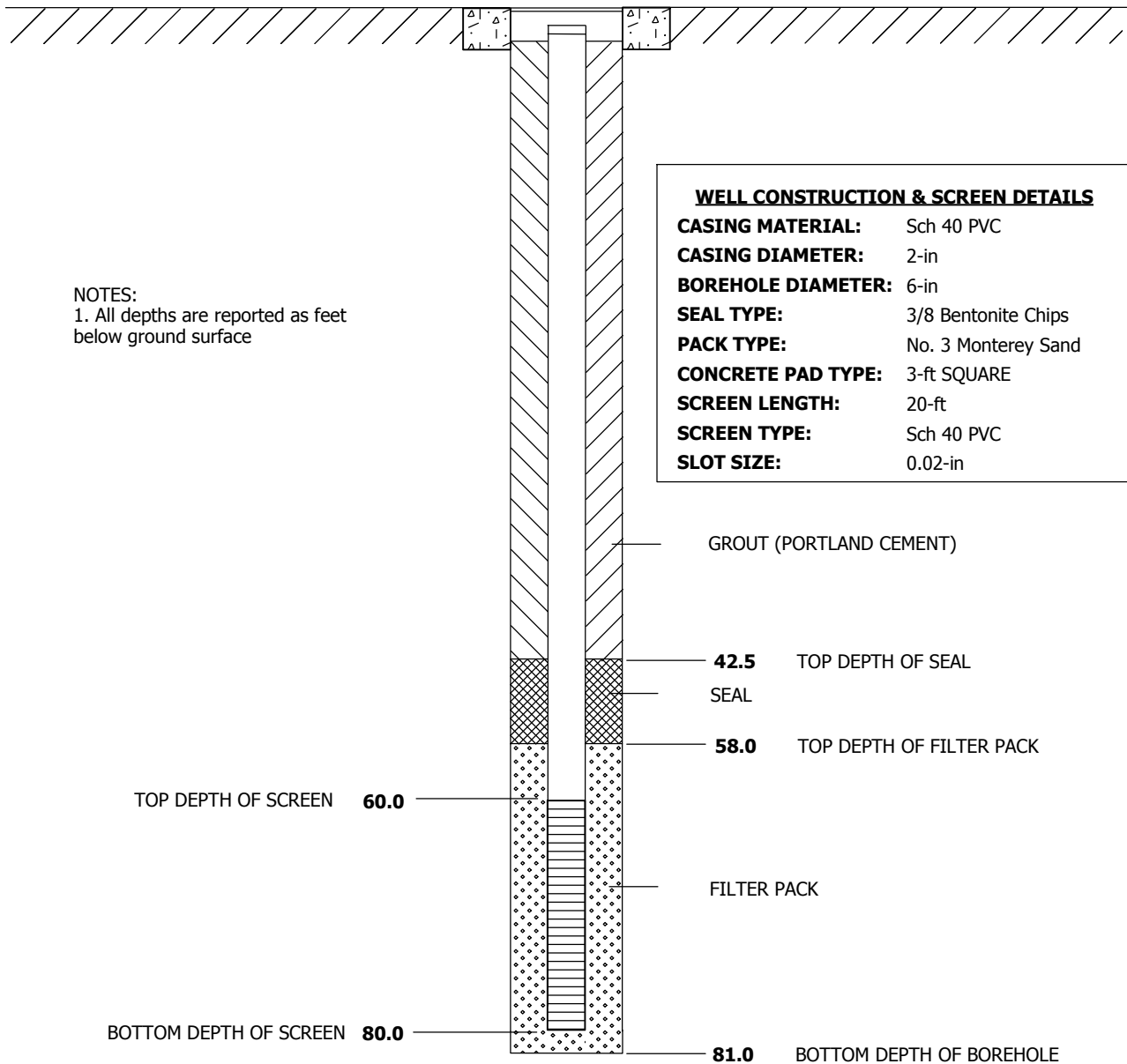


WELL COMPLETION DIAGRAM

| | | |
|--|--|---------------------------------|
| PROJECT NO: 417981.ER.02.FW | PROJECT: ER-TCS Groundwater Investigation | WELL NO: <i>MW-72-80</i> |
| LOCATION: Site K | | |
| DRILLING CONTRACTOR: Boart Longyear (R. Sawrey) | DRILLING START: 8/20/2011 | |
| DRILLING METHOD: Rotosonic/Wireline Rotary Core | DRILLING END: 8/29/2011 | |
| LOGGER: A. Brewster (Northstar) | WELL COMPLETION DATE: 8/29/2011 | |
| GROUND SURFACE ELEVATION (NAVD 88): 513.5 ft AMSL | GENERAL REMARKS: Centralizers at 15, 35, and 55 feet bgs. | |
| NORTHING (CCS NAD 83 Z 5): 2100674.44 | | |

