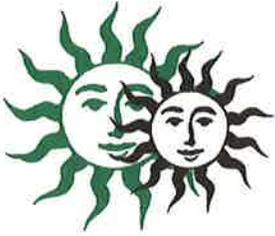


C/007/042 Incoming

#4727



Sunnyside Cogeneration Associates

P.O. Box 10, East Carbon, Utah 84520 • (435) 888-4476 • Fax (435) 888-2538

November 24, 2014

Daron Haddock
Utah Division of Oil, Gas & Mining
1594 W. North Temple, Suite 1210
Salt Lake City, Utah 84116

RECEIVED

NOV 25 2014

DIV. OF OIL, GAS & MINING

RE: C/007/042 SCA-Star Point Refuse and Slurry
Task #4685 Response to NOV#12148

Dear Daron,

Thank you for your team's review of the Star Point submittal. We have updated the submittal as needed to address the comments and as a summary, we have outlined how we have addressed each comment:

Road Systems Classification -

- Clarification on the remaining 0.07 miles of the original Haul Road
 - o The south 0.07 miles of this old road is no longer needed as a primary road. This portion is available for reclamation when that area is ready.

Hydrology Diversion-

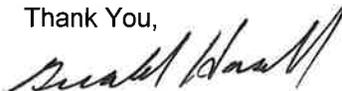
- Table 742b updates regarding Culvert 80A
 - o In discussions with Amanda Daniels, we determined that the question here was regarding Culvert 80B. No update is needed for the flows in Culvert 80A. Flows in Culvert 80B have been updated to 11.39 cfs
- Table 742d flow rate questions for culverts 80A and 80B, specifically in relation to flows from Ditch 72C
 - o Culvert 80A does not receive flows from Ditch 72C and remains with the same flow as previous at 11.01 cfs
 - o Culvert 80B receives flows from ditch 80A and now also receives flows from Ditch 72C. The new peak flow rate for Culvert 80B is now 11.39 cfs to match the flow previously determined for ditch 80B which was previously the point where ditch 80A and 72C were combined. The reason that the flows for ditches 72C and 80A are not just added together is that the times of concentration for the two areas are different and the peak flows arrive at different times.
- Updated Maps 731.720a and 731.720b in relation to lined ditches 72A-C

- o These maps have been updated to more accurately reflect the actual conditions in the field and specified on the design tables
- Riprapped ditch just north of the 72B ditch section
 - o The riprapped ditch observed during the site visit and represented on the photo provided with the review comments is the ditch 72B. That ditch was repaired this summer to address erosion concerns and SCA placed new rip rap in the ditch. We have updated the drawing 731.720a to more accurately label ditch 72B.
- Culverts 18A and 18B
 - o As we discussed, these culverts were copied over from the prior Cyprus / RAG permits. These culverts had been installed many years ago to convey water across the railroad bed. When RAG reclaimed their permit area, the railroad bed was reclaimed. The two culverts are no longer there and runoff coming from the reclamation area that then flows onto the SCA permit area is captured by SCA's ditches. The updates made to the permit documents were intended to match the actual conditions now on site.
- Ditch 16--concrete lining
 - o Thank you for noticing this. We have updated page 700-65 to be clearer about using a concrete lining option.
- Culvert south of Ditch 6C
 - o This culvert is south of the permit area and belongs to the BLM. SCA does not have ownership of the culvert. It is not part of the permit documents.

Reclamation Plan

- Bonding determination. Bond update to reflect demolition and disposal of the shot crete lining in Ditch 16
 - o Ditch 16 is adjacent to the county road and is not going to be reclaimed in the reclamation plan. Given the existing slope of the county road and consequently the slope of the ditch 16, the shot crete lining is an appropriate protection for that ditch and will not be removed at the time of reclamation. No bond cost is needed for that ditch.

Thank You,



Gerald Hascall
Agent For
Sunnyside Cogeneration Associate

c.c. Rusty Netz
Plant File

APPLICATION FOR COAL PERMIT PROCESSING

Permit Change New Permit Renewal Exploration Bond Release Transfer

Permittee: Sunnyside Cogeneration Associates

Mine: Star Point Waste Fuel

Permit Number:

C/007/042

Title: Culvert Removal

Description: Include reason for application and timing required to implement:

Site needs have changed and some culverts can be removed and allow the open channel ditch to extend through where the culvert was.

Instructions: If you answer yes to any of the first eight questions, this application may require Public Notice publication.

- Yes No 1. Change in the size of the Permit Area? Acres: _____ Disturbed Area: 0.00 increase decrease.
- Yes No 2. Is the application submitted as a result of a Division Order? DO# _____
- Yes No 3. Does the application include operations outside a previously identified Cumulative Hydrologic Impact Area?
- Yes No 4. Does the application include operations in hydrologic basins other than as currently approved?
- Yes No 5. Does the application result from cancellation, reduction or increase of insurance or reclamation bond?
- Yes No 6. Does the application require or include public notice publication?
- Yes No 7. Does the application require or include ownership, control, right-of-entry, or compliance information?
- Yes No 8. Is proposed activity within 100 feet of a public road or cemetery or 300 feet of an occupied dwelling?
- Yes No 9. Is the application submitted as a result of a Violation? NOV # 12148
- Yes No 10. Is the application submitted as a result of other laws or regulations or policies?

