RESULTS OF
TEMPERATURE GRADIENT
AND HEAT FLOW
IN
SANTIAM PASS AREA,
OREGON

VOLUME II: APPENDIX A & B

for
SUN ENERGY DEVELOPMENT CO.
Dallas, Texas

by
GeothermEx, Inc.
Berkeley, California

Billie L. Cox
Murray C. Gardner
James B. Koenig

August 1981
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APPENDIX A

LITHOLOGIC LOGS OF TEMPERATURE-GRADIENT HOLES
<table>
<thead>
<tr>
<th>Depth Interval, feet</th>
<th>Lithologic Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-40</td>
<td>100% OLIVINE BASALT, phenocrysts of pale yellow-green olivine and colorless plagioclase within a gray slightly vesicular aphanitic groundmass.</td>
</tr>
<tr>
<td>40-50</td>
<td>No Sample.</td>
</tr>
<tr>
<td>50-70</td>
<td>100% OLIVINE BASALT, as above. Trace CLAY.</td>
</tr>
</tbody>
</table>

Completion Date: 9/11/80
LITHOLOGIC LOG
SUN-S-80-A1A

<table>
<thead>
<tr>
<th>Depth Interval, feet</th>
<th>Completion Date:</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-40</td>
<td>9/15/80</td>
</tr>
</tbody>
</table>

100% OLIVINE BASALT, Phenocrysts of pale yellow-green olivine and colorless plagioclase within a gray, slightly vesicular aphanitic groundmass.
# LITHOLOGIC LOG

**EWEB-1**

<table>
<thead>
<tr>
<th>Depth Interval, feet</th>
<th>%</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-80</td>
<td>100%</td>
<td>BASALT, Black, vesicular, containing phenocrysts of olivine, orthopyroxene, and plagioclase.</td>
</tr>
<tr>
<td>80-160</td>
<td>100%</td>
<td>GRAVEL, composed of andesitic volcanic debris.</td>
</tr>
<tr>
<td>160-300</td>
<td>100%</td>
<td>ANDESITE, containing scarce hydrothermal minerals.</td>
</tr>
<tr>
<td>300-330</td>
<td>100%</td>
<td>TUFF, partially zeolitized.</td>
</tr>
<tr>
<td>330-340</td>
<td>100%</td>
<td>ANDESITE.</td>
</tr>
<tr>
<td>340-490</td>
<td>100%</td>
<td>GRAVEL, or interflow rubble zone, containing volcanic debris.</td>
</tr>
<tr>
<td>490-560</td>
<td>100%</td>
<td>ANDESITE, with scarce alteration minerals.</td>
</tr>
<tr>
<td>560-820</td>
<td>100%</td>
<td>GRAVEL, or interflow rubble zone, containing basalt or andesite; zeolitized throughout.</td>
</tr>
<tr>
<td>820-830</td>
<td>100%</td>
<td>ANDESITE.</td>
</tr>
<tr>
<td>830-1,370</td>
<td>60%</td>
<td>(?) GRAVEL, or interflow rubble zone, containing volcanic debris, zeolites, and montmorillonite.</td>
</tr>
<tr>
<td></td>
<td>40%</td>
<td>(?) BASALT or ANDESITE, flows are interlayered with interflow rubble zones.</td>
</tr>
<tr>
<td>1,370-TD</td>
<td>60%</td>
<td>(?) GRAVEL, or interflow rubble zone, as above.</td>
</tr>
<tr>
<td></td>
<td>40%</td>
<td>(?) ANDESITE, interlayered with rubble zone, as above, but less altered.</td>
</tr>
</tbody>
</table>

Logged by the U.S.G.S.
LITHOLOGIC LOG

EWEB-2

Logged by the U.S.G.S.

<table>
<thead>
<tr>
<th>Depth Interval, feet</th>
<th>Percent</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-60</td>
<td>100%</td>
<td>GRAVEL and SILT, composed of glacial debris containing large boulders.</td>
</tr>
<tr>
<td>60-120</td>
<td>100%</td>
<td>BASALT, containing olivine.</td>
</tr>
<tr>
<td>120-410</td>
<td>100%</td>
<td>ANDESITE.</td>
</tr>
<tr>
<td>410-550</td>
<td>100%</td>
<td>BASALT, containing three textures: crystalline, vesicular, and glassy. Lowermost 40 feet dominated by glassy layers.</td>
</tr>
<tr>
<td>550-640</td>
<td>100%</td>
<td>GRAVEL, containing volcaniclastic debris.</td>
</tr>
<tr>
<td>640-770</td>
<td>100%</td>
<td>GRAVEL, containing volcanic debris composed of olivine andesite.</td>
</tr>
<tr>
<td>770-830</td>
<td>100%</td>
<td>GRAVEL, containing volcanic debris of andesitic composition, with some volcaniclastics at base.</td>
</tr>
<tr>
<td>830-840</td>
<td>100%</td>
<td>ANDESITE, with olivine phenocrysts and some hydrothermal alteration.</td>
</tr>
<tr>
<td>840-890</td>
<td>100%</td>
<td>ANDESITE, as above, with no alteration.</td>
</tr>
<tr>
<td>890-1,020</td>
<td>100%</td>
<td>SAND and SILT, composed of volcanic debris.</td>
</tr>
<tr>
<td>1,020-1,180</td>
<td>100%</td>
<td>ANDESITE, containing olivine.</td>
</tr>
<tr>
<td>1,180-1,220</td>
<td>100%</td>
<td>PUMICE ASH, white.</td>
</tr>
<tr>
<td>1,220-1,260</td>
<td>100%</td>
<td>ANDESITE, containing olivine.</td>
</tr>
<tr>
<td>1,260-1,360</td>
<td>100%</td>
<td>SAND and SILT, containing volcanic debris.</td>
</tr>
<tr>
<td>1,360-1,430</td>
<td>100%</td>
<td>ANDESITE.</td>
</tr>
<tr>
<td>1,430-1,460</td>
<td>100%</td>
<td>PUMICE TUFF, white.</td>
</tr>
<tr>
<td>1,460-1,520</td>
<td>100%</td>
<td>SAND and SILT, containing volcanic debris.</td>
</tr>
<tr>
<td>1,520-1,580</td>
<td>50%</td>
<td>SAND and SILT, as above.</td>
</tr>
<tr>
<td></td>
<td>50%</td>
<td>ANDESITE.</td>
</tr>
</tbody>
</table>
**LITHOLOGIC LOG**

**EWEB-2 (continued)**

<table>
<thead>
<tr>
<th>Interval</th>
<th>Percent</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,580-1,670</td>
<td>100%</td>
<td>ANDESITE.</td>
</tr>
<tr>
<td>1,670-1,700</td>
<td>100%</td>
<td>SAND and SILT, rubble zone continuing volcanic debris.</td>
</tr>
<tr>
<td>1,700-1,740</td>
<td>100%</td>
<td>ANDESITE.</td>
</tr>
<tr>
<td>1,740-1,750</td>
<td>100%</td>
<td>GLASS FLOW, andesitic or basaltic, with olivine phenocrysts.</td>
</tr>
<tr>
<td>1,750-1,840</td>
<td>100%</td>
<td>GRAVEL, composed of volcanic debris, with hydrothermal alteration.</td>
</tr>
<tr>
<td>1,840-TD</td>
<td>100%</td>
<td>GRAVEL, as above, not altered.</td>
</tr>
</tbody>
</table>
LITHOLOGIC LOG
SUN-S-80-A3

Depth
Interval, feet

Completion
Date:
11/11/80

0-10 No Sample.