12-IN DIAMETER WELL VAULT (FLUSH WITH GRADE)



WELL DIAGRAM IS NOT TO SCALE



| | | |
|---|--------------------------------|---------------|
| PROJECT NUMBER: 417981.ER.02.FW | BORING NUMBER: BH-72 | SHEET 1 OF 10 |
| ROCK CORE LOG | | |

PROJECT : PG&E Topock, ER-TCS Investigation LOCATION : Site K (2100674.4 N, 7617083.4 E)
 ELEVATION : 513.5 ft DRILLING CONTRACTOR : Boart Longyear (B. Bradford)
 CORING EQUIPMENT AND METHOD : HQ Wire-Line Rotary ORIENTATION : Vertical
 WATER LEVELS : Approx. 58 ft BGS START : 6/26/2012 END : 6/27/2012 LOGGER : A. Brewster (Northstar)

| DEPTH BELOW SURFACE (ft) | CORE RUN LENGTH AND RECOVERY (%) | DISCONTINUITIES | | SYMBOLIC LOG | LITHOLOGY | COMMENTS | |
|--------------------------|----------------------------------|-----------------|--------------------|--------------|--|---|---|
| | | RQD (%) | FRACTURES PER FOOT | | | | DESCRIPTION |
| | | | | | | | DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS |
| 5 | | | | | Silty Sand (SM) 0-4.0' - brown, (10YR 5/3), dry, metadioritic gravel, no odor. | Hand augered to 2'. | |
| 10 | | | | | Well Graded Sand (SW) 4.0-13.0' - light brownish gray (10YR 6/2), silty sand with metadiorite and granitic gravel and cobble (50/30/20), dry, poorly sorted, no odor, gravel is subangular to angular, maximum diameter of 6 cm. | | |
| 15 | | | | | Metadiorite Bedrock (pTbr) 13.0-80.0' - dusky yellow green, (5GY 5/2), non-foliated, uniform, slightly decomposed to fresh, slightly fractured, competent, phaneritic. | 13.0-17.0': drilled with 4-inch sonic. Logging based on broken fragments generated from drilling process. | |
| 17.0 | | | | | | | |
| 20 | R1 3 ft 96% | 63 | 3 2 2 | | | R1 Drill rate=0.1 ft/min | |
| 20.0 | | | | | | | |



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|---|--------------------------------|---------------|
| PROJECT NUMBER: 417981.ER.02.FW | BORING NUMBER: BH-72 | SHEET 2 OF 10 |
| ROCK CORE LOG | | |

PROJECT : PG&E Topock, ER-TCS Investigation LOCATION : Site K (2100674.4 N, 7617083.4 E)
 ELEVATION : 513.5 ft DRILLING CONTRACTOR : Boart Longyear (B. Bradford)
 CORING EQUIPMENT AND METHOD : HQ Wire-Line Rotary ORIENTATION : Vertical
 WATER LEVELS : Approx. 58 ft BGS START : 6/26/2012 END : 6/27/2012 LOGGER : A. Brewster (Northstar)

| DEPTH BELOW SURFACE (ft) | CORE RUN LENGTH AND RECOVERY (%) | DISCONTINUITIES | | | SYMBOLIC LOG | LITHOLOGY | COMMENTS |
|--------------------------|----------------------------------|-----------------|--------------------|---|--------------|--|--|
| | | R O D (%) | FRACTURES PER FOOT | DESCRIPTION | | | |
| | | | | DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS | | | |
| 25 | R2 5 ft 100% | 100 | 1 | | | Metadiorite Bedrock (pTbr) 13.0-80.0' - dusky yellow green, (5GY 5/2), non-foliated, uniform, slightly decomposed to fresh, slightly fractured, competent, phaneritic. | R2 Drill rate=0.08 ft/min |
| | | | 1 | | | | |
| | | | 0 | | | | |
| | | | 1 | | | | |
| | | | 1 | | | | |
| 28.0 | R3 3 ft 93% | 87 | 0 | | | 27.0-29.5' - Quartz-rich interval, nonfoliated, uniform. | R3 Drill rate=0.06 ft/min |
| | | | 1 | | | | |
| | | | 1 | | | | |
| 30 | R4 2 ft 100% | 80 | 1 | | | 28.25-29.0' - Healed fractures at 85 degrees from horizontal. Calcite cement. | R4 Drill rate=0.07 ft/min |
| | | | 2 | | | | |
| 35 | R5 5 ft 98% | 96 | 1 | | | 32.8' - Fracture 80 degrees from horizontal. Black manganese mineralization on fracture surface. | R5 Drill rate=0.08 ft/min |
| | | | 0 | | | | |
| | | | 1 | | | | |
| | | | 1 | | | | |
| | | | 0 | | | | |
| 40 | R6 5 ft 100% | 92 | 0 | | | 36.6' - Joint, 60 deg, rough, undulating, <1mm calcite infilling, iron staining, narrow. 37.6' - Mechanical break at 50 degree dip. 38.4, 38.6, 38.7, 38.8' - Joint (4), 30, 60, 80, and 60 deg, rough, undulating, iron staining, no infill, narrow aperture. | Resume 08/26/2011 at 0800 R6 Drill rate=0.30 ft/min |
| | | | 1 | | | | |
| | | | 1 | | | | |
| | | | 4 | | | | |
| | | | 0 | | | | |



