Feasibility of Reconstruction of the Chicosa Siphon Oxford Farmers' Ditch Company

Sponsored by the

Oxford Farmers' Ditch Company

in conjunction with the

Colorado Water Conservation Board

August 1, 2023

Oxford Farmers' Ditch Company

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Background

The Oxford Farmer's Ditch Company (OFDC) is a mutual ditch and irrigation company located in Pueblo and Otero counties which provides domestic and irrigation water to water users in those counties. The OFDC experienced a series of failures in an aging siphon crossing underneath Chicosa Creek in 2023 and was forced to make emergency repairs to the siphon, a wood stave and steel hoop structure constructed in the late 1940's, in order to restore service to the ditch's shareholders. OFCD shareholders have experienced intermittent delivery of water rights under the ditch, and irrigators using ditch water have seen reduced quantities of water while temperatures in July 2023 have frequently been over 100 degrees Fahrenheit. A rehabilitation of the pipeline in order to ensure reliable water conveyance for water users and shareholders under the ditch is therefore of the highest priority.

The OFDC is seeking to apply to the loan program operated by Colorado Water Conservation Board (CWCB) to help finance the costs of both the repairs made to the siphon during its outages and to line the siphon with a permanent lining to help provide enhanced structural integrity and protection of the pipeline's interior. This feasibility report is being submitted to CWCB as part of its requirements for an application to the loan program.

Purpose

The Oxford Farmers' Ditch Company (OFDC), a ditch company formally incorporated on October 11th, 1888, is located in Fowler, Colorado. The service area of the OFDC straddles Pueblo and Otero Counties. The OFDC operates the ditch for the benefit of the shareholders by providing direct flow irrigation water. The OFDC currently has 87 shareholders and 1,196 shares of stock available. The ditch diverts from the Arkansas River, at a location near or within the SE1/4, NW1/4, Section 31, Township 21

South, Range 60 West, Sixth Principal Meridian, running from there in a southeasterly direction, near and along the south bank of the River before crossing US Highway 50 and crossing under Chicosa Creek through the Chicosa Siphon, then traveling west and south of the Town of Fowler and ending near the SE1/4, SE1/4, Section 34, Township 22 South, Range 59 West, where it outfalls into the Apishapa River. The total length in stream miles of the ditch from its headgate to its outfall at the Apishapa River is approximately 15 miles. The water is delivered through the OFDC ditch to 5,338 irrigated acres. Irrigation methods under the OFDC include flood, sprinkler, and drip irrigation. Table 1 shows the total number of parcels under each method and the percent of the total number of parcels irrigated by that method.

Table 1. A Summary of Irrigation Methods and Parcels under the OFDC.

Total Irrigated Farms	# of Flood Parcels	% Flood	# of Sprinkler Parcels	% Sprinkler	# of Drip Parcels	% Drip
443	432	97.5%	10	2.3%	1	0.2%

The OFDC is served by a board of directors made up of five shareholders elected each year at the annual meeting, as well as a president and a vice president.

As mentioned already, the ditch flows through a wooden siphon which carries the ditch water under Chicosa Creek (Figure 1), approximately three miles west of the town of Fowler (Figure 2).

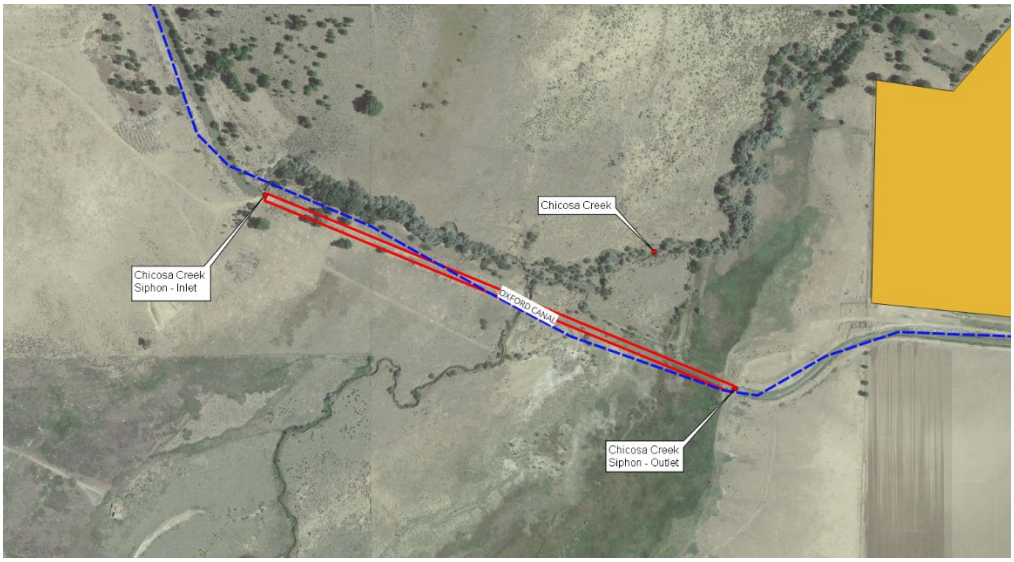


Figure 1. Site Map for the Oxford Farmer's Ditch Chicosa Creek Siphon

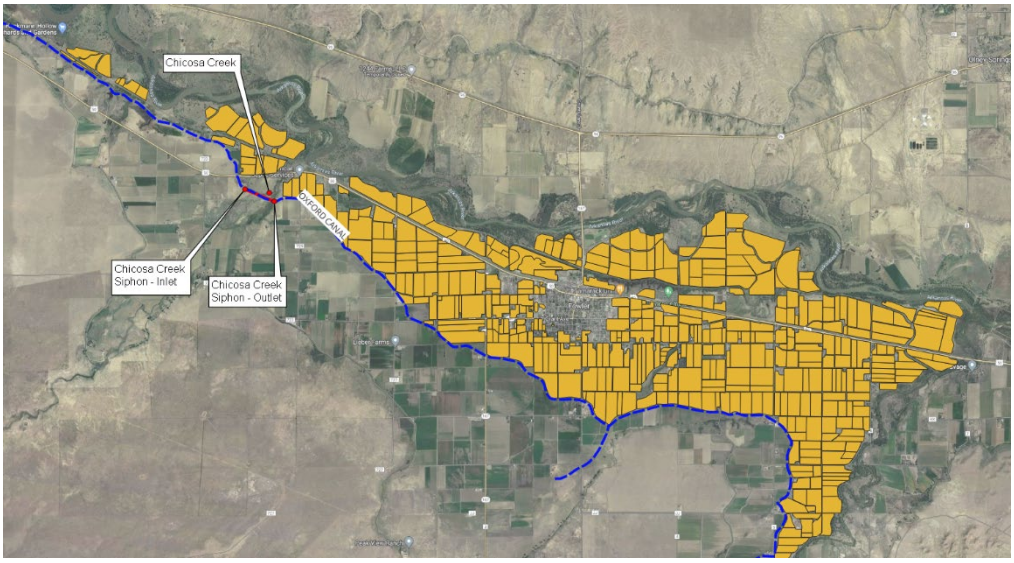


Figure 2. Location Map of the Oxford Farmer's Ditch Chicosa Creek Siphon. The town of Fowler is Near the Center of the Image.

This siphon was originally designed by the SCS sometime around 1944. Construction followed sometime thereafter. Table 2 provides the as-built dimensions of the siphon.

Table 2. OFDC Chicosa Creek Siphon As-Built Dimensions

Length, Feet	Outside Diameter, Feet
1800	6.19

The structure is composed of redwood staves, jointed together by tongue-and-groove joints, with steel banding wrapped around the conduit and placed at regularly recurring intervals. The siphon inlet and outlet are circular orifices in reinforced concrete headwalls. The headwall on the inlet end is tied into a wasteway allowing flows to be bypassed to Chicosa Creek if the siphon is undergoing repairs or maintenance.

The siphon has been repaired and rebuilt several times over the past 80 years. From anecdotal information collected by ditch company members, it is known that the original steel bands constructed in 1944 were replaced in 1973 by new steel bands. The reason for initiating that work is not known at this time. The original steel bands had corroded, likely to nearly constant submergence within the local groundwater table, leading to corrosion and ultimate failure of the bands.

The OFDC was in the process of procuring funds from NRCS, when, on April 15, 2023, the ditch had a major breach, and the siphon was shut down for seven days as repairs were made to the structure. For the second time on July 3rd the siphon was breached, leaving shareholders without water for 13 days. A third failure took the ditch out of service again on July 9th, and a fourth rupture occurred on July 25th, when a large section of the wood staving failed, forcing volunteers from the ditch company to excavate the damaged section for repairs.

