DIVERSION STRUCTURES REPLACEMENT FEASIBILITY STUDY

Smith & Emmons Ditch Company

Schnabel Reference # 20C26044.010
July 29, 2022

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Schnabel ENGINEERING

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1.0 BACKGROUND AND PURPOSE

This report presents the results of a feasibility study completed for The Smith and Emmons Ditch Company (Smith & Emmons, or Company) in the effort to obtain a Water Project Loan from the Colorado Water Conservation Board (CWCB) for the purpose of replacing its diversion structures and measurement flume. A map showing the location of the Smith & Emmons Ditch is included as **Figure 1**.

1.1 Smith and Emmons Ditch

The Smith & Emmons is one of several ditches diverting water from Boulder Creek at a common structure located on downstream of Weld County Road 16-1/2, referred to as the Idaho Creek headgate (see **Figure 1**). Diversions at the Idaho Creek headgate provide water to the Houck #1, Delehant, Carr & Tyler, Godding, and Smith & Emmons ditches via a channel referred to as Idaho Creek. Rural Ditch, which is the next downstream diversion on Boulder Creek) flows into Idaho Creek between the Godding Ditch diversion and the Smith & Emmons Ditch diversion, approximately 250 feet upstream of the Smith & Emmons headgate. **Figure 2** shows the features in the vicinity of the Smith & Emmons diversion including the Smith & Emmons headgate, check structure and measuring flume. Water diverted into the Smith & Emmons headgate is used for agricultural and other irrigation purposes and the ditch serves as the diversion and conveyance facility for filling future reservoirs located on formerly irrigated lands mined for aggregate and reclaimed as below grade storage.

The Smith & Emmons was decreed a direct flow water right for 47.16 cfs in the original adjudication of water for Boulder Creek (Case No. 1288; Appropriation Date, June 1, 1863; Adjudication Date, June 2, 1883; Admin. No. 4900.00000). In Case No. 94CW062 conditional storage rights decreed to Aggregate Industries for the Tull Pit (a/k/a Longmont Lakes) included the Smith & Emmons as a filler ditch.

In late 2020 Smith & Emmons was notified of deficiencies of its structures by the Division of Water Resources, Division 1 Engineer's Office and ordered to make repairs. The items at issue were leakage past the headgate and a non-standard measuring flume. Without repairs, the headgate structure cannot be relied upon to shut off water from the ditch when none is desired or allowed to be diverted. Though a potential alternative solution may exist, the non-standard flume is of unknown structural competency and since it requires special handling by the State water administration officials to accurately assess the amount of water actually being diverted, continued use of that structure may ultimately be deemed unacceptable to the State.

The concrete and steel headgate structure is quite old and has undergone significant repairs and modifications previously, but that those repairs are inadequate, and water is leaking around the structure threatening its stability. Because of its present condition, it is considered non-repairable, and replacement is recommended in order to achieve long-term stability and useful life. Similarly, the measuring flume has undergone past repairs that included replacement of its side walls (resulting in non-standard converging and diverging sections and a non-standard throat section) but continued the use of the old flume floor and substructure. The condition of that substructure is unknown which introduces uncertainty as to the future reliability of the measuring flume.

Finally, the ditch diversion system includes an informal check structure constructed with precast concrete blocks partially stabilized with rebar driven into the bed of Idaho Creek and requiring manual installation and removal of long check boards to control the level of the headwater on the headgate structure. While

not threatened with imminent failure, the long-term stability of the existing check is questionable, and its replacement is therefore under consideration by the ditch company. In order to protect it water supply, Smith & Emmons wishes to undertake such improvements to its diversion facilities as are necessary to achieve reliable access to its water right.

Appendix A contains photos of the three existing structures taken in December 2020.

2.0 PROJECT SPONSOR

The Smith and Emmons Ditch Company is a mutual ditch company organized by the owners in a previously unincorporated ditch through Articles of Incorporation dated June 1, 1946. The Company By-Laws were amended in February 1993 to add an article dealing with requirements pertaining to changes of water rights. A copy of Company's Articles of Incorporation and By-Laws are included in **Appendix B**. Officers of the Company including contact information are listed in **Table 2-1**. The Company has eight (8) total shares of stock outstanding, and five (5) shareholders as shown in **Table 2-2**.

Table 2-1: The Smith and Emmons Ditch Company – Directors

Name	Title	Contact Information
Eric Engelhard	President	303-772-0250; eric@tpcolorado.com
Erin Kunkel	Vice-President	303-253-2558; erin.kunkel@martinmarietta.com
Angie Swanson	Secretary/Treasurer	303-776-7207; angie@dangrantbookkeeping.com

Table 2-2: The Smith and Emmons Ditch Company – Shareholders

Shareholder	Number of Shares	Entity Type
Engelhard, William	1.000	Agricultural Irrigator
Lighthouse Cove HOA	0.264	Residential HOA
City of Longmont	2.500	Municipality
Martin Marietta Materials, Inc.	3.500	Industrial
Water Users Association of District No. 6	0.736	Association of Water Rights Holders
	8.000	

Smith & Emmons' revenues are currently $16,000 per year derived from annual assessments of $2,000 per share, plus a very small amount of interest. The company's financial position is presented in **Appendix C** which contains Smith & Emmons' financial statements for the past three years (2019, 2020 and 2021). The Company employs a part-time Superintendent who operates and maintains the ditch and appurtenant structures.

A total of 4.236 shares (1 share owned by Longmont, 2.5 shares owned by Martin Marietta, and the 0.736 shares owned by District 6) are committed to three 1980's era augmentation agreements for replacement of evaporative losses from unlined reclaimed gravel pit ponds. This commitment is equivalent to a 24.97 cfs pro-rata portion of the 47.16 cfs water right, leaving 22.29 cfs for other uses.

3.0 STRUCTURE REPLACEMENT ALTERNATIVES

Given the straight-forward nature of Smith & Emmons diversion replacement needs, the alternatives available for consideration for this feasibility study are somewhat limited. Therefore, the approach taken is to consider three forms of alternatives, a "no-action" alternative, alternative combinations of component (headgate, measurement and check) replacements, and combinations of component replacements including upgraded control and data acquisition. These three "alternatives" are discussed further in the following sections.

3.1 No-Action Alternative

Under the no-action alternative, Smith & Emmons would continue to use the existing diversion, check and measurement structure without further modifications, providing repairs and replacements and maintenance as necessary. It would provide as needed fixes to try to limit leakage at the headgate to a degree acceptable to the Division Engineer and would continue efforts to stabilize the check structure as needed delay or prevent failure. Since no modifications would be made to the existing measuring structure, this option would require that the State water administration officials accept the continued use of the existing measurement structure and it would rely on the unknown structural stability of that structure.

3.2 Structure Replacements with Manual Operation

For this alternative, Smith & Emmons would consider removal and replacement of any or all three of the diversion components with new structures. The two options for this alternative would consist of 1) replacing the headgate structure and the measuring flume, or 2) replacing both the headgate structure and the check structure with one structure providing both capabilities and replacing the measuring flume.

The replacement headgate would have a manually operated slide gate of the same size (3 ft x 4 ft) as at the existing structure and the structure would be of a similar size and configuration but with better horizontal and vertical cutoffs to reduce seepage through soils around the structure. A conceptual drawing of the replacement headgate structure is shown on **Figure 3A** and **Figure 3B**. **Table D-1** (see **Appendix D** attached) provides the current cost estimate for the replacement of the headgate structure, the total construction cost of which is estimated to be $134,400 including contingencies at 20 percent and construction oversight at 15 percent. With 20 percent of the construction plus contingencies cost added for design costs, the total cost of this component is estimated to be $158,000 (rounded to the nearest $1,000).

Replacement of the measuring structure would include removal of the existing structure and replacement with a new long-throated flume as shown on **Figure 4A** and **Figure 4B**. The replacement flume would have approximately the same capacity as the existing structure and would include a pressure transducer and data logger to record the flow data. The replacement flume with contingencies and construction engineering is estimated to cost $69,900 as shown in **Appendix D**, **Table D-2**. Adding design costs at 20 percent of construction plus contingencies, the total cost rounded to the nearest $1,000 would be $82,000. The total of all costs for replacement of both the headgate and the measurement structure, including design, is estimated to be $240,000.

The concept for including replacement of the check structure as part of the headgate replacement is shown in **Figure 5A** and **Figure 5B**. It would include a manually controlled sluice gate as well as stop logs to allow better control and easier control of the pool providing head on the headgate. Because the check structure is larger than the headgate structure, adding the check costs an additional $137,200 for a combined total construction cost for the headgate and check structure of $271,600 as shown in **Table D-3** in **Appendix D**. With design costs at 20 percent of construction plus contingencies, the total cost of this approach (rounded to the nearest $1,000) is $320,000.

The total construction cost for replacement of all three structures (headgate, check and measurement) is estimated to be $341,500 ($271,600 for the headgate and check plus $69,900 for the measuring flume). With design costs, the total project cost for this option would be $402,000.

The headgate structure is considered to have reached the end of its serviceable life. The benefit of the replacement headgate structure is that it will provide the start of a new, multi-decadal life (with maintenance, on the order of 50+ years for the bulk of the structure and 30+ years for the slide gate). The benefit of the flume replacement is that accurate measurements can be obtained, and the Company can know that each day it is receiving the amount of water which it desires and to which it is legally entitled. The existing check structure depends on the existing light rebar anchorage to keep the precast blocks in place and requires use of long, difficult to manage check boards. Replacing that structure would add operational certainty and prolonged life (the same as for the headgate structure) as well as provide ease of operation and improved safety for the current and future Superintendents.

3.3 Structure Replacements with Powered Operation and Automation

For this alternative, the same structure replacements are proposed, but with inclusion of the following optional a la carte additional items: powered gate operators for the headgate and for the check structure sluice gate, remote access to the flow measurement data, and automated control of the headgate using the measuring flume flow data. **Table 3-1** and **Table D-4 (Appendix D)** shows the estimated costs of the individual upgrades considered as part of this alternative.

Table 3-1: Additional Costs for Optional Upgrades

Item	Additional Cost
1. Remote Flow Data Access	$5,000
2. Motorized Lift – Headgate	$20,000
3. Motorized Lift – Check	$20,000
4. Headgate Automation	$5,000

Costs include contingencies, design and construction engineering.
Remote Flow Data Access cost may involve additional monthly access fees.