| | | |
|---|--------------------------------|---------------|
| PROJECT NUMBER: 417981.ER.02.FW | BORING NUMBER: BH-72 | SHEET 3 OF 10 |
| ROCK CORE LOG | | |

PROJECT : PG&E Topock, ER-TCS Investigation LOCATION : Site K (2100674.4 N, 7617083.4 E)
 ELEVATION : 513.5 ft DRILLING CONTRACTOR : Boart Longyear (B. Bradford)
 CORING EQUIPMENT AND METHOD : HQ Wire-Line Rotary ORIENTATION : Vertical
 WATER LEVELS : Approx. 58 ft BGS START : 6/26/2012 END : 6/27/2012 LOGGER : A. Brewster (Northstar)

| DEPTH BELOW SURFACE (ft) | CORE RUN LENGTH AND RECOVERY (%) | DISCONTINUITIES | | | | SYMBOLIC LOG | LITHOLOGY | COMMENTS |
|--------------------------|----------------------------------|-----------------|--------------------|--|--|--------------|--|-------------|
| | | R Q D (%) | FRACTURES PER FOOT | DESCRIPTION | | | | |
| | | | | DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS | | | | |
| 45 | R7 5 ft 100% | 100 | 2 | 40.5' - Joint, 60 deg, rough, undulating, <1mm calcite infilling, manganese staining, narrow, aperture. 40.6' - Mechanical break. | Metadiorite (pTbr) 13.0-80.0' - dusky yellow green, (5GY 5/2), non-foliated, uniform, slightly decomposed to fresh, slightly fractured, phaneritic, strong. | R7=0.37 FPM | | |
| | | | 0 | 42.4' - Mechanical break. | | | | |
| | | | 1 | 43.2, 43.4, 43.7' - Mechanical breaks. 43.5' - Joint, 60 deg, smooth, undulating, manganese staining, no infill, tight. | | | | |
| | | | 4 | 44.7' - Joint, 60 deg, rough, undulating, iron staining, no infill, narrow aperture. | | | | |
| | | | 2 | 45' - Mechanical break. 45.4, 45.5' - Mechanical breaks. 46' - Mechanical break. | | | | |
| 45 | R8 5 ft 100% | 80 | 2 | 46.6' - Joint, 30 deg, rough, undulating, manganese staining, no infill, tight. | | | 47.0-48.0' - Foliated | R8=0.50 FPM |
| | | | 2 | 47.5' - Mechanical break. | | | | |
| | | | 1 | 48.5' - Joint, 80 deg, rough, undulating, manganese staining, no infill, narrow aperture. | | | | |
| | | | 0 | 51.5' - Joint, 30 deg | | | | |
| 50 | R9 5 ft 100% | 97 | 0 | 53.3' - Joint, 70 deg, rough, undulating, dendritic manganese staining, no infill, tight aperture. | | | 55.0-55.5' - Increased quartz content. | R9=0.28 FPM |
| | | | 1 | 54.1' - Joint, 50 deg, rough, undulating, <1mm calcite infilling, manganese staining, tight aperture. | | | | |
| 55 | R10 5 ft 100% | 26 | 1 | 56.0-57.0' - Multiple fractures, no infill, manganese and iron staining. | 58.0-60.0' - Moderately weathered. | R10=0.17 FPM | | |
| | | | >10 | 57' - Joint, 80 deg, rough, undulating, manganese and iron staining, no infill, narrow aperture. | | | | |
| | | | >10 | 58.0-60.0' - Multiple fractures, no infill, manganese and iron staining. | | | | |
| 60 | | | >10 | | | | | |



