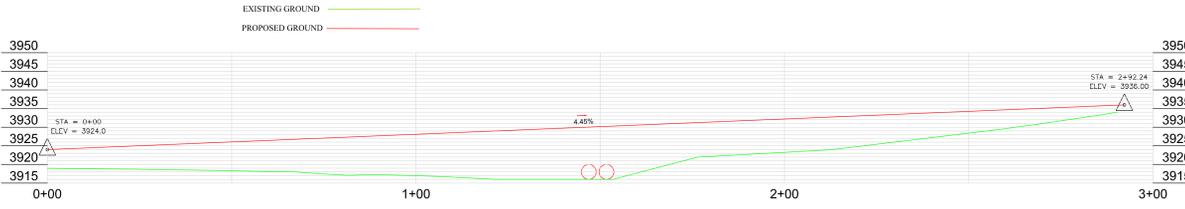
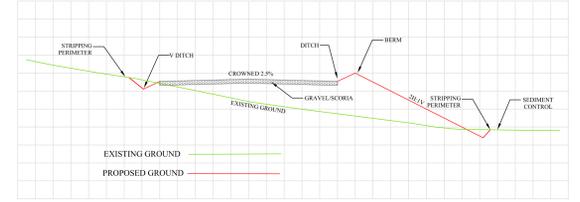




ROAD A CENTERLINE SECONDARY ROAD PROFILE



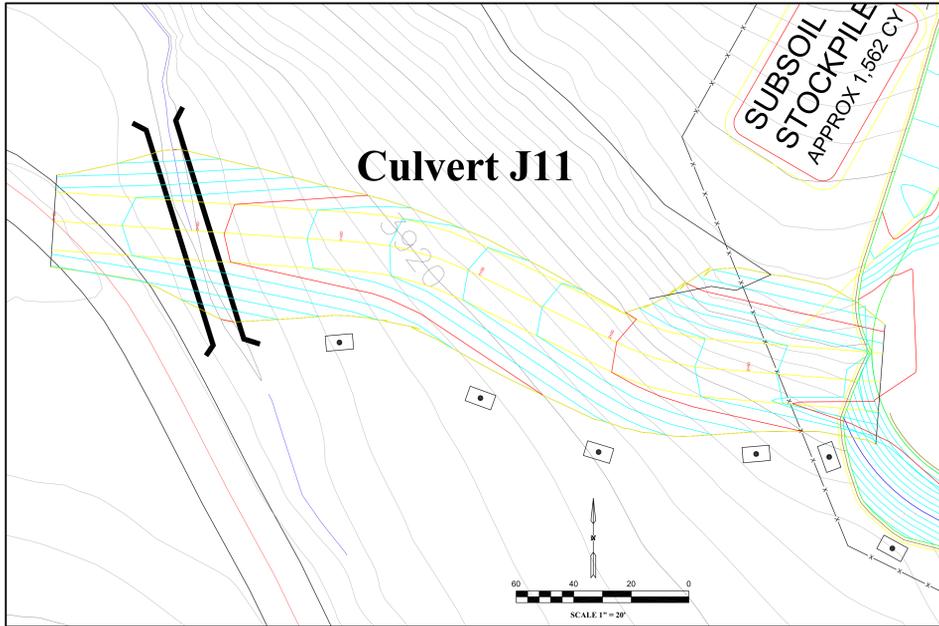
ROAD B CENTERLINE SECONDARY ROAD PROFILE