These added options if included in the final project would provide the benefit of having easily operable gates, remote access to the flow rate being delivered down the ditch and having the headgate adjust automatically to maintain a set flow rate.

4.0 ANALYSIS OF ALTERNATIVES

4.1 No Action Alternative

The no action alternative is the lowest immediate cost option. In the short-term, the direct cost of the no-action alternative is not quantified but would generally be low, consisting of periodic earthwork to try to limit leakage around the headgate structure, additional efforts to try to stabilize the precast concrete check structure blocks, and possibly repairs to the floor of the measuring flume. However, this alternative does not mitigate the risk of a catastrophic, unplanned failure of one or both of the diversion components, most likely when the system is in use and being depended upon for diversions. The failure would produce temporary or long-term loss of water delivery for irrigation and other uses. The eventual cost from such failure would likely be equal to the cost of the replacement alternatives described in the following sections, but at future costs which would be expected to be higher. Social and environmental impacts include a negative impact on the agricultural economy in the South Platte basin resulting from a more limited agricultural water supply, and loss of the ability to manage flows through storage for other beneficial uses.

4.2 Structure Replacements with Manual Operation

Replacement of the headgate and measuring flume would mitigate the risk of failure of those structures, would provide long-life, reliable, and low maintenance diversion and measurement structures, and would satisfy the State water administration requirements for accurate measurement of diverted flows. Being provided with manually operated gates, operations would still require in-person visits by the Company Superintendent to adjust the diversion flow rate for delivery to the shareholders.

Likewise, replacement of the check structure would mitigate against its possible failure and would improve the Superintendent's ability to control the check pool level for making diversions into the ditch and would improve safety of operation, reducing the risk of injury to the Superintendent when adjusting the check. Depending on which structures are included, total estimated costs range from $158,000 to $402,000.

4.3 Structure Replacements with Remote Data Access, Powered Operation and Automation

This alternative would provide the same mitigation of risk of failure, operational benefits, and safety improvements as the previous alternative but additionally would provide further ease of operation through motorized gate lifts, remote access to flow data, and the opportunity to automate the headgate to deliver a set flow rate based on transient hydraulic conditions rather than have the diversion rate fluctuate as the head upstream of the gate fluctuates due to Rural Ditch and Godding Ditch flow rate adjustments. Depending on which structures are included, and which options are added, total estimated costs range from $188,000 to $452,000.

4.4 Summary of Alternatives Costs

Depending on the combinations of options included, a total of fifteen alternative projects can be considered, the total costs of which range from $158,000 to $452,000 as shown in **Table 4-1**. The costs shown in **Table 4-1** are to complete the design and construction of the project and do not include the approx. $38,550 already invoiced and paid for. Those charges include $5,185 for the work to rate the existing non-standard measuring flume to allow for the possible continuation of its use, preparation of conceptual plans for the replacement of all three structures, investigating funding options, etc.

Additionally, current unbilled work on this feasibility study and work remaining to complete the CWCB loan process is estimated to require a budget of $10,000. Including the previous work and the CWCB feasibility study/loan process the overall project costs are estimated to range from approximately $206,550 to $500,550.

Table 4-1: Total Costs of Potential Alternatives

Alternatives and Options	Replace Headgate Only	Replace Headgate and Flume	Replace Headgate, Check and Flume
Base Cost	$158,000	$240,000	$402,000
Add Remote Flow Data Access (Base + $5,000)	$163,000	$245,000	$407,000
Add Powered Gate(s) (Base + $20,000 each)	$178,000	$260,000	$422,000
Add Remote Flow Data Access and Powered Gate(s) (Base + $5,000 + $20,000 each)	$183,000	$265,000	$447,000
Add Remote Data Access, Powered Gate(s) and Headgate Automation (Base + $5,000 + $20,000 each + $5,000)	$188,000	$270,000	$452,000

Note: Total Costs include estimated construction costs with 20% contingency, design at 20% and construction engineering at 12-15%. Headgate replacement includes one gate. Headgate and Check replacement includes two gates. See Section 4.4 for discussion of additional engineering costs incurred and considered as part of the total project costs.

5.0 SELECTED ALTERNATIVE

Smith & Emmons' preferred alternative for improving its diversion system is to replace all three structures (headgate structure, check structure and measuring flume), providing manually controlled gates, and adding remote access to the flow measurement data, at a total cost estimated to be $407,000 for construction and remaining design and construction engineering. This project alternative satisfies the need for mitigating against possible failure of the headgate and/or check, provides modern long-life structures requiring a minimum of future maintenance and repairs, satisfies the State's water administration requirements, and provides remote flow monitoring. Replacing the check as part of the new headgate structure is the most efficient approach as it avoids the redundancy of one portion of headgate wing wall that would be required if the check were not built along with the headgate and reduces multiple mobilizations of a contractor as compared to separate projects over time. Including the prior charges, current unbilled work, and future work to complete the CWCB loan process (approximately $48,550 combined) the total project cost is estimated to be $455,550. Should the Company determine to do so, it could add motorized headgate gate lifts for the two gates, and automate the headgate, for an estimated additional $30,000.

Depending on timing, which may be significantly affected by Smith & Emmons' attempt to apply for and receive approval for a Water Supply Revolving Fund Grant (assumed to be for up to $50,000), Smith and Emmons will complete the design work and begin engaging contractors for bids this summer and fall, seeking to complete construction of the project prior to April 1, 2023. If the opportunity for a grant seems likely but will require extended time to complete that process, Smith & Emmons may finish the design work, grant processing, and contractor engagement during late 2022 and 2023, and then go to construction in the fall of 2023. Whenever construction does occur, Smith & Emmons will coordinate with Rural Ditch as it seeks to do work in Idaho Creek required for replacement of the headgate and check, which at that location also conveys Rural Ditch's diversions.

6.0 FINANCIAL FEASIBILITY ANALYSIS

The total estimated project cost of $455,550 for the selected alternative is proposed to be funded by a CWCB loan in the amount of $410,000, representing 90 percent of the total. The prior charges and current unbilled work are sufficient to cover the Company's 10 percent match.

Addition of the one percent loan origination fee of $4,100 would bring the total financed amount to $414,100. The term and rate for the CWCB loan to finance the purchase are requested to be 30 years and 3.9 percent (weighted based on the makeup of the Smith & Emmons shareholders). At this rate, annual loan payments would be $23,658. Smith & Emmons would deposit $2,366 per year (10% of the annual payment) over the initial 10 years of the loan term to be used to make the final annual payment.

The Company's 2022 annual budget for management and general operations is $16,000. In order to finance the structures replacement project, Smith & Emmons will be required to increase its budget and its assessments from $2,000 to $5,000 per share in 2024, or 2.5 times the current assessment.

Table 6-1 on the following page presents an evaluation of Smith & Emmons' budget requirements over the term of a 30-year loan to finance the construction project. In the analysis, it is assumed that the additional costs are to be borne by the existing Company shareholders through increased assessments and does not rely on any projected membership growth or additional future income. A long-term average inflation rate of 3 percent and an earnings interest rate of 0.05 percent are assumed for the analysis. Future general expenses and assessments are assumed to escalate at the rate of inflation.

As shown in **Table 6-1** shows, the projected difference between annual revenues and expenses grows over time producing funds that can be used for operations and escrowed for maintenance and repairs. During the 30 years of the loan term, the total difference is approximately $480,000. Alternatively, the Company could reduce future assessments should the excess outpace its operational needs.

Table 6-1: Smith & Emmons Ditch Company - Schedule of Revenue and Expenditures for Selected Alternative
Headgate, Check and Flume Replacement, plus Remote Data Access