Explain: _____

- Yes No 11. Does the application affect the surface landowner or change the post mining land use?
- Yes No 12. Does the application require or include underground design or mine sequence and timing? (Modification of R2P2)
- Yes No 13. Does the application require or include collection and reporting of any baseline information?
- Yes No 14. Could the application have any effect on wildlife or vegetation outside the current disturbed area?
- Yes No 15. Does the application require or include soil removal, storage or placement?
- Yes No 16. Does the application require or include vegetation monitoring, removal or revegetation activities?
- Yes No 17. Does the application require or include construction, modification, or removal of surface facilities?
- Yes No 18. Does the application require or include water monitoring, sediment or drainage control measures?
- Yes No 19. Does the application require or include certified designs, maps or calculation?
- Yes No 20. Does the application require or include subsidence control or monitoring?
- Yes No 21. Have reclamation costs for bonding been provided?
- Yes No 22. Does the application involve a perennial stream, a stream buffer zone or discharges to a stream?
- Yes No 23. Does the application affect permits issued by other agencies or permits issued to other entities?
- Yes No 24. Does the application include confidential information and is it clearly marked and separated in the plan?

Please attach three (3) review copies of the application. If the mine is on or adjacent to Forest Service land please submit four (4) copies, thank you. (These numbers include a copy for the Price Field Office)

I hereby certify that I am a responsible official of the applicant and that the information contained in this application is true and correct to the best of my information and belief in all respects with the laws of Utah in reference to commitments, undertakings, and obligations, herein.

Gerald Hascall Plant Manager Nov 24 2014 Gerald Hascall
 Print Name Position Date Signature (Right-click above choose certify then have notary sign below)

Subscribed and sworn to before me this 24 day of November, 2014

Notary Public: Jody Hansen, state of Utah.

My commission Expires: Dec. 23, 2015 }
 Commission Number: 650231 } ss:

Address: _____ }
 City: Price State: Ut. Zip: 84501 }



For Office Use Only:

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DIVISION OF MINING

sediment ponds and diversion ditches. Details (including design drawings and calculations) for all sediment control ponds and diversion ditches are included in Chapter Seven, Section 720. All sediment ponds will be inspected as outlined for impoundments in Section 514. All impoundments meet or exceed the permanent program performance standards.

526.400. Air Pollution Control Facilities.

SCA will continue its programs in the SCA - Star Point Permit Area to comply with the requirements of the Clean Air Act and other applicable air quality laws and regulations, as well as health and safety standards. A copy of the SCA Air Quality permit is included in Exhibit 421a.

To control fugitive dust, roads around the main complex which are being used by mobile equipment will be treated with calcium chloride, potassium chloride, or other acceptable biodegradable, organic wetting agents or sprayed with water as required during dry periods as required by SCA's Air Quality Permit.

527. TRANSPORTATION FACILITIES.

527.100-200. Road Classification.

All transportation facilities are shown on Map 521.100a and 521.100b. Photos are included in Exhibit 526.112a. Three classifications of roads exist within the SCA Star Point Permit Area. These are as follows:

Primary Roads – roads within the permit area with frequent, long-term heavy use. Typically this includes the haul road for transport of the fuel being mined. Design information is included in the permit for these roads and includes plan, profile and cross section information.

Ancillary Roads – roads within the permit area with infrequent, limited or short-term use not intended for hauling of the fuel being mined. Typically, these roads include access roads to ponds, reference areas, monitoring sites, disposal areas, etc. Design information is included in the permit for these roads and includes plan, profile and cross section information.

Pit Roads – roads in the active mining section of the refuse pile. The locations of these roads change as mining progresses and may or may not be shown on current maps. Typically these roads do not include design criteria in the plan.

The primary and ancillary roads within the SCA Star Point Permit Area are identified on maps 534.100a through 534.100h and are labeled roads D, F, G, H, K, L, M, and P (Haul Road). Road M is a future road that is not anticipated to exist until hauling of Refuse Pile B and C. Road K is also a future road that is not anticipated to exist until reclamation time. Primary and ancillary roads are further discussed in Sections 527.210 and 534.

Table 527.100a Road Classification

Road	Type and Frequency and Duration of Use
Ancillary Road G to Pond 6	Occasional Access through Life of mine
Ancillary Road H to Pond 5	Occasional Access through Life of mine
Primary Road D	Regular use by haul trucks to access refuse pile
Primary Road F	Infrequent Regular-use by haul trucks to access refuse pile
Primary Road L	Regular use by haul trucks to access refuse pile
Future Primary Road K to Subsoil Area	Not in existence until reclamation then 2-3 months earthwork equipment during reclamation
Future Primary Road M to Refuse Pile B and C	Not in existence until hauling Refuse Pile B and C materials
Primary <u>Road P (Haul Road)</u>	In Frequent Fuel Hauling-. <u>May have haul use in the future through Life of mine</u>

Railroad systems near to the SCA - Star Point Permit Area consist of spur lines and main rail lines owned by Utah Railway Company (URC). A small portion of railroad passes near the southeast corner of the SCA - Star Point Permit Area east of the refuse pile. SCA does not control any trackage of any of the rails.