It is believed at this time that the cause of the last three failures is damage inflicted on the pipe wall by the first failure event on April 15th. During the repairs made after that failure, an inspection of the interior of the siphon revealed that the lower, flat section of the siphon below Chicosa Creek was estimated to be 80 percent full of accumulated sediment. Because this accumulation was never a factor in ditch operations throughout its history, it is believed that drier conditions starting in 2020 and lasting through 2022 caused the OFDC to deliver water at much lower rates than it has on a historical basis. The self-cleaning mechanism produced by higher flows, such as when the ditch diverts water during flood events, was not available to flush solids out of the siphon's lower flat section and significant sediments accumulated in that portion of the pipeline. Appendix G provides a construction drawing created by the Soil Conservation Service (SCS) in 1944 of the siphon. In this plan view drawing, a centerline alignment of the pipeline can be seen. At station 12+08, a manhole enclosing a blow-off assembly and 8-inch pipe can be seen which would allow for small flows and materials to be flushed into Chicosa Creek. During repairs in April, the sediment blockage in the pipe was observed as starting at nearly this blow-off assembly and extending to somewhere around station 12+58; the downstream extent of the obstruction is uncertain. Repair workers were able to operate the blow-off valve to remove the accumulated sediments. The sediment was in a liquid state and flowed through the valve and 8-inch line where it was discharged out to Chicosa Creek. All of the sediment was removed from the siphon's depressed section, and this was confirmed by field inspections inside the pipeline.

It is believed that this blockage created the failure mechanisms which led to the three subsequent failures in July. Stress was created by the over-pressurization of the pipeline walls by the large volume of water which encountered the accumulation of sediment in the pipeline as the canal diverted larger amounts of water for this first time in several years during the 2023 irrigation season. This over-pressurization created as

the water back up was applied to the pipe section upstream of the depressed section. The internal wall pressure weakened portions of the wood staves, which allowed for the stress created by the increased wall pressures to be transferred to the steel bands (Appendix C) around the pipe. Field examination of steel bands removed during the repair efforts show instances of elongation of the steel at points where the band failed and broke. This could support the theory that as the wall pressure increased, the wall material deflected outwards against the steel bands, creating a tensile strain in the bands until they failed. Once they failed, exterior support of the pipe wall failed, and the pipe ruptured.

In each of the four failures, members of the ditch company have performed the repairs themselves. Damaged sections of the wood material have been removed and replaced. The old steel banding around the pipe has been cut away and replaced with new steel wire rope. In each of the four damaged sections, concrete encasements have been poured in place around the section of siphon once repairs to the wooden pipe wall have been made and the steel banding has been replaced by the wire rope. The OFDC wants to secure funds to rebuild or replace the current Chicosa Siphon prior to the 2024 irrigation season, or as soon as possible.

Study Area Description

As mentioned above, the OFDC serves approximately 5,338 irrigated acres near the boundary between Pueblo and Otero Counties. The climate of the area, as with all of Southeastern Colorado, is semi-arid, with shortgrass prairie being the predominant native vegetation in the upland areas and riparian vegetation near waterways being composed largely of Cottonwood Trees (Sp. Populus), Oak trees (Sp. Quercus), Russian Olive (Sp.), Elm trees (Sp. Ulmus), and Tamarisk (Sp.). Annual precipitation averages 13 inches per year. The economy of the area is largely agricultural with

ranching and farming being the largest economic activities. Towns in the region have service-based economies and tend to be supportive of the agricultural production around them.

Previous Studies

No previous studies related to this project are known about at this time.

Project Sponsor

The Oxford Farmers' Ditch Company is a mutual ditch company and a non-profit corporation registered in the State of Colorado. There are currently 87 shareholders and 1,196 shares of stock. The OFDC has the power to set annual assessments to be paid by shareholders, the power to cut off water deliveries to shareholders that fail to pay their assessments, and the power to offer stock for sale to pay back assessments. The Oxford Farmers' Ditch Company Articles of incorporation and By-Laws are included in Appendix A.

Project Service Area and Facilities

The Oxford Farmers' Ditch Company Ditch diverts from the Arkansas River and delivers that water to a 5,338-acre service area. The water is used to irrigate land that primarily grows corn, wheat, alfalfa, hay grazer, onions and cattle grazing. A map of the service area is in Appendix F of this report.

Water Rights

The source of water for the OFDC are decreed water rights out of the Arkansas River, seven adjudicated wells and Southeast Colorado Water Conservancy District (SECWCD) Project and Winter Water Storage water and any purchased water. The water decrees date back to September 21st, 1867, for 13.40 cubic feet per second (CFS) and February 26, 1887, for 116 CFS. Records of the State Engineer's Office indicate the total average annual diversions are 25,224 AF based on record years 1911 to 2022. A summary of water rights and the State Engineer diversion records for the period of 1911 to 2022 are found in Appendix B.

Water Availability

As stated above, for the period of record between 1911 and 2022, the OFDC has diverted an average of 25,224 AF. As also stated above, the OFDC maintains and uses two decreed surface water rights for irrigation water. The first water right has an 09/21/1867 appropriation date and the second water right has an appropriation date of 02/26/1887. Performing a structure call analysis of these water rights using the state of Colorado's Decision Support Systems (DSS) website, the following data presented below in Table 3 show the water availability for each of the ditch company's water rights since 2003, or the last twenty years of diversion records. A summary of diversions by month and year is also provided in Appendix B.

Table 3. A Summary of Water Availability for the Water Rights of the OFDC, 2003-2023.

Adjudication Date	Appropriation Date	Priority Admin. Number	Priority Amount (CFS)	Percentage of Time out of Priority, 2003-2023
03/23/1896	09/21/1867	6473	13.4	0.00%
03/23/1896	02/26/1887	13571	116	24.8%

Water Supply Demands

The OFDC supplies irrigation water to approximately 5,338 acres in its service area. Crop usage under the ditch is comprised of several different types, including alfalfa, vegetables, and wheat. Each crop type requires a certain amount of water to be able to grow to maturity and be harvested. Table 2 below shows the crops grown under the OFDC per records obtained from the Colorado Division of Water Resources (CDWR) for 2021.

Table 4. A Summary of Crop Water Demand for Irrigated Lands under the OFDC, 2021.

Crop	Average Annual Crop Water Use, Inches	Irrigated Acres under OFDC	Total Average Crop Water Use by Crop, Ac-Ft
Alfalfa	33.0	2939	8083
Corn Grain	25.9	510	1101
Grass Pasture	26.4	325	714
No Crop	NA	672	NA
Sorghum Grain	25.1	677	1416
Spring Grain	22.0	64.9	119
Vegetables	24.0	89.7	179
Wheat Fall	37.0	59.8	184
Total	27.6*	5338	11796

*Average Crop Water Use, All Crop Types

As shown in Table 4, it appears that using the estimates of crop water use, also referred to as crop evapotranspiration (ET), provided above, approximately 11,796 AF of water is consumptively used in an average year under the ditch. Referring again to Table 1, about 97.5% of the ditch uses flood irrigation as the primary irrigation method. Assuming that surface irrigation is approximately 50% efficient, about 23,600 AF of water would need to be diverted at the ditch headgate to provide adequate water supply to the lands being irrigated by the ditch. This compares favorably with the historic diversion records discussed earlier in the section about water rights, where 25,224 AF is the historic annual total diverted by the ditch during the years between 1911 and 2022.

Project Description

The purpose of this project is to provide a means for the OFDC to continue providing irrigation water to shareholders while minimizing the occurrence of future failures of the Chicosa Siphon. Four alternatives were considered:

1. The no-action alternative.
2. Replacing the siphon completely with a new pipeline of equivalent or greater capacity to meet the needs of the ditch company.
3. Placing two smaller diameter pipes of equivalent capacity beside the existing siphon.
4. Lining the existing siphon with a cured in place (CIP) type liner.

Analysis of Alternatives

Alternative No. 1

This alternative was rejected as it became apparent that the siphon was going to continue to fail, and the cost of continued failures assumed by the shareholders currently has been over $48,000 at present to repair the damaged portions of the structure.