	Annual Revenues				Annual Expenditures						
Year of Repayment	Total Revenue Required	Revenue from Assessments	Revenue from Water Fees	Total Revenue	Annual General Expenses	Reserve Fund Deposit	Reserve Fund Balance	Interest on Reserve Funds	CWCB Loan Payments	Total Annual Expenses	Excess/ (Shortage)
2024	$ 42,997	$ 42,436	$ -	$ 42,436	$ 16,974	$ 2,366	$ 2,366	$ 1	$ 23,658	$ 42,997	$ (561)
2025	$ 43,506	$ 43,709	$ -	$ 43,709	$ 17,484	$ 2,366	$ 4,732	$ 2	$ 23,658	$ 43,506	$ 203
2026	$ 44,028	$ 45,020	$ -	$ 45,020	$ 18,008	$ 2,366	$ 7,098	$ 4	$ 23,658	$ 44,028	$ 992
2027	$ 44,567	$ 46,371	$ -	$ 46,371	$ 18,548	$ 2,366	$ 9,464	$ 5	$ 23,658	$ 44,567	$ 1,804
2028	$ 45,123	$ 47,762	$ -	$ 47,762	$ 19,105	$ 2,366	$ 11,830	$ 6	$ 23,658	$ 45,123	$ 2,639
2029	$ 45,695	$ 49,195	$ -	$ 49,195	$ 19,678	$ 2,366	$ 14,196	$ 7	$ 23,658	$ 45,695	$ 3,500
2030	$ 46,284	$ 50,671	$ -	$ 50,671	$ 20,268	$ 2,366	$ 16,562	$ 8	$ 23,658	$ 46,284	$ 4,387
2031	$ 46,891	$ 52,191	$ -	$ 52,191	$ 20,876	$ 2,366	$ 18,928	$ 9	$ 23,658	$ 46,891	$ 5,300
2032	$ 47,516	$ 53,757	$ -	$ 53,757	$ 21,503	$ 2,366	$ 21,294	$ 11	$ 23,658	$ 47,516	$ 6,240
2033	$ 48,160	$ 55,369	$ -	$ 55,369	$ 22,148	$ 2,366	$ 23,660	$ 12	$ 23,658	$ 48,160	$ 7,209
2034	$ 46,458	$ 57,030	$ -	$ 57,030	$ 22,812	0	$ 23,660	$ 12	$ 23,658	$ 46,458	$ 10,572
2035	$ 47,143	$ 58,741	$ -	$ 58,741	$ 23,497	0	$ 23,660	$ 12	$ 23,658	$ 47,143	$ 11,598
2036	$ 47,847	$ 60,504	$ -	$ 60,504	$ 24,201	0	$ 23,660	$ 12	$ 23,658	$ 47,847	$ 12,656
2037	$ 48,573	$ 62,319	$ -	$ 62,319	$ 24,927	0	$ 23,660	$ 12	$ 23,658	$ 48,573	$ 13,746
2038	$ 49,321	$ 64,188	$ -	$ 64,188	$ 25,675	0	$ 23,660	$ 12	$ 23,658	$ 49,321	$ 14,867
2039	$ 50,092	$ 66,114	$ -	$ 66,114	$ 26,446	0	$ 23,660	$ 12	$ 23,658	$ 50,092	$ 16,022
2040	$ 50,885	$ 68,097	$ -	$ 68,097	$ 27,239	0	$ 23,660	$ 12	$ 23,658	$ 50,885	$ 17,212
2041	$ 51,702	$ 70,140	$ -	$ 70,140	$ 28,056	0	$ 23,660	$ 12	$ 23,658	$ 51,702	$ 18,438
2042	$ 52,544	$ 72,244	$ -	$ 72,244	$ 28,898	0	$ 23,660	$ 12	$ 23,658	$ 52,544	$ 19,700
2043	$ 53,411	$ 74,412	$ -	$ 74,412	$ 29,765	0	$ 23,660	$ 12	$ 23,658	$ 53,411	$ 21,001
2044	$ 54,304	$ 76,644	$ -	$ 76,644	$ 30,658	0	$ 23,660	$ 12	$ 23,658	$ 54,304	$ 22,340
2045	$ 55,223	$ 78,943	$ -	$ 78,943	$ 31,577	0	$ 23,660	$ 12	$ 23,658	$ 55,223	$ 23,720
2046	$ 56,171	$ 81,312	$ -	$ 81,312	$ 32,525	0	$ 23,660	$ 12	$ 23,658	$ 56,171	$ 25,141
2047	$ 57,146	$ 83,751	$ -	$ 83,751	$ 33,500	0	$ 23,660	$ 12	$ 23,658	$ 57,146	$ 26,605
2048	$ 58,151	$ 86,264	$ -	$ 86,264	$ 34,505	0	$ 23,660	$ 12	$ 23,658	$ 58,151	$ 28,112
2049	$ 59,187	$ 88,852	$ -	$ 88,852	$ 35,541	0	$ 23,660	$ 12	$ 23,658	$ 59,187	$ 29,664
2050	$ 60,253	$ 91,517	$ -	$ 91,517	$ 36,607	0	$ 23,660	$ 12	$ 23,658	$ 60,253	$ 31,264
2051	$ 61,351	$ 94,263	$ -	$ 94,263	$ 37,705	0	$ 23,660	$ 12	$ 23,658	$ 61,351	$ 32,911
2052	$ 62,482	$ 97,090	$ -	$ 97,090	$ 38,836	0	$ 23,660	$ 12	$ 23,658	$ 62,482	$ 34,608
2053	$ 40,001	$ 100,003	$ -	$ 100,003	$ 40,001	$ (23,660)	$ -	$ -	$ 23,660	$ 40,001	$ 36,342

Assumptions (2021 Basis)	
Shares	8
Initial Annual Assessment	$ 5,000
2022 General Budget	$ 16,000
Other Revenues	$ -
Inflation	3%
Interest on Reserves	0.05%

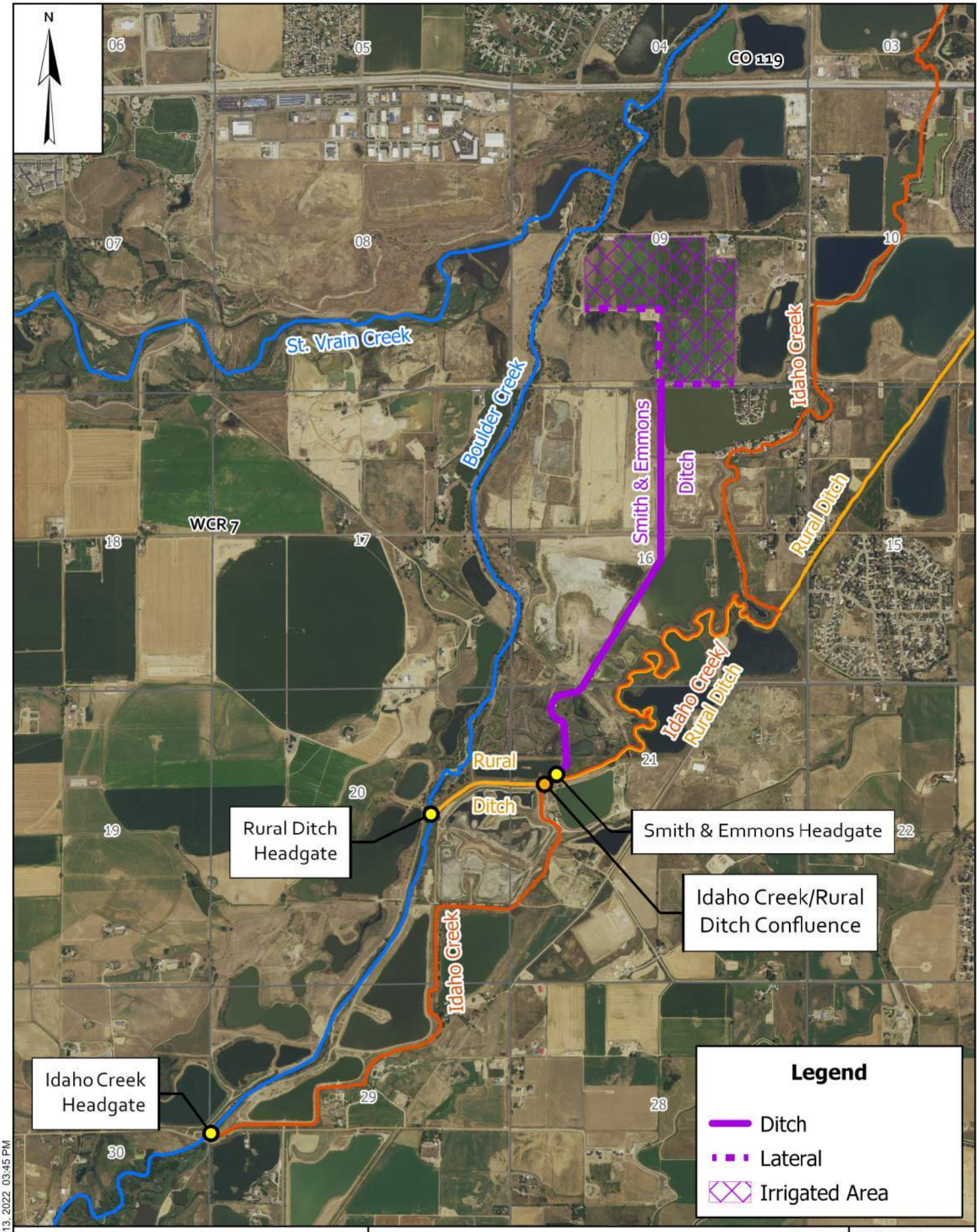
Total Project Cost	$ 455,550
Company Match	$ 41,450

Loan Financing	
Source	CWCB Loan
Principal + Origination Fee	$ 414,100
Interest Rate	3.90%
Loan Term (years)	30
Annual Payment	$ 23,658
Reserve Deposit	$ 2,366

7.0 CONCLUSION AND RECOMMENDATION

This report documents The Smith and Emmons Ditch Company's need for and benefits from replacement of its diversion and measurement infrastructure. Smith & Emmons intends on pursuing the preferred alternative of replacing the existing headgate, check, and measuring flume structures to create durable, long-lasting, easily operated, accurate and safe structures that will serve the Company well for the future. The shareholders are willing to increase the annual assessments as necessary to fund the improvements, demonstrating Smith and Emmons' ability to meet the repayment obligations and therefore, Smith & Emmons' application for a Construction Fund loan is recommended to the CWCB for board approval.

FIGURES



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SMITH & EMMONS DITCH
Location Map

FIGURE NO. 1

JOB NO: 20C26044.010

SCALE: 1 inch = 2,250 ft

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N

0 300 600 Feet

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SMITH & EMMMONS DITCH
Diversion Vicinity Map

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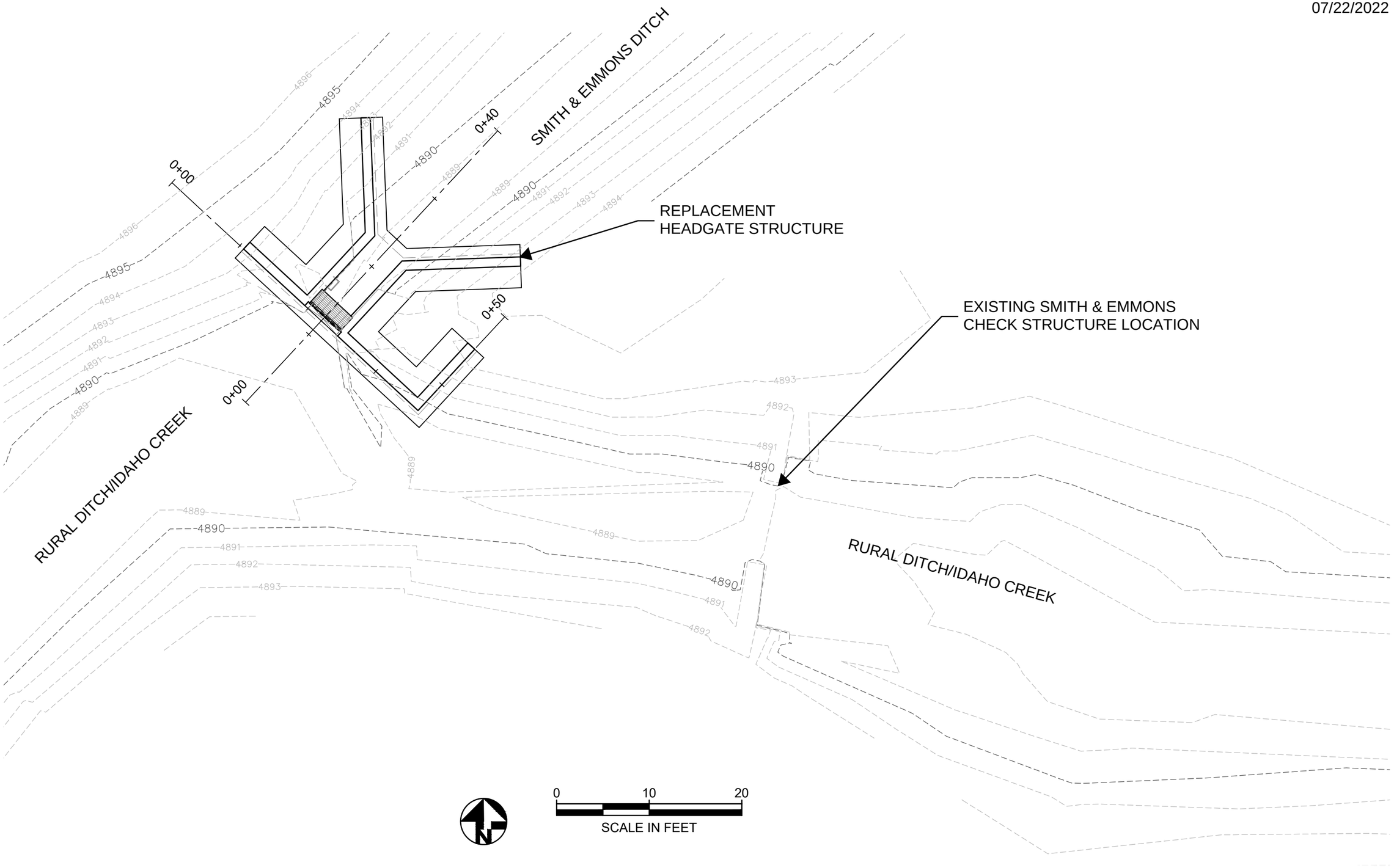
SCALE: 1 inch = 300 ft

