

All unconsolidated surficial deposits in the immediate RDA toe region will be stripped to bedrock to provide a firm foundation base.

2.04.7 Hydrology Description

(1) Groundwater Information

A detailed investigation of the groundwater hydrology for the permit area was conducted by Water, Waste, and Land in 1980. The investigation was updated by a report prepared by Basin Resources in 1994. These reports are provided in Exhibit 8-Hydrology and Geology Information. Both investigations indicate that groundwater resources in the Raton Formation near the New Elk Mine are limited. Additional hydrologic testing for the project area was performed in 2010 to support the permit renewal for mining in the Blue, Allen, and Apache coal seams. The 2010 testing program focused on evaluating the permeability of the coal beds and adjacent rocks. Three monitoring wells were also installed to evaluate bedrock groundwater levels. The results of the 2010 hydrologic investigation are summarized in the following sections. Complete documentation for the program is presented in Exhibit 8.

2010 Groundwater Investigation

Hydrogeologic studies during 2010 included the installation of three bedrock monitoring wells and packer permeability testing in exploration boreholes. The monitoring wells NE-1-10, NE-6-10(a), and NE-6-10(b) were installed in the Allen, Apache, and Blue coal seams, respectively. Packer permeability tests focused on evaluating the hydraulic conductivity of the Raton Formation between the Allen and Blue coal seams. Results from the packer testing program are summarized in Table 8. Well completion details and water level elevations are summarized in Table 9.

Table 7. Joint Orientation of the Refuse Disposal Area (RDA)

STATION	STRIKE	DIP
1	N78E	86N
2	E-W	87N
3	N88W	86N
5	N75E	86S
	N82E	88N-86S
8	N79E	84S

Table 8. Results of 2010 Packer Testing Program

Unit		Number of Tests	Hydraulic Conductivity (ft/day)	
			Range	Average
Allen	Roof	2	1.10 to 1.46	1.28
	Coal	3	0.35 to 0.64	0.51
	Floor	2	0.001 to 0.004	0.003
Apache	Roof	1	0.002	0.002
	Coal	3	0.15 to 0.80	0.48
	Floor	2	1.10 to 1.46	1.28
Maxwell	Roof	4	0.001 to 0.04	0.02
	Coal	5	0.02 to 0.29	0.013
	Floor	2	0.04 to 0.10	0.07
Blue	Roof	2	0.02 to 1.06	0.54
	Coal	3	0.12 to 0.47	0.43
	Floor	3	0.03 to 0.27	0.11
Other units	Coal	8	0.02 to 2.45	0.43
	Sandstone	3	0.01 to 0.84	0.31
	Siltstone, Mudstone and Shale	11	0.001 to 0.11	0.02

Table 9. Completion Summary for 2010 Monitoring Wells

Well ID	Monitored Unit	Northing (ft)	Easting (ft)	Top of Casing (ft elev.)	Screened Interval (ft bgs)	Completion Date	Depth to Water (ft btoc)
NE-1-10	Allen	1,179,572	3,161,180	7,334.3	418.5 to 428.5	9/13/10	288.8
NE-6-10(a)	Apache	1,183,658	3,167,370	7,370.9	715.2 to 735.2	11/15/10	597.8
NE-6-10(b)	Blue	1,183,658	3,167,370	7,370.6	426.2 to 436.2	11/16/10	337.4

Packer permeability tests indicate that the average hydraulic conductivities of the Allen, Apache, Red, Upper Bingham Canyon, Blue, Green, and Yellow coal seams are similar and range from 0.43 to 0.51 ft/day. The permeability of the Maxwell seam is lower with an average value of 0.013 ft/day. Clastic rocks including sandstone, siltstone, mudstone, and shale usually have lower permeability than the associated coals. Exceptions to this generalization include the interval between the Allen and Apache beds, which has an average hydraulic conductivity of 1.28 ft/day, and the roof of the Blue coal seam, which has an average hydraulic conductivity of 0.54 ft/day.

Water level measurements during packer testing indicate that heads in the coal seams are lower than in the surrounding rocks. In many cases, the observed vertical gradients are exceptionally high and exceed unity. The high vertical gradients are related to groundwater pumping from the coal beds for coalbed methane (CBM) production. Three hundred and seventy-two CBM wells are located within a one-mile radius of the permit area as of December 2021. The presence of high vertical gradients indicates that permeability is low, perpendicular to bedding, and limits the flow of groundwater from the surrounding elastic rocks to the coal beds.

Three bedrock monitoring wells were installed during the 2010 hydrologic investigation. Monitoring well NE-1-10 is located near the northeast corner of the permit boundary and is completed in the Allen seam. Monitoring wells NE-6-10(a) and NE-6-10(b) are located within the proposed PR5 permit boundary and are completed in the

Apache and Blue seams, respectively. The completion groundwater elevation in the Allen seam at NE-1-10 was 7,045.5 feet on September 13, 2010. The completion groundwater elevation in the Apache seam at NE-6-10(a) was 6,773.1 feet on November 15, 2010. The completion groundwater elevation in the Blue seam at NE-6-10(b) was 7,033.2 feet on November 16, 2010.

Groundwater Usage

Domestic wells for area residents are supplied by alluvial sediments and bedrock in the Raton Formation. A few higher-yield production wells are also located near the mine and are used for irrigation. The irrigation wells are completed in the Purgatoire River Alluvium. CBM development activities in the northern portion of the Raton Basin are currently producing groundwater from coal beds in the Raton and Vermejo Formations. Groundwater withdrawal related to CBM production has partially dewatered coal seams in the permit area but has not impacted water availability in alluvial wells. Similarly, dewatering of the Blue, Allen and Apache coal seams for mining is not expected to lower water levels in alluvial wells that are used for domestic supply and irrigation. It may, however, impact deeper bedrock wells that are completed in permeable strata near the Blue, Allen, and Apache coal seams. A summary of developed groundwater sources for domestic use and irrigation is presented in Table 10. Wells that are located within one mile of the permit boundary (excluding CBM wells) are shown on Map 8. Locations for CBM development wells are shown on Map 20.

Number		Instance	Easting	Northing
71271-F	XTO Energy Inc.	07/22/2010	509797.0	4112613.0
71273-F	XTO Energy Inc.	07/22/2010	507348.0	4113328.0
71274-F	XTO Energy Inc.	07/22/2010	508202.0	4113374.0
71284-F	XTO Energy Inc.	07/22/2010	509269.0	4112787.0
71287-F	XTO Energy Inc.	07/22/2010	507721.0	4113327.0
71288-F	XTO Energy Inc.	07/22/2010	508295.0	4112757.0
71305-F	XTO Energy Inc.	07/22/2010	509879.0	4112232.0
71306-F	XTO Energy Inc.	07/22/2010	509021.0	4112303.0
71307-F	XTO Energy Inc.	07/22/2010	508716.0	4112977.0
71311-F	XTO Energy Inc.	07/22/2010	507231.0	4112978.0
71312-F	XTO Energy Inc.	07/22/2010	507991.0	4111799.0
71313-F	XTO Energy Inc.	07/22/2010	507403.0	4112665.0
71314-F	XTO Energy Inc.	07/22/2010	506678.0	4112380.0
71315-F	XTO Energy Inc.	07/22/2010	506521.0	4111909.0
71318-F	XTO Energy Inc.	07/22/2010	507436.0	4107252.0
71320-F	XTO Energy Inc.	07/22/2010	507905.0	4112255.0
71323-F	XTO Energy Inc.	07/22/2010	508410.0	4112387.0
71324-F	XTO Energy Inc.	07/22/2010	507890.0	4110507.0
71325-F	XTO Energy Inc.	07/22/2010	506981.0	4110061.0
71326-F	XTO Energy Inc.	07/22/2010	507331.0	4110313.0
71327-F	XTO Energy Inc.	07/22/2010	507685.0	4110940.0
71328-F	XTO Energy Inc.	07/22/2010	507295.0	4111234.0
71330-F	XTO Energy Inc.	07/22/2010	507609.0	4111952.0
71338-F	XTO Energy Inc.	07/22/2010	508068.0	4111038.0
71339-F	XTO Energy Inc.	07/22/2010	505906.0	4111672.0
71406-F	XTO Energy Inc.	07/23/2010	507283.0	4106325.0
71478-F	Pioneer Natural Resources USA, Inc.	07/3/2010	510663	4116406
71629-F	Pioneer Natural Resources USA, Inc.	07/3/2010	507472	4117106
71630-F	Pioneer Natural Resources USA, Inc.	07/3/2010	507441	4117102
71725-F	Pioneer Natural Resources USA, Inc.	07/26/2010	508005	4116038
71726-F	Pioneer Natural Resources USA, Inc.	07/26/2010	508016	4116017
71822-F	Pioneer Natural Resources USA, Inc.	07/26/2010	509355	4116903
71833-F	Pioneer Natural Resources USA, Inc.	07/26/2010	509754	4116128
71834-F	Pioneer Natural Resources USA, Inc.	07/26/2010	509721	4116133
71841-F	Pioneer Natural Resources USA, Inc.	07/26/2010	506923	4112141
71882-F	Pioneer Natural Resources USA, Inc.	07/26/2010	508434	4117775
71902-F	Pioneer Natural Resources USA, Inc.	07/26/2010	507356	4114357
71903-F	Pioneer Natural Resources USA, Inc.	07/26/2010	507342	4114433
71939-F	Pioneer Natural Resources USA, Inc.	07/26/2010	508340	4115016
71960-F	Pioneer Natural Resources USA, Inc.	07/26/2010	509956	4115252
71961-F	Pioneer Natural Resources USA, Inc.	07/26/2010	509935	4115267
72001-F	Pioneer Natural Resources USA, Inc.	07/26/2010	503731	4114903
72002-F	Pioneer Natural Resources USA, Inc.	07/26/2010	503724	4114921

Number		Instant	Easting	Northing
72005-F	Pioneer Natural Resources USA, Inc.	07/26/2010	508204	4114475
72006-F	Pioneer Natural Resources USA, Inc.	07/26/2010	508181	4114491
72014-F	Pioneer Natural Resources USA, Inc.	07/26/2010	506764	4114179
72015-F	Pioneer Natural Resources USA, Inc.	07/26/2010	506726	4114259
72016-F	Pioneer Natural Resources USA, Inc.	07/26/2010	506805	4113714
72017-F	Pioneer Natural Resources USA, Inc.	07/26/2010	506798	4113714
72088-F	Pioneer Natural Resources USA, Inc.	07/26/2010	510635	4116390
72089-F	Pioneer Natural Resources USA, Inc.	07/26/2010	508941	4117326
72153-F	Pioneer Natural Resources USA, Inc.	07/26/2010	507403	4116668
72154-F	Pioneer Natural Resources USA, Inc.	07/26/2010	507426	4116666
72238-F	Pioneer Natural Resources USA, Inc.	07/26/2010	507984	4116775
72239-F	Pioneer Natural Resources USA, Inc.	07/26/2010	508003	4116751
72386-F	Pioneer Natural Resources USA, Inc.	07/26/2010	506050	4116972
72419-F	Pioneer Natural Resources USA, Inc.	07/26/2010	504615	4114505
72420-F	Pioneer Natural Resources USA, Inc.	07/26/2010	504665	4114921
72421-F	Pioneer Natural Resources USA, Inc.	07/26/2010	504526	4114970
72422-F	Pioneer Natural Resources USA, Inc.	07/26/2010	504906	4115326
72549-F	Pioneer Natural Resources USA, Inc.	07/26/2010	505717	4114431
72550-F	Pioneer Natural Resources USA, Inc.	07/26/2010	505814	4114424
72551-F	Pioneer Natural Resources USA, Inc.	07/26/2010	505886	4113026
72552-F	Pioneer Natural Resources USA, Inc.	07/26/2010	505837	4113038
72554-F	Pioneer Natural Resources USA, Inc.	07/26/2010	505659	4117830
72555-F	Pioneer Natural Resources USA, Inc.	07/26/2010	505692	4117839
72556-F	Pioneer Natural Resources USA, Inc.	07/26/2010	505695	4115762
72557-F	Pioneer Natural Resources USA, Inc.	07/26/2010	505717	4115766
72558-F	Pioneer Natural Resources USA, Inc.	07/26/2010	505810	4113538
72559-F	Pioneer Natural Resources USA, Inc.	07/26/2010	505819	4113509
72560-F	Pioneer Natural Resources USA, Inc.	07/26/2010	505732	4116568
72561-F	Pioneer Natural Resources USA, Inc.	07/26/2010	505744	4116537
72562-F	Pioneer Natural Resources USA, Inc.	07/26/2010	505629	4114898
72563-F	Pioneer Natural Resources USA, Inc.	07/26/2010	505644	4114871
72564-F	Pioneer Natural Resources USA, Inc.	07/26/2010	504632	4117752
72565-F	Pioneer Natural Resources USA, Inc.	07/26/2010	504636	4117782
72567-F	Pioneer Natural Resources USA, Inc.	07/26/2010	506126	4116098
72568-F	Pioneer Natural Resources USA, Inc.	07/26/2010	504680	4117202
72570-F	Pioneer Natural Resources USA, Inc.	07/26/2010	504681	4116507
72571-F	Pioneer Natural Resources USA, Inc.	07/26/2010	504670	4116507
72573-F	Pioneer Natural Resources USA, Inc.	07/26/2010	506505	4117712
72574-F	Pioneer Natural Resources USA, Inc.	07/26/2010	506513	4117743
72575-F	Pioneer Natural Resources USA, Inc.	07/26/2010	505310	4115968
72576-F	Pioneer Natural Resources USA, Inc.	07/26/2010	505334	4115968
72577-F	Pioneer Natural Resources USA, Inc.	07/26/2010	505260	4114536
72578-F	Pioneer Natural Resources USA, Inc.	07/26/2010	505219	4114570
72579-F	Pioneer Natural Resources USA, Inc.	07/26/2010	505145	4117802
72580-F	Pioneer Natural Resources USA, Inc.	07/26/2010	505168	4117722