527.210. Design and Specifications.

Ancillary Road G (Access to Pond 6) – The access road to Pond 6 is called Road G. The road is approximately 10 to 12 feet wide and the grade ranges from 0 to 15%. This road is dirt. Between stations 109+00 to 122+00 where grades are steeper, water bars are spaced at approximately 40 feet.

Ancillary Road H (Access to Pond 5) – The access road to Pond 5 is called Road H. The road is approximately 10 to 12 feet wide and the grade ranges from 0.8 to 12.2%. This road is dirt.

Primary Road D (Access to Refuse Pile A) – This access road is intended for regular use by haul trucks to provide access to the northeasterly point of Refuse Pile A. The 20'-60' wide road will have a gravel or road base surface and a grade that ranges from 0% to 10%. This road will also facilitate loading of excavated material from the refuse pile. ~~Construction on this primary road will begin within 1-2 years following DOGM approval.~~

Primary Road F (Access to Refuse Pile A) – This access road is intended to provide an access road to the refuse pile at a more gentle grade than the Primary Road P (Haul Road) and facilitates more efficient travel. The 15-35 ft road ~~will have~~has a maximum grade of 5% and crosses portions of old asphalt parking lot and also has a gravel surface. Use is currently infrequent, but may have increased use in the future.

Primary Road L (Access to Refuse Pile A and Disposal Area) – The one way access road to the middle of Refuse Pile A and the Disposal Area is called Road L. The road is approximately 15 to 30 feet wide and the grade ranges from 0% to 6.2%. This road is surfaced with gravel or road base. The road provides additional access

to the south side of Pond 9. ~~Construction efforts to upgrade this ancillary road to the primary road are expected to begin within 1-2 years following DOGM approval.~~

Future Primary Road K (Access to Subsoil Area) – The access road to the Subsoil Area is called Road K. The proposed road is approximately 10 to 25 feet wide and the grade ranges from 13% to 23%. Water bars are spaced at approximately 40 feet where grades are steeper between Stations 2+00 and Station 3+70.80. This road will be a dirt road. Prior to construction of Road K, topsoil will be salvaged in accordance with the plan outlined in Section 232.

Future Primary Road M (Access to Refuse Pile B and C) – The access road to Refuse Pile B and C is called Road M. The proposed road is approximately 10 to 24 feet wide and the grade ranges from 0% to 10.9%. This road will be a dirt road.

Primary Road P (Haul Road) – This is ~~formerly~~ the ~~preferred~~ access road to the coal refuse pile. The road is approximately 12 to 30 feet wide and the grade ranges from 0 to 11%. This road is dirt with some gravel surfacing. ~~Use is currently infrequent, but may have increased use in the future. Unneeded segments of the old road may be reclaimed when other reclamation work is done in this area.~~

527.220. Relocation of a Natural Drainageway.

No natural drainage will be relocated because of roads.

527.230. Maintenance and Repairs.

All roads will be maintained in safe condition. If a road is damaged it will be repaired as soon as practical.

527.240. Geotechnical Analysis.

No alternative specifications are required.

528. HANDLING AND DISPOSAL OF COAL, OVERBURDEN, EXCESS SPOIL, AND COAL MINE WASTE.

528.100. Coal Removal, Handling, Storage, Cleaning, and Transportation Areas and Structures.

All coal refuse, which is to be mined, is located within the permit boundary. The coal refuse will be excavated as explained in Section 523. All processing of the coal refuse will be completed in an approved manner outside of this SCA - Star Point Permit Area. Coal Refuse that is unusable (rejects) will be discarded in the disposal area as shown in Map 521.100a. Normally coal mine wastes would be disposed of in a refuse pile. However, due to the nature of this operation, that of excavating the existing refuse piles for fuel, disposal of rejects back on the refuse pile where they came from would impede the ability to continue the excavation.

533.600-700. MSHA Impoundments.

There are no impoundments that meet or exceed 30 CFR 77.216(a) criteria. Also, See Exhibit 513.

534. ROADS.

There are two ancillary roads, Road G, and Road H, which are within the SCA - Star Point Permit Area. In addition, there are four existing primary roads, ~~the Road P~~ (Haul Road) and Roads D, F and L, and two proposed primary roads, Road K to access the Subsoil Area and Road M to access Refuse Pile B and C. The plan, profile, and cross section of Roads D, F, G, H, K, L, M and ~~the Road P~~ (Haul Road) are shown on Maps 534.100a through 534.100h. All other roads are temporary pit roads, which may change with the progress of excavation. Existing access roads are in place to the Subsoil Area, additional roads may be desired at the time of reclamation to improve the operation of hauling soil material. Prior to construction of Road K, topsoil will be salvaged in accordance with the plan outlined in Section 232. Additional design and sediment control facilities for these roads if needed will be provided prior to construction of new roads. Road specifications can be found on Table 534.200a, Road Specifications. Exhibit 534 includes the calculation of the road embankments meeting the safety factor of 1.3 or greater.