FIGURE NO. 2

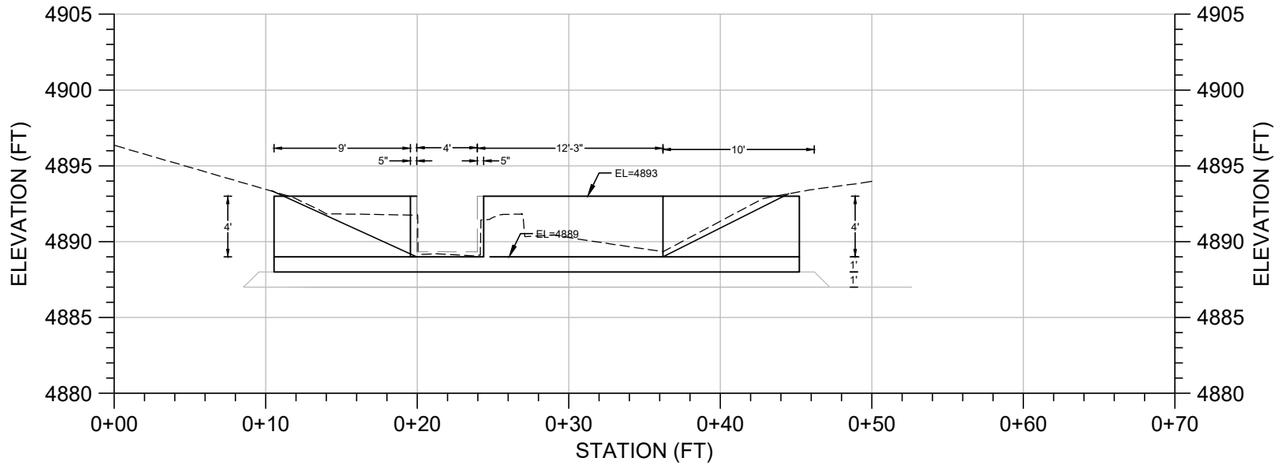
07/22/2022



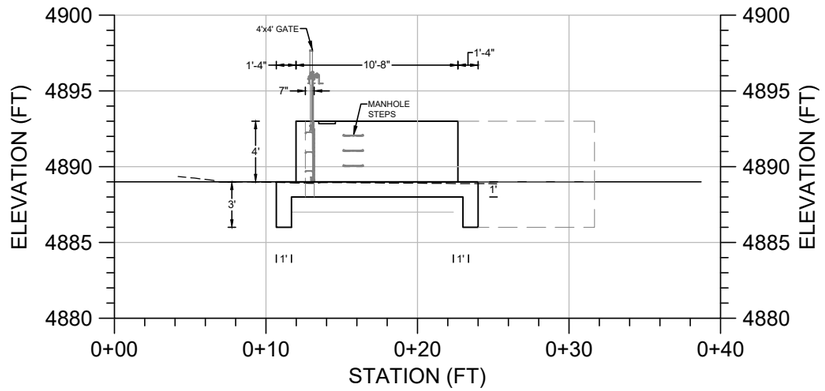
REPLACEMENT HEADGATE STRUCTURE
PLAN VIEW