Alternative No. 2

This alternative was rejected for several reasons. One reason was because of the projected costs of a complete replacement of the siphon. An estimate was prepared that shows costs to be approximately $2,000,000 for this alternative (Appendix I). This is likely a low estimate as material costs, particularly concrete, have experienced significant escalations in price recently, making it hard to estimate the costs of materials accurately and with the assurance that costs will remain stable. A second reason has

been the inability of the ditch company to source the pipe in a timely manner. Estimates given to the company did not provide assurances it that if an order was placed for the quantity of pipe needed, it would be available for delivery by the time work was projected to start. A third reason concerned the shareholders and their ability to perform in-kind work because of the need for larger equipment to work with the materials, particularly reinforced concrete pipe (RCP).

Alternative No. 3

As with Alternative No. 2 above, this alternative was eliminated from consideration for nearly the same reasons. A cost estimate has been prepared for this alternative (Appendix I) and the cost to replace the existing siphon with dual RCP has been estimated to be approximately $2,800,000. As with Alternative #2, the sourcing of the quantity of pipe – in this case, twice the amount as Alternative #2 - is a serious concern as is the shareholder's ability to perform in-kind work on what amounts to a heavy civil construction project.

Alternative No. 4

This is the preferred alternative identified by the Board of Directors due to it being the least costly alternative and because it can be installed and completed in a timely manner before the next irrigation season, restoring a measure of reliability to ditch operations.

Selected Alternative

The selected alternative involves the lining of the siphon with a custom composite polyurea lining system. This lining system uses a spray-on liner, applied in

increments of mils (one – one thousandth of an inch) depending on the required rate of application, to coat the interior surface of a structure. This technology has been widely deployed across many different industries, such as mining, water, recreation, air handling, and materials handling. In the case of water conveyance, the polyurea lining system has been applied to irrigation canals, hydropower flumes, storm sewers, and other hydraulic structures. The lining is applied by sprayer to the inside surface of the structure. The liner material, fundamentally a thermoplastic elastomer, requires between 45 and 60 seconds of curing time once applied. The liner, once cured, bonds securely to its substrate material and becomes a rigid and yet smooth surface with a high resistance to impacts, abrasion, tensile stress, and mechanical deformation. The lining system can be applied in temperatures below freezing although this is not preferred. Life expectancy of the liner is based on wear of the liner, which is in turn dependent on exposure of the liner to ultraviolet (UV) light and to abrasive materials. Under typical operation conditions where both of these criteria may be present, the liner can be expected to wear at an approximate rate of 1 mil per year. The Chicosa siphon should not expose the liner to any UV light and abrasion from coarse sediment should be at a minimum, so the lining should be expected to have a long service life. Since the liner will be inside of a subsurface structure, deflections may occur in the pipe which apply a stress to the lining system if there any changes to the subgrade below the pipe. The liner has an acceptable tensile stress of approximately 3,500 pounds per square inch (psi), while calculations to determine the surcharge load applied to the pipe by the soil cover show an average unit pressure, assuming a unit weight of 120 pounds per cubic foot (pcf), to be about 36.8 psi. Settlement beneath the pipe would place the pipe and the liner into a tensile stress condition; the liner would have enough strength to resist the pressure created by the overburden in an active pressure condition. A large amount of differential settlement like this is highly unlikely nearly 80 years after construction. Should any changes occur that cause differential settlement, flowable fill will be injected below the pipe to restore the vertical alignment to its pre-settlement condition. Appendix

C provides a summary of calculated unit pressures expected above the rehabilitated pipe.

Repairs to the lining can performed easily using a caulking gun at an approximate rate of $25/square foot (SF) not including labor. Appendix H provides a product data sheet for the lining material, as well as additional examples of specific examples where this lining technology has been used.

The scope of work for performing the lining is to commence at the conclusion of the 2023 irrigation season. In the Arkansas River Basin, this will be on November 15th, when most direct flow irrigation diversions in the basin below Pueblo Reservoir cease and the Winter Water Storage Program (WWSP) is in effect. On November 15th, work will begin to dewater the siphon; dewatering is to be performed by the ditch company in consultation with the contractor. Once completed, the siphon interior is to be allowed to dry, and detailed inspections are to be performed by OFDC members and the contractor. Upon completion of the inspection and acceptance of the interior conditions, the wooden pipe wall is to be blasted by either a dry quartz mixture or, if residual moisture is present, a composite vapor blasting using an abrasive and water is to be applied to the pipe wall. This will create a roughened texture inside the pipe which will create a good bonding surface for the spray-on lining. The blasting will be subsidiary to the pipelining itself in the cost estimate presented later in this report. Six cut outs for ventilation/egress/equipment access point will need to cut into the pipe during the work; these openings will be closed once longer required, and the lining will be applied to the edges of the openings to close them and bond to the surrounding lining. The lining is to be applied in detailed work around the inlet and outlet openings at each end of the siphon, and around small orifices which exist along the siphon, such as an inlet leading to an 8-inch blow-off valve at Station 12+08 (Appendices C, G). Completion of this alternative is tentatively scheduled on or around February 15, 2023. Table 5 in the “Cost

Estimate" section below provides a cost estimate to perform and complete the preferred alternative.

Cost Estimate

Table 5 Below is a summary of costs associated with the selected alternative. As Table 5 displays, the total estimated cost at this time to line the siphon and to have performed the emergency repairs needed during the spring and summer of 2023 is $1,392,130.

Table 5. Oxford Farmers' Ditch Company – Chicosa Siphon Project – Cost Estimate

Item	Quantity	Unit	Unit Price $	Amount $
Engineer's Report and Geotechnical Engineering	1	Job	$6,000	$6,000
Mobilization	1	Job	2,250	$2,250
Contractor Per Diem	50 5 nights per week for 10 weeks	Night	1250/ night	$62,500
Geo-composite Fabric	1	Job	54,000	$54,000
Dewatering, Drying, debris removal, surface profiling, patching	1800	Linear Foot	30	$54,000
Full lining of Siphon	1800	Linear Foot	550	$990,000
		Subtotal		$1,168,750
		Contingency	15%	$175,312
Emergency Repairs	1	Lump Sum	NA	$48,067
		Total		**$1,392,130**

Implementation Schedule

Arkansas Groundwater and Reservoir Association together with Jesik Consulting, Inc., is preparing the feasibility report and final design and Custom Linings has submitted a proposal to the OFDC. Construction is expected to begin as soon as is possible after the completion of the current irrigation season in the Arkansas River Basin, which is November 15, 2023.

Permitting

No permitting is required for this project.

Impacts

The repair of the siphon will result in a restoration of reliability to the delivery of irrigation water to the shareholders of the OFDC. This will result in restored and maintained crop yields under the ditch and will ensure that the OFDC continues to have a positive economic impact to Fowler and the surrounding areas.

Institutional Considerations

Entities that are, or may be, involved in the design, construction and financing of the project include:

Oxford Farmers' Ditch Company (OFDC): financing, in-kind work and project management.

Arkansas Groundwater and Reservoir Association (AGRA): Feasibility Study and Report

Jesik Consultants, Inc.: Geotechnical Testing and Services/Feasibility Study and Report

Colorado Water Conservation Board (CWCB): financing and construction.

The Oxford Farmers' Ditch Company will be the lead for the financing, design and construction of the project and will be the entity entering the contracts and agreements with the various entities for the services provided by each.

Financial Analysis

Several entities will be involved in financing the estimated total project cost of **$1,392,130**. The OFDC is applying for a loan from the CWCB in maximum amount of $1,400,000.

The actual or estimated amounts by entity are given in Table 6.

Table 6. Sources of Funding for the Chicosa Creek Siphon Repairs

Entity	Services	Grant	Loan	Percent Participation
OFDC	Engineering Analysis and Design	NA	NA	100%
CWCB	Construction	NA	**$1,400,000**	100%
OFDC	In-Kind Construction Services	NA	NA	TBD
OFDC	Cost Overages	NA	NA	100%
Totals				

As shown above, the OFDC will cover any costs that exceed the estimated project cost.

The OFDC is requesting a 30-year loan for CWCB. The current lending rate is 1.90%, resulting in annual payments of **$62,270.19**. To this would be added a 1% service fee, for a total annual cost of **$1,414,000**. The annual assessments will increase to cover these payments.

Credit Worthiness

The OFDC has no existing debt.

Collateral

As security for the CWCB loan the OFDC will pledge the project itself.

Alternative Financing Considerations:

The OFDC has obtained a Line of Credit (LoC) from Fowler State Bank in order to cover costs associated with repairs that have taken place during the 2023 irrigation season. OFDC anticipates complete repayment and replacement of debt being serviced under this LoC once it receives an approved loan application by CWCB.

