 F
FLUID TEMP. ..... >2910 F

SULFUR FORMS
SULFATE ..... 0.01
PYRITIC ..... 0.20
ORGANIC ..... 0.10

MISCELLANEOUS COMMENTS: BULLDOZER CUT ALONG DINGBAT CREEK.
COMPOSITE OF 4 SAMPLES COLLECTED ALONG COAL SEAM.

COUNTY: KITTITAS

SAMPLE NUMBER: (027)02-78 COAL NAME: #5 SEAM

MINE NAME: NONE
COAL AREA: ROSLYN-CLE ELUM
SAMPLE SITE ELEVATION (FT): 2245

QUARTER SECTION: NW SECTION: 12
TOWNSHIP: 20N RANGE: 14E
QUADRANGLE: KACHESS LAKE 15

GEOLOGIC FORMATION: ROSLYN
AGE: EOCENE

STRIKE: N44E DIP: 18SE
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: STRIP PIT
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: FRESH

TOTAL SECTION MEASURED (FT): N
COAL THICKNESS (FT): N
SAMPLE THICKNESS (FT): 1.5

OVERBURDEN THICKNESS (FT): 0
SAMPLE COLLECTOR: WALKER (DGER)

DATE OF SAMPLING: 08-09-78
DATE OF ANALYSIS: 01-15-79

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: K88393

| AIR DRY LOSS: 24.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 30.5 | 37.7 | N/A |
| VOLATILE MATTER | 23.9 | 29.6 | 47.5 |
| FIXED CARBON | 27.9 | 34.5 | 55.4 |
| ASH | 17.7 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 5.6 | 4.3 | 4.3 |
| CARBON | 35.3 | 43.7 | 70.2 |
| NITROGEN | 1.1 | 1.3 | 2.1 |
| SULFUR | 0.2 | N/A | N/A |
| OXYGEN(IND) | 40.2 | 49.7 | 26.0 |
| HEATING VALUE (BTU/LB) | 5510 | 6809 | 10940 |

ASH - INITIAL DEFORMATION ..... 2210 F
SOFTENING TEMP. ..... 2320 F
FLUID TEMP. ..... 2410 F

SULFUR FORMS
SULFATE ..... 0.01
PYRITIC ..... 0.14
ORGANIC ..... 0.04

MISCELLANEOUS COMMENTS: TOTAL COAL THICKNESS UNDETERMINED. WESTERN LIMIT OF #5 (ROSLYN) SEAM.

COUNTY: KITTITAS

SAMPLE NUMBER: (028)03-78

COAL NAME: #5 SEAM

MINE NAME: ROSLYN-CASCADE #4
COAL AREA: ROSLYN-CLE ELUM
SAMPLE SITE ELEVATION (FT): 2880

QUARTER SECTION: NW SECTION: 7
TOWNSHIP: 20N RANGE: 15E
QUADRANGLE: KACHESS LAKE 15

GEOLOGIC FORMATION: ROSLYN
AGE: EOCENE

STRIKE: N45W DIP: 10SW
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: STRIP PIT
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: FRESH

TOTAL SECTION MEASURED (FT): 3.9
COAL THICKNESS (FT): 3.9
SAMPLE THICKNESS (FT): 3.9

OVERBURDEN THICKNESS (FT): 26
SAMPLE COLLECTOR: WALKER (DGER)

DATE OF SAMPLING: 08-09-78
DATE OF ANALYSIS: 01-16-79

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: K88394

| AIR DRY LOSS: 0.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 2.5 | 3.0 | N/A |
| VOLATILE MATTER | 35.7 | 43.3 | 44.7 |
| FIXED CARBON | 45.6 | 55.3 | 57.1 |
| ASH | 16.2 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 5.2 | 6.1 | 6.1 |
| CARBON | 66.9 | 81.2 | 83.8 |
| NITROGEN | 1.6 | 1.9 | 1.9 |
| SULFUR | 0.4 | N/A | N/A |
| OXYGEN(IND) | 9.7 | 11.7 | 9.3 |
| HEATING VALUE (BTU/LB) | 12118 | 14703 | 15163 |

| | | |
|---|---|---|
| ASH - INITIAL DEFORMATION | 2450 | F |
| SOFTENING TEMP. | 2560 | F |
| FLUID TEMP. | 2640 | F |

| SULFUR FORMS | |
|---|---|
| SULFATE | 0.01 |
| PYRITIC | 0.16 |
| ORGANIC | 0.20 |

MISCELLANEOUS COMMENTS: BEST EXPOSURE OF #5 (ROSLYN) SEAM.

COUNTY: KITTITAS

SAMPLE NUMBER: (029)04-78

COAL NAME: #5 SEAM

MINE NAME: NONE
COAL AREA: ROSLYN-CLE ELUM
SAMPLE SITE ELEVATION (FT): 2880

QUARTER SECTION: NE SECTION: 16
TOWNSHIP: 20N RANGE: 15E
QUADRANGLE: CLE ELUM 15

GEOLOGIC FORMATION: ROSLYN
AGE: EOCENE

STRIKE: N/A DIP: N/A
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: STRIP PIT
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: FRESH

TOTAL SECTION MEASURED (FT): 40.0
COAL THICKNESS (FT): 4.5
SAMPLE THICKNESS (FT): 3.0

OVERBURDEN THICKNESS (FT): 0
SAMPLE COLLECTOR: WALKER (DGER)

DATE OF SAMPLING: 08-10-78
DATE OF ANALYSIS: 01-15-79

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: K88387

| AIR DRY LOSS: 22.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 27.9 | 37.6 | N/A |
| VOLATILE MATTER | 23.2 | 31.2 | 50.1 |
| FIXED CARBON | 25.1 | 33.8 | 54.2 |
| ASH | 23.8 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 5.3 | 4.7 | 4.7 |
| CARBON | 33.0 | 44.5 | 71.3 |
| NITROGEN | 0.7 | 0.9 | 1.4 |
| SULFUR | 0.3 | N/A | N/A |
| OXYGEN(IND) | 36.8 | 49.6 | 25.9 |
| HEATING VALUE (BTU/LB) | 5273 | 7093 | 11373 |

ASH - INITIAL DEFORMATION ..... 2320 F
SOFTENING TEMP. ..... 2410 F
FLUID TEMP. ..... 2510 F

SULFUR FORMS
SULFATE ..... 0.01
PYRITIC ..... 0.10
ORGANIC ..... 0.21

MISCELLANEOUS COMMENTS: BASE OF COAL NOT EXPOSED.

COUNTY: KITTITAS

SAMPLE NUMBER: (030)05-78

COAL NAME: #5 SEAM

MINE NAME: NONE
COAL AREA: ROSLYN-CLE ELUM
SAMPLE SITE ELEVATION (FT): 3300

QUARTER SECTION: NW SECTION: 15
TOWNSHIP: 20N RANGE: 15E
QUADRANGLE: CLE ELUM 15

GEOLOGIC FORMATION: ROSLYN
AGE: EOCENE

STRIKE: N/A DIP: N/A
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: STRIP PIT
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: FRESH

TOTAL SECTION MEASURED (FT): N
COAL THICKNESS (FT): 2.7
SAMPLE THICKNESS (FT): 2.7

OVERBURDEN THICKNESS (FT): 0
SAMPLE COLLECTOR: WALKER (DGER)

DATE OF SAMPLING: 08-10-78
DATE OF ANALYSIS: 01-05-79

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: K88388

| AIR DRY LOSS: 3.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 6.3 | 7.9 | N/A |
| VOLATILE MATTER | 29.6 | 37.4 | 40.7 |
| FIXED CARBON | 44.8 | 56.7 | 61.6 |
| ASH | 19.3 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 4.9 | 5.7 | 5.7 |
| CARBON | 56.7 | 71.8 | 78.0 |
| NITROGEN | 1.2 | 1.4 | 1.6 |
| SULFUR | 0.4 | N/A | N/A |
| OXYGEN(IND) | 17.3 | 21.8 | 16.0 |
| HEATING VALUE (BTU/LB) | 9950 | 12580 | 13671 |

ASH - INITIAL DEFORMATION ..... >2610 F
SOFTENING TEMP. ..... >2715 F
FLUID TEMP. ..... >2910 F

SULFUR FORMS
SULFATE ..... 0.01
PYRITIC ..... 0.25
ORGANIC ..... 0.15

MISCELLANEOUS COMMENTS: SAMPLE FROM ONLY STRIP PIT ON NE SIDE OF CLE ELUM RIDGE.

COUNTY: KITTITAS

SAMPLE NUMBER: (031)05-78

COAL NAME: #1 (BIG SEAM)

MINE NAME: #1 STRIP PIT
COAL AREA: ROSLYN-CLE ELUM
SAMPLE SITE ELEVATION (FT): 2960

QUARTER SECTION: NE SECTION: 7
TOWNSHIP: 20N RANGE: 15E
QUADRANGLE: KACHESS LAKE 15

GEOLOGIC FORMATION: ROSLYN
AGE: EOCENE

STRIKE: N80W DIP: 14SW
MAJOR JOINTS IN COAL: N-S 90

EXPOSURE TYPE: STRIP PIT
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: FRESH

TOTAL SECTION MEASURED (FT): 15.1
COAL THICKNESS (FT): 12.4
SAMPLE THICKNESS (FT): 5.8

OVERBURDEN THICKNESS (FT): 8
SAMPLE COLLECTOR: WALKER (DGER)

DATE OF SAMPLING: 08-09-78
DATE OF ANALYSIS: 01-15-79

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: K88390

| AIR DRY LOSS: 1.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 3.8 | 5.7 | N/A |
| VOLATILE MATTER | 25.8 | 39.3 | 41.8 |
| FIXED CARBON | 38.6 | 58.9 | 62.5 |
| ASH | 31.8 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 4.3 | 6.2 | 6.2 |
| CARBON | 50.7 | 77.4 | 82.2 |
| NITROGEN | 1.2 | 1.7 | 1.8 |
| SULFUR | 0.4 | N/A | N/A |
| OXYGEN(IND) | 11.7 | 17.8 | 13.4 |
| HEATING VALUE (BTU/LB) | 8974 | 13684 | 14527 |

ASH - INITIAL DEFORMATION ..... >2910 F
SOFTENING TEMP. ..... >2910 F
FLUID TEMP. ..... >2910 F

SULFUR FORMS
SULFATE ..... 0.01
PYRITIC ..... 0.18
ORGANIC ..... 0.19

MISCELLANEOUS COMMENTS: LOWER BENCH OF #1 SEAM. SEE (033)07-78 FOR ANALYSIS OF UPPER BENCH OF #1 SEAM, SAME LOCALITY. NORTHERN-MOST KNOWN OUTCROP OF #1 SEAM.

COUNTY: KITTITAS

SAMPLE NUMBER: (032)06-78 COAL NAME: #5 SEAM

MINE NAME: NONE
COAL AREA: ROSLYN-CLE ELUM
SAMPLE SITE ELEVATION (FT): 2240

QUARTER SECTION: SW SECTION: 23
TOWNSHIP: 20N RANGE: 15E
QUADRANGLE: CLE ELUM 15

GEOLOGIC FORMATION: ROSLYN
AGE: EOCENE

STRIKE: N45E DIP: 04SE
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: STRIP PIT
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: FRESH

TOTAL SECTION MEASURED (FT): N
COAL THICKNESS (FT): N
SAMPLE THICKNESS (FT): 3.9

OVERBURDEN THICKNESS (FT): 0
SAMPLE COLLECTOR: WALKER (DGER)

DATE OF SAMPLING: 08-10-78
DATE OF ANALYSIS: 01-15-79

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: K88389

| AIR DRY LOSS: 8.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 12.4 | 15.0 | N/A |
| VOLATILE MATTER | 29.6 | 35.9 | 42.2 |
| FIXED CARBON | 41.9 | 50.8 | 59.8 |
| ASH | 16.1 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 4.5 | 4.4 | 4.4 |
| CARBON | 53.2 | 64.5 | 75.9 |
| NITROGEN | 1.2 | 1.4 | 1.6 |
| SULFUR | 0.4 | N/A | N/A |
| OXYGEN(IND) | 24.7 | 29.9 | 19.5 |
| HEATING VALUE (BTU/LB) | 8857 | 10726 | 12626 |

ASH - INITIAL DEFORMATION >2910 F
SOFTENING TEMP. >2910 F
FLUID TEMP. >2910 F

SULFUR FORMS
SULFATE 0.01
PYRITIC 0.19
ORGANIC 0.17

MISCELLANEOUS COMMENTS: LOWER BENCH OF #5 SEAM. STRIKE AND DIP ARE ANOMALOUS FOR LOCALITY. TOTAL COAL THICKNESS UNKNOWN DUE TO EROSION.

COUNTY: KITTITAS

SAMPLE NUMBER: (033)07-78

COAL NAME: #1 (BIG SEAM)

MINE NAME: #1 STRIP PIT
COAL AREA: ROSLYN-CLE ELUM
SAMPLE SITE ELEVATION (FT): 2960

QUARTER SECTION: NE SECTION: 7
TOWNSHIP: 20N RANGE: 15E
QUADRANGLE: KACHESS LAKE 15

GEOLOGIC FORMATION: ROSLYN
AGE: EOCENE

STRIKE: N80W DIP: 14SW
MAJOR JOINTS IN COAL: N-S 90

EXPOSURE TYPE: STRIP PIT
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: FRESH

TOTAL SECTION MEASURED (FT): 12.4
COAL THICKNESS (FT): 12.4
SAMPLE THICKNESS (FT): 6.6

OVERBURDEN THICKNESS (FT): 0
SAMPLE COLLECTOR: WALKER (DGER)

DATE OF SAMPLING: 08-09-78
DATE OF ANALYSIS: 01-16-79

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: K88391

| AIR DRY LOSS: 7.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 10.1 | 17.3 | N/A |
| VOLATILE MATTER | 23.1 | 39.7 | 48.1 |
| FIXED CARBON | 28.1 | 48.3 | 58.5 |
| ASH | 38.7 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 3.8 | 5.5 | 5.5 |
| CARBON | 34.1 | 58.7 | 71.0 |
| NITROGEN | 0.8 | 1.3 | 1.6 |
| SULFUR | 0.3 | N/A | N/A |
| OXYGEN(IND) | 22.3 | 38.3 | 27.7 |
| HEATING VALUE (BTU/LB) | 5884 | 10112 | 12243 |

ASH - INITIAL DEFORMATION ..... >2910 F
SOFTENING TEMP. ..... >2910 F
FLUID TEMP. ..... >2910 F

SULFUR FORMS
SULFATE ..... 0.01
PYRITIC ..... 0.15
ORGANIC ..... 0.12

MISCELLANEOUS COMMENTS: ANALYSIS OF UPPER BENCH OF #1 SEAM. SEE (031)05-78 FOR ANALYSIS OF LOWER BENCH, SAME LOCALITY.

COUNTY: KITTITAS

SAMPLE NUMBER: (034)08-78

COAL NAME: #5 SEAM

MINE NAME: NONE
COAL AREA: ROSLYN-CLE ELUM
SAMPLE SITE ELEVATION (FT): 2960

QUARTER SECTION: SE SECTION: 15
TOWNSHIP: 20N RANGE: 15E
QUADRANGLE: CLE ELUM 15

GEOLOGIC FORMATION: ROSLYN
AGE: EOCENE

STRIKE: N70W DIP: 14SW
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: STRIP PIT
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: FRESH

TOTAL SECTION MEASURED (FT): N
COAL THICKNESS (FT): 4.3
SAMPLE THICKNESS (FT): 4.3

OVERBURDEN THICKNESS (FT): 0
SAMPLE COLLECTOR: WALKER (DGER)

DATE OF SAMPLING: 08-10-78
DATE OF ANALYSIS: 01-16-79

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: K88395

| AIR DRY LOSS: 8.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 12.0 | 15.5 | N/A |
| VOLATILE MATTER | 27.5 | 35.7 | 42.3 |
| FIXED CARBON | 39.3 | 51.0 | 60.4 |
| ASH | 21.2 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 5.1 | 5.7 | 5.7 |
| CARBON | 50.6 | 65.7 | 77.8 |
| NITROGEN | 1.1 | 1.4 | 1.6 |
| SULFUR | 0.3 | N/A | N/A |
| OXYGEN(IND) | 21.7 | 28.1 | 16.9 |
| HEATING VALUE (BTU/LB) | 8726 | 11322 | 13414 |

ASH - INITIAL DEFORMATION ..... >2910 F
SOFTENING TEMP. ..... >2910 F
FLUID TEMP. ..... >2910 F

SULFUR FORMS
SULFATE ..... 0.01
PYRITIC ..... 0.19
ORGANIC ..... 0.13

MISCELLANEOUS COMMENTS:

COUNTY: KITTITAS

SAMPLE NUMBER: (035)09-78

COAL NAME: #1 (BIG SEAM)

MINE NAME: #1 STRIP PIT
COAL AREA: ROSLYN-CLE ELUM
SAMPLE SITE ELEVATION (FT): 2880

QUARTER SECTION: SW SECTION: 8
TOWNSHIP: 20N RANGE: 15E
QUADRANGLE: KACHESS LAKE 15

GEOLOGIC FORMATION: ROSLYN
AGE: EOCENE

STRIKE: N80W DIP: 14SW
MAJOR JOINTS IN COAL: N-S 90

EXPOSURE TYPE: STRIP PIT
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: FRESH

TOTAL SECTION MEASURED (FT): 19.3
COAL THICKNESS (FT): 6.7
SAMPLE THICKNESS (FT): 5.4

OVERBURDEN THICKNESS (FT): 13
SAMPLE COLLECTOR: WALKER (DGER)

DATE OF SAMPLING: 08-09-78
DATE OF ANALYSIS: 01-15-79

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: K88396

| AIR DRY LOSS: 1.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 3.6 | 5.4 | N/A |
| VOLATILE MATTER | 27.1 | 41.1 | 43.5 |
| FIXED CARBON | 37.8 | 57.4 | 60.7 |
| ASH | 31.5 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 4.4 | 6.4 | 6.4 |
| CARBON | 50.2 | 76.2 | 80.6 |
| NITROGEN | 1.1 | 1.6 | 1.7 |
| SULFUR | 0.3 | N/A | N/A |
| OXYGEN(IND) | 12.4 | 18.8 | 14.7 |
| HEATING VALUE (BTU/LB) | 8819 | 13377 | 14151 |

ASH - INITIAL DEFORMATION ..... 2440 F
SOFTENING TEMP. ..... 2560 F
FLUID TEMP. ..... 2670 F

SULFUR FORMS
SULFATE ..... 0.01
PYRITIC ..... 0.19
ORGANIC ..... 0.15

MISCELLANEOUS COMMENTS: ANALYSIS OF LOWER BENCH, #1 SEAM.

COUNTY: KITTITAS

SAMPLE NUMBER: (036)10-78 COAL NAME: UNNAMED

MINE NAME: NONE
COAL AREA: ROSLYN-CLE ELUM
SAMPLE SITE ELEVATION (FT): 2240

QUARTER SECTION: SE SECTION: 4
TOWNSHIP: 20N RANGE: 15E
QUADRANGLE: KACHESS LAKE 15

GEOLOGIC FORMATION: ROSLYN
AGE: EOCENE

STRIKE: N08W DIP: 85SW
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: OUTCROP
SAMPLE TYPE: GRAB
SAMPLE CONDITION: WEATHERED

TOTAL SECTION MEASURED (FT): N
COAL THICKNESS (FT): 2.0
SAMPLE THICKNESS (FT): 1.0

OVERBURDEN THICKNESS (FT): 0
SAMPLE COLLECTOR: WALKER (DGER)

DATE OF SAMPLING: 09-28-78
DATE OF ANALYSIS: 05-17-79

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: K92616

| AIR DRY LOSS: 2.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 5.8 | 6.6 | N/A |
| VOLATILE MATTER | 28.2 | 32.7 | 35.1 |
| FIXED CARBON | 53.1 | 61.8 | 66.3 |
| ASH | 12.8 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 5.2 | 5.6 | 5.6 |
| CARBON | 66.6 | 77.5 | 83.1 |
| NITROGEN | 1.1 | 1.2 | 1.2 |
| SULFUR | 0.7 | N/A | N/A |
| OXYGEN(IND) | 13.6 | 15.7 | 10.4 |
| HEATING VALUE (BTU/LB) | 11678 | 13571 | 14555 |

ASH - INITIAL DEFORMATION ..... 2100 F
SOFTENING TEMP. ..... 2220 F
FLUID TEMP. ..... 2310 F

SULFUR FORMS
SULFATE ..... 0.01
PYRITIC ..... 0.11
ORGANIC ..... 0.53

MISCELLANEOUS COMMENTS: OUTCROP ALONG SW SIDE OF CLE ELUM LAKE. DURING HIGH WATER, OUTCROP IS FLOODED.

COUNTY: KITTITAS

SAMPLE NUMBER: (046)20-78

COAL NAME: #1 (BIG SEAM)

MINE NAME: NONE
COAL AREA: ROSLYN-CLE ELUM
SAMPLE SITE ELEVATION (FT): 2400

QUARTER SECTION: NE SECTION: 17
TOWNSHIP: 20N RANGE: 16E
QUADRANGLE: CLE ELUM 15

GEOLOGIC FORMATION: ROSLYN
AGE: EOCENE

STRIKE: N40W DIP: 16SW
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: DOZER CUT
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: FRESH

TOTAL SECTION MEASURED (FT): N
COAL THICKNESS (FT): 18.0
SAMPLE THICKNESS (FT): 1.0

OVERBURDEN THICKNESS (FT): 8
SAMPLE COLLECTOR: WALKER (DGER)

DATE OF SAMPLING: 11-02-78
DATE OF ANALYSIS: 07-17-79

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: K92617

| AIR DRY LOSS: 1.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 3.7 | 5.2 | N/A |
| VOLATILE MATTER | 31.3 | 44.5 | 47.0 |
| FIXED CARBON | 37.6 | 53.5 | 56.5 |
| ASH | 27.4 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 4.9 | 6.6 | 6.6 |
| CARBON | 54.8 | 78.0 | 82.4 |
| NITROGEN | 1.5 | 2.0 | 2.1 |
| SULFUR | 0.5 | N/A | N/A |
| OXYGEN(IND) | 11.6 | 16.4 | 12.4 |
| HEATING VALUE (BTU/LB) | 9658 | 13735 | 14500 |

ASH - INITIAL DEFORMATION ..... >2910 F
SOFTENING TEMP. ..... >2910 F
FLUID TEMP. ..... >2910 F

SULFUR FORMS
SULFATE ..... 0.01
PYRITIC ..... 0.06
ORGANIC ..... 0.40

MISCELLANEOUS COMMENTS: LOCALITY DEFORMED BY SERIES OF SMALL, OVERTURNED, RECUMBENT FOLDS RESTRICTED TO A 7 FT. THICK ZONE. FOLDED ZONE BOUNDED BY 6 IN. BONE LAYER BELOW AND CARB. SHALE ABOVE.

COUNTY: KITTITAS

SAMPLE NUMBER: (047)01-79 COAL NAME: PATRICK SEAM

MINE NAME: NONE
COAL AREA: ROSLYN-CLE ELUM
SAMPLE SITE ELEVATION (FT): 2900

QUARTER SECTION: NW SECTION: 19
TOWNSHIP: 20N RANGE: 16E
QUADRANGLE: CLE ELUM 15

GEOLOGIC FORMATION: ROSLYN
AGE: EOCENE

STRIKE: N70W DIP: 12SW
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: PORTAL
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: WEATHERED

TOTAL SECTION MEASURED (FT): 4.0
COAL THICKNESS (FT): 2.2
SAMPLE THICKNESS (FT): 2.2

OVERBURDEN THICKNESS (FT): 2
SAMPLE COLLECTOR: WALKER (DGER)

DATE OF SAMPLING: 05-01-79
DATE OF ANALYSIS: 07-17-79

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: K94306

| AIR DRY LOSS: 16.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 30.9 | 40.2 | N/A |
| VOLATILE MATTER | 25.5 | 33.1 | 55.4 |
| FIXED CARBON | 22.3 | 29.0 | 48.5 |
| ASH | 21.3 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 5.2 | 3.7 | 3.7 |
| CARBON | 30.8 | 40.0 | 67.0 |
| NITROGEN | 0.8 | 1.0 | 1.6 |
| SULFUR | 0.3 | N/A | N/A |
| OXYGEN(IND) | 41.7 | 54.2 | 30.9 |
| HEATING VALUE (BTU/LB) | 4626 | 6001 | 10039 |

ASH - INITIAL DEFORMATION ..... 2560 F
SOFTENING TEMP. ..... 2650 F
FLUID TEMP. ..... 2740 F

SULFUR FORMS
SULFATE ..... 0.01
PYRITIC ..... 0.03
ORGANIC ..... 0.29

MISCELLANEOUS COMMENTS: COAL EXPOSED BY SHOVELING AT PORTAL OF ABANDONED MINE.