FIGURE 3A

07/22/2022



HEADGATE A PROFILE

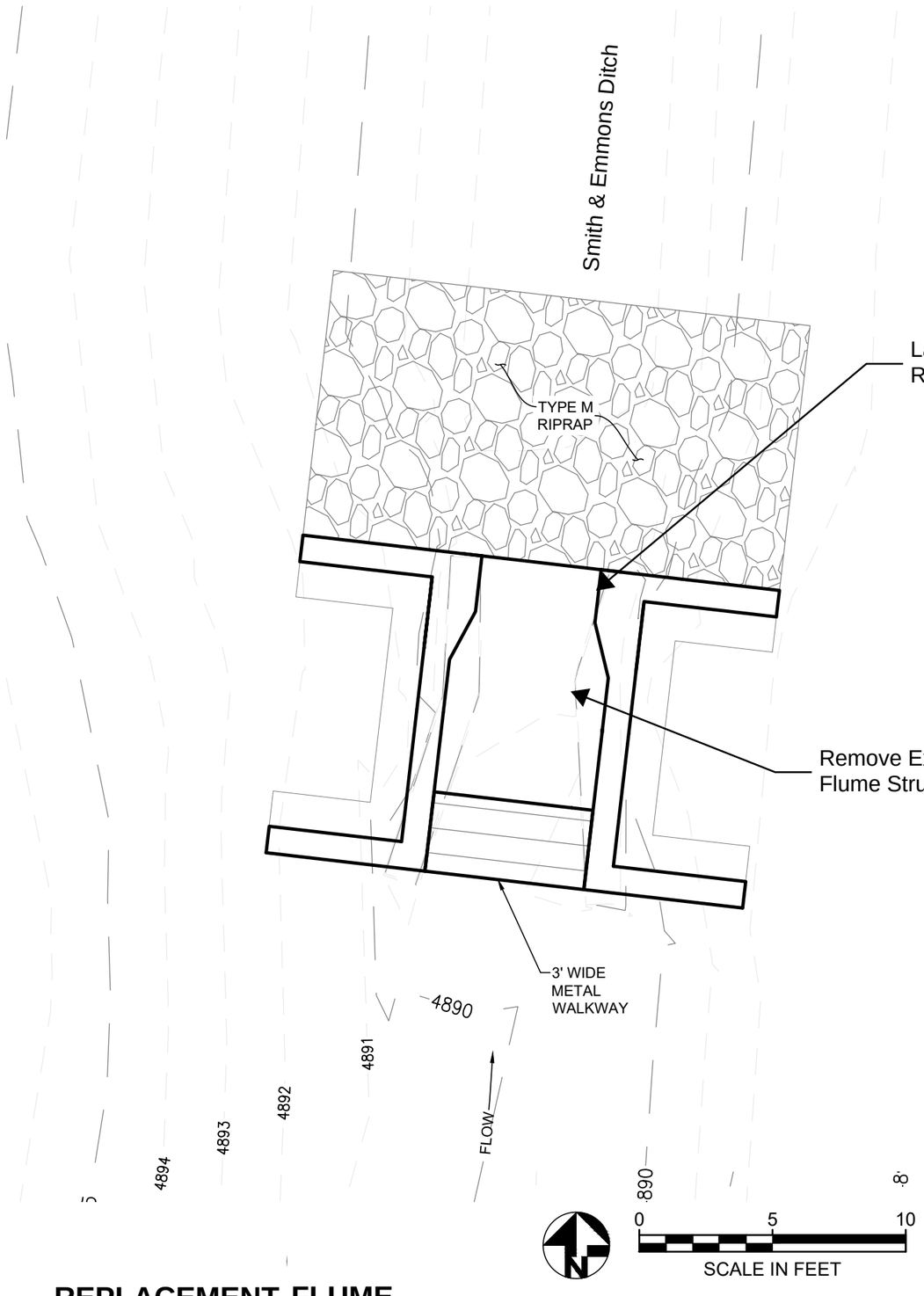


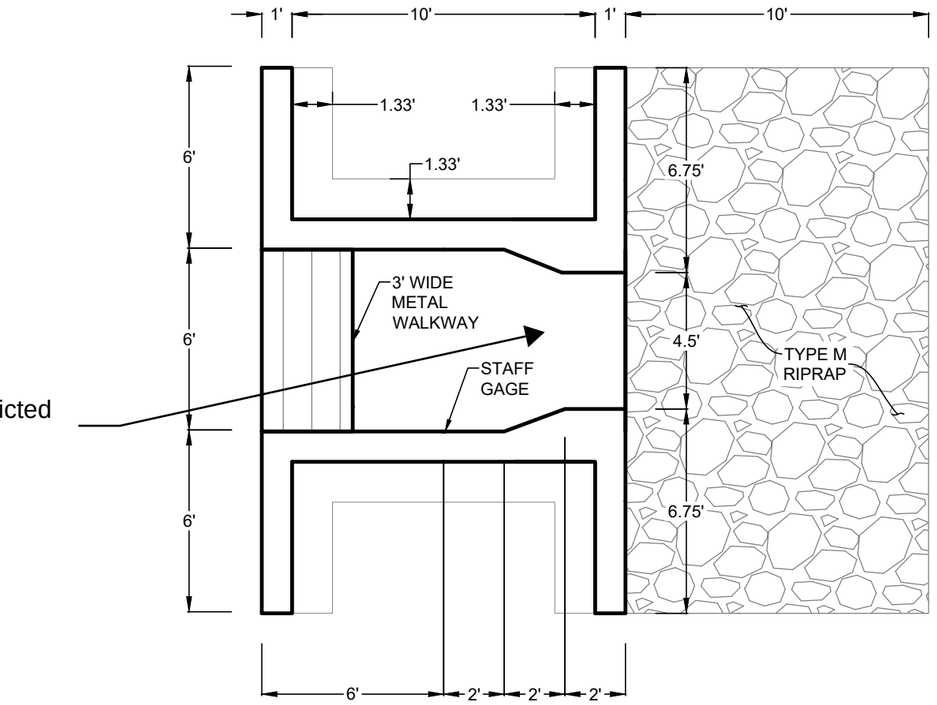
DIVERSION - PROFILE

REPLACEMENT HEADGATE STRUCTURE CROSS-SECTIONS

FIGURE 3B

07/22/2022

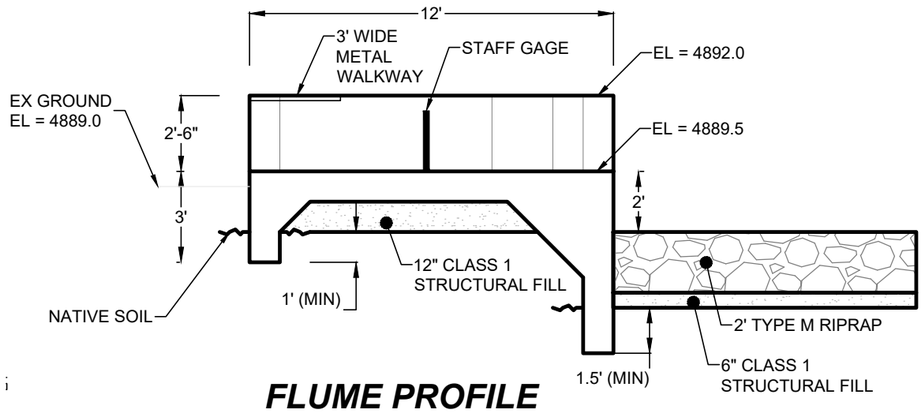




FLUME PLAN

0 5 10

SCALE IN FEET



FLUME PROFILE

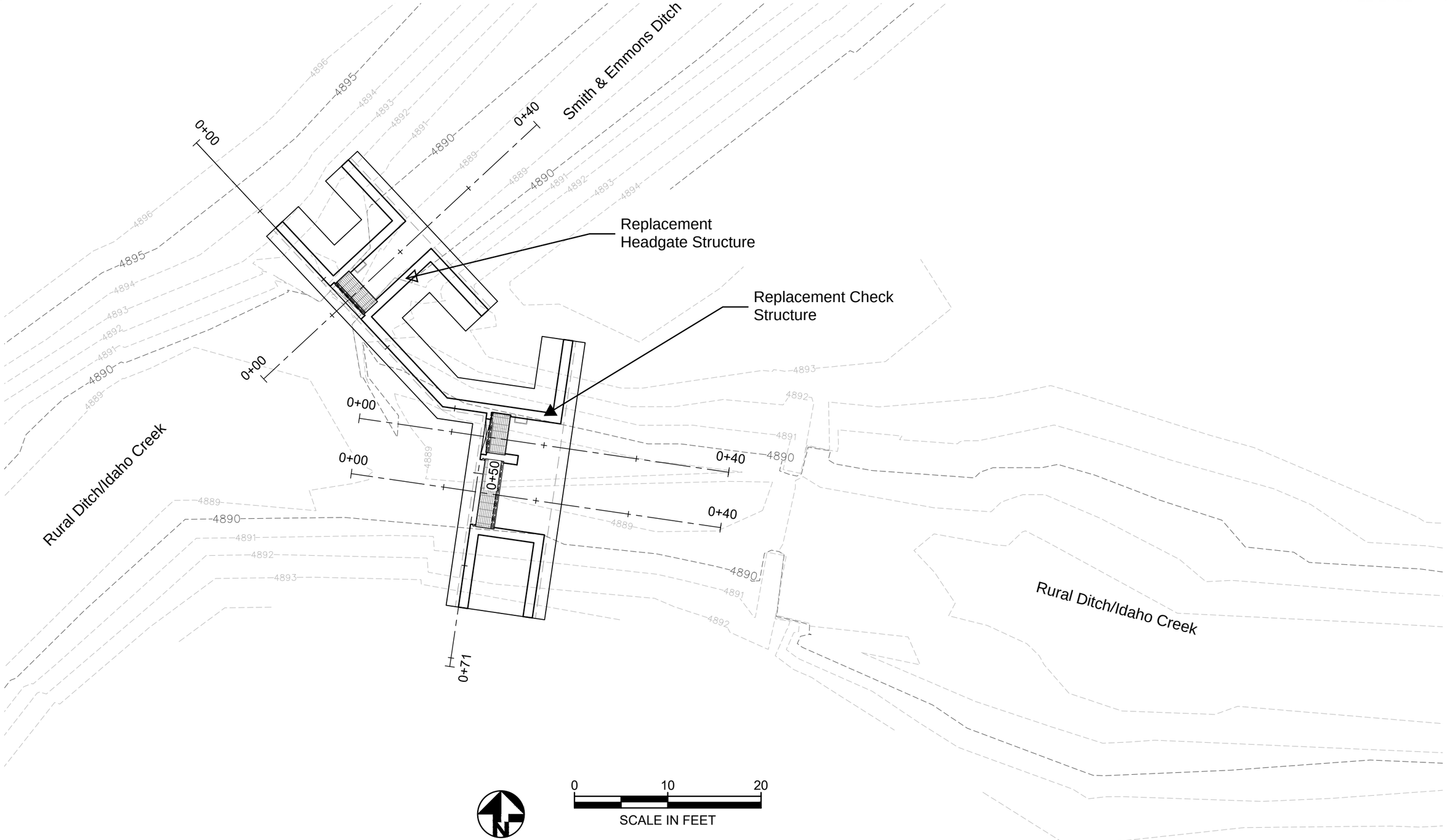
0 5 10

SCALE IN FEET

REPLACEMENT FLUME PLAN AND DETAILS

FIGURE 4

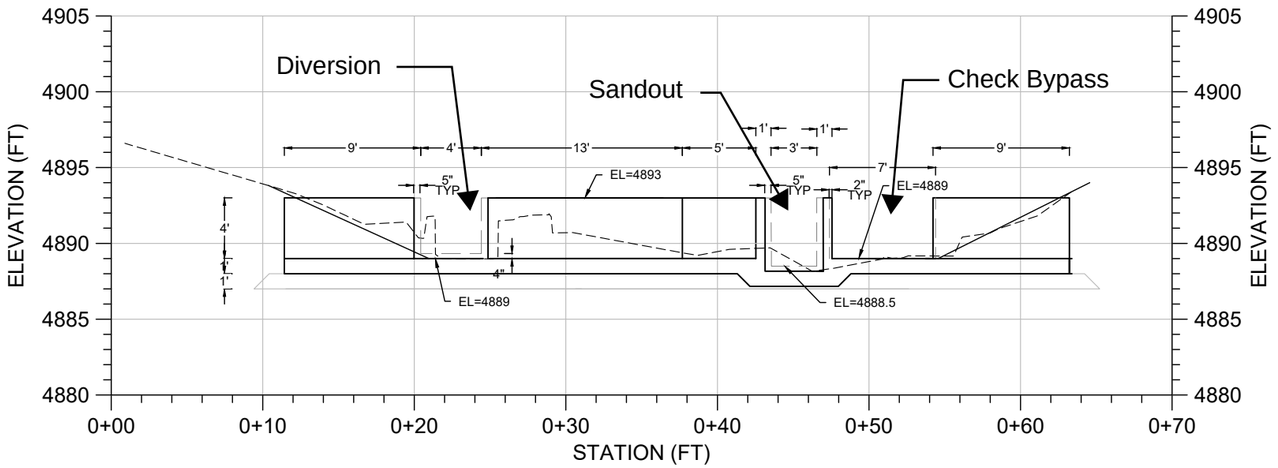
07/22/2022



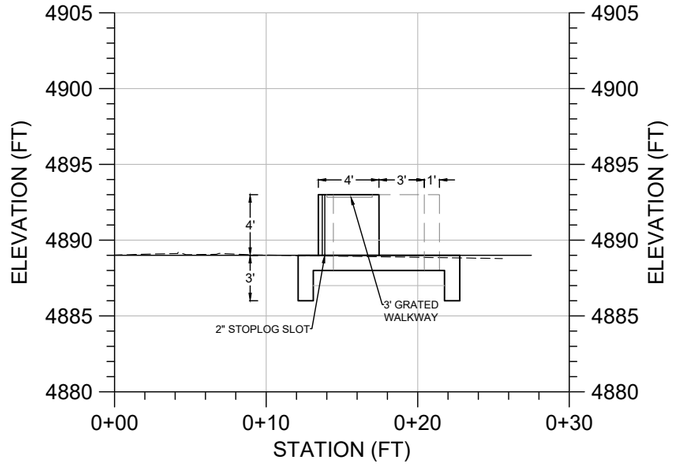
HEADGATE AND CHECK REPLACEMENT
PLAN VIEW