TABLE 534.200a. Road Specifications

ROAD*	SURFACE TYPE	SURFACE WIDTH	LENGTH	MAXIMUM GRADE %	MINIMUM GRADE %	AVERAGE GRADE %
D	Gravel or Road Base	20'-60'	0.1 miles	10	0	5
F	Gravel or pavement	15'-35'	0.05 miles	5	0	2.5
G'	Dirt & Gravel	10-12'	0.4 miles	14.6	0	4.7
H	Dirt & Gravel	12-24'	0.6 miles	12.24	0.83	3.8
K	Dirt & Gravel	12-24'	0.05 miles	22.6	11.5	17.3
L	Gravel or Road Base	15-30'	0.11 miles	6.2	0	4.4
M	Dirt & Gravel	10-24'	0.05 miles	10.9	0	8.5
P (Haul Road)	Dirt & Gravel	12-30'	0.16 0.09 miles	10.88	0	4.6

Table 742a
Diversion Ditch Peak Flow Design Data

Ditch No.	Acreage	Area (mi ²)	OCN	S (ft)	Basin Length, L (ft)	Basin Average Grade (%)	Lag Time, t _L (hr)	Overall Storm Precip., P (in)	Overall Storm, Overall Storm Runoff, S (in)	Time of Concentration, t _c (hr)	U.H. Time to Peak, t _p (hr)	Peak Flow, Q _p (cfs)	
												10yr 24hr	100yr 24hr
6B	7.6	0.0119	75	3.26	1,780	38	0.10	2.1	0.44	0.16	0.11	5.71	-
6C	13.9	0.0218	75	3.28	2,703	38	0.13	2.1	0.44	0.22	0.15	9.08	-
7E	4.3	0.0068	81	2.41	1,241	18	0.09	2.1	0.65	0.15	0.10	3.52	-
7G	7.6	0.0119	78	2.82	1,844	9	0.17	2.0	0.48	0.28	0.19	-	3.94
7H	1.7	0.0027	76	3.09	683	19	0.06	2.0	0.43	0.10	0.07	-	5.09
8	13.1	0.0204	70	4.29	1,698	12	0.19	2.0	0.24	0.31	0.21	-	2.45
14	221.8	0.3465	75	3.32	8,241	24	0.41	2.1	0.43	0.68	0.45	56.48	-
15A	1.7	0.0026	88	1.36	485	13	0.04	2.1	1.05	0.06	0.04	2.21	-
15B	0.3	0.0004	87	1.53	200	14	0.02	2.1	0.97	0.03	0.02	2.48	-
15Ba	1.5	0.0023	88	1.36	300	12	0.03	2.1	1.05	0.04	0.03	2.5	-
16A	0.6	0.0010	84	1.90	778	7	0.09	2.0	0.74	0.14	0.10	-	0.75
16B	0.7	0.0011	82	2.14	576	12	0.05	2.0	0.67	0.09	0.06	-	1.74
16Ba	0.9	0.0015	75	3.42	258	15	0.03	2.0	0.37	0.05	0.04	-	0.46
16C	0.5	0.0007	86	1.57	386	10	0.04	2.0	0.87	0.06	0.04	-	2.3
16D	2.6	0.0040	75	3.42	723	9	0.10	2.0	0.37	0.16	0.11	-	3.38
16E	2.5	0.0039	71	4.08	589	16	0.07	2.0	0.27	0.11	0.08	-	0.63
16Ea	3.4	0.0054	70	4.29	744	10	0.11	2.0	0.24	0.18	0.12	-	0.72
16F	3.1	0.0049	73	3.70	713	17	0.07	2.0	0.32	0.12	0.08	-	5.12
32	0.5	0.0008	70	4.29	158	23	0.02	2.0	0.24	0.03	0.02	-	0.11
33	0.3	0.0005	70	4.29	115	22	0.02	2.0	0.24	0.03	0.02	-	0.07
72A	1.3	0.0020	90	1.11	924	12	0.06	2.1	1.18	0.10	0.07	-	-
72B	0.2	0.0002	90	1.15	246	8	0.03	2.1	1.16	0.04	0.03	-	-
72C	0.2	0.0002	90	1.12	238	5	0.03	2.1	1.17	0.05	0.04	-	-
74A	1.6	0.0025	89	1.25	791	12	0.06	2.1	1.10	0.09	0.06	-	-
74Ab	1.0	0.0016	89	1.24	150	10	0.02	2.1	1.11	0.09	0.02	-	-
76	1.1	0.0018	70	4.29	518	22	0.05	2.0	0.24	0.09	0.06	-	0.24
77	1.2	0.0019	76	3.25	904	8	0.12	2.1	0.45	0.20	0.13	-	-
80A	3.8	0.0059	75	3.26	832	13	0.09	2.1	0.44	0.15	0.10	-	-
80B	0.3	0.0004	90	1.10	163	12	0.02	2.1	1.19	0.09	0.03	-	-
80C	0.7	0.0011	90	1.11	279	9	0.03	2.1	1.18	0.04	0.02	-	-
80D	2.3	0.0038	75	3.26	803	12	0.09	2.1	0.44	0.15	0.10	-	-
81	2.9	0.0046	72	3.97	860	14	0.10	2.0	0.28	0.16	0.11	-	4.53
82A	0.2	0.0003	90	1.10	236	15	0.02	2.1	1.19	0.03	0.02	-	-
82B	0.9	0.0014	90	1.10	495	16	0.03	2.1	1.19	0.05	0.04	-	-