10-20 100% GRAVEL, 2-5 mm, subangular to subround; composed of tuffaceous sediments and tuff.

20-30 100% TUFF (water laid?), abundant phenocrysts of anhedral, milky feldspar(?) within a fine light brown groundmass. Trace CLAY.

30-40 100% BASALT PORPHYRY, abundant phenocrysts of subhedral plagioclase within a gray, aphanitic matrix.

40-50 100% TUFF, as above. Trace CLAY.

50-60 50% TUFF, as above. 50% CLAY, brown.

60-70 100% CLAY, brown.

70-110 75% TUFF, as above. 25% CLAY, brown.

110-120 100% BASALT PORPHYRY, abundant phenocrysts of plagioclase and trace amounts of olivine phenocrysts within a dark gray aphanitic groundmass.

120-130 100% CLAY.

130-140 100% BASALT PORPHYRY, as above.

140-150 100% CLAY.

150-160 100% BASALT PORPHYRY, as above.

160-180 100% TUFF, as above.

180-190 50% TUFF, as above. 50% CLAY.

190-210 75% BASALT PORPHYRY. 25% CLAY.
<table>
<thead>
<tr>
<th>Interval</th>
<th>Description</th>
</tr>
</thead>
</table>
| 210-230  | 50% BASALT PORPHYRY.  
                 50% CLAY. |
| 230-270  | 100% BASALT PORPHYRY, abundant plagioclase phenocrysts and scattered pale yellow-green olivine phenocrysts within a gray to brown aphanitic groundmass. |
| 270-280  | No sample. |
| 280-300  | 100% BASALT PORPHYRY, as above.  
                 Trace CLAY, white to brown. |
| 300-310  | 100% CLAY, brown. |
| 310-320  | 50% BASALT PORPHYRY.  
                 50% CLAY. |
| 320-360  | 100% CLAY, brown. |
| 360-370  | No sample. |
| 370-390  | 100% CLAY, brown. |
| 390-400  | 50% BASALT PORPHYRY, as above.  
                 50% CLAY. |
| 400-410  | 50% BASALT PORPHYRY  
                 50% TUFFACEOUS SANDSTONE, brown; composed of volcanic rock fragments and plagioclase within a fine brown matrix. |
| 410-500  | 100% CLAY, brown, sandy. |
LITHOLOGIC LOG  
SUN-S-80-A5

<table>
<thead>
<tr>
<th>Depth Interval, feet</th>
<th>Completion Date: 11/1/80</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-20</td>
<td>90% GRAVEL, 2-10 mm, subround-round; composed of olivine basalt. 10% CLAY, brown.</td>
</tr>
<tr>
<td>20-30</td>
<td>100% CLAY, brown.</td>
</tr>
<tr>
<td>30-70</td>
<td>100% BASALT PORPHYRY, a fine holocrystalline porphyry composed of abundant plagioclase phenocrysts with intergranular olivine, pyroxene and iron ore.</td>
</tr>
<tr>
<td>70-80</td>
<td>100% GRAVEL, 2-10 mm, subround to subangular; composed of olivine basalt.</td>
</tr>
<tr>
<td>80-110</td>
<td>100% CLAY, brown.</td>
</tr>
<tr>
<td>110-120</td>
<td>100% SAND, 1-2 mm, round to subround; composed of olivine basalt.</td>
</tr>
<tr>
<td>120-140</td>
<td>100% CLAY, brown.</td>
</tr>
<tr>
<td>140-160</td>
<td>100% BASALT, brown and gray, mottled aphyric aphanitic rock.</td>
</tr>
<tr>
<td>160-170</td>
<td>100% CLAY, brown.</td>
</tr>
<tr>
<td>170-230</td>
<td>50% SAND, 1-2 mm, subround-subangular; composed of olivine basalt. 50% CLAY, brown.</td>
</tr>
<tr>
<td>230-240</td>
<td>100% CLAY, brown.</td>
</tr>
<tr>
<td>240-250</td>
<td>50% SAND, as above. 50% CLAY, brown.</td>
</tr>
<tr>
<td>250-270</td>
<td>100% CLAY, brown.</td>
</tr>
<tr>
<td>270-310</td>
<td>50% SAND, as above. 50% CLAY, brown.</td>
</tr>
<tr>
<td>310-320</td>
<td>100% CLAY, brown.</td>
</tr>
<tr>
<td>320-330</td>
<td>50% SAND, as above. 50% CLAY, brown.</td>
</tr>
<tr>
<td>330-350</td>
<td>100% CLAY, brown.</td>
</tr>
</tbody>
</table>
LITHOLOGIC LOG

SUN-S-80-A5 (continued)

350-360  100% SAND, pebbly; composed of basalt.
360-500  100% CLAY, brown, sandy.
LITHOLOGIC LOG

SUN-S-80-A7

<table>
<thead>
<tr>
<th>Depth Interval, feet</th>
<th>Completion Date:</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-20</td>
<td>11/26/80</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Depth Interval, feet</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-20</td>
<td>100% GRAVEL, 2-8 mm, round to subround, composed of volcanic rock.</td>
</tr>
<tr>
<td>20-40</td>
<td>100% BASALT, variable, scattered to abundant tabular phenocrysts of plagioclase and scattered phenocrysts of yellow-green olivine within a brown to dark gray aphanitic groundmass.</td>
</tr>
<tr>
<td>40-120</td>
<td>100% BASALT, as above with some pink and yellow-brown amorphous material coating fracture surfaces.</td>
</tr>
<tr>
<td>120-130</td>
<td>90% BASALT, as above. 10% Tuffaceous SANDSTONE, brown.</td>
</tr>
<tr>
<td>130-160</td>
<td>100% BASALT, Oxidized mafic phenocrysts and groundmass minerals give the rock a mottled gray-green and red color.</td>
</tr>
<tr>
<td>160-170</td>
<td>100% BASALT PORPHYRY, abundant plagioclase phenocrysts and scattered, altered mafic phenocrysts within a gray-green aphanitic groundmass.</td>
</tr>
<tr>
<td>170-180</td>
<td>100% BASALT PORPHYRY, abundant plagioclase phenocrysts and scattered mafic phenocrystals within a nonvesicular to vesicular aphanitic groundmass. Nonvesicular groundmasses are gray, brown or gray-green. Vesicular groundmasses are mottled gray and red. Vesicles are commonly filled with soft yellow-brown material.</td>
</tr>
<tr>
<td>180-190</td>
<td>100% BASALT PORPHYRY, abundant plagioclase and scattered olivine phenocrysts within a nonvesicular gray-green aphanitic groundmass.</td>
</tr>
<tr>
<td>190-200</td>
<td>90% BASALT PORPHYRY, as above. 10% CLAY</td>
</tr>
<tr>
<td>200-210</td>
<td>50% BASALT PORPHYRY, slightly vesicular and fractured. Vesicles are filled with a soft yellow material. 50% CLAY, brown.</td>
</tr>
<tr>
<td>210-220</td>
<td>100% BASALT PORPHYRY, some clasts oxidized to a red color.</td>
</tr>
<tr>
<td>220-300</td>
<td>50% BASALT PORPHYRY, fractured. Fractures are coated with soft orange-brown material. 50% CLAY.</td>
</tr>
</tbody>
</table>
LITHOLOGIC LOG
SUN-S-80-A7 (continued)

300-320  100% BASALT, scattered phenocrysts of yellow-brown olivine within a green aphanitic groundmass.

