ERO

Consultants in Natural Resources and the Environment

Level II Historic Resource Documentation
Gould Canal Segments 5DT2146.1 and 5MN10747.4
Montrose and Delta Counties, Colorado

Prepared for—

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November 2019

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Project Background

In support of the Fruitland Irrigation Company salinity control project, ERO Resources Corporation (ERO) completed Colorado Office of Archaeology and Historic Preservation (OAHP) Level II Historic Resource Documentation for Gould Canal of the Fruitland Mesa Irrigation Network (segments 5MN10747.4 and 5DT2146.1) on behalf of the Fruitland Irrigation District (District) and in coordination with the Bureau of Reclamation (Reclamation). In consultation with the Colorado State Historic Preservation Officer (SHPO), Reclamation determined the Fruitland Mesa Irrigation Network (5MN10747/5DT2146) eligible for listing in the National Register of Historic Places under Criteria A and C, and potentially under Criterion B.

Consultation between the SHPO and Reclamation also determined that the District's proposed salinity control project and associated alterations to the canal pose an "adverse effect" on the historic property pursuant to Section 106 of the National Historic Preservation Act of 1966, as amended (36 Code of Federal Regulations 800.5). Therefore, the SHPO, Reclamation, and District executed a Memorandum of Agreement to resolve "adverse effect" through advanced documentation pursuant to OAHP Level II Historic Resource Documentation standards and public outreach.

The Historic Resource Documentation standards for Level II Documentation established by the OAHP includes three elements: architectural and historical narratives (Part I), archival quality photographs (Part II), and measured drawings (Part III) (OAHP 2007). The scope of work deviated from the documentation standards by using high-resolution digital photographs in lieu of medium-format black-and-white photography. Applegate Group used LiDAR data to render measured drawings of segments 5MN10747.4 and 5DT2146.1 (MOA Stipulation 1). Maps of the resource with feature provenance (Part IV) are also included as outlined in MOA Stipulation 1.

The historic resource documentation and public interpretive materials provided under this treatment report fulfill the requirements of the MOA Stipulation 1 to resolve adverse effects to the Gould Canal segments 5DT2146.1/5MN10747.4. The SHPO's acceptance of this treatment report will have fulfilled Stipulation 1 of the MOA. The District will continue to hold presentations on the history of the canal system to fulfill public interpretation requirements.

Part I – Narratives

Historic Property Narrative Description

The Gould Canal, including segments 5DT2146.1 and 5MN10747.4, is part of the Fruitland Mesa Irrigation network in Montrose and Delta Counties. The Fruitland Mesa Irrigation Network extends from Crystal Creek east of State Highway 92 to a basin at the northwest end of Onion Valley and then up onto Fruitland Mesa southwest of Crawford and includes the Fruitland Highline Ditch, Gould Reservoir, Gould Canal, and an access road. The main canal is known as the Fruitland Highline Ditch; it diverts water from Crystal Creek in the NW ¼ of the SE ¼ of Section 34, T50N, R6W of the NMM. The ditch carries water from the creek westerly both to Gould Reservoir and to shareholders with land located (topographically) above Gould Reservoir. A feeder ditch connects the main canal with the reservoir (Colorado's Decision Support System [CDSS] 2004).

Gould Canal leaves the reservoir on the southern side of the dam in the NE ¼ of the NE ¼ of Section 13, T50N, R7W of the NMM. This ditch extends to the north and then west. The Fruitland Highline Ditch and the Gould Canal join in the SE ¼ of the NE ¼ of Section 34, T51N, R7W of the NMM. The joined canal crosses into Delta County in Section 24, T51N, R8W of the NMM and ends in the SW ¼ of the NW ¼ of Section 16, T51N, R8W of the NMM above an unnamed drainage that flows northerly into the Smith Fork (CDSS 2004). ERO and Reclamation defined the Gould Canal segments based on the extent of the proposed salinity control project: segment 5DT2146.1 comprises 0.7-mile of discontinuous portions of the canal in Delta County and segment 5MN10747.4 includes all of the canal in Montrose County (Figures 1-8). The setting of the segments is characterized by pinyon juniper woodland.

The entire extent of the Gould Canal is 14.8 miles long. From Gould Reservoir, the canal conveys water north and contours the west side of Iron Canyon north-northwest approximately 1.3 miles. The first 1.2 miles is an open U-shaped earthen channel; the last 0.1 mile of the canal before entering two separate tunnels is a concrete-lined channel approximately 6 feet (ft) deep and 5 ft wide (Figure 16). North of the tunnels, the canal conveys water in an open earthen U-shaped ditch cut along a 45 degree northeast facing slope for approximately 1.3 miles, then contours the surrounding valley into the east edge of Fruitland Mesa and the topography becomes gentler; the walls of the canal are vertical, the bottom of the canal is 2 to 4 ft deep and 8 to 12 ft wide, and the maximum waterway width is 12 ft wide. Within the Fruitland Mesa landform, the canal and remaining portion of the canal is an open earthen U-shaped ditch in the same design and dimensions of the canal between Gould Reservoir and the upper and lower tunnels. Two siphons (Features (F) 1 and 78) carry water underground in two areas.

The ditch conveys water north in two concrete- and rock-lined tunnels under the upper terrace to the west of Iron Canyon for about 0.8 mile (Figure 17). The upper tunnel (southernmost) is 1,643 ft in length and the lower tunnel (northernmost) is 2,650 feet in length. Both tunnels average about 7 ft in width and height varies from 4.5 ft to over 5 ft. The District has maintained the tunnels in the original design; although the District reinforced them with cedar stays and railroad ties at a later date, the District has not made any significant modifications to the tunnels. The upper and lower tunnels are divided by a

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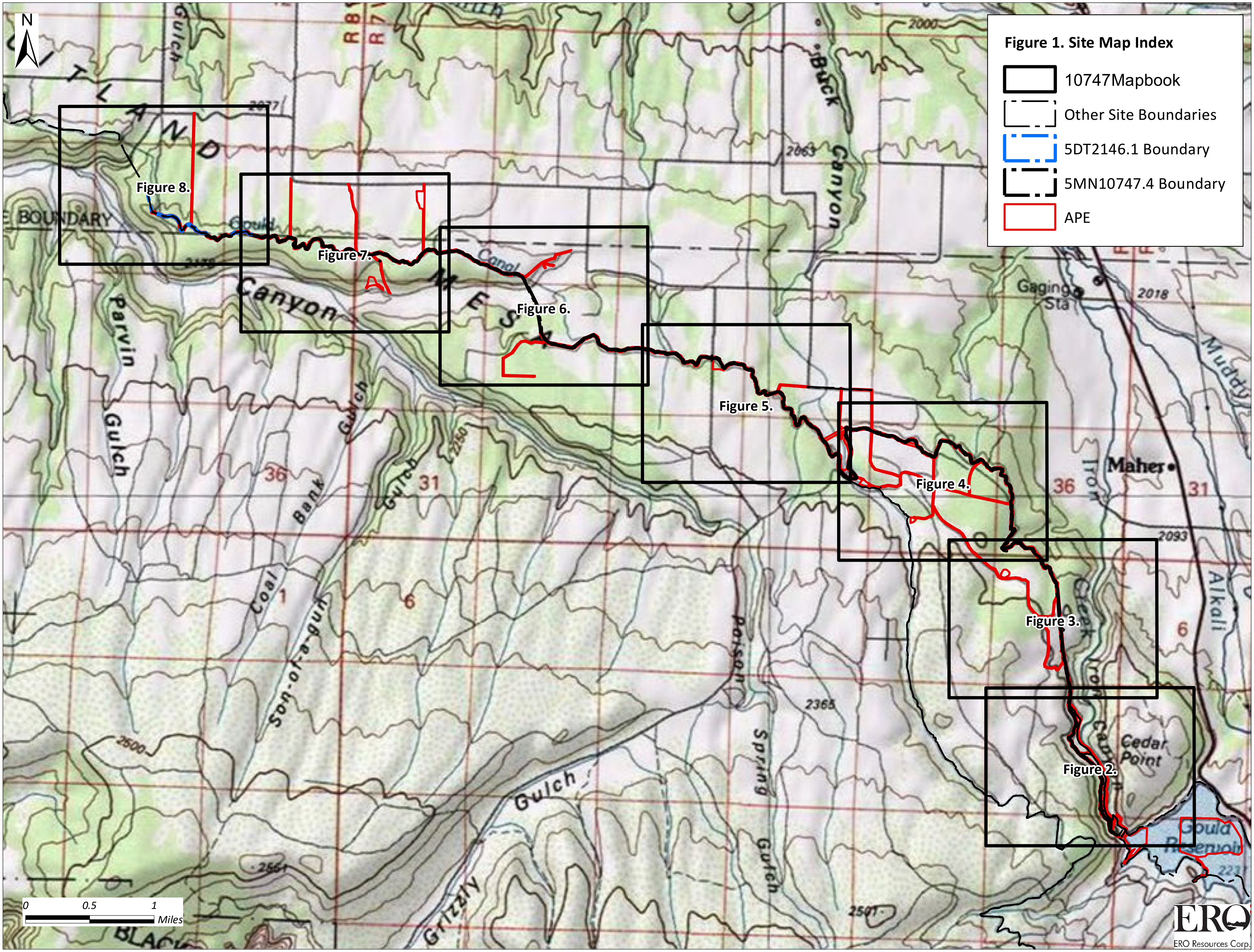