Economic Analysis

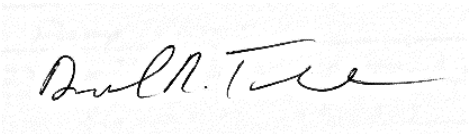
The economic benefit of the project is considerable. The OFDC estimates the value of property affected to be over $7,000,000 annually for the next 30 years, within the 5,338-acre service area. Total economic impacts then would total at least $210,000,000. The short-term value of potential damage to this property in the event the OFDC Chicosa Siphon is not repaired is estimated to be at least $7,000,000. Using the estimated total project cost of **$1,400,000** (to cover design, construction of the siphon and all appurtenances, construction supervision, and up to **$175,312** in cost overrun), the short-term project benefit/cost ratio is **$7,000,000/$1,400,000** or **5.0**. The project therefore has a net positive benefit.

Social and Physical Impacts

The project will have a significant social impact, as it will ensure the continued operation of a currently existing irrigation system and a key piece of the local economy in Pueblo and Otero Counties. The project will have minor *physical impacts*, once the construction is complete. The existing siphon will be rehabilitated in place at the same location to ensure future reliability of irrigation deliveries.

Conclusion and Recommendation

1. The Oxford Farmers' Ditch Company is an incorporated entity in the State of Colorado with the ability to enter into a contract with the CWCB for the purpose of obtaining a **$1,400,000** loan.
2. The Oxford Farmers' Ditch Company owns the land above, under, and around, the Chicosa Siphon.
3. The project would provide for continued, uninterrupted delivery of irrigation water to shareholders.
4. The total estimated cost of the project is **$1,392,130** and this will be financed by a CWCB loan. The OFDC is applying for a loan from the CWCB for the amount of $1,400,000.
5. The project is technically and financially feasible.



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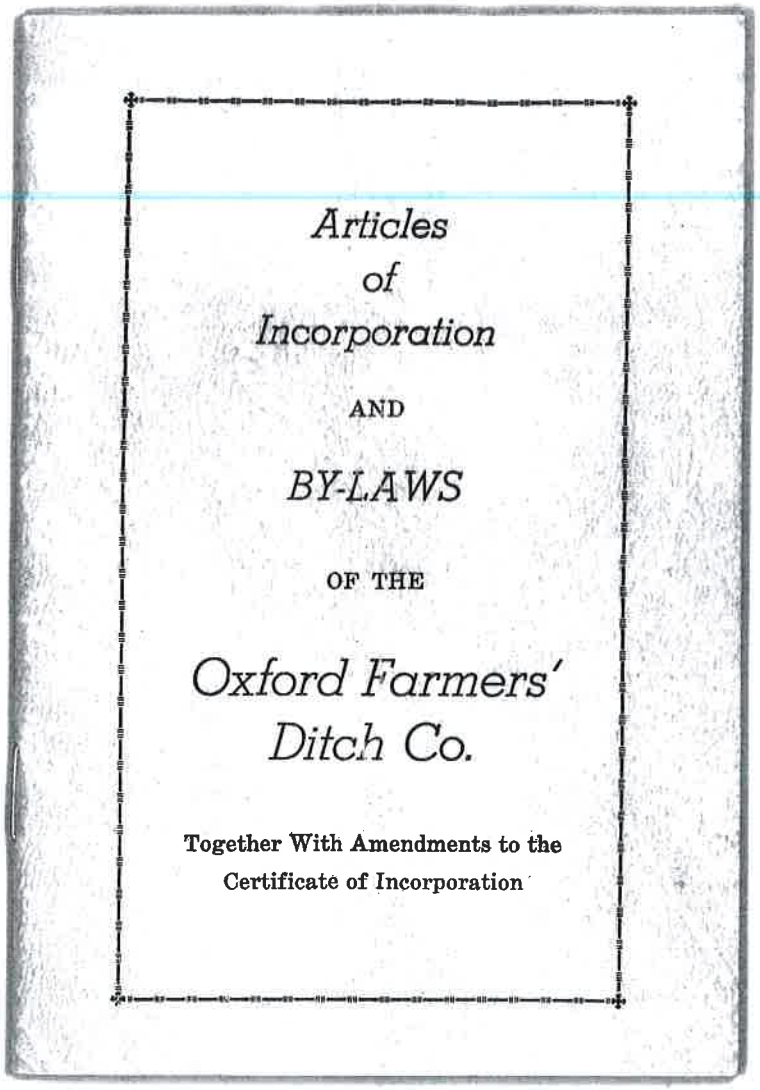
APPENDIX A

Oxford Farmer's Ditch Company

Articles of Incorporation and By-Laws


Articles
of
Incorporation
AND
BY-LAWS
OF THE
Oxford Farmers'
Ditch Co.
Together With Amendments to the
Certificate of Incorporation

Articles of Incorporation

AND

BY-LAWS

OF THE

Oxford Farmers' Ditch Co.

Together With Amendments to the

Certificate of Incorporation

Articles of Incorporation

The undersigned, desiring to form a corporation under the Statutes of the State of Colorado, do make sign and acknowledge, the following Articles of Incorporation in triplicate:

ARTICLE I.

The corporate name and style of this company shall be The Oxford Farmers' Ditch Company.

ARTICLE II.

The objects for which our said company is formed and incorporated are to construct, maintain and operate a ditch or canal for conveying water for domestic purposes and irrigation, for use upon the lands of the Stockholders of this company only, in the counties of Pueblo and Bent, in the State of Colorado; and to construct and maintain and operate lateral or branch irrigating ditches from the said main ditch of this company in such localities in the said counties of Pueblo and Bent, as will enable our company to use or dispose of the water conducted through its main line for the purposes hereinbefore set forth.

To acquire, hold and use such premises along the line of our said ditch as may be necessary for the right of way therefor, or in the construction and maintenance thereof, or its laterals.

To borrow money for the needs of our said work, to issue securities therefor in the name of our company, and to pledge the property rights and franchise of our said company in security therefor.

To do any and all things that may be incident or conducive to the attainment of the aforesaid objects, or any of them, or to the usual powers of corporate bodies.

ARTICLE III.

Our corporation shall exist for the term of twenty years, commencing from the date of the execution of these articles.

ARTICLE IV.

The capital stock of the company shall be twenty-four thousand dollars ($24,000.00) divided into eight hundred shares of thirty dollars each, which shall be issued non-assessable except for the purpose provided for in Section 310, on page 199, of the General Statutes of the State of Colorado.

ARTICLE V.

The affairs and management of our said company shall be under the control of five Directors, and the names of those who shall as Directors manage the affairs of our company for the first year, and until their successors are duly elected and qualified, are Lothar Hartig, Charles W. Taylor, Charles W. Fenlason, J. S. Garland and John H. Voorhees.

ARTICLE VI.

The officers of our said company shall be a President, a Vice President, a Secretary and a Treasurer.

ARTICLE VII.

The use to which said water is to be applied is for domestic purposes and the irrigation of the land of the Stockholders of this company, along the line of said ditch and the laterals thereof.

ARTICLE VIII.

The source from which the water is to be taken to supply said ditch and laterals is the

Arkansas river, at two points in the said county of Pueblo, on the south bank of said stream; the first of said points at which there will be a headgate located, is as near as practicable to the northwest corner of section thirty-one, in township twenty-one, south of range sixty west, and running from thence in a southeasterly direction, near and along the south bank of said river, about five-eighths of a mile, on to the north half of the northeast quarter of said section, at which point there will be a second headgate; from which point said ditch will run southeasterly across said section thirty-one, across said section thirty-two, and across the southwest corner of section thirty-three, all in said township, and across the northeasterly part of section four, township twenty-two, south of range sixty west; and across the southwesterly part of section three, across the northeast corner of section ten, across section eleven in a southeasterly direction, across the southwest corner of section twelve, across the northeast part of section thirteen, all in said township twenty-two, range sixty, and across the southwest corner of section eighteen, in township twenty-two, range fifty-nine, across the northeast corner of section nineteen, across section twenty in a southeasterly direction, across the southeast corner of section twenty-one; thence east a short distance north of the south section line of sections twenty-one and twenty-two, to the southeast corner of section twenty-two; thence running southeasterly across the southeast corner of section twenty-seven, on to the northwest corner of section twenty-six, thence southeasterly across section twenty-six near the line thereof, to near the southwest corner of said section, and from thence into the Apishapa creek.

ARTICLE IX.

In the management of the business of our company the Directors thereof are herby empowered, and shall have authority without prejudice to or derogation from their general powers under these articles:

To do all things necessary to carry into effect the powers specified in these articles, and in general to manage the property and transact the business of this company in such manner and upon such conditions as they may deem expedient and beneficial, and for the best interest of the company.