COUNTY: KITTITAS

SAMPLE NUMBER: (048)02-79

COAL NAME: LANIGAN SEAM

MINE NAME: NONE
COAL AREA: ROSLYN-CLE ELUM
SAMPLE SITE ELEVATION (FT): 2500

QUARTER SECTION: SW SECTION: 19
TOWNSHIP: 20N RANGE: 16E
QUADRANGLE: CLE ELUM 15

GEOLOGIC FORMATION: ROSLYN
AGE: EOCENE

STRIKE: N60W DIP: 20SW
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: OUTCROP
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: WEATHERED

TOTAL SECTION MEASURED (FT): 9.9
COAL THICKNESS (FT): 5.6
SAMPLE THICKNESS (FT): 2.1

OVERBURDEN THICKNESS (FT): 4
SAMPLE COLLECTOR: WALKER (DGER)

DATE OF SAMPLING: 05-03-79
DATE OF ANALYSIS: 07-17-79

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: K94307

| AIR DRY LOSS: 20.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 32.4 | 40.1 | N/A |
| VOLATILE MATTER | 26.0 | 32.2 | 53.8 |
| FIXED CARBON | 23.8 | 29.5 | 49.3 |
| ASH | 17.8 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 5.8 | 4.5 | 4.5 |
| CARBON | 32.3 | 40.0 | 66.9 |
| NITROGEN | 0.8 | 0.9 | 1.6 |
| SULFUR | 0.3 | N/A | N/A |
| OXYGEN(IND) | 43.0 | 53.3 | 29.4 |
| HEATING VALUE (BTU/LB) | 4970 | 6147 | 10278 |

ASH - INITIAL DEFORMATION ..... 2540 F
SOFTENING TEMP. ..... 2620 F
FLUID TEMP. ..... 2710 F

SULFUR FORMS
SULFATE ..... 0.01
PYRITIC ..... 0.03
ORGANIC ..... 0.23

MISCELLANEOUS COMMENTS: COAL DEFORMED AND BRECCIATED. SEE (049)03-79 FOR ANALYSIS FORM SAME LOCALITY.

COUNTY: KITTITAS

SAMPLE NUMBER: (049)03-79

COAL NAME: LANIGAN SEAM

MINE NAME: NONE
COAL AREA: ROSLYN-CLE ELUM
SAMPLE SITE ELEVATION (FT): 2500

QUARTER SECTION: SW SECTION: 19
TOWNSHIP: 20N RANGE: 16E
QUADRANGLE: CLE ELUM 15

GEOLOGIC FORMATION: ROSLYN
AGE: EOCENE

STRIKE: N60W DIP: 20SW
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: OUTCROP
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: WEATHERED

TOTAL SECTION MEASURED (FT): 9.9
COAL THICKNESS (FT): 5.6
SAMPLE THICKNESS (FT): 2.5

OVERBURDEN THICKNESS (FT): 6
SAMPLE COLLECTOR: WALKER (OGER)

DATE OF SAMPLING: 05-03-79
DATE OF ANALYSIS: 07-17-79

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: K94308

| AIR DRY LOSS: 14.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 28.1 | 36.8 | N/A |
| VOLATILE MATTER | 25.9 | 33.9 | 53.8 |
| FIXED CARBON | 24.1 | 31.6 | 50.0 |
| ASH | 21.9 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 5.0 | 3.8 | 3.8 |
| CARBON | 32.7 | 42.9 | 67.9 |
| NITROGEN | 0.8 | 1.0 | 1.6 |
| SULFUR | 0.3 | N/A | N/A |
| OXYGEN(IND) | 39.3 | 51.5 | 29.7 |
| HEATING VALUE (BTU/LB) | 5049 | 6608 | 10469 |

ASH - INITIAL DEFORMATION ..... 2800 F
SOFTENING TEMP. ..... 2800 F
FLUID TEMP. ..... 2800 F

SULFUR FORMS
SULFATE ..... 0.01
PYRITIC ..... 0.04
ORGANIC ..... 0.22

MISCELLANEOUS COMMENTS: SEE (048)02-79 FOR ANALYSIS FROM SAME LOCALITY.

COUNTY: KITTITAS

SAMPLE NUMBER: (050)04-79

COAL NAME: LANIGAN SEAM

MINE NAME: NONE
COAL AREA: ROSLYN-CLE ELUM
SAMPLE SITE ELEVATION (FT): 2500

QUARTER SECTION: SW SECTION: 19
TOWNSHIP: 20N RANGE: 16E
QUADRANGLE: CLE ELUM 15

GEOLOGIC FORMATION: ROSLYN
AGE: EOCENE

STRIKE: N50W DIP: 20SW
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: OUTCROP
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: WEATHERED

TOTAL SECTION MEASURED (FT): 12.0
COAL THICKNESS (FT): 15.4
SAMPLE THICKNESS (FT): 4.0

OVERBURDEN THICKNESS (FT): 6
SAMPLE COLLECTOR: WALKER (DGER)

DATE OF SAMPLING: 05-08-79
DATE OF ANALYSIS: 07-17-79

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: K94309

| AIR DRY LOSS: 20.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 33.5 | 43.2 | N/A |
| VOLATILE MATTER | 26.7 | 34.4 | 60.7 |
| FIXED CARBON | 19.0 | 24.5 | 43.2 |
| ASH | 20.8 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 5.5 | 4.0 | 4.0 |
| CARBON | 29.1 | 37.5 | 66.2 |
| NITROGEN | 0.8 | 1.0 | 1.8 |
| SULFUR | 0.2 | N/A | N/A |
| OXYGEN(IND) | 43.6 | 56.3 | 31.4 |
| HEATING VALUE (BTU/LB) | 4462 | 5750 | 10135 |

ASH - INITIAL DEFORMATION ..... 2800 F
SOFTENING TEMP. ..... 2800 F
FLUID TEMP. ..... 2800 F

SULFUR FORMS
SULFATE ..... 0.01
PYRITIC ..... 0.02
ORGANIC ..... 0.21

MISCELLANEOUS COMMENTS: COAL DEFORMED AND BRECCIATED. SEE (051)05-79 AND (052)06-79 FOR ANALYSIS FROM SAME LOCALITY.

COUNTY: KITTITAS

SAMPLE NUMBER: (051)05-79

COAL NAME: LANIGAN SEAM

MINE NAME: NONE
COAL AREA: ROSLYN-CLE ELUM
SAMPLE SITE ELEVATION (FT): 2500

QUARTER SECTION: SW SECTION: 19
TOWNSHIP: 20N RANGE: 16E
QUADRANGLE: CLE ELUM 15

GEOLOGIC FORMATION: ROSLYN
AGE: EOCENE

STRIKE: N60W DIP: 20SW
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: OUTCROP
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: WEATHERED

TOTAL SECTION MEASURED (FT): 23.0
COAL THICKNESS (FT): 15.4
SAMPLE THICKNESS (FT): 0.5

OVERBURDEN THICKNESS (FT): 8
SAMPLE COLLECTOR: WALKER (DGER)

DATE OF SAMPLING: 05-08-79
DATE OF ANALYSIS: 07-17-79

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: K94309

| AIR DRY LOSS: 13.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 20.0 | 24.3 | N/A |
| VOLATILE MATTER | 27.3 | 33.1 | 43.8 |
| FIXED CARBON | 36.4 | 44.2 | 58.4 |
| ASH | 16.3 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 5.8 | 5.7 | 5.7 |
| CARBON | 49.3 | 59.9 | 79.2 |
| NITROGEN | 1.0 | 1.1 | 1.5 |
| SULFUR | 0.4 | N/A | N/A |
| OXYGEN(IND) | 27.2 | 33.0 | 15.1 |
| HEATING VALUE (BTU/LB) | 8675 | 10532 | 13920 |

ASH - INITIAL DEFORMATION ..... 2800 F
SOFTENING TEMP. ..... 2800 F
FLUID TEMP. ..... 2800 F

SULFUR FORMS
SULFATE ..... 0.01
PYRITIC ..... 0.03
ORGANIC ..... 0.37

MISCELLANEOUS COMMENTS: SEE (050)04-79 AND (052)06-79 FOR ANALYSIS FROM SAME LOCALITY.

COUNTY: KITTITAS

SAMPLE NUMBER: (052)06-79

COAL NAME: LANIGAN SEAM

MINE NAME: NONE
COAL AREA: ROSLYN-CLE ELUM
SAMPLE SITE ELEVATION (FT): 2500

QUARTER SECTION: SW SECTION: 19
TOWNSHIP: 20N RANGE: 16E
QUADRANGLE: CLE ELUM 15

GEOLOGIC FORMATION: ROSLYN
AGE: EOCENE

STRIKE: N50W DIP: 20SW
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: OUTCROP
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: WEATHERED

TOTAL SECTION MEASURED (FT): 23.0
COAL THICKNESS (FT): 15.4
SAMPLE THICKNESS (FT): 7.5

OVERBURDEN THICKNESS (FT): 8
SAMPLE COLLECTOR: WALKER (DGER)

DATE OF SAMPLING: 05-08-79
DATE OF ANALYSIS: 07-20-79

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: K94311

| AIR DRY LOSS: 21.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 29.5 | 41.4 | N/A |
| VOLATILE MATTER | 23.2 | 32.5 | 55.5 |
| FIXED CARBON | 20.8 | 29.1 | 49.8 |
| ASH | 26.5 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 5.4 | 5.0 | 5.0 |
| CARBON | 28.4 | 39.8 | 68.0 |
| NITROGEN | 0.7 | 0.9 | 1.6 |
| SULFUR | 0.3 | N/A | N/A |
| OXYGEN(IND) | 38.7 | 54.3 | 29.8 |
| HEATING VALUE (BTU/LB) | 4437 | 6209 | 10601 |

ASH - INITIAL DEFORMATION ..... >2800 F
SOFTENING TEMP. ..... >2800 F
FLUID TEMP. ..... >2800 F

SULFUR FORMS
SULFATE ..... 0.01
PYRITIC ..... 0.04
ORGANIC ..... 0.21

MISCELLANEOUS COMMENTS: COMPOSITE SAMPLE (051)05-79 AND (050)04-79.

COUNTY: KITTITAS

SAMPLE NUMBER: (053)07-79

COAL NAME: UNNAMED

MINE NAME: NONE
COAL AREA: ROSLYN-CLE ELUM
SAMPLE SITE ELEVATION (FT): 2300

QUARTER SECTION: NE SECTION: 15
TOWNSHIP: 20N RANGE: 16E
QUADRANGLE: CLE ELUM 15

GEOLOGIC FORMATION: ROSLYN
AGE: EOCENE

STRIKE: N60W DIP: 42NE
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: STREAMCUT
SAMPLE TYPE: GRAB
SAMPLE CONDITION: WEATHERED

TOTAL SECTION MEASURED (FT): 47.5
COAL THICKNESS (FT): 1.0
SAMPLE THICKNESS (FT): 1.0

OVERBURDEN THICKNESS (FT): 17
SAMPLE COLLECTOR: WALKER (DGER)

DATE OF SAMPLING: 06-06-79
DATE OF ANALYSIS: 07-17-79

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: K94312

| AIR DRY LOSS: 5.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 12.7 | 40.6 | N/A |
| VOLATILE MATTER | 17.3 | 55.3 | 93.3 |
| FIXED CARBON | 6.4 | 20.4 | 34.4 |
| ASH | 63.6 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 2.9 | 7.9 | 7.9 |
| CARBON | 13.2 | 42.2 | 71.2 |
| NITROGEN | 0.4 | 1.2 | 2.0 |
| SULFUR | 0.2 | N/A | N/A |
| OXYGEN(IND) | 19.8 | 63.4 | 45.8 |
| HEATING VALUE (BTU/LB) | 1798 | 5730 | 9664 |

ASH - INITIAL DEFORMATION ..... 2800 F
SOFTENING TEMP. ..... 2800 F
FLUID TEMP. ..... 2800 F

SULFUR FORMS
SULFATE ..... 0.02
PYRITIC ..... 0.09
ORGANIC ..... 0.04

MISCELLANEOUS COMMENTS: COAL IS IRREGULAR IN THICKNESS AND QUALITY. LOWER, MIDDLE ROSLYN FORMATION.

COUNTY: KITTITAS

SAMPLE NUMBER: (054)08-79 COAL NAME: UNKNOWN

MINE NAME: NONE
COAL AREA: ROSLYN-CLE ELUM
SAMPLE SITE ELEVATION (FT): 2320

QUARTER SECTION: NE SECTION: 15
TOWNSHIP: 20N RANGE: 16E
QUADRANGLE: CLE ELUM 15

GEOLOGIC FORMATION: UNKNOWN
AGE: EOCENE

STRIKE: N/A DIP: N/A
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: ROADCUT
SAMPLE TYPE: GRAB
SAMPLE CONDITION: WEATHERED

TOTAL SECTION MEASURED (FT): N
COAL THICKNESS (FT): N
SAMPLE THICKNESS (FT): N

OVERBURDEN THICKNESS (FT): 10
SAMPLE COLLECTOR: WALKER (DGER)

DATE OF SAMPLING: 06-06-79
DATE OF ANALYSIS: 07-17-79

LABORATORY: DOE-PITTSBURG LAB. NUMBER: K94313

| AIR DRY LOSS: 2.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 7.7 | 10.1 | N/A |
| VOLATILE MATTER | 31.0 | 41.0 | 45.6 |
| FIXED CARBON | 38.8 | 51.3 | 57.1 |
| ASH | 22.5 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 4.9 | 5.9 | 5.9 |
| CARBON | 53.9 | 71.3 | 79.4 |
| NITROGEN | 1.3 | 1.7 | 1.9 |
| SULFUR | 0.3 | N/A | N/A |
| OXYGEN(IND) | 17.1 | 22.6 | 15.1 |
| HEATING VALUE (BTU/LB) | 9442 | 12480 | 13897 |

ASH - INITIAL DEFORMATION ..... 2410 F
SOFTENING TEMP. ..... 2520 F
FLUID TEMP. ..... 2610 F

SULFUR FORMS
SULFATE ..... 0.01
PYRITIC ..... 0.07
ORGANIC ..... 0.27

MISCELLANEOUS COMMENTS: SAMPLE FROM 1 FT. ZONE UNDER AND OVERLAIN BY GRAVELS. CONTAINS 50% COAL, 30% CLINKER, 5% BURNED WOOD, 15% CLAY SAND AND GRAVEL. COAL PROBABLY FROM CIRCA 1900 ROADGRADE. SAMPLED TO DETERMINE IF COAL MINED LOCALLY.

COUNTY: KITTITAS

SAMPLE NUMBER: (055)09-79

COAL NAME: NO. 7 SEAM (?)

MINE NAME: NONE
COAL AREA: ROSLYN-CLE ELUM
SAMPLE SITE ELEVATION (FT): 2350

QUARTER SECTION: SE SECTION: 24
TOWNSHIP: 20N RANGE: 15E
QUADRANGLE: CLE ELUM 15

GEOLOGIC FORMATION: ROSLYN
AGE: EOCENE

STRIKE: N/A DIP: N/A
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: ROADCUT
SAMPLE TYPE: GRAB
SAMPLE CONDITION: WEATHERED

TOTAL SECTION MEASURED (FT): N
COAL THICKNESS (FT): 1.0
SAMPLE THICKNESS (FT): 1.0

OVERBURDEN THICKNESS (FT): 2
SAMPLE COLLECTOR: WALKER (DGER)

DATE OF SAMPLING: 06-07-79
DATE OF ANALYSIS: 07-20-79

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: K94314

| AIR DRY LOSS: 5.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 11.7 | 31.6 | N/A |
| VOLATILE MATTER | 19.4 | 52.5 | 76.8 |
| FIXED CARBON | 10.6 | 28.6 | 41.9 |
| ASH | 58.3 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 3.2 | 7.4 | 7.4 |
| CARBON | 16.8 | 45.4 | 66.5 |
| NITROGEN | 0.5 | 1.3 | 1.9 |
| SULFUR | 0.2 | N/A | N/A |
| OXYGEN(IND) | 21.0 | 56.8 | 41.9 |
| HEATING VALUE (BTU/LB) | 2527 | 6816 | 9978 |

ASH - INITIAL DEFORMATION ..... >2800 F
SOFTENING TEMP. ..... >2800 F
FLUID TEMP. ..... >2800 F

SULFUR FORMS
SULFATE ..... 0.01
PYRITIC ..... 0.07
ORGANIC ..... 0.10

MISCELLANEOUS COMMENTS: COAL IMPURE AND IRREGULARLY BEDDED.

COUNTY: KITTITAS

SAMPLE NUMBER: (057)11-79

COAL NAME: UNNAMED

MINE NAME: NONE
COAL AREA: ROSLYN-CLE ELUM
SAMPLE SITE ELEVATION (FT): 2000

QUARTER SECTION: SE SECTION: 24
TOWNSHIP: 20N RANGE: 16E
QUADRANGLE: CLE ELUM 15

GEOLOGIC FORMATION: ROSLYN
AGE: EOCENE

STRIKE: N55W DIP: 16SW
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: RIVERCUT
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: WEATHERED

TOTAL SECTION MEASURED (FT): 128.8
COAL THICKNESS (FT): 4.0
SAMPLE THICKNESS (FT): 3.0

OVERBURDEN THICKNESS (FT): 125
SAMPLE COLLECTOR: WALKER (DGER)

DATE OF SAMPLING: 06-07-79
DATE OF ANALYSIS: 07-17-79

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: K94316

| AIR DRY LOSS: 3.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 8.4 | 15.4 | N/A |
| VOLATILE MATTER | 27.0 | 49.6 | 58.7 |
| FIXED CARBON | 22.5 | 41.3 | 48.9 |
| ASH | 42.1 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 4.3 | 7.2 | 7.2 |
| CARBON | 35.4 | 65.1 | 77.0 |
| NITROGEN | 0.8 | 1.4 | 1.6 |
| SULFUR | 0.4 | N/A | N/A |
| OXYGEN(IND) | 16.9 | 31.0 | 20.4 |
| HEATING VALUE (BTU/LB) | 6332 | 11622 | 13748 |

ASH - INITIAL DEFORMATION ..... 2800 F
SOFTENING TEMP. ..... 2800 F
FLUID TEMP. ..... 2800 F

SULFUR FORMS
SULFATE ..... 0.01
PYRITIC ..... 0.06
ORGANIC ..... 0.32

MISCELLANEOUS COMMENTS: COAL IS IN LOWER, MIDDLE ROSLYN. EXPOSED ALONG THE TEANAWAY RIVER.

COUNTY: KITTITAS

SAMPLE NUMBER: (058)12-79 COAL NAME: UNNAMED

MINE NAME: NONE
COAL AREA: ROSLYN-CLE ELUM
SAMPLE SITE ELEVATION (FT): 2750

QUARTER SECTION: SW SECTION: 27
TOWNSHIP: 20N RANGE: 16E
QUADRANGLE: CLE ELUM 15

GEOLOGIC FORMATION: ROSLYN
AGE: EOCENE

STRIKE: N75W DIP: 25SW
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: ROADCUT
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: WEATHERED

TOTAL SECTION MEASURED (FT): N
COAL THICKNESS (FT): 1.5
SAMPLE THICKNESS (FT): 1.5

OVERBURDEN THICKNESS (FT): 82
SAMPLE COLLECTOR: WALKER (DGER)

DATE OF SAMPLING: 06-13-79
DATE OF ANALYSIS: 08-06-79

LABORATORY: DOE-PITTSBURG LAB. NUMBER: K94317

| AIR DRY LOSS: 3.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 8.8 | 28.9 | N/A |
| VOLATILE MATTER | 13.6 | 44.7 | 63.0 |
| FIXED CARBON | 13.2 | 43.4 | 61.1 |
| ASH | 64.4 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 2.8 | 8.3 | 8.3 |
| CARBON | 18.4 | 60.6 | 85.3 |
| NITROGEN | 0.4 | 1.2 | 1.7 |
| SULFUR | 0.2 | N/A | N/A |
| OXYGEN(IND) | 13.8 | 45.4 | 27.6 |
| HEATING VALUE (BTU/LB) | 3014 | 9902 | 13947 |

ASH - INITIAL DEFORMATION ..... 2180 F
SOFTENING TEMP. ..... 2270 F
FLUID TEMP. ..... 2390 F

SULFUR FORMS
SULFATE ..... 0.01
PYRITIC ..... 0.09
ORGANIC ..... 0.07

MISCELLANEOUS COMMENTS: COAL IS IN THE LOWER PART OF THE LOWER ROSLYN FORMATION - PROBABLY WITHIN 1000 FT. OF TEANAWAY-ROSLYN CONTACT.

COUNTY: KITTITAS

SAMPLE NUMBER: (059)13-79

COAL NAME: LANIGAN SEAM

MINE NAME: NONE
COAL AREA: ROSLYN-CLE ELUM
SAMPLE SITE ELEVATION (FT): 2500

QUARTER SECTION: SW SECTION: 19
TOWNSHIP: 20N RANGE: 16E
QUADRANGLE: KACHESS LAKE 15

GEOLOGIC FORMATION: ROSLYN
AGE: EOCENE

STRIKE: N/A DIP: N/A
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: BACKHOE PIT
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: WEATHERED

TOTAL SECTION MEASURED (FT): 20.0
COAL THICKNESS (FT): 15.4
SAMPLE THICKNESS (FT): 15.4

OVERBURDEN THICKNESS (FT): 4
SAMPLE COLLECTOR: WALKER (DGER)

DATE OF SAMPLING: 06-27-79
DATE OF ANALYSIS: 08-06-79

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: K94601

| AIR DRY LOSS: 6.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 12.8 | 15.9 | N/A |
| VOLATILE MATTER | 31.4 | 39.1 | 46.6 |
| FIXED CARBON | 37.6 | 46.9 | 55.8 |
| ASH | 18.2 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 5.6 | 6.1 | 6.1 |
| CARBON | 52.8 | 65.8 | 78.4 |
| NITROGEN | 1.1 | 1.3 | 1.5 |
| SULFUR | 0.5 | N/A | N/A |
| OXYGEN(IND) | 21.8 | 27.1 | 15.4 |
| HEATING VALUE (BTU/LB) | 9389 | 11695 | 13920 |

ASH - INITIAL DEFORMATION ..... >2800 F
SOFTENING TEMP. ..... >2800 F
FLUID TEMP. ..... >2800 F

SULFUR FORMS
SULFATE ..... 0.02
PYRITIC ..... 0.12
ORGANIC ..... 0.35

MISCELLANEOUS COMMENTS: PIT A DUG BY BACKHOE.

COUNTY: KITTITAS

SAMPLE NUMBER: (060)14-79

COAL NAME: LANIGAN SEAM

MINE NAME: NONE
COAL AREA: ROSLYN-CLE ELUM
SAMPLE SITE ELEVATION (FT): 2500

QUARTER SECTION: SW SECTION: 19
TOWNSHIP: 20N RANGE: 16E
QUADRANGLE: CLE ELUM 15

GEOLOGIC FORMATION: ROSLYN
AGE: EOCENE

STRIKE: N/A DIP: N/A
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: TEST PIT
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: WEATHERED

TOTAL SECTION MEASURED (FT): 24.0
COAL THICKNESS (FT): 10.0
SAMPLE THICKNESS (FT): 10.0

OVERBURDEN THICKNESS (FT): 12
SAMPLE COLLECTOR: WALKER (DGER)

DATE OF SAMPLING: 06-27-79
DATE OF ANALYSIS: 08-13-79

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: K94602

| AIR DRY LOSS: 8.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 17.4 | 23.0 | N/A |
| VOLATILE MATTER | 28.0 | 37.0 | 48.1 |
| FIXED CARBON | 32.1 | 42.4 | 55.2 |
| ASH | 22.5 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 5.6 | 6.2 | 6.2 |
| CARBON | 43.6 | 57.7 | 75.0 |
| NITROGEN | 1.0 | 1.2 | 1.6 |
| SULFUR | 0.4 | N/A | N/A |
| OXYGEN(IND) | 26.8 | 35.4 | 19.4 |
| HEATING VALUE (BTU/LB) | 7451 | 9845 | 12794 |

ASH - INITIAL DEFORMATION >2800 F
SOFTENING TEMP. >2800 F
FLUID TEMP. >2800 F

SULFUR FORMS
SULFATE 0.02
PYRITIC 0.06
ORGANIC 0.30

MISCELLANEOUS COMMENTS: PIT B DUG BY BACKHOE. BOTTOM OF PIT STILL IN COAL DEFORMED BY CLAY INJECTION.

COUNTY: KITTITAS

SAMPLE NUMBER: (061)15-79

COAL NAME: LANIGAN SEAM

MINE NAME: NONE
COAL AREA: ROSLYN-CLE ELUM
SAMPLE SITE ELEVATION (FT): 2500

QUARTER SECTION: SW SECTION: 19
TOWNSHIP: 20N RANGE: 16E
QUADRANGLE: CLE ELUM 15

GEOLOGIC FORMATION: ROSLYN
AGE: EOCENE

STRIKE: N/A DIP: N/A
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: TEST PIT
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: WEATHERED

TOTAL SECTION MEASURED (FT): 19.0
COAL THICKNESS (FT): 13.0
SAMPLE THICKNESS (FT): 13.0

OVERBURDEN THICKNESS (FT): 4
SAMPLE COLLECTOR: WALKER (DGER)

DATE OF SAMPLING: 06-27-79
DATE OF ANALYSIS: 08-06-79

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: K94603

| AIR DRY LOSS: 12.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 23.4 | 32.6 | N/A |
| VOLATILE MATTER | 26.4 | 36.8 | 54.6 |
| FIXED CARBON | 24.1 | 33.6 | 49.9 |
| ASH | 26.1 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 5.0 | 4.9 | 4.9 |
| CARBON | 33.6 | 46.8 | 69.5 |
| NITROGEN | 0.9 | 1.2 | 1.8 |
| SULFUR | 0.3 | N/A | N/A |
| OXYGEN(IND) | 34.2 | 47.7 | 27.7 |
| HEATING VALUE (BTU/LB) | 5360 | 7460 | 11078 |

ASH - INITIAL DEFORMATION ..... >2800 F
SOFTENING TEMP. ..... >2800 F
FLUID TEMP. ..... >2800 F

SULFUR FORMS
SULFATE ..... 0.02
PYRITIC ..... 0.07
ORGANIC ..... 0.19

MISCELLANEOUS COMMENTS: PIT C DUG BY BACKHOE. COAL DEFORMED AND BRECCIATED.