320-350  100% BASALT, as above with some orange iron-oxide stains and traces of soft buff to gray amorphous material in voids.

350-370  100% BASALT, as above. 20% of all clasts are brick red.

370-390  100% BASALT, scattered phenocrysts of olivine and plagioclase within a gray-green groundmass. Traces of soft resinous brown material.

390-400  50% BASALT, as above. 50% CLAY, brown.

400-410  100% BASALT, as above. 30% of all clasts are brick red.

410-420  100% BASALT, as above. 75% of all clasts are red-brown.

420-440  100% BASALT, widely scattered phenocrysts of yellow-green olivine within a slightly vesicular green-brown groundmass. Traces of soft resinous brown material filling voids.

440-450  100% BASALT, as above. Traces of soft resinous brown or white material filling voids and traces of fine opal.

450-470  100% BASALT, scattered phenocrysts of olivine and plagioclase within a slightly vesicular, gray-green groundmass. Traces of soft white, blue or resinous brown material filling voids.

470-499  100% CLAY, brown.

490-500  No Sample.
LITHOLOGIC LOG
SUN-S-80-A10

<table>
<thead>
<tr>
<th>Depth Interval, feet</th>
<th>Completion Date: 12/22/80</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-10</td>
<td>100% CLAY, brown, sandy. Sand-sized clasts are altered volcanic rock.</td>
</tr>
<tr>
<td>10-20</td>
<td>100% GRAVEL, 2-6 mm, subangular to angular. Clasts are gray basalt with phenocrysts of feldspars, dark resinous brown mafics.</td>
</tr>
<tr>
<td>20-30</td>
<td>50% CLAY, brown, 50% GRAVEL, as above.</td>
</tr>
<tr>
<td>30-40</td>
<td>100% CLAY, brown, sandy.</td>
</tr>
<tr>
<td>40-60</td>
<td>100% GRAVEL, 2-5 mm, subangular to angular. Clasts are gray and brown basalt with phenocrysts of white feldspar and dark brown to black mafic minerals.</td>
</tr>
<tr>
<td>60-70</td>
<td>100% CLAY, brown.</td>
</tr>
<tr>
<td>70-80</td>
<td>50% GRAVEL, 2-4 mm, subangular to angular. 50% CLAY, brown.</td>
</tr>
<tr>
<td>80-100</td>
<td>100% CLAY, brown.</td>
</tr>
<tr>
<td>100-140</td>
<td>50% GRAVEL, as above. 50% CLAY, brown.</td>
</tr>
<tr>
<td>140-150</td>
<td>80% GRAVEL, as above. 20% CLAY, brown.</td>
</tr>
<tr>
<td>150-160</td>
<td>90% GRAVEL, 2-10 mm, subround to angular. Clasts are of gray to brown basalt with abundant phenocrysts of feldspar and black mafics and of volcanic breccia. 10% CLAY, brown.</td>
</tr>
<tr>
<td>160-240</td>
<td>100% GRAVEL, as above.</td>
</tr>
<tr>
<td>240-260</td>
<td>Lost Circulation Material.</td>
</tr>
<tr>
<td>260-270</td>
<td>100% BASALT, light brown to gray aphanitic rock with phenocrysts of feldspar and dark mafics.</td>
</tr>
<tr>
<td>270-280</td>
<td>100% BASALT, dark green to black aphanitic rock.</td>
</tr>
</tbody>
</table>
LITHOLOGIC LOG

SUN-S-80-A10 (continued)

280-290  90% BASALT, as above.
         10% BRECCIA, brick red volcanic breccia.

290-300  No Sample.

300-310  50% BASALT, as above.
         50% CLAY, brown.

310-320  100% BASALT, as above.

320-330  100% BRECCIA, brown, subhedral phenocrysts of feldspar and lithic
         fragments within a welded matrix. Some alteration to white clay.

330-340  50% BRECCIA, as above.
         50% BASALT, as above.

340-430  100% BRECCIA, brown to brick red. Abundant phenocrysts of feldspar
         and lithic fragments within a welded matrix. Variable alteration
         to white clay.

430-480  100% BASALT, gray to brown aphanitic rock with abundant phenocrysts
         of feldspar and minor pyroxene.
# LITHOLOGIC LOG

**SUN-S-80-A11**

<table>
<thead>
<tr>
<th>Depth, Interval, feet</th>
<th>Completion Date: 12/8/80</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-10</td>
<td>100% GRAVEL, 2-5 mm, subround to subangular. Clasts are black aphanitic volcanic rock. Trace CLAY.</td>
</tr>
<tr>
<td>10-20</td>
<td>100% GRAVEL, 2-7 mm, subround to subangular. Clasts are composed of black to red, non-vesicular to vesicular, aphanitic volcanic rock. Trace CLAY, brown, coats clasts.</td>
</tr>
<tr>
<td>20-40</td>
<td>100% GRAVEL, as above. Red clasts are scoriaceous. Black clasts are nonvesicular. Trace CLAY, brown coating clasts and white filling vesicles or fractures.</td>
</tr>
<tr>
<td>40-50</td>
<td>100% GRAVEL, 2-20 mm, round to subround. Clasts are black, aphanitic volcanic rock.</td>
</tr>
<tr>
<td>50-120</td>
<td>80% SILT, brown, sandy (based on driller's report). 20% GRAVEL, as above.</td>
</tr>
<tr>
<td>120-140</td>
<td>100% BASALT, brick red flow composed of rare phenocrysts of feldspar, olivine and black mafics within a matrix of trachytic feldspar laths, intersertal material. Some scoriaceous material. Trace VITROPHYRE.</td>
</tr>
<tr>
<td>140-150</td>
<td>100% BASALT, pink and green aphanitic rock with rare phenocrysts of feldspar and black mafics.</td>
</tr>
<tr>
<td>150-180</td>
<td>100% PYroxene Andesite, green aphanitic rock with abundant crystals of dark green mafic minerals.</td>
</tr>
<tr>
<td>180-250</td>
<td>100% PYroxene Andesite, green to brown aphanitic rock with abundant dark green crystals.</td>
</tr>
<tr>
<td>250-290</td>
<td>100% BASALT, brick red rock with anhedral feldspar phenocrysts and dark mafics within a matrix of trachytic feldspar laths and oxidized intersertal material.</td>
</tr>
<tr>
<td>290-300</td>
<td>100% BRECCIA, pale brown brecciated volcanic rock altering to clay.</td>
</tr>
<tr>
<td>300-340</td>
<td>100% TUFF(?), pale green and brown crystal-lithic rock with red-brown opal.</td>
</tr>
</tbody>
</table>
LITHOLOGIC LOG
SUN-S-80-A11 (continued)

340-370  100% PYROXENE ANDESITE, dark green aphanitic rock with dark green mafic phenocrysts.