To make such prudential by-laws as they may deem proper and necessary for the management, conduct and control of the affairs, business and property of the company.

ARTICLE X.

The principal business of our company shall be carried on in the counties of Pueblo and Bent, in the State of Colorado, and the principal office for the transaction of such business shall be kept at Oxford, in Bent county, in said state; but an office of the company may be kept at any point, within the State of Colorado, which the Directors of the company may appoint, and the meetings of the company and its Directors may be held at such office.

In Witness Whereof, We have hereunto set our hands and seals, this eleventh day of October, A. D. 1888.

ISAAC E. BARNUM, (Seal.)
LOTHAR HARTIG, (Seal.)
CHARLES W. FENLASON. (Seal.)

STATE OF COLORADO, }
ARAPAHOE COUNTY, } ss.

I, Henry C. Tenny, a Notary Public in and for said County, do hereby certify that on this day personally appeared before me Isaac E. Barnum, Lothar Hartig and Charles W. Fenlason, to me known to be the persons whose names are subscribed to the foregoing Articles of Incorporation, and acknowledged to me that they signed, sealed and delivered the said instrument of writing, as their free and voluntary act, for the uses and purposes therein mentioned.

In Witness Whereof, I have hereunto set my hand and official seal, this eleventh day of October, A. D. 1888.

(Signed) HENRY C. TENNY,
Notary Public.

AMENDMENT TO THE CERTIFICATE OF INCORPORATION OF THE OXFORD FARMERS' DITCH COMPANY

This is to Certify, That a specal meeting of the Stockholders of the Oxford Farmers' Ditch Company was duly called by the Directors of said company and held at its principal office at Oxford, in the County of Bent, in the State of Colorado, on the 27th day of April, A. D. 1889, for the purpose of submitting to a vote of said Stockholders the question of an increase of the capital stock of said company, from twenty-four thousand dollars ($24,000.00) to thirty-four thousand five hundred dollars ($34,500).

That notice was given of said meeting in pursuance of a resolution of the Board of Directors of said company duly passed, by depositing in the postoffice at Oxford a notice properly addressed to each and every Stockholder of said company more than thirty days before the time fixed for said meeting.

That each and every of said notices so deposited in the postoffice stated plainly and clearly the object for which said meeting was to be held, and was signed by Lothar Hartig, the Secretary of said company.

That at said meeting, after the same had been duly convened, the following resolution was submitted to the Stockholders of said company there present, to-wit:

Resolved, That the capital stock of The Oxford Farmers' Ditch Company be increased from twenty-four thousand dollars ($24,000) to thirty-four thousand five hundred dollars ($34,500).

Thereupon a motion to adopt the said resolution, the same was adopted by a vote in the affirmative representing more than two-thirds of all the stock of the said company, each share of stock being allowed one vote on said question, either by the person holding the same or by proxy.

In Testimony Whereof, The said corporation has caused its name to be thereto subscribed by its President, C. W. Fenlason, and its corporate seal attached and attested by its Secretary, Lothar Hartig, this 25th day of May, A. D. 1889.

THE OXFORD FARMERS' DITCH CO.
Attest:

By C. W. FENLASON, President.
LOTHAR HARTIG, Secretary.
(SEAL.)

AMENDMENT TO THE CERTIFICATE OF INCORPORATION OF THE OXFORD FARMERS' DITCH COMPANY

This is to Certify, That a special meeting of the stockholders of The Oxford Farmers' Ditch Company was duly called by the Directors of said Company, upon the written request, filed

with the Secretary, of stockholders representing one-fourth of the capital stock of the Company, and said meeting was duly held at the principal office of the Company, at Fowler, Otero County, Colorado, on the 8th day of August, 1902, for the purpose of submitting to a vote of said stockholders the question of amending Articles II. and IV. of the Articles of Incorporation of said Company.

That notice was given of said meeting in pursuance of a resolution of the Board of Directors of said Company duly passed, by depositing in the postoffice at Fowler a notice properly addressed to each and every stockholder of said Company more than thirty days before the time fixed for said meeting. That each and every of said notices so deposited in the postoffice stated plainly and clearly the object for which said meeting was to be held, and was signed by F. M. Weiland, the Secretary of said Company.

That at said meeting after the same had been duly convened, the proposed amendments to the Articles of Incorporation of the Company were read by the Secretary, as follows:

First. An amendment by addition to Article II. of the Articles of Incorporation of the Company as heretofore existing in its articles of the following: "In order to carry out the purposes and objects of the Company, the Company shall also have the right to acquire, possess and own by appropriation, purchase or otherwise, water rights and priorities to the use of water from the Arkansas river and its tributaries and ditches, reservoirs or other waterways, through which the said rights and priorities may be applied to beneficial purposes, and to apply said water rights and priorities to such purposes through the canals specified in these Articles of Incorporation, or any other canals owned,

purchased or constructed by the Company, or through or in which it has acquired or may acquire the right to apply such water right or priorities. Also to similarly procure any interests in any ditches, reservoirs, water ways, or water rights on the Arkansas river and its tributaries, however the same be represented, and all other property used in connection therewith or necessary therefor, using the same for beneficial purposes, together also with the right to change the points of diversion and use of any and all water and water rights owned or acquired, to any points on the course of the Arkansas river or its tributaries, and to sell or otherwise dispose of any part or all of the ditches, reservoirs, water rights or other property of the Company.

Second. An amendment by the addition to Article IV. of the Articles of Incorporation of the Company as heretofore existing of the following: Save that the Board of Directors shall have full power and authority to contract a loan and indebtedness for and in the name of the Company, for the purpose of procuring the necessary funds to carry on the corporate enterprise, and to purchase property, and may issue bonds or other evidences of indebtedness of such denominations and bearing such interest and payable at such times and according to such terms in effecting such loans or procuring money for the Company enterprises, as may to them seem proper, securing such loans or indebtedness by trust deed or mortgage, upon any or all of the Company's property and franchises, and for the payment of such bonds or other evidence of indebtedness and liquidating the same, whether principal or interest, the capital stock of the Company shall be assessable in such amounts as may be necessary. Such assessments may be levied upon the capital stock of the Company in such manner as

may be provided by the provisions of the Statutes of the State of Colorado, or in accordance with the By-Laws of the Company, or at an annual or special meeting of the stockholders, and for such purposes sinking funds may be provided and continuing assessments provided in advance, and such other steps may be taken as may be necessary or desirable, and the payment of all assessments upon stock for any purpose may be enforced by forfeiture or by such other modes as the Board of Directors or the Statutes of the State of Colorado may prescribe.

Motion was made and seconded that the amendments be adopted as read. After a full discussion of the proposed amendments the motion was placed upon passage. Vote was then taken, voting the capital stock by ballot, with result as follows: For the amendments, 860 40-100 votes; against the amendments, 34 votes. More than two-thirds of the entire capital stock of the Company voting in the affirmative, the motion was declared carried by the President.

In Testimony Whereof, The said corporation has caused its name to be thereto subscribed by its president, T. J. Barnard, and its corporate seal attached and attested by its Secretary, F. M. Weiland, this 8th day of August A.D. 1902.

THE OXFORD FARMERS' DITCH CO.
Attest: T. J. BARNARD, President
(Seal.) F. M. WEILAND, Secretary.

AMENDMENT TO THE CERTIFICATE OF INCORPORATION OF THE OXFORD FARMERS' DITCH COMPANY

THIS IS TO CERTIFY, That a special meeting of the Stockholders of the Oxford Farmers' Ditch Company was duly called by the Directors of said company and held in the offices of the Soil Conservation Service at Fowler, in the County of Otero, in the State of Colorado, on the 4th day of December, A. D. 1965, for the purpose of submitting to a vote of said Stockholders the question of an increase of the capital stock of said company, from thirty-four thousand five hundred dollars ($34-500.00), representing one thousand one hundred fifty shares (1150) at thirty dollars ($30.00) each, to thirty-five thousand eight hundred eighty dollars ($35880.00), representing one thousand one hundred ninety-six shares (1196) at thirty dollars ($30.00) each.

That, notice of said meeting was given in pursuance of a resolution of the Board of Directors of said company duly passed, by depositing in the postoffice at Fowler, Colorado, a notice properly addressed to each and every Stockholder of said company more than thirty days before the time fixed for said meeting.

That, each and every of said notices so deposited in the postoffice stated plainly and clearly the object for which said meeting was to be held, and was signed by James F. Moffit, the Secretary of said company.

