15-005-20117 11-07S-20E

Professional Energy Services
9402 Kessler Lane
Shawnee Mission, KS 66212
Ph.913.341.7434

GEOLOGICAL REPORT

Operator: **EVERGREEN OPERATING CORPORATION**
Project: Pleasant Valley Well Name: Ernzen 43-11
Location: SE NW NE SE - 2100' FSL & 700' FEL
Sec. 11-7S-20E County: Atchison State: Kansas
All measurements GL: 1099' API: 15-005-20117-00-00
Professional Energy Services: Geologist: Rich Robba
Crown: Drilling Superintendent: Fred O'Doan
Patterson Logging: Engineer: Roger Taylor
Ensign Drilling Company: Drilling Contractor
CBM Solutions: Desorption: Dean/Ken Glover/Dion
Geosearch Logging: Mudloggers: Kevin Clark/Nathan Barnes
Commenced: 03/18/04 Completed: 03/23/04

This geological report is prepared for **EVERGREEN OPERATING CORPORATION**. Wellsite geological supervision was conducted from surface to Total Depth. The Ernzen 43-11 was water drilled to the core point, continuous cored from above the Summitt Shale to the Mississippi and then deepened by rotary to TD. ROP, gas curves and sample descriptions from water rotary chips are recorded on the mud log and geophysical survey formation tops, visual core recovery descriptions and desorption canisters are listed below.

Ernzen 43-11

This well has fair to good coal intersection development with an overall area increase of degassing data.

Formation E-Log Tops

Heebner Shale:	241'	Excello:	1072'
Lansing:	492'	VShale:	1177'
Stark Shale:	783'	Tebo Shale:	1251'
B/Kansas City:	828'	Mississippi:	1641'
Altamount:	976'	RTD:	1710'
Summit:	1048'	LTD: (65' fill)	1645'

Geophysical Density Survey Coal and Coal Shale Intersections

Net Coals(ft) < 1.75 g.cc

Name/Canister	Depth
Bevier/T649	1170.4-1172.1
Mineral/411	1207.8-1208.9
Tebo/X18,422	1252.1-1253.8
Weir A/431	1270.6-1272
Rowe D/T661	1460.5-1462.2
Neutral B/T66	1518-1520
Warner A	1561.7-1563.3

Net Coals(ft) >1.75g.cc< 2.00 g.cc

Name/Canister	Depth
Oswego/407	1026-1027.1
Iron Post/408	1036.7-1037.7
Bluejacket D/JJ	1386.9-1388.1
Rowe E/Z	1475.6-1476.5

Net Carbonaceous Shale (ft)

Name/Canister	Depth
Summit/T643	1048-1050
Excello/T646	1072-1073.8
Fleming	1192-1193
Weir B/444	1276.3-1277.8
Weir C/X30	1291-1292
Bluejacket E/M	1409-1410.5
Bluejacket F/474	1414.7-1415.9
Neutral A	1513.2-1514
Neutral D/Z2	1551-1552.3

Cumulative Net Thickness Geophysical Density Survey

Net Coals (ft) < 1.75 g.cc	Net Coals (ft)>1.75g.cc < 2.00 g.cc	Net Carbonaceous Shale (ft)
11.2'	4.2'	12.1'

Visual Core Sample Descriptions

1015-1019 SHALE: gy, fissile, sli slty.
1019-1019.5 SILTSTONE: gy, sli sndy.
1019.5-1021 SHALE: gy, fissile foss at base.
1021-1023 LIMESTONE: gry, microxln, sli foss, dnse.
1023-1025.5 SHALE: dk gy, fissile, sli foss, rare ss inter-bed.
1025.5-1026.7 COAL: shly, dull w/ br bands, butt cleats, calc.
1026.7-1028 SHALE: gy, fissile, sli foss, sli slty.
1028-1032 UNDERCLAY: gy, grn, soft, slty, washout.
1032-1035 LIMESTONE: lt gy, fnxln, sli foss, dnse.
1035-1036 SHALE: lt gy, slty.
1036-1038 LIMESTONE: lt gy, fnxln, sli foss.
1038-1040 SHALE: gy, fissile, slty, occ plant mat.
1040-1041 UNDERCLAY: gr, gy, soft, occ plant mat.
1041-1043 SHALE: lt gy, fissile, pyr.
1043-1045 LIMESTONE: lt gy, fnxln, foss, dnse.
1045-1046.7 SHALE: gry, fissile, foss, clay, slty.
1046.7-1048 SHALE: dk gy, fissile, carb, occ wh clay laminations.
1048-1051 SHALE: gy, fissile, foss, occ plant mat.
1051-1053 SHALE: dk gy, fissile, foss, num plant mat.
1053-1055 SHALE: gy, fissile, w/ clay inter-bed.
1055-1060 SHALE: gy, fissile, slty, sli foss, pyr.