COUNTY: KITTITAS

SAMPLE NUMBER: (063)17-79 COAL NAME: UNNAMED

MINE NAME: NONE
COAL AREA: CABIN CREEK
SAMPLE SITE ELEVATION (FT): 2560

QUARTER SECTION: N/A SECTION: 21
TOWNSHIP: 20N RANGE: 13E
QUADRANGLE: EASTON 15

GEOLOGIC FORMATION: NACHES
AGE: EOCENE

STRIKE: N15W DIP: 55SW
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: ROADCUT
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: WEATHERED

TOTAL SECTION MEASURED (FT): 130.0
COAL THICKNESS (FT): 1.4
SAMPLE THICKNESS (FT): 1.4

OVERBURDEN THICKNESS (FT): 15
SAMPLE COLLECTOR: WALKER (DGER)

DATE OF SAMPLING: 06-27-79
DATE OF ANALYSIS: 08-06-79

LABORATORY: DOE-PITTSBURG LAB. NUMBER: K94605

| AIR DRY LOSS: 7.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 9.5 | 23.5 | N/A |
| VOLATILE MATTER | 8.7 | 21.5 | 28.2 |
| FIXED CARBON | 26.6 | 66.0 | 86.4 |
| ASH | 55.2 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 3.0 | 6.2 | 6.2 |
| CARBON | 28.4 | 70.5 | 92.3 |
| NITROGEN | 0.8 | 1.9 | 2.5 |
| SULFUR | 0.3 | N/A | N/A |
| OXYGEN(IND) | 12.2 | 30.2 | 12.1 |
| HEATING VALUE (BTU/LB) | 4697 | 11641 | 15241 |

ASH - INITIAL DEFORMATION ..... 2510 F
SOFTENING TEMP. ..... 2620 F
FLUID TEMP. ..... 2710 F

SULFUR FORMS
SULFATE ..... 0.02
PYRITIC ..... 0.16
ORGANIC ..... 0.16

MISCELLANEOUS COMMENTS:

COUNTY: KITTITAS

SAMPLE NUMBER: (064)18-79

COAL NAME: UNNAMED

MINE NAME: NONE
COAL AREA: CABIN CREEK
SAMPLE SITE ELEVATION (FT): 2560

QUARTER SECTION: N/A SECTION: 21
TOWNSHIP: 20N RANGE: 13E
QUADRANGLE: EASTON 15

GEOLOGIC FORMATION: NACHES
AGE: EOCENE

STRIKE: N15W DIP: 55SW
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: ROADCUT
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: WEATHERED

TOTAL SECTION MEASURED (FT): 130.0
COAL THICKNESS (FT): 1.9
SAMPLE THICKNESS (FT): 1.9

OVERBURDEN THICKNESS (FT): 15
SAMPLE COLLECTOR: WALKER (DGER)

DATE OF SAMPLING: 06-27-79
DATE OF ANALYSIS: 08-06-79

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: K94606

| AIR DRY LOSS: 5.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 7.5 | 31.5 | N/A |
| VOLATILE MATTER | 8.5 | 35.7 | 52.1 |
| FIXED CARBON | 13.5 | 56.7 | 82.9 |
| ASH | 70.5 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 2.6 | 10.7 | 10.7 |
| CARBON | 16.2 | 68.1 | 99.5 |
| NITROGEN | 0.6 | 2.4 | 3.5 |
| SULFUR | 0.2 | N/A | N/A |
| OXYGEN(IND) | 9.9 | 41.6 | 19.7 |
| HEATING VALUE (BTU/LB) | 2453 | 10286 | 15034 |

| | | |
|---|---|---|
| ASH - INITIAL DEFORMATION | 2460 | F |
| SOFTENING TEMP. | 2550 | F |
| FLUID TEMP. | 2640 | F |

| SULFUR FORMS | |
|---|---|
| SULFATE | 0.01 |
| PYRITIC | 0.20 |
| ORGANIC | 0.02 |

MISCELLANEOUS COMMENTS: COMPOSITE OF TWO SMALL SEAMS FROM ROAD CUT. SEAM NO. 1 IS 0.5 FT. THICK. SEAM NO. 2 IS 1.4 FT. THICK.

COUNTY: KITTITAS

SAMPLE NUMBER: (065)19-79

COAL NAME: UNNAMED

MINE NAME: NONE
COAL AREA: CABIN CREEK
SAMPLE SITE ELEVATION (FT): 2560

QUARTER SECTION: N/A SECTION: 21
TOWNSHIP: 20N RANGE: 13E
QUADRANGLE: EASTON 15

GEOLOGIC FORMATION: NACHES
AGE: EOCENE

STRIKE: N15W DIP: 55SW
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: ROADCUT
SAMPLE TYPE: GRAB
SAMPLE CONDITION: WEATHERED

TOTAL SECTION MEASURED (FT): 130.0
COAL THICKNESS (FT): 0.3
SAMPLE THICKNESS (FT): 0.3

OVERBURDEN THICKNESS (FT): 15
SAMPLE COLLECTOR: WALKER (DGER)

DATE OF SAMPLING: 06-27-79
DATE OF ANALYSIS: 08-06-79

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: K94607

| AIR DRY LOSS: 6.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 11.3 | 36.0 | N/A |
| VOLATILE MATTER | 12.3 | 39.2 | 61.3 |
| FIXED CARBON | 12.9 | 41.1 | 64.3 |
| ASH | 63.5 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 2.7 | 7.1 | 7.1 |
| CARBON | 17.1 | 54.5 | 85.3 |
| NITROGEN | 0.7 | 2.1 | 3.3 |
| SULFUR | 0.2 | N/A | N/A |
| OXYGEN(IND) | 15.8 | 50.4 | 28.6 |
| HEATING VALUE (BTU/LB) | 2569 | 8173 | 12789 |

ASH - INITIAL DEFORMATION ..... 2480 F
SOFTENING TEMP. ..... 2570 F
FLUID TEMP. ..... 2680 F

SULFUR FORMS
SULFATE ..... 0.03
PYRITIC ..... 0.11
ORGANIC ..... 0.02

MISCELLANEOUS COMMENTS:

COUNTY: KITTITAS

SAMPLE NUMBER: (066)20-79

COAL NAME: UNNAMED

MINE NAME: NONE
COAL AREA: CABIN CREEK
SAMPLE SITE ELEVATION (FT): 2560

QUARTER SECTION: N/A SECTION: 21
TOWNSHIP: 20N RANGE: 13E
QUADRANGLE: EASTON 15

GEOLOGIC FORMATION: NACHES
AGE: EOCENE

STRIKE: N15W DIP: 55SW
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: ROADCUT
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: WEATHERED

TOTAL SECTION MEASURED (FT): 130.0
COAL THICKNESS (FT): 2.3
SAMPLE THICKNESS (FT): 2.3

OVERBURDEN THICKNESS (FT): 15
SAMPLE COLLECTOR: WALKER (DGER)

DATE OF SAMPLING: 06-27-79
DATE OF ANALYSIS: 08-06-79

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: K94608

| AIR DRY LOSS: 2.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 5.4 | 13.3 | N/A |
| VOLATILE MATTER | 10.3 | 25.5 | 29.5 |
| FIXED CARBON | 29.1 | 72.3 | 83.5 |
| ASH | 55.2 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 2.9 | 6.4 | 6.4 |
| CARBON | 31.2 | 77.5 | 89.6 |
| NITROGEN | 0.9 | 2.1 | 2.4 |
| SULFUR | 0.4 | N/A | N/A |
| OXYGEN(IND) | 9.4 | 23.3 | 13.1 |
| HEATING VALUE (BTU/LB) | 5099 | 12646 | 14610 |

ASH - INITIAL DEFORMATION ..... 2490 F
SOFTENING TEMP. ..... 2580 F
FLUID TEMP. ..... 2680 F

SULFUR FORMS
SULFATE ..... 0.13
PYRITIC ..... 0.24
ORGANIC ..... 0.02

MISCELLANEOUS COMMENTS:

COUNTY: KITTITAS

SAMPLE NUMBER: (067)21-79

COAL NAME: UNNAMED

MINE NAME: NONE
COAL AREA: CABIN CREEK
SAMPLE SITE ELEVATION (FT): 2500

QUARTER SECTION: N/A SECTION: 21
TOWNSHIP: 20N RANGE: 13E
QUADRANGLE: EASTON 15

GEOLOGIC FORMATION: NACHES
AGE: EOCENE

STRIKE: N/A DIP: N/A
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: ROADCUT
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: WEATHERED

TOTAL SECTION MEASURED (FT): N
COAL THICKNESS (FT): 1.1
SAMPLE THICKNESS (FT): 1.1

OVERBURDEN THICKNESS (FT): 20
SAMPLE COLLECTOR: WALKER (DGER)

DATE OF SAMPLING: 06-27-79
DATE OF ANALYSIS: 08-06-79

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: K94609

| AIR DRY LOSS: 7.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 16.1 | 17.7 | N/A |
| VOLATILE MATTER | 24.4 | 26.8 | 32.6 |
| FIXED CARBON | 51.1 | 56.3 | 68.4 |
| ASH | 8.4 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 4.5 | 3.6 | 3.6 |
| CARBON | 58.9 | 64.9 | 78.9 |
| NITROGEN | 1.5 | 1.6 | 1.9 |
| SULFUR | 0.4 | N/A | N/A |
| OXYGEN(IND) | 26.4 | 29.0 | 16.1 |
| HEATING VALUE (BTU/LB) | 9443 | 10388 | 12630 |

ASH - INITIAL DEFORMATION ..... 2020 F
SOFTENING TEMP. ..... 2140 F
FLUID TEMP. ..... 2230 F

SULFUR FORMS
SULFATE ..... 0.01
PYRITIC ..... 0.15
ORGANIC ..... 0.24

MISCELLANEOUS COMMENTS:

COUNTY: KITTITAS

SAMPLE NUMBER: (068)22-79 COAL NAME: UNNAMED

MINE NAME: NONE
COAL AREA: TEANAWAY
SAMPLE SITE ELEVATION (FT): 2720

QUARTER SECTION: SE SECTION: 5
TOWNSHIP: 21N RANGE: 16E
QUADRANGLE: EASTON 15

GEOLOGIC FORMATION: ROSLYN
AGE: EOCENE

STRIKE: N15E DIP: 08NW
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: ROADCUT
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: WEATHERED

TOTAL SECTION MEASURED (FT): N
COAL THICKNESS (FT): 2.5
SAMPLE THICKNESS (FT): 2.5

OVERBURDEN THICKNESS (FT): 50
SAMPLE COLLECTOR: WALKER (DGER)

DATE OF SAMPLING: 06-28-79
DATE OF ANALYSIS: 08-06-79

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: K94610

| AIR DRY LOSS: 2.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 6.1 | 18.4 | N/A |
| VOLATILE MATTER | 17.1 | 51.7 | 63.4 |
| FIXED CARBON | 14.9 | 45.0 | 55.2 |
| ASH | 61.9 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 3.2 | 9.3 | 9.3 |
| CARBON | 20.2 | 61.1 | 74.9 |
| NITROGEN | 0.5 | 1.4 | 1.7 |
| SULFUR | 0.2 | N/A | N/A |
| OXYGEN(IND) | 14.1 | 42.6 | 32.1 |
| HEATING VALUE (BTU/LB) | 3281 | 9901 | 12143 |

ASH - INITIAL DEFORMATION ..... >2800 F
SOFTENING TEMP. ..... >2800 F
FLUID TEMP. ..... >2800 F

SULFUR FORMS
SULFATE ..... 0.01
PYRITIC ..... 0.09
ORGANIC ..... 0.10

MISCELLANEOUS COMMENTS: OUTCROP IS LOCATED NEAR THE JUNCTION OF JUNGLE CREEK AND NORTH FORK TEANAWAY RIVER.

COUNTY: KITTITAS

SAMPLE NUMBER: (085)39-79

COAL NAME: PATRICK SEAM

MINE NAME: GALLAGER (?)
COAL AREA: ROSLYN-CLE ELUM
SAMPLE SITE ELEVATION (FT): 2152

QUARTER SECTION: NW SECTION: 28
TOWNSHIP: 20N RANGE: 16E
QUADRANGLE: CLE ELUM 15

GEOLOGIC FORMATION: ROSLYN
AGE: EOCENE

STRIKE: N65E DIP: 15SE
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: FLOAT
SAMPLE TYPE: GRAB
SAMPLE CONDITION: WEATHERED

TOTAL SECTION MEASURED (FT): N
COAL THICKNESS (FT): N
SAMPLE THICKNESS (FT): N

OVERBURDEN THICKNESS (FT): N
SAMPLE COLLECTOR: WALKER (DGER)

DATE OF SAMPLING: 10-11-79
DATE OF ANALYSIS: 12-06-79

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: K97358

| AIR DRY LOSS: 3.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 8.3 | 11.7 | N/A |
| VOLATILE MATTER | 29.3 | 41.7 | 47.3 |
| FIXED CARBON | 35.0 | 49.8 | 56.5 |
| ASH | 27.4 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 4.7 | 6.0 | 6.0 |
| CARBON | 47.9 | 68.2 | 77.3 |
| NITROGEN | 0.9 | 1.2 | 1.3 |
| SULFUR | 0.5 | N/A | N/A |
| OXYGEN(IND) | 18.5 | 26.3 | 17.9 |
| HEATING VALUE (BTU/LB) | 8447 | 12009 | 13621 |

ASH - INITIAL DEFORMATION ..... >2800 F
SOFTENING TEMP. ..... >2800 F
FLUID TEMP. ..... >2800 F

SULFUR FORMS
SULFATE ..... 0.01
PYRITIC ..... 0.05
ORGANIC ..... 0.48

MISCELLANEOUS COMMENTS: SAMPLE FROM OUTSIDE OF OLD PORTAL. PRESUMED TO HAVE ORIGINATED FROM WITHIN THE OLD MINE.

COUNTY: KITTITAS

SAMPLE NUMBER: (087)41-79

COAL NAME: #1 (BIG SEAM)

MINE NAME: #1 STRIP PIT
COAL AREA: ROSLYN-CLE ELUM
SAMPLE SITE ELEVATION (FT): 2960

QUARTER SECTION: NE SECTION: 7
TOWNSHIP: 20N RANGE: 15E
QUADRANGLE: KACHESS LAKE 15

GEOLOGIC FORMATION: ROSLYN
AGE: EOCENE

STRIKE: N80W DIP: 14SW
MAJOR JOINTS IN COAL: N-S 90

EXPOSURE TYPE: STRIP PIT
SAMPLE TYPE: GRAB
SAMPLE CONDITION: FRESH

TOTAL SECTION MEASURED (FT): N
COAL THICKNESS (FT): N
SAMPLE THICKNESS (FT): N

OVERBURDEN THICKNESS (FT): 8
SAMPLE COLLECTOR: WALKER (DGER)

DATE OF SAMPLING: 10-15-79
DATE OF ANALYSIS: 01-11-80

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: K98492

| AIR DRY LOSS: 1.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 2.5 | 3.7 | N/A |
| VOLATILE MATTER | 39.9 | 59.7 | 62.0 |
| FIXED CARBON | 27.0 | 40.4 | 41.9 |
| ASH | 30.6 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 2.8 | 3.9 | 3.9 |
| CARBON | 44.7 | 66.9 | 69.5 |
| NITROGEN | 0.9 | 1.3 | 1.3 |
| SULFUR | 0.3 | N/A | N/A |
| OXYGEN(IND) | 20.7 | 30.9 | 28.7 |
| HEATING VALUE (BTU/LB) | 6740 | 10069 | 10461 |

ASH - INITIAL DEFORMATION 2550 F
SOFTENING TEMP. 2610 F
FLUID TEMP. 2680 F

SULFUR FORMS
SULFATE N
PYRITIC N
ORGANIC N

MISCELLANEOUS COMMENTS:

COUNTY: KITTITAS

SAMPLE NUMBER: (100)12-80 COAL NAME: UNNAMED

MINE NAME: NONE
COAL AREA: CABIN CREEK
SAMPLE SITE ELEVATION (FT): 2780

QUARTER SECTION: NW SECTION: 21
TOWNSHIP: 20N RANGE: 13E
QUADRANGLE: EASTON 15

GEOLOGIC FORMATION: NACHES
AGE: EOCENE

STRIKE: N60W DIP: 32NE
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: ROADCUT
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: WEATHERED

TOTAL SECTION MEASURED (FT): 82.5
COAL THICKNESS (FT): 3.5
SAMPLE THICKNESS (FT): 3.5

OVERBURDEN THICKNESS (FT): 2
SAMPLE COLLECTOR: WALKER (DGER)

DATE OF SAMPLING: 05-15-80
DATE OF ANALYSIS: 08-27-80

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: L03309

| AIR DRY LOSS: 1.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 8.2 | 27.8 | N/A |
| VOLATILE MATTER | 13.1 | 44.5 | 61.7 |
| FIXED CARBON | 13.4 | 45.5 | 63.2 |
| ASH | 65.3 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 2.6 | 7.8 | 7.8 |
| CARBON | 18.0 | 61.2 | 84.9 |
| NITROGEN | 0.4 | 1.3 | 1.7 |
| SULFUR | 0.2 | N/A | N/A |
| OXYGEN(IND) | 13.4 | 45.5 | 28.7 |
| HEATING VALUE (BTU/LB) | 2655 | 9007 | 12496 |

ASH - INITIAL DEFORMATION ..... 2400 F
SOFTENING TEMP. ..... 2530 F
FLUID TEMP. ..... 2620 F

SULFUR FORMS
SULFATE ..... N
PYRITIC ..... N
ORGANIC ..... N

MISCELLANEOUS COMMENTS: STRATIGRAPHICALLY ABOVE SAMPLE (101)13-80.

COUNTY: KITTITAS

SAMPLE NUMBER: (101)13-80

COAL NAME: UNNAMED

MINE NAME: NONE
COAL AREA: CABIN CREEK
SAMPLE SITE ELEVATION (FT): 2780

QUARTER SECTION: NW SECTION: 21
TOWNSHIP: 20N RANGE: 13E
QUADRANGLE: EASTON 15

GEOLOGIC FORMATION: NACHES
AGE: EOCENE

STRIKE: N60W DIP: 32NW
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: ROADCUT
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: WEATHERED

TOTAL SECTION MEASURED (FT): 82.5
COAL THICKNESS (FT): 2.5
SAMPLE THICKNESS (FT): 2.5

OVERBURDEN THICKNESS (FT): 6
SAMPLE COLLECTOR: WALKER (DGER)

DATE OF SAMPLING: 05-15-80
DATE OF ANALYSIS: 08-27-80

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: L03310

| AIR DRY LOSS: 2.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 9.9 | 15.1 | N/A |
| VOLATILE MATTER | 19.8 | 30.3 | 35.7 |
| FIXED CARBON | 38.2 | 58.5 | 69.0 |
| ASH | 32.1 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 3.8 | 4.8 | 4.8 |
| CARBON | 45.2 | 69.3 | 81.7 |
| NITROGEN | 1.0 | 1.5 | 1.7 |
| SULFUR | 0.3 | N/A | N/A |
| OXYGEN(IND) | 17.5 | 26.8 | 15.7 |
| HEATING VALUE (BTU/LB) | 7275 | 11141 | 13136 |

ASH - INITIAL DEFORMATION ..... 2020 F
SOFTENING TEMP. ..... 2100 F
FLUID TEMP. ..... 2190 F

SULFUR FORMS
SULFATE ..... N
PYRITIC ..... N
ORGANIC ..... N

MISCELLANEOUS COMMENTS: STRATIGRAPHICALLY BELOW SAMPLE (100)12-80.

COUNTY: KITTITAS

SAMPLE NUMBER: (102)14-80 COAL NAME: UNNAMED

MINE NAME: NONE
COAL AREA: CABIN CREEK
SAMPLE SITE ELEVATION (FT): 2800

QUARTER SECTION: NE SECTION: 20
TOWNSHIP: 20N RANGE: 13E
QUADRANGLE: EASTON 15

GEOLOGIC FORMATION: NACHES
AGE: EOCENE

STRIKE: N/A DIP: N/A
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: OUTCROP
SAMPLE TYPE: GRAB
SAMPLE CONDITION: WEATHERED

TOTAL SECTION MEASURED (FT): N
COAL THICKNESS (FT): N
SAMPLE THICKNESS (FT): 3.0

OVERBURDEN THICKNESS (FT): N
SAMPLE COLLECTOR: WALKER (DGER)

DATE OF SAMPLING: 05-15-80
DATE OF ANALYSIS: 08-27-80

LABORATORY: DOE-PITTSBURG LAB. NUMBER: L03311

| AIR DRY LOSS: 2.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 11.1 | 13.2 | N/A |
| VOLATILE MATTER | 22.5 | 26.9 | 31.0 |
| FIXED CARBON | 51.3 | 61.5 | 70.9 |
| ASH | 15.1 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 4.1 | 3.8 | 3.8 |
| CARBON | 58.6 | 70.2 | 81.1 |
| NITROGEN | 1.3 | 1.4 | 1.6 |
| SULFUR | 0.8 | N/A | N/A |
| OXYGEN(IND) | 20.0 | 23.9 | 13.9 |
| HEATING VALUE (BTU/LB) | 9368 | 11205 | 12928 |

ASH - INITIAL DEFORMATION ..... 2070 F
SOFTENING TEMP. ..... 2160 F
FLUID TEMP. ..... 2240 F

SULFUR FORMS
SULFATE ..... N
PYRITIC ..... N
ORGANIC ..... N

MISCELLANEOUS COMMENTS: COAL FOUND AT HEAD OF LARGE LANDSLIDE INTO CABIN CREEK.

COUNTY: KITTITAS

SAMPLE NUMBER: (120)32-80

COAL NAME: WILSON SEAM

MINE NAME: WILSON
COAL AREA: TANEUM
SAMPLE SITE ELEVATION (FT): 2350

QUARTER SECTION: N/A SECTION: 33
TOWNSHIP: 19N RANGE: 16E
QUADRANGLE: CLE ELUM 15

GEOLOGIC FORMATION: ROSLYN
AGE: EOCENE

STRIKE: N55E DIP: 20SE
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: PORTAL
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: WEATHERED

TOTAL SECTION MEASURED (FT): 7.7
COAL THICKNESS (FT): 3.4
SAMPLE THICKNESS (FT): 3.4

OVERBURDEN THICKNESS (FT): 2
SAMPLE COLLECTOR: WALKER (DGER)

DATE OF SAMPLING: 06-03-80
DATE OF ANALYSIS: 09-23-80

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: L03825

| AIR DRY LOSS: 16.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 26.0 | 41.1 | N/A |
| VOLATILE MATTER | 24.9 | 39.3 | 66.8 |
| FIXED CARBON | 15.2 | 24.0 | 40.7 |
| ASH | 33.9 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 4.9 | 5.3 | 5.3 |
| CARBON | 25.6 | 40.4 | 68.7 |
| NITROGEN | 0.7 | 1.0 | 1.8 |
| SULFUR | 0.3 | N/A | N/A |
| OXYGEN(IND) | 34.6 | 54.7 | 30.7 |
| HEATING VALUE (BTU/LB) | 3996 | 6297 | 10695 |

ASH - INITIAL DEFORMATION ..... 2260 F
SOFTENING TEMP. ..... 2360 F
FLUID TEMP. ..... 2470 F

SULFUR FORMS
SULFATE ..... N
PYRITIC ..... N
ORGANIC ..... N

MISCELLANEOUS COMMENTS: COAL SEAM HAD 1.3 FT. OF SHALE PARTING. COAL SAMPLED FROM 2.8 FT. ABOVE AND 0.6 FT. BELOW THIS PARTING. SAMPLES WERE MIXED TOGETHER FOR ANALYSIS.