Table 742b
Culvert Peak Flow Design Data

Culvert	Drainage Acreage	Drainage Area (mi ²)	CCN	S _c (ft.)	Basin Length, L (ft)	Basin Grade (%)	Basin Average Lag Time, L (hr)	Overall Storm Precip., P (in.)	Overall Storm Runoff, R (ft.)	Time of Concentration, L _c (hr)	LH Time to Peak, L _p (hr)	Design Peak Flow, Q _p (cfs)
81	14.4	0.0225	70	4.29	1,134	2.6	0.29	2.0	0.24	0.49	0.32	2.30
82	7.1	0.0111	71	4.08	1,176	11	0.14	2.0	0.27	0.24	0.16	1.60
15A												2.21
15B												2.48
16A												0.75
16Ba												0.46
16F												5.10
16G												3.83
33A												2.45
33B												2.45
72A												4.59
72B												4.65
72C												4.68
74B												2.25
7E												5.09
7Ea	3.4	0.0058	77	3.07	891	17	0.08	2.1	0.48	0.13	0.09	2.04
7F												3.94
80A												3.52
80B												11.39
8A												2.45

Table 742c
Diversion Ditch Design Criteria

Exch No	Flowrate (MGD)	Design Velocity (ft/s)	Design Manning's n	Channel Width (ft)	Slope (ft/ft)	Minimum Slope Conditions				Maximum Slope Conditions				Concrete Depth (ft)	Minimum Required Depth (ft)	Variance			
						Area A (sq ft)	Velocity (ft/s)	Depth (ft)	Radius (ft)	Area B (sq ft)	Velocity (ft/s)	Depth (ft)	Radius (ft)						
6B	5.7	0.03	0.03	2.5	1.3	0.018	1.61	4.17	0.39	0.51	0.59	0.98	1.08	3.69	5.29	0.29	11.9	YES	0.25
6C	9.1	0.03	0.03	2.5	2	0.010	2.90	5.77	0.50	0.73	0.82	0.61	2.26	5.22	4.01	0.43	15.0	NO	
7E	3.5	0.03	0.03	2.7	0	0.040	0.87	3.34	0.26	0.32	0.143	0.21	0.58	3.13	16.73	1.00	8.1	NO	Variance ³
7G	3.9	0.03	0.03	0	0	0.010	1.48	3.85	0.39	0.86	0.10	0.66	1.48	3.95	2.62	0.38	1.50	YES	
7H	5.1	0.03	0.03	3	2	0.067	1.03	4.29	0.24	0.29	0.200	0.21	0.71	3.93	7.10	0.18	0.75	YES	0.5
8	2.5	0.03	0.03	0.1	5.3	0.080	0.59	3.61	0.16	0.33	0.120	0.30	0.51	3.95	4.90	0.15	0.60	NO	
14	56.5	0.023	0.023	4.37	5.40	0.053	4.37	5.40	0.81	1.44	0.260	0.86	2.48	4.32	22.76	0.57	2.25	YES	concrete slopes > 10%
15A ¹	2.2	0.03	0.03	0	2	0.11	0.96	1.98	0.20	0.43	0.130	0.43	0.37	1.92	5.95	0.19	0.75	YES	0.5 ft slope > 8%
15B	2.5	0.03	0.03	0	2	0.1	0.95	2.12	0.21	0.47	0.100	0.47	0.45	2.12	5.66	0.21	0.75	YES	0.5 ft slope > 10%
15BA	2.5	0.03	0.03	0	1.5	0.015	0.18	1.26	0.15	0.35	0.050	0.25	0.09	0.90	2.45	0.10	0.75	NO	
16A	0.8	0.03	0.03	0.1	4	0.04	0.31	2.29	0.13	0.27	0.060	0.24	0.26	2.11	3.02	0.12	0.60	NO	