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|---|--------------------------------|---------------|
| PROJECT NUMBER: 417981.ER.02.FW | BORING NUMBER: BH-72 | SHEET 4 OF 10 |
| ROCK CORE LOG | | |

PROJECT : PG&E Topock, ER-TCS Investigation LOCATION : Site K (2100674.4 N, 7617083.4 E)
 ELEVATION : 513.5 ft DRILLING CONTRACTOR : Boart Longyear (B. Bradford)
 CORING EQUIPMENT AND METHOD : HQ Wire-Line Rotary ORIENTATION : Vertical
 WATER LEVELS : Approx. 58 ft BGS START : 6/26/2012 END : 6/27/2012 LOGGER : A. Brewster (Northstar)

| DEPTH BELOW SURFACE (ft) | CORE RUN LENGTH AND RECOVERY (%) | DISCONTINUITIES | | | | SYMBOLIC LOG | LITHOLOGY | COMMENTS |
|--------------------------|----------------------------------|-----------------|--------------------|--|--|--|--------------|----------|
| | | RQD (%) | FRACTURES PER FOOT | DESCRIPTION | | | | |
| | | | | DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS | | | | |
| 65 | R11 5 ft 100% | 38 | 2 | 60.2, 60.7' - Joint, 60 deg, rough, undulating, <1mm calcite infilling, manganese staining, narrow aperture. | | Metadiorite (pTbr) 13.0-80.0' - dusky yellow green, (5GY 5/2), non-foliated, uniform, slightly decomposed to fresh, slightly fractured, phaneritic, strong. 60.0-64.0' - Vuggy with coarse nodular calcite growth, brecciated. 64.5-66.0' - Increase in chlorite content. 67.7' - Shear zone with offset of 25mm. 71.0-72.5' - Increase in quartz content. | R11=0.23 FPM | |
| | | | 1 | 61.4' - Joint, 80 deg, rough, undulating, <10mm calcite infilling, manganese staining, moderately narrow aperture. | | | | |
| | | | 0 | 63.2' - Joint, 80 deg, rough, undulating, <10mm calcite infilling, manganese staining, moderately narrow aperture. | | | | |
| | | | 1 | 65' - Joint, 60 deg, rough, undulating, <1mm calcite infilling, manganese staining, tight aperture. | | | | |
| | | | 0 | 66.0-67.0' - Multiple fractures, some calcite infill (<1mm), manganese and iron staining. | | | | |
| 69.0 | R12 4 ft 100% | 78 | >10 | | | | | |
| | | | 0 | | | | | |
| 70 | R13 5 ft 100% | 84 | 0 | 70.7, 70.9' - Joint (2), 60 deg, rough, undulating, <1mm calcite infilling, manganese and iron staining, tight aperture. | | | | |
| | | | 2 | | | | | |
| | | | 0 | | | | | |
| | | | 0 | | | | | |
| 74.0 | | | 1 | 73.8' - Joint, 70 deg, rough, undulating, <1mm calcite infilling, manganese and iron staining, narrow aperture. | | | | |
| 75 | R14 5 ft 100% | 50 | 0 | 75' - Joint, 40 deg, rough, undulating, <1mm calcite infilling, iron staining, tight aperture. | | | | |
| | | | 1 | | | | | |
| | | | 0 | | | | | |
| | | | >10 | 77.0-79.0' - Multiple fractures, no infill, manganese staining. | | | | |
| 79.0 | | | >10 | | | | | |
| 80 | R15 1 ft 100% | 20 | 2 | | | | | |
| | | | | | | | | |



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| PROJECT NUMBER: 417981.ER.02.FW | BORING NUMBER: BH-72 | SHEET 5 OF 10 |
| ROCK CORE LOG | | |

PROJECT : PG&E Topock, ER-TCS Investigation LOCATION : Site K (2100674.4 N, 7617083.4 E)
 ELEVATION : 513.5 ft DRILLING CONTRACTOR : Boart Longyear (B. Bradford)
 CORING EQUIPMENT AND METHOD : HQ Wire-Line Rotary ORIENTATION : Vertical
 WATER LEVELS : Approx. 58 ft BGS START : 6/26/2012 END : 6/27/2012 LOGGER : A. Brewster (Northstar)

| DEPTH BELOW SURFACE (ft) | CORE RUN LENGTH AND RECOVERY (%) | DISCONTINUITIES | | SYMBOLIC LOG | LITHOLOGY | COMMENTS | |
|--------------------------|----------------------------------|-----------------|--------------------|--------------|---|--|--|
| | | R Q D (%) | FRACTURES PER FOOT | | DESCRIPTION | ROCK TYPE, COLOR, MINERALOGY, TEXTURE, HARDNESS, WEATHERING, AND ROCK MASS CHARACTERISTICS | SIZE AND DEPTH OF CASING, FLUID LOSS, CORING RATE AND SMOOTHNESS, CAVING ROD DROPS, TEST RESULTS, ETC. |
| | | | | | DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS | | |
| 85 | | | | | | | |
| 90 | | | | | | | |
| 95 | | | | | | | |
| 100 | | | | | | | |

79.7, 80.0' - Joint, 60 deg and 70 deg, rough, undulating, iron and manganese staining, no infill, tight aperture.