COUNTY: KITTITAS

SAMPLE NUMBER: (121)33-80

COAL NAME: UNNAMED

MINE NAME: NONE
COAL AREA: MANASTASH
SAMPLE SITE ELEVATION (FT): 4560

QUARTER SECTION: N/A SECTION: 10
TOWNSHIP: 18N RANGE: 15E
QUADRANGLE: CLE ELUM 15

GEOLOGIC FORMATION: MANASTASH
AGE: EOCENE

STRIKE: N/A DIP: N/A
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: TAILINGS
SAMPLE TYPE: GRAB
SAMPLE CONDITION: WEATHERED

TOTAL SECTION MEASURED (FT): N
COAL THICKNESS (FT): N
SAMPLE THICKNESS (FT): N

OVERBURDEN THICKNESS (FT): N
SAMPLE COLLECTOR: WALKER (DGER)

DATE OF SAMPLING: 06-17-80
DATE OF ANALYSIS: 09-23-80

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: L03826

| AIR DRY LOSS: 1.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 4.2 | 5.7 | N/A |
| VOLATILE MATTER | 37.6 | 52.3 | 55.5 |
| FIXED CARBON | 32.4 | 45.0 | 47.8 |
| ASH | 25.8 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 4.0 | 5.1 | 5.1 |
| CARBON | 60.4 | 84.1 | 89.3 |
| NITROGEN | 1.5 | 1.9 | 2.0 |
| SULFUR | 0.8 | N/A | N/A |
| OXYGEN(IND) | 7.6 | 10.4 | 5.6 |
| HEATING VALUE (BTU/LB) | 10267 | 14264 | 15152 |

| | | |
|---|---|---|
| ASH - INITIAL DEFORMATION | 2490 | F |
| SOFTENING TEMP. | 2600 | F |
| FLUID TEMP. | 2710 | F |

| SULFUR FORMS | |
|---|---|
| SULFATE | N |
| PYRITIC | N |
| ORGANIC | N |

MISCELLANEOUS COMMENTS: TAILINGS FROM UNNAMED ABANDONED MINE. HIGH GRADED FOR THIS SAMPLE. SAMPLE (122)34-80 IS RANDOM SAMPLE.

COUNTY: KITTITAS

SAMPLE NUMBER: (122)34-80

COAL NAME: UNNAMED

MINE NAME: UNKNOWN
COAL AREA: MANASTASH
SAMPLE SITE ELEVATION (FT): 4560

QUARTER SECTION: N/A SECTION: 10
TOWNSHIP: 18N RANGE: 15E
QUADRANGLE: CLE ELUM 15

GEOLOGIC FORMATION: MANASTASH
AGE: EOCENE

STRIKE: N/A DIP: N/A
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: TAILINGS
SAMPLE TYPE: GRAB
SAMPLE CONDITION: WEATHERED

TOTAL SECTION MEASURED (FT): N
COAL THICKNESS (FT): N
SAMPLE THICKNESS (FT): N

OVERBURDEN THICKNESS (FT): 0
SAMPLE COLLECTOR: WALKER (DGER)

DATE OF SAMPLING: 06-04-80
DATE OF ANALYSIS: 09-23-80

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: L03827

| AIR DRY LOSS: 3.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 6.6 | 29.7 | N/A |
| VOLATILE MATTER | 33.6 | 152 | 216 |
| FIXED CARBON | 0.0 | -0.1 | -0.2 |
| ASH | 72.0 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 2.3 | 9.9 | 9.9 |
| CARBON | 15.1 | 68.1 | 97.0 |
| NITROGEN | 0.5 | 2.1 | 3.0 |
| SULFUR | 0.2 | N/A | N/A |
| OXYGEN(IND) | 9.8 | 44.1 | 25.1 |
| HEATING VALUE (BTU/LB) | 2229 | 10027 | 14288 |

ASH - INITIAL DEFORMATION ..... 2440 F
SOFTENING TEMP. ..... 2520 F
FLUID TEMP. ..... 2640 F

SULFUR FORMS
SULFATE ..... N
PYRITIC ..... N
ORGANIC ..... N

MISCELLANEOUS COMMENTS: RANDOM SAMPLE OF TAILINGS FROM ABANDONED MINE.

COUNTY: KITTITAS

SAMPLE NUMBER: (123)35-80

COAL NAME: UNNAMED

MINE NAME: NONE
COAL AREA: MANASTASH
SAMPLE SITE ELEVATION (FT): 4600

QUARTER SECTION: N/A SECTION: 10
TOWNSHIP: 18N RANGE: 15E
QUADRANGLE: CLE ELUM 15

GEOLOGIC FORMATION: MANASTASH
AGE: EOCENE

STRIKE: N90E DIP: 40S
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: ROADCUT
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: FRESH

TOTAL SECTION MEASURED (FT): 4.4
COAL THICKNESS (FT): 3.9
SAMPLE THICKNESS (FT): 3.9

OVERBURDEN THICKNESS (FT): 6
SAMPLE COLLECTOR: WALKER (DGER)

DATE OF SAMPLING: 06-17-80
DATE OF ANALYSIS: 09-23-80

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: L03828

| AIR DRY LOSS: 6.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 12.8 | 40.8 | N/A |
| VOLATILE MATTER | 14.0 | 44.6 | 75.5 |
| FIXED CARBON | 9.7 | 30.9 | 52.2 |
| ASH | 63.5 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 2.5 | 5.7 | 5.7 |
| CARBON | 15.7 | 50.0 | 84.7 |
| NITROGEN | 0.4 | 1.2 | 2.0 |
| SULFUR | 0.2 | N/A | N/A |
| OXYGEN(IND) | 17.7 | 56.4 | 34.0 |
| HEATING VALUE (BTU/LB) | 2210 | 7027 | 11885 |

ASH - INITIAL DEFORMATION ..... 2040 F
SOFTENING TEMP. ..... 2170 F
FLUID TEMP. ..... 2290 F

SULFUR FORMS
SULFATE ..... N
PYRITIC ..... N
ORGANIC ..... N

MISCELLANEOUS COMMENTS: COAL FROM AREA OF POSSIBLE TECTONIC ACTIVITY DIP-STRIKE UNLIKE GOOD MEASURED SECTION NEARBY. BOTTOM OF COAL ZONE NOT REACHED.

COUNTY: KITTITAS

SAMPLE NUMBER: (124)36-80

COAL NAME: UNNAMED

MINE NAME: UNKNOWN
COAL AREA: MANASTASH
SAMPLE SITE ELEVATION (FT): 4480

QUARTER SECTION: N/A SECTION: 14
TOWNSHIP: 18N RANGE: 15E
QUADRANGLE: CLE ELUM 15

GEOLOGIC FORMATION: MANASTASH
AGE: EOCENE

STRIKE: N70W DIP: 46SW
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: PORTAL
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: WEATHERED

TOTAL SECTION MEASURED (FT): 20.7
COAL THICKNESS (FT): 5.7
SAMPLE THICKNESS (FT): 5.7

OVERBURDEN THICKNESS (FT): N
SAMPLE COLLECTOR: WALKER (DGER)

DATE OF SAMPLING: 06-18-80
DATE OF ANALYSIS: 09-23-80

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: L03829

| AIR DRY LOSS: N | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 20.3 | 29.6 | N/A |
| VOLATILE MATTER | 24.0 | 35.0 | 49.8 |
| FIXED CARBON | 26.6 | 38.8 | 55.2 |
| ASH | 29.1 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 4.6 | 4.8 | 4.8 |
| CARBON | 35.7 | 52.1 | 74.1 |
| NITROGEN | 0.9 | 1.2 | 1.8 |
| SULFUR | 0.3 | N/A | N/A |
| OXYGEN(IND) | 29.4 | 42.9 | 23.5 |
| HEATING VALUE (BTU/LB) | 5789 | 8441 | 12002 |

ASH - INITIAL DEFORMATION ..... 2230 F
SOFTENING TEMP. ..... 2320 F
FLUID TEMP. ..... 2390 F

SULFUR FORMS
SULFATE ..... N
PYRITIC ..... N
ORGANIC ..... N

MISCELLANEOUS COMMENTS: SAMPLE FROM NORTHERNMOST OF THREE DRIFTS IN UNNAMED, ABANDONED COAL FIELD. SAMPLE (125)37-80 FROM IMPURE COAL IMMEDIATELY ABOVE THIS SAMPLE.

COUNTY: KITTITAS

SAMPLE NUMBER: (125)37-80

COAL NAME: UNNAMED

MINE NAME: UNKNOWN
COAL AREA: MANASTASH
SAMPLE SITE ELEVATION (FT): 4480

QUARTER SECTION: N/A SECTION: 14
TOWNSHIP: 18N RANGE: 15E
QUADRANGLE: CLE ELUM 15

GEOLOGIC FORMATION: MANASTASH
AGE: EOCENE

STRIKE: N70W DIP: 46SW
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: PORTAL
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: WEATHERED

TOTAL SECTION MEASURED (FT): 20.7
COAL THICKNESS (FT): 1.8
SAMPLE THICKNESS (FT): 1.8

OVERBURDEN THICKNESS (FT): N
SAMPLE COLLECTOR: WALKER (DGER)

DATE OF SAMPLING: 06-18-80
DATE OF ANALYSIS: 09-24-80

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: L03830

| AIR DRY LOSS: 5.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 8.9 | 63.6 | N/A |
| VOLATILE MATTER | 11.8 | 84.3 | 232 |
| FIXED CARBON | 0.0 | -0.1 | -0.3 |
| ASH | 79.6 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 2.0 | 19.6 | 19.6 |
| CARBON | 5.2 | 37.1 | 102 |
| NITROGEN | 0.3 | 2.0 | 5.6 |
| SULFUR | 0.1 | N/A | N/A |
| OXYGEN(IND) | 12.8 | 91.5 | 96.0 |
| HEATING VALUE (BTU/LB) | 693 | 4922 | 13551 |

ASH - INITIAL DEFORMATION ..... 2430 F
SOFTENING TEMP. ..... 2520 F
FLUID TEMP. ..... 2620 F

SULFUR FORMS
SULFATE ..... N
PYRITIC ..... N
ORGANIC ..... N

MISCELLANEOUS COMMENTS: IMPURE COAL EXPOSED IN NORTHERNMOST OF THREE DRIFTS IN UNNAMED ABANDONED COAL FIELD. SAMPLE IMMEDIATELY ABOVE SAMPLE (124)36-80.

COUNTY: KITTITAS

SAMPLE NUMBER: (131)43-80

COAL NAME: UNNAMED

MINE NAME: NONE
COAL AREA: MANASTASH
SAMPLE SITE ELEVATION (FT): N

QUARTER SECTION: N/A SECTION: 17
TOWNSHIP: 18N RANGE: 15E
QUADRANGLE: CLE ELUM 15

GEOLOGIC FORMATION: MANASTASH
AGE: EOCENE

STRIKE: HORZ DIP: 0
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: ROADCUT
SAMPLE TYPE: GRAB
SAMPLE CONDITION: WEATHERED

TOTAL SECTION MEASURED (FT): N
COAL THICKNESS (FT): N
SAMPLE THICKNESS (FT): N

OVERBURDEN THICKNESS (FT): 0
SAMPLE COLLECTOR: CUSHMAN (DGER)

DATE OF SAMPLING: 07-18-80
DATE OF ANALYSIS: 09-23-80

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: L03831

| AIR DRY LOSS: 14.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 26.7 | 36.2 | N/A |
| VOLATILE MATTER | 25.2 | 34.2 | 53.6 |
| FIXED CARBON | 23.8 | 32.3 | 50.7 |
| ASH | 24.3 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 5.1 | 4.5 | 4.5 |
| CARBON | 33.5 | 45.5 | 71.3 |
| NITROGEN | 1.0 | 1.3 | 2.0 |
| SULFUR | 0.3 | N/A | N/A |
| OXYGEN(IND) | 35.9 | 48.7 | 25.9 |
| HEATING VALUE (BTU/LB) | 5416 | 7339 | 11518 |

ASH - INITIAL DEFORMATION ..... 2190 F
SOFTENING TEMP. ..... 2270 F
FLUID TEMP. ..... 2360 F

SULFUR FORMS
SULFATE ..... N
PYRITIC ..... N
ORGANIC ..... N

MISCELLANEOUS COMMENTS:

COUNTY: KITTITAS

SAMPLE NUMBER: (132)44-80 COAL NAME: UNNAMED

MINE NAME: UNNAMED QUARTER SECTION: NW SECTION: 21
COAL AREA: MANASTASH TOWNSHIP: 18N RANGE: 15E
SAMPLE SITE ELEVATION (FT): N QUADRANGLE: CLE ELUM 15

GEOLOGIC FORMATION: MANASTASH STRIKE: N/A DIP: N/A
AGE: EOCENE MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: PROSPECT TOTAL SECTION MEASURED (FT): 8.5
SAMPLE TYPE: GRAB COAL THICKNESS (FT): 3.5
SAMPLE CONDITION: WEATHERED SAMPLE THICKNESS (FT): 3.5

OVERBURDEN THICKNESS (FT): 0 DATE OF SAMPLING: 07-18-80
SAMPLE COLLECTOR: CUSHMAN (DGER) DATE OF ANALYSIS: 09-23-80

LABORATORY: DOE-PITTSBURG LAB. NUMBER: L03832

| AIR DRY LOSS: 9.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 12.7 | 78.1 | N/A |
| VOLATILE MATTER | 9.6 | 59.0 | 270 |
| FIXED CARBON | 0.2 | 1.1 | 5.2 |
| ASH | 77.5 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 2.4 | 27.5 | 27.5 |
| CARBON | 4.3 | 26.4 | 121 |
| NITROGEN | 0.1 | 0.5 | 2.4 |
| SULFUR | 0.1 | N/A | N/A |
| OXYGEN(IND) | 15.7 | 96.6 | 124 |
| HEATING VALUE (BTU/LB) | 479 | 2918 | 13371 |

ASH - INITIAL DEFORMATION ..... 2680 F
SOFTENING TEMP. ..... 2760 F
FLUID TEMP. ..... 2800 F

SULFUR FORMS
SULFATE ..... N
PYRITIC ..... N
ORGANIC ..... N

MISCELLANEOUS COMMENTS: BECAUSE STRIKE AND DIP OF COAL NOT KNOWN, SAMPLE WAS OF "BEST" COAL VISIBLE IN SEAM. COMPLETE COAL SECTION NOT EXPOSED AT PROSPECT.

COUNTY: KITTITAS

SAMPLE NUMBER: (133)45-80

COAL NAME: UNNAMED

MINE NAME: UNNAMED
COAL AREA: MANASTASH
SAMPLE SITE ELEVATION (FT): N

QUARTER SECTION: NW SECTION: 21
TOWNSHIP: 18N RANGE: 15E
QUADRANGLE: CLE ELUM 15

GEOLOGIC FORMATION: MANASTASH
AGE: EOCENE

STRIKE: N/A DIP: N/A
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: TIPPLE
SAMPLE TYPE: GRAB
SAMPLE CONDITION: WEATHERED

TOTAL SECTION MEASURED (FT): N
COAL THICKNESS (FT): N
SAMPLE THICKNESS (FT): N

OVERBURDEN THICKNESS (FT): 0
SAMPLE COLLECTOR: CUSHMAN (DGER)

DATE OF SAMPLING: 07-18-80
DATE OF ANALYSIS: 09-23-80

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: L03833

| AIR DRY LOSS: 9.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 14.9 | 40.8 | N/A |
| VOLATILE MATTER | 13.1 | 35.9 | 60.7 |
| FIXED CARBON | 13.2 | 36.2 | 61.2 |
| ASH | 58.8 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 3.1 | 6.6 | 6.6 |
| CARBON | 18.3 | 50.2 | 84.9 |
| NITROGEN | 0.3 | 0.8 | 1.3 |
| SULFUR | 0.1 | N/A | N/A |
| OXYGEN(IND) | 19.4 | 53.2 | 28.5 |
| HEATING VALUE (BTU/LB) | 2755 | 7546 | 12766 |

ASH - INITIAL DEFORMATION ..... 2800 F
SOFTENING TEMP. ..... 2800 F
FLUID TEMP. ..... 2800 F

SULFUR FORMS
SULFATE ..... N
PYRITIC ..... N
ORGANIC ..... N

MISCELLANEOUS COMMENTS:

COUNTY: LEWIS

SAMPLE NUMBER: (007)03-76

COAL NAME: CEDAR CREEK #1

MINE NAME: WINDOM
COAL AREA: KELSO-CASTLE ROCK
SAMPLE SITE ELEVATION (FT): 400

QUARTER SECTION: SW SECTION: 15
TOWNSHIP: 12N RANGE: 01E
QUADRANGLE: TOUTLE 15

GEOLOGIC FORMATION: WILKES
AGE: MIOCENE

STRIKE: N05E DIP: 08NW
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: STRIP PIT
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: FRESH

TOTAL SECTION MEASURED (FT): N
COAL THICKNESS (FT): 16.8
SAMPLE THICKNESS (FT): 3.5

OVERBURDEN THICKNESS (FT): 40
SAMPLE COLLECTOR: VONHEEDER (DGER)

DATE OF SAMPLING: 08-19-76
DATE OF ANALYSIS: 01-21-77

LABORATORY: USBM

LAB. NUMBER: UNKNOW

| AIR DRY LOSS: 17.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 27.0 | 38.9 | N/A |
| VOLATILE MATTER | 24.2 | 34.8 | 57.1 |
| FIXED CARBON | 20.5 | 29.4 | 48.3 |
| ASH | 28.1 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 5.3 | 5.1 | 5.1 |
| CARBON | 30.1 | 43.3 | 71.1 |
| NITROGEN | 0.6 | 0.7 | 1.1 |
| SULFUR | 1.0 | N/A | N/A |
| OXYGEN(IND) | 34.8 | 50.1 | 25.3 |
| HEATING VALUE (BTU/LB) | 5174 | 7415 | 12170 |

ASH - INITIAL DEFORMATION ..... 2345 F
SOFTENING TEMP. ..... 2450 F
FLUID TEMP. ..... 2530 F

SULFUR FORMS
SULFATE ..... 0.13
PYRITIC ..... 0.15
ORGANIC ..... 0.67

MISCELLANEOUS COMMENTS:

COUNTY: LEWIS

SAMPLE NUMBER: (069)23-79

COAL NAME: NO. 6 SEAM (?)

MINE NAME: WEIKEL
COAL AREA: SUMMIT CREEK
SAMPLE SITE ELEVATION (FT): 3120

QUARTER SECTION: NE SECTION: 13
TOWNSHIP: 14N RANGE: 10E
QUADRANGLE: WHITE PASS 15

GEOLOGIC FORMATION: PUGET GROUP (?)
AGE: EOCENE

STRIKE: N/A DIP: N/A
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: MINE DUMP
SAMPLE TYPE: GRAB
SAMPLE CONDITION: WEATHERED

TOTAL SECTION MEASURED (FT): N
COAL THICKNESS (FT): N
SAMPLE THICKNESS (FT): N

OVERBURDEN THICKNESS (FT): N
SAMPLE COLLECTOR: MILNE (DGER)

DATE OF SAMPLING: 07-02-79
DATE OF ANALYSIS: 10-02-79

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: K95700

| AIR DRY LOSS: 1.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 2.7 | 5.1 | N/A |
| VOLATILE MATTER | 10.9 | 21.1 | 22.3 |
| FIXED CARBON | 41.5 | 80.9 | 85.4 |
| ASH | 44.9 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 2.6 | 4.6 | 4.6 |
| CARBON | 45.1 | 87.9 | 92.8 |
| NITROGEN | 1.1 | 2.0 | 2.1 |
| SULFUR | 0.5 | N/A | N/A |
| OXYGEN(IND) | 5.8 | 11.2 | 6.9 |
| HEATING VALUE (BTU/LB) | 7237 | 14077 | 14860 |

ASH - INITIAL DEFORMATION ..... 2330 F
SOFTENING TEMP. ..... 2420 F
FLUID TEMP. ..... 2500 F

SULFUR FORMS
SULFATE ..... 0.01
PYRITIC ..... 0.26
ORGANIC ..... 0.23

MISCELLANEOUS COMMENTS: COAL ASSOCIATED WITH CARBONACEOUS SANDSTONE AND ANDESITIC FLOWS AND LAHARS. MINE AREA HAS BEEN BULLDOZED OVER. OUTCROPS OF SEDIMENTARY UNITS NOT OBSERVED IN IMMEDIATE AREA.

COUNTY: LEWIS

SAMPLE NUMBER: (071)25-79

COAL NAME: TONO NO. 7

MINE NAME: COLUMBIA COLLIERIES
COAL AREA: CENTRALIA
SAMPLE SITE ELEVATION (FT): 400

QUARTER SECTION: N/A SECTION: 32
TOWNSHIP: 15N RANGE: 03W
QUADRANGLE: ADNA 15

GEOLOGIC FORMATION: SKOOKUMCHUCK
AGE: EOCENE

STRIKE: N23E DIP: 11NW
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: PORTAL
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: FRESH

TOTAL SECTION MEASURED (FT): N
COAL THICKNESS (FT): 7.8
SAMPLE THICKNESS (FT): 1.0

OVERBURDEN THICKNESS (FT): N
SAMPLE COLLECTOR: VONHEEDER (DGER)

DATE OF SAMPLING: 08-10-79
DATE OF ANALYSIS: 10-02-79

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: K95702

| AIR DRY LOSS: 16.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 30.1 | 31.9 | N/A |
| VOLATILE MATTER | 34.2 | 36.2 | 53.3 |
| FIXED CARBON | 30.6 | 32.4 | 47.6 |
| ASH | 5.1 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 6.7 | 5.1 | 5.1 |
| CARBON | 46.5 | 49.3 | 72.5 |
| NITROGEN | 1.0 | 1.0 | 1.4 |
| SULFUR | 0.7 | N/A | N/A |
| OXYGEN(IND) | 40.0 | 42.4 | 20.5 |
| HEATING VALUE (BTU/LB) | 7989 | 8452 | 12427 |

| | | |
|---|---|---|
| ASH - INITIAL DEFORMATION | 2170 | F |
| SOFTENING TEMP. | 2250 | F |
| FLUID TEMP. | 2340 | F |

| SULFUR FORMS | |
|---|---|
| SULFATE | 0.01 |
| PYRITIC | 0.19 |
| ORGANIC | 0.46 |

MISCELLANEOUS COMMENTS:

COUNTY: LEWIS

SAMPLE NUMBER: (073)27-79

COAL NAME: UNNAMED

MINE NAME: NONE
COAL AREA: CENTRALIA
SAMPLE SITE ELEVATION (FT): 800

QUARTER SECTION: NE
TOWNSHIP: 14N
QUADRANGLE: ADNA 15

SECTION: 8
RANGE: 03W

GEOLOGIC FORMATION: SKOOKUMCHUCK
AGE: EOCENE

STRIKE: N12E
DIP: 07SE
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: ROADCUT
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: WEATHERED

TOTAL SECTION MEASURED (FT): 8.8
COAL THICKNESS (FT): 2.3
SAMPLE THICKNESS (FT): 2.3

OVERBURDEN THICKNESS (FT): 0
SAMPLE COLLECTOR: VONHEEDER (DGER)

DATE OF SAMPLING: 08-15-79
DATE OF ANALYSIS: 10-02-79

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: K95704

| AIR DRY LOSS: 12.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 21.5 | 28.5 | N/A |
| VOLATILE MATTER | 29.0 | 38.7 | 54.6 |
| FIXED CARBON | 26.8 | 35.7 | 50.3 |
| ASH | 22.7 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 5.4 | 4.9 | 4.9 |
| CARBON | 37.3 | 49.9 | 70.4 |
| NITROGEN | 0.9 | 0.6 | 0.9 |
| SULFUR | 3.0 | N/A | N/A |
| OXYGEN(IND) | 30.7 | 41.0 | 21.3 |
| HEATING VALUE (BTU/LB) | 6577 | 8705 | 12281 |

ASH - INITIAL DEFORMATION ..... 1960 F
SOFTENING TEMP. ..... 2050 F
FLUID TEMP. ..... 2190 F

SULFUR FORMS
SULFATE ..... 0.04
PYRITIC ..... 1.88
ORGANIC ..... 1.03

MISCELLANEOUS COMMENTS: COAL SEAM NOT RECORDED IN LITERATURE.

COUNTY: LEWIS

SAMPLE NUMBER: (089)01-80

COAL NAME: THO/BLDIRT/SMI

MINE NAME: WIDCO, OLD KING COAL
COAL AREA: CENTRALIA
SAMPLE SITE ELEVATION (FT): N

QUARTER SECTION: N/A SECTION: N
TOWNSHIP: 15N RANGE: 01W
QUADRANGLE: BUCODA 7.5

GEOLOGIC FORMATION: SKOOKUMCHUCK
AGE: EOCENE

STRIKE: N/A DIP: N/A
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: STOCK PILE
SAMPLE TYPE: GRAB
SAMPLE CONDITION: FRESH

TOTAL SECTION MEASURED (FT): N
COAL THICKNESS (FT): N
SAMPLE THICKNESS (FT): N

OVERBURDEN THICKNESS (FT): N
SAMPLE COLLECTOR: WALKER (DGER)

DATE OF SAMPLING: 01-25-80
DATE OF ANALYSIS: 04-15-80

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: L00655

| AIR DRY LOSS: 12.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 19.8 | 23.8 | N/A |
| VOLATILE MATTER | 31.6 | 38.1 | 50.1 |
| FIXED CARBON | 32.9 | 39.7 | 52.2 |
| ASH | 15.7 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 6.0 | 5.9 | 5.9 |
| CARBON | 47.3 | 57.1 | 75.1 |
| NITROGEN | 0.9 | 0.9 | 1.2 |
| SULFUR | 0.8 | N/A | N/A |
| OXYGEN(IND) | 29.3 | 35.3 | 18.4 |
| HEATING VALUE (BTU/LB) | 8337 | 10044 | 13211 |

ASH - INITIAL DEFORMATION ..... 2050 F
SOFTENING TEMP. ..... 2160 F
FLUID TEMP. ..... 2280 F

SULFUR FORMS
SULFATE ..... N
PYRITIC ..... N
ORGANIC ..... N

MISCELLANEOUS COMMENTS: WASHINGTON IRRIGATION DEVELOPMENT COMPANY (WIDCO) WASHING PLANT REJECT SOLD TO OLD KING COAL COMPANY. MIXTURE OF THOMPSON(THO), BIG AND LITTLE DIRTY(BLDIRT), AND SMITH(SMI) SEAMS.