16B	1.7	0.03	0.03	0.1	4	0.040	0.54	3.04	0.18	0.36	0.030	0.36	0.60	3.19	2.62	0.19	0.60	NO	
16BA	0.5	0.03	0.03	1	2	0.040	0.21	1.70	0.12	0.16	0.100	0.12	0.15	1.54	3.32	0.10	0.75	NO	
16C	2.9	0.03	0.03	0.1	4	0.040	0.69	3.39	0.20	0.40	0.060	0.37	0.58	3.15	3.95	0.19	0.80	NO	
16D	3.4	0.03	0.03	0.1	4	0.040	0.81	3.93	0.23	0.46	0.060	0.43	0.78	3.64	4.34	0.21	0.80	NO	
16E	0.6	0.03	0.03	0.1	4	0.073	2.51	6.53	0.38	0.78	0.100	0.11	0.22	1.91	1.21	0.11	0.75	NO	
16Ea	0.7	0.03	0.03	1	2	0.040	0.26	1.84	0.14	0.19	0.011	0.22	0.21	1.65	3.68	0.11	0.75	NO	
16F	5.1	0.03	0.03	0.1	4	0.040	1.23	4.58	0.27	0.54	0.060	0.50	1.06	4.24	4.81	0.25	0.80	NO	
16G	1.6	0.03	0.03	0	1.5	0.003	1.16	3.17	0.37	0.88	0.019	0.82	0.58	2.24	2.77	0.18	0.60	NO	
16B	0.3	0.03	0.03	0	1.5	0.005	0.28	1.65	0.18	0.43	0.005	0.43	0.28	1.55	2.06	0.18	1.00	NO	
16C	2.1	0.03	0.03	0	1.5	0.038	0.54	2.16	0.25	0.60	0.050	0.57	0.49	2.06	4.24	0.14	1.00	NO	
16D	2.2	0.03	0.03	3	1.5	0.022	0.84	3.90	0.25	0.60	0.050	0.57	0.49	2.06	4.24	0.14	1.00	NO	
16E	2.2	0.03	0.03	3	1.5	0.050	0.62	3.69	0.22	0.25	0.085	0.17	0.55	3.61	4.19	0.15	0.80	NO	
32	0.1	0.03	0.03	0.6	2.6	0.100	0.60	2.72	0.17	0.39	0.120	0.15	0.48	3.54	4.55	0.14	0.97	NO	
72A	4.6	0.038	0.038	3	2	0.060	0.81	4.43	0.26	0.65	0.060	0.65	0.05	1.32	2.12	0.04	0.60	NO	
72B	4.7	0.035	0.035	2	2	0.125	0.16	3.98	0.24	0.32	0.290	0.20	0.69	3.90	6.62	0.18	1.40	NO	
72C	4.7	0.035	0.035	2	2	0.065	1.02	3.66	0.28	0.37	0.125	0.31	0.81	3.98	5.79	0.24	1.50	YES	0.5 ft slope > 10%
74A	2.3	0.03	0.03	0	4	0.090	0.44	2.09	0.21	0.47	0.090	0.47	0.44	2.09	5.24	0.21	0.80	NO	
74Ab	1.5	0.03	0.03	0	4	0.030	0.64	3.30	0.19	0.40	0.060	0.20	0.16	1.65	2.58	0.10	0.60	NO	
76	0.2	0.03	0.03	0.1	6.3	0.120	0.09	1.54	0.06	0.11	0.120	0.11	0.09	1.54	2.62	0.06	0.63	NO	
77 ²	0.6	0.03	0.03	0.1	4	0.060	-	-	-	0.31	0.080	0.32	0.29	1.95	4.10	0.15	0.80	NO	
80A	11.0	0.038	0.038	6	2	0.050	2.59	7.71	0.34	0.38	0.085	0.35	2.37	7.58	4.60	0.31	1.00	NO	
80B	11.4	0.03	0.03	10	2	0.010	5.19	17.59	0.30	0.37	0.100	0.38	5.19	17.59	2.20	0.30	1.00	NO	
80C	12.4	0.042	0.042	10	2	0.240	2.12	10.91	0.19	0.24	0.240	0.20	2.12	10.91	5.82	0.19	0.96	NO	
80D	0.9	0.03	0.03	1	2	0.028	0.89	3.33	0.27	0.414	0.026	0.41	0.59	2.17	3.35	0.27	1.00	YES	0.5
82A	0.2	0.03	0.03	0	2	0.005	0.11	1.05	0.11	0.78	0.016	0.19	0.07	0.85	1.21	0.08	0.75	NO	
82B	1.3	0.03	0.03	0	2	0.002	0.64	2.52	0.25	0.564	0.080	0.28	0.15	1.23	3.68	0.12	1.00	NO	