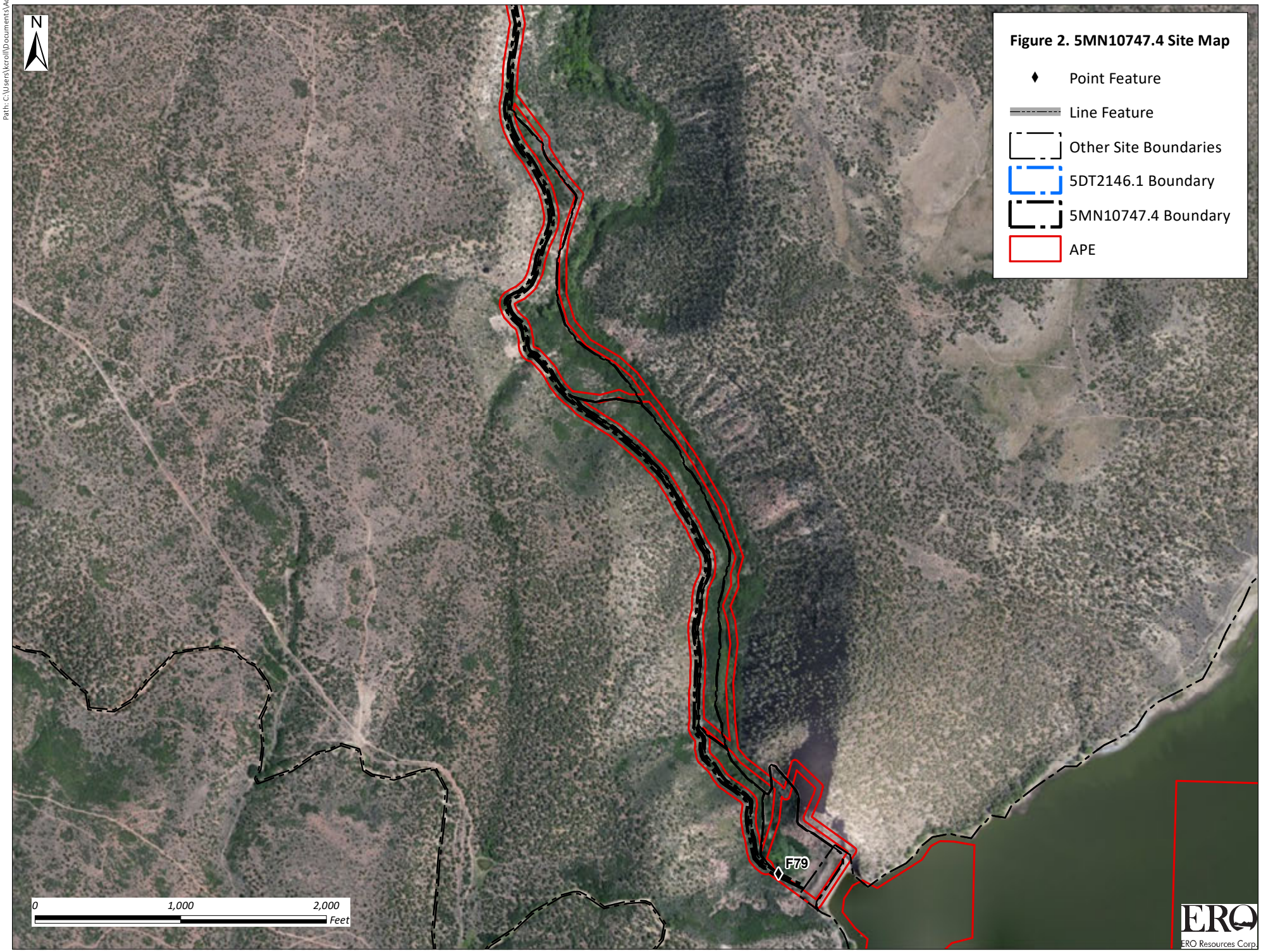
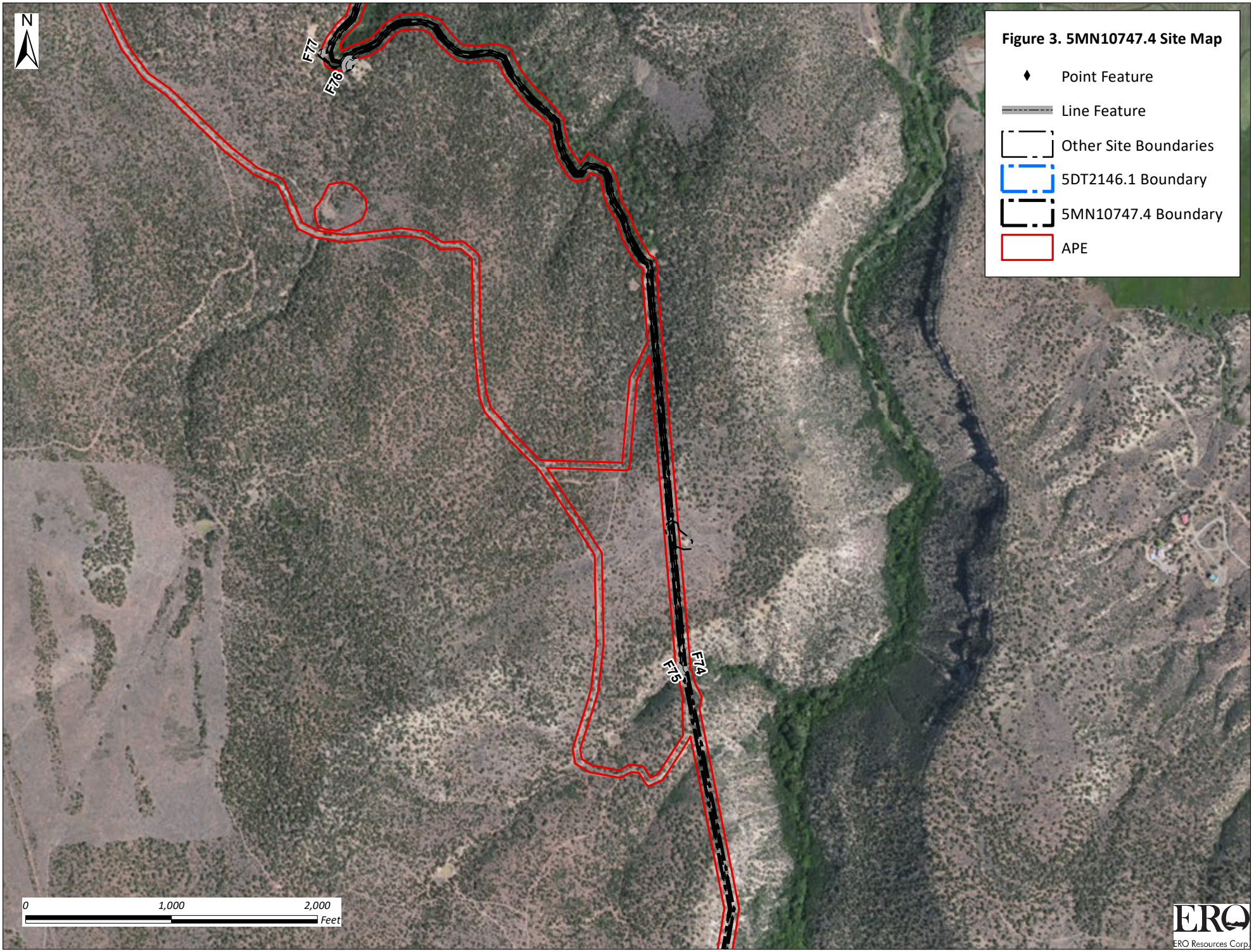


Figure 2. 5MN10747.4 Site Map
Point Feature
Line Feature
Other Site Boundaries
5DT2146.1 Boundary
5MN10747.4 Boundary
APE
N
F79
0
1,000
2,000
Feet
ERO
ERO Resources Corp.