370-380  100% CLAY, red.

380-410  100% BASALT, gray-green and brown mottled aphanitic rock.

410-450  100% CLAY, gray-green.

450-470  100% BASALT, dark green aphanitic rock with abundant subhedral feldspar phenocrysts.

470-480  No sample.
### LITHOLOGIC LOG

**SUN-S-80-A12**

<table>
<thead>
<tr>
<th>Depth Interval, feet</th>
<th>Completion Date: 10/7/80</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-20</td>
<td>100% OLIVINE BASALT, scattered phenocrysts of pale yellow-green olivine (&lt; .5 mm) and colorless to frosted plagioclase (&lt; .5 mm) within slightly vesicular fine gray matrix of feldspar and pyroxene.</td>
</tr>
<tr>
<td>20-30</td>
<td>100% PYROXENE ANDESITE, scattered dark green phenocrysts of pyroxene within a vesicular, green aphanitic matrix. Some vesicles are filled with pale brown or white clay.</td>
</tr>
<tr>
<td>30-60</td>
<td>100% PYROXENE ANDESITE, scattered dark green phenocrysts of pyroxene, colorless to frosted plagioclase and pale green olivine within a vesicular mottled green and brown aphanitic groundmass.</td>
</tr>
<tr>
<td>60-210</td>
<td>100% OLIVINE BASALT, scattered phenocrysts of pale green olivine of colorless to frosted plagioclase and dark green pyroxene within a slightly vesicular mottled green and brown aphanitic groundmass.</td>
</tr>
<tr>
<td>210-220</td>
<td>100% CLAY.</td>
</tr>
<tr>
<td>220-240</td>
<td>100% OLIVINE (?) BASALT, scattered phenocrysts of dark brown olivine and plagioclase within a highly vesicular brown and green aphanitic matrix.</td>
</tr>
<tr>
<td>240-270</td>
<td>100% OLIVINE (?) BASALT, abundant dark green and brown phenocrysts of olivine and colorless to frosted plagioclase within a vesicular mottled brown and green, aphanitic matrix.</td>
</tr>
<tr>
<td>270-290</td>
<td>100% OLIVINE (?) BASALT, abundant dark green and brown phenocrysts of olivine and colorless plagioclase within a mottled red and black, aphanitic matrix. Trace CLAY.</td>
</tr>
<tr>
<td>290-320</td>
<td>100% OLIVINE BASALT, variable, scattered to abundant phenocrysts of olivine and minor plagioclase within a mottled brown and green vesicular matrix.</td>
</tr>
<tr>
<td>320-340</td>
<td>95% OLIVINE BASALT, as above.  5% CLAY.</td>
</tr>
</tbody>
</table>
LITHOLOGIC LOG
SUN-S-80-A12 (continued)

340-350  100% CLAY.

350-370  100% OLIVINE BASALT, as above.

370-390  100% OLIVINE BASALT, as above.
         Trace CHALCEDONY, orange; OPAL.

390-430  100% OLIVINE BASALT, as above.
         Trace CLAY, orange, white, green.

430-500  100% CLAY.
**LITHOLOGIC LOG**

**SUN-S-80-A13**

<table>
<thead>
<tr>
<th>Depth Interval, feet</th>
<th>Completion Date:</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-20</td>
<td>1/26/81</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Depth Interval, feet</th>
<th>Lithology Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-20</td>
<td>100% GRAVEL, 2-15 mm, round to subangular; composed of gray-black, aphanitic basalt.</td>
</tr>
<tr>
<td>20-30</td>
<td>80% SILT, brown, clayey. 20% GRAVEL, 2-10 mm, subangular to subround, composed of gray, andesitic rock.</td>
</tr>
<tr>
<td>30-40</td>
<td>100% BASALT, dark gray to black, aphanitic rock.</td>
</tr>
<tr>
<td>40-60</td>
<td>100% BASALT, vesicular to nonvesicular rock with scattered phenocrysts of plagioclase within a brown, gray or black aphanitic groundmass.</td>
</tr>
<tr>
<td>60-70</td>
<td>80% BASALT, as above. 20% CLAY, gray.</td>
</tr>
<tr>
<td>70-80</td>
<td>100% BASALT, some brecciation of aphanitic material is highlighted by mottled red and black colors.</td>
</tr>
<tr>
<td>80-100</td>
<td>100% VITRIC TUFF, patches of fresh dark brown resinous glass and volcanic rock fragments are embedded in a fine gray-brown sugary matrix.</td>
</tr>
<tr>
<td>100-110</td>
<td>100% BASALT, scattered phenocrysts of yellow-green olivine and patches of brown, resinous material are in a mottled brown and black aphanitic groundmass.</td>
</tr>
<tr>
<td>110-130</td>
<td>100% BASALT BRECCIJA, vesicular, red-brown breccia of basaltic rock.</td>
</tr>
<tr>
<td>130-150</td>
<td>100% BASALT, scattered phenocrysts of yellow-green olivine and white plagioclase are in a gray to green-black, aphanitic groundmass.</td>
</tr>
<tr>
<td>150-160</td>
<td>100% BASALT, scattered phenocrysts of green olivine, resinous brown iddingsite or pyroxene and plagioclase are in a slightly vesicular, green aphanitic groundmass.</td>
</tr>
</tbody>
</table>
LITHOLOGIC LOG

SUN-S-80-A13 (continued)

160-190  100% BASALT, phenocrysts of green olivine, resinous brown mineral and plagioclase are in a vesicular, black, gray-green or red-brown aphanitic groundmass. Some vesicles are filled with a soft buff or pale green material.

190-200  100% BASALT, as above, but oxidized to a red color.

200-210  100% BASALT, scattered phenocrysts of a resinous brown mafic mineral in a slightly vesicular, red to black groundmass. There is some brecciation.

210-220  100% BASALT, scattered phenocrysts of yellow-green olivine and translucent plagioclase are within a gray-green aphanitic groundmass.

220-230  100% BASALT, rare phenocrysts of yellow-green olivine and a resinous brown mafic mineral are in a gray-brown aphanitic groundmass.

230-260  100% BASALT, as above, but highly vesicular.

260-280  100% BASALT, scattered phenocrysts of yellow-green olivine and white plagioclase are in a slightly vesicular to nonvesicular gray-green aphanitic groundmass.