COUNTY: LEWIS

SAMPLE NUMBER: (090)02-80

COAL NAME: THO/BLDIRT/SMI

MINE NAME: WIDCO, OLD KING COAL
COAL AREA: CENTRALIA
SAMPLE SITE ELEVATION (FT): N

QUARTER SECTION: N/A SECTION: N
TOWNSHIP: 15N RANGE: 01W
QUADRANGLE: BUCODA 7.5

GEOLOGIC FORMATION: SKOOKUMCHUCK
AGE: EOCENE

STRIKE: N/A DIP: N/A
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: STOCK PILE
SAMPLE TYPE: GRAB
SAMPLE CONDITION: FRESH

TOTAL SECTION MEASURED (FT): N
COAL THICKNESS (FT): N
SAMPLE THICKNESS (FT): N

OVERBURDEN THICKNESS (FT): N
SAMPLE COLLECTOR: WALKER (DGER)

DATE OF SAMPLING: 01-25-80
DATE OF ANALYSIS: 04-15-80

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: L00656

| AIR DRY LOSS: 7.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 18.1 | 21.8 | N/A |
| VOLATILE MATTER | 33.0 | 40.0 | 51.3 |
| FIXED CARBON | 32.9 | 39.8 | 51.1 |
| ASH | 16.0 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 5.8 | 5.7 | 5.7 |
| CARBON | 48.8 | 59.2 | 75.9 |
| NITROGEN | 0.9 | 0.9 | 1.2 |
| SULFUR | 0.9 | N/A | N/A |
| OXYGEN(IND) | 27.7 | 33.5 | 17.9 |
| HEATING VALUE (BTU/LB) | 8559 | 10355 | 13277 |

ASH - INITIAL DEFORMATION ..... 2130 F
SOFTENING TEMP. ..... 2250 F
FLUID TEMP. ..... 2340 F

SULFUR FORMS
SULFATE ..... N
PYRITIC ..... N
ORGANIC ..... N

MISCELLANEOUS COMMENTS: WASHINGTON IRRIGATION DEVELOPMENT COMPANY (WIDCO) WASHING PLANT REJECT SOLD TO OLD KING COAL COMPANY. MIXTURE OF THOMPSON(THO), BIG AND LITTLE DIRTY(BLDIRT), AND SMITH(SMI) SEAMS.

COUNTY: LEWIS

SAMPLE NUMBER: (091)03-80

COAL NAME: THO/BLDIRT/SMI

MINE NAME: WIDCO, OLD KING COAL
COAL AREA: CENTRALIA
SAMPLE SITE ELEVATION (FT): N

QUARTER SECTION: N/A SECTION: N
TOWNSHIP: 15N RANGE: 01W
QUADRANGLE: BUCODA 7.5

GEOLOGIC FORMATION: SKOOKUMCHUCK
AGE: EOCENE

STRIKE: N/A DIP: N/A
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: STOCK PILE
SAMPLE TYPE: GRAB
SAMPLE CONDITION: FRESH

TOTAL SECTION MEASURED (FT): N
COAL THICKNESS (FT): N
SAMPLE THICKNESS (FT): N

OVERBURDEN THICKNESS (FT): N
SAMPLE COLLECTOR: WALKER (DGER)

DATE OF SAMPLING: 01-25-80
DATE OF ANALYSIS: 04-14-80

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: L00657

| AIR DRY LOSS: 6.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 17.5 | 19.7 | N/A |
| VOLATILE MATTER | 34.7 | 39.2 | 48.8 |
| FIXED CARBON | 37.3 | 42.1 | 52.5 |
| ASH | 10.5 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 6.0 | 5.6 | 5.6 |
| CARBON | 53.1 | 60.0 | 74.8 |
| NITROGEN | 0.9 | 0.9 | 1.2 |
| SULFUR | 0.4 | N/A | N/A |
| OXYGEN(IND) | 29.1 | 32.8 | 19.0 |
| HEATING VALUE (BTU/LB) | 9272 | 10461 | 13042 |

ASH - INITIAL DEFORMATION ..... 2030 F
SOFTENING TEMP. ..... 2140 F
FLUID TEMP. ..... 2220 F

SULFUR FORMS
SULFATE ..... N
PYRITIC ..... N
ORGANIC ..... N

MISCELLANEOUS COMMENTS: WASHINGTON IRRIGATION DEVELOPMENT COMPANY (WIDCO) WASHING PLANT REJECT SOLD TO OLD KING COAL COMPANY. MIXTURE OF THOMPSON(THO), BIG AND LITTLE DIRTY(BLDIRT), AND SMITH(SMI) SEAMS.

COUNTY: LEWIS

SAMPLE NUMBER: (092)04-80

COAL NAME: UNNAMED

MINE NAME: WIDCO, OLD KING
COAL AREA: KELSO-CASTLE ROCK
SAMPLE SITE ELEVATION (FT): 182

QUARTER SECTION: N/A SECTION: 30
TOWNSHIP: 11N RANGE: 01E
QUADRANGLE: TOUTLE 15

GEOLOGIC FORMATION: TOUTLE
AGE: EOCENE/OLIGOCENE

STRIKE: N22E DIP: 05NW
MAJOR JOINTS IN COAL: N50E

EXPOSURE TYPE: STREAMCUT
SAMPLE TYPE: GRAB
SAMPLE CONDITION: WEATHERED

TOTAL SECTION MEASURED (FT): N
COAL THICKNESS (FT): 3.0
SAMPLE THICKNESS (FT): 3.0

OVERBURDEN THICKNESS (FT): 0
SAMPLE COLLECTOR: WALKER (OGER)

DATE OF SAMPLING: 02-27-80
DATE OF ANALYSIS: 04-15-80

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: L00658

| AIR DRY LOSS: N | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 22.1 | 29.5 | N/A |
| VOLATILE MATTER | 27.8 | 37.3 | 53.8 |
| FIXED CARBON | 27.2 | 36.5 | 52.6 |
| ASH | 22.9 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 4.3 | 2.0 | 2.0 |
| CARBON | 34.1 | 46.1 | 66.4 |
| NITROGEN | 0.8 | -0.1 | -0.1 |
| SULFUR | 5.6 | N/A | N/A |
| OXYGEN(IND) | 32.2 | 43.4 | 23.4 |
| HEATING VALUE (BTU/LB) | 6059 | 8005 | 11538 |

ASH - INITIAL DEFORMATION ..... 1840 F
SOFTENING TEMP. ..... 2010 F
FLUID TEMP. ..... 2140 F

SULFUR FORMS
SULFATE ..... N
PYRITIC ..... N
ORGANIC ..... N

MISCELLANEOUS COMMENTS: COAL SEAM PROBABLY AT THE CONTACT OF THE TOUTLE AND WILKES FORMATIONS. SAMPLE FROM CEDAR CREEK STREAM CUT.

COUNTY: LEWIS

SAMPLE NUMBER: (093)05-80

COAL NAME: UNNAMED

MINE NAME: NONE
COAL AREA: KELSO-CASTLE ROCK
SAMPLE SITE ELEVATION (FT): 180

QUARTER SECTION: N/A SECTION: 30
TOWNSHIP: 11N RANGE: 01E
QUADRANGLE: TOUTLE 15

GEOLOGIC FORMATION: WILKES (?)
AGE: MIOCENE

STRIKE: N30W DIP: 06NE
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: STREAMCUT
SAMPLE TYPE: GRAB
SAMPLE CONDITION: WEATHERED

TOTAL SECTION MEASURED (FT): N
COAL THICKNESS (FT): 3.0
SAMPLE THICKNESS (FT): 3.0

OVERBURDEN THICKNESS (FT): 0
SAMPLE COLLECTOR: WALKER (DGER)

DATE OF SAMPLING: 02-27-80
DATE OF ANALYSIS: 04-15-80

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: L00659

| AIR DRY LOSS: N | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 16.2 | 21.1 | N/A |
| VOLATILE MATTER | 38.7 | 50.5 | 64.1 |
| FIXED CARBON | 23.6 | 30.8 | 39.0 |
| ASH | 21.5 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 4.8 | 4.8 | 4.8 |
| CARBON | 40.0 | 52.2 | 66.3 |
| NITROGEN | 0.4 | 0.4 | 0.5 |
| SULFUR | 0.7 | N/A | N/A |
| OXYGEN(IND) | 32.6 | 42.5 | 30.1 |
| HEATING VALUE (BTU/LB) | 6818 | 8879 | 11268 |

ASH - INITIAL DEFORMATION ..... 2440 F
SOFTENING TEMP. ..... 2520 F
FLUID TEMP. ..... 2620 F

SULFUR FORMS
SULFATE ..... N
PYRITIC ..... N
ORGANIC ..... N

MISCELLANEOUS COMMENTS: COAL OUTCROPS IN CEDAR CREEK STREAM CUT.

COUNTY: LEWIS

SAMPLE NUMBER: (138)50-80 COAL NAME: U THOMP/B DIRT

MINE NAME: NONE
COAL AREA: CENTRALIA
SAMPLE SITE ELEVATION (FT): N

QUARTER SECTION: NE SECTION: 36
TOWNSHIP: 15N RANGE: 01W
QUADRANGLE: CENTRALIA 15

GEOLOGIC FORMATION: SKOOKUMCHUCK
AGE: EOCENE

STRIKE: N35W DIP: 15NE
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: STREAMCUT
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: WEATHERED

TOTAL SECTION MEASURED (FT): 22.1
COAL THICKNESS (FT): 13.0
SAMPLE THICKNESS (FT): 13.0

OVERBURDEN THICKNESS (FT): 100
SAMPLE COLLECTOR: VONHEEDER (DGER)

DATE OF SAMPLING: 07-29-80
DATE OF ANALYSIS: 10-08-80

LABORATORY: C.T. & E. CO.

LAB. NUMBER: 72-978

| AIR DRY LOSS: N | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 22.9 | 25.7 | N/A |
| VOLATILE MATTER | 29.8 | 33.5 | 45.1 |
| FIXED CARBON | 37.2 | 41.8 | 56.3 |
| ASH | 10.1 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 6.0 | 5.2 | 5.2 |
| CARBON | 49.7 | 55.8 | 75.2 |
| NITROGEN | 0.8 | 0.8 | 1.1 |
| SULFUR | 0.3 | N/A | N/A |
| OXYGEN(IND) | 33.1 | 37.2 | 19.2 |
| HEATING VALUE (BTU/LB) | 8408 | 9438 | 12711 |

ASH - INITIAL DEFORMATION ..... 2200 F
SOFTENING TEMP. ..... 2230 F
FLUID TEMP. ..... 2400 F

SULFUR FORMS
SULFATE ..... N
PYRITIC ..... N
ORGANIC ..... N

MISCELLANEOUS COMMENTS: OUTCROP ON STATE-ADMINISTERED LANDS. AN 8.0 FT. PORTION OF THE SECTION COVERED AND THEREFORE NOT SAMPLED.

COUNTY: LEWIS

SAMPLE NUMBER: (140)52-80

COAL NAME: UNNAMED

MINE NAME: NONE
COAL AREA: CENTRALIA
SAMPLE SITE ELEVATION (FT): 400

QUARTER SECTION: NE SECTION: 36
TOWNSHIP: 15N RANGE: 01W
QUADRANGLE: CENTRALIA 15

GEOLOGIC FORMATION: SKOOKUMCHUCK
AGE: EOCENE

STRIKE: N05W DIP: 15NE
MAJOR JOINTS IN COAL: N10W 61S

EXPOSURE TYPE: STREAMCUT
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: WEATHERED

TOTAL SECTION MEASURED (FT): 3.1
COAL THICKNESS (FT): 0.8
SAMPLE THICKNESS (FT): 0.8

OVERBURDEN THICKNESS (FT): 5
SAMPLE COLLECTOR: VONHEEDER (DGER)

DATE OF SAMPLING: 08-13-80
DATE OF ANALYSIS: 10-13-80

LABORATORY: C.T. & E. CO.

LAB. NUMBER: 72-978

| AIR DRY LOSS: N | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 19.8 | 30.2 | N/A |
| VOLATILE MATTER | 25.8 | 39.5 | 56.8 |
| FIXED CARBON | 22.5 | 34.4 | 49.5 |
| ASH | 31.9 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 4.7 | 5.2 | 5.2 |
| CARBON | 32.6 | 49.9 | 71.8 |
| NITROGEN | 0.6 | 0.7 | 1.0 |
| SULFUR | 1.1 | N/A | N/A |
| OXYGEN(IND) | 29.2 | 44.7 | 25.3 |
| HEATING VALUE (BTU/LB) | 5450 | 8307 | 11951 |

ASH - INITIAL DEFORMATION ..... >2400 F
SOFTENING TEMP. ..... >2440 F
FLUID TEMP. ..... >2700 F

SULFUR FORMS
SULFATE ..... N
PYRITIC ..... N
ORGANIC ..... N

MISCELLANEOUS COMMENTS:

COUNTY: LEWIS

SAMPLE NUMBER: (141)53-80

COAL NAME: BIG DIRTY(?)

MINE NAME: NONE
COAL AREA: CENTRALIA
SAMPLE SITE ELEVATION (FT): N

QUARTER SECTION: NW SECTION: 36
TOWNSHIP: 15N RANGE: 01W
QUADRANGLE: CENTRALIA 15

GEOLOGIC FORMATION: SKOOKUMCHUCK
AGE: EOCENE

STRIKE: N70W DIP: 32NE
MAJOR JOINTS IN COAL: N47W 77S

EXPOSURE TYPE: STREAMCUT
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: FRESH

TOTAL SECTION MEASURED (FT): 17.1
COAL THICKNESS (FT): 4.9
SAMPLE THICKNESS (FT): 1.7

OVERBURDEN THICKNESS (FT): 15
SAMPLE COLLECTOR: VONHEEDER (DGER)

DATE OF SAMPLING: 08-13-80
DATE OF ANALYSIS: 10-13-80

LABORATORY: C.T. & E. CO.

LAB. NUMBER: 729788

AIR DRY LOSS: N

| | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 16.0 | 18.0 | N/A |
| VOLATILE MATTER | 37.8 | 42.8 | 52.4 |
| FIXED CARBON | 35.6 | 40.3 | 49.3 |
| ASH | 10.6 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 4.0 | 2.8 | 2.8 |
| CARBON | 51.5 | 58.5 | 71.5 |
| NITROGEN | 1.0 | 0.9 | 1.1 |
| SULFUR | 1.6 | N/A | N/A |
| OXYGEN(IND) | 15.2 | 17.1 | 1.0 |
| HEATING VALUE (BTU/LB) | 8812 | 9960 | 12183 |

ASH - INITIAL DEFORMATION ..... >2700 F
SOFTENING TEMP. ..... >2700 F
FLUID TEMP. ..... >2700 F

SULFUR FORMS
SULFATE ..... N
PYRITIC ..... N
ORGANIC ..... N

MISCELLANEOUS COMMENTS: SAMPLE FROM STATE-ADMINISTERED LAND. "HIGH-GRADED" SAMPLE OF UPPER-SECTION, SAME LOCALITY AS SAMPLE (142)54-80.

COUNTY: LEWIS

SAMPLE NUMBER: (142)54-80

COAL NAME: UNNAMED

MINE NAME: NONE
COAL AREA: CENTRALIA
SAMPLE SITE ELEVATION (FT): 400

QUARTER SECTION: NE SECTION: 36
TOWNSHIP: 15N RANGE: 01W
QUADRANGLE: CENTRALIA 15

GEOLOGIC FORMATION: SKOOKUMCHUCK
AGE: EOCENE

STRIKE: N70W DIP: 32NE
MAJOR JOINTS IN COAL: N47W 77S

EXPOSURE TYPE: STREAMCUT
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: WEATHERED

TOTAL SECTION MEASURED (FT): 17.1
COAL THICKNESS (FT): 4.9
SAMPLE THICKNESS (FT): 2.8

OVERBURDEN THICKNESS (FT): 75
SAMPLE COLLECTOR: VONHEEDER (DGER)

DATE OF SAMPLING: 08-13-80
DATE OF ANALYSIS: 10-15-80

LABORATORY: C.T. & E. CO.

LAB. NUMBER: 72-978

| AIR DRY LOSS: | N | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|---|
| PROXIMATE ANALYSIS | | | | |
| MOISTURE | | 17.2 | 24.8 | N/A |
| VOLATILE MATTER | | 30.6 | 44.4 | 59.3 |
| FIXED CARBON | | 23.8 | 34.4 | 46.0 |
| ASH | | 28.4 | N/A | N/A |
| ULTIMATE ANALYSIS | | | | |
| HYDROGEN | | 4.5 | 4.6 | 4.6 |
| CARBON | | 37.2 | 54.0 | 72.2 |
| NITROGEN | | 0.5 | 0.4 | 0.5 |
| SULFUR | | 1.7 | N/A | N/A |
| OXYGEN(IND) | | 27.7 | 40.1 | 23.7 |
| HEATING VALUE (BTU/LB) | | 6004 | 8654 | 11562 |

ASH - INITIAL DEFORMATION ..... 2460 F
SOFTENING TEMP. ..... 2510 F
FLUID TEMP. ..... 2640 F

SULFUR FORMS
SULFATE ..... N
PYRITIC ..... N
ORGANIC ..... N

MISCELLANEOUS COMMENTS:

COUNTY: LEWIS

SAMPLE NUMBER: (143)55-80

COAL NAME: UNNAMED

MINE NAME: NONE
COAL AREA: CENTRALIA
SAMPLE SITE ELEVATION (FT): 400

QUARTER SECTION: NE SECTION: 36
TOWNSHIP: 15N RANGE: 01W
QUADRANGLE: CENTRALIA 15

GEOLOGIC FORMATION: SKOOKUMCHUCK
AGE: EOCENE

STRIKE: N70W DIP: 20NE
MAJOR JOINTS IN COAL: N27W 79N

EXPOSURE TYPE: STREAMCUT
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: WEATHERED

TOTAL SECTION MEASURED (FT): 3.7
COAL THICKNESS (FT): 1.2
SAMPLE THICKNESS (FT): 1.2

OVERBURDEN THICKNESS (FT): 5
SAMPLE COLLECTOR: VONHEEDER (DGER)

DATE OF SAMPLING: 08-13-80
DATE OF ANALYSIS: 10-08-80

LABORATORY: C.T. & E. CO.

LAB. NUMBER: 72-978

AIR DRY LOSS: N

| | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 18.6 | 31.0 | N/A |
| VOLATILE MATTER | 26.3 | 44.0 | 64.1 |
| FIXED CARBON | 18.2 | 30.3 | 44.2 |
| ASH | 36.9 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 4.5 | 5.4 | 5.4 |
| CARBON | 27.7 | 46.3 | 67.5 |
| NITROGEN | 0.6 | 0.6 | 0.9 |
| SULFUR | 1.6 | N/A | N/A |
| OXYGEN(IND) | 28.8 | 48.2 | 29.6 |
| HEATING VALUE (BTU/LB) | 4549 | 7540 | 10989 |

| | | |
|---|---|---|
| ASH - INITIAL DEFORMATION | >2580 | F |
| SOFTENING TEMP. | >2650 | F |
| FLUID TEMP. | >2700 | F |

| | |
|---|---|
| SULFUR FORMS | |
| SULFATE | N |
| PYRITIC | N |
| ORGANIC | N |

MISCELLANEOUS COMMENTS:

COUNTY: LEWIS

SAMPLE NUMBER: (144)56-80

COAL NAME: UNNAMED

MINE NAME: NONE
COAL AREA: CENTRALIA
SAMPLE SITE ELEVATION (FT): 400

QUARTER SECTION: NE SECTION: 36
TOWNSHIP: 15N RANGE: 01W
QUADRANGLE: CENTRALIA 15

GEOLOGIC FORMATION: SKOOKUMCHUCK
AGE: EOCENE

STRIKE: N35W DIP: 22NE
MAJOR JOINTS IN COAL: N78W 76S

EXPOSURE TYPE: STREAMCUT
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: WEATHERED

TOTAL SECTION MEASURED (FT): 6.7
COAL THICKNESS (FT): 4.3
SAMPLE THICKNESS (FT): 4.3

OVERBURDEN THICKNESS (FT): 50
SAMPLE COLLECTOR: VONHEEDER (DGER)

DATE OF SAMPLING: 08-19-80
DATE OF ANALYSIS: 10-08-80

LABORATORY: C.T. & E. CO.

LAB. NUMBER: 72-978

| AIR DRY LOSS: N | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 12.2 | 28.2 | N/A |
| VOLATILE MATTER | 19.1 | 44.7 | 63.1 |
| FIXED CARBON | 16.2 | 37.8 | 53.3 |
| ASH | 52.5 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 3.3 | 5.2 | 5.2 |
| CARBON | 22.3 | 52.4 | 73.9 |
| NITROGEN | 0.6 | 0.5 | 0.7 |
| SULFUR | 2.7 | N/A | N/A |
| OXYGEN(IND) | 18.7 | 43.8 | 25.2 |
| HEATING VALUE (BTU/LB) | 3695 | 8514 | 12021 |

ASH - INITIAL DEFORMATION ..... >2420 F
SOFTENING TEMP. ..... >2475 F
FLUID TEMP. ..... >2700 F

SULFUR FORMS
SULFATE ..... N
PYRITIC ..... N
ORGANIC ..... N

MISCELLANEOUS COMMENTS:

COUNTY: LEWIS

SAMPLE NUMBER: (154)05-81

COAL NAME: UPPER THOMPSON

MINE NAME: NONE
COAL AREA: CENTRALIA
SAMPLE SITE ELEVATION (FT): 400

QUARTER SECTION: NE SECTION: 36
TOWNSHIP: 15N RANGE: 01W
QUADRANGLE: CENTRALIA 15

GEOLOGIC FORMATION: SKOOKUMCHUCK
AGE: EOCENE

STRIKE: N85W DIP: 15NE
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: STREAMCUT
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: FRESH

TOTAL SECTION MEASURED (FT): N
COAL THICKNESS (FT): 22.1
SAMPLE THICKNESS (FT): 7.5

OVERBURDEN THICKNESS (FT): 100
SAMPLE COLLECTOR: VONHEEDER (DGER)

DATE OF SAMPLING: 05-22-81
DATE OF ANALYSIS: 07-02-81

LABORATORY: C.T. & E. CO.

LAB. NUMBER: 72-107

| | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| AIR DRY LOSS: N | | | |
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 25.0 | 30.2 | N/A |
| VOLATILE MATTER | 30.2 | 36.5 | 52.5 |
| FIXED CARBON | 28.9 | 34.9 | 50.2 |
| ASH | 15.9 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 5.8 | 5.0 | 5.0 |
| CARBON | 40.5 | 49.1 | 70.5 |
| NITROGEN | 0.7 | 0.7 | 0.9 |
| SULFUR | 1.1 | N/A | N/A |
| OXYGEN(IND) | 36.1 | 43.7 | 24.0 |
| HEATING VALUE (BTU/LB) | 6769 | 8166 | 11733 |

ASH - INITIAL DEFORMATION ..... 2520 F
SOFTENING TEMP. ..... 2570 F
FLUID TEMP. ..... 2670 F

SULFUR FORMS
SULFATE ..... N
PYRITIC ..... N
ORGANIC ..... N

MISCELLANEOUS COMMENTS: SAMPLE FROM DEPT. NATURAL RESOURCES ADMINISTERED LANDS. CORRELATION OF COAL WITH UPPER THOMPSON SEAM IS UNCERTAIN.

COUNTY: LEWIS

SAMPLE NUMBER: (155)06-81

COAL NAME: SMITH

MINE NAME: NONE
COAL AREA: CENTRALIA
SAMPLE SITE ELEVATION (FT): N

QUARTER SECTION: NE SECTION: 36
TOWNSHIP: 15N RANGE: 01W
QUADRANGLE: CENTRALIA 15

GEOLOGIC FORMATION: SKOOKUMCHUCK
AGE: EOCENE

STRIKE: N/A DIP: N/A
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: STREAMCUT
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: WEATHERED

TOTAL SECTION MEASURED (FT): N
COAL THICKNESS (FT): N
SAMPLE THICKNESS (FT): N

OVERBURDEN THICKNESS (FT): N
SAMPLE COLLECTOR: PARKIN (PRIVATE)

DATE OF SAMPLING: UNKNOWN
DATE OF ANALYSIS: 03-27-79

LABORATORY: BENNETT

LAB. NUMBER: NONE

| AIR DRY LOSS: N | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 20.9 | N | N/A |
| VOLATILE MATTER | 36.1 | N | N |
| FIXED CARBON | 38.5 | N | N |
| ASH | 4.5 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | N | N | N |
| CARBON | N | N | N |
| NITROGEN | N | N | N |
| SULFUR | N | N/A | N/A |
| OXYGEN(IND) | N | N | N |
| HEATING VALUE (BTU/LB) | 9599 | N | N |

ASH - INITIAL DEFORMATION ..... N F
SOFTENING TEMP. ..... N F
FLUID TEMP. ..... N F

SULFUR FORMS
SULFATE ..... N
PYRITIC ..... N
ORGANIC ..... N

MISCELLANEOUS COMMENTS: SAMPLED BY NON-DGER PERSONNEL.