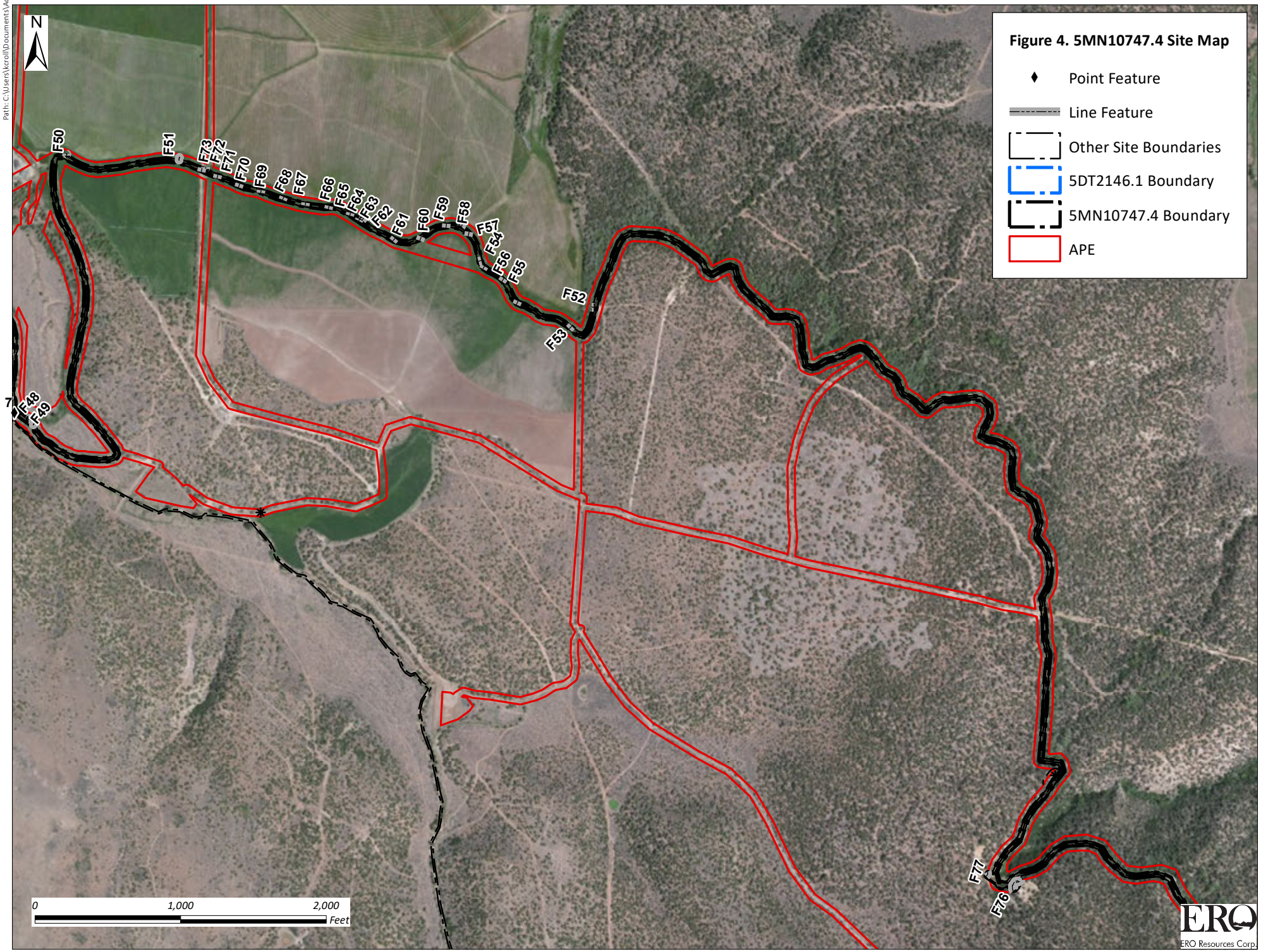


Figure 4. 5MN10747.4 Site Map
Point Feature
Line Feature
Other Site Boundaries
5DT2146.1 Boundary
5MN10747.4 Boundary
APE
N
F50
F51
F73
F72
F71
F70
F69
F68
F67
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F64
F63
F62
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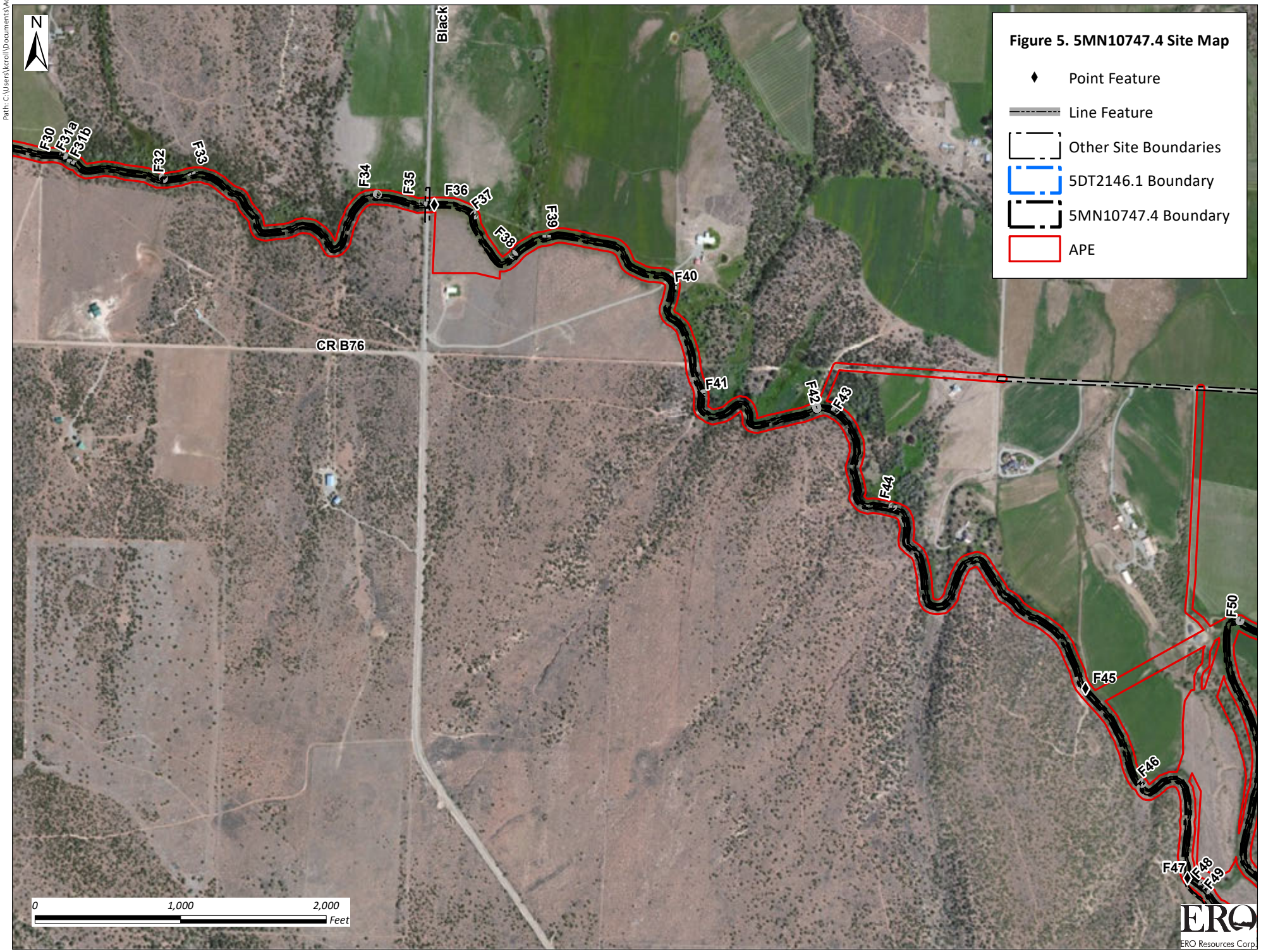
Figure 5. 5MN10747.4 Site Map
Point Feature
Line Feature
Other Site Boundaries
5DT2146.1 Boundary
5MN10747.4 Boundary
APE
N
Black
CR B76
F30
F31a
F31b
F32
F33
F34
F35
F36
F37
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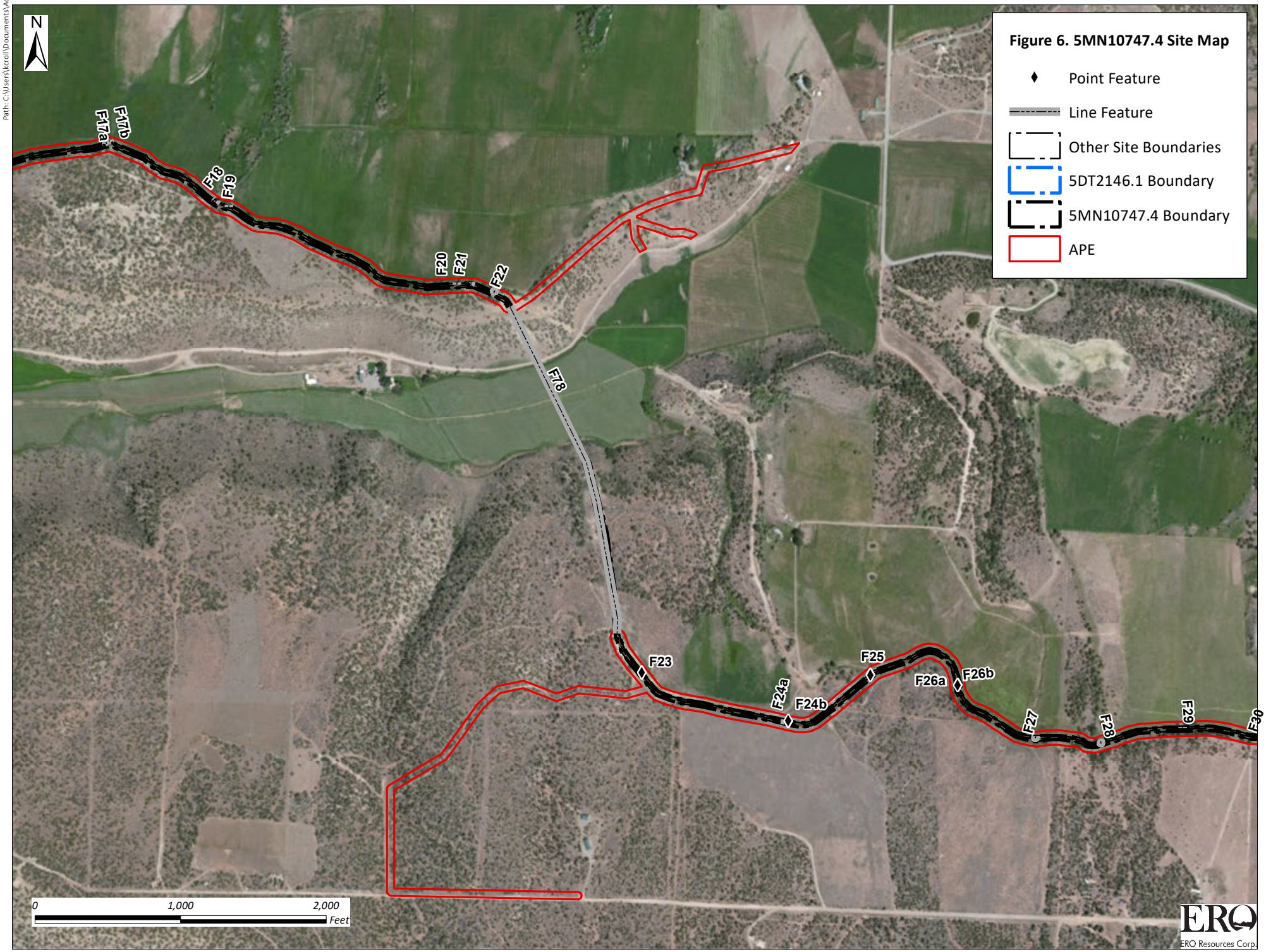

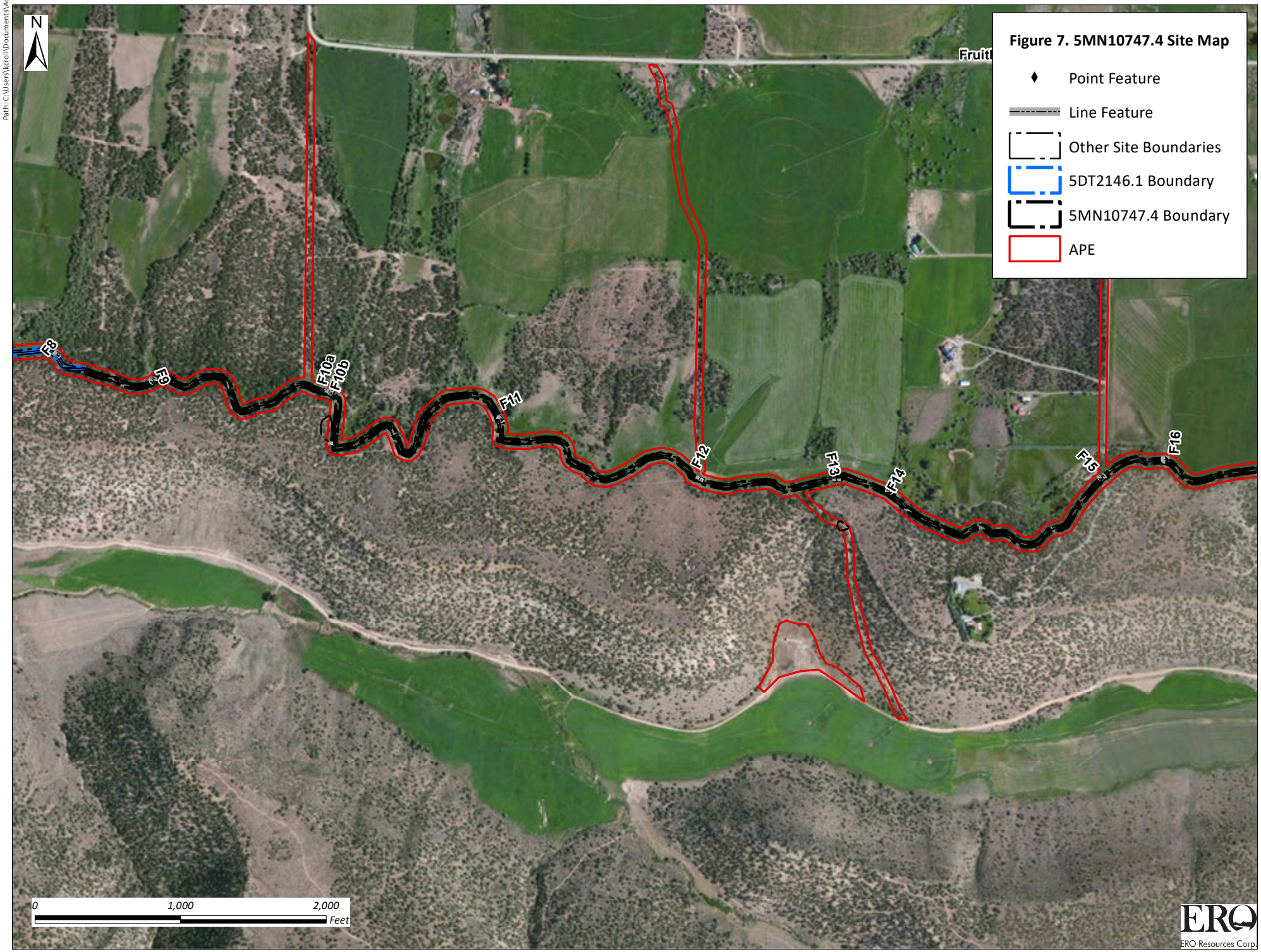
Figure 7. 5MN10747.4 Site Map
Point Feature
Line Feature
Other Site Boundaries
5DT2146.1 Boundary
5MN10747.4 Boundary
APE
N
F8
F9
F10a
F10b
F11
F12
F13
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F16
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ERO Resources Corp.

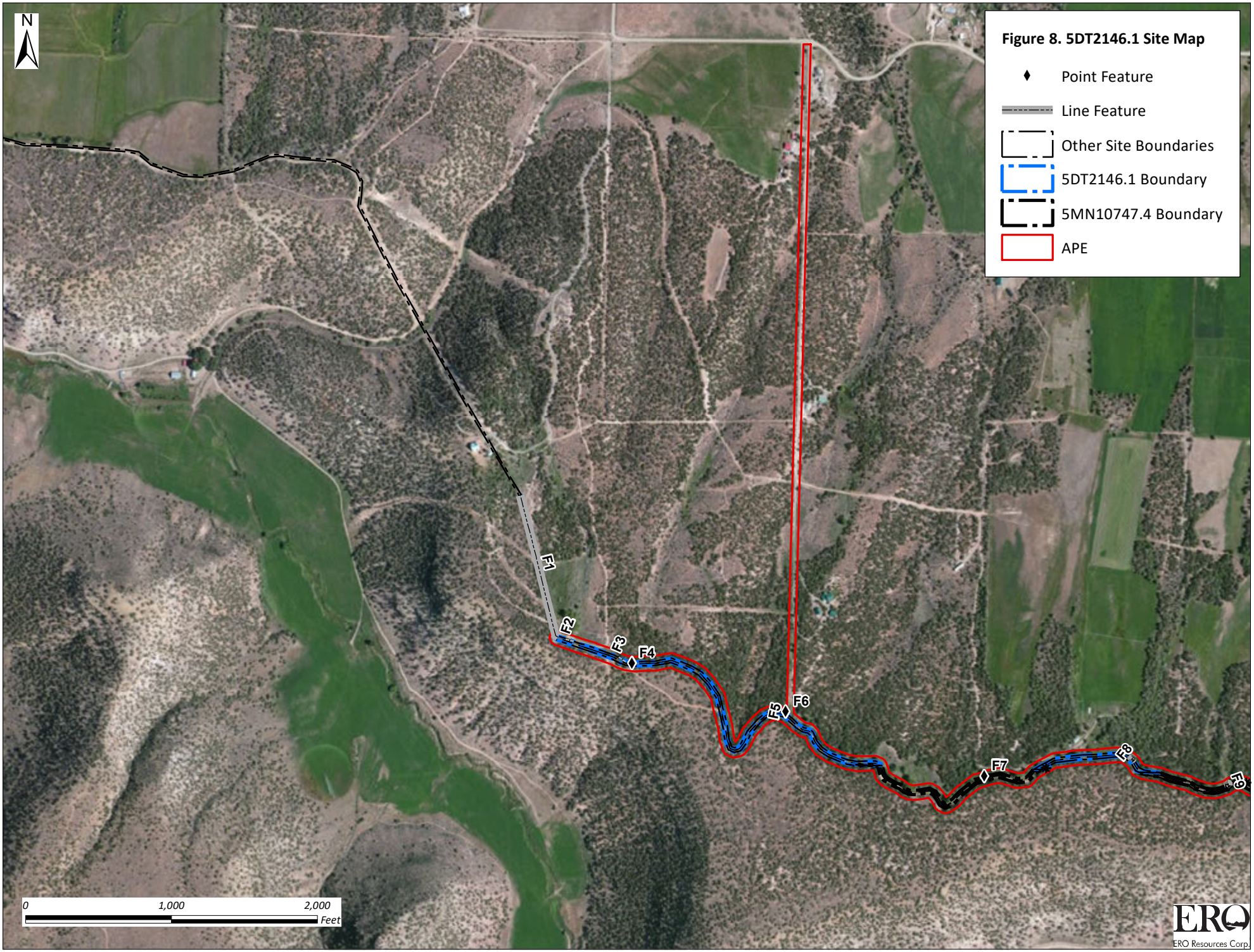
Figure 8. 5DT2146.1 Site Map
Point Feature
Line Feature
Other Site Boundaries
5DT2146.1 Boundary
5MN10747.4 Boundary
APE
N
F1
F2
F3
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F5
F6
F7
F8
F9
0
1,000
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Feet
ERO
ERO Resources Corp.

short opening at a drainage; it is an open U-shaped concrete-lined channel about 6 ft deep and 5 ft wide (F74). At the opening between the tunnels is a dry stacked stone retaining wall made of local stone(F75). At the northern exit of the lower tunnel exit, the ditch becomes an open earthen U-shaped ditch cut into a northeast facing slope for approximately 1.3 miles.