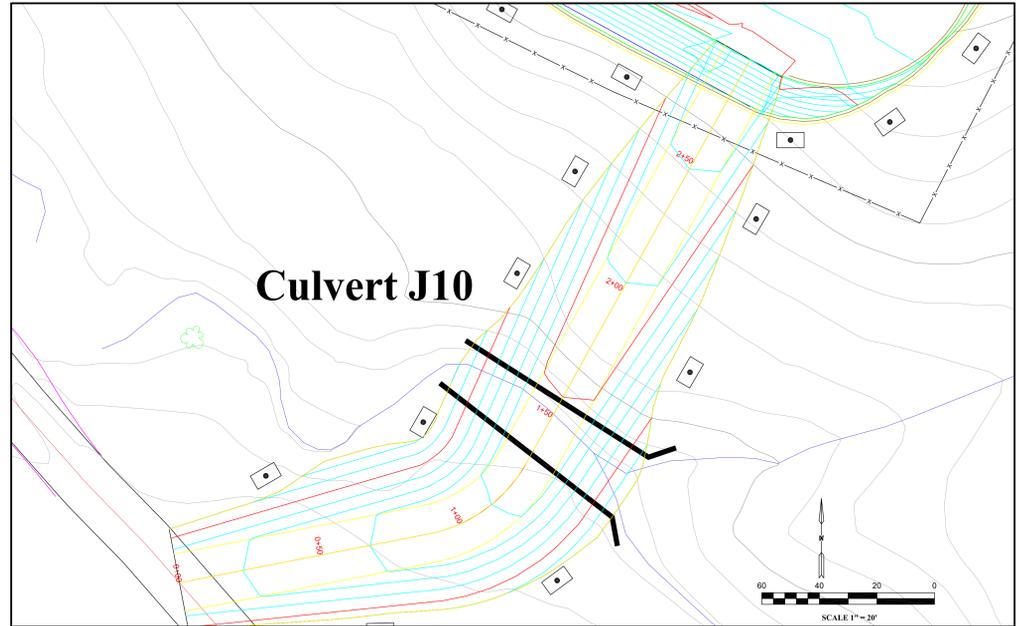
TYPICAL CROSS SECTION



AERIAL



FAN PAD ROAD A SECONDARY ROAD DESIGN



FAN PAD ROAD B SECONDARY ROAD DESIGN

ESTIMATED SECONDARY ROAD A TOPSOIL SALVAGE  
 Volumes by Triangulation (Prisma) Fri Jun 22 10:21:06 2012  
 Existing Surface: J:\PERMIT\MINOR REVISIONS\MR 154 Fan Pad\Surfaces\Pad Site EG.in  
 Final Surface: J:\PERMIT\MINOR REVISIONS\MR 154 Fan Pad\Surfaces\Pad Site EG minus 1 Topsoil.in  
 Total inclusion area: 10,588.3 S.F., 0.24 Acres  
 Average Cut Depth: 1.00 feet  
 Export Volume: 391.3 C.Y.

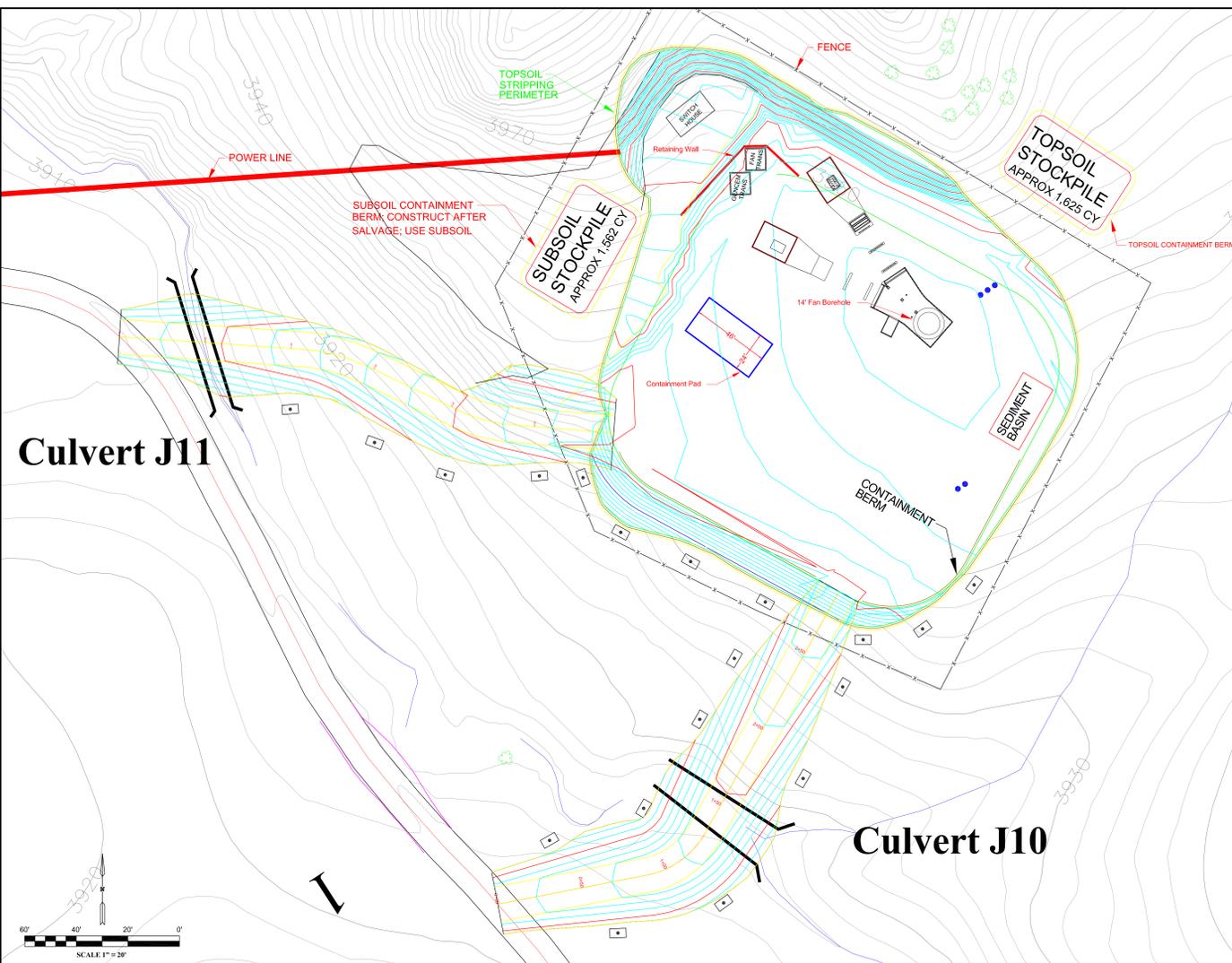
ESTIMATED SECONDARY ROAD A SUBSOIL SALVAGE  
 Volumes by Triangulation (Prisma) Fri Jun 22 10:24:56 2012  
 Existing Surface: J:\PERMIT\MINOR REVISIONS\MR 154 Fan Pad\Surfaces\Pad Site EG minus 1 Topsoil.in  
 Final Surface: J:\PERMIT\MINOR REVISIONS\MR 154 Fan Pad\Surfaces\Pad Site EG minus 2 Subsoil.in  
 Total inclusion area: 10,566.3 S.F., 0.24 Acres  
 Average Cut Depth: 1.00 feet  
 Export Volume: 391.3 C.Y.