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|---|--------------------------------|---------------|
| PROJECT NUMBER: 417981.ER.02.FW | BORING NUMBER: BH-72 | SHEET 6 OF 10 |
| ROCK CORE LOG | | |

PROJECT : PG&E Topock, ER-TCS Investigation LOCATION : Site K (2100674.4 N, 7617083.4 E)
 ELEVATION : 513.5 ft DRILLING CONTRACTOR : Boart Longyear (B. Bradford)
 CORING EQUIPMENT AND METHOD : HQ Wire-Line Rotary ORIENTATION : Vertical
 WATER LEVELS : Approx. 58 ft BGS START : 6/26/2012 END : 6/27/2012 LOGGER : A. Brewster (Northstar)

| DEPTH BELOW SURFACE (ft) | CORE RUN LENGTH AND RECOVERY (%) | DISCONTINUITIES | | | | SYMBOLIC LOG | LITHOLOGY | COMMENTS |
|--------------------------|----------------------------------|-----------------|--------------------|---|--|--|--|----------|
| | | R Q D (%) | FRACTURES PER FOOT | DESCRIPTION | | | | |
| | | | | DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS | | | | |
| 105 | | | | | | | | |
| 107.0 | R1 3 ft 100% | 50 | 2 | 107.7, 107.9, 108.7, 109.0, 109.1' - Joint (6), 50, 30, 30, 50, 50, and 60 deg, rough, undulating, <1mm calcite infilling, iron and manganese staining, very narrow apertures | | Metadiorite dusky yellow green, (5GY 5/2), medium foliation, uniform, slightly weathered, strong, phaneritic, slightly fractured, and healed with chlorite cement. | Run 1: drill rate = 0.5 feet per minute (ft/min) | |
| 110 | R2 2.5 ft 100% | 14 | 1 | 110.4, 110.8, 111.2, 111.5, 111.6' - Joint (5), 60, 30, 20, 40, and 40 deg, rough, undulating, <1mm calcite infilling, manganese staining, very narrow apertures | | | Run 2: drill rate = 0.6 ft/min | |
| 112.5 | | | 3 | 112.5-113.5' - Highly fractured | | | Run 3: drill rate = 0.7 ft/min | |
| 115 | R3 5.5 ft 100% | 53 | >10 | 112.5-113.5' - Highly fractured | | 114.3' - Change to aphanitic, non-foliated. 115.5' - Change to phaneritic | | |
| | | | >10 | | | | | |
| | | | 3 | 114.2, 114.6, 114.7, 115.5, 116.2, 116.8, 117.0, 117.6, 117.7, 117.9' - Joint (10), 30, 20, 30, 30, 20, 20, 30, 40, 60, and 60 deg, rough, undulating to stepped, <1mm calcite infilling, manganese staining, very narrow to narrow apertures | | | | |
| | | | 1 | | | | | |
| 118.0 | | | 2 | | | | | |
| | R4 2 ft 100% | 78 | 4 | | | | | |
| 120 | 120.0 | | 2 | 118.2, 118.4, 119.8' - Joint (3), 30, 30, and 40 deg, rough, undulating, <1mm calcite infilling, some manganese staining, narrow aperture | | | Run 4: drill rate = 0.5 ft/min | |
| | | | 1 | | | | | |



| | | |
|---|--------------------------------|---------------|
| PROJECT NUMBER: 417981.ER.02.FW | BORING NUMBER: BH-72 | SHEET 7 OF 10 |
| ROCK CORE LOG | | |