280-290  Lost circulation material.
<table>
<thead>
<tr>
<th>Depth Interval, feet</th>
<th>Lithologic Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-60</td>
<td>OLIVINE BASALT, phenocrysts of red and green olivine within a vesicular mottled green and brown aphanitic matrix.</td>
</tr>
<tr>
<td>60-100</td>
<td>OLIVINE BASALT, as above, but highly vesicular.</td>
</tr>
<tr>
<td>100-120</td>
<td>OLIVINE BASALT, abundant phenocrysts of red and green olivine within a slightly vesicular green aphanitic groundmass.</td>
</tr>
<tr>
<td>120-160</td>
<td>OLIVINE BASALT, highly vesicular, oxidized red and green.</td>
</tr>
<tr>
<td>160-180</td>
<td>OLIVINE BASALT, slightly vesicular, green and brown.</td>
</tr>
<tr>
<td>180-220</td>
<td>OLIVINE BASALT, highly vesicular, oxidized red.</td>
</tr>
<tr>
<td>220-340</td>
<td>OLIVINE BASALT, phenocrysts of red, altered olivine within a slightly vesicular brown groundmass. Clasts are platy.</td>
</tr>
<tr>
<td>340-350</td>
<td>No sample.</td>
</tr>
</tbody>
</table>
**LITHOLOGIC LOG**

**SUN-S-80-A16**

<table>
<thead>
<tr>
<th>Depth Interval, feet</th>
<th>Completion</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-10</td>
<td>100% SAND, 1-2 mm, round to angular; composed of olivine basalt and tuffaceous sandstone.</td>
</tr>
<tr>
<td>10-30</td>
<td>100% OLIVINE BASALT, abundant green to brown phenocrysts of olivine within a gray aphanitic groundmass.</td>
</tr>
<tr>
<td>30-50</td>
<td>100% OLIVINE BASALT, variable, scattered to abundant resinous brown phenocrysts of altered olivine (?) with either a gray-green aphanitic groundmass or an oxidized red to brown aphanitic groundmass.</td>
</tr>
<tr>
<td>50-60</td>
<td>100% OLIVINE BASALT, variable, scattered to abundant resinous brown to dark green phenocrysts of olivine (?) within a slightly vesicular, oxidized red to brown, aphanitic groundmass.</td>
</tr>
<tr>
<td>60-80</td>
<td>100% BASALT, vesicular, mottled red and black aphyric, aphanitic rock.</td>
</tr>
<tr>
<td>80-200</td>
<td>100% OLIVINE BASALT, abundant phenocrysts of pale green olivine, typically intergrown with iron ore, mafics, phenocrysts, and translucent plagioclase within a gray or mottled gray and brown groundmass.</td>
</tr>
<tr>
<td>200-220</td>
<td>100% OLIVINE BASALT, scattered phenocrysts of yellow-green olivine and translucent plagioclase within a mottled gray-brown or red-brown aphanitic groundmass. Trace CLAY.</td>
</tr>
<tr>
<td>220-270</td>
<td>100% OLIVINE BASALT, variable, scattered to abundant phenocrysts of yellow-green olivine and translucent plagioclase within a mottled gray and brown aphanitic groundmass. Trace CLAY.</td>
</tr>
<tr>
<td>270-280</td>
<td>No sample.</td>
</tr>
<tr>
<td>280-290</td>
<td>100% OLIVINE BASALT, as above. Trace clay.</td>
</tr>
</tbody>
</table>
290-300  100% OLIVINE BASALT, phenocrysts of pale-green resinous olivine and translucent plagioclase within a gray, slightly vesicular aphanitic groundmass.

300-310  50% OLIVINE BASALT, as above.
          50% CLAY, brown.

310-330  100% OLIVINE BASALT, as above.

330-370  100% OLIVINE BASALT, phenocrysts of olivine and plagioclase within a mottled gray and red aphanitic groundmass.

370-400  100% OLIVINE BASALT, phenocrysts of pale yellow and green olivine with an accessory black or dark green mafic mineral and phenocrysts of translucent plagioclase within a gray, aphanitic groundmass.
          Trace CLAY.

400-410  No sample.

410-420  100% OLIVINE BASALT, phenocrysts of olivine, an accessory black or dark green mafic mineral and phenocrysts of plagioclase within a red-brown and gray aphanitic groundmass.
## LITHOLOGIC LOG

**SUN-S-80-A17**

<table>
<thead>
<tr>
<th>Depth Interval, feet</th>
<th>Composition and Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-20</td>
<td>100% BASALT, abundant phenocrysts of resinous iddingsite (?) are in a mottled red-brown and blue-gray aphanitic groundmass.</td>
</tr>
<tr>
<td>20-30</td>
<td>100% BASALT, as above, but vesicular.</td>
</tr>
<tr>
<td>30-40</td>
<td>95% BASALT, abundant phenocrysts of resinous iddingsite(?) are in a slightly vesicular, mottled brown and gray aphanitic groundmass. 5% CLAY, brown.</td>
</tr>
<tr>
<td>40-50</td>
<td>100% GRAVEL, 2-10 mm, subround to subangular; composed of red-brown basalt.</td>
</tr>
<tr>
<td>50-60</td>
<td>100% BASALT, abundant phenocrysts of yellow-green olivine and a dark brown to black mafic mineral are in a slightly vesicular, mottled gray and brown aphanitic groundmass.</td>
</tr>
<tr>
<td>60-70</td>
<td>50% BASALT, as above. 50% CLAY, gray-brown.</td>
</tr>
<tr>
<td>70-100</td>
<td>90% BASALT, as above. 10% CLAY, white to gray-brown.</td>
</tr>
<tr>
<td>100-110</td>
<td>100% BASALT, as above.</td>
</tr>
<tr>
<td>110-130</td>
<td>100% BASALT, phenocrysts of yellow-green olivine are in a glassy, black to gray-green, vesicular groundmass.</td>
</tr>
<tr>
<td>130-140</td>
<td>100% BASALT, phenocrysts of yellow-green olivine are in a gray-green, aphanitic groundmass.</td>
</tr>
<tr>
<td>140-150</td>
<td>100% BASALT, rare phenocrysts of olivine are in a highly vesicular black, brown or gray-green groundmass.</td>
</tr>
</tbody>
</table>
LITHOLOGIC LOG
SUN-S-80-A17 (continued)

150-170  100% BASALT, scattered olivine phenocrysts are in a non-vesicular gray-green aphanitic groundmass.

170-180  100% BASALT, scattered olivine phenocrysts are in a vesicular black to gray-green groundmass.

180-190  100% BASALT, abundant olivine phenocrysts are in a slightly vesicular, gray-green aphanitic groundmass.

190-200  100% BASALT, abundant olivine and plagioclase phenocrysts are in a vesicular gray-green aphanitic groundmass.

200-220  100% BASALT, as above, but nonvesicular.

220-250  100% BASALT, scattered phenocrysts of olivine and plagioclase are in a glassy, vesicular, red to black aphanitic groundmass.

250-270  100% BASALT, scattered phenocrysts of olivine and plagioclase are in a slightly vesicular, gray-green to black groundmass. Traces of breccia and black to brown glass.