Number		Instance	Easting	Northing
72662-F	Pioneer Natural Resources USA, Inc.	07/26/2010	505285	4117351
72663-F	Pioneer Natural Resources USA, Inc.	07/26/2010	505248	4114924
72664-F	Pioneer Natural Resources USA, Inc.	07/26/2010	505279	4114918
72665-F	Pioneer Natural Resources USA, Inc.	07/26/2010	505182	4116508
72666-F	Pioneer Natural Resources USA, Inc.	07/26/2010	505201	4116533
72708-F	Pioneer Natural Resources USA, Inc.	07/26/2010	509619	4117777
72724-F	Pioneer Natural Resources USA, Inc.	07/26/2010	504068	4116046
72725-F	Pioneer Natural Resources USA, Inc.	07/26/2010	504090	4116049
72726-F	Pioneer Natural Resources USA, Inc.	07/26/2010	504137	4116627
72727-F	Pioneer Natural Resources USA, Inc.	07/26/2010	504118	4116644
72732-F	Pioneer Natural Resources USA, Inc.	07/26/2010	509000	4114999
72820-F	Pioneer Natural Resources USA, Inc.	07/26/2010	509575	4117756
72833-F	Pioneer Natural Resources USA, Inc.	07/26/2010	509807	4117303
72863-F	Pioneer Natural Resources USA, Inc.	07/26/2010	509380	4115390
72864-F	Pioneer Natural Resources USA, Inc.	07/26/2010	509377	4115420
72883-F	Pioneer Natural Resources USA, Inc.	07/26/2010	509807	4117303
72951-F	Pioneer Natural Resources USA, Inc.	07/26/2010	506898	4116117
72968-F	Pioneer Natural Resources USA, Inc.	07/26/2010	506048	4117339
72969-F	Pioneer Natural Resources USA, Inc.	07/26/2010	505357	4116894
72970-F	Pioneer Natural Resources USA, Inc.	07/26/2010	505321	4116910
72986-F	Pioneer Natural Resources USA, Inc.	07/26/2010	509727	4114940
73004-F	Pioneer Natural Resources USA, Inc.	07/26/2010	506076	4114132
73031-F	Pioneer Natural Resources USA, Inc.	07/26/2010	509093	4116126
73129-F	Pioneer Natural Resources USA, Inc.	07/26/2010	507659	4113663
73140-F	Pioneer Natural Resources USA, Inc.	07/26/2010	507630	4113668
73163-F	Pioneer Natural Resources USA, Inc.	07/26/2010	506073	4115205
73164-F	Pioneer Natural Resources USA, Inc.	07/26/2010	506039	4115216
73165-F	Pioneer Natural Resources USA, Inc.	07/26/2010	506337	4115614
73166-F	Pioneer Natural Resources USA, Inc.	07/26/2010	506327	4115593
73185-F	Pioneer Natural Resources USA, Inc.	07/26/2010	509112	4114141
73186-F	Pioneer Natural Resources USA, Inc.	07/26/2010	509044	4114150
73187-F	Pioneer Natural Resources USA, Inc.	07/26/2010	508874	4113361
73188-F	Pioneer Natural Resources USA, Inc.	07/26/2010	508853	4113365
73189-F	Pioneer Natural Resources USA, Inc.	07/26/2010	509143	4114695
73190-F	Pioneer Natural Resources USA, Inc.	07/26/2010	509197	4114655
73191-F	Pioneer Natural Resources USA, Inc.	07/26/2010	509294	4113895
73192-F	Pioneer Natural Resources USA, Inc.	07/26/2010	509342	4113903
73193-F	Pioneer Natural Resources USA, Inc.	07/26/2010	509389	4113332
73194-F	Pioneer Natural Resources USA, Inc.	07/26/2010	509403	4113313
73195-F	Pioneer Natural Resources USA, Inc.	07/26/2010	509768	4114186
73196-F	Pioneer Natural Resources USA, Inc.	07/26/2010	509735	4114263
73197-F	Pioneer Natural Resources USA, Inc.	07/26/2010	509826	4113490
73198-F	Pioneer Natural Resources USA, Inc.	07/26/2010	509858	4113504
73199-F	Pioneer Natural Resources USA, Inc.	07/26/2010	509999	4114663
73200-F	Pioneer Natural Resources USA, Inc.	07/26/2010	510025	4114645

Number		Instance	Easting	Northing
73202-F	Pioneer Natural Resources USA, Inc.	07/26/2010	510057	4113893
73203-F	Pioneer Natural Resources USA, Inc.	07/26/2010	510215	4113365
73204-F	Pioneer Natural Resources USA, Inc.	07/26/2010	510189	4113327
73312-F	Pioneer Natural Resources USA, Inc.	07/26/2010	510449	4114642
73313-F	Pioneer Natural Resources USA, Inc.	07/26/2010	510456	4114672
73315-F	Pioneer Natural Resources USA, Inc.	07/26/2010	510449	4114207
73316-F	Pioneer Natural Resources USA, Inc.	07/26/2010	510499	4114225
73353-F	Pioneer Natural Resources USA, Inc.	07/26/2010	507349	4115237
73358-F	Pioneer Natural Resources USA, Inc.	07/26/2010	506902	4115074
73359-F	Pioneer Natural Resources USA, Inc.	07/26/2010	506878	4115071
73373-F	Pioneer Natural Resources USA, Inc.	07/26/2010	508329	4114035
73374-F	Pioneer Natural Resources USA, Inc.	07/26/2010	508343	4114063
73383-F	Pioneer Natural Resources USA, Inc.	07/26/2010	508871	4117759
73401-F	Pioneer Natural Resources USA, Inc.	07/26/2010	507978	4115504
73402-F	Pioneer Natural Resources USA, Inc.	07/26/2010	507958	4115493
73407-F	Pioneer Natural Resources USA, Inc.	07/26/2010	504029	4115494
73408-F	Pioneer Natural Resources USA, Inc.	07/27/2010	504043	4115466
73532-F	Pioneer Natural Resources USA, Inc.	07/27/2010	508117	4113639
73533-F	Pioneer Natural Resources USA, Inc.	07/27/2010	508134	4113658
73541-F	Pioneer Natural Resources USA, Inc.	07/27/2010	508221	4117222
73549-F	Pioneer Natural Resources USA, Inc.	07/27/2010	508243	4117207
73577-F	Pioneer Natural Resources USA, Inc.	07/27/2010	506643	4117289
73579-F	Pioneer Natural Resources USA, Inc.	07/27/2010	506612	4117284
73604-F	Pioneer Natural Resources USA, Inc.	07/27/2010	506735	4116562
73605-F	Pioneer Natural Resources USA, Inc.	07/27/2010	507537	4115949
73606-F	Pioneer Natural Resources USA, Inc.	07/27/2010	507506	4115901
73607-F	Pioneer Natural Resources USA, Inc.	07/27/2010	506330	4113029
73609-F	Pioneer Natural Resources USA, Inc.	07/27/2010	508369	4116436
73610-F	Pioneer Natural Resources USA, Inc.	07/27/2010	508398	4116437
73967-F	XTO Energy Inc. (Ogris Operating LLC-Brian Sirgo)	07/30/2010	502518.0	410633.0
73968-F	XTO Energy Inc.	07/30/2010	502558.0	4106402.0
74006-F	XTO Energy Inc. (Ogris Operating LLC-Brian Sirgo)	07/30/2010	506669.0	4107352.0
74011-F	XTO Energy Inc. (Ogris Operating LLC-Brian Sirgo)	07/30/2010	504016.0	4106172.0
74029-F	XTO Energy Inc. (Ogris Operating LLC-Brian Sirgo)	07/30/2010	507464.0	4107275.0
74036-F	XTO Energy Inc.	07/30/2010	507670.0	4112496.0
74072-F	XTO Energy Inc.	07/30/2010	503495.0	4106962.0
74076-F	XTO Energy Inc.	07/30/2010	503362.0	4107914.0
74116-F	XTO Energy Inc. (Ogris Operating LLC-Brian Sirgo)	07/30/2010	502756.0	4107403.0
74127-F	XTO Energy Inc. (Ogris Operating LLC-Brian Sirgo)	07/30/2010	505844.0	4106355.0
74133-F	XTO Energy Inc. (Ogris Operating LLC-Brian Sirgo)	07/30/2010	507260.0	4106328.0
74139-F	XTO Energy Inc. (Ogris Operating LLC-Brian Sirgo)	07/30/2010	505131.0	4107603.0
74140-F	XTO Energy Inc.	07/30/2010	504189.0	4107658.0
74141-F	XTO Energy Inc. (Ogris Operating LLC-Brian Sirgo)	07/30/2010	505227.0	4106964.0
74142-F	XTO Energy Inc.	07/30/2010	504393.0	4107000.0
74143-F	XTO Energy Inc.	07/30/2010	502903.0	4108762.0

Number		Instance	Easting	Northing
74146-F	XTO Energy Inc. (Ogris Operating LLC-Brian Sirgo)	07/30/2010	503551.0	4108277.0
74147-F	XTO Energy Inc. (Ogris Operating LLC-Brian Sirgo)	07/30/2010	502553.0	4108417.0
74149-F	XTO Energy Inc.	07/30/2010	502236.0	4107318.0
74151-F	XTO Energy Inc. (Ogris Operating LLC-Brian Sirgo)	07/30/2010	504695.0	4107353.0
74154-F	XTO Energy Inc.	07/30/2010	503123.0	4109438.0
74156-F	XTO Energy Inc. (Ogris Operating LLC-Brian Sirgo)	07/30/2010	503578.0	4107390.0
74160-F	XTO Energy Inc. (Ogris Operating LLC-Brian Sirgo)	07/30/2010	503031.0	4106796.0
74161-F	XTO Energy Inc. (Ogris Operating LLC-Brian Sirgo)	07/30/2010	502141.0	4106539.0
74163-F	XTO Energy Inc.	07/30/2010	509263.0	412794.0
74164-F	XTO Energy Inc. (Ogris Operating LLC-Brian Sirgo)	07/30/2010	504516.0	4106541.0
74166-F	XTO Energy Inc. (Ogris Operating LLC-Brian Sirgo)	07/30/2010	505755.0	4108152.0
74169-F	XTO Energy Inc. (Ogris Operating LLC-Brian Sirgo)	07/30/2010	506037.0	4106786.0
74170-F	XTO Energy Inc. (Ogris Operating LLC-Brian Sirgo)	07/30/2010	506019.0	4107481.0
74171-F	XTO Energy Inc.	07/30/2010	502864.0	4108077.0
74173-F	XTO Energy Inc.	07/30/2010	504479.0	4108864.0
74174-F	XTO Energy Inc. (Ogris Operating LLC-Brian Sirgo)	07/30/2010	504479.0	4108855.0
74175-F	XTO Energy Inc. (Ogris Operating LLC-Brian Sirgo)	07/30/2010	505809.0	4109627.0
74180-F	XTO Energy Inc.	07/30/2010	502500.0	4110231.0
74181-F	XTO Energy Inc.	07/30/2010	503617.0	4110533.0
74183-F	XTO Energy Inc.	07/30/2010	506885.0	4106892.0
74184-F	XTO Energy Inc. (Ogris Operating LLC-Brian Sirgo)	07/30/2010	503798.0	4108873.0
74185-F	XTO Energy Inc. (Ogris Operating LLC-Brian Sirgo)	07/30/2010	503715.0	4109551.0
74186-F	XTO Energy Inc. (Ogris Operating LLC-Brian Sirgo)	07/30/2010	505740.0	4107254.0
74193-F	XTO Energy Inc. (Ogris Operating LLC-Brian Sirgo)	07/30/2010	506047.0	4110037.0
74194-F	XTO Energy Inc. (Ogris Operating LLC-Brian Sirgo)	07/30/2010	508112.0	4109011.0
74196-F	XTO Energy Inc. (Ogris Operating LLC-Brian Sirgo)	07/30/2010	507545.0	4109100.0
74197-F	XTO Energy Inc.	07/30/2010	506733.0	4109372.0
74200-F	XTO Energy Inc. (Ogris Operating LLC-Brian Sirgo)	07/30/2010	506117.0	4112236.0
74201-F	XTO Energy Inc. (Ogris Operating LLC-Brian Sirgo)	07/30/2010	506168.0	4112493.0
74202-F	XTO Energy Inc. (Ogris Operating LLC-Brian Sirgo)	07/30/2010	508272.0	4113122.0
74203-F	XTO Energy Inc. (Ogris Operating LLC-Brian Sirgo)	07/30/2010	507954.0	4113053.0
74204-F	XTO Energy Inc. (Ogris Operating LLC-Brian Sirgo)	07/30/2010	503971.0	4106546.0
74205-F	XTO Energy Inc.	07/30/2010	505448.0	4108364.0
74207-F	XTO Energy Inc.	07/30/2010	504404.0	4108227.0
74208-F	XTO Energy Inc. (Ogris Operating LLC-Brian Sirgo)	07/30/2010	506325.0	4108105.0
74209-F	XTO Energy Inc. (Ogris Operating LLC-Brian Sirgo)	07/30/2010	506778.0	4107720.0
74210-F	XTO Energy Inc. (Ogris Operating LLC-Brian Sirgo)	07/30/2010	502632.0	4107827.0
74213-F	XTO Energy Inc. (Ogris Operating LLC-Brian Sirgo)	07/30/2010	506565.0	4113309.0
74215-F	XTO Energy Inc.	07/30/2010	506904.0	4108515.0
74218-F	XTO Energy Inc.	07/30/2010	507274.0	4107949.0
74235-F	XTO Energy Inc.	07/30/2010	506555.0	4109717.0
74236-F	XTO Energy Inc. (Ogris Operating LLC-Brian Sirgo)	07/30/2010	508438.0	4110128.0
74237-F	XTO Energy Inc. (Ogris Operating LLC-Brian Sirgo)	07/30/2010	508182.0	4109596.0
74238-F	XTO Energy Inc. (Ogris Operating LLC-Brian Sirgo)	07/30/2010	506576.0	4108938.0
74239-F	XTO Energy Inc. (Ogris Operating LLC-Brian Sirgo)	07/30/2010	505633.0	4109001.0

Number		Instance	Easting	Northing
74241-F	XTO Energy Inc.	07/30/2010	506726	4107321
74242-F	XTO Energy Inc. (Ogris Operating LLC-Brian Sirgo)	07/30/2010	507176.0	4108906.0
74243-F	XTO Energy Inc. (Ogris Operating LLC-Brian Sirgo)	07/30/2010	507709.0	4108462.0
74244-F	XTO Energy Inc. (Ogris Operating LLC-Brian Sirgo)	07/30/2010	507923.0	4106950.0
74245-F	XTO Energy Inc. (Ogris Operating LLC-Brian Sirgo)	07/30/2010	507212.0	4106985.0
74250-F	XTO Energy Inc. (Ogris Operating LLC-Brian Sirgo)	07/30/2010	505007.0	4108728.0
74251-F	XTO Energy Inc. (Ogris Operating LLC-Brian Sirgo)	07/30/2010	507243.0	4109847.0
74252-F	XTO Energy Inc. (Ogris Operating LLC-Brian Sirgo)	07/30/2010	507798.0	4110000.0
74255-F	XTO Energy Inc. (Ogris Operating LLC-Brian Sirgo)	07/30/2010	505795.0	4110990.0
74258-F	XTO Energy Inc. (Ogris Operating LLC-Brian Sirgo)	07/30/2010	504947.0	4109106.0
74259-F	XTO Energy Inc. (Ogris Operating LLC-Brian Sirgo)	07/30/2010	504176.0	4109123.0
74260-F	XTO Energy Inc. (Ogris Operating LLC-Brian Sirgo)	07/30/2010	505298.0	4110121.0
74261-F	XTO Energy Inc. (Ogris Operating LLC-Brian Sirgo)	07/30/2010	505256.0	4109727.0
74264-F	XTO Energy Inc. (Ogris Operating LLC-Brian Sirgo)	07/30/2010	506014.0	4108318.0
74265-F	XTO Energy Inc. (Ogris Operating LLC-Brian Sirgo)	07/30/2010	506534.0	4110422.0
74266-F	XTO Energy Inc.	07/30/2010	506179.0	4109162.0
74278-F	XTO Energy Inc. (Ogris Operating LLC-Brian Sirgo)	07/30/2010	505486.0	4111319.0
74286-F	XTO Energy Inc. (Ogris Operating LLC-Brian Sirgo)	07/30/2010	504810.0	4111657.0
74287-F	XTO Energy Inc. (Ogris Operating LLC-Brian Sirgo)	07/30/2010	505209.0	4111615.0
74288-F	XTO Energy Inc. (Ogris Operating LLC-Brian Sirgo)	07/30/2010	504940.0	4111310.0
74289-F	XTO Energy Inc. (Ogris Operating LLC-Brian Sirgo)	07/30/2010	503953.0	4107187.0
74296-F	XTO Energy Inc. (Ogris Operating LLC-Brian Sirgo)	07/30/2010	505304.0	4110818.0
74297-F	XTO Energy Inc. (Ogris Operating LLC-Brian Sirgo)	07/30/2010	504150.0	4111925.0
74298-F	XTO Energy Inc. (Ogris Operating LLC-Brian Sirgo)	07/30/2010	504286.0	4111197.0
74299-F	XTO Energy Inc. (Ogris Operating LLC-Brian Sirgo)	07/30/2010	504566.0	4110960.0
74300-F	XTO Energy Inc. (Ogris Operating LLC-Brian Sirgo)	07/30/2010	504628.0	4110089.0
74301-F	XTO Energy Inc. (Ogris Operating LLC-Brian Sirgo)	07/30/2010	504807.0	4110516.0
3311-F	Colorado Fuel & Iron Corp	08/29/1961	SE¼ NW¼ Sec 23	T33S R68W
6498-R	Colorado Fuel & Iron Corp	12/16/1958	503276.8	4112061.0
6499-R	Picketwire Processing Company LLC	07/29/1998 changed ownership	SW¼ NE¼ Sec 23	T33S R68W
21791-MH	Sharon Nelson (existing well 113302)	11/26/1985	SW¼ NW¼ Sec 4	T33S R67W
34127-MH	Al Van Staveren	08/12/1998	NE¼ SW¼ Sec 17	T33S R67W
39685	O.T. Storz-CFI Lessee	10/30/1969	SE¼ SW¼ Sec 22	T33S R68W
39686	O.T. Storz-CFI Lessee	10/30/1969	NW¼ SE¼ Sec 21	T33S R68W
44583	Pinon Valley Ranch, Inc.	02/03/1971	SW¼ NE¼ Sec 7	T33S R67W
44584	Youth with a Mission-Mission Village	12/19/1995 changed ownership	NE¼ NW¼ Sec 7	T33S R67W
49847-MH	New Elk Coal Company LLC	05/19/2011	NE¼ NW¼ Sec 8	T34S R67W
49848-MH	New Elk Coal Company LLC	05/19/2011	NE¼ NW¼ Sec 8	T34S R67W
49849-MH	New Elk Coal Company LLC	05/19/2011	NE¼ NW¼ Sec 8	T34S R67W
49850-MH	New Elk Coal Company LLC	05/19/2011	NE¼ NW¼ Sec 8	T34S R67W
67268	Albert Robinson	02/01/1973	SW¼ SW¼ Sec 3	T33S R67W