¹ Ditch geometry assumed the same as for Ditch 15B

² Channel geometry varies. Some values taken from CPMC permit. However, peak flows have now decreased, making the design conservative

³ Variance was granted since channel had already eroded down to bedrock.

recommended gradation for both mild and steep channel conditions. In some cases, concrete grout lining was used in riprapped sections to increase channel stability and/or reduce riprap size and or eliminate the need for riprap altogether.

**TABLE 742.312a
Recommended Riprap Gradation Limits**

Design Ratio	Steep Slope	Mild Slope
D_{max}/D_{50}	1.25	2
D_{50}/D_{10-20}	2-3	2-3

From "Surface Mining Water Diversion Design Manual", 1982

Conveyor Lining

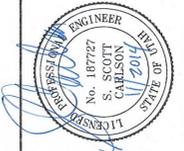
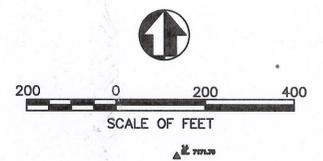
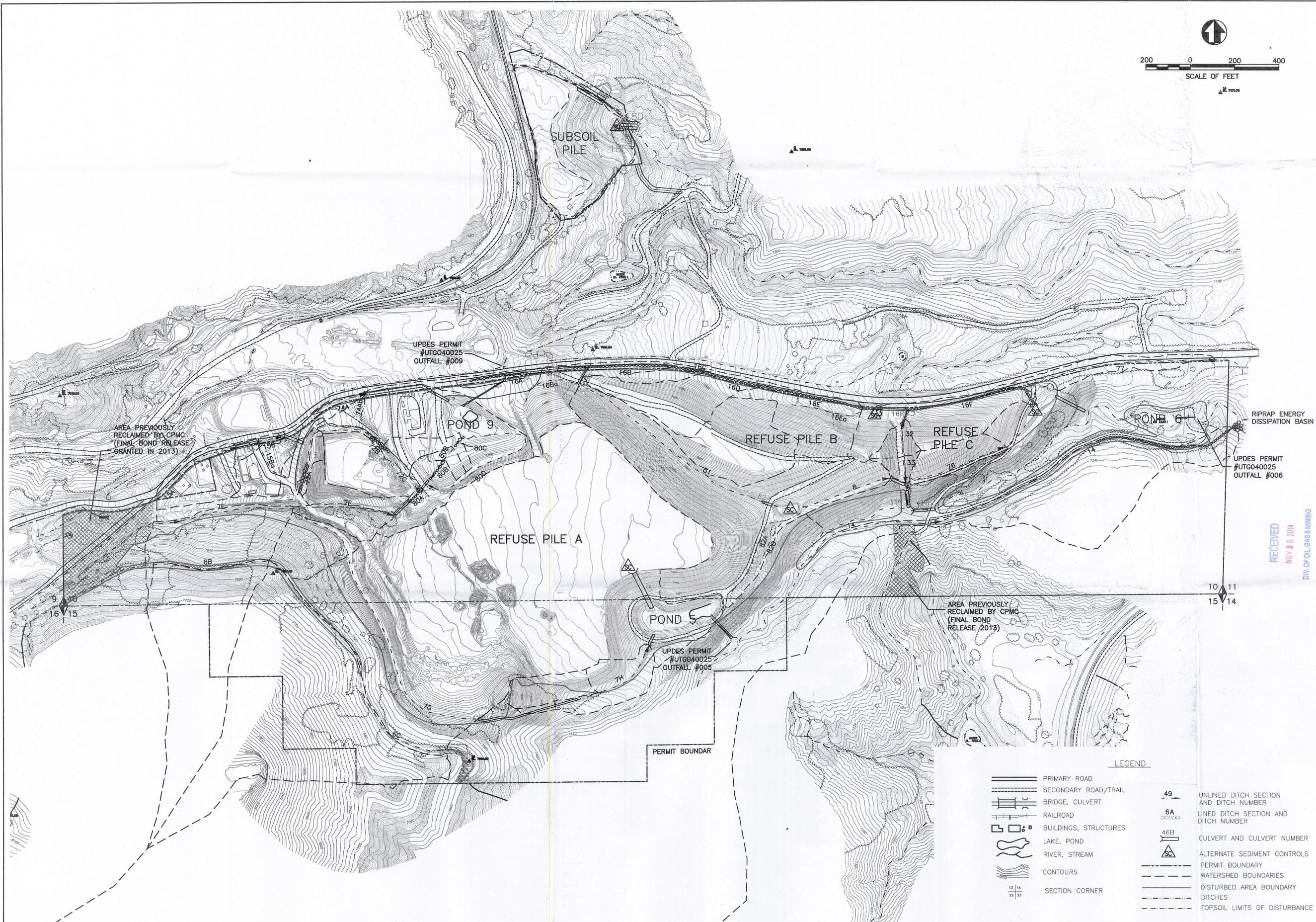
A second type of channel lining utilized consists of overlapped conveyor belt material. This lining was installed in excavated channels in short pieces so that the upstream belt material overlapped the downstream piece thereby preventing water from washing beneath the downstream liner. Each section of channel lining was secured with wire and rebar anchors. The locations of lined channel sections are shown on Maps 731.720a through 731.720b.

Half Round CMP Pipe

In other locations such as around Pond 6, half round CMP pipe has been placed to provide the required erosion protection. CMP pipe has also been used in steep areas where channel flow is infeasible but yet the water must be conveyed down a hillside.

Ditch sections requiring erosion protection are shown on Maps 731.720a through 731.720b. Areas downstream from culvert installations requiring similar protection are shown on Maps 731.720a and 731.720b. Specific mention should be made with regard to the design of erosion protection at some of the locations shown on the maps. Current riprap design methodologies do not allow for the design of erosion protection on extremely steep slopes using such materials as rock riprap. In some locations, however, such as at Culverts 57A through 60A (as well as at other locations within the mine permit area), consideration must be given to the fact that local drainage must be transferred down a steep hillside or stream channel. At such locations, procedures are not available for designing riprap erosion protection and, therefore, calculations under such conditions have not been, nor can they be made.

An effort has been made by SCA to reduce or eliminate the potential for serious erosion at these locations by placing culvert exits onto existing or man-made rock rubble piles, or onto rock ledges which act as energy dissipation devices and effectively reduce downstream erosion. SCA will continue to monitor culvert outfalls at these locations and thereby determine the efficiency of the rock rubble piles and what additional action, if any, should or can be taken.