PROJECT : PG&E Topock, ER-TCS Investigation LOCATION : Site K (2100674.4 N, 7617083.4 E)
 ELEVATION : 513.5 ft DRILLING CONTRACTOR : Boart Longyear (B. Bradford)
 CORING EQUIPMENT AND METHOD : HQ Wire-Line Rotary ORIENTATION : Vertical
 WATER LEVELS : Approx. 58 ft BGS START : 6/26/2012 END : 6/27/2012 LOGGER : A. Brewster (Northstar)

| DEPTH BELOW SURFACE (ft) | CORE RUN LENGTH AND RECOVERY (%) | DISCONTINUITIES | | | SYMBOLIC LOG | LITHOLOGY | COMMENTS |
|--------------------------|----------------------------------|-----------------|--------------------|---|--|---|--|
| | | R Q D (%) | FRACTURES PER FOOT | DESCRIPTION | | | |
| | | | | DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS | | | |
| 125 | R5 5 ft 100% | 95 | 0 | 121.0, 121.6, 123.0, 123.7' - Joint (4), 30, 60, 40, and 30 deg, rough, undulating, <1mm calcite infilling, no staining, tight | | Metadiorite dusky yellow green, (5GY 5/2), non-foliated, uniform, slightly weathered, strong, phaneritic, slightly fractured, and healed with chlorite cement | Run 5: drill rate = 0.6 ft/min |
| | | | 2 | | | | |
| | | | 0 | | | | |
| | | | 2 | | | | |
| | | | 0 | | | | |
| 130 | R6 1 ft 100% | 35 | 2 | 125.6, 125.7' - Joint (2), 60 and 30 deg, rough, undulating, <1mm calcite infilling, iron staining, narrow aperture 126.4, 126.7, 126.9, 127.8, 128.4, 128.9, 129.1, 129.5, 129.7' - Joint, 60, 40, 20, 30, 50, 50, 50, 20, and 60 deg, rough, undulating, <1mm calcite infilling, heavy manganese staining, smooth and undulating at 128.9 and 129.1, tight to very narrow aperture | | | Run 6: drill rate = 0.3 ft/min Run 7: drill rate = 0.5 ft/min |
| | | | 3 | | | | |
| | | | 1 | | | | |
| | | | 2 | | | | |
| 135 | R7 4 ft 100% | 82 | 3 | | | | 130.8' - Change to aphanitic |
| | | | 0 | | | | |
| | | | 0 | | | | |
| | | | >10 | | | | |
| | | | >10 | | | | |
| 140 | R8 5 ft 100% | 30 | >10 | | 132.0-135.0' - Highly fractured, calcite infill (<1mm), iron and manganese staining. | Run 9: drill rate = 0.5 ft/min | |
| | | | >10 | | | | |
| | | | >10 | | | | |
| | | | >10 | | | | |
| 140 | R9 3 ft 100% | 0 | >10 | | 135.0-138.0' - Highly fractured, calcite infill (<1mm), manganese staining | Run 10: drill rate = 0.6 ft/min | |
| | | | >10 | | | | |
| | | | >10 | | | | |
| 140 | | | >10 | 138.0-138.5' - Highly fractured, calcite infill (<1mm), | | | |
| | | | 0 | | | | |



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|---|--------------------------------|---------------|
| PROJECT NUMBER: 417981.ER.02.FW | BORING NUMBER: BH-72 | SHEET 8 OF 10 |
| ROCK CORE LOG | | |

PROJECT : PG&E Topock, ER-TCS Investigation LOCATION : Site K (2100674.4 N, 7617083.4 E)
 ELEVATION : 513.5 ft DRILLING CONTRACTOR : Boart Longyear (B. Bradford)
 CORING EQUIPMENT AND METHOD : HQ Wire-Line Rotary ORIENTATION : Vertical
 WATER LEVELS : Approx. 58 ft BGS START : 6/26/2012 END : 6/27/2012 LOGGER : A. Brewster (Northstar)