Number		Instance	Easting	Northing
88823-A	CF&I Steel Corporation	03/16/1977	<i>SW¹/₄ SW¹/₄ Sec 20</i>	<i>T33S R67W</i>
94106	Albert Robinson	10/13/1977	<i>SE¹/₄ NW¹/₄ Sec 15</i>	<i>T33S R67W</i>
94106-A	Albert Robinson	11/15/1977	<i>SE¹/₄ NW¹/₄ Sec 15</i>	<i>T33S R67W</i>
100182	Meredith Drilling Co, Inc. (Robert Jespersen) – owner unknown	10/27/1978 pump install	unknown	unknown
112020	Ann M. Neely & Esther L. Romyns	03/11/1996	<i>SE¹/₄ NE¹/₄ Sec 4</i>	<i>T33S R67W</i>
113302A	Wayne L. Monk	12/23/1993	<i>SW¹/₄ NW¹/₄ Sec 4</i>	<i>T33S R67W</i>
113302A-1	Sharon Nelson (113302)	11/26/1985	<i>SW¹/₄ NW¹/₄ Sec 4</i>	<i>T33S R67W</i>
119892	James Perry Smittle	08/31/1981	<i>S¹/₄ of the ¹/₂ Sec 4</i>	<i>T33S R67W</i>
120462	Raymond D. Thornton	07/03/1981	<i>SE¹/₄ NE¹/₄ Sec 4</i>	<i>T33S R67W</i>
121983	Kenneth & Donna Feudner	04/30/1982	<i>NE¹/₄ SW¹/₄ Sec 9</i>	<i>T33S R67W</i>
121983A	Michael Schedler & Phillip Stephens	01/14/2004	<i>NE¹/₄ SW¹/₄ Sec 9</i>	<i>T33S R67W</i>
155111	Robert A. Dickerhoof	04/10/1990	<i>NW¹/₄ NE¹/₄ Sec 29</i>	<i>T33S R68W</i>
161244	Julia Silva	04/19/1992	<i>NW¹/₄ NE¹/₄ Sec 12</i>	<i>T33S R68W</i>
161353	Mary C. Hitt	07/17/1992	<i>SE¹/₄ NE¹/₄ Sec 4</i>	<i>T33S R67W</i>
177019	Pete Vallejos	06/24/1996	<i>SE¹/₄ SE¹/₄ Sec 5</i>	<i>T33S R67W</i>
184109	Allen Armstrong	12/20/1994	<i>SW¹/₄ SW¹/₄ Sec 12</i>	<i>T33S R68W</i>
188836	Larry Fach	11/03/1995	<i>NW¹/₄ SW¹/₄ Sec 17</i>	<i>T33S R67W</i>
190870	Gerald M. Law	03/03/1997	<i>NE¹/₄ NE¹/₄ Sec 8</i>	<i>T33S R67W</i>
194257	Skip Runzel	03/11/1997	<i>NE¹/₄ SW¹/₄ Sec 18</i>	<i>T33S R67W</i>
195336	Harrison F. Kenner	09/10/1996	<i>SW¹/₄ SE¹/₄ Sec 7</i>	<i>T33S R67W</i>
200356	Raymond Paul Sterbick	08/2/1999	<i>NW¹/₄ NW¹/₄ Sec 4</i>	<i>T33S R67W</i>
213086	Thomas D. Royal	11/03/1999	<i>SE¹/₄ SW¹/₄ Sec 8</i>	<i>T33S R67W</i>
213453	Al Van Staveren	10/28/1998	<i>SE¹/₄ NW¹/₄ Sec 17</i>	<i>T33S R67W</i>
219485	John Larosa	10/29/1999	<i>NE¹/₄ NW¹/₄ Sec 8</i>	<i>T33S R67W</i>
220219	Roger K. Diller	09/01/1999	<i>SW¹/₄ SW¹/₄ Sec 12</i>	<i>T33S R68W</i>
220596	Monroe Allen Armstrong	09/21/1999	<i>SW¹/₄ SW¹/₄ Sec 12</i>	<i>T33S R68W</i>
220597	Monroe Allen Armstrong	09/21/1999	<i>NE¹/₄ NE¹/₄ Sec 19</i>	<i>T33S R67W</i>
227348	Richard D Stiles	07/19/2000	<i>SE¹/₄ SE¹/₄ Sec 18</i>	<i>T33S R67W</i>
232998	Don W. Turner & Kathryn S. Rader	04/30/2001	<i>NW¹/₄ SW¹/₄ Sec 9</i>	<i>T33S R67W</i>
241287	Lisa C. York	05/28/2002	<i>SE¹/₄ SW¹/₄ Sec 16</i>	<i>T33S R68W</i>
250869	William Poirier	06/06/2003	<i>NW¹/₄ NE¹/₄ Sec 5</i>	<i>T33S R67W</i>
251283	Bob & Barbara Chenoweth	06/24/2003	498356.9	4111362.5
252851	Ronald E. Leef	09/12/2003	<i>NE¹/₄ NE¹/₄ Sec 14</i>	<i>T33S R68W</i>
252854	Roger Dennis Clouch	09/12/2003	<i>NW¹/₄ NE¹/₄ Sec 29</i>	<i>T33S R68W</i>
253209	Selayne A. Tilson	09/30/2003	<i>NW¹/₄ NE¹/₄ Sec 29</i>	<i>T33S R68W</i>
255230	Donald Mounier	02/22/2004	<i>SW¹/₄ NW¹/₄ Sec 17</i>	<i>T33S R67W</i>
259889	Charles & Patricia Festi	10/20/2004	<i>NW¹/₄ NE¹/₄ Sec 29</i>	<i>T33S R68W</i>
259904	Joseph C. Pachorek Jr.	10/21/2004	<i>NW¹/₄ NE¹/₄ Sec 29</i>	<i>T33S R68W</i>
260090	Elizabeth J. Edwards	10/28/2004	<i>NW¹/₄ NE¹/₄ Sec 29</i>	<i>T33S R68W</i>
260492	Robert G. Baird	11/23/2004	<i>NW¹/₄ NE¹/₄ Sec 29</i>	<i>T33S R68W</i>
263449	Linda Paz	06/06/2005	<i>NE¹/₄ SE¹/₄ Sec 17</i>	<i>T33S R67W</i>
263517	Charles M. Neas	06/06/2005	<i>NW¹/₄ NE¹/₄ Sec 29</i>	<i>T33S R68W</i>
263781	R.C. Patrick	06/20/2005	<i>NW¹/₄ NE¹/₄ Sec 29</i>	<i>T33S R68W</i>
263977	Mary Claire Worrell Haslam	06/27/2005	<i>NW¹/₄ NE¹/₄ Sec 29</i>	<i>T33S R68W</i>

Number		Instanced	Easting	Northing
264674	Dustin Howard	08/01/2005	506590	4113429
264789	David & Robin Timmons	08/04/2005	NW¼ NE¼ Sec 29	T33S R68W
265698	Stephen D. Handley	09/26/2005	NW¼ NE¼ Sec 29	T33S R68W
265771	Mary Sturgeon (Scott & Britt Sturgeon)	09/28/2005	498341.7	4111370.5
269004	Smith James Dallas Jr. (Bill & Tina Hallmark)	05/19/2006	498304.5	4111316.8
269720	Chris E. Erickson	07/12/2006	504580	4113403
269852	Robert M. Kosslyn	07/24/2006	503272	4115083
275545	Terry Hawkins	10/09/2007	507477	4116960
275680	Jerry Scatena	10/18/2007	507013	4117602
276011	James A. Toupal	11/19/2007	498004	4111412
277118	Allen Mitchener (Jerry J. Box	04/10/2010	507134.0	4116003.0
277155	Marino & Pat Montoya	04/14/2008	505553	4112507
284213	New Elk Coal Company LLC	10/05/2010	SE¼ NW¼ Sec 24	T33S R68W
284748	New Elk Coal Company LLC	11/15/2010	506604.9	4113693.9
284749	New Elk Coal Company LLC	11/16/2010	506604.9	4113693.9
287118	New Elk Coal Company LLC	08/04/2011	507681.263	4106422.545
287119	New Elk Coal Company LLC	08/18/2011	507697.592	4106427.682
287120	New Elk Coal Company LLC	08/07/2011	507681.272	4108424.257
287121	New Elk Coal Company LLC	08/10/2011	507692.133	4106425.972
295693	James S. Hopkins	09/16/2014	510266	4116449
313766	Darin Telfer	06/14/2019	SW¼ Sec 22	T33S R68W
321617	Colorado Parks and Wildlife	05/04/2021	505310.0	4107018.0
321618	Colorado Parks and Wildlife	05/04/2021	501849.0	4110116.0
321620	Colorado Parks and Wildlife	05/04/2021	506889.0	4111374.0
321621	Colorado Parks and Wildlife	05/04/2021	505409.0	4110815.0
MH-17829	Mary Hitt	07/24/1991	SE¼ NE¼ Sec 4	T33S R67W
MH-24564	Allen Armstrong	10/24/1994	SW¼ SW¼ Sec 12	T33S R68W

Notes:

Italicized font indicates no coordinates are available.

Gray shading = unknown

In the spring of 1984, WFC completed a water user survey for the permit and surrounding area. The survey included wells, windmills, and stock ponds within a one-mile radius of the permit boundaries for the New Elk and Golden Eagle mines and supplemented the inventory that had been previously compiled by CF&I (Exhibit 11). Information from the WFC and CF&I surveys has been updated for the current permit revision with water well data from the Colorado Department of Water Resources. The updated inventory reflects all permitted wells within a one-mile radius of the permit area (including the PR5 area) as of December 2021 as well as the stock ponds and windmills identified in the previous surveys. The updated groundwater user inventory is presented in Table 10. Resource locations are presented on the updated Map 8-Regional Hydrology.

According to the 1984 survey, the water supply for the city of Trinidad is the primary source of water for domestic use east of the North Fork of the Purgatoire River. The city water originates from North Lake and Monument Lake and is piped via an aqueduct in a southeasterly direction along the North Fork and then east along the north side of Highway 12. With the exception of two residents (Wells 15 and 16), everyone contacted in 1984 used city water for domestic supply. City water was not available west of the North Fork and those users relied on well water.

Since 1984, a number of wells have been installed within one mile of the permit boundary. The wells include 14 bedrock wells that produce from the Raton Formation and 17 wells that are completed in alluvium (Table 10 and Map 8). Current totals for wells and other sources that access groundwater are presented in Table 11.

Table 11. Summary of Groundwater Users/Access Points within One Mile of the Permit Boundary

Groundwater Source	Number
Alluvial water supplies	29
Bedrock water supplies	15
Unknown water supplies	10
Alluvial monitoring wells	7
Bedrock monitoring wells	3

The well inventory and user survey indicates that there are two primary groundwater sources in the study area. The first source consists of alluvial aquifers and springs associated with the Purgatoire River and its tributaries. The second source is bedrock groundwater from the Raton Formation. Alluvial wells are typically less than 100 ft deep and access groundwater that is hydraulically connected to surface water. Bedrock wells range from about 30 to 513 ft in depth and produce groundwater from poorly interconnected zones of limited areal extent. The USGS describes the groundwater system in Raton Formation Aquifer as being heterogeneous and anisotropic with individual beds having limited lateral continuity (Watts, 2006)¹. Alluvial

¹ Watts, K., R., (2006), "Hydrostratigraphic Framework of the Raton, Vermejo, and Trinidad Aquifers in the Raton Basin, Las Animas County, Colorado," United States Geological Survey Scientific Investigations Report 2006-5129.

water sources have low potential to be affected by mining in the Blue, Allen and Apache coal seams because of the low vertical hydraulic conductivity of the rocks and limited lateral continuity of water-bearing zones.

Two bedrock water supply wells are located in the permit area. Well 39685 is a 220-ft-deep domestic supply well. The owner of record is Storz O.T.-CF&I Lessee. Well 8 is a 390-ft-deep industrial supply well owned by New Elk Coal Company. Both wells could be impacted by mining in the Blue, Allen, and Apache coal seams. Impacts to the wells could include changes in water levels and water quality.

Users located near Stonewall primarily rely on shallow wells in the alluvium adjacent to the Middle Fork of the Purgatoire River for domestic water supply. One well (269004) may be completed in bedrock, but it is only 60 feet deep, and it is not likely to be affected by mining.

A number of residents are located north and northeast of the permit area and use bedrock wells for domestic water supply. Wells 269720 and 264440 are located closest to the permit boundary and have the greatest potential to be impacted by mining. Well 269720 is 60 ft deep, and given its shallow completion, it is unlikely that mining will affect the water level or water quality in the well. Well 264440 is 200 ft deep and is completed in an unidentified coal seam. Well 264440 has a greater potential to be adversely impacted by mining in the Blue, Allen, and Apache coal seams than Well 269720.

Wells 12, 13, and 14 are actually cisterns. These cisterns have been in use for over 65 years. No problems were reported with water quality or quantity during previous mining. The water levels in the cisterns vary slightly with the season. These variations suggest that the cisterns are fed by runoff and infiltration from the Purgatoire River.

Wells 15, 16, and 17 were the only wells identified east of the North Fork of the Purgatoire River during previous studies. Well 15 is a cistern that is believed to be spring fed from a northeasterly direction because of the presence of springs to the north in Santistevan Canyon. The water quality is reported to be excellent with no problems in quantity. Well 16 is approximately 60 ft deep. The well produces poor quality water. Chavez (1984) describes the well water as having a terrible odor. It is believed that the well is completed in an upper coal seam and that hydrogen sulfide gas is the source of the bad smell. Well 17 is no longer in use because of the availability of city water.