Within 5DT2146.1 and 5MN10747.4 are 84 features (Table 1, see Part IV for maps); seven of these fall within 5DT2146.1 and 77 fall within 5MN10747.4. The tunnels (Figure 14), the open earthen canal structure, and four features (F1, F76, F77, and F78) convey significant aspects of historic trends and engineering for operation of the canal related to water conveyance and irrigation. There were no visible surface artifacts associated with these elements. Because these elements likely date to the original construction of the canal, they are recommended contributing to the eligibility of the canal. The four features that contribute to the significance of segments 5DT2146.1 and 5MN10747 are the two siphons described above (F1 and F78) and two wood and earthen chutes (F76 and F77). One of these (F1) is located within 5DT2146.1 and the remaining three are within Montrose County (5MN10747.4).

Both siphons are constructed of wood stave pipe (Figure 15). F78 is located about 8 miles from the beginning of the ditch at the Gould Reservoir and is approximately 0.4 mile long, and another siphon (F1) is at the western end of the area of potential effect (APE) in the Delta County segment (5DT2146.1) in Section 23, T51N, R8W and is 0.6 mile long. The siphons are buried and are assumed to be in good condition because they are functional (Figure 9).

Figure 9. 5MN10747.4, F78 overview. Southern outlet of siphon. View faces west-northwest.

The wood and earthen chutes (F76 and F77) are located on steep slopes above an unnamed tributary of Iron Creek above a bend in the canal, and are constructed of wood cribbing that retain artificial earthen berms that form a central chute; the wood cribbing likely reinforces the downslope berm of the ditch and the cribbing and associated earthen berms function to convey gravels and sediments into natural drainages that cross under the canal. F76 consists of a stacked log retaining wall (F76a) covered with an earthen berm (F76b); a collapsed shaft (F76c) bisects the berm, and an excavated pit (F76d) is located on the southeast end of the berm. Both features are built into the edge of a relatively flat terrace edge, and the shaft was built at an angle with the upper end opening to the terrace surface and the lower end opening pointed downslope. The terrace behind both features appears to have been mechanically leveled, indicating the terrace was created from use of the landform as a borrow area to construct the chute features. Sediments from these areas may have been excavated and then carried downslope via the chute in the center of the berm. F77 is located directly across the drainage to the west and appears to have very similar construction (Figure 10). Proposed construction activities associated with the salinity control project will not impact the contributing features, and therefore they were not included in the high-resolution digital photographic documentation.

Figure 10. 5MN10747.4, F77 overview. View faces east-southeast.

Most features along segments 5DT2146.1 and 5MN10747.4 are turnouts (dropgates or sluicegates) to convey water for irrigation into field laterals, and do not date to the period of significance. Forty-two of

these features consist of dropgates for field laterals with a narrow concrete-lined channel with a wood lumber gate that drops into grooves on the sides of the concrete (Figure 11); many of these have "Orlo Cotten" as well as a construction date inscribed in the concrete wall (Figure 12, Table 1). Dates range from 1941 to 1956. One of these dropgates, F79, empties water into Iron Creek, which then conveys water downstream to the Cattlemans Ditch, located outside of the APE. A concrete-lined canal section (F74) and retaining wall (F75) are associated with later alterations to the canal between the upper and lower tunnels. Four features are sluicegates with concrete-lined channels, and seven are sluicegates with a screw stem and handwheel to control the flow of water into a buried field lateral conduit under the northern berm of the ditch. Other feature types include two Parshall flumes, four concrete drop structures, one metal drop structure, two 12-inch-diameter steel pipes, and two bridges. Fourteen features are steel pipe bridges used to access and maintain a center pivot irrigation system. Materials and design demonstrate the District and irrigators constructed and altered these features for modern use after the period of significance (1901-1930); they do not contribute to the eligibility of the resource and were not included in the high-resolution digital photographic documentation.

Figure 11. Representative example of dropgate structures: Gate 47 (F8). View faces north.

Figure 12. Orlo Cotten inscription: Gate 45 (F10a).

Table 1. Features documented in association with 5DT2146.1 and 5MN10747.4.

Smith No.	Feature No.	Headgate No.	Description	Contributing/Noncontributing
5DT2146.1	1	--	Siphon (#2) on western end of canal-concrete headwall and side walls with steel tubes vertically across opening, ditch extends underground to the northwest outside of APE (photo 332).	Contributing; outside of APE; not included in Level II photographic documentation
5DT2146.1	2	50?	Sluicegate with screw stem and handwheel for a field lateral on north berm of ditch. Concrete headwall and side walls extending into ground surface (photo 333).	Noncontributing; not included in Level II photographic documentation
5DT2146.1	3	49?	Dropgate for a field lateral with narrow concrete-lined channel on north berm of ditch with wood lumber gate that drops into grooves on sides of concrete. Metal tag stamped with "SELL 2 26 307"; sediment covers part of the gate on the ditch side (photo 336).	Noncontributing; not included in Level II photographic documentation
5DT2146.1	4	--	Parshall flume drop structure in main channel (photo 339).	Noncontributing; not included in Level II photographic documentation
5DT2146.1	5	48	Dropgate for a field lateral with narrow concrete-lined channel on north berm of ditch with wood lumber gate that drops into grooves on sides of concrete (photo 341).	Noncontributing; not included in Level II photographic documentation

Smith No.	Feature No.	Headgate No.	Description	Contributing/Noncontributing
5DT2146.1	6	--	Parshall flume and gauge on side channel (photo 342).	Noncontributing; not included in Level II photographic documentation
5MN10747.4	7	Unknown	Abandoned wood dropgate for a field lateral with wood-lined channel; located on north berm of ditch (photo 345).	Noncontributing; not included in Level II photographic documentation
5DT2146.1	8	47	Dropgate for a field lateral with narrow concrete-lined channel on north berm of ditch with wood lumber gate that drops into grooves on sides of concrete. "Orlo Cotten" inscribed into concrete; aluminum tags stamped with "C. Perry 3000 No. 44" and "Perry 3000" (photo 347).	Noncontributing; not included in Level II photographic documentation
5MN10747.4	9	46	Dropgate for a field lateral with narrow concrete-lined channel on north berm of ditch with wood lumber gate that drops into grooves on sides of concrete. "Orlo Cotten 1954" inscribed into concrete; aluminum tags stamped with "H. Huling 2100 No. 43" (photo 353).	Noncontributing; not included in Level II photographic documentation
5MN10747.4	10a	45	Dropgate for a field lateral with narrow concrete-lined channel on north berm of ditch with wood lumber gate that drops into grooves on sides of concrete. "Orlo Cotten" and "10/6/1951" inscribed into concrete (photo 361).	Noncontributing; not included in Level II photographic documentation
5MN10747.4	10b	44	Dropgate for a field lateral located approximately 20 ft east of F10a with narrow concrete-lined channel on north berm of ditch with wood lumber gate that drops into grooves on sides of concrete. "Orlo Cotten" inscribed into concrete (photo 367).	Noncontributing; not included in Level II photographic documentation
5MN10747.4	11	43	Dropgate for a field lateral with narrow concrete-lined channel on north berm of ditch with wood lumber gate that drops into grooves on sides of concrete. "Orlo Cotten" inscribed into concrete (photo 390).	Noncontributing; not included in Level II photographic documentation
5MN10747.4	12	42	Dropgate for a field lateral with narrow concrete-lined channel on north berm of ditch with wood lumber gate that drops into grooves on sides of concrete. "Orlo Cotten" and "9/(?)/1954(?)" inscribed into concrete (photo 392).	Noncontributing; not included in Level II photographic documentation
5MN10747.4	13	41	Dropgate for a field lateral with narrow concrete-lined channel on north berm of ditch with wood lumber gate that drops into grooves on sides of concrete. "Orlo Cotten" and "11/4/55(?)" inscribed into concrete (photo 413).	Noncontributing; not included in Level II photographic documentation

Smith No.	Feature No.	Headgate No.	Description	Contributing/Noncontributing
5MN10747.4	14	40	Dropgate for a field lateral with narrow concrete-lined channel on north berm of ditch with wood lumber gate that drops into grooves on sides of concrete (photo 416).	Noncontributing; not included in Level II photographic documentation
5MN10747.4	15	39	Dropgate for a field lateral with narrow concrete-lined channel on north berm of ditch with wood lumber gate that drops into grooves on sides of concrete. Concrete inscribed with "?/?/51 (?)" (photo 425).	Noncontributing; not included in Level II photographic documentation
5MN10747.4	16	38	Dropgate for a field lateral with narrow concrete-lined channel on north berm of ditch with wood lumber gate that drops into grooves on sides of concrete. Wood components have been recently updated (photo 430).	Noncontributing; not included in Level II photographic documentation
5MN10747.4	17a	37	Dropgate for a field lateral with narrow concrete-lined channel on north berm of ditch with wood lumber gate that drops into grooves on sides of concrete. Wood components have been recently updated. Concrete wingwalls and riprap added upstream and downstream of dropgate (photo 436).	Noncontributing; not included in Level II photographic documentation
5MN10747.4	17b	36	Dropgate for a field lateral located approximately 20 ft east of F17a with narrow concrete-lined channel on north berm of ditch with wood lumber gate that drops into grooves on sides of concrete. Wood components have been recently updated. Riprap has been added upstream and downstream of dropgate; new concrete-lined channels connect to the original structure on north side. "?/?/53" inscribed into original concrete structure (photo 437).	Noncontributing; not included in Level II photographic documentation
5MN10747.4	18	35	Dropgate for a field lateral with narrow concrete-lined channel on north berm of ditch with wood lumber gate that drops into grooves on sides of concrete. Concrete inscribed with "4/15/50(?)" (photo 442).	Noncontributing; not included in Level II photographic documentation
5MN10747.4	19	34	Dropgate for a field lateral with narrow concrete-lined channel on north berm of ditch with wood lumber gate that drops into grooves on sides of concrete. New concrete structure connects to north side of original (photo 446).	Noncontributing; not included in Level II photographic documentation

Smith No.	Feature No.	Headgate No.	Description	Contributing/Noncontributing
5MN10747.4	20	33	Dropgate for a field lateral with narrow concrete-lined channel on north berm of ditch with wood lumber gate that drops into grooves on sides of concrete. Wood components have been recently updated. Concrete wingwalls added upstream and downstream of dropgate. Old steel hammer attached to dropgate (photo 449).	Noncontributing; not included in Level II photographic documentation
5MN10747.4	21	32	Sluicegate with screw stem and handwheel for a field lateral that has been recently added to the original narrow concrete-lined channel on north berm of ditch. Milled lumber covers top of channel. New concrete-lined channel has been added to north side of original structure and is solar powered (photo 452).	Noncontributing; not included in Level II photographic documentation
5MN10747.4	22	31	Dropgate for a field lateral with narrow concrete-lined channel on north berm of ditch with wood lumber gate that drops into grooves on sides of concrete. Milled lumber covers top of channel (photo 454).	Noncontributing; not included in Level II photographic documentation
5MN10747.4	23	30	Sluicegate with screw stem and handwheel for a field lateral. Concrete headwall and side walls extending into ground surface (photo 471).	Noncontributing; not included in Level II photographic documentation
5MN10747.4	24a	--	Concrete-lined drop structure with bridge (photo 472).	Noncontributing; not included in Level II photographic documentation
5MN10747.4	24b	29	Sluicegate with screw stem and handwheel for a field lateral. Concrete headwall and side walls extending into ground surface (photo 473).	Noncontributing; not included in Level II photographic documentation
5MN10747.4	25	28	Sluicegate with screw stem and handwheel for a field lateral. Concrete headwall and side walls extending into ground surface (photo 474).	Noncontributing; not included in Level II photographic documentation
5MN10747.4	26a	--	Concrete drop structure with drop board gate in main channel of ditch (photo 479).	Noncontributing; not included in Level II photographic documentation
5MN10747.4	26b	27	Dropgate for a field lateral with narrow concrete-lined channel on north berm of ditch with wood lumber gate that drops into grooves on sides of concrete. Milled lumber covers top of channel (photo 480).	Noncontributing; not included in Level II photographic documentation
5MN10747.4	27	26	Dropgate for a field lateral with narrow concrete-lined channel on north berm of ditch with wood lumber gate that drops into grooves on sides of concrete. Milled lumber covers top of channel. Some wood components have recently been updated (photo 484).	Noncontributing; not included in Level II photographic documentation