FIGURE 5A

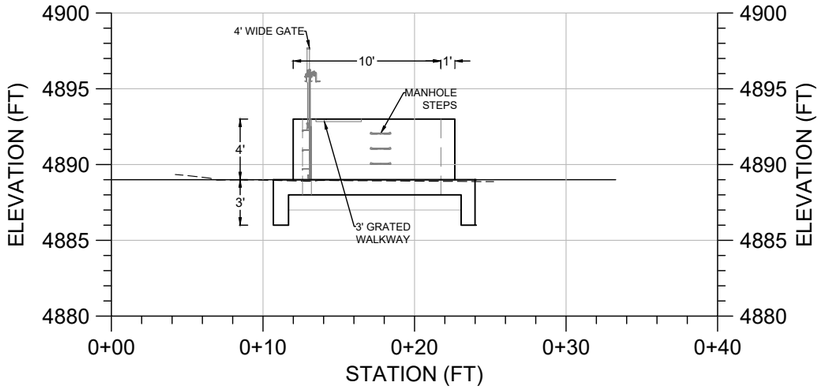
07/22/2022



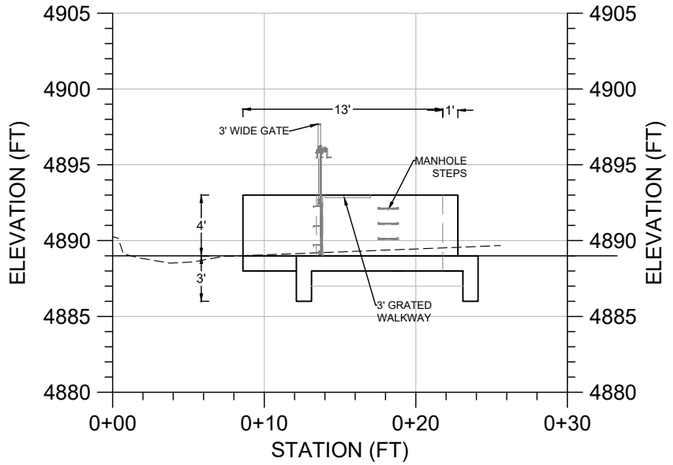
HEADGATE A PROFILE



CHECK - PROFILE



DIVERSION - PROFILE



SANDOUT - PROFILE

HEADGATE AND CHECK REPLACEMENT CROSS-SECTIONS

FIGURE 5B

APPENDIX A

PHOTOS OF EXISTING SMITH AND EMMONS DITCH STRUCTURES

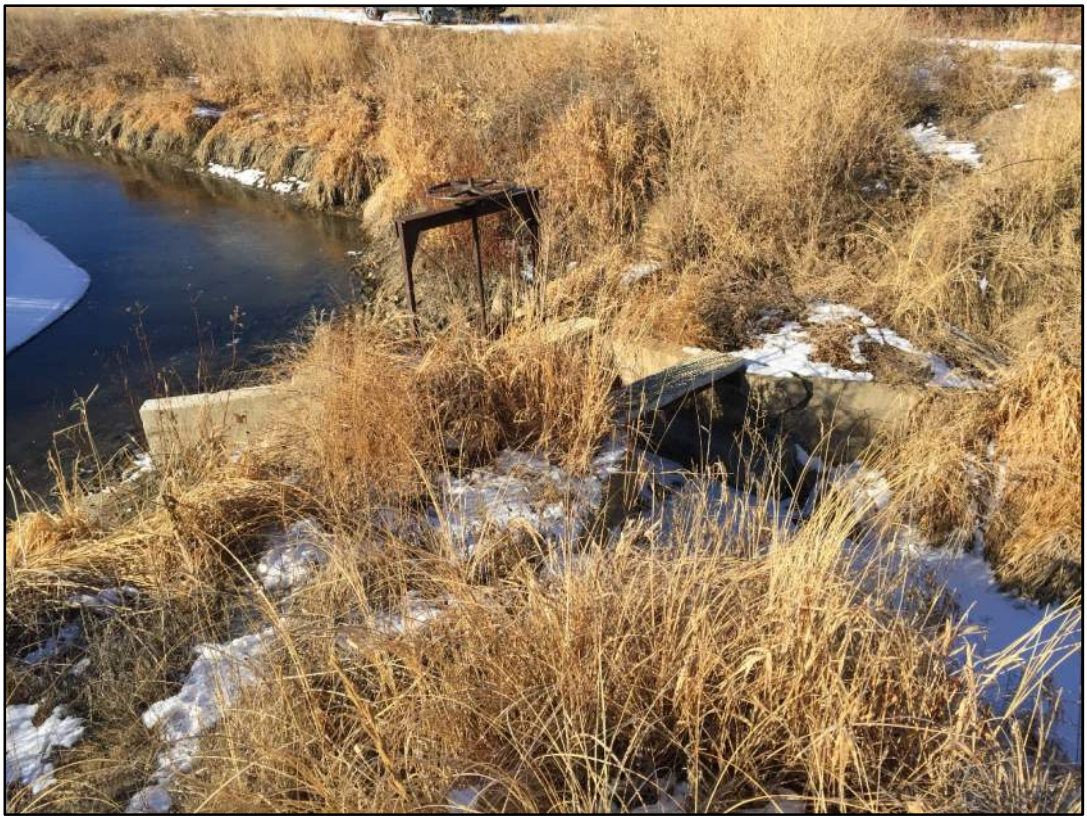


Photo 1: Smith and Emmons Ditch Headgate

Photo 2: Smith and Emmons Ditch Headgate - Detail

Photo 3: Smith and Emmons Ditch Check Structure

Photo 4: Smith and Emmons Ditch Check Structure - Detail

Photo 5: Smith and Emmons Ditch Measuring Flume

Photo 6: Smith and Emmons Ditch Measuring Flume - Throat Detail

APPENDIX B

THE SMITH AND EMMONS DITCH COMPANY COMPANY DOCUMENTS

SS: FORM D2 NP (Rev. 7/90)
Submit in duplicate
Fee: $25.00

This document must be typewritten

NONPROFIT

MAIL TO:
COLORADO SECRETARY OF STATE
CORPORATIONS OFFICE
1560 Broadway, Suite 200
Denver, Colorado 80202
(303) 894-2251

for office use only

FILED COPY
931112514 $25.00
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ARTICLES OF AMENDMENT TO THE ARTICLES OF INCORPORATION

Pursuant to the provisions of the Colorado Nonprofit Corporation Act, the undersigned corporation adopts the following Articles of Amendments to its Articles of Incorporation:

FIRST: The name of the corporation is the Smith and Emmons Ditch Company (NOTE 1)

SECOND: The following amendment of the Articles of Incorporation was adopted on the 2nd day of March 19 93, in the manner prescribed by the Colorado Nonprofit Corporation Act, according to the procedure marked with an X below:

X a quorum of members was present at such meeting, and the amendment received at least two-thirds of the votes which members present or represented by proxy were entitled to cast.

_____ such amendment was adopted by a consent in writing signed by all members entitled to vote with respect thereto.

_____ there are no members, or no members entitled to vote thereon, such amendment received the vote of a majority of the directors in office.

NINTH:

A director of the corporation shall not be personally liable to the corporation or its stockholders for monetary damages for breach of fiduciary duty as a director, except for liability arising from (i) any breach of the director's loyalty to the corporation or its stockholders, (ii) acts or omissions not in good faith or which involve intentional misconduct or a knowing violation of any law, (iii) any transaction from which the director derived any improper personal benefit, or (iv) any other act expressly proscribed or for which directors are otherwise liable under the Colorado Corporation Code. Any repeal or modification of this paragraph (section) by the stockholders of the corporation shall not adversely affect any right or protection of a director of the corporation existing at the time of such repeal or modification.

William L Engelhardt
Its _____ President

and Margaret E. Hill
Its _____ Secretary

TH

MAY - 1 1993

Note (1) If this is a change of name amendment, the name to be typed in PARAGRAPH *FIRST* is the corporate name before this amendment is filed.

ARTICLES OF INCORPORATION

OF

THE SMITH AND EMMONS DITCH COMPANY

(Not for Pecuniary Profit)

KNOW ALL MEN BY THESE PRESENTS, That **ALBERT HAKONSON, LEE POWELL and HARVEY POTTS,** all residents of the Counties of Weld and Boulder and State of Colorado, and citizens of the United States, being desirous of associating ourselves for the lawful purpose hereinafter set forth, and not for pecuniary profit, do hereby under and by virtue and in conformance of the provisions of Article 13 of Chapter 41 of the 1935 Colorado Statutes Annotated, entitled "Corporations Not For Profit," avail ourselves of its provisions, and associate ourselves together, and we do hereby make, sign and acknowledge this, our certificate in writing, of our intention so to become a body corporate not for pecuniary profit, and we do state and set forth:

FIRST:

The name by which such corporation shall be known to law is **THE SMITH AND EMMONS DITCH COMPANY.**

SECOND:

The particular business and objects for which it is formed are as follows:

(a) To acquire by purchase, condemnation or other lawful means, and to operate and maintain for the use and mutual benefit of the members of the corporation that certain irrigating ditch known as the "Smith and Emmons Ditch," taking water from the "Boulder Creek," for the purpose of supplying water to the members of this company for irrigation and domestic uses; said members to be owners, lessees or persons interested in the land to be supplied by said ditch.

(b) To enlarge and extend said ditch at any time deemed necessary or expedient by said company.

(c) To do all things incident to or usual in the business of the maintenance and operation of a mutual ditch company, and to levy and collect, pro-rata, all such assessments as from time to time shall be necessary for the enlargement, repairs, maintenance and superintendence of the said ditch, and for the purpose of defraying any expenses and indebtedness of the company not provided for otherwise.

(d) To take, own and convey real estate the same as a natural person, and to purchase, acquire, hold or sell, convey, mortgage and dispose of the same as the Board of Directors in their judgment may think either necessary or convenient for the purpose for which the company was organized, and to promote its business.

(e) To take over, operate, carry on and continue the affairs and business of the unincorporated organization now operating said ditch under the name and

style of "The Smith and Emmons Ditch Company" and to give and grant to the parties in said organization the same rights and privileges in this corporation, pro-rata, as they would be entitled to in the aforementioned organization.

THIRD:

The number of directors to have control and management of the affairs of the said corporation shall be three, and the names of those selected for the first year of its existence are **ALBERT HAKONSON, LEE POWELL and HARVEY POTTS,** and the directors of said company shall have power from time to time to make such by-laws not inconsistent with the laws of this State as they shall deem proper for the management of the affairs of the said company for the maintenance of its business.

FOURTH:

The stream or source from which the water is to be taken for the purpose mentioned in this certificate is the Boulder Creek at a point or place which is the headgate of "The Highland South Side Ditch" and of "The Smith and Emmons Ditch," a well defined landmark located on the east bank of said creek near the west quarter (W¼) corner of section twenty-nine (29), in township two (2) north of range sixty-eight (68) west of the 6th P.M., in Weld County, Colorado, from which point said water is taken through the Little Idaho Creek, a well defined channel and landmark, and running in a general northeasterly direction to a point in the northeast quarter (NE¼) of the northwest quarter (NW¼) of section twenty-one (21), in township two (2) north of range sixty-eight (68) west of the 6th P.M., in said county, which is the headgate of the "Smith and Emmons Ditch" as now located and constructed. From last mentioned point or place the line of this company's said ditch as near as may be is as follows: Beginning at said last mentioned headgate, running thence in a general northerly direction across part of section twenty-one (21) and across section sixteen (16), to the north line of said section 16, all in township two (2) north of range sixty-eight (68) west of the 6th P.M., in said county, which said ditch is a well defined channel and landmark. Also that certain waste ditch beginning at a headgate or box in said Smith and Emmons Ditch at a point on the line dividing the north half (N½) from the south half (S½) of the northeast quarter (NE¼) of said section 16 running thence east along said line to the Little Idaho Creek.