COUNTY: LEWIS

SAMPLE NUMBER: (156)07-81

COAL NAME: BIG THOMPSON

MINE NAME: NONE
COAL AREA: CENTRALIA
SAMPLE SITE ELEVATION (FT): N

QUARTER SECTION: NE SECTION: 36
TOWNSHIP: 15N RANGE: 01W
QUADRANGLE: CENTRALIA 15

GEOLOGIC FORMATION: SKOOKUMCHUCK
AGE: EOCENE

STRIKE: N/A DIP: N/A
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: STREAMCUT
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: WEATHERED

TOTAL SECTION MEASURED (FT): N
COAL THICKNESS (FT): N
SAMPLE THICKNESS (FT): N

OVERBURDEN THICKNESS (FT): N
SAMPLE COLLECTOR: PARKIN (PRIVATE)

DATE OF SAMPLING: UNKNOWN
DATE OF ANALYSIS: 03-27-79

LABORATORY: BENNETT

LAB. NUMBER: NONE

AIR DRY LOSS: N

| | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 19.4 | N | N/A |
| VOLATILE MATTER | 39.7 | N | N |
| FIXED CARBON | 31.6 | N | N |
| ASH | 9.3 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | N | N | N |
| CARBON | N | N | N |
| NITROGEN | N | N | N |
| SULFUR | N | N/A | N/A |
| OXYGEN(IND) | N | N | N |

HEATING VALUE (BTU/LB) ... 10268 ..... N ..... N

ASH - INITIAL DEFORMATION ..... N F
SOFTENING TEMP. ..... N F
FLUID TEMP. ..... N F

SULFUR FORMS
SULFATE ..... N
PYRITIC ..... N
ORGANIC ..... N

MISCELLANEOUS COMMENTS: SAMPLED BY NON-DGER PERSONNEL.

COUNTY: LEWIS

SAMPLE NUMBER: (158)09-81 COAL NAME: UNNAMED

MINE NAME: NONE
COAL AREA: VADER-WINLOCK
SAMPLE SITE ELEVATION (FT): 330

QUARTER SECTION: SW SECTION: 9
TOWNSHIP: 12N RANGE: 03W
QUADRANGLE: ADNA 15

GEOLOGIC FORMATION: LINCOLN CREEK
AGE: EOCENE

STRIKE: N87E DIP: 11NW
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: DRILL-HOLE
SAMPLE TYPE: CUTTINGS
SAMPLE CONDITION: FRESH

TOTAL SECTION MEASURED (FT): N
COAL THICKNESS (FT): 40.0
SAMPLE THICKNESS (FT): N

OVERBURDEN THICKNESS (FT): 125
SAMPLE COLLECTOR: VONHEEDER (DGER)

DATE OF SAMPLING: 04-07-81
DATE OF ANALYSIS: 07-02-81

LABORATORY: C.T. & E. CO.

LAB. NUMBER: 72-107

| AIR DRY LOSS: N | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 11.6 | 13.1 | N/A |
| VOLATILE MATTER | 41.4 | 47.2 | 54.4 |
| FIXED CARBON | 35.9 | 40.9 | 47.2 |
| ASH | 11.1 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 5.6 | 5.4 | 5.4 |
| CARBON | 54.3 | 62.0 | 71.5 |
| NITROGEN | 1.0 | 0.9 | 1.1 |
| SULFUR | 1.3 | N/A | N/A |
| OXYGEN(IND) | 26.8 | 30.5 | 21.5 |
| HEATING VALUE (BTU/LB) | 9361 | 10649 | 12281 |

ASH - INITIAL DEFORMATION ..... 2120 F
SOFTENING TEMP. ..... 2160 F
FLUID TEMP. ..... 2200 F

SULFUR FORMS
SULFATE ..... N
PYRITIC ..... N
ORGANIC ..... N

MISCELLANEOUS COMMENTS: SAMPLE FROM DRILL-HOLE.

COUNTY: LEWIS

SAMPLE NUMBER: (159)10-81

COAL NAME: SUMMIT CREEK

MINE NAME: WEIKEL
COAL AREA: SUMMIT CREEK
SAMPLE SITE ELEVATION (FT): 3120

QUARTER SECTION: NE SECTION: 13
TOWNSHIP: 14N RANGE: 10E
QUADRANGLE: WHITE PASS 15

GEOLOGIC FORMATION: PUGET GROUP
AGE: EOCENE

STRIKE: N-S DIP: 90
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: STREAMCUT
SAMPLE TYPE: GRAB
SAMPLE CONDITION: WEATHERED

TOTAL SECTION MEASURED (FT): N
COAL THICKNESS (FT): N
SAMPLE THICKNESS (FT): N

OVERBURDEN THICKNESS (FT): N
SAMPLE COLLECTOR: PHILLIPS (DGER)

DATE OF SAMPLING: 06-05-81
DATE OF ANALYSIS: 08-31-81

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: L08722

| AIR DRY LOSS: 2.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 4.3 | 6.3 | N/A |
| VOLATILE MATTER | 9.4 | 13.9 | 14.9 |
| FIXED CARBON | 55.9 | 83.5 | 89.2 |
| ASH | 30.4 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 3.3 | 4.4 | 4.4 |
| CARBON | 57.6 | 86.0 | 92.0 |
| NITROGEN | 1.1 | 1.5 | 1.6 |
| SULFUR | 0.6 | N/A | N/A |
| OXYGEN(IND) | 7.1 | 10.5 | 5.1 |
| HEATING VALUE (BTU/LB) | 9657 | 14403 | 15394 |

ASH - INITIAL DEFORMATION N F
SOFTENING TEMP. N F
FLUID TEMP. N F

SULFUR FORMS
SULFATE N
PYRITIC N
ORGANIC N

MISCELLANEOUS COMMENTS: SAMPLE FROM PORTAL AREA OF ABANDONED WATER LEVEL DRIFT. BRIGHT ORANGE IRON(?) STAINING PRESENT NEAR PORTAL. DUE TO SHEARING ALONG BEDDING PLANES, COAL EASILY CONFUSED WITH SHEARED CARB. SHALES.

COUNTY: PIERCE

SAMPLE NUMBER: (010)06-76

COAL NAME: WILKESON #6

MINE NAME: NONE
COAL AREA: WILKESON
SAMPLE SITE ELEVATION (FT): 1370

QUARTER SECTION: SW SECTION: 2
TOWNSHIP: 18N RANGE: 06E
QUADRANGLE: WILKESON 7.5

GEOLOGIC FORMATION: CARBONADO
AGE: EOCENE

STRIKE: N82W DIP: 48NE
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: ROAD CUT
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: FRESH

TOTAL SECTION MEASURED (FT): 14.7
COAL THICKNESS (FT): 9.4
SAMPLE THICKNESS (FT): 9.4

OVERBURDEN THICKNESS (FT): 175
SAMPLE COLLECTOR: VONHEEDER (DGER)

DATE OF SAMPLING: 08-03-76
DATE OF ANALYSIS: 01-13-77

LABORATORY: USBM

LAB. NUMBER: K69674

| AIR DRY LOSS: 6.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 11.8 | 16.3 | N/A |
| VOLATILE MATTER | 18.4 | 25.5 | 30.6 |
| FIXED CARBON | 43.9 | 61.1 | 73.1 |
| ASH | 25.9 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 3.8 | 4.0 | 4.0 |
| CARBON | 47.8 | 66.5 | 79.7 |
| NITROGEN | 1.8 | 2.4 | 2.9 |
| SULFUR | 0.6 | N/A | N/A |
| OXYGEN(IND) | 20.1 | 27.9 | 15.9 |
| HEATING VALUE (BTU/LB) | 7839 | 10892 | 13037 |

ASH - INITIAL DEFORMATION ..... >2800 F
SOFTENING TEMP. ..... >2800 F
FLUID TEMP. ..... >2800 F

SULFUR FORMS
SULFATE ..... 0.01
PYRITIC ..... 0.15
ORGANIC ..... 0.41

MISCELLANEOUS COMMENTS:

COUNTY: PIERCE

SAMPLE NUMBER: (011)07-76

COAL NAME: WILKESON NO. 7

MINE NAME: NONE
COAL AREA: WILKESON
SAMPLE SITE ELEVATION (FT): 1400

QUARTER SECTION: SW SECTION: 2
TOWNSHIP: 18N RANGE: 06E
QUADRANGLE: WILKESON 7.5

GEOLOGIC FORMATION: CARBONADO
AGE: EOCENE

STRIKE: N82W DIP: 48NE
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: ROADCUT
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: FRESH

TOTAL SECTION MEASURED (FT): 9.4
COAL THICKNESS (FT): 6.2
SAMPLE THICKNESS (FT): 6.2

OVERBURDEN THICKNESS (FT): 40
SAMPLE COLLECTOR: VONHEEDER (DGER)

DATE OF SAMPLING: 08-03-76
DATE OF ANALYSIS: 01-13-77

LABORATORY: USBM

LAB. NUMBER: K69675

| AIR DRY LOSS: 4.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 5.0 | 6.5 | N/A |
| VOLATILE MATTER | 17.0 | 22.6 | 24.2 |
| FIXED CARBON | 55.1 | 73.4 | 78.7 |
| ASH | 22.9 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 4.3 | 5.2 | 5.2 |
| CARBON | 62.2 | 82.9 | 88.9 |
| NITROGEN | 1.9 | 2.4 | 2.6 |
| SULFUR | 0.7 | N/A | N/A |
| OXYGEN(IND) | 8.0 | 10.5 | 4.9 |
| HEATING VALUE (BTU/LB) | 10931 | 14551 | 15592 |

ASH - INITIAL DEFORMATION ..... >2800 F
SOFTENING TEMP. ..... >2800 F
FLUID TEMP. ..... >2800 F

SULFUR FORMS
SULFATE ..... 0.01
PYRITIC ..... 0.26
ORGANIC ..... 0.43

MISCELLANEOUS COMMENTS: APPROXIMATELY 2 FT. WEATHERED COAL EXCAVATED BEFORE SAMPLING.

COUNTY: PIERCE

SAMPLE NUMBER: (012)08-76 COAL NAME: NISQUALLY #8

MINE NAME: MASHELL #1
COAL AREA: ASHFORD
SAMPLE SITE ELEVATION (FT): 1720

QUARTER SECTION: NW SECTION: 27
TOWNSHIP: 15N RANGE: 06E
QUADRANGLE: KAPOWSIN 15

GEOLOGIC FORMATION: PUGET GROUP
AGE: EOCENE

STRIKE: N/A DIP: N/A
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: MINE DUMP
SAMPLE TYPE: GRAB
SAMPLE CONDITION: WEATHERED

TOTAL SECTION MEASURED (FT): N
COAL THICKNESS (FT): N
SAMPLE THICKNESS (FT): N

OVERBURDEN THICKNESS (FT): N
SAMPLE COLLECTOR: VONHEEDER (DGER)

DATE OF SAMPLING: 08-19-76
DATE OF ANALYSIS: 01-10-77

LABORATORY: USBM

LAB. NUMBER: K69490

| AIR DRY LOSS: 0.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 2.4 | 3.2 | N/A |
| VOLATILE MATTER | 22.8 | 31.1 | 32.2 |
| FIXED CARBON | 50.1 | 68.5 | 70.8 |
| ASH | 24.7 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 4.2 | 5.4 | 5.4 |
| CARBON | 60.8 | 83.2 | 86.0 |
| NITROGEN | 1.6 | 2.1 | 2.1 |
| SULFUR | 0.6 | N/A | N/A |
| OXYGEN(IND) | 8.2 | 11.1 | 8.5 |
| HEATING VALUE (BTU/LB) | 10669 | 14575 | 15071 |

ASH - INITIAL DEFORMATION >2800 F
SOFTENING TEMP. >2800 F
FLUID TEMP. >2800 F

SULFUR FORMS
SULFATE 0.01
PYRITIC 0.17
ORGANIC 0.38

MISCELLANEOUS COMMENTS: MINE CLOSED SINCE 1925. 3-4 FT. DUMP MATERIAL EXCAVATED BEFORE SAMPLING.

COUNTY: SKAGIT

SAMPLE NUMBER: (017)01-77

COAL NAME: CUMBERLAND #2

MINE NAME: #2 TUNNEL
COAL AREA: HAMILTON
SAMPLE SITE ELEVATION (FT): 450

QUARTER SECTION: SE SECTION: 22
TOWNSHIP: 35N RANGE: 06E
QUADRANGLE: HAMILTON 15

GEOLOGIC FORMATION: CHUCKANUT
AGE: CRETACEOUS-TERTIARY

STRIKE: N25W DIP: 47SW
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: TUNNEL
SAMPLE TYPE: GRAB
SAMPLE CONDITION: FRESH

TOTAL SECTION MEASURED (FT): N
COAL THICKNESS (FT): N
SAMPLE THICKNESS (FT): N

OVERBURDEN THICKNESS (FT): 200
SAMPLE COLLECTOR: VONHEEDER (DGER)

DATE OF SAMPLING: 03-10-77
DATE OF ANALYSIS: 07-20-77

LABORATORY: USBM

LAB. NUMBER: K74812

| AIR DRY LOSS: 1.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 2.3 | 3.9 | N/A |
| VOLATILE MATTER | 15.7 | 27.6 | 28.8 |
| FIXED CARBON | 42.1 | 74.3 | 77.5 |
| ASH | 39.9 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 3.2 | 5.2 | 5.2 |
| CARBON | 50.8 | 89.7 | 93.6 |
| NITROGEN | 0.7 | 1.0 | 1.1 |
| SULFUR | 0.8 | N/A | N/A |
| OXYGEN(IND) | 4.6 | 7.9 | 4.5 |
| HEATING VALUE (BTU/LB) | 8673 | 15288 | 15937 |

ASH - INITIAL DEFORMATION ..... 2100 F
SOFTENING TEMP. ..... 2195 F
FLUID TEMP. ..... 2395 F

SULFUR FORMS
SULFATE ..... 0.01
PYRITIC ..... 0.43
ORGANIC ..... 0.37

MISCELLANEOUS COMMENTS: FROM BASAL PORTION OF CHUCKANUT FM. #2 TUNNEL OPEN FOR 225 FT. SAMPLE FROM CAVED AREA AT END OF TUNNEL. SEAM THICKNESS NOT DETERMINED DUE TO SLUMPING AT SAMPLE POINT.

COUNTY: SKAGIT

SAMPLE NUMBER: (018)02-77

COAL NAME: CUMBERLAND #1

MINE NAME: #2 TUNNEL
COAL AREA: HAMILTON
SAMPLE SITE ELEVATION (FT): 450

QUARTER SECTION: SE SECTION: 22
TOWNSHIP: 35N RANGE: 06E
QUADRANGLE: HAMILTON 15

GEOLOGIC FORMATION: CHUCKANUT
AGE: CRETACEOUS-TERTIARY

STRIKE: N25W DIP: 47SW
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: TUNNEL
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: FRESH

TOTAL SECTION MEASURED (FT): 1.6
COAL THICKNESS (FT): 1.6
SAMPLE THICKNESS (FT): 1.6

OVERBURDEN THICKNESS (FT): 200
SAMPLE COLLECTOR: VONHEEDER (DGER)

DATE OF SAMPLING: 03-10-77
DATE OF ANALYSIS: 07-20-77

LABORATORY: USBM

LAB. NUMBER: K74813

| AIR DRY LOSS: 6.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 7.6 | 13.4 | N/A |
| VOLATILE MATTER | 16.7 | 29.8 | 34.5 |
| FIXED CARBON | 35.1 | 62.8 | 72.7 |
| ASH | 40.6 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 3.3 | 4.9 | 4.9 |
| CARBON | 43.9 | 78.5 | 90.9 |
| NITROGEN | 0.7 | 1.1 | 1.2 |
| SULFUR | 0.7 | N/A | N/A |
| OXYGEN(IND) | 10.8 | 19.2 | 8.2 |
| HEATING VALUE (BTU/LB) | 7366 | 13146 | 15220 |

ASH - INITIAL DEFORMATION ..... 2200 F
SOFTENING TEMP. ..... 2290 F
FLUID TEMP. ..... 2410 F

SULFUR FORMS
SULFATE ..... 0.01
PYRITIC ..... 0.46
ORGANIC ..... 0.25

MISCELLANEOUS COMMENTS: SAMPLE FROM END OF #2 TUNNEL. 10 FT. DOWN-SECTION FROM (017)01-77. MEASURED SECTION CORRELATED WITH SECTION OF (019)03-77.

COUNTY: SKAGIT

SAMPLE NUMBER: (019)03-77

COAL NAME: CUMBERLAND #1

MINE NAME: NONE
COAL AREA: HAMILTON
SAMPLE SITE ELEVATION (FT): 500

QUARTER SECTION: SE SECTION: 22
TOWNSHIP: 35N RANGE: 06E
QUADRANGLE: HAMILTON 15

GEOLOGIC FORMATION: CHUCKANUT
AGE: CRETACEOUS-TERTIARY

STRIKE: N40W DIP: 45SW
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: ROADCUT
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: WEATHERED

TOTAL SECTION MEASURED (FT): 3.0
COAL THICKNESS (FT): 2.4
SAMPLE THICKNESS (FT): 2.4

OVERBURDEN THICKNESS (FT): 0
SAMPLE COLLECTOR: VONHEEDER (DGER)

DATE OF SAMPLING: 03-10-77
DATE OF ANALYSIS: 07-20-77

LABORATORY: USBM

LAB. NUMBER: K74814

| AIR DRY LOSS: 4.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 5.4 | 10.5 | N/A |
| VOLATILE MATTER | 13.3 | 26.1 | 29.3 |
| FIXED CARBON | 35.8 | 70.7 | 79.2 |
| ASH | 45.5 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 3.2 | 5.5 | 5.5 |
| CARBON | 43.9 | 86.8 | 97.2 |
| NITROGEN | 0.7 | 1.2 | 1.3 |
| SULFUR | 0.7 | N/A | N/A |
| OXYGEN(IND) | 7.9 | 15.4 | 6.6 |
| HEATING VALUE (BTU/LB) | 7156 | 14108 | 15798 |

ASH - INITIAL DEFORMATION ..... 2440 F
SOFTENING TEMP. ..... 2555 F
FLUID TEMP. ..... 2670 F

SULFUR FORMS
SULFATE ..... 0.01
PYRITIC ..... 0.43
ORGANIC ..... 0.26

MISCELLANEOUS COMMENTS: 2 FT. WEATHERED MATERIAL EXCAVATED BEFORE SAMPLING. ROADCUT LOCATED AT CUMBERLAND CREEK BRIDGE. MEASURED SECTION CORRELATED WITH #2 TUNNEL SECTION (SAMPLE (018)02-77).

COUNTY: SKAGIT

SAMPLE NUMBER: (037)11-78

COAL NAME: CUMBERLAND #3

MINE NAME: TUNNEL #3 (?)
COAL AREA: HAMILTON
SAMPLE SITE ELEVATION (FT): 1500

QUARTER SECTION: SE SECTION: 23
TOWNSHIP: 35N RANGE: 06E
QUADRANGLE: HAMILTON 15

GEOLOGIC FORMATION: CHUCKANUT
AGE: CRETACEOUS-TERTIARY

STRIKE: N15W DIP: 12SW
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: TUNNEL
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: FRESH

TOTAL SECTION MEASURED (FT): N
COAL THICKNESS (FT): 2.0
SAMPLE THICKNESS (FT): 2.0

OVERBURDEN THICKNESS (FT): 45
SAMPLE COLLECTOR: VONHEEDER (DGER)

DATE OF SAMPLING: 10-10-78
DATE OF ANALYSIS: 05-18-78

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: K92618

| AIR DRY LOSS: 3.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 4.3 | 12.6 | N/A |
| VOLATILE MATTER | 10.0 | 29.5 | 33.8 |
| FIXED CARBON | 24.5 | 72.6 | 83.3 |
| ASH | 61.2 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 2.6 | 7.0 | 7.0 |
| CARBON | 27.8 | 82.4 | 94.5 |
| NITROGEN | 0.6 | 1.6 | 1.8 |
| SULFUR | 0.5 | N/A | N/A |
| OXYGEN(IND) | 7.3 | 21.5 | 11.6 |
| HEATING VALUE (BTU/LB) | 4080 | 12058 | 13826 |

ASH - INITIAL DEFORMATION ..... 2460 F
SOFTENING TEMP. ..... 2560 F
FLUID TEMP. ..... 2650 F

SULFUR FORMS
SULFATE ..... 0.01
PYRITIC ..... 0.21
ORGANIC ..... 0.26

MISCELLANEOUS COMMENTS: TUNNEL FLOODED FOR 79 YEARS. RIGHT-ENTRY SAMPLE. SEE (040)14-78 AND (041)15-78 FOR ANALYSES FROM SAME LOCATION.

COUNTY: SKAGIT

SAMPLE NUMBER: (038)12-78

COAL NAME: CUMBERLAND #1

MINE NAME: NONE
COAL AREA: HAMILTON
SAMPLE SITE ELEVATION (FT): 500

QUARTER SECTION: SE SECTION: 23
TOWNSHIP: 35N RANGE: 06E
QUADRANGLE: HAMILTON 15

GEOLOGIC FORMATION: CHUCKANUT
AGE: CRETACEOUS-TERTIARY

STRIKE: N40W DIP: 45SW
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: ROADCUT
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: WEATHERED

TOTAL SECTION MEASURED (FT): 3.0
COAL THICKNESS (FT): 2.3
SAMPLE THICKNESS (FT): 2.3

OVERBURDEN THICKNESS (FT): 0
SAMPLE COLLECTOR: VONHEEDER (DGER)

DATE OF SAMPLING: 10-10-78
DATE OF ANALYSIS: 05-17-78

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: K92621

| AIR DRY LOSS: 0.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 1.6 | 3.0 | N/A |
| VOLATILE MATTER | 15.6 | 30.9 | 31.9 |
| FIXED CARBON | 37.0 | 73.5 | 75.9 |
| ASH | 45.8 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 2.8 | 5.2 | 5.2 |
| CARBON | 44.5 | 88.5 | 91.4 |
| NITROGEN | 0.8 | 1.4 | 1.5 |
| SULFUR | 0.6 | N/A | N/A |
| OXYGEN(IND) | 5.5 | 10.8 | 8.2 |
| HEATING VALUE (BTU/LB) | 7418 | 14715 | 15200 |

ASH - INITIAL DEFORMATION ..... 2120 F
SOFTENING TEMP. ..... 2210 F
FLUID TEMP. ..... 2320 F

SULFUR FORMS
SULFATE ..... 0.00
PYRITIC ..... 0.20
ORGANIC ..... 0.40

MISCELLANEOUS COMMENTS: SAME LOCALITY AND COAL AS (019)03-77.

COUNTY: SKAGIT

SAMPLE NUMBER: (039)13-78

COAL NAME: CUMBERLAND #1

MINE NAME: TUNNEL #2
COAL AREA: HAMILTON
SAMPLE SITE ELEVATION (FT): 450

QUARTER SECTION: SE SECTION: 23
TOWNSHIP: 35N RANGE: 06E
QUADRANGLE: HAMILTON 15

GEOLOGIC FORMATION: CHUCKANUT
AGE: CRETACEOUS-TERTIARY

STRIKE: N20W DIP: 65SW
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: TUNNEL
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: FRESH

TOTAL SECTION MEASURED (FT): 2.7
COAL THICKNESS (FT): 2.7
SAMPLE THICKNESS (FT): 2.7

OVERBURDEN THICKNESS (FT): 200
SAMPLE COLLECTOR: VONHEEDER (DGER)

DATE OF SAMPLING: 10-25-78
DATE OF ANALYSIS: 05-17-78

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: K92622

| AIR DRY LOSS: 5.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 6.4 | 11.4 | N/A |
| VOLATILE MATTER | 11.3 | 20.3 | 23.0 |
| FIXED CARBON | 41.1 | 74.4 | 84.1 |
| ASH | 41.2 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 3.4 | 5.3 | 5.3 |
| CARBON | 45.0 | 81.5 | 92.2 |
| NITROGEN | 0.9 | 1.4 | 1.6 |
| SULFUR | 0.7 | N/A | N/A |
| OXYGEN(IND) | 8.7 | 15.6 | 6.0 |
| HEATING VALUE (BTU/LB) | 7776 | 14044 | 15889 |

ASH - INITIAL DEFORMATION ..... >2620 F
SOFTENING TEMP. ..... >2710 F
FLUID TEMP. ..... >2800 F

SULFUR FORMS
SULFATE ..... N
PYRITIC ..... N
ORGANIC ..... N

MISCELLANEOUS COMMENTS: SAMPLED 180 FT. FROM PORTAL INSIDE TUNNEL.