Well 11 is apparently completed in the Purgatory River alluvial aquifer. No problems were reported with the quantity or quality of water from the well during previous mining activities. The well is the water supply source for the Picketwire Lodge.

The highland wells (windmills) south of the Purgatoire River are all listed as being owned by the Division of Wildlife. The respective water levels for Wells 4, 5, 6, 7, and 9 are reported to be 25, 15.5, 46.5, and 7.5 ft but no information is available for when these were measured. The water quality is reported to be similar that of coal seepage and different from surface water quality in streams and stock ponds, suggesting that the windmill water is coming from an upper coal seam. Geologic logs for the highland area show a series of coal seams approximately 100 to 150 ft.

below ground surface. Experience from previous mining operations suggests that the water source for the windmills will not be affected by mining in the Blue, Apache, and Allen coal seams.

The existing workings for the New Elk Mine extend under the Purgatoire River beneath Wells 8, 9, 10, 12, 13, and 14. Well owners did not report adverse effects on either water quality or quantity during previous mining.

(2) Surface Water Information

Surface water quality and quantity information was developed historically through a study by Water, Waste and Land, Ltd. The report of the quality and quantity of water associated with the permit and areas adjacent to the New Elk Mine is found in Exhibit 8, Hydrology and Geology Information. In addition, historical water quality analyses are provided in Exhibit 10, Water Quality Analysis. All surface waters in the New Elk permit area and adjacent areas are shown on Map 8, Regional Hydrology. Discharges of surface water at the New Elk Mine are shown on Map 8. Discharges from the mine and from the coalbed methane (CBM) gas- production operations in Apache Canyon are permitted under the National Pollutant Discharge Elimination System (NPDES), which requires quarterly monitoring and reporting of the quality and quantity of discharges to surface water. The results of recent NPDES monitoring at the mine are presented in Table 10A. As indicated in Table 10A, no discharges have been measured in Apache Canyon Creek during 2009 and the first quarter of 2010. Average flow rates for the Purgatoire River at Madrid, Colorado, since 2002 are presented by month in Table 10B.

Table 10A. New Elk Mine NPDES Monitoring Data 2021

Discharge Point	Flow Rate (Mgd)	Specific Conductance (dS/m)	pH	Total Iron (µg/L)	Total Manganese (µg/L)	Total Sodium (mg/L)
001 Mine Water to Purgatoire River	0.851	3.03	8.7	180	Not analyzed	700
004 Runoff Pond 4 to Purgatoire River	No discharge*					
007 Runoff Pond 7 to Purgatoire River	No discharge*					
008 Refuse Area Pond to Purgatoire	No discharge*					
009 Mine Water to Left Fork Apache Canyon Creek	No discharge*					
Monitoring Well 1				240	8	

*No discharge occurred during any monitoring period from January 2009 through March 2010

**Table 10B. Average Monthly Flow Rates for the Purgatoire River
at Madrid, Colorado (USGS Data)**

Year	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
2002	12.4	14.2	13.3	11.0	14.4	9.51	12.5	8.12	17.9	16.4	12.7	10.3
2003	12.0	11.3	15.7	24.1	59.9	119.9	46.3	51.0	119.3	35.5	23.8	18.4
2004	17.0	18.6	22.9	172.1	306.6	146.6	164.7	263.7	46.0	35.7	31.0	28.5
2005	30.2	35.1	38.4	141.1	332.7	326.4	115.9	104.1	44.4	39.5	29.4	22.6
2006	21.8	21.7	17.3	20.8	46.9	38.8	80.8	136.9	74.2	73.1	47.2	37.5
2007	40.0	51.9	75.3	103.2	233.5	236.5	115.5	145.5	65.7	44.5	30.0	26.4
2008	26.5	30.0	40.1	72.6	151.6	203.0	114.3	148.4	68.6	44.3	35.8	34.0
2009	32.3	29.1	29.8	50.8	178.2	180.5	14.9	35.2	41.5			
Average	24.0	26.5	31.6	74.5	165.5	157.7	83.1	111.6	59.7	41.3	30.0	25.4
Maximum	40.0	51.9	75.3	172.1	332.7	326.4	164.7	263.7	119.3	73.1	47.2	37.5
Minimum	12.0	11.3	13.3	11.0	14.4	9.5	12.5	8.1	17.9	16.4	12.7	10.3

The existing surface water rights in the permit area and adjacent areas were compiled from records of the Colorado Division of Water Resources and are summarized in Table I0C. The primary sources of diversion are the Purgatoire River, South Fork Purgatoire River, North Fork Purgatoire River, and various seepage locations. Irrigation is the primary use of surface water diversions in the areas adjacent to the permit area. Other uses include domestic, industrial, stock, municipal, and fisheries.

WFC has conducted further surface water baseline and operational monitoring. Baseline studies include establishing flumes in Apache and Santistevan Canyons. Quality and flow measurements were taken during 1984 and 1985 in these canyons as well as the Middle Fork or the Purgatoire River. Monthly flow and water quality data has been collected in Wet, Lopez, and Cherry Canyons and the Purgatoire River. WFC also evaluated springs and seeps in and adjacent to the permit area. Exhibit 10, Annual Hydrologic Monitoring Report, contains all surface water data taken since NECC acquired the New Elk Mine.

Spring and Seeps

As part of previous New Elk and Golden Eagle permitting, preliminary spring/seep surveys were conducted as early as 1984 using aerial photographs. Previously identified by the USGS were first examined for characteristic features which were then applied to the area of interest. Primary selection criteria included anomalous green vegetation and the presence of deciduous trees along drainage bottoms. In 2022, four additional springs and seeps were identified based on results from the Colorado Natural Heritage Program CODEX web mapper. With the additional four springs and seeps there is a total of thirty-two potential sites identified within a one-mile buffer of the PR5 permit boundary. Locations of these springs and seeps are shown on Map 8 and are summarized in Table 11a, Preliminary Spring/Seep Locations. Stock pond and windmill locations are also plotted on Map 8, Regional Hydrology.

As part of the 2022 hydrology sampling the springs and seeps will be monitored as well as their locations confirmed. Parameters measured will include pH, flow, conductivity, and temperature. The results of this inventory will be presented in Table 12, Results of Field Spring and Seep Inventory.

For the purposes of this discussion no distinction is made between springs or seeps. It appears however, most of the water encountered was a result of seepage. All of the water, with the exception of No. 23 in Apache Canyon and springs in Santistevan Canyon, come from seepage from coal or the interfaces between coal and shale or sandstone.

Table 10C
Existing Water Rights in the Permit and Adjacent Areas

Admin No	Name of Structure	Structure Type	Appropriation Date	Use Type	Location of Point of Diversion	Water Source	Decreed Amount of Water	Total Volumetric Limit (AF)
4323	Golden Eagle Discharge	Well	11/1/1861	1, 4, Q	T33S R68W Sec. 29 SWNE	Middle Fork Purgatoire River	0.75	
4323	Golden Eagle Diversion	Mine	11/1/1861	1, 4, Q	T33S R68W Sec. 29 SWNE	Middle Fork Purgatoire River	0.75	
4323	Maxwell Ditch No 9	Ditch	11/1/1861	1, 4, Q	T33S R68W Sec. 30 NW	Middle Fork Purgatoire River	0.75	
4323	Maxwell Ditch No 10	Ditch	11/1/1861	4, 1	T33S R68W Sec. 29 SWNW	Middle Fork Purgatoire River	0.75	
4323	New Elk East Diversion	Mine	11/1/1861	1, 4, Q	T33S R68W Sec. 23 SWNE	Middle Fork Purgatoire River	0.75	
4323	New Elk Mine Discharge	Mine	11/1/1861	1, 4, Q	T33S R68W Sec. 23 SWNE	Middle Fork Purgatoire River	0.75	
4323	New Elk West Diversion	Mine	11/1/1861	1, 4, Q	T33S R68W Sec. 21 NESE	Middle Fork Purgatoire River	0.75	
4323	Russell Reservoir	Reservoir	11/1/1861	1, 4, Q	T33S R68W Sec. 20 NESW	Whiskey Creek	0.75	
4780	Dolores Duran Ditch	Ditch	2/1/1863	1	T33S R68W Sec. 24 SWNE	Middle Fork Purgatoire River	1	
5904	Golden Eagle Discharge	Well	3/1/1866	1, 4, Q	T33S R67W Sec. 29 NESW	Middle Fork Purgatoire River	0.33	
5904	Golden Eagle Diversion	Mine	3/1/1866	1, 4, Q	T33S R68W Sec. 29 SWNE	Middle Fork Purgatoire River	0.33	
5904	Hill Ranch Aug Plan	Augmentation/ Replacement Plan	3/1/1866	A	T34S R68W Sec.	Rincon Creek	0.72	
5904	Maxwell Ditch No 9	Ditch	3/1/1866	1, 4, Q	T33S R68W Sec. 30 NW	Middle Fork Purgatoire River	0.33	
5904	Maxwell Ditch No 10	Ditch	3/1/1866	1, 4	T33S R68W Sec. 29 SWNW	Middle Fork Purgatoire River	0.33	
5904	New Elk East Diversion	Mine	3/1/1866	1, 4, Q	T33S R68W Sec. 23 SWNE	Middle Fork Purgatoire River	0.33	
5904	New Elk Mine Discharge	Mine	3/1/1866	1, 4, Q	T33S R68W Sec. 23 SWNE	Middle Fork Purgatoire River	0.33	
5904	New Elk West Diversion	Mine	3/1/1866	1, 4, Q	T33S R68W Sec. 21 NESE	Middle Fork Purgatoire River	0.33	
5904	Russell Reservoir	Reservoir	3/1/1866	1, 4, Q	T33S R68W Sec. 20 NESW	Whiskey Creek	0.33	
5935	Dorn Ditch	Ditch	4/1/1866	1	T34S R67W Sec. 2 NESW	South Fork Purgatoire River	2.4	
5935	Dorn Ditch	Ditch	4/1/1866	1	T34S R67W Sec. 2 NENW	South Fork Purgatoire River	2.4	
5935	Dorn Ditch	Ditch	4/1/1866	1, 9, W, 6, 5, A, 7	T34S R67W Sec. 2 NENW	South Fork Purgatoire River	2.4	
5994	Russell Reservoir	Reservoir	5/30/1866	1, 2, 4, 0	T33S R68W Sec. 20 NESW	Whiskey Creek	5	
5994	South Lake Reservoir	Reservoir	5/30/1866	1, 2, 4, 0	T33S R68W Sec. 30 NESW	Middle Fork Purgatoire River	5	
5994	South Valley Reservoir	Reservoir	5/30/1866	1, 2, 4, 0	T34S R68W Sec. 7 NESW	South Fork Purgatoire River	5	
5994	Stonewall Reservoir No 1	Reservoir	5/30/1866	1, 2, 4, 0	T33S R68W Sec. 29 NESW	South Fork Purgatoire River	5	
5994	Stonewall Reservoir No 2	Reservoir	5/30/1866	1, 2, 4, 0	T33S R68W Sec. 29 NESW	South Fork Purgatoire River	5	
5994	Sueno Reservoir	Reservoir	5/30/1866	X	T33S R68W Sec. 30 SENE	Middle Fork Purgatoire River	0.25	17.5
6149	Golden Eagle Discharge	Well	11/1/1866	X	T33S R67W Sec. 29 NESW	Middle Fork Purgatoire River	1	
6149	Golden Eagle Discharge	Well	11/1/1866	X	T33S R67W Sec. 29 NESW	Groundwater: Middle Fork Purgatoire River	1	
6149	Golden Eagle Diversion	Mine	11/1/1866	X	T33S R68W Sec. 29 SWNE	Middle Fork Purgatoire River	1	
6149	Golden Eagle Diversion	Mine	11/1/1866	X	T33S R68W Sec. 29 SWNE	Middle Fork Purgatoire River	1	
6149	New Elk East Diversion	Mine	11/1/1866	X	T33S R68W Sec. 23 SWNE	Middle Fork Purgatoire River	1	
6149	New Elk East Diversion	Mine	11/1/1866	X	T33S R68W Sec. 23 SWNE	Middle Fork Purgatoire River	1	
6149	New Elk Mine Discharge	Mine	11/1/1866	X	T33S R68W Sec. 23 SWNE	Middle Fork Purgatoire River	1	

Table 10C
Existing Water Rights in the Permit and Adjacent Areas (cont.)

Admin No	Name of Structure	Structure Type	Appropriation Date	Use Type	Location of Point of Diversion	Water Source	Decreed Amount of Water	Total Volumetric Limit (AF)
6149	New Elk Mine Discharge	Mine	11/1/1866	X	T33S R68W Sec. 23 SWNE	Middle Fork Purgatoire River	1	
6149	New Elk West Diversion	Mine	11/1/1866	X	T33S R68W Sec. 21 NESE	Middle Fork Purgatoire River	1	
6149	New Elk West Diversion	Mine	11/1/1866	X	T33S R68W Sec. 21 NESE	Middle Fork Purgatoire River	1	
6149	Ramon Torres Ditch	Ditch	11/1/1866	1	T34S R68W Sec.	South Fork Purgatoire River	7	
6149	Ramon Torres Ditch	Ditch	11/1/1866	1	T34S R68W Sec.	South Fork Purgatoire River	6	
6149	Russell Reservoir	Reservoir	11/1/1866	1, 2, 4, 0	T33S R68W Sec. 20 NESW	Whiskey Creek	5.6	
6149	South Lake Reservoir	Reservoir	11/1/1866	1, 2, 4, 0	T33S R68W Sec. 30 NESW	Middle Fork Purgatoire River	5.6	
6149	South Valley Reservoir	Reservoir	11/1/1866	1, 2, 4, 0	T34S R68W Sec. 7 NESW	South Fork Purgatoire River	5.6	
6149	Stonewall Reservoir No 1	Reservoir	11/1/1866	1, 2, 4, 0	T33S R68W Sec. 29 NESW	South Fork Purgatoire River	5.6	
6149	Stonewall Reservoir No 2	Reservoir	11/1/1866	1, 2, 4, 0	T33S R68W Sec. 29 NESW	South Fork Purgatoire River	5.6	
6149	Tafoya & Vigil Ditch	Ditch	11/1/1866	1	T33S R68W Sec. 13 SESW	North Fork Purgatoire River	1.6	
6288	Rafael Cordova Ditch	Ditch	3/20/1867	1	T33S R67W Sec. 36 SWNE	Purgatoire River	2.2	
6329	Dolores Duran Ditch	Ditch	4/30/1867	1	T33S R68W Sec. 24 SWNE	Middle Fork Purgatoire River	2	
6329	Ignacio & Chacon Ditch	Ditch	4/30/1867	1	T33S R68W Sec. 24 NESW	North Fork Purgatoire River	1.2	
6391	Maxwell Ditch No 8	Ditch	7/1/1867	1	T33S R68W Sec. 19 SESW	Wilkins Creek	3.5	
6391	Maxwell Ditch No 11	Ditch	7/1/1867	1	T33S R68W Sec. 29 NW	Middle Fork Purgatoire River	4	
6391	Maxwell Ditch No 11	Ditch	7/1/1867	1	T33S R68W Sec. 29 SWNW	Middle Fork Purgatoire River	4	
6391	Maxwell Ditch No 11	Ditch	7/1/1867	X	T33S R68W Sec. 29 SWNW	Middle Fork Purgatoire River	4	
6391	Maxwell Ditch No 11	Ditch	7/1/1867	X	T33S R68W Sec. 29 SWNW	Middle Fork Purgatoire River	3	
6391	Russell & Storz Ditch	Ditch	7/1/1867	1	T33S R68W Sec. 7 NWNE	Whiskey Creek	4	
6391	Russell Reservoir	Reservoir	7/1/1867	1	T33S R68W Sec. 20 NESW	Whiskey Creek		312
6391	Russell Reservoir	Reservoir	7/1/1867	1, 2, 4, 0	T33S R68W Sec. 20 NESW	Whiskey Creek	4	
6391	South Lake Reservoir	Reservoir	7/1/1867	1, 2, 4, 0	T33S R68W Sec. 30 NESW	Middle Fork Purgatoire River	4	
6391	South Valley Reservoir	Reservoir	7/1/1867	1, 2, 4, 0	T34S R68W Sec. 7 NESW	South Fork Purgatoire River	4	
6391	Stonewall Reservoir No 1	Reservoir	7/1/1867	1, 2, 4, 0	T33S R68W Sec. 29 NESW	South Fork Purgatoire River	4	
6391	Stonewall Reservoir No 2	Reservoir	7/1/1867	1, 2, 4, 0	T33S R68W Sec. 29 NESW	South Fork Purgatoire River	4	
6391	Storz Ditch	Ditch	7/1/1867	1	T33S R68W Sec. 20 SWSE	Middle Fork Purgatoire River	2.2	
6635	Russell Reservoir	Reservoir	3/1/1868	1, 2, 4, 0	T33S R68W Sec. 20 NESW	Whiskey Creek	1.6	
6635	South Lake Reservoir	Reservoir	3/1/1868	1, 2, 4, 0	T33S R68W Sec. 30 NESW	Middle Fork Purgatoire River	1.6	
6635	South Valley Reservoir	Reservoir	3/1/1868	1, 2, 4, 0	T34S R68W Sec. 7 NESW	South Fork Purgatoire River	1.6	
6635	Stonewall Reservoir No 1	Reservoir	3/1/1868	1, 2, 4, 0	T33S R68W Sec. 29 NESW	South Fork Purgatoire River	1.6	
6635	Stonewall Reservoir No 2	Reservoir	3/1/1868	1, 2, 4, 0	T33S R68W Sec. 29 NESW	South Fork Purgatoire River	1.6	
6666	James Lash Ditch	Ditch	4/1/1868	1	T33S R68W Sec. 13 SENW	North Fork Purgatoire River	1.8	
6666	Jose L Vialpando Ditch	Ditch	4/1/1868	1	T33S R68W Sec. 11 SENW	North Fork Purgatoire River	1.6	
6666	Jose L Vialpando Ditch	Ditch	4/1/1868	1	T33S R68W Sec. 11 SWNW	North Fork Purgatoire River	1.57	
6666	Jose L Vialpando Ditch	Ditch	4/1/1868	1	T33S R68W Sec. 11 SWNW	North Fork Purgatoire River	0.03	
7030	Prudencia Chacon Ditch	Ditch	3/31/1869	1	T33S R68W Sec. 22 SESE	Middle Fork Purgatoire River	1.2	