Visual Core Sample Descriptions

1060-1061 LIMESTONE: gy, microxln, dnse, w/ lt gy sh inter-bed.
1061-1067 SHALE: gy, gn, slty, pyr.
1067-1068 LIMESTONE: gy, fnxln, sli foss, dnse.
1068-1070 SHALE: lt gy, slty, foss.
1070.3-1072.3 SHALE: dk gy, carb, occ ss laminations.
1072-1073 SHALE: dk gy, fissile, slty, occ plant mat.
1073-1078 SHALE: lt gy, slty, sli sndy, mica.
1078-1081 SILTSTONE: gy, sli sndy, occ cross bedding.
1081-1082 SANDSTONE: gy, v fn grn, slty, varved w/ siltstone.
1082-1089 SILTSTONE: lt gy, sli sndy, occ gy shale laminations.
1089-1092 SHALE: lt gy and gy banding, slty, mica.
1092-1102 SANDSTONE: gy, v fn grn, slty, mica.
1102-1113 SHALE: lt gy, slty, mica, rare plant mat, occ dk gy lamination.
1113-1114 SHALE: lt gy, soft, num plant mat.
1114-1121 SHALE: gy, fissile, occ pyr, plant mat.
1121-1124 SHALE: gy, fissile, pyr.
1124-1127.10 SHALE: dk gy, fissile, pyr, foss, occ plant mat.
1127.1-1128.1 COAL: rare shly bands, p sho gas, p-f cleats.
1128.10-1131 SHALE: gy, slty, sndy, occ coal lam, varved.
1131-1133 SANDSTONE: gy, med grn, w/ dk gy sh and underclay lamination.
1133-1137 SHALE: dk gy, slty, lt gy lam, occ cross-bed.
1137-1142 UNDERCLAY: gy, soft, occ plant mat, 2" coal at base.
1143-1144 UNDERCLAY: gy, soft, occ coal lam.
1144-1148 SHALE: lt gy to dk gy laminations, slty, sndy, varved.
1148-1156 SHALE: gy, fissile, occ plant mat, occ lt gy lam.
1156-1160 SHALE: lt gy, fissile, sli slty, mica.
1160-1165.8 SHALE: dk gy, fissile, occ plant mat.
1165.8-1167.8 COAL: mod ash, shly bands, p cleats.
1167.8-1169 SHALE: blk, carb, w/ coal lamination.
1169-1172 SHALE: gy, slty, mica, dk gy plant mat lam.
1172-1177 SHALE: gy, slty, sli mica, soft w/ carb shale inter-bed.
1177-1180 SANDSTONE: gy, fn grn, slty, sli mica.
1180-1186 SHALE: lt and dk gy, slty, mica, varved.
1186-1189 SHALE: gy, fissile, num plant mat.
1189-1190 SHALE: blk, carb, pyr, occ sand lenses, 2" coal at base.
1190-1193 SHALE: gy, soft, num plant mat, varved.
1193-1196 SANDSTONE: gy, fn grn, slty.
1196-1200 SHALE: gy, soft, slty.
1200 1202 UNDERCLAY: gy, soft, sli slty, thin (<1/2") coal inter-bed.
1202-1205.5 SHALE: dk gy, sli carb, fissile.
1205.5-1206.5 COAL: soft, pyr, calc in cleats, f cleating pattern devel.
1206.5-1207 SHALE: dk gy, carb, fissile.
1207-1210 UNDERCLAY: gy, soft, slty.
1210-1213 SHALE: gy, slty, sndy.
1213-1219 SANDSTONE: gy, fn grn, shly, slty, varved.
1219-1224 SILTSTONE: gy, massive, sli sndy.