Smith No.	Feature No.	Headgate No.	Description	Contributing/Noncontributing
5MN10747.4	28	25	Dropgate for a field lateral with narrow concrete-lined channel on north berm of ditch with wood lumber gate that drops into grooves on sides of concrete. Milled lumber covers top of channel. Concrete wingwalls are located upstream and downstream of the ditch on either side of the dropgate. Some wood components have recently been updated (photo 488).	Noncontributing; not included in Level II photographic documentation
5MN10747.4	29	24	Sluicegate with screw stem and handwheel for a field lateral. Riprap headwall (photo 492).	Noncontributing; not included in Level II photographic documentation
5MN10747.4	30	23	Narrow concrete-lined channel on north berm; dropgate on ditch side of gate is missing; back gate is intact. Milled lumber covers channel (photo 495).	Noncontributing; not included in Level II photographic documentation
5MN10747.4	31a		Concrete drop structure with wood board gate in main channel of ditch (photo 502).	Noncontributing; not included in Level II photographic documentation
5MN10747.4	31b	Unknown	Large sluicegate with screw stem and handwheel and concrete-lined channel on north berm of ditch. Measures 6 ft wide by 9 ft long. "Orlo Cotten 1952" inscribed in concrete wall of channel. Grass and sediment are located within the channel, suggesting the sluicegate is not currently in use (photo 501).	Noncontributing; not included in Level II photographic documentation
5MN10747.4	32	22	Dropgate for a field lateral with narrow concrete-lined channel on north berm of ditch with wood lumber gate that drops into grooves on sides of concrete. "Orlo Cotten" inscribed in concrete. Milled lumber covers top of channel (photo 504).	Noncontributing; not included in Level II photographic documentation
5MN10747.4	33	21	Sluicegate with screw stem and handwheel for a field lateral (photo 508).	Noncontributing; not included in Level II photographic documentation
5MN10747.4	34	20	Dropgate for a field lateral with narrow concrete-lined channel on north berm of ditch with wood lumber gate that drops into grooves on sides of concrete. "8/28/56" inscribed in concrete. Milled lumber covers part of the top of channel (photo 511).	Noncontributing; not included in Level II photographic documentation
5MN10747.4	35	19	Dropgate for a field lateral with narrow concrete-lined channel on north berm of ditch with wood lumber gate that drops into grooves on sides of concrete. "Orlo Cotten" and "8/26/51" inscribed in concrete. Milled lumber covers part of the top of channel (photo 515).	Noncontributing; not included in Level II photographic documentation
5MN10747.4	36	--	Metal drop structure (photo 524).	Noncontributing; not included in Level II photographic documentation

Smith No.	Feature No.	Headgate No.	Description	Contributing/Noncontributing
5MN10747.4	37	18	Dropgate for a field lateral with narrow concrete-lined channel on north berm of ditch with wood lumber gate that drops into grooves on sides of concrete. "Orlo Cotten" and "4/11/52" inscribed in concrete. Milled lumber covers part of the top of channel (photo 526).	Noncontributing; not included in Level II photographic documentation
5MN10747.4	38	17	Sluicegate with screw stem and handwheel for a field lateral with narrow concrete-lined channel on north berm of ditch with wood lumber gate that drops into grooves on sides of concrete. Concrete is in poor condition; no inscriptions visible. Milled lumber covers part of the top of channel (photo 532).	Noncontributing; not included in Level II photographic documentation
5MN10747.4	39	16	Dropgate for a field lateral with narrow concrete-lined channel on north berm of ditch with wood lumber gate that drops into grooves on sides of concrete. "Orlo Cotten" and "5/(?)/51(?)" inscribed in concrete. Milled lumber covers part of the top of channel (photo 536).	Noncontributing; not included in Level II photographic documentation
5MN10747.4	40	15	Dropgate for a field lateral with narrow concrete-lined channel on north berm of the ditch with wood lumber gate that drops into grooves on sides of concrete. "Orlo Cotten" and "?/(?)/5(?)" inscribed in concrete. Milled lumber covers part of the top of channel (photo 541).	Noncontributing; not included in Level II photographic documentation
5MN10747.4	41	14	Dropgate for a field lateral with narrow concrete-lined channel on north berm of ditch with wood lumber gate that drops into grooves on sides of concrete. "Orlo Cotten" and "?/(?)/41" inscribed in concrete. Milled lumber and a palette covers part of the top of channel (photo 545).	Noncontributing; not included in Level II photographic documentation
5MN10747.4	42	13	Dropgate for a field lateral with narrow concrete-lined channel on north berm of ditch with wood lumber gate that drops into grooves on sides of concrete (photo 548).	Noncontributing; not included in Level II photographic documentation
5MN10747.4	43	12b	Dropgate for a field lateral with narrow concrete-lined channel on north berm of ditch with wood lumber gate that drops into grooves on sides of concrete. "Orlo Cotten" and "9/26/51" inscribed in concrete (photo 551).	Noncontributing; not included in Level II photographic documentation
5MN10747.4	44	12a	Dropgate for a field lateral with narrow concrete-lined channel on north berm of ditch with wood lumber gate that drops into grooves on sides of concrete (photo 555).	Noncontributing; not included in Level II photographic documentation

Smith No.	Feature No.	Headgate No.	Description	Contributing/Noncontributing
5MN10747.4	45	10	Sluicegate with screw stem and handwheel for a field lateral. Riprap headwall (photo 558).	Noncontributing; not included in Level II photographic documentation
5MN10747.4	46	9	Dropgate for a field lateral with narrow concrete-lined channel on north berm of the ditch with wood lumber gate that drops into grooves on sides of concrete (photo 562).	Noncontributing; not included in Level II photographic documentation
5MN10747.4	47	--	Concrete drop structure at confluence of original Fruitland Mesa Ditch and the Gould Canal (photo 565).	Noncontributing; not included in Level II photographic documentation
5MN10747.4	48	8	Dropgate for a field lateral with narrow concrete-lined channel on north berm of ditch with wood lumber gate that drops into grooves on sides of concrete (photo 566).	Noncontributing; not included in Level II photographic documentation
5MN10747.4	49	7	Wide sluicegate with screw stem and handwheel for a field lateral with wide concrete-lined channel on north berm of ditch with wood lumber gate that drops into grooves on sides of concrete (photo 571).	Noncontributing; not included in Level II photographic documentation
5MN10747.4	50	6	Dropgate for a field lateral with narrow concrete-lined channel on north berm of ditch with wood lumber gate that drops into grooves on sides of concrete. "Orlo Cotten" and "7/23/56" inscribed in concrete (photo 583).	Noncontributing; not included in Level II photographic documentation
5MN10747.4	51	5	Dropgate for a field lateral with narrow concrete-lined channel on north berm of ditch with wood lumber gate that drops into grooves on sides of concrete. "Orlo Cotten" inscribed in concrete (photo 586).	Noncontributing; not included in Level II photographic documentation
5MN10747.4	52	1	Dropgate for a field lateral with narrow concrete-lined channel on north berm of ditch with wood lumber gate that drops into grooves on sides of concrete (photo 595).	Noncontributing; not included in Level II photographic documentation
5MN10747.4	53		Steel pipe bridge for center pivot sprinkler system (photo 596).	Noncontributing; not included in Level II photographic documentation
5MN10747.4	54		Steel pipe bridge for center pivot sprinkler system (photo 597).	Noncontributing; not included in Level II photographic documentation
5MN10747.4	55		Steel pipe bridge for center pivot sprinkler system (photo 598).	Noncontributing; not included in Level II photographic documentation
5MN10747.4	56		Steel pipe bridge for center pivot sprinkler system (photo 599).	Noncontributing; not included in Level II photographic documentation
5MN10747.4	57		Steel pipe; about 12-inch-diameter (photo 600).	Noncontributing; not included in Level II photographic documentation
5MN10747.4	58		Steel pipe bridge for center pivot sprinkler system (photo 601).	Noncontributing; not included in Level II photographic documentation

Smith No.	Feature No.	Headgate No.	Description	Contributing/Noncontributing
5MN10747.4	59	2	Dropgate for a field lateral with narrow concrete-lined channel on north berm of ditch with wood lumber gate that drops into grooves on sides of concrete (photo 602).	Noncontributing; not included in Level II photographic documentation
5MN10747.4	60		Steel pipe bridge for center pivot sprinkler system (photo 603).	Noncontributing; not included in Level II photographic documentation
5MN10747.4	61		Steel pipe bridge for center pivot sprinkler system (photo 604).	Noncontributing; not included in Level II photographic documentation
5MN10747.4	62		Steel pipe bridge for center pivot sprinkler system (photo 605).	Noncontributing; not included in Level II photographic documentation
5MN10747.4	63	3	Dropgate for a field lateral with narrow concrete-lined channel on north berm of ditch with wood lumber gate that drops into grooves on sides of concrete. Not active (photo 607).	Noncontributing; not included in Level II photographic documentation
5MN10747.4	64		Steel pipe; about 12-inch-diameter (photo 606).	Noncontributing; not included in Level II photographic documentation
5MN10747.4	65	--	Steel pipe bridge for center pivot sprinkler system (photo 606).	Noncontributing; not included in Level II photographic documentation
5MN10747.4	66		Steel pipe bridge for center pivot sprinkler system (photo 609).	Noncontributing; not included in Level II photographic documentation
5MN10747.4	67		Steel pipe bridge for center pivot sprinkler system (photo 609).	Noncontributing; not included in Level II photographic documentation
5MN10747.4	68		Steel pipe bridge for center pivot sprinkler system (photo 610).	Noncontributing; not included in Level II photographic documentation
5MN10747.4	69		Steel pipe bridge for center pivot sprinkler system (photo 610).	Noncontributing; not included in Level II photographic documentation
5MN10747.4	70		Steel pipe bridge for center pivot sprinkler system (photo 610).	Noncontributing; not included in Level II photographic documentation
5MN10747.4	71		Steel pipe bridge for center pivot sprinkler system (photo 611).	Noncontributing; not included in Level II photographic documentation
5MN10747.4	72	4	Dropgate for a field lateral with narrow concrete-lined channel on north berm of ditch with wood lumber gate that drops into grooves on sides of concrete. Not active (photo 612).	Noncontributing; not included in Level II photographic documentation
5MN10747.4	73		Bridge with concrete abutments and wood superstructure (photo 613).	Noncontributing; not included in Level II photographic documentation
5MN10747.4	74		Concrete-lined canal exposed at tunnel opening between upper and lower tunnels (photo 663).	Noncontributing; not included in Level II photographic documentation
5MN10747.4	75		Retaining wall above tunnel opening built into the drainage (photo 664).	Noncontributing; not included in Level II photographic documentation
5MN10747.4	76		Partially buried wood cribbing with a central chute likely used to convey gravels and soil into the drainage for canal construction (photo 632).	Contributing; outside of APE; not included in Level II photographic documentation
5MN10747.4	77		Partially buried wood cribbing with a central chute likely used to convey gravels and soil into the drainage for canal construction (photo 631).	Contributing; outside of APE; not included in Level II photographic documentation

Smith No.	Feature No.	Headgate No.	Description	Contributing/Noncontributing
5MN10747.4	78	--	Siphon #1 in central portion of APE; ditch is buried for approximately 0.44 mile. Located between headgates 22 and 23 (photo 456).	Contributing; outside of APE; not included in Level II photographic documentation
5MN10747.4	79	Cattleman's Turnout	Dropgate turnout for a field lateral with narrow concrete-lined channel on north berm of ditch with wood lumber gate; Concrete wingwalls are located upstream and downstream of dropgate.	Noncontributing; not included in Level II photographic documentation

Historical Context

Colorado's semiarid climate made the development of irrigation necessary for settlement of the area. Irrigation ditches and canals across the state divert water from rivers and streams and carry it to cultivated fields, grass pastures, and reservoirs. The Fruitland Mesa Irrigation Network, including Gould Canal segments 5DT2146.1 and 5MN10747.4, is representative of organized efforts in which ditch users and commercial agriculture investors collaborated to operate and maintain a ditch. Users and/or investors organized themselves as a mutual ditch company, a unique legal entity in Colorado. The purpose of these types of companies was to operate the ditch on behalf of people who used the ditch and owned legal shares, or rights, to take water from the ditch; these shareholders were considered owners of the ditch and contributed to decision making pertaining to improvements and maintenance to the ditch. A share in a mutual ditch company represents an actual pro rata ownership interest in all of the water rights, ditches, facilities, and other assets of the company. The shareholders are, in essence, the company (Hobbs 1997).