Table 10C
Existing Water Rights in the Permit and Adjacent Areas (cont.)

Admin No	Name of Structure	Structure Type	Appropriation Date	Use Type	Location of Point of Diversion	Water Source	Decreed Amount of Water	Total Volumetric Limit (AF)
7030	Prudencia Chacon Ditch	Ditch	3/31/1869	1	T33S R68W Sec. 22 SESE	Middle Fork Purgatoire River	1.2	
7045	Peter Caplett NS Ditch	Ditch	4/15/1869	1	T33S R68W Sec. 14 NWNE	North Fork Purgatoire River	2.2	
7315	Samora Ditch	Ditch	1/10/1870	1	T33S R67W Sec. 29 SWNE	Purgatoire River	2.4	
7337	Peter Caplett Ditch	Ditch	2/1/1870	1	T33S R68W Sec. 13 SENW	North Fork Purgatoire River	1	
7394	Maes-Duran Ditch	Ditch	3/30/1870	1	T34S R67W Sec. 10 NWSE	South Fork Purgatoire River	5	
7394	Maes-Duran Ditch	Ditch	3/30/1870	1	T34S R67W Sec. 10 NWSE	South Fork Purgatoire River	5	
7397	Santistevan Ditch	Ditch	4/2/1870	1	T33S R67W Sec. 19 NWSE	Purgatoire River	3.2	
7426	Ramos Ditch	Ditch	5/1/1870	1	T33S R67W Sec. 34 NENE	Purgatoire River	1.8	
7775	Dolores Bialpando Ditch	Ditch	4/15/1871	1	T33S R68W Sec. 3 NESW	North Fork Purgatoire River	1	
7791	Garcia & Trujillo Ditch	Ditch	5/1/1871	1	T34S R68W Sec. 1 NESW	South Fork Purgatoire River	0.8	
7791	Garcia & Trujillo Ditch	Ditch	5/1/1871	1	T34S R68W Sec. 1 NESW	South Fork Purgatoire River	0.8	
8096	Juan Torres Ditch	Ditch	3/1/1872	1	T34S R67W Sec. 16 SENE	South Fork Purgatoire River	1.6	
8096	Juan Torres Ditch	Ditch	3/1/1872	1	T34S R67W Sec. 16 SENE	South Fork Purgatoire River	1.6	
8126	Chavez Ditch	Ditch	3/31/1872	1	T33S R68W Sec. 22 SWNE	Middle Fork Purgatoire River	1.4	
8126	Chavez Ditch	Ditch	3/31/1872	1	T33S R68W Sec. 22 SWNW	Middle Fork Purgatoire River	1.4	
8126	Maxwell Ditch No 9	Ditch	3/31/1872	1	T33S R68W Sec. 30 NW	Middle Fork Purgatoire River	3	
8156	Antonio de Torres Ditch	Ditch	4/30/1872	1	T34S R67W Sec. 16 NESW	South Fork Purgatoire River	0.8	
8156	Antonio de Torres Ditch	Ditch	4/30/1872	1	T34S R67W Sec. 16 NESW	South Fork Purgatoire River	0.8	
8156	Wood Ditch No 2	Ditch	4/30/1872	1	T33S R68W Sec. 5 SENW	Whiskey Creek	1.6	
8157	Maxwell Ditch No 7	Ditch	5/1/1872	1	T33S R68W Sec. 19 NENW	Wilkins Creek	2	
8217	Juan Matias Duran Ditch	Ditch	6/30/1872	1	T34S R67W Sec. 20 NWSE	South Fork Purgatoire River	3	
8217	Juan Matias Duran Ditch	Ditch	6/30/1872	1	T34S R67W Sec. 20 NWSE	South Fork Purgatoire River	3	
8350	Turner Ditch	Ditch	11/10/1872	1	T33S R67W Sec. 29 SWNE	Purgatoire River	1.8	
8521	Weston Ditch	Ditch	4/30/1873	1	T33S R67W Sec. 35 SENW	South Fork Purgatoire River	5	
8521	Weston Ditch	Ditch	4/30/1873	1	T33S R67W Sec. 35 SENW	South Fork Purgatoire River	5	
8825	Alejandro Torres & Vigil	Ditch	2/28/1874	1	T34S R67W Sec.	South Fork Purgatoire River	1.6	
8825	Alejandro Torres & Vigil	Ditch	2/28/1874	1	T34S R67W Sec.	South Fork Purgatoire River	1.6	
8825	Russell Reservoir	Reservoir	2/28/1874	1, 2, 4, 0	T33S R68W Sec. 20 NESW	Whiskey Creek	1.6	
8825	South Lake Reservoir	Reservoir	2/28/1874	1, 2, 4, 0	T33S R68W Sec. 30 NESW	Middle Fork Purgatoire River	1.6	
8825	South Valley Reservoir	Reservoir	2/28/1874	1, 2, 4, 0	T34S R68W Sec. 7 NESW	South Fork Purgatoire River	1.6	
8825	Stonewall Reservoir No 1	Reservoir	2/28/1874	1, 2, 4, 0	T33S R68W Sec. 29 NESW	South Fork Purgatoire River	1.6	
8825	Stonewall Reservoir No 2	Reservoir	2/28/1874	1, 2, 4, 0	T33S R68W Sec. 29 NESW	South Fork Purgatoire River	1.6	
8857	Duran Martinez Ditch	Ditch	4/1/1874	1	T34S R67W Sec. 29 NENW	South Fork Purgatoire River	0.8	
8857	Duran Martinez Ditch	Ditch	4/1/1874	1	T34S R67W Sec. 29 NENW	South Fork Purgatoire River	0.8	
8857	Maxwell Ditch No 19	Ditch	4/1/1874	1	T34S R68W Sec. 16 NE	South Fork Purgatoire River	0.8	
9231	Cosme Deaguero Ditch	Ditch	4/10/1875	1	T33S R67W Sec. 27 SWNE	Purgatoire River	1.2	
9251	Randolph & Howlett Ditch	Ditch	4/30/1875	1	T33S R68W Sec. 30 NE	Middle Fork Purgatoire River	0.5	

Table 10C
Existing Water Rights in the Permit and Adjacent Areas (cont.)

Admin No	Name of Structure	Structure Type	Appropriation Date	Use Type	Location of Point of Diversion	Water Source	Decreed Amount of Water	Total Volumetric Limit (AF)
9952	Cresencio Ortiz Ditch	Ditch	3/31/1877	1	T33S R68W Sec. 3 NESW	North Fork Purgatoire River	1.8	
9953	Russell & Storz Ditch	Ditch	4/1/1877	1	T33S R68W Sec. 7 NWNE	Whiskey Creek	3	
9959	Florida Ditch	Ditch	4/7/1877	1	T33S R68W Sec. 6 SENW	Purgatoire River	10.23	
9982	Trujillo & Vallegos	Ditch	4/30/1877	1	T34S R67W Sec. 30 NENW	South Fork Purgatoire River	1	
9982	Trujillo & Vallegos	Ditch	4/30/1877	1	T34S R67W Sec. 30 NENW	South Fork Purgatoire River	1	
9983	Golden Eagle Discharge	Well	5/1/1877	1, 4, Q	T33S R67W Sec. 29 NESW	Middle Fork Purgatoire River	0.9	
9983	Golden Eagle Diversion	Mine	5/1/1877	1, 4, Q	T33S R68W Sec. 29 SWNE	Middle Fork Purgatoire River	0.9	
9983	Maxwell Ditch No 9	Ditch	5/1/1877	1, 4, Q	T33S R68W Sec. 30 NENW	Middle Fork Purgatoire River	0.9	
9983	Maxwell Ditch No 10	Ditch	5/1/1877	1, 4	T33S R68W Sec. 29 SWNW	Middle Fork Purgatoire River	0.9	
9983	Maxwell Ditch No 13	Ditch	5/1/1877	1	T33S R68W Sec. 30 NWNW	Middle Fork Purgatoire River	0.9	
9983	Maxwell Ditch No 13	Ditch	5/1/1877	1	T33S R68W Sec. 30 NWNW	Middle Fork Purgatoire River	0.9	
9983	New Elk East Diversion	Mine	5/1/1877	1, 4, Q	T33S R68W Sec. 23 SWNE	Middle Fork Purgatoire River	0.9	
9983	New Elk Mine Discharge	Mine	5/1/1877	1, 4, Q	T33S R68W Sec. 23 SWNE	Middle Fork Purgatoire River	0.9	
9983	New Elk West Diversion	Mine	5/1/1877	1, 4, Q	T33S R68W Sec. 21 NESE	Middle Fork Purgatoire River	0.9	
9983	Russell Reservoir	Reservoir	5/1/1877	1, 4, Q	T33S R68W Sec. 20 NESW	Whiskey Creek	0.9	
10044	A Storz Ditch No 2	Ditch	7/1/1877	1	T33S R68W Sec. 21 SESE	Middle Fork Purgatoire River	0.7	
10044	A Storz Ditch No 2	Ditch	7/1/1877	1	T33S R68W Sec. 21 SESE	Middle Fork Purgatoire River	0.7	
10044	Golden Eagle Discharge	Well	7/1/1877	1, 4, Q	T33S R67W Sec. 29 NESW	Middle Fork Purgatoire River	0.7	
10044	Golden Eagle Diversion	Mine	7/1/1877	1, 4, Q	T33S R68W Sec. 29 SWNE	Middle Fork Purgatoire River	0.7	
10044	Maxwell Ditch No 9	Ditch	7/1/1877	1, 4, Q	T33S R68W Sec. 30 NW	Middle Fork Purgatoire River	0.7	
10044	Maxwell Ditch No 10	Ditch	7/1/1877	1, 4	T33S R68W Sec. 29 SWNW	Middle Fork Purgatoire River	0.7	
10044	New Elk East Diversion	Mine	7/1/1877	1, 4, Q	T33S R68W Sec. 23 SWNE	Middle Fork Purgatoire River	0.7	
10044	New Elk Mine Discharge	Mine	7/1/1877	1, 4, Q	T33S R68W Sec. 23 SWNE	Middle Fork Purgatoire River	0.7	
10044	New Elk West Diversion	Mine	7/1/1877	1, 4, Q	T33S R68W Sec. 21 NESE	Middle Fork Purgatoire River	0.7	
10044	Russell Reservoir	Reservoir	7/1/1877	1, 4, Q	T33S R68W Sec. 20 NESW	Whiskey Creek	0.7	
10228	Emerson Ditch	Ditch	1/1/1878	1	T34S R68W Sec. 32 SWSE	Guajatomah Creek	0.2	
10228	Maxwell Ditch No 10	Ditch	1/1/1878	1	T33S R68W Sec. 29 SWNW	Middle Fork Purgatoire River	1.3	
10228	Russell Lake Ditch	Ditch	1/1/1878	1	T33S R68W Sec. 29 NESW	Middle Fork Purgatoire River	0.7	
10712	Maxwell Ditch No 18	Ditch	4/30/1879	1	T33S R68W Sec. 6 SENW	Whiskey Creek	1.2	
10712	Maxwell Ditch No 18	Ditch	4/30/1879	1	T33S R68W Sec. 6 SENW	Whiskey Creek	1.2	
11111	Juan Felipe Lopez Ditch	Ditch	6/2/1880	1	T33S R67W Sec. 27 NESW	Purgatoire River	0.2	
11111	Juan Felipe Lopez Ditch	Ditch	6/2/1880	1	T33S R67W Sec. 27 NESW	Purgatoire River	0.2	
11324	Maxwell Ditch No 15	Ditch	1/1/1881	1	T33S R68W Sec. 1 SWNE	Whiskey Creek	5	
11324	Maxwell Ditch No 15	Ditch	1/1/1881	1	T33S R68W Sec. 1 SWNE	Whiskey Creek	3.5	
12539	Rafael Griego Ditch	Ditch	4/30/1884	1	T33S R68W Sec. 24 NESW	Purgatoire River	0.8	
12539	Rafael Griego Ditch	Ditch	4/30/1884	1	T33S R68W Sec. 24 NESW	Purgatoire River	0.8	
13454	Albino Vasquez Ditch	Ditch	11/1/1886	1	T33S R68W Sec. 23 NESW	Middle Fork Purgatoire River	0.76	

Table 10C
Existing Water Rights in the Permit and Adjacent Areas (cont.)