That, notice of said meeting was also given ten days before the date of December 4, 1965, A. D., in the Fowler Tribune in accordance with the By-Laws of said company.

That, at said meeting, after the same had been duly convened, the following resolution was submitted to the Stockholders of said company there present, to-wit:

RESOLVED, That the capital stock of the Oxford Farmers' Ditch Company be increased from thirty-four thousand five hundred dollars ($34500.00) representing one thousand one hundred fifty shares (1150) at thirty dollars ($30.00) per share, to thirty-five thousand eight hundred eighty dollars ($35880.00) representing one thousand one hundred ninety-six shares (1196) at thirty dollars ($30.00) per share.

Thereupon a motion was made to adopt the said resolution, and was adopted by a vote by ballot as follows: For the amendment, 984.08 shares. Against the amendment, None. The total affirmative vote was on the basis of one vote for each share of stock represented at the meeting, either by vote in person, or by proxy held by members present, and being more than two-thirds of all outstanding stock of the company the resolution was declared adopted by the Chairman.

IN TESTIMONY WHEREOF, The said corporation has caused its name to be thereto subscribed by its President, LaVern McClure, and its corporate seal attached and attested by its Secretary, James F. Moffitt, this 4th day of December, A. D. 1965.

THE OXFORD FARMERS' DITCH COMPANY
By: LaVern McClure, President

ATTEST:
James F. Moffitt, Secretary
(SEAL)

BY-LAWS

ARTICLE I.

STOCKHOLDERS' MEETINGS, VOTING, ETC.

Section 1. The annual meeting of the Stockholders for the election of Directors, and the performance of such other business as may be done by them, shall be held at Fowler on the third Saturday in August in each year, during the existence of this company.

Section 2. Special meetings of the stockholders may be held at any time, and shall be called as follows, to-wit: 1. By a vote of the Board of Directors. 2. By the written request of any two Directors filed with the Secretary. 3. By the written request, filed with the Secretary, of Stockholders representing one-fourth of the capital stock of the company. Every request for a special meeting of the Stockholders shall specify the subjects on which action by the Stockholders is desired.

Section 3. Notice of such special meetings of the Stockholders, stating the authority by which it is called and the business to be attended to, shall be published not less than ten days previous thereto in a newspaper published in or nearest to the place in which the principal office of the company shall be kept, and by delivering personally or depositing in the postoffice at least thirty days before such meetings, a notice properly addressed to each Stockholder as his address may appear on the books of the company.

Section 4. All elections and votes by the Stockholders, on every subject shall be by ballot, except on parliamentary motions, and each share of stock shall entitle the holder to one vote, except where the statutes otherwise

provide; but such vote must be given by the Stockholder in person, or by some one having for that purpose a written proxy, which must be filed with the Secretary before such vote can be counted.

Section 5. In case the Stockholders fail to elect a Board of Directors for the ensuing year at any annual meeting, it shall be the duty of the Board of Directors to call a special meeting of the Stockholders for that purpose within thirty days.

ARTICLE II.
THE DIRECTORS.

Section 1. No person not a Stockholder of this company shall be a Director thereof.

Section 2. The Board of Directors shall meet at the office of the company on the day of their election and organize by the election of officers for the ensuing year.

Section 3. All vacancies in the Board of Directors, or in the officers of the Board shall be filled by the Board of Directors at the meeting at which such vacancy occurs, or at the next meeting thereafter.

Section 4. The Board of Directors shall exercise a general control and supervision over the affairs of the company, elect all officers and remove them for cause, receive and pass upon the reports of all officers and agents of the company, audit all bills and documents, fix the compensation of all officers, agents and employees of the company, and shall have full control of all funds of the company and the direction of all work to be performed.

Section 5. Meetings of the Board of Directors may be called by the President, or by two Directors, by giving to each member of the Board at least one day's notice of such meeting. A majority of the Board of Directors

shall constitute a quorum for the transaction of business, but a less number may adjourn from day to day.

Section 6. The Directors of this company shall receive as compensation for their services as such, the sum of one and 50-100 dollars per day. Provided that they shall not receive pay for more than six days in any one year, for their services as such, but may be employed in any other capacity and receive such compensation therefore as may be fixed by the Board.

Section 7. The Directors shall have power and authority to elect and employ a Secretary, a Treasurer and a Ditch Superintendent. The powers and duties of the Ditch Superintendent shall be under the immediate control of the Board of Directors, and generally, as follows, to-wit: He shall have general control and supervision of the Ditch, of all headgates and measurements of water to the stockholders, and immediate control of all work done; shall notify all parties of work to be done on said Ditch by giving five days' notice in writing, before time of beginning work, and shall keep and report all time of said parties; shall be required to sleep at the headgate and perform all duties as by law prescribed and as the Board of Directors may from time to time direct.

ARTICLE III.
OFFICERS AND THEIR DUTIES.

Section 1. The officers of the company shall consist of a President, a Vice President, a Secretary and a Treasurer, who shall hold their offices until their successors are elected and enter upon the duties of their offices, and shall be eligible to re-election unless removed from office for cause by the Board of Directors.

Section 2. All officers shall prepare reports for their several departments and submit them

to the Board of Directors for their approval, when requested by the Board so to do.

Section 3. It shall be the duty of the President to preside at all meetings of the Stockholders, and of the Board of Directors; to sign all instruments of writing and contracts entered into by or in behalf of this company by its Board of Directors; to sign all certificates of stock and all orders for money on the Treasurer; he shall have general supervision of the business of the company under the Board of Directors, and shall perform such other duties as are incidental to the office or that may be required of him by the Board of Directors.

Section 4. The Vice President shall perform all the duties of the President in the absence of that officer.

Section 5. The Secretary shall keep the minutes of the proceedings of the meetings of the Stockholders and of the Board of Directors, and record all transactions of the company and attend to the correspondence thereof. He shall keep a ledger showing at all times the amount of stock outstanding and the names of the parties to whom issued; he shall also keep a record of all surrenders, transfers and cancellations of stock certificates, and of all assessments for repairs or improvements, and for the payment of principal and interest on money hired by the company, and of all forfeitures of stock made by the non-payment of assessments for the liquidation of the principal and interest of hired money, and such other books as the Board of Directors shall direct. He shall be the custodian of the seal of the company, shall countersign and attest all orders drawn on the Treasurer; shall attest all certificates of stock with his hand and the seal of the company; shall sign, with the President, all papers of the company, and shall give all

notices of meetings of the Stockholders and of the Board of Directors as required by the statutes and by these By-Laws. He shall be prepared at all times to inform the Directors and the Stockholders of the affairs of the company, and at the annual meeting of the Stockholders he shall furnish a detailed statement of the condition of the company, and shall perform such other services as are incidental to his office. All the official acts of the company shall be sealed with the company seal.

Section 6. The Treasurer shall be the custodian of the funds of the company, and shall give a bond satisfactory to the Board of Directors for the faithful performance of his duties and the proper disposition of the funds of the campany. He shall make a report annually—and oftener if required by the Board of Directors—of the receipts and expenditures, accompanied by the proper vouchers during the preceding year. He shall perform such other duties as are incidental to his office.

ARTICLE IV.

DISTRIBUTION OF WATER.

Section 1. Each holder of capital stock herein shall be entitled to receive from the irrigation system owned by this Company his, her or its share of the waters diverted, carried and delivered by and through said system, which share shall be the proportion which the number of shares of stock held by such stockholder shall bear to the entire number of shares issued by this Company and outstanding.

Section 2. The Company shall not be considered as guaranteeing to the holders of stock the use of any particular amount of water at any time, and they shall be entitled to receive only such amount as shall be readily

available from the source from which the system shall be supplied.

Section 3. If in the distribution of water any stockholder may at any time fail to receive his, her or its proportionate share, the Company shall not be liable to such stockholder for any damages, if such failure was caused by an error of judgment on the part of those charged with the distribution of water, or by reason of circumstances beyond the control of such persons, but shall only be liable in case such failure was the result of a wilful discrimination against such stockholder on the part of the directors, or of those charged by the directors with the distribution of water.

ARTICLE V.
ASSESSMENTS.