| DEPTH BELOW SURFACE (ft) | CORE RUN LENGTH AND RECOVERY (%) | DISCONTINUITIES | | | SYMBOLIC LOG | LITHOLOGY | COMMENTS |
|--------------------------|----------------------------------|---------------------------------|--------------------|---|---|--|---|
| | | RQD (%) | FRACTURES PER FOOT | DESCRIPTION | | | |
| | | | | DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS | | | |
| 145 | R10 5.5 ft 100% | 63 | 0 | 141.0-141.6' - Highly fractured, calcite infill (<1mm), manganese staining. | | Metadiorite dusky yellow green, (5GY 5/2), non-foliated, uniform, slightly weathered, strong, aphanitic, slightly fractured, and healed with chlorite cement 142.5' - Change to phaneritic 142.8' - Change to foliated Change to non-foliated | SIZE AND DEPTH OF CASING, FLUID LOSS, CORING RATE AND SMOOTHNESS, CAVING ROD DROPS, TEST RESULTS, ETC. Run 11: drill rate = 0.5 ft/min |
| | | | >10 | | | | |
| | R11 5 ft 100% | 34 | 0 | 142.5' - Mechanical fracture | | | |
| | | | 0 | 144.6' - Joint, 70 deg, rough, undulating, <1mm calcite infilling, iron and manganese staining, narrow aperture | | | |
| | | | 1 | 145.3-145.5' - Highly fractured, calcite infill (<1mm), iron staining | | | |
| | | | >10 | 145.6, 145.7' - Joint, 30 deg, rough, undulating, no infill, iron staining, tight | | | |
| | | | >10 | 146.4-146.8' - Highly fractured | | | |
| | | | 1 | 147.7' - Joint, 70 deg, <1mm calcite infilling, heavy iron staining, tight | | | |
| | | | 1 | 148.7, 149.6, 151.0' - Joint, 60, 60, and 30 deg, rough, undulating, some iron staining, narrow aperture | | | |
| | | | 1 | 150-150.6' - Increase in chlorite content | | | |
| 150 | R12 5 ft 100% | 45 | >10 | 151.2-152.0' - Highly fractured, calcite infill (<3mm), no staining | 151.2-152.0' - Highly weathered | Run 12: drill rate = 0.5 ft/min Run 13: drill rate = 0.3 ft/min | |
| | | | 0 | 154.7, 154.9' - Joint, 30 and 40 deg, rough, stepped, <2mm iron staining, moderately narrow aperture | 155.3-155.6' - Increase in non-feldspar content | | |
| | | | 0 | | | | |
| | | | 2 | 156.0-157.0' - Highly fractured, heavy manganese staining, some iron staining | 157.6-157.8' - Increase in non-feldspar content | | |
| | | | 0 | | | | |
| | | | 0 | 157.3' - Joint, 70 deg, rough, undulating, manganese staining, narrow aperture | 158' - Change to foliated | | |
| 0 | 159.3' - Change to non-foliated | Run 14: drill rate = 0.1 ft/min | | | | | |
| 155 | R13 5.5 ft 100% | 65 | >10 | | | | |
| 159.0 | | | 0 | | | | |
| 160 | | | 0 | | | | |



| | | |
|---|--------------------------------|---------------|
| PROJECT NUMBER: 417981.ER.02.FW | BORING NUMBER: BH-72 | SHEET 9 OF 10 |
| ROCK CORE LOG | | |

PROJECT : PG&E Topock, ER-TCS Investigation LOCATION : Site K (2100674.4 N, 7617083.4 E)
 ELEVATION : 513.5 ft DRILLING CONTRACTOR : Boart Longyear (B. Bradford)
 CORING EQUIPMENT AND METHOD : HQ Wire-Line Rotary ORIENTATION : Vertical
 WATER LEVELS : Approx. 58 ft BGS START : 6/26/2012 END : 6/27/2012 LOGGER : A. Brewster (Northstar)

| DEPTH BELOW SURFACE (ft) | CORE RUN LENGTH AND RECOVERY (%) | DISCONTINUITIES | | SYMBOLIC LOG | LITHOLOGY | COMMENTS | | | | |
|--------------------------|----------------------------------|-----------------------|--|---|---|--|--|---|---------------------------------|---------------------------------|
| | | R Q D (%) | FRACTURES PER FOOT | | | | DESCRIPTION | | | |
| | | | | | | | DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS | | | |
| 165 | R14 2.5 ft 100% | 40 | 2 | | Metadiorite dusky yellow green, (5GY 5/2), non-foliated, uniform, slightly weathered, strong, phaneritic, slightly fractured, and healed with chlorite cement | Run 15: drill rate = 0.2 ft/min Run 16: drill rate = 0.3 ft/min | | | | |
| | 161.5 | >10 | 160.5, 160.7' - Joint, 30 deg, rough, undulating to stepped, manganese staining, narrow aperture 161.0-161.3' - Highly fractured, manganese and iron staining | | | | | | | |
| | R15 3.5 ft 100% | 0 | >10 | | | | 162.5' - Joint, 70 deg, rough, undulating, <1mm manganese staining, tight 162.6-163.5' - Highly fractured, manganese staining | | | |
| | | >10 | >10 | | | | 164' - Joint, 70 deg, rough, undulating, <1mm calcite infilling, iron and manganese staining, tight 164.3-165.0' - Highly fractured | | | |
| | | 1 | 0 | | | | 165.6, 169.7' - Joint, 70 and 10 deg, rough, undulating, <1mm calcite infilling, iron staining, very narrow aperture | | | |
| | | 38 | >10 | | | | 167.7-168.4' - Highly fractured, manganese staining | | | |
| | 170 | 170.0 | 1 | | | | | | Run 17: drill rate = 0.1 ft/min | |
| | 175 | R17 1.5 ft 100% | 100 | | | | 0 | | | Run 18: drill rate = 0.1 ft/min |
| | | 171.5 | 0 | | | | | | | |
| | | R18 2 ft 100% | 38 | | | | >10 | 172.6, 172.7, 172.8' - Joint, 30, 20, and 40 deg, rough, undulating, manganese staining, narrow aperture 172.8-173.0' - Highly fractured | | Run 19: drill rate = 0.8 ft/min |
| 180 | R19 1.5 ft 100% | 57 | 0 | 173.3, 173.4, 173.6, 173.7, 173.9' - Joint, 30 deg, rough, undulating, iron and manganese staining, tight | | Run 20: drill rate = 0.9 ft/min | | | | |
| | R20 5 ft 100% | 15 | >10 | 175.8, 176.2, 177.1, 177.2, 178.2' - Joint, 30, 30, 70, 80, and 60 deg, rough, undulating to stepped, iron and manganese staining, narrow aperture 176.5-177.0, 177.4-178.0, 178.4-180' - Highly fractured, no infill, iron staining | | | | | | |
| | | >10 | >10 | | | | | | | |
| | | >10 | >10 | | | | | | | |