SCA / STAR POINT WASTE FUEL
 REFUSE PILE SURFACE WATER
 DRAINAGES AND DIVERSIONS

RECEIVED
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 DIV. OF OIL, GAS & MINING

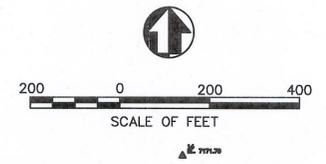
TWIN PEAKS
 Engineering & Land Surveying
 2264 NORTH 1450 EAST LEHI, UTAH 84043
 (801) 450-3511, (801) 439-0700 FAX

DWG DATE: SEPT 2014
 PLOT DATE: 12 November 2014

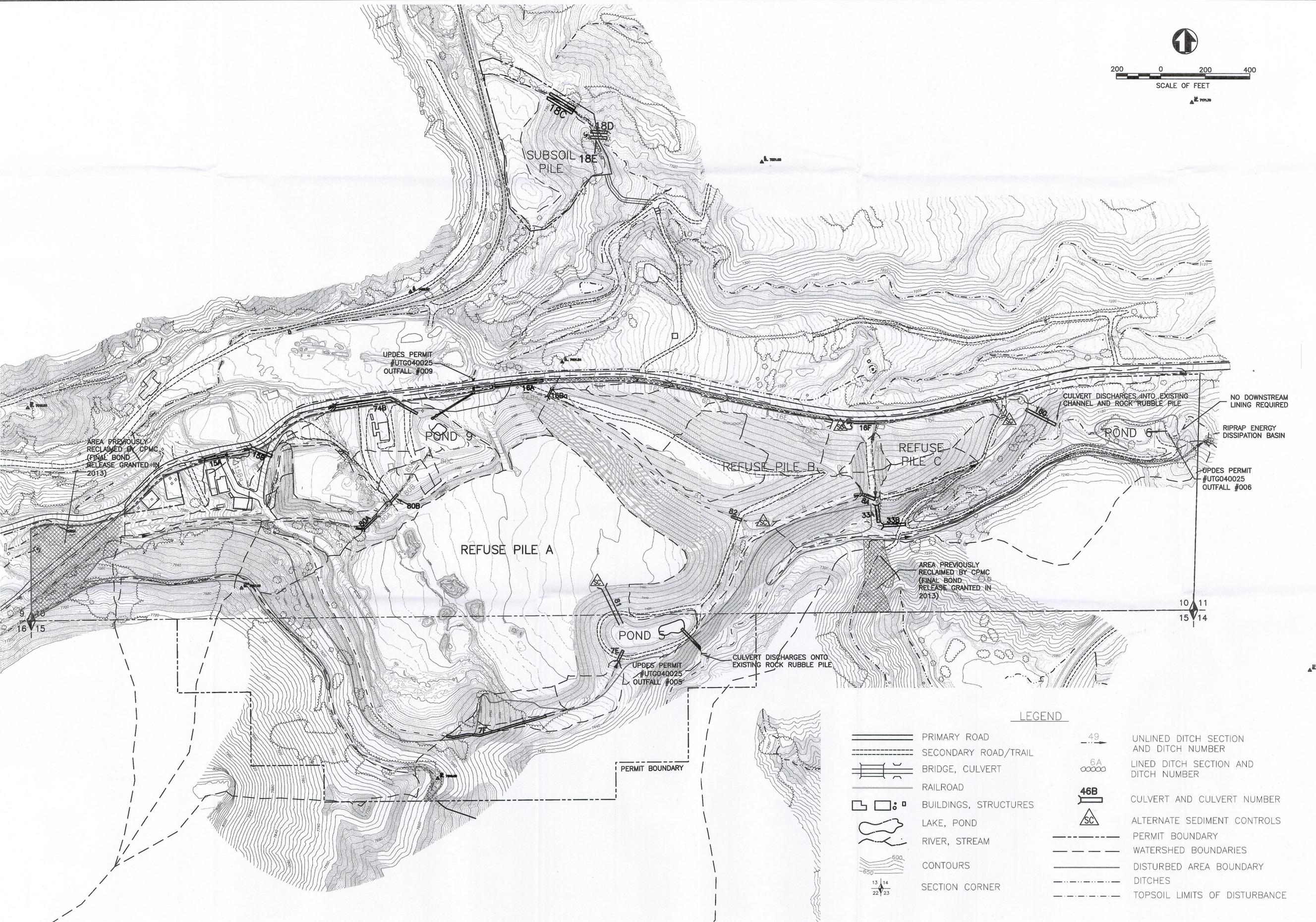
LEGEND

	PRIMARY ROAD		UNLINED DITCH SECTION AND DITCH NUMBER
	SECONDARY ROAD/TRAIL		LINED DITCH SECTION AND DITCH NUMBER
	BRIDGE, CULVERT		CULVERT AND CULVERT NUMBER
	RAILROAD		ALTERNATE SEDIMENT CONTROLS
	BUILDINGS, STRUCTURES		PERMIT BOUNDARY
	LAKE, POND		WATERSHED BOUNDARIES
	RIVER, STREAM		DISTURBED AREA BOUNDARY
	CONTOURS		DITCHES
	SECTION CORNER		TOPSOIL LIMITS OF DISTURBANCE

SHEET
 731.720a



SCA / STAR POINT WASTE FUEL
REFUSE PILE SURFACE WATER
CULVERTS



LEGEND

- PRIMARY ROAD
- SECONDARY ROAD/TRAIL
- BRIDGE, CULVERT
- RAILROAD
- BUILDINGS, STRUCTURES
- LAKE, POND
- RIVER, STREAM
- CONTOURS
- SECTION CORNER
- UNLINED DITCH SECTION AND DITCH NUMBER
- LINED DITCH SECTION AND DITCH NUMBER
- CULVERT AND CULVERT NUMBER
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DWG DATE: MAY 2014
PLOT DATE: 17 November

SHEET
731.720b