270-310  100% BASALT, scattered phenocrysts of olivine and plagioclase are in a vesicular, gray-green or black and brown, glassy, aphanitic groundmass.
LITHOLOGIC LOG

SUN-A-80-A19

<table>
<thead>
<tr>
<th>Depth Interval, feet</th>
<th>Completion Date: 10/1/80</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-70</td>
<td>100% GRAVEL, 2-64 mm, subround to angular; composed of gray olivine basalt.</td>
</tr>
<tr>
<td>70-90</td>
<td>100% GRAVEL, subround to angular; composed of mottled red and black, vesicular olivine basalt.</td>
</tr>
<tr>
<td>90-110</td>
<td>100% BASALT, mottled off-white and dark gray aphanitic rock.</td>
</tr>
<tr>
<td>110-200</td>
<td>100% OLIVINE BASALT, abundant phenocrysts of fresh pale yellow or altered, red-brown olivine and phenocrysts of colorless plagioclase within a slightly vesicular gray aphanitic groundmass. Trace OLIVINE BASALT VITROPHYRE, oxidized.</td>
</tr>
<tr>
<td>200-270</td>
<td>90% OLIVINE BASALT, as above. 10% OLIVINE BASALT, oxidized to a red-brown color. Trace OLIVINE BASALT VITROPHYRE.</td>
</tr>
</tbody>
</table>
**LITHOLOGIC LOG**

**SUN-S-80-A20**

<table>
<thead>
<tr>
<th>Depth Interval, feet</th>
<th>Completion Date: 1/15/81</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-20</td>
<td>100% GRAVEL, 5-15 mm, angular to subround; composed of dark gray to red-brown aphanitic basalt and light brown tuffaceous mudstone.</td>
</tr>
<tr>
<td>20-30</td>
<td>100% GRAVEL, sandy 1-10 mm, angular to subround; composed of dark gray, vesicular basalt, red oxidized basalt and traces of glass.</td>
</tr>
<tr>
<td>30-50</td>
<td>100% GRAVEL, sandy 1-10 mm, angular to round; composed of gray basalt and brown tuffaceous mudstone.</td>
</tr>
<tr>
<td>50-70</td>
<td>100% GRAVEL, 5-15 mm, angular to subangular; composed of gray, red and brown, vesicular to nonvesicular olivine basalt.</td>
</tr>
<tr>
<td>70-80</td>
<td>100% GRAVEL, sandy 1-4 mm, subangular to subround; composition as above.</td>
</tr>
<tr>
<td>80-90</td>
<td>100% CLAY, brown.</td>
</tr>
<tr>
<td>90-100</td>
<td>100% GRAVEL, 3-10 mm, subangular; composition as above.</td>
</tr>
<tr>
<td>100-130</td>
<td>100% CLAY, brown, pebbly.</td>
</tr>
<tr>
<td>130-140</td>
<td>100% GRAVEL, 2-5 mm, subangular to angular; composition as above.</td>
</tr>
<tr>
<td>140-150</td>
<td>100% GRAVEL, 5-10 mm, angular to round; composed of gray basalt and brown tuffaceous mudstone.</td>
</tr>
<tr>
<td>150-160</td>
<td>100% CLAY, brown, pebbly.</td>
</tr>
<tr>
<td>160-170</td>
<td>100% GRAVEL, sandy .5-3 mm, subangular to subround; composition as above.</td>
</tr>
<tr>
<td>170-200</td>
<td>50% GRAVEL, as above.</td>
</tr>
<tr>
<td></td>
<td>50% CLAY, brown.</td>
</tr>
<tr>
<td>200-210</td>
<td>100% BASALT, glassy, slightly vesicular, red and black aphanitic rock.</td>
</tr>
</tbody>
</table>
LITHOLOGIC LOG

SUN-S-80-A20 (continued)

210-240  100% BASALT, glassy slightly vesicular rock with scattered, yellow-green olivine phenocrysts in a green-gray to red-brown aphanitic groundmass.

240-260  100% BASALT, as above, mixed with lost circulation material.

260-270  100% BASALT, extremely glassy rock with some apparent autobrecciation. Scattered phenocrysts of olivine are embedded in sugary, mottled gray to red-brown aphanitic matrix.

270-300  50% BASALT, as above.
          50% SILT, gray-brown, clayey.

300-320  100% BASALT, as above.

320-330  25% BASALT, as above.
          75% SILT, gray-brown, clayey.

330-340  100% BASALT, as above.

340-370  100% SILT, gray-brown, clayey, sandy.

370-390  80% BASALT-BRECCIA, glassy, mottled red and black, autobrecciated rock.
          20% CLAY, brown.

390-400  100% ANDESITE, trace amounts of yellow-green olivine phenocrysts in a gray-green aphanitic matrix with abundant iron ore disseminations.

400-420  100% SILT, red, sandy, clayey.

420-440  100% ANDESITE-BRECCIA, glassy, mottled gray, green and brown, aphanitic rock.

440-460  100% ANDESITE, scattered phenocrysts of yellow-green olivine and translucent plagioclase with a mottled gray-green and white, aphanitic groundmass.
LITHOLOGIC LOG

SUN-S-80-5

Depth Interval, feet Completion Date:

0-10 100% GRAVEL, 2-7 mm, subangular to angular; composed of vesicular to nonvesicular volcanic rocks. Vesicles are filled with green chloritic material.

10-70 100% GRAVEL, 5-15 mm, subround to subangular; composed of slightly vesicular, red-brown and olive-brown volcanic rocks.

70-90 100% GRAVEL, 5-10 mm, round to subangular; composed of red-brown and olive-brown aphanitic volcanic rocks and white to pale gray volcanic rocks with abundant black pyroxene phenocrysts.

90-110 100% GRAVEL, 2-12 mm, subangular; composed of red-brown oxidized volcanic rock. Some clasts are breccias with cement of milky chalcedony.

110-150 100% GRAVEL, 2-20 mm, subangular to subround; composed of red-brown and olive-green volcanic rocks with scattered pyroxene and plagioclase phenocrysts. Some clasts are silicified breccias composed of both red-brown and olive-green clasts with a green mineral filling voids.

150-170 100% GRAVEL, 2-20 mm, angular to subangular; composed of silicified volcanic breccias with green mineralization and milky chalcedony.

170-250 100% CLAY, brown.

250-270 100% BASALT, abundant plagioclase phenocrysts (<1 mm) and scattered black pyroxene phenocrysts (<1 mm) within a green to black aphanitic matrix. The rock is fractured or brecciated, silicified, and plagioclase phenocrysts are altered to a blue-green mineral.

270-280 100% CLAY, gray-green.

280-290 100% BASALT, abundant plagioclase phenocrysts, scattered black pyroxene phenocrysts and traces of yellow-brown olivine within a gray non-vesicular aphanitic groundmass.

290-320 100% CLAY, gray.

320-330 100% BASALT, as above, but oxidized to a red-brown color.