Section 1. Each share of the capital stock which is issued and outstanding shall be subject to an assessment, or assessments, for the expense of maintaining and operating the canal of this Company and conducting the business thereof. At each annual meeting the stockholders, by a majority vote thereof, shall levy an assessment for said purposes for the ensuing year in an amount deemed to be sufficient therefor, including an amount deemed to be sufficient for the leasing or rental of additional water. The Board of Directors of the Company shall, from time to time, at any regular meeting of the Board, or at any special meeting thereof called for that purpose, call for the payment of such portions of said assessments, at the time and in the amount which the majority of said Board shall determine to be necessary for the efficient maintenance and operation of said canal and the conduct of the business of this Company.

Section 2. The stockholders of this Company,

by a majority vote thereof, may at any special meeting of the stockholders called for that purpose, levy a special assessment in an amount necessary to meet any unforeseen contingency in the maintenance or operation of said canal, the same to be called and collected by the Board of Directors in the same manner as herein provided for the call and collection of regular assessments.

Section 3. Whenever the Board of Directors shall have made a call for the payment of any assessment, regular or special, or for any part thereof, as hereinabove provided, the Secretary shall immediately notify each stockholder in writing of the amount of payment thereof as fixed by said Board. Said assessment, or portion thereof so called, shall become delinquent fifteen (15) days after the date fixed for the payment thereof, and shall draw interest thereafter at the rate of one per cent. per month, or any part of a month.

Section 4. Any stockholders who shall become delinquent in the payment of any regular or special assessment, or any portion thereof, called as hereinbefore provided, shall not receive or be entitled to receive, any water for domestic or irrigation purposes, or to vote at any regular or special meeting of the stockholders until all such arrears shall have been fully paid.

Section 5. The shares of any stockholder who becomes delinquent in the payment of any assessment, or any portion thereof, so called by the Board of Directors as aforesaid, may be forfeited and sold in the manner following:

A notice in writing shall be mailed to said delinquent stockholder at his last known post-office address, which notice shall be signed by the President or Secretary of the Company, stating such delinquency, the amount due and

demanding payment thereof. Said notice shall also state that unless payment of such assessment be made on or before a certain date, which shall not be less than thirty days from the date of such notice, the stock so delinquent shall be forfeited to the Company, and shall be sold pursuant to this By-Law. If payment be not made on or before the date specified, the President or Secretary shall then give notice by advertising in a weekly newspaper published in the County of Otero, in the State of Colorado, for not less than three consecutive weeks, that the shares of such delinquent stockholder will be sold for cash to the highest bidder at a time and place in Otero County, Colorado, in said notice specified, for the purpose of realizing such assessment. At the time and place aforesaid the President or Secretary shall offer said stock for sale, and sell the same for the highest cash price obtainable, not less than the amount of said assessment, together with the cost of said sale; and the proceeds of said sale over and above the amount due on said shares, including cost of sale, shall be paid to the delinquent stockholder. New certificate or certificates shall be issued to the purchaser, and the certificate or certificates of the delinquent stockholder shall be cancelled on the books of the Company.

The remedy provided in this section for collecting delinquent and past due assessments is cumulative and shall not be deemed or taken to prevent the collection of said assessments by any other lawful means nor shall it be deemed to take away or affect any other right which the Company may now or hereafter have relative to the collection of delinquent assessments.

ARTICLE VI.
MISCELLANEOUS.

Section 1. Certificates of stock shall be

numbered and registered as issued, and shall be signed by the President and Secretary, and shall have the seal of the Company affixed thereto.

Section 2. Transfers of stock shall be made on the books of the Company in person or by attorney only, and the transfer books shall be closed five days before the annual meeting of the stockholders and remain closed until the meeting is over.

Section 3. All bills and accounts against this Company must be presented to the Board of Directors, and be audited and allowed by them before an order can be drawn on the Treasurer for their payment, and no money shall be paid out by the Treasurer except on an order signed by the President and Secretary and sealed with the Company seal.

Section 4. No debt or liability shall be contracted by any agent or officer of this Company except by order of the Board of Directors.

Section 5. These By-Laws may be repealed, altered or amended only by a majority vote of all stockholders in attendance, in person or by proxy, at any regular annual meeting, or at any special meeting called for that purpose of the stockholders of this Company.

BE IT FURTHER RESOLVED, That all parts of the By-Laws of this Company now in force which are in conflict with any of the provisions of the above and foregoing amendments, be, and they hereby are, repealed.

Approved and adopted by the Stockholders, this 19th day of August, A. D. 1950.

AMENDMENT TO THE BY-LAWS

The By-Laws of the Oxford Farmers Ditch Company were amended at the annual Stockholders meeting of August 19, 1967, by resolution introduced and unanimously adopted as follows:

Section I, Of Article I, is amended to read as follows: The annual meeting of the Stockholders for the election of Directors, and the performance of such other business as may be done by them, shall be held at Fowler on the third Monday in November in each year, during the existence of this Company.

Section 6, of Article II, is amended to read as follows: The Directors of this Company shall receive as compensation for their services as such, the sum of one and 50/100 dollars per day. Provided they shall not receive pay for more then twelve days in any one year for their services as such, but may be employed in any other capacity and receive such compensation therefore as may be fixed by the Board.

Approved and adopted by the Stockholders this 19th day of August, A.D. 1967.

AMENDMENT TO THE BY-LAWS

The By-Laws of the Oxford Farmers Ditch Company were amended at the annual Stockholders meeting of November, 1996, by resolution introduced and unanimously adopted as follows:

Article IV of the By-Laws Shall be amended to include the following provisions:

a) Use of water from the Oxford Farmers' Ditch Company shall be limited to Shareholders of the Oxford Farmers' Ditch Co. exclusively.

b) That water from the Oxford Farmers' Ditch Co. shall not be used for any purpose or applied to any ground located above the canal.

c) That these amendments shall take effect prospectively from the date of their passage.

Approved and adopted by the Stockholders this 18th day of November, A.D. 1996.

APPENDIX B

Oxford Farmer's Ditch Company

Annual Diversion Records

1911-2022

Oxford Farmer's Ditch Company
Annual Diversions 1911-2022

WDID	Structure Name	Irrigation Year	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Annual Total
1700541	OXFORD CANAL	2022	533				1182	1210	3367	3793	2077	1553	860	871	15446
1700541	OXFORD CANAL	2021	572				629	1004	2376	4443	3404	2504	1207	897	17036
1700541	OXFORD CANAL	2020	706				2169	2083	3100	5613	3597	2827	927	898	21918
1700541	OXFORD CANAL	2019	1000				2006	1954	3475	4100	5983	4154	2225	1698	26595
1700541	OXFORD CANAL	2018	443				4585	3109	4219	3535	3020	1835	1209	1146	23101
1700541	OXFORD CANAL	2017	1705				2589	4238	2275	5278	6859	5730	4123	1741	34537
1700541	OXFORD CANAL	2016	1167				5248	4480	5667	4437	5122	3349	1416	866	31752
1700541	OXFORD CANAL	2015	3001	1365	1365	1233	4470	4852	4773	4213	7192	6823	2417	2688	44392
1700541	OXFORD CANAL	2014	1906				505	1422	3118	7682	6613	4944	1475	1996	29661
1700541	OXFORD CANAL	2013	383				493	1174	2104	3961	1684	3004	2190	1277	16269
1700541	OXFORD CANAL	2012	1316				510	1069	1342	1373	1703	1568	888	853	10622
1700541	OXFORD CANAL	2011	2148				2031	1720	2686	7160	7583	3643	1658	1179	29809
1700541	OXFORD CANAL	2010	1679				2238	4749	6005	6297	3632	4925	1448	1420	32393
1700541	OXFORD CANAL	2009	1005				885	3141	5170	7257	5685	3350	1260	1420	29173
1700541	OXFORD CANAL	2008	1715				2813	5102	4889	7218	6488	4227	1970	2061	36481
1700541	OXFORD CANAL	2007	390				1646	3405	4879	5223	5140	5763	1631	1076	29152
1700541	OXFORD CANAL	2006	2510				905	1321	3587	6058	2917	2305	855	1203	21662
1700541	OXFORD CANAL	2005					1029	5102	6396	7087	3354	2120	1045	876	27010
1700541	OXFORD CANAL	2004	373				587	1895	6257	4079	3232	2783	1023	788	21017
1700541	OXFORD CANAL	2003	405				575	1359	2916	5885	1417	998	743	763	15062
1700541	OXFORD CANAL	2002	871				670	1468	1434	1103	1131	1236	827	887	9627
1700541	OXFORD CANAL	2001	766				1841	2547	3646	4977	4138	2988	1663	1251	23815