ESTIMATED SECONDARY ROAD A DIRT WORK AFTER SOILS SALVAGE  
 Volumes by Triangulation (Prisma) Fri Jul 13 10:14:22 2012  
 Existing Surface: J:\PERMIT\MINOR REVISIONS\MR 154 Fan Pad\Surfaces\Pad Site EG minus 2 Subsoil.in  
 Final Surface: J:\PERMIT\MINOR REVISIONS\MR 154 Fan Pad\Surfaces\Pad Site EXIT RD.in  
 Cut volume: 0 C.F., 0 C.Y.  
 Fill volume: 20,992.3 C.F., 777.49 C.Y.  
 Total inclusion area: 10,498.2 S.F., 0.24 Acres  
 Average Cut Depth: 0 feet  
 Average Fill Depth: 2.0 feet  
 Cut to Fill ratio: 0.00

ESTIMATED SECONDARY ROAD B TOPSOIL SALVAGE  
 Volumes by Triangulation (Prisma) Fri Jun 22 10:26:12 2012  
 Existing Surface: J:\PERMIT\MINOR REVISIONS\MR 154 Fan Pad\Surfaces\Pad Site EG.in  
 Final Surface: J:\PERMIT\MINOR REVISIONS\MR 154 Fan Pad\Surfaces\Pad Site EG minus 1 Topsoil.in  
 Total inclusion area: 13,160.2 S.F., 0.30 Acres  
 Average Cut Depth: 1.00 feet  
 Export Volume: 487.4 C.Y.

ESTIMATED ROAD B SECONDARY ROAD SUBSOIL SALVAGE  
 Volumes by Triangulation (Prisma) Fri Jun 22 10:26:36 2012  
 Existing Surface: J:\PERMIT\MINOR REVISIONS\MR 154 Fan Pad\Surfaces\Pad Site EG minus 1 Topsoil.in  
 Final Surface: J:\PERMIT\MINOR REVISIONS\MR 154 Fan Pad\Surfaces\Pad Site EG minus 2 Subsoil.in  
 Total inclusion area: 13,160.2 S.F., 0.30 Acres  
 Average Cut Depth: 1.00 feet  
 Export Volume: 487.4 C.Y.