330-380 100% CLAY, brown or gray.
## LITHOLOGIC LOG

SUN-S-80-5 (continued)

<table>
<thead>
<tr>
<th>Depth Range</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>380-400</td>
<td>100% BASALT, abundant plagioclase and pyroxene phenocrysts in a dark green or red-brown aphanitic groundmass. Abundant pyrite disseminations within the groundmass. Some alteration of mafic(?) phenocrysts to an orange-red color.</td>
</tr>
<tr>
<td>400-410</td>
<td>100% CLAY, gray-green.</td>
</tr>
<tr>
<td>410-450</td>
<td>100% BASALT, abundant phenocrysts of plagioclase and pyroxene within a gray aphanitic groundmass. Some red-brown oxidation.</td>
</tr>
<tr>
<td>450-500</td>
<td>100% CLAY, red-brown or gray.</td>
</tr>
</tbody>
</table>
APPENDIX B

TEMPERATURE LOGS OF TEMPERATURE-GRADIENT HOLES
EXPLANATION OF SYMBOLS USED ON LITHOLOGIC LOGS

Gravel

Sand, Sandstone

Silt

Clay

Breccia

Tuff

Basalt

Olivine Basalt

Basalt Porphyry

Andesite

Pyroxene Andesite

Glass Flow

F = Fractures
L.C. = Lost Circulation
P.L.C. = Partial Lost Circulation
N. S. = No Sample
TEMPERATURE LOG

SUN-S-80-A3

T. 13 S., R. 6 E., SW \( \frac{1}{4} \) of SE \( \frac{1}{4} \), Sec. 2

Hole completed 11/11/80

Survey #1 11/23/80

Elevation 4,560 feet

Logged by GeothermEx, Inc.

<table>
<thead>
<tr>
<th>Depth, in feet</th>
<th>°C</th>
<th>°F</th>
</tr>
</thead>
<tbody>
<tr>
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</table>

<table>
<thead>
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TEMPERATURE LOG

SUN-S-80-A3

T. 13 S., R. 6 E., SW ¼ of SE ¼, Sec. 2

Hole completed 11/11/80

Survey #2 01/15/81

Elevation 4,560 feet

Logged by GeothermEx, Inc.

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TEMPERATURE LOG

SUN-S-80-A3

T. 13 S., R. 6 E., SW \( \frac{1}{4} \) of SE \( \frac{1}{4} \), Sec. 2

Hole completed 11/11/80

Survey #3 06/27/81

Elevation 4,560 feet

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TEMPERATURE LOG

SUN-S-80-A5

T. 13 S., R. 7 E., SW ¼ of SE ¼, Sec. 18

Hole completed 11/01/80

Survey #1 11/23/80

Elevation 3,440 feet

Logged by GeothermEx, Inc.

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TEMPERATURE LOG
SUN-S-80-A5

T. 13 S., R. 7 E., SW ¼ of SE ¼, Sec. 18

Hole completed 11/01/80
Survey #2 01/15/81
Elevation 3,440 feet
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TEMPERATURE LOG

SUN-S-80-A5

T. 13 S., R. 7 E., SW \( \frac{1}{4} \) of SE \( \frac{1}{4} \), Sec. 18

Hole completed 11/01/80

Survey #3 02/13/81

Elevation 3,440 feet

Logged by GeothermEx, Inc.

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TEMPERATURE LOG -- SUN-SANTIAM

SUN-S-80-A5
Survey #3  02/13/81

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TEMPERATURE LOG

SUN-S-80-A5

T. 13 S., R. 7 E., SW 1/4 of SE 1/4, Sec. 18

Hole Completed 11/01/80
Survey #4 06/27/81
Elevation 3,440 feet
Logged by GeothermEx, Inc.

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TEMPERATURE LOG

SUN-S-80-A7

T. 13 S., R. 6 E., NE ¼ of NW ¼, Sec. 26

Hole completed 11/26/80

Survey #1 01/15/81

Elevation 3,680 feet

Logged by GeothermEx, Inc.

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TEMPERATURE LOG

SUN-S-80-A7

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Hole completed 11/26/80

Survey #2 02/13/81

Elevation 3,680 feet

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TEMPERATURE LOG

SUN-S-80-A7

T. 13 S., R. 6 E., NE ¼ of NW ¼, Sec. 26

Hole completed 11/26/80
Survey #3 06/28/81
Elevation 3,680
Logged by GeothermEx, Inc.

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TEMPERATURE LOG

SUN-S-80-A10

T. 14 S., R. 6 E., SE \( \frac{1}{4} \) of NE \( \frac{1}{4} \), Sec. 12

Hole completed 12/22/80

Survey #1 01/15/81

Elevation 3,360 feet

Logged by GeothermEx, Inc.

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TEMPERATURE LOG

SUN-S-80-A10

T. 14 S., R. 6 E., SE ¼ of NE ¼, Sec. 12

Hole completed 12/22/80

Survey #2 02/13/81

Elevation 3,360 feet

Logged by GeothermEx, Inc.

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TEMPERATURE LOG

SUN-S-80-A11

T. 14 S., R. 6 E., SE \(\frac{1}{4}\) of NE \(\frac{1}{4}\), Sec. 15

Hole completed 12/08/80

Survey #1 02/13/81

Elevation 3,840 feet

Logged by GeothermEx, Inc.

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TEMPERATURE LOG

SUN-S-80-A11

T. 14 S., R. 6 E., SE ¼ of NE ¼, Sec. 12

Hole completed 12/08/80

Survey #2 06/28/81

Elevation 3,840 feet

Logged by GeothermEx, Inc.

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TEMPERATURE LOG -- SUN-SANTIAM

SUN-S-80-A11
Survey #2  6/28/81
TEMPERATURE LOG

SUN-S-80-A12

T. 14 S., R. 7 E., SE ¼ of SE ¼, Sec. 31

Hole completed 10/07/80
Survey #1 11/23/80
Elevation 2,880 feet
Logged by GeothermEx, Inc.

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TEMPERATURE LOG

SUN-S-80-A12

T. 14 S., R. 7 E., SE ¼ of SE ¼, Sec. 31

Hole completed 10/07/80

Survey #2 01/15/81

Elevation 2,880 feet

Logged by GeothermEx, Inc.

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TEMPERATURE LOG

SUN-S-80-A12

T. 14 S., R. 7 E., SE ½ of SE ¼, Sec. 31

Hole completed 10/07/80

Survey #3 02/12/81

Elevation 2,880 feet

Logged by GeothermEx, Inc.

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SUN-S-80-A12

T. 14 S., R. 7 E., SE \(\frac{1}{4}\) of SE \(\frac{1}{4}\), Sec. 31

Hole completed 10/07/80

Survey #4 06/27/81

Elevation 2,880

Logged by GeothermEx, Inc.

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TEMPERATURE LOG -- SUN-SANTIAM

Survey #4  6/27/81

OF

L.C.