The Fruitland Mesa Irrigation Network was constructed in the early 1900s to supply water to what would come to be known as Fruitland Mesa and has been continuously in use for irrigation since its original construction. The canal and reservoir were named for the developers of the water conveyance network – brothers Jim, Ernest, John, and George Gould. Fruitland Mesa was so named because of the high hopes developers had for the area to become a large supplier of fruit similar to Paonia to the north. Many of the photos and much of the historical information comes from presentations given by Danny Cotten (now deceased) via Greg Powers, who is the water commissioner for Water District 40 of the Colorado Division of Water Resources. Danny Cotten was the grandson of Roy Cotten, who was the first ditch rider for the Gould Canal. Roy Cotten's father, John W. Cotten, was one of the early settlers in Delta County. Orlo "Babe" Cotten was one of Roy's sons and was either father or uncle to Danny Cotten. Orlo replaced his father as ditch rider and constructed many of the dropgates documented during the 2018 survey (Croll and Nordstrom 2018). A quick search of the white pages for Hotchkiss and Crawford, Colorado indicates that Cotten is a common family name in the area to this day.

Local irrigators and investors constructed the irrigation network by hand using manual labor, mules, and dynamite (Figure 13). The construction of the Upper and Lower Tunnels using dynamite and manual labor was an inventive strategy for transporting water up to the mesa (Figure 14). Wood stave water pipe was commonly used for siphons during the period of significance for the irrigation network (1910-

1930) (Figure 15). Although the technology available for construction of irrigation ditch systems has improved through time, many historical gravity-fed earthen ditches like the Gould Canal have undergone very few modifications or improvements. Changes to the canal are more the result of continual use and maintenance than improvement of materials and equipment to make maintenance and water monitoring more efficient. One significant change to the canal is the use of concrete; concrete can be seen in ditch features, such as turnouts and dropgates, and as a channel liner in sections of the canal in the Iron Creek drainage.

Harry F. White
Plate 003

Figure 13. Harry F. White Plate 003: Gould Canal construction, date unknown (early 1900s?). Photo credit: Harry F. White, received from Danny Cotten via Greg Powers, electronic version on file at ERO.

Figure 14. Tunnel construction/maintenance, date unknown (mid 1900s?). Orlo (Babe) Cotten and Everett and George Howard in photo. Photo credit: Danny Cotten, electronic version on file at ERO.

Figure 15. Harry F. White Plate 008: siphon construction, 1907–1908). Photo credit: Harry F. White, received from Danny Cotten via Greg Powers, electronic version on file at ERO.

According to the CDSS structure summaries, water rights for both the Gould Reservoir (referred to as the Fruitland Reservoir in CDSS records) and the canal were first appropriated on May 17, 1901, and were adjudicated on June 23, 1914. A second adjudication occurred on February 10, 1930, and a third on March 20, 1954 (CDSS 2018a, 2018b). The Fruitland Mesa Irrigation Network irrigates approximately 7400 acres (CDSS 2004). According to the 1914 decree dated June 23, 1914, Gould Reservoir was originally decreed 2,800 acre-ft of water (the Onion Valley Reservoir water rights decree 1914); this amount was increased to 5,283 acre-ft in 1930 (the Onion Valley Reservoir water rights decree 1930). An additional 2,532 acre-ft were added to the decree in 1949 before the raising of the height of the dam (the Onion Valley Reservoir water rights decree 1954). The period of significance is from 1901, at the time water was appropriated for the project, to 1930 when the original decree was modified. This would be the date range in which the network played the largest role in early settlement of the mesa specifically and the region more broadly.

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2018a Fruitland Canal Structure Detail, Colorado Decision Support System Structure Report webpage. Electronic document, https://dnrweb.state.co.us/cdss/Structures/4000549, accessed October 3, 2018.

2018b Fruitland Reservoir Structure Detail, Colorado Decision Support System Structure Report webpage. Electronic document, https://dnrweb.state.co.us/cdss/Structures/4003395, accessed October 3, 2018.

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The Onion Valley Reservoir Water Rights Decree

1914 No. A-8, The Onion Valley Reservoir, CA0617. Dated June 23, 1914.

1930 Priority No. G-3 1/2, the Onion Valley Reservoir, CA2030. Dated February 10, 1930.

1954 Priority No. J-344 Stor. Conditional, Reservoir No. J-66, The Onion Valley Reservoir, CA3503. Dated March 20, 1954.

Part II – Representative Photographs

Photograph Log

Property Name: Gould Canal (5DT2146.1/5MN10747.4)
Property Location: Montrose and Delta Counties, Colorado
SE ¼ Section 12, Township 2 North, Range 70 West
of the New Mexico Meridian
Photographer: Kathy Croll
Date Taken: April 17, 2019
Location of Digital File: ERO Resources

Photo_#	Facing	Description
IMG_5604	N	Profile of concrete-lined portion of canal south of tunnels
IMG_5605	N	Profile of canal at southern tunnel opening
IMG_5606	N	Profile of tunnel
IMG_5607	S	Profile of earthen portion of canal south of tunnels
IMG_5610	S	Profile 5 of earthen portion of canal south of tunnels, Feature 79 in view
IMG_5611	N	Profile 5 of earthen portion of canal south of tunnels
IMG_5612	S	Profile of canal at outlet from Gould Reservoir
IMG_5613	NNE	Profile of earthen canal on Fruitland Mesa
IMG_5615	W	Profile of earthen canal at end of 5DT2146.1 east of Siphon #2 (F1)
IMG_5616	N	Overview of dropgate (F5)
IMG_5617	-	Planview of Orlo Cotton signature in turnout
IMG_5618	-	Planview of Orlo Cotton signature in turnout

Figure 16. 5MN10747.4 – Profile 1 of concrete-lined portion of canal south of tunnels, view to the north.
Photo Number: IMG_5604 Date: 4.17.19

Figure 17. 5MN10747.4 – Profile 2 of canal at southern tunnel opening, view to the north.
Photo Number: IMG_5605 Date: 4.17.19

Figure 18. 5MN10747.4 – Profile 3 of tunnel, view to the north.
Photo Number: IMG_5606 Date: 4.17.19

Figure 19. 5MN10747.4 – Profile 4 of earthen portion of canal south of tunnels, view to the south.
Photo Number: IMG_5607 Date: 4.17.19

Figure 20. 5MN10747.4 – Profile 5 of earthen portion of canal south of tunnels, view to the north.
Photo Number: IMG_5611 Date: 4.17.19

Figure 21. 5MN10747.4 – Profile 5 of earthen portion of canal south of tunnels, view to the south.
Photo Number: IMG_5610 Date: 4.17.19

Figure 22. 5MN10747.4 – Profile 6 of canal at outlet from Gould Reservoir, view to the south.
Photo Number: IMG_5612 Date: 4.17.19

Figure 23. 5MN10747.4 – Profile 7 of earthen canal on Fruitland Mesa, view to the north/northeast.
Photo Number: IMG_5613 Date: 4.17.19

Figure 24. 5DT2146.1 – Profile 8 of earthen canal at end of 5DT2146.1 east of Siphon #2 (F1), view to the west.
Photo Number: IMG_5615 Date: 4.17.19

Figure 25. 5MN10747.4 – Overview of dropgate (F5), view to the north.
Photo Number: IMG_5616 Date: 4.17.19

Figure 26. 5MN10747.4 – Planview of Orlo Cotton signature in turnout.
Photo Number: IMG_5617 Date: 4.17.19

Figure 27. 5MN10747.4 – Planview of Orlo Cotton signature in turnout.
Photo Number: IMG_5618 Date: 4.17.19

Part III – Measured Drawings

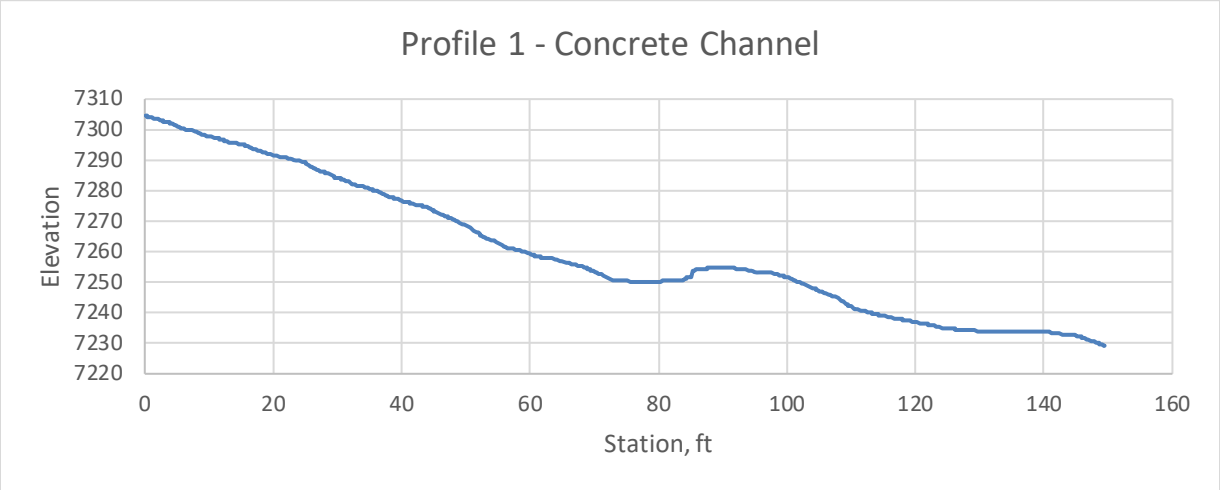


Figure 28. Profile 1; concrete channel on southern end of ditch.

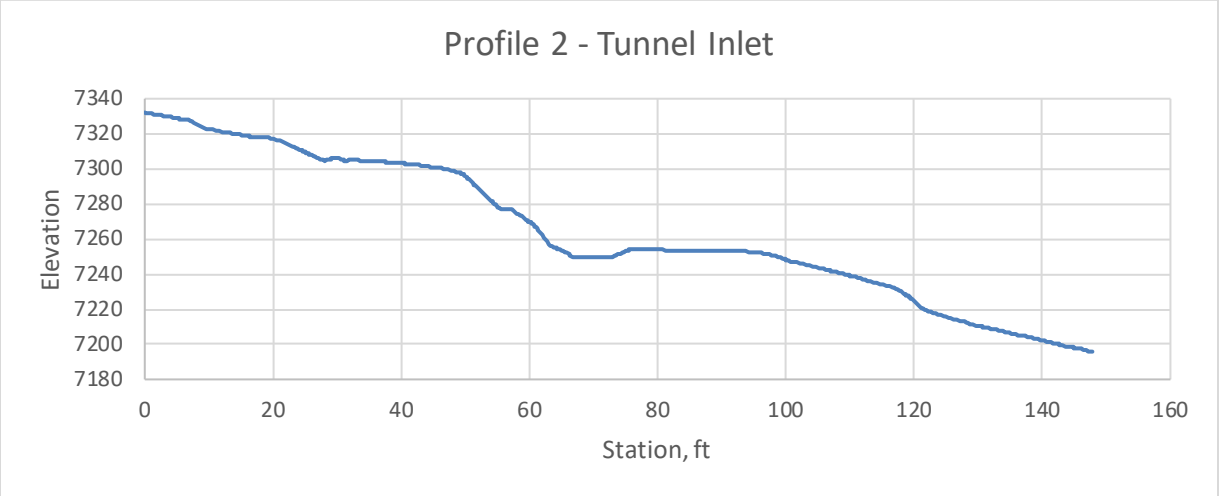


Figure 29. Profile 2; southern opening of tunnel.