Visual Core Sample Descriptions

1224-1230 SILTSTONE: gy, sli sndy, lt gy sh lam.
1230-1240 SHALE: dk gy, w/ lt gy laminations, fissile, mica, occ siderite nod, plant mat.
1240-1247 SHALE: dk gy, fissile, occ lt gy sh banding, sli mica, foss, plant mat.
1247-1249.6 SHALE: dk gy, carb, fissile, foss, plant mat.
1249.6-1250.8 COAL, 2 runs, dull bands, carb sh parting, f cleats w/ wh minerals.
1250.8-1256 SHALE: gy, slty, sndy, occ siderite nod, varved.
1256-1262 SHALE: gy, fissile, sli mica, occ siderite nod.
1262-1266.2 SHALE: dk gy, fissile, sli mica, occ siderite nod, foss.
1266.2-1267.2 COAL SHALE: pyr, coal bands, v p cleating.
1267.2-1270 UNDERCLAY: lt gy, slty, sli sndy, num plant mat.
1270-1273.8 SHALE: dk gy, sli carb, fissile.
1273.8-1274.4 COAL: pyr, abund sh partings, f cleats.
1274.4-1281 SHALE: dk gy, sli carb, fissile, plant mat, occ foss, lt gy clay laminations.
1281-1287 SHALE: dk gy, fissile, sli pyr.
1287-88.8 SHALE: dk gy, slty, num foss shells.
1288.8-1289.4 COAL SHALE: calcareous, foss w/ wisp of coal seams, p cleats, no sho.
1289.4-1291 SHALE: gry, sli slty, sli mica, occ plant mat, pyr.
1291-1294 UNDERCLAY: lt gry, slty, occ plant mat.
1294-1297 SHALE: gry, fissile, sndy, sli slty, occ plant mat, pyr.
1297-1299 SANDSTONE: gy, slty, shly, occ plant mat.
1299-1309 SHALE: gy, fissile, sli slty, sli pyr, fn grn ss lense at base.
1309-1316 SHALE: dk gy, fissile, num plant mat, sli pyr.
1316-1319 SHALE: gry, slty, sli sndy, mica.
1319-1321 SANDSTONE: gy, v fn gn, slty, sndy, sli mica.
1321-1325 SANDSTONE: gy, fn-med gn, w/ dk gy sh band, varved.
1325-1331 SANDSTONE: gy, v fn gn, w/ lt gy sh lam, bio turb.
1331-1333 SHALE: gy, fissile, sli slty, pyr, occ plant mat.
1333-1336 SANDSTONE: gy, fn grn, silty, occ siderite nod.
1336-1339 SHALE: gy, sli gn, slty, occ bio turb.
1339-1343 SANDSTONE: gr, fn grn, slty.
1343-1344 SILTSTONE: gy, mica, dk gy sh lam.
1344-1353 SHALE: dk gy, fissile, fracs, sli mica, occ plant mat.
1353-1357 SHALE: gy, dk gy, slty, mica, num plant mat lam.
1357-1358 SANDSTONE: gy, v fn grn, slty, mica, w/ gy sh lam.
1358-1359 SHALE: dk gy, fissile, pyr,1/4" coal at base.
1359-1361 SHALE: lt gy, slty, micas, num plant mat, bio turb.
1361-1365 SANDSTONE: gy, fn-med grn, slty, pyr, num plant mat, gy sh laminations at base.
1365-1369 SILTSTONE: gy, mica, sli sndy, sli pyr.
1369-1380 SHALE: gy dk gy, fissile, occ plant mat, foss, siderite band.
1380-1385.6 SHALE: dk gry, fissile, sli mica, occ plant mat.
1385.6-1385.9 COAL: high ash content, br bands, plant fragments, f cleats, calcite.
1385.9-1389 UNDERCLAY: lt gy, slty, sndy, occ plant mat.
1389-1393 SANDSTONE: gy, v fn grn, slty, massive.
1393-1396 SHALE: gr gy, waxy, occ plant mat.
1396-1398 SHALE: gy, slty, bio turb, coal fragments.