Said ditch and waste ditch as now existing, until the Board of Directors shall further determine by resolution or by-law to operate and maintain other extensions and branches of said ditch, shall be the extent of the ditch to be maintained and operated by this company.

FIFTH:

This corporation shall have a first lien on all the rights and shares of the registered holder thereof for any and all indebtedness of such stockholder to the corporation, whether due and payable or not due and payable at the time when the corporation shall seek to enforce such lien, and whether such indebtedness to the corporation occurred before or after such stockholder became a stockholder of the company, and such lien shall continue until such indebtedness shall have been

paid in full, and such stock shall not be transferred on the books of the corporation until such indebtedness shall be paid.

SIXTH:

The principal office of said company shall be kept at the City of Longmont, in said County of Boulder in the said state, and the principal business of said company shall be carried on in the said County of Weld.

SEVENTH:

For the purpose of fixing, apportioning and evidencing the respective rights and interests of members of this corporation who may be designated as stockholders, there shall be issued rights or shares in the corporation not exceeding eight (8) in number, and certificates therefor shall be given in manner and form as prescribed by the by-laws, and said rights or shares shall be deemed personal property and shall be assignable, transferable and subject to alienation in the same manner as any other personal property.

EIGHTH:

In the election of directors or in any other matters requiring action by stockholders of this corporation, cumulative voting shall be allowed.

IN WITNESS WHEREOF, We have to this certificate respectively, signed our names this first day of June, 1946.

/s/ Albert Hakonson

/s/ Lee Powell

/s/ Harvey Potts

State of Colorado)
) ss.
County of Boulder)

The foregoing instrument was acknowledged before me this first day of June, 1946, by ALBERT HAKONSON, LEE POWELL and HARVEY POTTS.

Witness my hand and official seal.

My commission expires August 15th, 1948.

/s/ Clara M. Mathews
Notary Public

MAY - 1 1993

AMENDMENT TO THE ARTICLES OF INCORPORATION

NINTH:

A director of the corporation shall not be personally liable to the corporation or its stockholders for monetary damages for breach of fiduciary duty as a director, except for liability arising from (i) any breach of the director's loyalty to the corporation or its stockholders, (ii) acts or omissions not in good faith or which involve intentional misconduct or a knowing violation of any law, (iii) any transaction from which the director derived any improper personal benefit, or (iv) any other act expressly proscribed or for which directors are otherwise liable under the Colorado Corporation Code. Any repeal or modification of this paragraph (section) by the stockholders of the corporation shall not adversely affect any right or protection of a director of the corporation existing at the time of such repeal or modification.

Adopted by the Shareholders at the annual meeting on March 2, 1993.

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AMENDMENT TO THE BY-LAWS
OF
THE SMITH AND EMMONS DITCH COMPANY

WHEREAS, the Smith and Emmons Ditch Company ("Company") was organized to provide irrigation water to its shareholders.

WHEREAS, changes of water rights which reduce the amount of water carried in the Smith and Emmons Ditch may result in injury to the Company and the Company's shareholders.

WHEREAS, in order to prevent said injury from occurring, the Company will incur expense which is borne by all of the shareholders of the Company.

WHEREAS, the shareholders not seeking a change of water rights will not benefit from a change of water rights.

WHEREAS, the adoption of this amendment to the By-Laws of the Company shall allow changes of the Company's water rights while reducing the expense to the Company and its shareholders.

NOW, THEREFORE, the Directors adopt the following Amendment to the By-Laws of the Company:

1. A new Article XVII is adopted:

ARTICLE XVII

Changes of Water Rights

Any stockholder ("applicant") desiring a change of water right, including, but not limited to, a change in point of diversion or place of use of any water that the applicant is entitled to receive as a result of stock ownership must first make a written application therefore to the Directors of the Company. A change of water right shall include the use of water the shareholder is entitled to as a result of stock ownership as augmentation water in a plan for augmentation or exchange. The request should detail the requested change and include adequate terms and conditions to prevent injury to the Company and its shareholders. If, in the reasonable opinion of the Directors, such change may be approved without injury to the Company and all of its stockholders, the Directors shall then approve the change application subject to necessary terms and conditions. In evaluating whether the requested change of water rights can be made without injury to the Company and its shareholders, the Company may obtain an engineering and legal analysis of the requested change by the applicant and the terms and conditions offered by the applicant.

The Company shall evaluate the application for change of water right with diligence and reach a decision within a reasonable amount of time.

No application for approval of a change of water right or plan for augmentation as described above may be made to the District Court for Water Division No. 1, State of Colorado ("Water Court"), unless the same has been approved by the Company. If an application has been approved by the Company, the applicant must include terms and conditions at least as stringent as those

approved by the Company in an application to the District Court for Water Division No. 1, State of Colorado.

An applicant for a change of water right must reimburse the Company for the Company's reasonable costs and fees in analyzing the application to the Company and in any judicial litigation that follows, including a challenge to the Company's denial of an application. Prior to obtaining legal and engineering analyses of the proposed change, the Company shall obtain an estimate of the costs. The Company shall obtain said estimates of cost within 30 days of submission of an application and the applicant shall have 30 days after receipt of the estimate from the Company to make the deposit. The Company shall not take final action on any application until, and unless, the applicant makes said deposit. If the estimate and deposit needs to be adjusted by further payment or reimbursement, said adjustment shall be made upon the completion of the analysis. In no event shall the Company be required to finally approve or disapprove the application until all fees incurred by the Company are reimbursed.

If any portion of this Article XVII is declared void by a court of law, the remaining portions of this by-law shall remain in full force and unaffected.

2. Article XVII shall take effect as of Feb 18, 1993

William Engelhard

William Engelhard, President

Margaret Hill

Margaret Hill, Secretary

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NONPROFIT

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ELECTION TO ACCEPT
the Colorado Nonprofit Corporation Act

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Pursuant to the provisions of the Colorado Nonprofit Corporation Act, the undersigned Corporation elects to adopt the provisions of the Colorado Nonprofit Corporation Act and does hereby state that:

1. The name of the Corporation is the Smith and Emmons Ditch Company.

2. All required reports have been or will be filed, and all fees, taxes and penalties due to the State of Colorado accruing under any act to which the Corporation has been subject have been paid.

3. On the 2nd day of March, 1993, the Stockholders of the Corporation, a quorum being present, voted to accept the Colorado Nonprofit Corporation Act, and such acceptance is authorized by at least 2/3 of the votes of the shareholders present at the meeting.

4. The Corporation followed the requirements of the law under which it was organized in effecting acceptance of the Colorado Nonprofit Corporation Act.

5. The street address of the registered office in Colorado is 4739 Weld County Road 22, Longmont, Colorado 80504 and the name of the registered agent at such address is Margaret Hill.

6. The following are the names and addresses of the officers and directors of the Corporation.

Name	Title	Address
William L. Engelhard	Director	10477 Weld County Road 7 Longmont, Colorado 80504
Jay L. Groom	Director	9777 Weld County Road 7 Longmont, Colorado 80504
Robert D. Duckworth	Director	2719 Weld County Road 20½ Longmont, Colorado 80504
Margaret Hill	Secretary	4739 Weld County Road 22 Longmont, Colorado 80504

MAY - 1 1993

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7. The organizational documents of this Corporation are on file in the office of the Secretary of State of Colorado.

8. Issued shares of stock are authorized as follows:

Number of Shares Authorized	Number of Shares Issued and Outstanding
8	8

William L. Engelhard
Its President

Margaret E. Hill
Its Secretary

STATE OF COLORADO)
) ss.
COUNTY OF Boulder)

The foregoing instrument was acknowledged before me this 1st day of May, 1993, by William L. Engelhard, President and Margaret Hill, Secretary of the Smith and Emmons Ditch Company.

Witness my hand and official seal.

My commission expires: 07/19/1995.

Kim L. Kelley
Notary Public

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MAY - 1 1993

BY-LAWS OF THE SMITH AND EMMONS DITCH COMPANY

ARTICLE I.

The officers of this company shall be a president, vice-president, secretary, treasurer and superintendent. The president and vice-president shall be elected by the Board of Directors of the first meeting after the annual election, and shall hold office for one year, and until their successors are chosen. The other officers may be appointed by the Board of Directors at any regular meeting, and shall hold office at the will of the board.

ARTICLE II. The President

The president shall preside at all meetings of the company and at all directors' meetings. He shall be the chief executive officer and shall have a general oversight over the affairs of the company. He shall sign all orders upon the treasurer, and all certificates of stock. In the absence or inability to act of the president, the vice-president shall perform his duties.

ARTICLE III. The Secretary

The secretary shall keep a correct record of all meetings of the company and of the directors. He shall collect all moneys due the company and shall pay the same over to the treasurer. He shall be the custodian of the books and papers of the company, and shall countersign all orders and certificates of stock.

ARTICLE IV. The Treasurer

The treasurer shall receive all moneys of the company, and shall keep a correct account of the same and pay them out only on the order of the president, countersigned by the secretary.

ARTICLE V. The Superintendent

The superintendent shall have charge of the ditch and the repairs thereof; he shall keep the time of the laborers and report the same to the Board of Directors at each regular meeting, or whenever called upon by the president. He shall have control of all headgates and measuring boxes, and of the flow of water into the ditch, and its distribution therefrom.

In all his duties, he shall be under the supervision of the Board of Directors.

ARTICLE VI. The Meetings of Stockholders

The annual meetings of the stockholders shall be held at some suitable place in Longmont, on the fourth Monday in January, for the election of directors and for the transaction of such other business proper to come before the meeting.

Whenever a vacancy shall occur in the Board of Directors, the remaining directors shall fill such vacancy by appointment, for the remainder of the year. Special meetings of the stockholders may be called at any time, upon notice given in the manner provided by law for calling annual meetings, the object of such meetings to be specified in the call.

The owners of 50% or more of the capital stock of said company shall constitute a quorum at said meeting.