Admin No	Name of Structure	Structure Type	Appropriation Date	Use Type	Location of Point of Diversion	Water Source	Decreed Amount of Water	Total Volumetric Limit (AF)
13454	Albino Vasquez Ditch	Ditch	11/1/1886	1	T33S R68W Sec. 23 NESW	Middle Fork Purgatoire River	0.76	
17533	Maxwell Ditch No 3	Ditch	1/1/1898	1	T33S R68W Sec. 31 NWNW	Abbot Creek	1.02	
17533	Maxwell Ditch No 17	Ditch	1/1/1898	1	T33S R68W Sec. 6 SW	Whiskey Creek	0.32	
17533	Maxwell Ditch No 19	Ditch	1/1/1898	1	T34S R68W Sec. 16 NE	South Fork Purgatoire River	4	
17533	Maxwell Ditch No 19	Ditch	1/1/1898	1	T34S R68W Sec. 16 NE	South Fork Purgatoire River	4	
19579.09	Crooked Creek Ditch No 1	Ditch	6/1/1874	1	T33S R68W Sec. 17 NWNE	Crooked Creek	1.5	
19579.09	Crooked Creek Ditch No 2	Ditch	6/1/1874	1	T33S R68W Sec. 17 NENE	Crooked Creek	4	
19579.09	Crooked Creek Ditch No 3	Ditch	6/1/1874	1	T33S R68W Sec. 17 SWNE	Crooked Creek	4	
19579.13	Julianita Vigil Ditch	Ditch	7/31/1886	1	T33S R67W Sec. 35 NWNE	South Fork Purgatoire River	0.5	
19579.13	Julianita Vigil Ditch	Ditch	7/31/1886	1	T33S R67W Sec. 35 NWNE	South Fork Purgatoire River	0.5	
19579.17	James Cherry Creek Ditch	Ditch	8/31/1895	1	T33S R68W Sec. 6 NENW	Cherry Creek	2	
19579.19	Tercio Pipeline	Pipeline	4/1/1902	4, 8	T34S R68W Sec. 7 NWNW	South Fork Purgatoire River	4.5	
19579.19	Purgatoire Reservoir	Reservoir	6/1/1902	4, 8	T34S R68W Sec. 18 NESW	South Fork Purgatoire River		1747.5881
19579.19	East Weston Pipeline	Pipeline	6/30/1902	4, 8	T33S R67W Sec. 35 SWSE	South Fork Purgatoire River	0.25	
20088	Wall of Legends Well No 2	Well	12/31/1904	3, 1, 8	T33S R68W Sec. 30 NWNE	Arkansas River		3.9757
26662	Valdez Well	Well	12/31/1922	8, 9	T33S R67W Sec. 12 NWSE	Arkansas River	0.033	
35226	John Bearden Well No 1	Well	6/12/1946	8	T33S R68W Sec. 30 NWNE	Arkansas River	0.013	
35364	Bearden Well No 1	Well	10/28/1946	8	T33S R68W Sec. 30 NWNE	Arkansas River	0.022	
35861	Gross Well No 1	Well	3/8/1948	8	T33S R68W Sec. 30 NWNE	Arkansas River	0.044	
36159	Whiskey Well No 1	Well	12/31/1948	1, 8	T33S R68W Sec. 8 NWNW	Purgatoire River	0.2222	
36159	Whiskey Well No 1	Well	12/31/1948	1	T33S R68W Sec. 8 NWNW	Purgatoire River	0	
36159	Whiskey Well No 1	Well	12/31/1948	8	T33S R68W Sec. 8 NWNW	Purgatoire River	0.1555	
36284	Jamieson Well No 1	Well	5/5/1949	8	T33S R68W Sec. 30 NWNE	Arkansas River	0.044	
37070	CF&I Well No 1	Well	6/30/1951	4, 8	T33S R68W Sec. 21 SENW	Purgatoire River	0.011	
37070	CF&I Well No 1	Well	6/30/1951	4, 8	T33S R68W Sec. 21 SENW	Purgatoire River	0.011	
37375	CF&I Well No 2	Well	4/30/1952	4	T33S R68W Sec. 23 NWSE	Purgatoire River	0.25	
37375	CF&I Well No 2	Well	4/30/1952	4	T33S R68W Sec. 23 NWSE	Purgatoire River	0.25	
38888	CF&I Well No 1	Well	6/21/1956	1, 8, 9	T33S R68W Sec. 31 NWNW	Purgatoire River	0.133	
39171	CF&I Well No 3	Well	3/31/1957	4, 8	T33S R68W Sec. 23 SENW	Purgatoire River	0.028	
40786	CF&I Well No 4	Well	9/1/1961	4	T33S R68W Sec. 23 SENW	Purgatoire River	0.067	
41603	CF&I Well No 13	Well	11/27/1963	9	T34S R67W Sec. 32 NENE	Arkansas River	0.0022	
41609	CF&I Well No 16	Well	12/3/1963	9	T34S R67W Sec. 34 SWSE	Arkansas River	0.022	
41843	CF&I Well No 18	Well	7/24/1964	9	T34S R67W Sec. 28 NWNE	Arkansas River	0.0066	
42001	CF&I Well No 19	Well	12/29/1964	8	T33S R67W Sec. 35 NWSE	Arkansas River	0.031	
42087	CF&I Well No 22	Well	3/25/1965	9	T34S R67W Sec. 28 SWSW	Arkansas River	0.015	
42091	CF&I Well No 21	Well	3/29/1965	9	T34S R67W Sec. 4 NWSW	Arkansas River	0.011	
42096	CF&I Well No 20	Well	4/3/1965	9	T34S R67W Sec. 1 SESW	Arkansas River	0.0089	

Table 10C
Existing Water Rights in the Permit and Adjacent Areas (cont.)

Admin No	Name of Structure	Structure Type	Appropriation Date	Use Type	Location of Point of Diversion	Water Source	Decreed Amount of Water	Total Volumetric Limit (AF)
42458	Stonewall Well	Well	3/31/1966	8	T33S R68W Sec. 30 NENW	Arkansas River	0.033	
42611	Barron Well No 1	Well	8/31/1966	8	T33S R68W Sec. 30 NWNE	Arkansas River	0.067	
43788	CF&I Well No 30	Well	11/20/1969	8	T33S R68W Sec. 22 SESW	Arkansas River	0.022	
44559.22	Rosa James Spring	Spring	12/31/1910	1	T33S R68W Sec. 24 NWNE	Purgatoire River	1.111	
46386.45	Smokey's Fish Flow	Pipeline	12/31/1973	6	T33S R68W Sec. 30 SWNE	Middle Fork Purgatoire River	1	
47769	Golden Eagle Discharge	Well	10/14/1980	X	T33S R67W Sec. 29 SWNE	Groundwater: Middle Fork Purgatoire River	0.4	
47769	Golden Eagle Mine Discharge	Well	10/14/1980	X	T33S R67W Sec. 29 NESW	Groundwater: Middle Fork Purgatoire River	0.4	
48940	Golden Eagle Discharge	Well	12/29/1983	1, 2, 3, 4, 5, 6, 8, 9, W	T33S R67W Sec. 29 NESW	Middle Fork Purgatoire River	25	
48940	Golden Eagle Diversion	Mine	12/29/1983	1, 2, 3, 4, 5, 6, 8, 9, W	T33S R68W Sec. 29 SWNE	Middle Fork Purgatoire River	25	
48940	New Elk East Diversion	Mine	12/29/1983	1, 2, 3, 4, 5, 6, 8, 9, W	T33S R68W Sec. 23 SWNE	Middle Fork Purgatoire River	25	
48940	New Elk East Diversion	Mine	12/29/1983	1, 2, 3, 4, 5, 6, 8, 9, W	T33S R68W Sec. 23 SWNE	Middle Fork Purgatoire River	25	
48940	New Elk East Diversion	Mine	12/29/1983	1, 2, 3, 4, 5, 6, 8, 9, W	T33S R68W Sec. 23 SWNE	Middle Fork Purgatoire River	25	
48940	New Elk Mine Discharge	Mine	12/29/1983	1, 2, 3, 4, 5, 6, 8, 9, W	T33S R68W Sec. 23 SWNE	Middle Fork Purgatoire River	25	
48940	New Elk Mine Discharge	Mine	12/29/1983	1, 2, 3, 4, 5, 6, 8, 9, W	T33S R68W Sec. 23 SWNE	Middle Fork Purgatoire River	25	
48940	New Elk Mine Discharge	Mine	12/29/1983	1, 2, 3, 4, 5, 6, 8, 9, W	T33S R68W Sec. 23 SWNE	Middle Fork Purgatoire River	25	
48940	New Elk West Diversion	Mine	12/29/1983	1, 2, 3, 4, 5, 6, 8, 9, W	T33S R68W Sec. 21 NESE	Middle Fork Purgatoire River	25	
48940	New Elk West Diversion	Mine	12/29/1983	1, 2, 3, 4, 5, 6, 8, 9, W	T33S R68W Sec. 21 NESE	Middle Fork Purgatoire River	25	
48940	New Elk West Diversion	Mine	12/29/1983	1, 2, 3, 4, 5, 6, 8, 9, W	T33S R68W Sec. 21 NESE	Middle Fork Purgatoire River	25	
48940	Russell Reservoir	Reservoir	12/29/1983	1, 2, 3, 4, 5, 6, 8, 9, W	T33S R68W Sec. 20 NESW	Whiskey Creek	25	
48940	Russell Reservoir	Reservoir	12/29/1983	1, 2, 3, 4, 5, 6, 8, 9, W	T33S R68W Sec. 20 NESW	Whiskey Creek	25	
48940	Russell Reservoir	Reservoir	12/29/1983	1, 2, 3, 4, 5, 6, 8, 9, W	T33S R68W Sec. 20 NESW	Whiskey Creek	25	
48940	South Lake Reservoir	Reservoir	12/29/1983	1, 2, 4, 0	T33S R68W Sec. 30 NESW	Middle Fork Purgatoire River		300
48940	South Lake Reservoir	Reservoir	12/29/1983	1, 2, 3, 4, 5, 6, 8, 9, W	T33S R68W Sec. 30 NESW	Middle Fork Purgatoire River	25	
48940	South Lake Reservoir	Reservoir	12/29/1983	1, 2, 3, 4, 5, 6, 8, 9, W	T33S R68W Sec. 30 NESW	Middle Fork Purgatoire River	25	
48940	South Lake Reservoir	Reservoir	12/29/1983	1, 2, 3, 4, 5, 6, 8, 9, W	T33S R68W Sec. 30 NESW	Middle Fork Purgatoire River	25	
48940	South Valley Reservoir	Reservoir	12/29/1983	1, 2, 4, 0	T34S R68W Sec. 7 NESW	South Fork Purgatoire River		5000
48940	South Valley Reservoir	Reservoir	12/29/1983	1, 2, 3, 4, 5, 6, 8, 9, W	T34S R68W Sec. 7 NESW	South Fork Purgatoire River	25	
48940	South Valley Reservoir	Reservoir	12/29/1983	1, 2, 3, 4, 5, 6, 8, 9, W	T34S R68W Sec. 7 NESW	South Fork Purgatoire River	25	
48940	South Valley Reservoir	Reservoir	12/29/1983	1, 2, 3, 4, 5, 6, 8, 9, W	T34S R68W Sec. 7 NESW	South Fork Purgatoire River	25	
48940	Stonewall Reservoir No 1	Reservoir	12/29/1983	1, 2, 4, 0	T33S R68W Sec. 29 NESW	South Fork Purgatoire River		5000
48940	Stonewall Reservoir No 1	Reservoir	12/29/1983	1, 2, 3, 4, 5, 6, 8, 9, W	T33S R68W Sec. 29 NESW	South Fork Purgatoire River	25	
48940	Stonewall Reservoir No 1	Reservoir	12/29/1983	1, 2, 3, 4, 5, 6, 8, 9, W	T33S R68W Sec. 29 NESW	South Fork Purgatoire River	25	
48940	Stonewall Reservoir No 1	Reservoir	12/29/1983	1, 2, 3, 4, 5, 6, 8, 9, W	T33S R68W Sec. 29 NESW	South Fork Purgatoire River	25	
48940	Stonewall Reservoir No 2	Reservoir	12/29/1983	1, 2, 4, 9, 0	T33S R68W Sec. 29 NESW	South Fork Purgatoire River		2100
48940	Stonewall Reservoir No 2	Reservoir	12/29/1983	1, 2, 3, 4, 5, 6, 8, 9, W	T33S R68W Sec. 29 NESW	South Fork Purgatoire River	25	
48940	Stonewall Reservoir No 2	Reservoir	12/29/1983	1, 2, 3, 4, 5, 6, 8, 9, W	T33S R68W Sec. 29 NESW	South Fork Purgatoire River	25	

Table 10C
Existing Water Rights in the Permit and Adjacent Areas (cont.)

Admin No	Name of Structure	Structure Type	Appropriation Date	Use Type	Location of Point of Diversion	Water Source	Decreed Amount of Water	Total Volumetric Limit (AF)
48940	Stonewall Reservoir No 2	Reservoir	12/29/1983	1, 2, 3, 4, 5, 6, 8, 9, W	T33S R68W Sec. 29 NESW	South Fork Purgatoire River	25	
53386	New Elk/Dakota Well #1	Well	3/1/1996	X	T33S R68W Sec. 24 NWNW	Dakota		7237
54621	McDonald Spring No 9	Spring	7/19/1999	9	T33S R67W Sec. 1 NESW	Purgatoire River	0.0044	
55152.54	Tercio Pond # 5	Reservoir	10/31/1996	5, 9	T34S R68W Sec. 33 NE	Rincon Creek		5
55152.54	Tercio Pond # 4	Reservoir	10/31/1997	5, 9	T34S R68W Sec. 33 NE	Rincon Creek		4.2
55152.54	Tercio Pond # 6	Reservoir	10/31/1997	5, 9	T34S R68W Sec. 33 NE	Rincon Creek		4.16
55152.54	Tercio Pond # 1	Reservoir	10/31/1998	5, 9	T34S R68W Sec. 28 NE	Rincon Creek		3.87
55152.54	Tercio Pond # 2	Reservoir	10/31/1998	5, 9	T34S R68W Sec. 28 SE	Rincon Creek		1.52
55152.55	Tercio Pond # 3	Reservoir	10/31/1999	5, 9	T34S R68W Sec. 28 SE	Rincon Creek		9.9
55152.55	Tercio Pond # 7	Reservoir	10/31/1999	5, 9	T34S R68W Sec. 33 SE	Rincon Creek		2.32
55517.51	Sueno Reservoir	Reservoir	12/31/1989	9, 5, 6, 7	T33S R68W Sec. 30 SENE	Middle Fork Purgatoire River		10.4
55517.51	Sueno Reservoir	Reservoir	12/31/1989	9, 5, 6, 7	T33S R68W Sec. 30 SENE	Middle Fork Purgatoire River	1	50
55736	Commelina Mesa Dahl Well	Well	8/7/2002	8	T33S R68W Sec. 2 SWSE	Arkansas River	0.0044	
55821	Sueno Reservoir	Reservoir	10/31/2002	X	T33S R68W Sec. 30 SENE	Middle Fork Purgatoire River	0.25	
57708.55	Parsons Augmentation Pond	Reservoir	7/1/1999	A, 0	T33S R67W Sec. 36 SENW	Purgatoire River		7
57708.55	Parsons Pond	Reservoir	7/1/1999	9, W, 6, 5, 7, 0	T33S R67W Sec. 36 NENE	Purgatoire River		13.5
57708.55	Parsons Pond Diversion	Ditch	7/1/1999	9, W, 6, 5, A, 7	T33S R67W Sec. 36 NWNE	Purgatoire River	0.5	
58101	Purgatoire River Min Flow	Minimum Flow	1/27/2009	M	T33S R68W Sec. 24 SWNW	Purgatoire River	21	
58101	South Fork Purgatoire Min Flow	Minimum Flow	1/27/2009	M	T34S R68W Sec. 22 NWSE	South Fork Purgatoire River	18	
58347	Lopez Canyon Pond	Reservoir	9/30/2009	3, A, 7, 9, W, 4	T33S R67W Sec. 21 SWSE	Lopez Canyon		7.5
58347	Lopez Canyon Pond	Reservoir	9/30/2009	3, 4, 7, 9, A, W	T33S R67W Sec. 21 SWSE	Lopez Canyon		
58347	Lopez Canyon Pond	Reservoir	9/30/2009	3, 4, 7, 9, A, W	T33S R67W Sec. 21 SWSE	Lopez Canyon		
58347	Lopez Canyon Pond	Reservoir	9/30/2009	3, A, 7, 9, W, 4, 0	T33S R67W Sec. 20 SWSW	Lopez Canyon	1	7.5
58347	Mid Fork Pond No 1	Reservoir	9/30/2009	3, A, 7, 9, W, 4, 0	T33S R67W Sec. 20 SWSW	Middle Fork Purgatoire River	3	11.3
58347	Mid Fork Pond No 1	Reservoir	9/30/2009	3, 4, 7, 9, A, W	T33S R67W Sec. 20 SWSW	Middle Fork Purgatoire River		
58347	Mid Fork Pond No 1	Reservoir	9/30/2009	3, A, 7, 9, W, 4	T33S R67W Sec. 20 SWSW	Middle Fork Purgatoire River		11.3
58347	South Fork Pond No 1	Reservoir	9/30/2009	3, A, 7, 9, W, 4, 0	T34S R68W Sec. 24 SWSW	South Fork Purgatoire River	3	11.3
58347	South Fork Pond No 1	Reservoir	9/30/2009	3, A, 7, 9, W, 4	T34S R68W Sec. 24 SWSW	South Fork Purgatoire River		
58347	South Fork Pond No 1	Reservoir	9/30/2009	3, A, 7, 9, W, 4	T34S R68W Sec. 24 SWSW	South Fork Purgatoire River		
58347	South Fork Pond No 1	Reservoir	9/30/2009	3, A, 7, 9, W, 4	T34S R68W Sec. 24 SWSW	South Fork Purgatoire River		11.3
58347	Stage Coach Pond	Reservoir	9/30/2009	3, A, 7, 9, W, 4	T33S R67W Sec. 26 SENE	Purgatoire River		
58347	Stage Coach Pond	Reservoir	9/30/2009	3, A, 7, 9, W, 4	T33S R67W Sec. 26 SENE	Purgatoire River		
58347	Stage Coach Pond	Reservoir	9/30/2009	3, A, 9, W, 7, 4	T33S R67W Sec. 26 SENE	Purgatoire River		47.5
58347	Stage Coach Pond	Reservoir	9/30/2009	3, A, 9, W, 7, 4	T33S R67W Sec. 26 SENE	Purgatoire River	1	47.5
58471	Golden Eagle Discharge Mid Fork Pond 1 Exch	Reach	2/1/2010	X	T33S R67W Sec. 20 SWSW	Middle Fork Purgatoire River	0.4	
58471	Golden Eagle Discharge Reach B Exch	Reach	2/1/2010	X	T33S R68W Sec. 20 SWSE	Middle Fork Purgatoire River	0.4	
58471	Golden Eagle Discharge Reach D Exch	Reach	2/1/2010	X	T33S R68W Sec. 24 SENE	Purgatoire River	0.4	