Visual Core Sample Descriptions

1398-1400 SANDSTONE: gy, v fn grn, slty, dk gy sh lam.
1400-1405 SILTSTONE: gry, sndy, mica, dk gy plant mat lam.
1405-1407.1 SHALE: dk gy, fissile, mica.
1407.1-1407.4 COAL: mod ash, br bands, occ plants, calcite
1407.4-1410 SANDSTONE: gy, fn grn, slty, num plant mat, bio turb, coal fragments at base.
1410-1412.2 SILTSTONE: gy, num plat mat, bio turb.
1412.2-1412.9 COAL: dull, occ pyr, f cleats, gd sho gas.
1412.9-1414 SANDSTONE: gy, v fn grn, slty, num plant mat, bio turb.
1414-1416 SHALE: dk gy, mica, num plant mat, varved, w/ lt gy sh lam.
1416-50 SHALE: dk gy, platy, v mica, occ plant mat, w/ lt gy sh laminations, occ siderite band.
1450-1456.9 SHALE: gy, fissile, mica, w/ lt gy sh inter-bed.
1456.9-1459.2 COAL: mod ash, pyr, thin sh bands, br, p cleats, calcite, carb sh parting.
1459.2-1461 UNDERCLAY: gy, slty, sndy, soft, num plant mat.
1461-1464 SILTSTONE: gy, sli sndy, mica, num plant mat, 4" underclay at base.
1464-1465 SHALE: dk gy, carb, fissile.
1465-1468 SHALE: dk gy, fissile, mica.
1468-1469 SHALE: dk gy, carb, num plant mat.
1469-1472.9 SHALE: dk gy, fissile, mica, pyr.
1472.9-1473.1 COAL: rubble, mod ash content, br banded, shly in part.
1473.1-1474 SHALE: dk gy, slty, num plant mat.
1474-1475 SANDSTONE: gy, fn grn, sli slty, occ plant mat, occ foss, bio turb.
1475-1480 SANDSTONE: gy, v fn grn, slty, w/ dk gy sh lamination, mica.
1480-1484 SILTSTONE: lt-dk gy, lam, micaceous.
1484-1486 SANDSTONE: gy, v fn grn, shly.
1486-1487 SHALE: gy, soft, sli carb.
1487-1489 SHALE: dk gy, fissile, mica, occ plant mat.
1489-1501 SHALE: dk gy, carb, soft.
1501-1502 SHALE: dk gy, fissile, mica, inter-bed w/ ss, m grn, x-bed.
1502-1508 SANDSTONE: gy, fn-med grn, w/ occ carb sh lam.
1508-1509 SHALE: gy, fissile.
1509-1512 SHALE: gy, soft, mica, occ plant mat.
1512-1515.3 SHALE: dk gy, fissile, sli mica, pyr, occ plant mat.
1515.3-1517.3 COAL: blk, mod ash, br, plant fragments, abund pyr, f cleats, p sho gas.
1517.3-1519 SHALE: dk gy, slty, mica, occ plant mat.
1519-1521 UNDERCLAY: gy, sli slty.
1521-1527 SHALE: dk gy, sli carb, fissle, soft, occ plant mat.
1527-1530 SHALE: dk gy, fissile, mica, sli pyr, occ plant mat.
1530-1535 SHALE: dk gy, inter-bed fissle-soft, occ plant mat.
1535-1540 SILTSTONE: lt gy, sli sndy, num plant mat, bio turb.
1540-1542 SHALE: dk gy, fissile, mica, num plant mat.
1542-1548 SHALE: blk, carb, soft, fissile.
1548-1548.3 COAL: br, f-gd cleats, p sho gas, low density.
1548.3-1549 SHALE: lt-dk gy, fissile, mica, num plant mat.
1549-1552 SANDSTONE: gy, f grn, slty, shly.
1552-1554 SHALE: dk gy, sli carb, fissile, num plant mat.

Visual Core Sample Descriptions

1554-1560 SHALE: lost 2'+ recovery (coal on log), blk, low-med carb, few inches rubble of coaly sh.
1560-1569 UNDERCLAY: lt gy w/ wh-gy thin beds.
1569-1580 SHALE: gy w/ ss thin beds up to few inches, some slumping, cross bedding, redeposition w/ vertical beds in contact w/ horizontal, fracs.
1580-1594 SANDSTONE: fn gn, well sorted, shly thin beds, v low carb, sli to occ v friable, no vis sho gas, cut or fluorescence.
1594-1606 SHALE: sdy, carb, broken bedding planes, blk, fissile in part.
1606-1612 SANDSTONE: v friable, w/ gd por, shly in matrix and bedding, no vis sho.
1612-1637 SHALE: sdy at top bec/ gy sh banded w/ lt gy sh, fissile, rubble in part.
1637 –1640 LIMESTONE: v shly, micro-v fnxln, fast effervescence w/ sh calc at base.

Conventional Oil and Gas Shows

Mclouth Sandstone: SHALE-sandy from 1565-1580, 1594-1606 & 1612-1630 and SANDSTONE-shly from 1580-1594 &1606-1612: Gas kicks from 1595-1633 are 9-29 units, sh= gy w/ thin - up to few inches ss layers, some slumping, cross bedding, redeposited area's w/ fracs, horizontal beds in contact with vertical lineation, pred horiz, no vis sho gas, cut or fluorescence: ss= fn gn, well sorted, shly thin beds, v low carb, sli to occ v friable, no vis sho gas, cut or fluorescence.

Burgess Sandstone: SANDSTONE: 1637-1641, pred loose gns, clusters clean to shly, clr to frost, sli calc in part, ang/sub ang some rnd, f sorted, v friable, no vis sho gas, cut or fluorescence, has Resistivity and SP increase on induction log.

Respectfully submitted,

Richard A. Robba, PG
Director of Operations
Professional Energy Services