ESTIMATED SECONDARY ROAD B DIRT WORK AFTER SOILS SALVAGE  
 Volumes by Triangulation (Prisma) Fri Jul 13 10:24:50 2012  
 Existing Surface: J:\PERMIT\MINOR REVISIONS\MR 154 Fan Pad\Surfaces\Pad Site EG minus 2 Subsoil.in  
 Final Surface: J:\PERMIT\MINOR REVISIONS\MR 154 Fan Pad\Surfaces\ROAD B ENTRY.in  
 Cut volume: 0 C.F., 0.00 C.Y.  
 Fill volume: 91,307.82 C.F., 3,381.77 C.Y.  
 Total inclusion area: 15,951.0 S.F., 0.36 Acres  
 Average Fill Depth: 6.99 feet  
 Cut to Fill ratio: 0.00



PAD DESIGN  
 T6NR27E NE 1/4 OF SECTION 18  
 SE 1/4 OF SECTION 7

FAN PAD DIRTWORK VOLUMES

ESTIMATED FAN PAD TOPSOIL SALVAGE  
 Volumes by Triangulation (Prisma) Wed Jun 20 15:17:04 2012  
 Existing Surface: J:\PERMIT\MINOR REVISIONS\MR 152 Fan Pad\Surfaces\Pad Site EG.in  
 Final Surface: J:\PERMIT\MINOR REVISIONS\MR 152 Fan Pad\Surfaces\Pad Site EG minus 1 Topsoil.in  
 Area in Cut: 43,858.9 S.F., 1.01 Acres  
 Average Cut Depth: 1.00 feet  
 Export Volume: 1,628.5 C.Y.

ESTIMATED FAN PAD SUBSOIL SALVAGE  
 Volumes by Triangulation (Prisma) Wed Jun 20 15:18:08 2012  
 Existing Surface: J:\PERMIT\MINOR REVISIONS\MR 152 Fan Pad\Surfaces\Pad Site EG minus 1 Topsoil.in  
 Final Surface: J:\PERMIT\MINOR REVISIONS\MR 152 Fan Pad\Surfaces\Pad Site EG minus 2 Subsoil.in  
 Total inclusion area: 42,155.5 S.F., 0.97 Acres  
 Average Cut Depth: 1.00 feet  
 Export Volume: 1,581.3 C.Y.

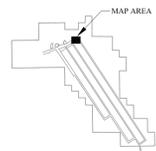
ESTIMATED FAN PAD DIRT WORK AFTER SOILS SALVAGE  
 PAD REPORT Wed Jun 20 15:58:25 2012

Pad Earthwork Volumes  
 Pad slope percent: 0.500%  
 Total cut: 385,286.5 C.F., 13,529.20 C.Y.  
 Total fill: 41,569.2 C.F., 1,520.60 C.Y.  
 Balance Export: 323,719.3 C.F., 11,989.60 C.Y.  
 Area: 5995.1 Sq.Ft., 1.377 Acres

- NOTES:
1. See MAP 308-4 for general location of pad
  2. Most of the sediment control features need to be installed prior to construction
  3. Do not begin any pad construction until soils excavation has been validated
  4. Strip all available topsoil up to a maximum of 1 foot deep
  5. Strip all available subsoil up to a maximum of 2 feet deep
  6. DO NOT disturb anything outside the topsoil stripping perimeter shown
  7. Existing contours from June 2009 Fugro Horizons
  8. PMT will be original Topography
  9. All soils salvage will be placed in Stockpiles
  10. All road and pad slopes will be seeded at the first available opportunity

LEGEND

	2' Design Contour
	10' Existing Contour
	2' Existing Contour
	Approximate Berm
	Approximate Sediment Control
	Tree



REV.	DATE	BY	DESCRIPTION
4	8/4/11	S.T.E.	MR 179 Permit Update
3	8/18/11	S.T.E.	MR 179 Permit Submittal
2	9/10/12	S.T.E.	UPDATE PERMIT
1	8/21/12	S.T.E.	RESPONSE MR154
0	6/26/12	S.T.E.	PREPARED FOR PERMIT SUBMITTAL

CERTIFICATION PURSUANT TO §17-24-213(1)

I, THE UNDERSIGNED, HEREBY CERTIFY THAT THE PLANS AND DRAWINGS FOR EACH PADE ROAD, ACCESS ROAD, CONVEYING, BARRICADE, FENCE, AND/OR OTHER CONSTRUCTION PREPARED BY OR UNDER THE DIRECTION AND SUPERVISION OF ME, A QUALIFIED LICENSED PROFESSIONAL ENGINEER WITH EXPERTISE IN THE DESIGN AND CONSTRUCTION OF SUCH FACILITIES AND THAT THE DESIGN MEETS THE PERFORMANCE STANDARDS OF ASCE 7-05 AND 7-24-05, §17-24-205, AND CURRENT PRECEDENT ENGINEERING PRACTICES.

**BULL MOUNTAINS MINE NO. 1**  
 Permit C1993017

MUSSELSHELL AND YELLOWSTONE COUNTIES  
 September 4, 2013  
**MAP 308-9**  
 PUMPABLE CRIB PAD 3, FAN, & SECONDARY ROAD DESIGN