Table 10C
Existing Water Rights in the Permit and Adjacent Areas (cont.)

Admin No	Name of Structure	Structure Type	Appropriation Date	Use Type	Location of Point of Diversion	Water Source	Decreed Amount of Water	Total Volumetric Limit (AF)
58471	Legend Lake Reach B Exch	Reach	2/1/2010	3, 4, 7, 9, A, W	T33S R68W Sec. 20 SWSE	Middle Fork Purgatoire River	5	
58471	Legend Lake Reach C Exch	Reach	2/1/2010	3, 4, 7, 9, A, W	T34S R68W Sec. 28 NWSE	South Fork Purgatoire River	5	
58471	Legend Lake Reach D Exch	Reach	2/1/2010	3, 4, 7, 9, A, W	T33S R68W Sec. 24 SENE	Purgatoire River	5	
58471	Legend Lake Reach E Exch	Reach	2/1/2010	3, 4, 7, 9, A, W	T33S R67W Sec. 29 NENW	Purgatoire River	5	
58471	Legend Lake Reach F Exch	Reach	2/1/2010	3, 4, 7, 9, A, W	T33S R67W Sec. 36 NWNW	Purgatoire River	5	
58471	Lopez Canyon Conf Lopez Canyon Pond Exch	Reach	2/1/2010	X	T33S R67W Sec. 21 SWSE	Lopez Canyon	0.4	
58471	Lopez Canyon Conf Reach B Exch	Reach	2/1/2010	3, 4, 7, 9, A, W	T33S R68W Sec. 20 SWSE	Lopez Canyon	1	
58471	Lopez Canyon Conf Reach D Exch	Reach	2/1/2010	3, 4, 7, 9, A, W	T33S R68W Sec. 24 SENE	Lopez Canyon	1	
58471	Lopez Canyon Conf Reach E Exch	Reach	2/1/2010	3, 4, 7, 9, A, W	T33S R67W Sec. 29 NENW	Lopez Canyon	1	
58471	Mid Fork Pond No 1	Reservoir	2/1/2010	4, 3, A, 7, 9, W	T33S R67W Sec. 20 SWSW	Middle Fork Purgatoire River		
58471	Mid Fork Pond No 1 Reach B Exch	Reach	2/1/2010	3, 4, 7, 9, A, W	T33S R68W Sec. 20 SWSE	Middle Fork Purgatoire River	3	
58471	Mid Fork Pond No 1 Reach D Exch	Reach	2/1/2010	3, 4, 7, 9, A, W	T33S R68W Sec. 24 SENE	Middle Fork Purgatoire River	3	
58471	Pioneer CBM Reach B	Reach	2/1/2010	3, 4, 7, 9, A, W	T33S R68W Sec. 20 SESE	Middle Fork Purgatoire River		
58471	Pioneer CBM Reach B	Reach	2/1/2010	3, 4, 7, 9, A, W	T33S R68W Sec. 20 SESE	Middle Fork Purgatoire River		
58471	Pioneer CBM Reach B	Reach	2/1/2010	3, 4, 7, 9, A, W	T33S R68W Sec. 20 SESE	Middle Fork Purgatoire River		
58471	Pioneer CBM Reach B	Reach	2/1/2010	3, 4, 7, 9, A, W	T33S R68W Sec. 20 SESE	Middle Fork Purgatoire River		
58471	Pioneer CBM Reach B	Reach	2/1/2010	A	T33S R68W Sec. 20 SESE	Middle Fork Purgatoire River		
58471	Pioneer CBM Reach B	Reach	2/1/2010	3, 4, 7, 9, A, W	T33S R68W Sec. 20 SESE	Middle Fork Purgatoire River		
58471	Pioneer CBM Reach B	Reach	2/1/2010	X	T33S R68W Sec. 20 SESE	Middle Fork Purgatoire River		
58471	Pioneer CBM Reach C	Reach	2/1/2010	3, 4, 7, 9, A, W	T34S R68W Sec. 28 SENW	South Fork Purgatoire River		
58471	Pioneer CBM Reach C	Reach	2/1/2010	A	T34S R68W Sec. 28 SENW	South Fork Purgatoire River		
58471	Pioneer CBM Reach C	Reach	2/1/2010	3, 4, 7, 9, A, W	T34S R68W Sec. 28 SENW	South Fork Purgatoire River		
58471	Pioneer CBM Reach C	Reach	2/1/2010	3, 4, 7, 9, A, W	T34S R68W Sec. 28 SENW	South Fork Purgatoire River		
58471	Pioneer CBM Reach C	Reach	2/1/2010	3, 4, 7, 9, A, W	T34S R68W Sec. 28 SENW	South Fork Purgatoire River		
58471	Pioneer CBM Reach C	Reach	2/1/2010	3, 4, 7, 9, A, W	T34S R68W Sec. 28 SENW	South Fork Purgatoire River		
58471	Pioneer CBM Reach C	Reach	2/1/2010	3, 4, 7, 9, A, W	T34S R68W Sec. 28 SENW	South Fork Purgatoire River		
58471	Pioneer CBM Reach D	Reach	2/1/2010	3, 4, 7, 9, A, W	T33S R68W Sec. 24 SENE	Purgatoire River		
58471	Pioneer CBM Reach D	Reach	2/1/2010	3, 4, 7, 9, A, W	T33S R68W Sec. 24 SENE	Purgatoire River		
58471	Pioneer CBM Reach D	Reach	2/1/2010	3, 4, 7, 9, A, W	T33S R68W Sec. 24 SENE	Purgatoire River		
58471	Pioneer CBM Reach D	Reach	2/1/2010	3, 4, 7, 9, A, W	T33S R68W Sec. 24 SENE	Purgatoire River		
58471	Pioneer CBM Reach D	Reach	2/1/2010	3, 4, 7, 9, A, W	T33S R68W Sec. 24 SENE	Purgatoire River		
58471	Pioneer CBM Reach D	Reach	2/1/2010	A	T33S R68W Sec. 24 SENE	Purgatoire River		
58471	Pioneer CBM Reach D	Reach	2/1/2010	3, 4, 7, 9, A, W	T33S R68W Sec. 24 SENE	Purgatoire River		
58471	Pioneer CBM Reach D	Reach	2/1/2010	X	T33S R68W Sec. 24 SENE	Purgatoire River		

Table 10C
Existing Water Rights in the Permit and Adjacent Areas (cont.)

Admin No	Name of Structure	Structure Type	Appropriation Date	Use Type	Location of Point of Diversion	Water Source	Decreed Amount of Water	Total Volumetric Limit (AF)
58471	Pioneer CBM Reach E	Reach	2/1/2010	3, 4, 7, 9, A, W	T33S R67W Sec. 29 NENW	Purgatoire River		
58471	Pioneer CBM Reach E	Reach	2/1/2010	A	T33S R67W Sec. 29 NENW	Purgatoire River		
58471	Pioneer CBM Reach E	Reach	2/1/2010	3, 4, 7, 9, A, W	T33S R67W Sec. 29 NENW	Purgatoire River		
58471	Pioneer CBM Reach E	Reach	2/1/2010	3, 4, 7, 9, A, W	T33S R67W Sec. 29 NENW	Purgatoire River		
58471	Pioneer CBM Reach E	Reach	2/1/2010	3, 4, 7, 9, A, W	T33S R67W Sec. 29 NENW	Purgatoire River		
58471	Pioneer CBM Reach E	Reach	2/1/2010	3, 4, 7, 9, A, W	T33S R67W Sec. 29 NENW	Purgatoire River		
58471	Pioneer CBM Reach E	Reach	2/1/2010	3, 4, 7, 9, A, W	T33S R67W Sec. 29 NENW	Purgatoire River		
58471	Pioneer CBM Reach F	Reach	2/1/2010	3, 4, 7, 9, A, W	T33S R67W Sec. 36 NWNW	Purgatoire River		
58471	Pioneer CBM Reach F	Reach	2/1/2010	3, 4, 7, 9, A, W	T33S R67W Sec. 36 NWNW	Purgatoire River		
58471	Pioneer CBM Reach F	Reach	2/1/2010	A	T33S R67W Sec. 36 NWNW	Purgatoire River		
58471	Pioneer CBM Reach F	Reach	2/1/2010	3, 4, 7, 9, A, W	T33S R67W Sec. 36 NWNW	Purgatoire River		
58471	Sarcillo Canyon Conf Reach B Exch	Reach	2/1/2010	3, 4, 7, 9, A, W	T33S R68W Sec. 20 SE	Middle Fork Purgatoire River	1	
58471	Sarcillo Canyon Conf Reach B Exch	Reach	2/1/2010	3, 4, 7, 9, A, W	T33S R68W Sec. 20 SE	Middle Fork Purgatoire River	1	
58471	Sarcillo Canyon Conf Reach B Exch	Reach	2/1/2010	3, 4, 7, 9, A, W	T33S R68W Sec. 20 SE	Middle Fork Purgatoire River	1	
58471	Sarcillo Canyon Conf Reach C Exch	Reach	2/1/2010	3, 4, 7, 9, A, W	T34S R68W Sec. 28 SW	South Fork Purgatoire River	1	
58471	Sarcillo Canyon Conf Reach C Exch	Reach	2/1/2010	3, 4, 7, 9, A, W	T34S R68W Sec. 28 SW	South Fork Purgatoire River	1	
58471	Sarcillo Canyon Conf Reach C Exch	Reach	2/1/2010	3, 4, 7, 9, A, W	T34S R68W Sec. 28 SW	South Fork Purgatoire River	1	
58471	Sarcillo Canyon Conf Reach D Exch	Reach	2/1/2010	3, 4, 7, 9, A, W	T33S R68W Sec. 24 SENE	Purgatoire River	1	
58471	Sarcillo Canyon Conf Reach D Exch	Reach	2/1/2010	3, 4, 7, 9, A, W	T33S R68W Sec. 24 SENE	Purgatoire River	1	
58471	Sarcillo Canyon Conf Reach D Exch	Reach	2/1/2010	3, 4, 7, 9, A, W	T33S R68W Sec. 24 SENE	Purgatoire River	1	
58471	Sarcillo Canyon Conf Reach E Exch	Reach	2/1/2010	3, 4, 7, 9, A, W	T33S R67W Sec. 29 NENW	Purgatoire River	1	
58471	Sarcillo Canyon Conf Reach E Exch	Reach	2/1/2010	3, 4, 7, 9, A, W	T33S R67W Sec. 29 NENW	Purgatoire River	1	
58471	Sarcillo Canyon Conf Reach E Exch	Reach	2/1/2010	3, 4, 7, 9, A, W	T33S R67W Sec. 29 NENW	Purgatoire River	1	
58471	Sarcillo Canyon Conf Reach F Exch	Reach	2/1/2010	3, 4, 7, 9, A, W	T33S R67W Sec. 36 NWNW	Purgatoire River	1	
58471	Sarcillo Canyon Conf Reach F Exch	Reach	2/1/2010	3, 4, 7, 9, A, W	T33S R67W Sec. 36 NWNW	Purgatoire River	1	
58471	Sarcillo Canyon Conf Reach F Exch	Reach	2/1/2010	3, 4, 7, 9, A, W	T33S R67W Sec. 36 NWNW	Purgatoire River	1	
58471	South Fk Conf Reach B Exch	Reach	2/1/2010	3, 4, 7, 9, A, W	T33S R68W Sec. 20 SWSE	South Fork Purgatoire River	3	
58471	South Fk Conf Reach C Exch	Reach	2/1/2010	3, 4, 7, 9, A, W	T34S R68W Sec. 28 NWSE	South Fork Purgatoire River	3	
58471	South Fk Conf Reach C Exch	Reach	2/1/2010	3, 4, 7, 9, A, W	T34S R68W Sec. 28 NWSE	South Fork Purgatoire River	1	
58471	South Fk Conf Reach C Exch	Reach	2/1/2010	3, 4, 7, 9, A, W	T34S R68W Sec. 28 NWSE	South Fork Purgatoire River	0.4	
58471	South Fk Conf Reach D Exch	Reach	2/1/2010	3, 4, 7, 9, A, W	T33S R68W Sec. 24 SENE	South Fork Purgatoire River	3	
58471	South Fk Conf Reach E Exch	Reach	2/1/2010	3, 4, 7, 9, A, W	T33S R67W Sec. 29 NENW	South Fork Purgatoire River	3	
58471	South Fk Conf South Fk Pond No 1 Exch	Reach	2/1/2010	3, 4, 7, 9, A, W	T34S R68W Sec. 24 SW	South Fork Purgatoire River	0.4	
58471	South Fork Pond No 1 Reach C Exch	Reach	2/1/2010	3, 4, 7, 9, A, W	T34S R68W Sec. 28 SW	South Fork Purgatoire River	3	
58471	Stage Coach Pond Reach B Exch	Reach	2/1/2010	3, 4, 7, 9, A, W	T33S R68W Sec. 20 SE	Middle Fork Purgatoire River	1	
58471	Stage Coach Pond Reach C Exch	Reach	2/1/2010	3, 4, 7, 9, A, W	T34S R68W Sec. 28 SW	Middle Fork Purgatoire River	1	
58471	Stage Coach Pond Reach D Exch	Reach	2/1/2010	3, 4, 7, 9, A, W	T33S R68W Sec. 24 SENE	Middle Fork Purgatoire River	1	

Table 10C
Existing Water Rights in the Permit and Adjacent Areas (cont.)