ARTICLE VII. The Meetings of Directors

The regular annual meeting of the Board of Directors shall be held immediately following the annual meeting of the stockholders without further notice being necessary. At all meetings of the directors two shall constitute a quorum.

ARTICLE VIII.

Rights known as shares of stock may be transferred by the holder by surrendering the certificates therefor to the secretary accompanied by an order of transfer therefor; provided, however, no certificate shall be issued for less than one full share.

ARTICLE IX. The Directors

It shall be the duty of the directors, by a majority vote, and they are hereby authorized to make all contracts that may be deemed necessary for the carrying on of all kinds of business, within the objects and purposes of the company. They shall make a memorandum of such contracts upon the minutes of the meeting and all such contracts when so made and entered of record shall be signed by the president on behalf of the company, and when so signed shall be binding upon the company.

ARTICLE X. The Assessment

All assessments shall be paid in cash within thirty (30) days after due notice thereof, and in case of failure to pay said assessment the stock shall be sold, for such an amount thereof as may be necessary to pay said tax or indebtedness together with cost of sale.

Stock shall be sold to highest bidder after having been duly advertised for thirty (30) days. Any money remaining shall be paid over to the party whose stock was sold.

Unpaid assessments shall draw interest at the rate of ten percent per annum from date until paid.

No transfer of stock shall be made upon the order of any stockholder from whom assessments are due or who is in any way indebted to the company.

No stockholder shall be entitled to water from the company's irrigation system until all past due assessments are paid.

ARTICLE XI.

These by-laws may be altered, amended or repealed at any meeting of the Board of Directors by a majority vote of all the directors.

ARTICLE XII.

The company adopts as its corporate seal a circular disc with its name thereon and the word "Seal" in the center.

ARTICLE XIII.

Certificates of the capital stock in said company shall be issued to the following persons:

Jesse Powell	1½ shares
Joseph Thompson	1½ shares
Lee Powell	1 share
Harvey Potts	1 share
Ward Burrett	1 share
Alice Jewett	1 share
James and Albert Hakonson	1 share

ARTICLE XIV. The Certificates of Stock

In case of loss of original certificates of stock, in this company, and for which a new or duplicate certificate in this company may be desired, the secretary shall require proof of such loss and upon the giving of an indemnity bond in double the value of the stock, such bond in no case to be less in amount than one thousand dollars, and to be approved by the president or secretary, a new certificate of stock of this company or duplicate certificate in this company may be issued.

ARTICLE XV. The Salaries

The secretary and superintendent shall receive such salary as the Board of Directors may from time to time determine.

ARTICLE XVI.

Each individual stockholder shall construct and maintain his or her own dividing box and any necessary bridges across the company's ditch, each such boxes or bridges shall be so constructed and maintained that it will not unreasonably interfere with the flow of water in said ditch. No construction shall cause the channel of said ditch to be less than four feet in width. No new headgates,

checks or other structures shall be constructed in the ditch without the written consent of the holders of a majority of the stock of the company.

ARTICLE XVII. Changes of Water Rights

Any stockholder ("applicant") desiring a change of water right, including, but not limited to, a change in point of diversion or place of use of any water that the applicant is entitled to receive as a result of stock ownership must first make a written application therefore to the Directors of the Company. A change of water right shall include the use of water the shareholder is entitled to as a result of stock ownership as augmentation water in a plan for augmentation or exchange. The request should detail the requested change and include adequate terms and conditions to prevent injury to the Company and its shareholders. If, in the reasonable opinion of the Directors, such change may be approved without injury to the Company and all of its stockholders, the Directors shall then approve the change application subject to necessary terms and conditions. In evaluating whether the requested change of water rights can be made without injury to the Company and its shareholders, the Company may obtain an engineering and legal analysis of the requested change by the applicant and the terms and conditions offered by the applicant.

The Company shall evaluate the application for change of water right with diligence and reach a decision within a reasonable amount of time.

No application for approval of a change of water right or plan for augmentation as described above may be made to the District Court for Water Division No. 1, State of Colorado ("Water Court"), unless the same has been approved by the Company. If an application has been approved by the Company, the applicant must include terms and conditions at least as stringent as those approved by the Company in an application to the District Court for Water Division No. 1, State of Colorado.

An applicant for a change of water right must reimburse the Company for the Company's reasonable costs and fees in analyzing the application to the Company and in any judicial litigation that follows, including a challenge to the Company's denial of an application. Prior to obtaining legal and engineering analyses of the proposed change, the Company shall obtain an estimate of the costs. The Company shall obtain said estimates of cost within 30 days of submission of an application and the applicant shall have 30 days after receipt of the estimate from the Company to make the deposit. The Company shall not take final action on any application until, and unless, the applicant makes said deposit. If the estimate and deposit needs to be adjusted by further payment or reimbursement, said adjustment shall be made upon the completion of the analysis. In no event shall the Company be required to finally approve or disapprove the application until all fees incurred by the Company are reimbursed.

If any portion of this Article XVII is declared void by a court of law, the remaining portions of this by-law shall remain in full force and unaffected.

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APPENDIX C

THE SMITH AND EMMONS DITCH COMPANY
COMPANY FINANCIALS

APPENDIX D

COST ESTIMATE TABLES

TABLE D-1: SMITH & EMMONS DITCH COMPANY - HEADGATE STRUCTURE REPLACEMENT
30% Design: ENGINEER'S OPINION OF PROBABLE COST
July 2022

	Construction Item	Quantity	Unit	Unit Cost	Extension
1	Mobilization, Bonding, Insurance @ 10%	1	LS	$8,900	$8,900
2	Site Work, Dewatering and Grading	1	LS	$5,000	$5,000
3	Rural Ditch/Idaho Creek Water Handling	1	LS	$10,000	$10,000
4	Demolition	1	LS	$2,000	$2,000
5	Structural Concrete	30	CY	$1,600	$48,000
6	Galvanized Steel Grating	1	LS	$1,000	$1,000
7	4' x 4' Slide Gate	1	LS	$13,375	$13,400
8	Type M Riprap with Bedding and Filter Fabric	30	CY	$104	$3,100
9	Site Cleanup and Grade Access Road	1	LS	$2,000	$2,000
10	Erosion Control	1	LS	$2,000	$2,000
11	Revegetation	1	LS	$2,000	$2,000
				Sub-Total Construction Items	$97,400
				Unlisted and Contingencies @ 20%	$19,500
				Total Construction Items	$116,900
	Construction Engineering @ 15%	1	LS	$17,535	$17,500
				CONSTRUCTION SUBTOTAL	**$134,400**
	Design Engineering @ 20%	1	LS	$23,380	$23,400
				ESTIMATED TOTAL (rounded to nearest $1,000)	**$158,000**

Table D-2: SMITH & EMMONS DITCH COMPANY - MEASURING FLUME REPLACEMENT
30% Design: ENGINEER'S OPINION OF PROBABLE COST
July 2022

	Construction Item	Quantity	Unit	Cost	Extension
1	Mobilization, Bonding, Insurance @ 10%	1	LS	$4,600	$4,600
2	Site Work, Dewatering and Grading	1	LS	$2,000	$2,000
3	Demolition	1	LS	$2,000	$2,000
4	Structural Concrete	20	CY	$1,600	$32,000
5	Galvanized Steel Grating	1	LS	$1,000	$1,000
6	Flume Monitoring Equipment	1	LS	$3,000	$3,000
7	Type M Riprap with Bedding and Filter Fabric	30	CY	$104	$3,100
8	Site Cleanup and Grade Access Road	1	LS	$1,000	$1,000
9	Erosion Control	1	LS	$1,000	$1,000
10	Revegetation	1	LS	$1,000	$1,000
				Sub-Total Construction Items	$50,700
				Unlisted and Contingencies @ 20%	$10,100
				Total Construction Items	$60,800
	Construction Engineering @15%	1	LS	$9,120	$9,100
				CONSTRUCTION SUBTOTAL	**$69,900**
	Design Engineering @ 20%	1	LS	$12,160	$12,200
				ESTIMATED TOTAL (rounded to nearest $1,000)	**$82,000**

TABLE D-3: SMITH & EMMONS DITCH COMPANY - HEADGATE AND CHECK REPLACEMENT
30% Design: ENGINEER'S OPINION OF PROBABLE COST
July 2022

	Construction Item	Quantity	Unit	Cost	Extension
1	Mobilization, Bonding, Insurance @ 10%	1	LS	$18,400	$18,400
2	Site Work, Dewatering and Grading	1	LS	$10,000	$10,000
3	Rural Ditch/Idaho Creek Water Handling	1	LS	$20,000	$20,000
4	Demolition	1	LS	$3,000	$3,000
5	Structural Concrete	70	CY	$1,600	$112,000
6	Galvanized Steel Grating	1	LS	$2,000	$2,000
7	4' x 4' Slide Gate	1	LS	$13,375	$13,400
8	3' x 4' Slide Gate	1	LS	$9,125	$9,100
9	Type M Riprap with Bedding and Filter Fabric	60	CY	$104	$6,200
10	Site Cleanup and Grade access Road	1	LS	$2,000	$2,000
11	Erosion Control	1	LS	$3,000	$3,000
12	Revegetation	1	LS	$3,000	$3,000
				Sub-Total Construction Items	$202,100
				Unlisted and Contingencies @ 20%	$40,400
				Total Construction Items	$242,500
	Construction Engineering @ 12%	1	LS	$29,100	$29,100
				CONSTRUCTION SUBTOTAL	**$271,600**
	Design Engineering @ 20%	1	LS	$48,500	$48,500
				ESTIMATED TOTAL (rounded to nearest $1,000)	**$320,000**

TABLE D-4: SMITH & EMMONS DITCH COMPANY - ADDITIONAL COSTS FOR OPTIONAL UPGRADES
30% Design: ENGINEER'S OPINION OF PROBABLE COST

July 2022

	Construction Item	Quantity	Unit	Cost	Extension
1	Add Remote Data Access	1	LS	$5,000	$5,000
2	Add Motorized Gate Operator at Headgate	1	LS	$20,000	$20,000
3	Add Motorized Gate Operator at Check	1	LS	$20,000	$20,000
4	Add Headgate Automation	1	LS	$5,000	$5,000

Sub-Total Construction Items	$50,000
Unlisted and Contingencies	(included)
Total Construction Items	$50,000
ESTIMATED TOTAL (rounded to nearest $1,000)	**$50,000**