COUNTY: SKAGIT

SAMPLE NUMBER: (040)14-78

COAL NAME: CUMBERLAND #3

MINE NAME: TUNNEL #3
COAL AREA: HAMILTON
SAMPLE SITE ELEVATION (FT): 1500

QUARTER SECTION: SE SECTION: 23
TOWNSHIP: 35N RANGE: 06E
QUADRANGLE: HAMILTON 15

GEOLOGIC FORMATION: CHUCKANUT
AGE: CRETACEOUS-TERTIARY

STRIKE: N01W DIP: 12W
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: TUNNEL
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: FRESH

TOTAL SECTION MEASURED (FT): 2.8
COAL THICKNESS (FT): 2.8
SAMPLE THICKNESS (FT): 2.8

OVERBURDEN THICKNESS (FT): 45
SAMPLE COLLECTOR: VONHEEDER (DGER)

DATE OF SAMPLING: 10-25-78
DATE OF ANALYSIS: 05-17-78

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: K92619

| AIR DRY LOSS: 5.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 6.0 | 10.6 | N/A |
| VOLATILE MATTER | 12.3 | 21.9 | 24.5 |
| FIXED CARBON | 41.1 | 73.5 | 82.3 |
| ASH | 40.6 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 3.6 | 5.7 | 5.7 |
| CARBON | 46.3 | 82.8 | 92.8 |
| NITROGEN | 0.8 | 1.3 | 1.4 |
| SULFUR | 0.6 | N/A | N/A |
| OXYGEN(IND) | 8.0 | 14.2 | 5.2 |
| HEATING VALUE (BTU/LB) | 7898 | 14095 | 15792 |

ASH - INITIAL DEFORMATION ..... 2320 F
SOFTENING TEMP. ..... 2410 F
FLUID TEMP. ..... 2500 F

SULFUR FORMS
SULFATE ..... 0.01
PYRITIC ..... 0.19
ORGANIC ..... 0.45

MISCELLANEOUS COMMENTS: SEE (037)11-78 AND (41)15-78 FOR ANALYSES FROM SAME LOCATION.

COUNTY: SKAGIT

SAMPLE NUMBER: (041)15-78

COAL NAME: CUMBERLAND #3

MINE NAME: TUNNEL #3
COAL AREA: HAMILTON
SAMPLE SITE ELEVATION (FT): 1500

QUARTER SECTION: SE SECTION: 23
TOWNSHIP: 35N RANGE: 06E
QUADRANGLE: HAMILTON 15

GEOLOGIC FORMATION: CHUCKANUT
AGE: CRETACEOUS-TERTIARY

STRIKE: N15W DIP: 12SW
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: TUNNEL
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: FRESH

TOTAL SECTION MEASURED (FT): 1.8
COAL THICKNESS (FT): 1.8
SAMPLE THICKNESS (FT): 1.8

OVERBURDEN THICKNESS (FT): 45
SAMPLE COLLECTOR: VONHEEDER (DGER)

DATE OF SAMPLING: 10-25-78
DATE OF ANALYSIS: 05-17-78

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: K92620

| AIR DRY LOSS: 4.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 5.1 | 11.5 | N/A |
| VOLATILE MATTER | 10.7 | 24.3 | 27.5 |
| FIXED CARBON | 32.4 | 73.8 | 83.6 |
| ASH | 51.8 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 3.5 | 7.4 | 7.4 |
| CARBON | 35.8 | 81.6 | 92.4 |
| NITROGEN | 0.7 | 1.4 | 1.6 |
| SULFUR | 0.5 | N/A | N/A |
| OXYGEN(IND) | 7.7 | 17.4 | 8.0 |
| HEATING VALUE (BTU/LB) | 6102 | 13880 | 15711 |

| | | |
|---|---|---|
| ASH - INITIAL DEFORMATION | 2510 | F |
| SOFTENING TEMP. | 2610 | F |
| FLUID TEMP. | 2710 | F |

| SULFUR FORMS | |
|---|---|
| SULFATE | 0.01 |
| PYRITIC | 0.17 |
| ORGANIC | 0.35 |

MISCELLANEOUS COMMENTS: SEE (037)11-78 AND (040)14-78 FOR ANALYSES FROM SAME LOCATION.

COUNTY: SKAGIT

SAMPLE NUMBER: (042)16-78

COAL NAME: UNNAMED

MINE NAME: NONE
COAL AREA: HAMILTON
SAMPLE SITE ELEVATION (FT): 3560

QUARTER SECTION: NW
TOWNSHIP: 34N
QUADRANGLE: OSO 15

SECTION: 18
RANGE: 07E

GEOLOGIC FORMATION: CHUCKANUT
AGE: CRETACEOUS-TERTIARY

STRIKE: N15W
DIP: 53SW
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: ROADCUT
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: FRESH

TOTAL SECTION MEASURED (FT): 7.5
COAL THICKNESS (FT): 1.5
SAMPLE THICKNESS (FT): 1.5

OVERBURDEN THICKNESS (FT): 2
SAMPLE COLLECTOR: VONHEEDER (DGER)

DATE OF SAMPLING: 10-25-78
DATE OF ANALYSIS: 05-18-79

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: K92623

| AIR DRY LOSS: 12.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 18.2 | 25.8 | N/A |
| VOLATILE MATTER | 22.0 | 31.3 | 42.2 |
| FIXED CARBON | 32.4 | 46.1 | 62.3 |
| ASH | 27.4 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 4.7 | 5.0 | 5.0 |
| CARBON | 42.6 | 60.7 | 81.9 |
| NITROGEN | 0.8 | 1.0 | 1.4 |
| SULFUR | 0.6 | N/A | N/A |
| OXYGEN(IND) | 23.9 | 34.0 | 14.7 |
| HEATING VALUE (BTU/LB) | 7129 | 10130 | 13684 |

ASH - INITIAL DEFORMATION ..... >2800 F
SOFTENING TEMP. ..... >2800 F
FLUID TEMP. ..... >2800 F

SULFUR FORMS
SULFATE ..... 0.03
PYRITIC ..... 0.08
ORGANIC ..... 0.46

MISCELLANEOUS COMMENTS: ONLY BOTTOM 1.5 FT. OF A BONEY AND IMPURE SEAM SAMPLED.

COUNTY: SKAGIT

SAMPLE NUMBER: (043)17-78 COAL NAME: UNNAMED

MINE NAME: NONE
COAL AREA: DEFOREST CREEK
SAMPLE SITE ELEVATION (FT): 2100

QUARTER SECTION: NW SECTION: 36
TOWNSHIP: 34N RANGE: 07E
QUADRANGLE: OSO 15

GEOLOGIC FORMATION: CHUCKANUT
AGE: CRETACEOUS-TERTIARY

STRIKE: N02E DIP: 47NW
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: STREAMCUT
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: FRESH

TOTAL SECTION MEASURED (FT): 2.7
COAL THICKNESS (FT): 2.7
SAMPLE THICKNESS (FT): 2.7

OVERBURDEN THICKNESS (FT): 35
SAMPLE COLLECTOR: VONHEEDER (DGER)

DATE OF SAMPLING: 10-26-78
DATE OF ANALYSIS: 05-18-79

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: K92624

| AIR DRY LOSS: 10.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 11.5 | 21.4 | N/A |
| VOLATILE MATTER | 15.0 | 28.0 | 35.7 |
| FIXED CARBON | 30.6 | 57.3 | 73.0 |
| ASH | 42.9 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 4.0 | 6.2 | 6.2 |
| CARBON | 36.8 | 68.9 | 87.9 |
| NITROGEN | 1.1 | 1.8 | 2.3 |
| SULFUR | 0.8 | N/A | N/A |
| OXYGEN(IND) | 14.5 | 27.0 | 10.0 |
| HEATING VALUE (BTU/LB) | 6480 | 12099 | 15433 |

ASH - INITIAL DEFORMATION >2800 F
SOFTENING TEMP. >2800 F
FLUID TEMP. >2800 F

SULFUR FORMS
SULFATE 0.02
PYRITIC 0.42
ORGANIC 0.31

MISCELLANEOUS COMMENTS:

COUNTY: SKAGIT

SAMPLE NUMBER: (044)18-78

COAL NAME: UNNAMED

MINE NAME: NONE
COAL AREA: COKEDALE
SAMPLE SITE ELEVATION (FT): 100

QUARTER SECTION: NW SECTION: 13
TOWNSHIP: 35N RANGE: 05E
QUADRANGLE: WICKERSHAM 15

GEOLOGIC FORMATION: CHUCKANUT
AGE: CRETACEOUS-TERTIARY

STRIKE: N05E DIP: 42NW
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: ROADCUT
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: FRESH

TOTAL SECTION MEASURED (FT): 9.3
COAL THICKNESS (FT): 5.2
SAMPLE THICKNESS (FT): 5.2

OVERBURDEN THICKNESS (FT): 70
SAMPLE COLLECTOR: VONHEEDER (DGER)

DATE OF SAMPLING: 10-26-78
DATE OF ANALYSIS: 05-18-79

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: K92625

| AIR DRY LOSS: 2.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 4.0 | 7.4 | N/A |
| VOLATILE MATTER | 20.6 | 38.9 | 42.1 |
| FIXED CARBON | 31.9 | 60.3 | 65.3 |
| ASH | 43.5 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 3.7 | 6.5 | 6.5 |
| CARBON | 42.7 | 80.8 | 87.4 |
| NITROGEN | 0.9 | 1.6 | 1.7 |
| SULFUR | 0.5 | N/A | N/A |
| OXYGEN(IND) | 8.7 | 16.4 | 10.4 |
| HEATING VALUE (BTU/LB) | 7475 | 14125 | 15284 |

ASH - INITIAL DEFORMATION ..... 2560 F
SOFTENING TEMP. ..... 2650 F
FLUID TEMP. ..... 2750 F

SULFUR FORMS
SULFATE ..... 0.01
PYRITIC ..... 0.20
ORGANIC ..... 0.32

MISCELLANEOUS COMMENTS:

COUNTY: SKAGIT

SAMPLE NUMBER: (045)19-78

COAL NAME: UNNAMED

MINE NAME: NONE
COAL AREA: COKEDALE
SAMPLE SITE ELEVATION (FT): 410

QUARTER SECTION: NW
TOWNSHIP: 35N
QUADRANGLE: OSO 15

SECTION: 13
RANGE: 05E

GEOLOGIC FORMATION: CHUCKANUT
AGE: CRETACEOUS-TERTIARY

STRIKE: N56W
DIP: 62SW
MAJOR JOINTS IN COAL: N73E 41N

EXPOSURE TYPE: TRENCH
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: FRESH

TOTAL SECTION MEASURED (FT): 11.3
COAL THICKNESS (FT): 2.3
SAMPLE THICKNESS (FT): 2.3

OVERBURDEN THICKNESS (FT): 10
SAMPLE COLLECTOR: VONHEEDER (DGER)

DATE OF SAMPLING: 10-26-78
DATE OF ANALYSIS: 05-18-79

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: K92626

| AIR DRY LOSS: 2.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 3.7 | 5.9 | N/A |
| VOLATILE MATTER | 21.5 | 35.1 | 37.4 |
| FIXED CARBON | 39.0 | 63.8 | 68.0 |
| ASH | 35.8 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 4.1 | 6.2 | 6.2 |
| CARBON | 51.0 | 83.6 | 89.0 |
| NITROGEN | 1.1 | 1.6 | 1.7 |
| SULFUR | 0.8 | N/A | N/A |
| OXYGEN(IND) | 7.3 | 11.8 | 6.8 |
| HEATING VALUE (BTU/LB) | 9025 | 14755 | 15709 |

ASH - INITIAL DEFORMATION ..... 2560 F
SOFTENING TEMP. ..... 2610 F
FLUID TEMP. ..... 2700 F

SULFUR FORMS
SULFATE ..... 0.02
PYRITIC ..... 0.21
ORGANIC ..... 0.52

MISCELLANEOUS COMMENTS: TRENCH 25 FT. X 250 FT. EXPOSED DURING FOUNDATION WORK FOR SKAGIT NUCLEAR REACTOR PROJECT.

COUNTY: SKAGIT

SAMPLE NUMBER: (079)33-79

COAL NAME: GLACIER ANTHR

MINE NAME: NONE
COAL AREA: DEFOREST CREEK
SAMPLE SITE ELEVATION (FT): 3600

QUARTER SECTION: NE
SECTION: 23
TOWNSHIP: 34N
RANGE: 07E
QUADRANGLE: OSO 15

GEOLOGIC FORMATION: CHUCKANUT
AGE: CRETACEOUS-TERTIARY

STRIKE: N41E
DIP: N/A
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: ROADCUT
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: FRESH

TOTAL SECTION MEASURED (FT): N
COAL THICKNESS (FT): 0.6
SAMPLE THICKNESS (FT): 0.6

OVERBURDEN THICKNESS (FT): 110
SAMPLE COLLECTOR: VONHEEDER (DGER)

DATE OF SAMPLING: 09-12-79
DATE OF ANALYSIS: 12-06-79

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: K97352

| AIR DRY LOSS: 6.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 8.8 | 11.0 | N/A |
| VOLATILE MATTER | 23.1 | 29.0 | 32.7 |
| FIXED CARBON | 49.2 | 62.0 | 69.7 |
| ASH | 18.9 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 4.6 | 5.0 | 5.0 |
| CARBON | 59.0 | 74.3 | 83.6 |
| NITROGEN | 1.5 | 1.8 | 2.0 |
| SULFUR | 0.6 | N/A | N/A |
| OXYGEN(IND) | 15.4 | 19.3 | 10.6 |
| HEATING VALUE (BTU/LB) | 10269 | 12919 | 14532 |

ASH - INITIAL DEFORMATION ..... 2500 F
SOFTENING TEMP. ..... 2590 F
FLUID TEMP. ..... 2680 F

SULFUR FORMS
SULFATE ..... 0.01
PYRITIC ..... 0.17
ORGANIC ..... 0.46

MISCELLANEOUS COMMENTS: COLLECTED IN STRUCTURALLY DISTURBED AREA.

COUNTY: SKAGIT

SAMPLE NUMBER: (082)36-79

COAL NAME: UNNAMED

MINE NAME: NONE
COAL AREA: DEFOREST CREEK
SAMPLE SITE ELEVATION (FT): 3600

QUARTER SECTION: SW SECTION: 25
TOWNSHIP: 34N RANGE: 07E
QUADRANGLE: OSO 15

GEOLOGIC FORMATION: CHUCKANUT
AGE: CRETACEOUS-TERTIARY

STRIKE: N50E DIP: 39NW
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: ROADCUT
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: FRESH

TOTAL SECTION MEASURED (FT): 12.7
COAL THICKNESS (FT): 1.7
SAMPLE THICKNESS (FT): 1.7

OVERBURDEN THICKNESS (FT): 175
SAMPLE COLLECTOR: VONHEEDER (DGER)

DATE OF SAMPLING: 09-12-79
DATE OF ANALYSIS: 12-06-79

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: K97355

| AIR DRY LOSS: 6.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 8.9 | 11.4 | N/A |
| VOLATILE MATTER | 22.4 | 29.0 | 32.8 |
| FIXED CARBON | 47.6 | 61.8 | 69.9 |
| ASH | 21.1 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 4.3 | 4.7 | 4.7 |
| CARBON | 57.8 | 75.1 | 84.9 |
| NITROGEN | 1.5 | 1.8 | 2.1 |
| SULFUR | 0.7 | N/A | N/A |
| OXYGEN(IND) | 14.6 | 18.9 | 9.7 |
| HEATING VALUE (BTU/LB) | 9940 | 12893 | 14582 |

ASH - INITIAL DEFORMATION ..... 2290 F
SOFTENING TEMP. ..... 2440 F
FLUID TEMP. ..... 2550 F

SULFUR FORMS
SULFATE ..... 0.01
PYRITIC ..... 0.21
ORGANIC ..... 0.48

MISCELLANEOUS COMMENTS: MAY BE A CONTINUATION OF THE DEFOREST CREEK #1 SEAM. AREA SOMEWHAT DEFORMED AND JUMBLED.

COUNTY: THURSTON

SAMPLE NUMBER: (004)04-75 COAL NAME: SMITH

MINE NAME: WIDCO STRIP MINE
COAL AREA: CENTRALIA
SAMPLE SITE ELEVATION (FT): N

QUARTER SECTION: NE SECTION: 23
TOWNSHIP: 15N RANGE: 01W
QUADRANGLE: BUCODA 7.5

GEOLOGIC FORMATION: SKOOKUMCHUCK
AGE: EOCENE

STRIKE: N30W DIP: 06NE
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: STRIP MINE
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: FRESH

TOTAL SECTION MEASURED (FT): 8.1
COAL THICKNESS (FT): 6.3
SAMPLE THICKNESS (FT): 6.3

OVERBURDEN THICKNESS (FT): N
SAMPLE COLLECTOR: VONHEEDER (DGER)

DATE OF SAMPLING: 09-10-75
DATE OF ANALYSIS: 11-05-76

LABORATORY: USBM

LAB. NUMBER: K67735

| AIR DRY LOSS: 8.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 19.3 | 22.9 | N/A |
| VOLATILE MATTER | 32.9 | 39.0 | 50.7 |
| FIXED CARBON | 33.3 | 39.5 | 51.3 |
| ASH | 14.5 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 5.7 | 5.4 | 5.4 |
| CARBON | 48.1 | 57.1 | 74.1 |
| NITROGEN | 0.8 | 0.9 | 1.1 |
| SULFUR | 0.4 | N/A | N/A |
| OXYGEN(IND) | 30.5 | 36.2 | 20.5 |
| HEATING VALUE (BTU/LB) | 8319 | 9866 | 12803 |

ASH - INITIAL DEFORMATION ..... 2280 F
SOFTENING TEMP. ..... 2394 F
FLUID TEMP. ..... 2460 F

SULFUR FORMS
SULFATE ..... 0.00
PYRITIC ..... 0.10
ORGANIC ..... 0.30

MISCELLANEOUS COMMENTS: SAMPLE FROM NORTH PIT, WASHINGTON IRRIGATION DEVELOPMENT COMPANY'S CENTRALIA STRIP PIT.

COUNTY: THURSTON

SAMPLE NUMBER: (070)24-79

COAL NAME: TONO NO. 2

MINE NAME: NONE
COAL AREA: CENTRALIA
SAMPLE SITE ELEVATION (FT): 380

QUARTER SECTION: NE SECTION: 20
TOWNSHIP: 15N RANGE: 01W
QUADRANGLE: TENINO 15

GEOLOGIC FORMATION: SKOOKUMCHUCK
AGE: EOCENE

STRIKE: N36W DIP: 07NE
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: ROADCUT
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: FRESH

TOTAL SECTION MEASURED (FT): 3.0
COAL THICKNESS (FT): 2.1
SAMPLE THICKNESS (FT): 2.1

OVERBURDEN THICKNESS (FT): 0
SAMPLE COLLECTOR: VONHEEDER (DGER)

DATE OF SAMPLING: 07-23-79
DATE OF ANALYSIS: 10-02-79

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: K95701

| AIR DRY LOSS: 9.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 17.6 | 29.4 | N/A |
| VOLATILE MATTER | 24.2 | 41.1 | 59.7 |
| FIXED CARBON | 21.2 | 35.8 | 52.0 |
| ASH | 37.0 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 4.4 | 3.8 | 3.8 |
| CARBON | 26.9 | 45.9 | 66.6 |
| NITROGEN | 0.7 | -0.5 | -0.7 |
| SULFUR | 6.4 | N/A | N/A |
| OXYGEN(IND) | 24.6 | 41.8 | 20.5 |
| HEATING VALUE (BTU/LB) | 4756 | 7849 | 11398 |

| | | |
|---|---|---|
| ASH - INITIAL DEFORMATION | 2170 | F |
| SOFTENING TEMP. | 2250 | F |
| FLUID TEMP. | 2350 | F |

| SULFUR FORMS | |
|---|---|
| SULFATE | 0.32 |
| PYRITIC | 4.27 |
| ORGANIC | 1.80 |

MISCELLANEOUS COMMENTS: NEW ROADCUT THROUGH POSSIBLE LANDSLIDE. TOP OF SEAM NOT EXPOSED.

COUNTY: THURSTON

SAMPLE NUMBER: (076)30-79

COAL NAME: TONO NO. 1

MINE NAME: HANAFORD #1
COAL AREA: CENTRALIA
SAMPLE SITE ELEVATION (FT): 340

QUARTER SECTION: SW SECTION: 21
TOWNSHIP: 15N RANGE: 01W
QUADRANGLE: TENINO 15

GEOLOGIC FORMATION: SKOOKUMCHUCK
AGE: EOCENE

STRIKE: N/A DIP: N/A
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: STRIP PIT
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: FRESH

TOTAL SECTION MEASURED (FT): 8.7
COAL THICKNESS (FT): 8.5
SAMPLE THICKNESS (FT): 8.5

OVERBURDEN THICKNESS (FT): 0
SAMPLE COLLECTOR: VONHEEDER (DGER)

DATE OF SAMPLING: 08-16-79
DATE OF ANALYSIS: 10-02-79

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: K95707

| AIR DRY LOSS: 17.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 26.3 | 28.6 | N/A |
| VOLATILE MATTER | 32.1 | 34.9 | 49.0 |
| FIXED CARBON | 34.2 | 37.2 | 52.2 |
| ASH | 7.4 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 6.4 | 5.2 | 5.2 |
| CARBON | 46.3 | 50.4 | 70.7 |
| NITROGEN | 1.1 | 1.1 | 1.5 |
| SULFUR | 0.6 | N/A | N/A |
| OXYGEN(IND) | 38.3 | 41.7 | 22.7 |
| HEATING VALUE (BTU/LB) | 7884 | 8567 | 12013 |

ASH - INITIAL DEFORMATION ..... >2770 F
SOFTENING TEMP. ..... >2800 F
FLUID TEMP. ..... >2800 F

SULFUR FORMS
SULFATE ..... 0.00
PYRITIC ..... 0.19
ORGANIC ..... 0.40

MISCELLANEOUS COMMENTS:

COUNTY: WALLOWA

SAMPLE NUMBER: (099)11-80

COAL NAME: UNNAMED

MINE NAME: NONE
COAL AREA: GRANDE RONDE
SAMPLE SITE ELEVATION (FT): 3580

QUARTER SECTION: NE SECTION: 35
TOWNSHIP: 06N RANGE: 44E
QUADRANGLE: FLORA 7.5

GEOLOGIC FORMATION: SADDLE MTN.
AGE: MIOCENE

STRIKE: N/A DIP: N/A
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: ROAD CUT
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: FRESH

TOTAL SECTION MEASURED (FT): 7.0
COAL THICKNESS (FT): 2.0
SAMPLE THICKNESS (FT): 2.0

OVERBURDEN THICKNESS (FT): 5
SAMPLE COLLECTOR: STOFFEL (DGER)

DATE OF SAMPLING: 04-17-80
DATE OF ANALYSIS: 09-23-80

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: L03815

| AIR DRY LOSS: 2.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 12.5 | 15.0 | N/A |
| VOLATILE MATTER | 43.9 | 52.7 | 62.1 |
| FIXED CARBON | 28.2 | 33.8 | 39.8 |
| ASH | 15.4 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 5.4 | 5.6 | 5.6 |
| CARBON | 46.6 | 56.0 | 65.9 |
| NITROGEN | 0.5 | 0.5 | 0.6 |
| SULFUR | 0.4 | N/A | N/A |
| OXYGEN(IND) | 31.7 | 38.1 | 29.1 |
| HEATING VALUE (BTU/LB) | 7944 | 9530 | 11216 |

ASH - INITIAL DEFORMATION ..... 2310 F
SOFTENING TEMP. ..... 2420 F
FLUID TEMP. ..... 2500 F

SULFUR FORMS
SULFATE ..... N
PYRITIC ..... N
ORGANIC ..... N

MISCELLANEOUS COMMENTS: SAMPLE FROM THE STATE OF OREGON.

COUNTY: WHATCOM

SAMPLE NUMBER: (003)03-75

COAL NAME: UNNAMED

MINE NAME: NONE
COAL AREA: GLACIER
SAMPLE SITE ELEVATION (FT): 4250

QUARTER SECTION: SE SECTION: 29
TOWNSHIP: 39N RANGE: 07E
QUADRANGLE: MT. BAKER 15

GEOLOGIC FORMATION: CHUCKANUT
AGE: CRETACEOUS-TERTIARY

STRIKE: N54E DIP: 56NW
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: STREAMCUT
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: WEATHERED

TOTAL SECTION MEASURED (FT): 14.3
COAL THICKNESS (FT): 14.3
SAMPLE THICKNESS (FT): 14.3

OVERBURDEN THICKNESS (FT): N
SAMPLE COLLECTOR: VONHEEDER (DGER)

DATE OF SAMPLING: 08-13-75
DATE OF ANALYSIS: 11-11-76

LABORATORY: USBM

LAB. NUMBER: K67734

| AIR DRY LOSS: 1.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 2.7 | 3.0 | N/A |
| VOLATILE MATTER | 7.6 | 8.6 | 8.9 |
| FIXED CARBON | 77.7 | 89.6 | 92.5 |
| ASH | 12.0 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 2.8 | 2.8 | 2.8 |
| CARBON | 78.9 | 91.0 | 93.9 |
| NITROGEN | 0.8 | 0.8 | 0.8 |
| SULFUR | 0.9 | N/A | N/A |
| OXYGEN(IND) | 4.5 | 5.0 | 2.3 |
| HEATING VALUE (BTU/LB) | 12799 | 14737 | 15211 |

ASH - INITIAL DEFORMATION ..... 2415 F
SOFTENING TEMP. ..... 2525 F
FLUID TEMP. ..... 2620 F

SULFUR FORMS
SULFATE ..... 0.00
PYRITIC ..... 0.10
ORGANIC ..... 0.80

MISCELLANEOUS COMMENTS: NEAR DISCOVERY MINE, TUNNEL #1.