SUN-S-80-A12

OF

SUN-S-80-A12

OF

Survey #4  6/27/81
TEMPERATURE LOG

SUN-S-80-A13

T. 15 S., R. 7 E., SW 1/4 of SW 1/4, Sec. 4

Hole completed 01/26/81
Survey #1 02/12/81
Elevation 3,560 feet
Logged by GeothermEx, Inc.

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TEMPERATURE LOG

SUN-S-80-A13

T. 15 S., R. 7 E., SW ¼ of SW ¼, Sec. 4

Hole completed 01/26/81

Survey #2 06/27/81

Elevation 3,560 feet

Logged by GeothermEx, Inc.

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TEMPERATURE LOG

SUN-S-80-A14

T. 15 S., R. 7 E., SW ¼ of NW ¼, Sec. 15

Hole completed 10/18/80

Survey #1 11/23/80

Elevation 3,800 feet

Logged by GeothermEx, Inc.

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TEMPERATURE LOG

SUN-S-80-A16

T. 15 S., R. 6 E., NE 1/4 of SW 1/4, Sec. 25

Hole completed 10/28/80

Survey #1 11/22/80

Elevation 2,640 feet

Logged by GeothermEx, Inc.

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TEMPERATURE LOG

SUN-S-80-A16

T. 15 S., R. 6 E., NE ¼ of SW ¼, Sec. 25

Hole completed 10/28/80

Survey #2        01/14/81

Elevation 2,640 feet

Logged by GeothermEx, Inc.

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TEMPERATURE LOG
SUN-S-80-A16
T. 15 S., R. 6 E., NE ¼ of SW ¼, Sec. 25
Hole completed 10/28/80
Survey #3  02/12/81
Elevation 2,640 feet
Logged by GeothermEx, Inc.

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TEMPERATURE LOG

SUN-S-80-A16

T. 15 S., R. 6 E., NE ¼ of SW ¼, Sec. 25

Hole completed 10/28/80

Survey #4 06/26/81

Elevation 2,640 feet

Logged by GeothermEx, Inc.

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TEMPERATURE LOG

SUN-S-80-A17

T. 16 S., R. 7 E., NE ¼ of SW ¼, Sec. 2

Hole completed 02/06/81

Survey #1 02/12/81

Elevation 4,480 feet

Logged by GeothermEx, Inc.

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TEMPERATURE LOG

SUN-S-80-A17

T. 16 S., R. 7 E., NE ¼ of SW ¼, Sec. 2

Hole completed 02/06/81
Survey #2 06/25/81
Elevation 4,480 feet
Logged by GeothermEx, Inc.

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TEMPERATURE LOG

SUN-S-80-A19

T. 16 S., R. 7 E., NE 1/4 of SE 1/4, Sec. 19

Hole completed 10/01/80

Survey #1 11/22/80

Elevation 2,080 feet

Logged by GeothermEx, Inc.

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TEMPERATURE LOG

SUN-S-80-A19

T. 16 S., R. 7 E., NE ¼ of SE ¼, Sec. 19

Hole completed 10/01/80

Survey #2  01/14/81

Elevation 2,080 feet

Logged by GeothermEx, Inc.

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TEMPERATURE LOG

SUN-S-80-A19

T. 16 S., R. 7 E., NE ¼ of SE ¼, Sec. 19

Hole completed 10/01/80

Survey #3 02/12/81

Elevation 2,080 feet

Logged by Geothermex, Inc.

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TEMPERATURE LOG

SUN-S-80-A19

T. 16 S., R. 7 E., NE ¼ of SE ¼, Sec. 19

Hole completed 10/01/80

Survey #4 06/26/81

Elevation 2,080 feet

Logged by GeothermEx, Inc.

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**TEMPERATURE LOG**

**SUN-S-80-A20**

T. 16 S., R. 7 E., SW ¼ of SE ¼, Sec. 21

Hole completed 01/15/81

Survey #1 02/12/81

Elevation 3,920 feet

Logged by GeothermEx, Inc.

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TEMPERATURE LOG

SUN-S-80-A20

T. 16 S., R. 7 E., SW ¼ of SE ¼, Sec. 21

Hole completed 01/15/81

Survey #2 06/26/81

Elevation 3,920 feet

Logged by GeothermEx, Inc.

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**TEMPERATURE LOG**

**SUN-S-80-5**

T. 16 S., R. 6 E., SE ¼ of NE ¼, Sec. 30

Hole completed 01/06/81

Survey #1 01/14/81

Elevation 2,000 feet

Logged by GeothermEx, Inc.

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Maximum reading thermometer: 68°F
TEMPerature log

SUN-S-80-5

T. 16 S., R. 6 E., SE \( \frac{1}{4} \) of NE \( \frac{1}{4} \), Sec. 30

Hole completed 01/06/81

Survey #2 02/13/81

Elevation 2,000 feet

Logged by GeothermEx, Inc.

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TEMPERATURE LOG

SUN-S-80-5

T. 16 S., R. 6 E., SE ¼ of NE ¼, Sec. 30

Hole completed 11/01/80

Survey #3 06/26/81

Elevation 3,440 feet

Logged by GeothermEx, Inc.

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# TEMPERATURE LOG

**EWEB-1**

T. 13 S., R. 7 E., SW ¼ of SE ¼, Sec. 32

04/24/80

Elevation 3,120 feet

Logged by Oregon Department of Geology and Mineral Industries

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T. 12 S., R. 7 E., NE \( \frac{1}{4} \) of SE \( \frac{1}{4} \), Sec. 9

05/29/80

Elevation 3,760 feet

Logged by Oregon Department of Geology and Mineral Industries

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## TEMPERATURE LOG

**EWEB-2**

T. 12 S., R. 7 E., NE ¼ of SE ¼, Sec. 9

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TEMPERATURE LOG

0-1

T. 14 S., R. 6 E., SW 1/4 of SE 1/4, Sec. 32

Elevation 3,440 feet

Logged by Oregon Department of Geology and Mineral Industries

09/25/80

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TEMPERATURE LOG °F

0-1 09/25/80
TEMPERATURE LOG

0-2

T. 16 S., R 6 E., NE ¼ of SW ¼, Sec. 2

09/29/76

Elevation 2,320 feet

Logged by Oregon Department of Geology
and Mineral Industries

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TEMPERATURE LOG

0-3

16S/5E-30AAB

T. 16 S., R. 5 E., SE ¼ of SE ¼, Sec. 19

08/08/79

Elevation 1,520 feet

Logged by Oregon Department of Geology
and Mineral Industries

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T. 16 S., R 5 E., SE 1/4 of SE 1/4, Sec. 19

08/08/79

Elevation 1,440 feet

Logged by Oregon Department of Geology and Mineral Industries

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TEMPERATURE LOG

0-5

T. 16 S., R. 5 E., NW ¼ of NE ¼, Sec. 30

08/08/79

Elevation 1,240 feet

Logged by Oregon Department of Geology

and Mineral Industries

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T. 16 S., R. 6 E., NW \( \frac{1}{4} \) of NW \( \frac{1}{4} \), Sec. 27

09/29/76

Elevation 1,760 feet

Logged by Oregon Department of Geology and Mineral Industries

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