Admin No	Name of Structure	Structure Type	Appropriation Date	Use Type	Location of Point of Diversion	Water Source	Decreed Amount of Water	Total Volumetric Limit (AF)
58471	Stage Coach Pond Reach E Exch	Reach	2/1/2010	3, 4, 7, 9, A, W	T33S R67W Sec. 29 NENW	Middle Fork Purgatoire River	1	
58471	Trinidad Res Lopez Canyon Pond Exch	Reach	2/1/2010	3, 4, 7, 9, A, W	T33S R67W Sec. 21 SWSE	Purgatoire River	1	
58471	Trinidad Res Mid Fork Purgatoire Pond No 1 Exch	Reach	2/1/2010	3, 4, 7, 9, A, W	T33S R67W Sec. 20 SWSW	Purgatoire River	3	
58471	Trinidad Res Pioneer CBM Reach B Exch	Reach	2/1/2010	3, 4, 7, 9, A, W	T33S R68W Sec. 20 SE	Purgatoire River	5	
58471	Trinidad Res Pioneer CBM Reach C Exch	Reach	2/1/2010	3, 4, 7, 9, A, W	T34S R68W Sec. 28 SW	Purgatoire River	5	
58471	Trinidad Res Pioneer CBM Reach D Exch	Reach	2/1/2010	3, 4, 7, 9, A, W	T33S R68W Sec. 24 SENE	Purgatoire River	5	
58471	Trinidad Res Pioneer CBM Reach E Exch	Reach	2/1/2010	3, 4, 7, 9, A, W	T33S R67W Sec. 29 NENW	Purgatoire River	5	
58471	Trinidad Res Pioneer CBM Reach F Exch	Reach	2/1/2010	3, 4, 7, 9, A, W	T33S R67W Sec. 36 NWNW	Purgatoire River	5	
58471	Trinidad Res South Fk Pond No 1 Exch	Reach	2/1/2010	3, 4, 7, 9, A, W	T34S R68W Sec. 24 SW	Purgatoire River	5	
58471	Trinidad Res Stage Coach Pond Exch	Reach	2/1/2010	3, 4, 7, 9, A, W	T33S R67W Sec. 26 SENE	Purgatoire River	5	
58471	Wet Canyon Conf Stage Coach Pond Exch	Reach	2/1/2010	3, 4, 7, 9, A, W	T33S R67W Sec. 26 SENE	Middle Fork Purgatoire River	0.4	
58985	New Elk East Diversion	Mine	6/30/2011	4	T33S R68W Sec. 23 SWNE	Middle Fork Purgatoire River	2	
58985	New Elk East Diversion	Mine	6/30/2011	4	T33S R68W Sec. 23 SWNE	Middle Fork Purgatoire River	5	160
58985	New Elk Mine Discharge	Mine	6/30/2011	4	T33S R68W Sec. 23 SWNE	Middle Fork Purgatoire River	5	160
58985	New Elk Mine Discharge	Mine	6/30/2011	4	T33S R68W Sec. 23 SWNE	Middle Fork Purgatoire River	2	
58985	New Elk West Diversion	Mine	6/30/2011	4	T33S R68W Sec. 21 NESE	Middle Fork Purgatoire River	2	
58985	New Elk West Diversion	Mine	6/30/2011	4	T33S R68W Sec. 21 NESE	Middle Fork Purgatoire River	5	160
59017	Stage Coach Pipeline	Pipeline	8/1/2011	0	T33S R67W Sec. 26 SENW	Purgatoire River	1	
59017	Stage Coach Pipeline APOD	Pipeline	8/1/2011	0	T33S R67W Sec. 36 NWNE	Purgatoire River	1	
59535.4	New Elk Storage Tank #1	Other	6/15/1960	4, A, 8	T33S R68W Sec. 23 NWSE	Middle Fork Purgatoire River		3200
59535.43	Rainbow Pond	Reservoir	12/31/1966	6, 5, 9, W, 7	T33S R68W Sec. 30 SWSW	Abbot Creek	1.75	3.194
59535.51	Entrance Pond 1	Reservoir	12/31/1988	6, 5, 9, W, 7	T33S R68W Sec. 30 NWNW	Middle Fork Purgatoire River	1	1.45
59535.57	New Elk Pond	Reservoir	7/16/2006	4, A, 8	T33S R68W Sec. 23 SENW	Middle Fork Purgatoire River	12	3200
59535.58	Bar Ni Exchange B	Reach	10/15/2009	E	T33S R67W Sec. 19 NESW	Purgatoire River	8	
59535.58	Entrance Pond 1	Reservoir	10/15/2009	A	T33S R68W Sec. 30 NWNW	Middle Fork Purgatoire River	1	1.45
59535.58	Rainbow Pond	Reservoir	10/15/2009	A	T33S R68W Sec. 30 SWSW	Abbot Creek	1.75	3.194
59535.59	New Elk Surface Diversion	Ditch	2/7/2011	4, A, 8	T33S R68W Sec. 23 SWNE	Middle Fork Purgatoire River	7	3200
59535.59	Allen Mine Borehole	Mine	7/13/2011	4, A, 8	T33S R68W Sec. 23 SWNE	Middle Fork Purgatoire River	2.6726	1930
59535.59	Allen Mine Borehole No 2	Mine	7/13/2011	4, A, 8	T33S R68W Sec. 23 SWNE	Middle Fork Purgatoire River	2.6726	1930
59535.59	Allen Mine Well No 1	Mine	7/13/2011	4, A, 8	T33S R68W Sec. 23 NENE	Middle Fork Purgatoire River	2.6726	1930
59535.59	Allen Mine Well No 2	Mine	7/13/2011	4, A, 8	T33S R68W Sec. 23 SENE	Middle Fork Purgatoire River	2.6726	1930
59535.59	New Elk Surface Diversion	Ditch	11/28/2011	4, A, 8	T33S R68W Sec. 23 SWNE	Middle Fork Purgatoire River	7	3200
59628	New Elk Storage Tank #3	Other	4/3/2013	4, A, 8	T33S R68W Sec. 23 NWSE	Middle Fork Purgatoire River		3200
59900	Solitario Pond	Reservoir	12/31/2013	6, 5, 9, W, 7, 1, A	T33S R67W Sec. 19 NESW	Purgatoire River	7	7
	Bar Ni Ranch Aug Plan	Augmentation/ Replacement Plan		A	T33S R68W Sec. 30 NWNW	Undefined		

Table 10C
Existing Water Rights in the Permit and Adjacent Areas (cont.)

Admin No	Name of Structure	Structure Type	Appropriation Date	Use Type	Location of Point of Diversion	Water Source	Decreed Amount of Water	Total Volumetric Limit (AF)
	Hill Ranch Aug Plan	Augmentation/ Replacement Plan		A	T34S R68W Sec.	Rincon Creek	0.72	
	New Elk Aug Plan	Augmentation/ Replacement Plan		A	T33S R68W Sec. 23 SWNE	Middle Fork Purgatoire River		
	Parsons Aug Plan	Augmentation/ Replacement Plan		A	T33S R67W Sec. 36 NENE	Purgatoire River		
	Pioneer XTO Aug Plan	Augmentation/ Replacement Plan		A	T33S R67W Sec. 29 NESW	Undefined		
	Sheep Camp Aug Plan	Augmentation/ Replacement Plan		A	T34S R68W Sec. 6 SWSW	South Fork Purgatoire River		
	Sueno Reservoir Aug Plan	Augmentation/ Replacement Plan		A	T33S R68W Sec. 30 SENE	Purgatoire River		
	Wall of Legends Aug Plan	Augmentation/ Replacement Plan		A	T33S R68W Sec. 30 NESW	Purgatoire River		

Notes:

0 - Storage

3 - Commercial

6 - Fishery

9 - Stock

C - Change of Use Return Flow

G - Geothermal

M - Minimum Streamflow

R - Recharge

W - Wildlife

Abbreviations:

cfs = cubic feet per second

Source: Colorado Division of Water Resources 2022

1 - Irrigation

4 - Industrial

7 - Fire

A - Augmentation

E - Evaporative

H - Household Use Only

P - Power Generation

S - Export from State

X - All Beneficial Uses

Q = quarter

2 - Municipal

5 - Recreation

8 - Domestic

B - Sub-basin Export

F - Federal Reserved

K - Snow Making

Q - Other

T - Transmountain Export

AF = acre feet

Table 11
Preliminary Spring/Seep Locations

Site No.	Location	Remarks
1	Wet Canyon	Spring or Seep as identified from 2022 search on Colorado National Heritage Program (CNHP) online web mapper
2	Pratt Canyon	Spring or Seep identified July 1988
3	Pratt Canyon	Spring or Seep identified July 1988
4	Sawmill Canyon	Spring or Seep identified July 1988
5	Sawmill Canyon	Spring or Seep identified July 1988
6	Santistevan Canyon	Spring identified by USGS
7	Santistevan Canyon	Spring or Seep as identified from 2022 search on Colorado National Heritage Program (CNHP) online web mapper
8	Santistevan Canyon	Spring identified by USGS
9	Santistevan Canyon	Spring or Seep as identified from 2022 search on Colorado National Heritage Program (CNHP) online web mapper
10	Santistevan Canyon	Potential Spring or Seep as identified on aerial photographs
11	Santistevan Canyon	Spring identified by USGS
12	Santistevan Canyon	Potential Spring or Seep as identified on aerial photographs
13	Drainage between Santistevan Canyon and Lopez Canyon north of State Highway 12	Potential Spring or Seep as identified on aerial photographs
14	Drainage between Santistevan Canyon and Lopez Canyon north of State Highway 12	Potential Spring or Seep as identified on aerial photographs
15	Lopez Canyon	Spring or Seep identified July 1988
16	Drainage between Santistevan Canyon and Vigil north of Vigil and State Highway 12	Potential Spring or Seep as identified on aerial photographs
17	NW of Vigil, North Fork Purgatoire	Potential Spring or Seep as identified on aerial photographs
18	Drainage between Santistevan Canyon and Vigil north of Vigil and State Highway 12	Potential Spring or Seep as identified on aerial photographs
19	Drainage between Santistevan Canyon and Vigil north of Vigil and State Highway 12	Potential Spring or Seep as identified on aerial photographs
20	Parras Canyon	Potential Spring or Seep as identified on aerial photographs
21	Parras Canyon	Potential Spring or Seep as identified on aerial photographs
22	Peru Canyon	Potential Spring or Seep as identified on aerial photographs
23	Fork Apache Canyon	Potential Spring or Seep as identified on aerial photographs
24	Right Fork Apache Canyon	Potential Spring or Seep as identified on aerial photographs
25	Right Fork Apache Canyon	Potential Spring or Seep as identified on aerial photographs
26	Left Fork Apache Canyon	Potential Spring or Seep as identified on aerial photographs
27	Left Fork Apache Canyon	Potential Spring or Seep as identified on aerial photographs
28	Left Fork Apache Canyon	Potential Spring or Seep as identified on aerial photographs
29	Drainage off Ciruela Canyon	Potential Spring or Seep as identified on aerial photographs
30	Ciruela Canyon	Potential Spring or Seep as identified on aerial photographs
31	Ciruela Canyon	Potential Spring or Seep as identified on aerial photographs
32	Ciruela Canyon	Potential Spring or Seep as identified on aerial photographs

Notes:

Springs and seeps are identified one-mile radius of the permit area

Springs and seeps are illustrated on Map 8

Table 12
Results of Field Spring and Seep Inventory

Site No.	Location	Date Sampled	Temp (°C)	K (umhos)	pH (std units)	Notes
1	Wet Canyon					Spring or Seep as identified from 2022 search on Colorado National Heritage Program (CNHP) online web mapper
2	Pratt Canyon					Spring or Seep identified July 1988
3	Pratt Canyon					Spring or Seep identified July 1988
4	Sawmill Canyon					Spring or Seep identified July 1988
5	Sawmill Canyon					Spring or Seep identified July 1988
6	Santistevan Canyon					Spring identified by USGS
7	Santistevan Canyon					Spring or Seep as identified from 2022 search on Colorado National Heritage Program (CNHP) online web mapper
8	Santistevan Canyon					Spring identified by USGS
9	Santistevan Canyon					Spring or Seep as identified from 2022 search on Colorado National Heritage Program (CNHP) online web mapper
10	Santistevan Canyon					Potential Spring or Seep as identified on aerial photographs
11	Santistevan Canyon					Spring identified by USGS
12	Santistevan Canyon					Potential Spring or Seep as identified on aerial photographs
13	Drainage between Santistevan Canyon and Lopez Canyon north of State Highway 12					Potential Spring or Seep as identified on aerial photographs
14	Drainage between Santistevan Canyon and Lopez Canyon north of State Highway 12					Potential Spring or Seep as identified on aerial photographs
15	Lopez Canyon					Spring or Seep identified July 1988
16	Drainage between Santistevan Canyon and Vigil north of Vigil and State Highway 12					Potential Spring or Seep as identified on aerial photographs
17	NW of Vigil, North Fork Purgatoire					Potential Spring or Seep as identified on aerial photographs
18	Drainage between Santistevan Canyon and Vigil north of Vigil and State Highway 12					Potential Spring or Seep as identified on aerial photographs
19	Drainage between Santistevan Canyon and Vigil north of Vigil and State Highway 12					Potential Spring or Seep as identified on aerial photographs
20	Parras Canyon					Potential Spring or Seep as identified on aerial photographs

Table 12
Results of Field Spring and Seep Inventory

Site No.	Location	Date Sampled	Temp (°C)	K (umhos)	pH (std units)	Notes
21	Parras Canyon					Potential Spring or Seep as identified on aerial photographs
22	Peru Canyon					Potential Spring or Seep as identified on aerial photographs
23	Fork Apache Canyon					Potential Spring or Seep as identified on aerial photographs
24	Right Fork Apache Canyon					Potential Spring or Seep as identified on aerial photographs
25	Right Fork Apache Canyon					Potential Spring or Seep as identified on aerial photographs
26	Left Fork Apache Canyon					Potential Spring or Seep as identified on aerial photographs
27	Left Fork Apache Canyon					Potential Spring or Seep as identified on aerial photographs
28	Left Fork Apache Canyon					Potential Spring or Seep as identified on aerial photographs
29	Drainage off Ciruela Canyon					Potential Spring or Seep as identified on aerial photographs
30	Ciruela Canyon					Potential Spring or Seep as identified on aerial photographs
31	Ciruela Canyon					Potential Spring or Seep as identified on aerial photographs
32	Ciruela Canyon					Potential Spring or Seep as identified on aerial photographs

Notes:

Springs and seeps are identified one-mile radius of the permit area

Springs and seeps are illustrated on Map 8

Monitoring the spring and seeps will occur as part of the hydrological monitoring for PR5