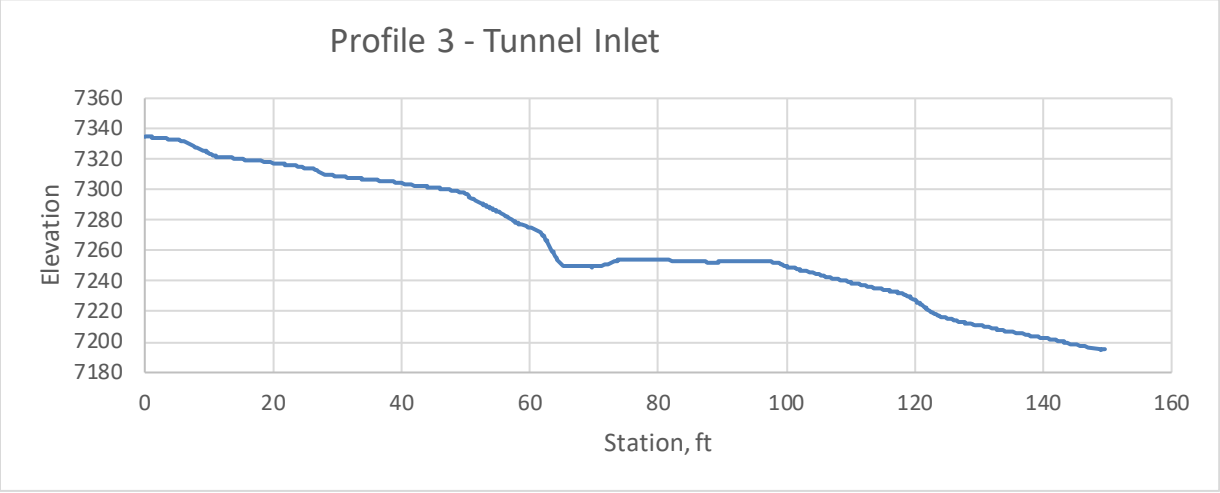


Figure 30. Profile 3; inside southern end of tunnel.

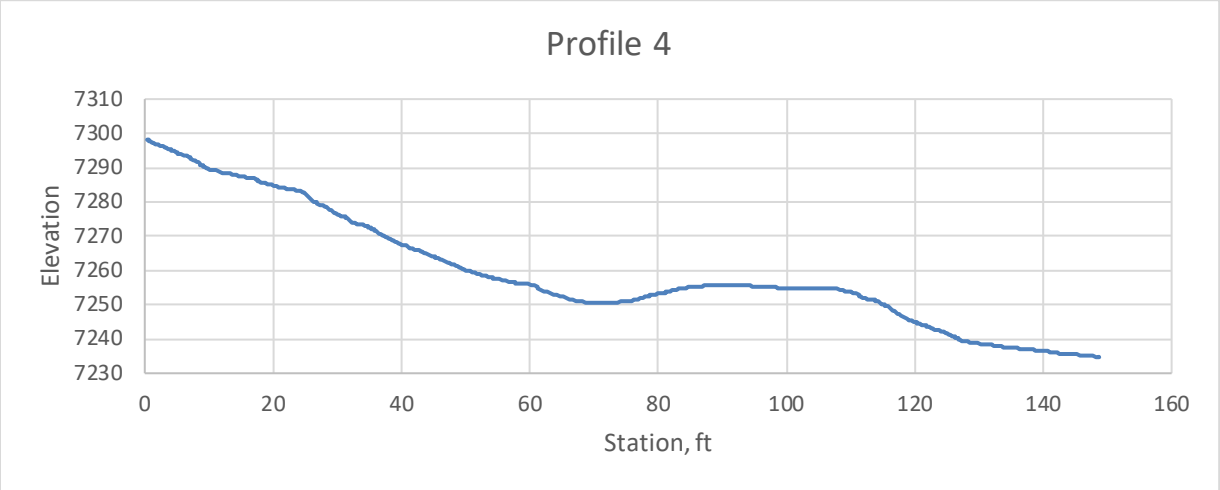


Figure 31. Profile 4; earthen portion of southern end of ditch.

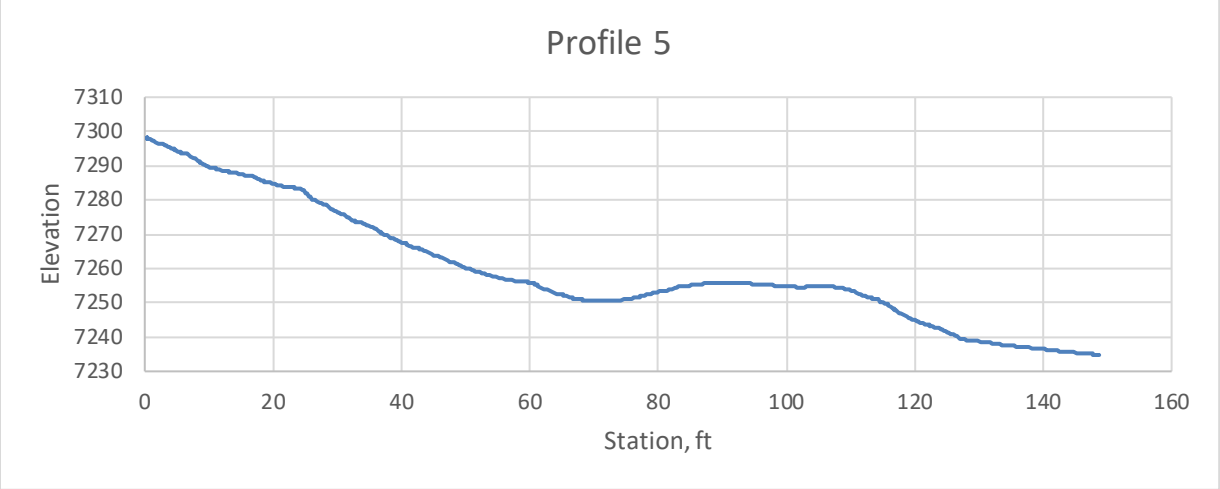


Figure 32. Profile 5; earthen portion of ditch near Gould Reservoir outlet.

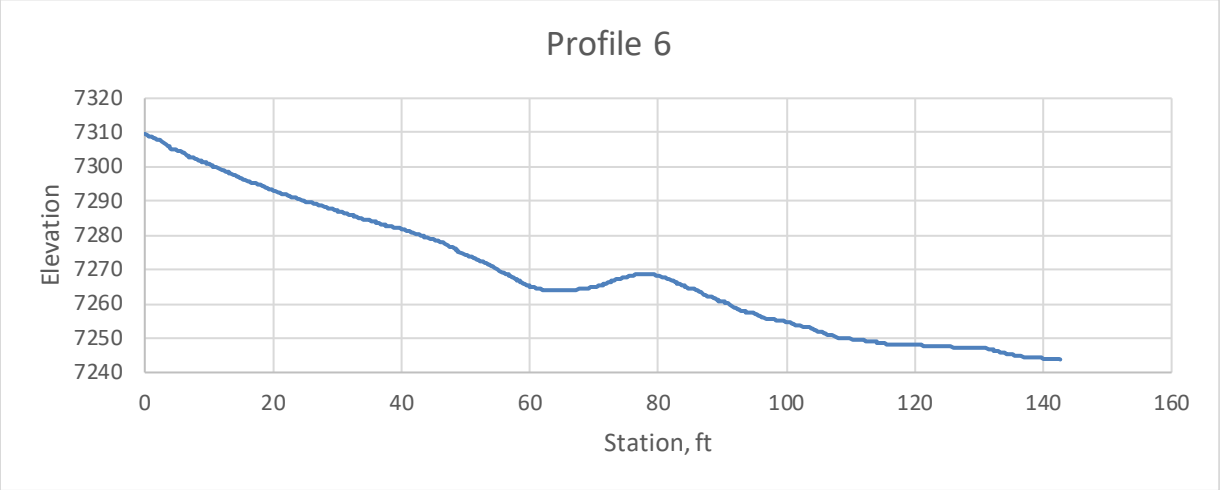


Figure 33. Profile 6; at Gould Reservoir outlet.

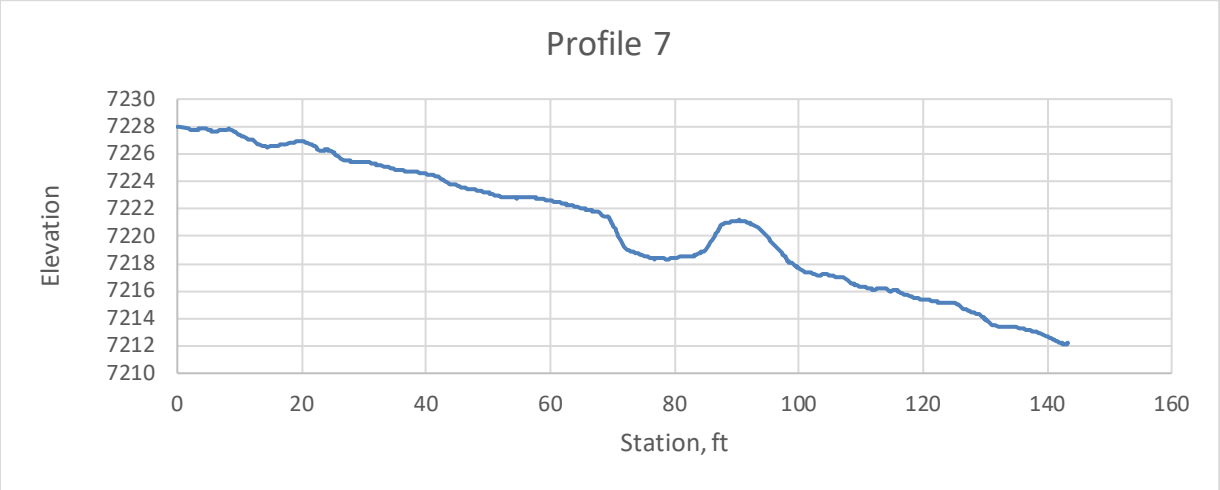


Figure 34. Profile 7; portion of ditch on Fruitland Mesa.