| | | |
|---|--------------------------------|----------------|
| PROJECT NUMBER: 417981.ER.02.FW | BORING NUMBER: BH-72 | SHEET 10 OF 10 |
| ROCK CORE LOG | | |

PROJECT : PG&E Topock, ER-TCS Investigation LOCATION : Site K (2100674.4 N, 7617083.4 E)
 ELEVATION : 513.5 ft DRILLING CONTRACTOR : Boart Longyear (B. Bradford)
 CORING EQUIPMENT AND METHOD : HQ Wire-Line Rotary ORIENTATION : Vertical
 WATER LEVELS : Approx. 58 ft BGS START : 6/26/2012 END : 6/27/2012 LOGGER : A. Brewster (Northstar)

| DEPTH BELOW SURFACE (ft) | CORE RUN LENGTH AND RECOVERY (%) | DISCONTINUITIES | | | SYMBOLIC LOG | LITHOLOGY | COMMENTS |
|--------------------------|----------------------------------|-----------------|--------------------|---|--|--|----------|
| | | R Q D (%) | FRACTURES PER FOOT | DESCRIPTION | | | |
| | | | | DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS | | | |
| 185 | R21 5 ft 100% | 0 | >10 | 180-185.0' - Highly fractured, calcite infill (<5mm), heavy iron staining | Metadiorite dusky yellow green, (5GY 5/2), non-foliated, uniform, slightly weathered, strong, phaneritic, slightly fractured, and healed with chlorite cement | Run 21: drill rate = 0.9 ft/min | |
| | | | >10 | 182.2' - Joint, 80 deg, rough, undulating, <5mm calcite infilling, heavy iron staining, narrow aperture | | | |
| | | | >10 | 182.5-182.8' - Change to highly weathered | | | |
| | | | >10 | | | | |
| 190 | R22 5 ft 100% | 66 | 2 | 185.1, 185.6, 188.6, 189.7' - Joint, 60, 30, 50, and 40 deg, rough, undulating to stepped, heavy iron staining, moderately narrow apertures | Run 22: drill rate = 0.8 ft/min | | |
| | | | 0 | 188.3-188.5' - Highly fractured | | | |
| | | | >10 | | | | |
| 195 | R23 5 ft 100% | 27 | 1 | 190.7, 190.9, 191.5, 191.6, 194.4, 195.0' - Joint, 30, 60, 40, 60, 40 and 40 deg, rough, undulating, <1mm some iron and manganese staining, tight to narrow apertures | Run 23: drill rate = 0.8 ft/min | | |
| | | | >10 | 192.0-193.0' - Highly fractured, heavy iron staining | | | |
| | | | 0 | | | | |
| 200 | R24 5 ft 100% | 55 | 2 | 195.9, 199.5' - Joint, 30 and 80 deg, rough, undulating, some iron and manganese staining, narrow apertures | Run 24: drill rate = 0.7 ft/min | | |
| | | | 0 | 196.6-198.0' - Change to aphanitic | | | |
| | | | >10 | 199.0-200.0' - Highly fractured, calcite infill (<1mm) | | | |
| | | | | | | | |
| | | | | | End Drilling on 6/27/2012 Total Borehole Depth: 200.0 ft bgs | This borehole was converted into the following monitoring well(s): MW-72-80 and MW-72BR-200 | |