COUNTY: WHATCOM

SAMPLE NUMBER: (005)01-76 COAL NAME: UNNAMED

MINE NAME: NONE
COAL AREA: RACEHORSE
SAMPLE SITE ELEVATION (FT): 475

QUARTER SECTION: SE SECTION: 2
TOWNSHIP: 39N RANGE: 05E
QUADRANGLE: VAN ZANDT 15

GEOLOGIC FORMATION: CHUCKANUT
AGE: CRETACEOUS-TERTIARY

STRIKE: N40E DIP: 40NW
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: ROADCUT
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: FRESH

TOTAL SECTION MEASURED (FT): 2.6
COAL THICKNESS (FT): 1.1
SAMPLE THICKNESS (FT): 1.1

OVERBURDEN THICKNESS (FT): 25
SAMPLE COLLECTOR: VONHEEDER (DGER)

DATE OF SAMPLING: 03-31-76
DATE OF ANALYSIS: N/A

LABORATORY: USGS

LAB. NUMBER: D18312

| AIR DRY LOSS: 1.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 3.6 | 5.6 | N/A |
| VOLATILE MATTER | 27.7 | 44.1 | 46.7 |
| FIXED CARBON | 34.4 | 54.7 | 58.1 |
| ASH | 34.3 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 4.0 | 6.0 | 6.0 |
| CARBON | 50.0 | 79.6 | 84.4 |
| NITROGEN | 1.4 | 2.1 | 2.3 |
| SULFUR | 0.4 | N/A | N/A |
| OXYGEN(IND) | 9.9 | 15.7 | 11.2 |
| HEATING VALUE (BTU/LB) | 8878 | 14119 | 14979 |

ASH - INITIAL DEFORMATION ..... 2215 F
SOFTENING TEMP. ..... 2300 F
FLUID TEMP. ..... 2420 F

SULFUR FORMS
SULFATE ..... 0.01
PYRITIC ..... 0.08
ORGANIC ..... 0.32

MISCELLANEOUS COMMENTS: TOP AND BOTTOM OF SECTION NOT EXPOSED. STRATIGRAPHIC POSITION IN CHUCKANUT FM. NOT KNOWN. COAL REPORTED TO YIELD 4.5 COKE BUTTON.

COUNTY: WHATCOM

SAMPLE NUMBER: (006)02-76

COAL NAME: UNNAMED

MINE NAME: VAN ZANDT
COAL AREA: VAN ZANDT
SAMPLE SITE ELEVATION (FT): N

QUARTER SECTION: SE SECTION: 12
TOWNSHIP: 38N RANGE: 04E
QUADRANGLE: VAN ZANDT 15

GEOLOGIC FORMATION: CHUCKANUT
AGE: CRETACEOUS-TERTIARY

STRIKE: N45E DIP: 27NW
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: MINE DUMP
SAMPLE TYPE: GRAB
SAMPLE CONDITION: WEATHERED

TOTAL SECTION MEASURED (FT): N
COAL THICKNESS (FT): N
SAMPLE THICKNESS (FT): N

OVERBURDEN THICKNESS (FT): N
SAMPLE COLLECTOR: VONHEEDER (DGER)

DATE OF SAMPLING: 01-04-76
DATE OF ANALYSIS: N/A

LABORATORY: C.T. & E. CO.

LAB. NUMBER: UNKNOWN

AIR DRY LOSS: N

| | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 2.9 | 4.7 | N/A |
| VOLATILE MATTER | 29.5 | 49.1 | 51.6 |
| FIXED CARBON | 30.9 | 51.4 | 54.0 |
| ASH | 36.8 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | N | N | N |
| CARBON | N | N | N |
| NITROGEN | N | N | N |
| SULFUR | 0.6 | N/A | N/A |
| OXYGEN(IND) | N | N | N |
| HEATING VALUE (BTU/LB) | 6744 | 11204 | 11774 |

ASH - INITIAL DEFORMATION ..... N F
SOFTENING TEMP. ..... N F
FLUID TEMP. ..... N F

SULFUR FORMS
SULFATE ..... N
PYRITIC ..... N
ORGANIC ..... N

MISCELLANEOUS COMMENTS: VAN ZANDT MINE LAST ACIVE CIRCA 1946. ADIT CURRENTLY FLOODED. APPROX. 4 FT. DUMP MATERIAL EXCAVATED BEFORE SAMPLING. 3 EXCAVATIONS MADE WITH ABOUT 10 POUNDS TOTAL SAMPLE TAKEN BEFORE SPLITTING.

COUNTY: WHATCOM

SAMPLE NUMBER: (014)10-76 COAL NAME: UNNAMED

MINE NAME: NONE
COAL AREA: GLACIER
SAMPLE SITE ELEVATION (FT): 4380

QUARTER SECTION: NE SECTION: 22
TOWNSHIP: 39N RANGE: 06E
QUADRANGLE: CANYON LAKE 7.5

GEOLOGIC FORMATION: CHUCKANUT
AGE: CRETACEOUS-TERTIARY

STRIKE: N45E DIP: 78NW
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: OUTCROP
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: FRESH

TOTAL SECTION MEASURED (FT): 6.0
COAL THICKNESS (FT): 4.0
SAMPLE THICKNESS (FT): 4.0

OVERBURDEN THICKNESS (FT): N
SAMPLE COLLECTOR: VONHEEDER (DGER)

DATE OF SAMPLING: 10-12-76
DATE OF ANALYSIS: 07-20-77

LABORATORY: USBM LAB. NUMBER: K74807

| AIR DRY LOSS: 6.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 9.3 | 19.9 | N/A |
| VOLATILE MATTER | 13.6 | 29.2 | 36.5 |
| FIXED CARBON | 27.7 | 59.5 | 74.4 |
| ASH | 49.4 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 3.5 | 6.5 | 6.5 |
| CARBON | 33.4 | 71.8 | 89.7 |
| NITROGEN | 0.5 | 1.0 | 1.2 |
| SULFUR | 0.3 | N/A | N/A |
| OXYGEN(IND) | 12.9 | 27.7 | 12.3 |
| HEATING VALUE (BTU/LB) | 5657 | 12138 | 15174 |

ASH - INITIAL DEFORMATION ..... 2160 F
SOFTENING TEMP. ..... 2260 F
FLUID TEMP. ..... 2445 F

SULFUR FORMS
SULFATE ..... 0.01
PYRITIC ..... 0.21
ORGANIC ..... 0.07

MISCELLANEOUS COMMENTS: SAMPLE FROM POSSIBLE LANDSLIDE AREA. COAL BRECCIATED.

COUNTY: WHATCOM

SAMPLE NUMBER: (015)11-76

COAL NAME: UNNAMED

MINE NAME: NONE
COAL AREA: GLACIER
SAMPLE SITE ELEVATION (FT): 3480

QUARTER SECTION: SW SECTION: 22
TOWNSHIP: 39N RANGE: 06E
QUADRANGLE: CANYON LAKE 7.5

GEOLOGIC FORMATION: CHUCKANUT
AGE: CRETACEOUS-TERTIARY

STRIKE: N22E DIP: 54NW
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: OUTCROP
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: WEATHERED

TOTAL SECTION MEASURED (FT): 2.5
COAL THICKNESS (FT): 1.3
SAMPLE THICKNESS (FT): 1.3

OVERBURDEN THICKNESS (FT): N
SAMPLE COLLECTOR: VONHEEDER (DGER)

DATE OF SAMPLING: 10-13-76
DATE OF ANALYSIS: 07-20-77

LABORATORY: USBM

LAB. NUMBER: K74808

| AIR DRY LOSS: 10.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 19.4 | 26.1 | N/A |
| VOLATILE MATTER | 19.3 | 25.9 | 35.1 |
| FIXED CARBON | 37.6 | 50.6 | 68.5 |
| ASH | 23.7 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 4.7 | 4.5 | 4.5 |
| CARBON | 44.4 | 59.8 | 80.9 |
| NITROGEN | 0.7 | 0.9 | 1.2 |
| SULFUR | 0.4 | N/A | N/A |
| OXYGEN(IND) | 26.1 | 35.1 | 16.1 |
| HEATING VALUE (BTU/LB) | 7317 | 9836 | 13320 |

ASH - INITIAL DEFORMATION ..... 2400 F
SOFTENING TEMP. ..... 2520 F
FLUID TEMP. ..... 2620 F

SULFUR FORMS
SULFATE ..... 0.01
PYRITIC ..... 0.25
ORGANIC ..... 0.11

MISCELLANEOUS COMMENTS: CORRELATION WITH OTHER COAL SEAMS IN AREA DIFFICULT DUE TO LIMITED EXPOSURE.

COUNTY: WHATCOM

SAMPLE NUMBER: (016)12-76 COAL NAME: UNNAMED

MINE NAME: NONE
COAL AREA: GLACIER
SAMPLE SITE ELEVATION (FT): 4080

QUARTER SECTION: SE SECTION: 17
TOWNSHIP: 39N RANGE: 06E
QUADRANGLE: CANYON LAKE 7.5

GEOLOGIC FORMATION: CHUCKANUT
AGE: CRETACEOUS-TERTIARY

STRIKE: N-S DIP: 31E
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: ROADCUT
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: WEATHERED

TOTAL SECTION MEASURED (FT): 2.2
COAL THICKNESS (FT): 1.7
SAMPLE THICKNESS (FT): 1.7

OVERBURDEN THICKNESS (FT): N
SAMPLE COLLECTOR: VONHEEDER (DGER)

DATE OF SAMPLING: 09-27-76
DATE OF ANALYSIS: 07-20-77

LABORATORY: USBM

LAB. NUMBER: K74809

| AIR DRY LOSS: 10.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 18.4 | 43.2 | N/A |
| VOLATILE MATTER | 17.1 | 40.1 | 70.7 |
| FIXED CARBON | 11.4 | 26.7 | 47.1 |
| ASH | 53.1 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 3.9 | 7.6 | 7.6 |
| CARBON | 18.2 | 42.7 | 75.3 |
| NITROGEN | 0.7 | 1.6 | 2.8 |
| SULFUR | 0.2 | N/A | N/A |
| OXYGEN(IND) | 23.7 | 55.6 | 30.3 |
| HEATING VALUE (BTU/LB) | 2910 | 6817 | 12012 |

ASH - INITIAL DEFORMATION ..... 2455 F
SOFTENING TEMP. ..... 2550 F
FLUID TEMP. ..... 2645 F

SULFUR FORMS
SULFATE ..... 0.01
PYRITIC ..... 0.15
ORGANIC ..... 0.08

MISCELLANEOUS COMMENTS: ABOUT 1.5 FT. WEATHERED COAL EXCAVATED BEFORE SAMPLING.

COUNTY: WHATCOM

SAMPLE NUMBER: (020)04-77

COAL NAME: UNNAMED

MINE NAME: NONE
COAL AREA: ROCKY CREEK
SAMPLE SITE ELEVATION (FT): 2850

QUARTER SECTION: SW SECTION: 35
TOWNSHIP: 39N RANGE: 06E
QUADRANGLE: MT. BAKER 15

GEOLOGIC FORMATION: CHUCKANUT
AGE: CRETACEOUS-TERTIARY

STRIKE: N02E DIP: 56W
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: ROADCUT
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: WEATHERED

TOTAL SECTION MEASURED (FT): 5.3
COAL THICKNESS (FT): 3.9
SAMPLE THICKNESS (FT): 3.9

OVERBURDEN THICKNESS (FT): 25
SAMPLE COLLECTOR: VONHEEDER (DGER)

DATE OF SAMPLING: 10-14-76
DATE OF ANALYSIS: 07-20-77

LABORATORY: USBM

LAB. NUMBER: K74810

| AIR DRY LOSS: 3.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 4.8 | 18.0 | N/A |
| VOLATILE MATTER | 11.2 | 42.3 | 51.7 |
| FIXED CARBON | 16.0 | 60.4 | 73.9 |
| ASH | 68.0 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 2.1 | 7.0 | 7.0 |
| CARBON | 19.4 | 73.3 | 89.6 |
| NITROGEN | 7.1 | 26.7 | 32.7 |
| SULFUR | 0.3 | N/A | N/A |
| OXYGEN(IND) | 3.0 | 11.2 | -6.1 |
| HEATING VALUE (BTU/LB) | 2958 | 11150 | 13628 |

| | | |
|---|---|---|
| ASH - INITIAL DEFORMATION | 2800 | F |
| SOFTENING TEMP. | 2800 | F |
| FLUID TEMP. | 2800 | F |

| SULFUR FORMS | |
|---|---|
| SULFATE | 0.01 |
| PYRITIC | 0.23 |
| ORGANIC | 0.11 |

MISCELLANEOUS COMMENTS: FROM BASAL PORTION OF THE CHUCKANUT FORMATION.

COUNTY: WHATCOM

SAMPLE NUMBER: (021)05-77

COAL NAME: UNNAMED

MINE NAME: NONE
COAL AREA: STEWART PK.
SAMPLE SITE ELEVATION (FT): 1950

QUARTER SECTION: NE SECTION: 22
TOWNSHIP: 38N RANGE: 06E
QUADRANGLE: MT. BAKER 15

GEOLOGIC FORMATION: CHUCKANUT
AGE: CRETACEOUS-TERTIARY

STRIKE: N62E DIP: 38NW
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: ROADCUT
SAMPLE TYPE: GRAB
SAMPLE CONDITION: WEATHERED

TOTAL SECTION MEASURED (FT): 3.3
COAL THICKNESS (FT): 1.3
SAMPLE THICKNESS (FT): 1.3

OVERBURDEN THICKNESS (FT): 200
SAMPLE COLLECTOR: VONHEEDER (DGER)

DATE OF SAMPLING: 10-14-76
DATE OF ANALYSIS: 07-20-77

LABORATORY: USBM

LAB. NUMBER: K74811

| AIR DRY LOSS: 11.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 19.8 | 40.1 | N/A |
| VOLATILE MATTER | 16.4 | 33.2 | 55.4 |
| FIXED CARBON | 17.0 | 34.4 | 57.4 |
| ASH | 46.8 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 3.6 | 4.6 | 4.6 |
| CARBON | 23.2 | 47.0 | 78.4 |
| NITROGEN | 0.3 | 0.5 | 0.9 |
| SULFUR | 0.2 | N/A | N/A |
| OXYGEN(IND) | 25.8 | 52.2 | 27.7 |
| HEATING VALUE (BTU/LB) | 3436 | 6943 | 11595 |

ASH - INITIAL DEFORMATION ..... 2445 F
SOFTENING TEMP. ..... 2555 F
FLUID TEMP. ..... 2660 F

SULFUR FORMS
SULFATE ..... 0.01
PYRITIC ..... 0.15
ORGANIC ..... 0.04

MISCELLANEOUS COMMENTS: NO EXCAVATION OF WEATHERED MATERIAL DONE BEFORE SAMPLING.

COUNTY: WHATCOM

SAMPLE NUMBER: (022)06-77

COAL NAME: NORTHSIDE

MINE NAME: NONE
COAL AREA: VAN ZANDT
SAMPLE SITE ELEVATION (FT): 675

QUARTER SECTION: NE SECTION: 34
TOWNSHIP: 39N RANGE: 05E
QUADRANGLE: VAN ZANDT 15

GEOLOGIC FORMATION: CHUCKANUT
AGE: CRETACEOUS-TERTIARY

STRIKE: N51E DIP: 51NW
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: STREAMCUT
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: FRESH

TOTAL SECTION MEASURED (FT): 3.1
COAL THICKNESS (FT): 3.1
SAMPLE THICKNESS (FT): 3.1

OVERBURDEN THICKNESS (FT): 55
SAMPLE COLLECTOR: VONHEEDER (DGER)

DATE OF SAMPLING: 11-03-76
DATE OF ANALYSIS: N/A

LABORATORY: USGS-DENVER

LAB. NUMBER: N/A

| AIR DRY LOSS: 1.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 2.3 | 3.9 | N/A |
| VOLATILE MATTER | 15.7 | 27.6 | 28.8 |
| FIXED CARBON | 42.1 | 74.3 | 77.5 |
| ASH | 39.9 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 3.2 | 5.2 | 5.2 |
| CARBON | 50.8 | 89.7 | 93.6 |
| NITROGEN | 0.7 | 1.0 | 1.1 |
| SULFUR | 0.8 | N/A | N/A |
| OXYGEN(IND) | 4.6 | 7.9 | 4.5 |
| HEATING VALUE (BTU/LB) | 8673 | 15288 | 15937 |

ASH - INITIAL DEFORMATION ..... 2100 F
SOFTENING TEMP. ..... 2195 F
FLUID TEMP. ..... 2395 F

SULFUR FORMS
SULFATE ..... 0.01
PYRITIC ..... 0.43
ORGANIC ..... 0.37

MISCELLANEOUS COMMENTS: 2 FT. OF COAL EXCAVATED BEFORE SAMPLE TAKEN. LOCALITY ON STATE-ADMINISTERED LANDS.

COUNTY: WHATCOM

SAMPLE NUMBER: (078)32-79

COAL NAME: UNNAMED

MINE NAME: DISCOVERY
COAL AREA: GLACIER
SAMPLE SITE ELEVATION (FT): N

QUARTER SECTION: SE SECTION: 29
TOWNSHIP: 39N RANGE: 07E
QUADRANGLE: MT. BAKER 15

GEOLOGIC FORMATION: CHUCKANUT
AGE: CRETACEOUS-TERTIARY

STRIKE: N68E DIP: 67NW
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: TUNNEL
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: FRESH

TOTAL SECTION MEASURED (FT): N
COAL THICKNESS (FT): 14.3
SAMPLE THICKNESS (FT): 4.0

OVERBURDEN THICKNESS (FT): 25
SAMPLE COLLECTOR: VONHEEDER (DGER)

DATE OF SAMPLING: 09-13-79
DATE OF ANALYSIS: 12-06-79

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: K97351

| AIR DRY LOSS: 6.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 9.4 | 32.5 | N/A |
| VOLATILE MATTER | 8.1 | 28.0 | 41.6 |
| FIXED CARBON | 16.7 | 57.9 | 86.0 |
| ASH | 65.8 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 2.3 | 6.2 | 6.2 |
| CARBON | 19.8 | 68.7 | 102 |
| NITROGEN | 0.2 | 0.5 | 0.8 |
| SULFUR | 0.3 | N/A | N/A |
| OXYGEN(IND) | 11.5 | 39.8 | 16.0 |
| HEATING VALUE (BTU/LB) | 3009 | 10406 | 15456 |

ASH - INITIAL DEFORMATION ..... 2240 F
SOFTENING TEMP. ..... 2330 F
FLUID TEMP. ..... 2450 F

SULFUR FORMS
SULFATE ..... 0.01
PYRITIC ..... 0.21
ORGANIC ..... 0.09

MISCELLANEOUS COMMENTS:

COUNTY: WHATCOM

SAMPLE NUMBER: (080)34-79

COAL NAME: UNNAMED

MINE NAME: NONE
COAL AREA: GLACIER
SAMPLE SITE ELEVATION (FT): 4500

QUARTER SECTION: SE SECTION: 29
TOWNSHIP: 39N RANGE: 07E
QUADRANGLE: MT. BAKER 15

GEOLOGIC FORMATION: CHUCKANUT
AGE: CRETACEOUS-TERTIARY

STRIKE: N/A DIP: N/A
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: DOZER CUT
SAMPLE TYPE: GRAB
SAMPLE CONDITION: WEATHERED

TOTAL SECTION MEASURED (FT): N
COAL THICKNESS (FT): N
SAMPLE THICKNESS (FT): N

OVERBURDEN THICKNESS (FT): 0
SAMPLE COLLECTOR: VONHEEDER (DGER)

DATE OF SAMPLING: 09-13-79
DATE OF ANALYSIS: 12-06-79

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: K97353

| AIR DRY LOSS: 2.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 5.6 | 6.1 | N/A |
| VOLATILE MATTER | 8.1 | 8.8 | 9.4 |
| FIXED CARBON | 78.0 | 85.9 | 91.6 |
| ASH | 8.3 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 2.9 | 2.6 | 2.6 |
| CARBON | 79.2 | 87.3 | 93.0 |
| NITROGEN | 0.7 | 0.7 | 0.7 |
| SULFUR | 0.7 | N/A | N/A |
| OXYGEN(IND) | 8.2 | 8.9 | 3.7 |
| HEATING VALUE (BTU/LB) | 12816 | 14099 | 15027 |

ASH - INITIAL DEFORMATION ..... 2250 F
SOFTENING TEMP. ..... 2370 F
FLUID TEMP. ..... 2470 F

SULFUR FORMS
SULFATE ..... 0.01
PYRITIC ..... 0.03
ORGANIC ..... 0.63

MISCELLANEOUS COMMENTS: THICKNESS OF COAL NOT DETERMINED BECAUSE OF SLUMPING OF BULLZOZER CUT.

COUNTY: WHATCOM

SAMPLE NUMBER: (081)35-79

COAL NAME: UNNAMED

MINE NAME: NONE
COAL AREA: GLACIER
SAMPLE SITE ELEVATION (FT): 3700

QUARTER SECTION: NW SECTION: 20
TOWNSHIP: 39N RANGE: 07E
QUADRANGLE: MT. BAKER 15

GEOLOGIC FORMATION: CHUCKANUT
AGE: CRETACEOUS-TERTIARY

STRIKE: N12W DIP: 44NE
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: ROADCUT
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: WEATHERED

TOTAL SECTION MEASURED (FT): N
COAL THICKNESS (FT): 7.0
SAMPLE THICKNESS (FT): 7.0

OVERBURDEN THICKNESS (FT): 15
SAMPLE COLLECTOR: VONHEEDER (DGER)

DATE OF SAMPLING: 09-13-79
DATE OF ANALYSIS: 12-06-79

LABORATORY: DOE-PITTSBURG

LAB. NUMBER: K97354

| AIR DRY LOSS: 13.0 | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 16.7 | 48.7 | N/A |
| VOLATILE MATTER | 11.3 | 32.9 | 64.2 |
| FIXED CARBON | 11.2 | 32.6 | 63.6 |
| ASH | 60.8 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 3.1 | 7.0 | 7.0 |
| CARBON | 14.3 | 41.7 | 81.3 |
| NITROGEN | 0.2 | 0.5 | 1.1 |
| SULFUR | 0.1 | N/A | N/A |
| OXYGEN(IND) | 21.5 | 62.7 | 37.8 |
| HEATING VALUE (BTU/LB) | 1914 | 5569 | 10858 |

ASH - INITIAL DEFORMATION ..... 2540 F
SOFTENING TEMP. ..... 2660 F
FLUID TEMP. ..... 2750 F

SULFUR FORMS
SULFATE ..... 0.01
PYRITIC ..... 0.08
ORGANIC ..... 0.04

MISCELLANEOUS COMMENTS:

COUNTY: WHATCOM

SAMPLE NUMBER: (139)51-80

COAL NAME: UNNAMED

MINE NAME: NONE
COAL AREA: GLACIER
SAMPLE SITE ELEVATION (FT): 4500

QUARTER SECTION: SE SECTION: 19
TOWNSHIP: 39N RANGE: 07E
QUADRANGLE: MT. BAKER 15

GEOLOGIC FORMATION: CHUCKANUT
AGE: CRETACEOUS-TERTIARY

STRIKE: N10E DIP: 65NW
MAJOR JOINTS IN COAL: N/A

EXPOSURE TYPE: ROAD CUT
SAMPLE TYPE: CHANNEL
SAMPLE CONDITION: FRESH

TOTAL SECTION MEASURED (FT): N
COAL THICKNESS (FT): 30.0
SAMPLE THICKNESS (FT): 30.0

OVERBURDEN THICKNESS (FT): 10
SAMPLE COLLECTOR: VONHEEDER (DGER)

DATE OF SAMPLING: 08-08-80
DATE OF ANALYSIS: 09-10-80

LABORATORY: C.T. & E. CO.

LAB. NUMBER: 72-978

| AIR DRY LOSS: N | COAL (AR) | COAL (MMMF) | COAL (DMMF) |
|---|---|---|---|
| PROXIMATE ANALYSIS | | | |
| MOISTURE | 6.2 | 6.5 | N/A |
| VOLATILE MATTER | 23.3 | 24.6 | 26.3 |
| FIXED CARBON | 65.8 | 69.6 | 74.5 |
| ASH | 4.8 | N/A | N/A |
| ULTIMATE ANALYSIS | | | |
| HYDROGEN | 3.1 | 2.6 | 2.6 |
| CARBON | 81.1 | 85.8 | 91.8 |
| NITROGEN | 0.7 | 0.6 | 0.7 |
| SULFUR | 0.7 | N/A | N/A |
| OXYGEN(IND) | 9.8 | 10.3 | 4.7 |
| HEATING VALUE (BTU/LB) | 12943 | 13669 | 14630 |

ASH - INITIAL DEFORMATION ..... >2530 F
SOFTENING TEMP. ..... >2700 F
FLUID TEMP. ..... >2700 F

SULFUR FORMS
SULFATE ..... N
PYRITIC ..... N
ORGANIC ..... N

MISCELLANEOUS COMMENTS: SEAM EXPOSED APPROX. 1/4 MILES NORTH OF DISCOVERY SEAM TUNNEL. ROADCUT EXCAVATED 1-2 YEARS AGO.