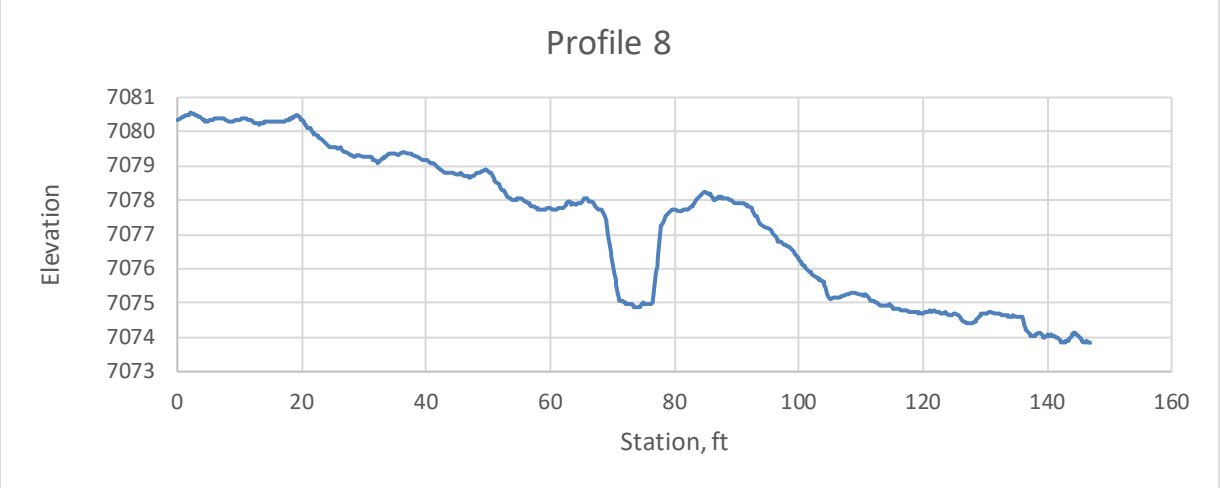
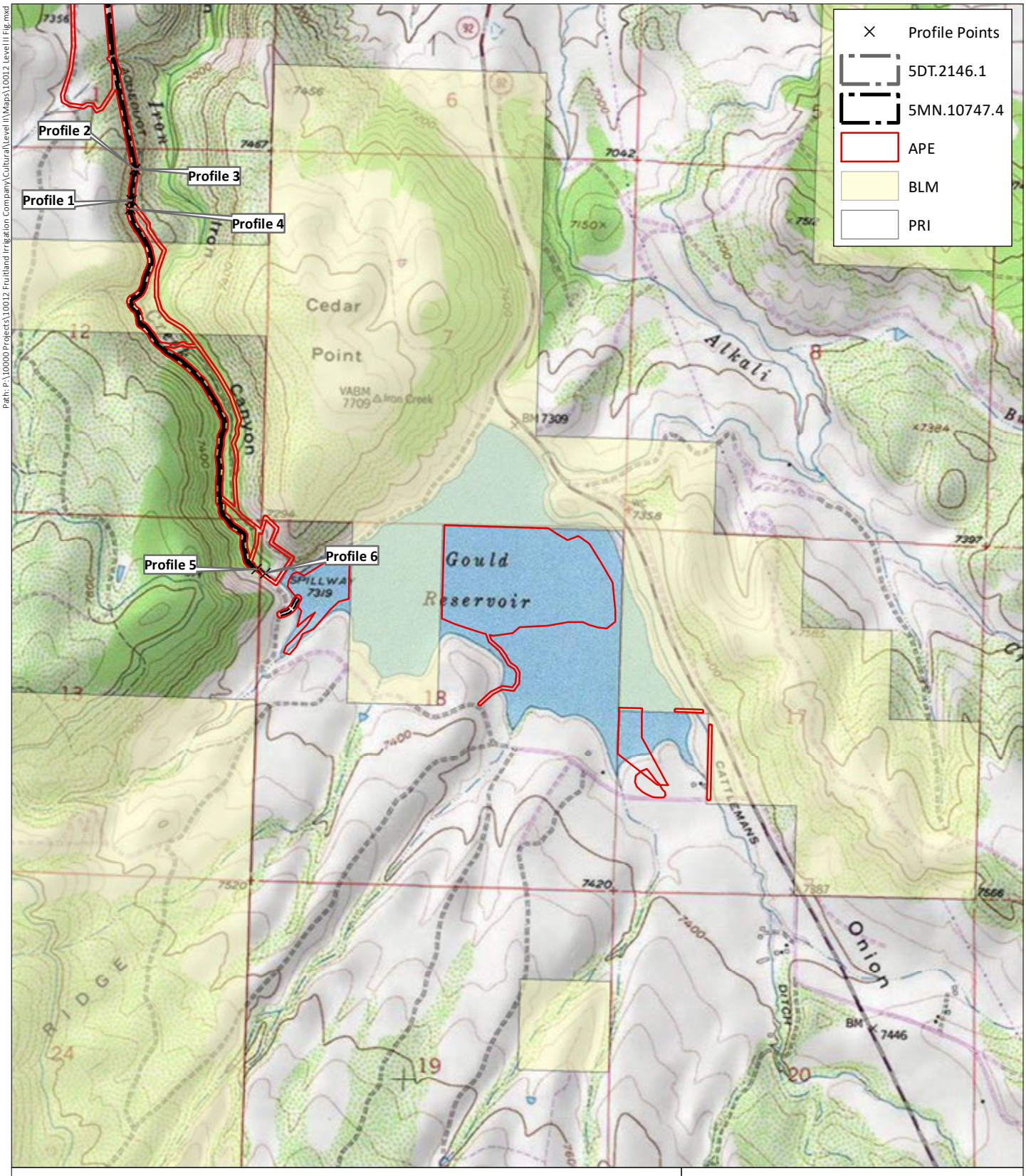


Figure 35. Profile 8; earthen canal at end of 5DT2146.1 east of Siphon #2 (F1).



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Level II Historic Resource Documentation
Gould Canal Segment 5MN10747.4 and 5DT2146.1
Montrose and Delta Counties, Colorado

S1, 12-13; T50N, R7W; S17-18, T50N, R6W; 6th PM
Cathedral Peak, CO USGS Quad
Montrose County, Colorado

N

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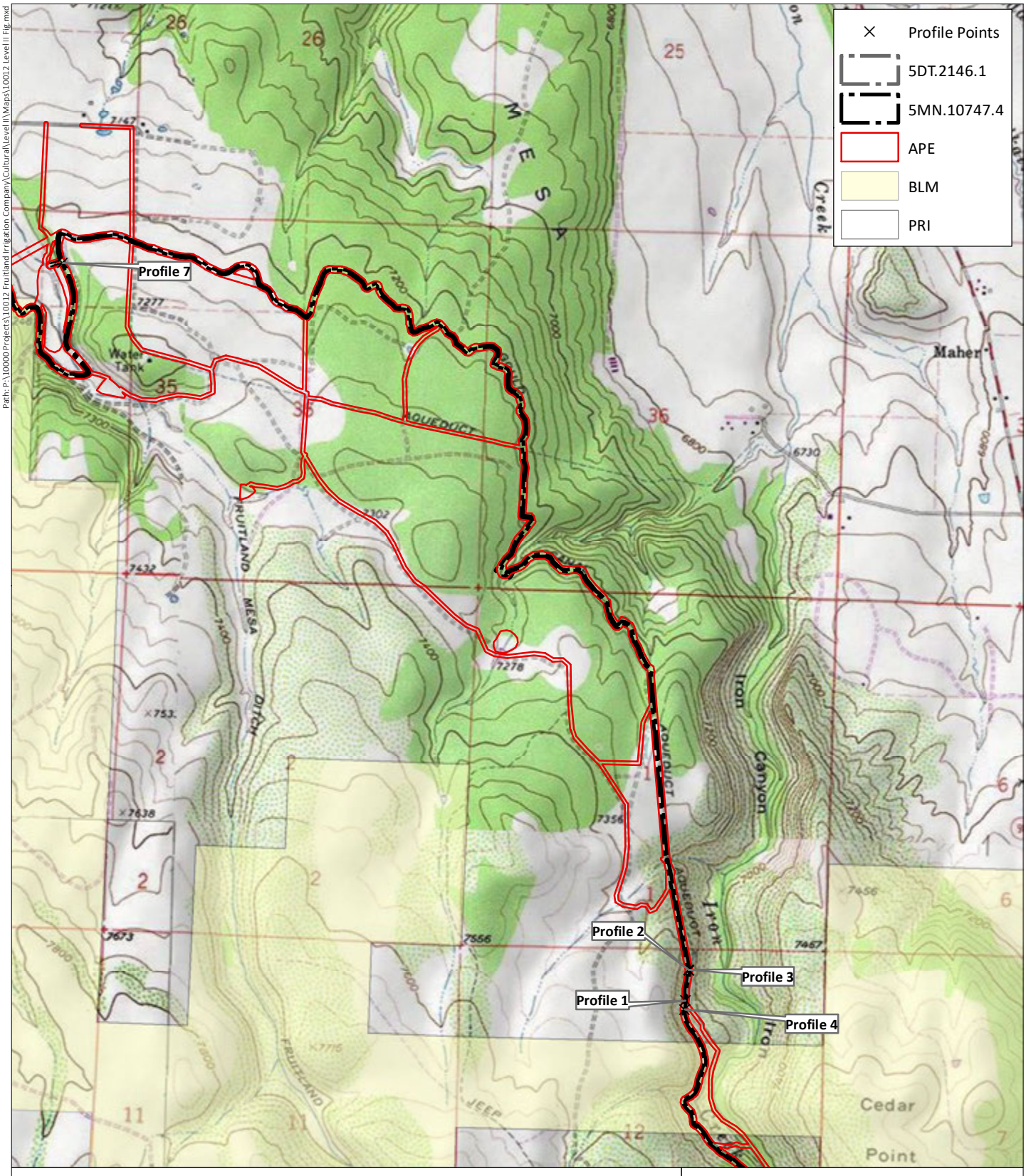
1:24,000

Figure 36
Measured Drawing Locations

Prepared for: BLM FWA
File: 10012 Level II Fig.mxd (KC)
November 14, 2019



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Level II Historic Resource Documentation
Gould Canal Segment 5MN10747.4 and 5DT2146.1
Montrose and Delta Counties, Colorado

S27, 34-36, T51N, R7W; S1- 2, 12, T50N, R7W;
6th PM; Crawford and Cathedral Peak, CO USGS Quads
Montrose County, Colorado

N

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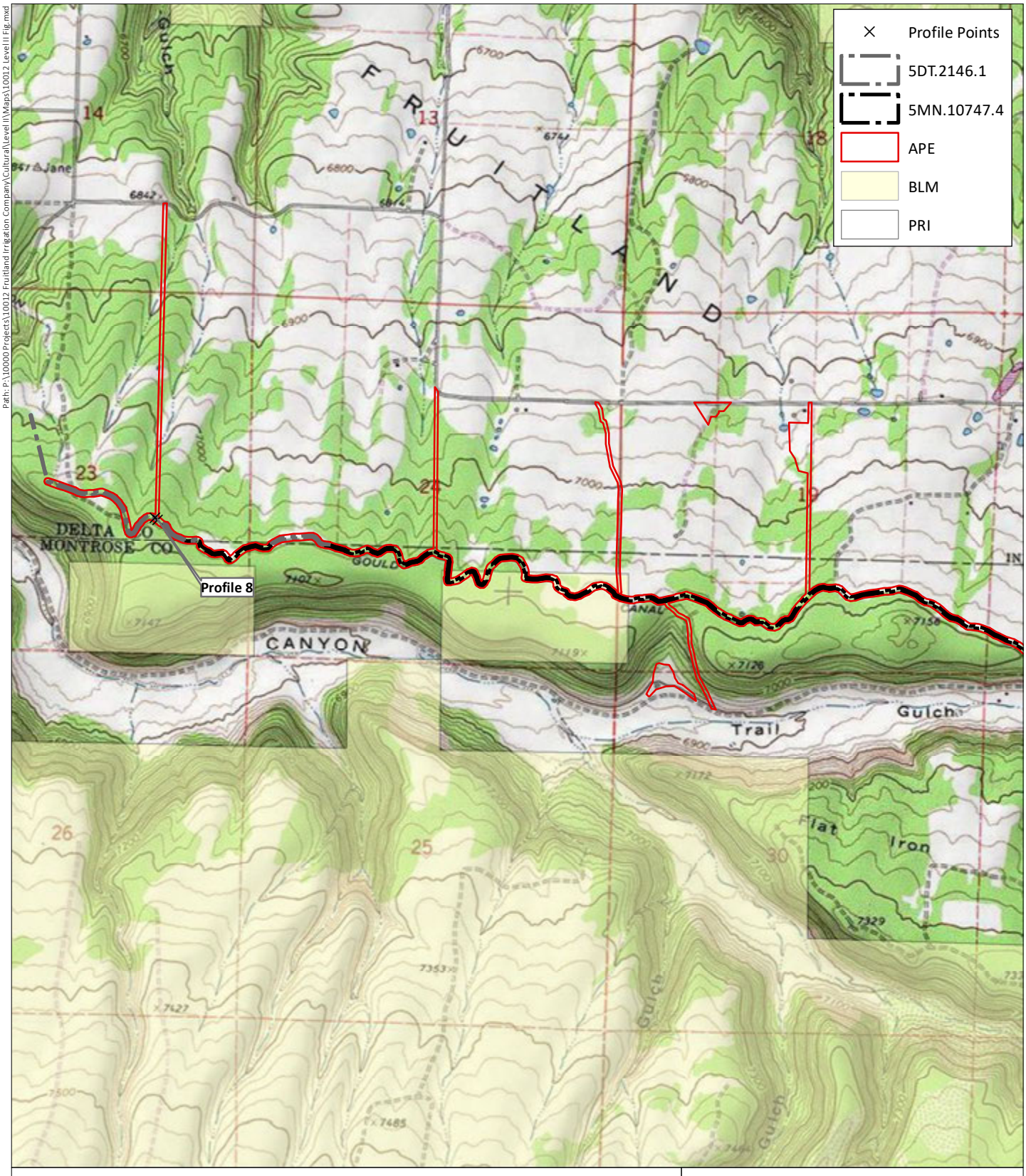
Figure 37
Measured Drawing Locations

Prepared for: BLM FWA
File: 10012 Level II Fig.mxd (KC)
November 14, 2019



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Level II Historic Resource Documentation
Gould Canal Segment 5MN10747.4 and 5DT2146.1
Montrose and Delta Counties, Colorado

S 23, 24, 30, T51N, R8W; S 19, T51N, R7W; 6th PM
Grand View Mesa, CO USGS Quad
Montrose County, Colorado

N

0 1,000 2,000 Feet

1:24,000

Figure 38
Measured Drawing Locations

Prepared for: BLM FWA
File: 10012 Level II Fig.mxd (KC)
November 14, 2019