Oxford Farmer's Ditch Company
Annual Diversions 1911-2022

1700541	OXFORD CANAL	2000	1257		59	3248	3073	4765	7090	5937	5600	1872	1252	34152
1700541	OXFORD CANAL	1999	1398			2193	2804	1550	5735	6281	6563	4663	2647	33833
1700541	OXFORD CANAL	1998				237	3721	5653	6204	6756	2458	3132	2940	31100
1700541	OXFORD CANAL	1997	1085			1743	3965	5349	4262	7181	2989	3574	2076	32224
1700541	OXFORD CANAL	1996	839			2205	6033	5422	5676	6904	5442	2438	2377	37336
1700541	OXFORD CANAL	1995	729			1129	3862	4061	3300	5650	6021	4142	2465	31359
1700541	OXFORD CANAL	1994	456			1693	4122	4728	5993	3140	2802	2024	2108	27065
1700541	OXFORD CANAL	1993	1109			1073	5062	5299	5608	7103	3994	1014	1333	31595
1700541	OXFORD CANAL	1992	149			1089	4503	3712	4499	5326	3233	1773	1035	25319
1700541	OXFORD CANAL	1991	338			1784	2482	3166	7063	3946	4687	1151	895	25510
1700541	OXFORD CANAL	1990	1609			640	2094	2409	6881	4957	4338	1725	2162	26816
1700541	OXFORD CANAL	1989	1335			3556	2912	4475	5725	3871	3803	1161	1250	28089
1700541	OXFORD CANAL	1988	880			1102	2662	4469	6751	4586	3921	1593	1195	27161
1700541	OXFORD CANAL	1987	1395			1653	3305	4850	6067	6971	5426	3781	2490	35939
1700541	OXFORD CANAL	1986	634		152	2766	2734	3556	5371	8052	5659	3117	3081	35123
1700541	OXFORD CANAL	1985	667			1097	5893	5839	6752	5310	5531	3586	3191	37865
1700541	OXFORD CANAL	1984	752			1334	3810	4890	7383	7609	5601	3837	2533	37749
1700541	OXFORD CANAL	1983	998			976	3882	4520	4297	7274	7670	6146	1081	36842
1700541	OXFORD CANAL	1982	774			611	2279	1378	5410	5957	5426	4318	3691	29844
1700541	OXFORD CANAL	1981	1446			488	1679	1170	2876	2168	3642	829	883	15182
1700541	OXFORD CANAL	1980	1748	0		770	1215	2073	5382	7019	3060	2057	941	24264
1700541	OXFORD CANAL	1979	444			409	1541	2327	3652	6245	2971	1064	927	19581
1700541	OXFORD CANAL	1978	946	1037	124	305	1019	852	882	4437	3637	1295	815	834	16183

Oxford Farmer's Ditch Company
Annual Diversions 1911-2022

1700541	OXFORD CANAL	1977	712	0	0	0	909	1161	773	1011	1636	2199	760	703	9866
1700541	OXFORD CANAL	1976	1291				1044	1739	843	4136	1696	1856	1136	1084	14826
1700541	OXFORD CANAL	1975	1720	696	332	217	968	885	885	4943	6089	2400	882	782	20800
1700541	OXFORD CANAL	1974		840	217	375	1756	1853	3016	3959	1408	283	591	816	15114
1700541	OXFORD CANAL	1973	285	0	34	280	1303	2332	3502	4907	5782	2688	1048	95	22255
1700541	OXFORD CANAL	1972	1993	1146	401	1001	1339	786	1822	6243	2727	1414	1068	787	20728
1700541	OXFORD CANAL	1971	400	1124	331	1465	2202	922	1000	6218	6477	1199	858	870	23068
1700541	OXFORD CANAL	1970	674	584	299	212	1868	3071	4399	4951	5389	2794	2438	1184	27862
1700541	OXFORD CANAL	1969	1613	937	880	1690	1278	809	4034	4758	5776	4492	1845	831	28942
1700541	OXFORD CANAL	1968	951	652	206	591	1270	1108	1241	6660	4110	4638	853	745	23028
1700541	OXFORD CANAL	1967	1320	970	446	1406	911	834	2479	4339	4202	2802	3864	1294	24865
1700541	OXFORD CANAL	1966	1091	869	426	222	1686	805	4689	6235	2828	3837	1134	1351	25174
1700541	OXFORD CANAL	1965	833	895	1444	629	970	833	2186	3761	5508	4655	3723	762	26198
1700541	OXFORD CANAL	1964	805	583	379	504	831	805	2686	3904	1565	1551	833	861	15307
1700541	OXFORD CANAL	1963	1208	887	276	811	964	750	1496	2069	1043	2618	1991	861	14973
1700541	OXFORD CANAL	1962	1626	492	85	540	1557	3654	3850	4961	6343	2104	805	833	26851
1700541	OXFORD CANAL	1961	1121	706	307	292	861	1087	1753	4530	2640	3900	3195	2023	22416
1700541	OXFORD CANAL	1960	1037	1119	236	101	303	1942	3467	5732	2813	748	982	1206	19686
1700541	OXFORD CANAL	1959	873	422	422	436	1317	1932	2753	6744	2198	960	805	2154	21017
1700541	OXFORD CANAL	1958	849	680	661	778	500	2311	2515	5792	5643	2509	1218	845	24300
1700541	OXFORD CANAL	1957	805	333	722	750	805	996	2775	2702	6425	5639	4072	1920	27944
1700541	OXFORD CANAL	1956	833	647	555	417	694	778	2402	5867	1527	1991	778	833	17322
1700541	OXFORD CANAL	1955	553	666	361	389	833	778	2416	5853	2836	4633	782	861	20962

Oxford Farmer's Ditch Company
Annual Diversions 1911-2022

1700541	OXFORD CANAL	1954	1099	488		1285	750	833	1993	694	1964	2061	742	718	12627
1700541	OXFORD CANAL	1953	986			204	780	722	1226	6651	5447	3664	778	805	21261
1700541	OXFORD CANAL	1952	678	0	532	1813	696	1916	5453	6087	4485	3529	805	805	26799
1700541	OXFORD CANAL	1951	970	1023	518	434	583	805	4514	6962	7160	6557	805	833	31167
1700541	OXFORD CANAL	1950	2926	1811	1434	2281	833	833	3295	6869	6508	1426	2448	805	31468
1700541	OXFORD CANAL	1949	1392	498	1271	1964	2366	2757	5197	3675	6363	3606	1662	1974	32726
1700541	OXFORD CANAL	1948	1073	742	184	0	333	3045	5645	4360	5494	4697	833	869	27275
1700541	OXFORD CANAL	1947	583	571	298	415	536	2301	2690	1930	5429	6192	4854	1980	27777
1700541	OXFORD CANAL	1946	1454	613	413	581	1131	924	5264	6226	2456	2224	1503	1668	24457
1700541	OXFORD CANAL	1945	1434	670	649	553	1246	1509	5574	3471	4798	3245	2402	3852	29403
1700541	OXFORD CANAL	1944	1220	742	611	512	1734	1103	3737	6649	4503	1993	1301	1202	25305
1700541	OXFORD CANAL	1943	1442	889	430	968	1734	1989	4786	6633	4290	2894	789	805	27650
1700541	OXFORD CANAL	1942	117	1246	462	563	1472	2465	3866	4481	6893	5625	2158	2317	31665
1700541	OXFORD CANAL	1941	686	793	972	690	694	1321	4094	3941	4911	3977	914	1313	24308
1700541	OXFORD CANAL	1940	778	659	422	666	805	750	1527	2158	1089	1039	1236	833	11962
1700541	OXFORD CANAL	1939	1424	1341	899	343	1351	1571	4796	3906	1299	424	805	833	18992
1700541	OXFORD CANAL	1938	778	647	692	629	879	1037	3648	5873	5302	2953	2602	1012	26051
1700541	OXFORD CANAL	1937	131	1458	359	490	764	750	5082	5205	1993	1775	2283	861	21150
1700541	OXFORD CANAL	1936	815	238	192	268	817	722	3759	5619	3191	3437	1077	700	20837
1700541	OXFORD CANAL	1935	865	250	240	190	865	833	2646	5137	5631	2828	1367	1004	21856
1700541	OXFORD CANAL	1934	686	906	1131	641	946	833	1890	1335	1388	924	1089	744	12514
1700541	OXFORD CANAL	1933	702	571	615	274	829	885	3154	4046	3246	3396	1267	668	19653
1700541	OXFORD CANAL	1932	732	1904	119	714	869	750	2789	6877	4951	3080	805	861	24451

Oxford Farmer's Ditch Company
Annual Diversions 1911-2022

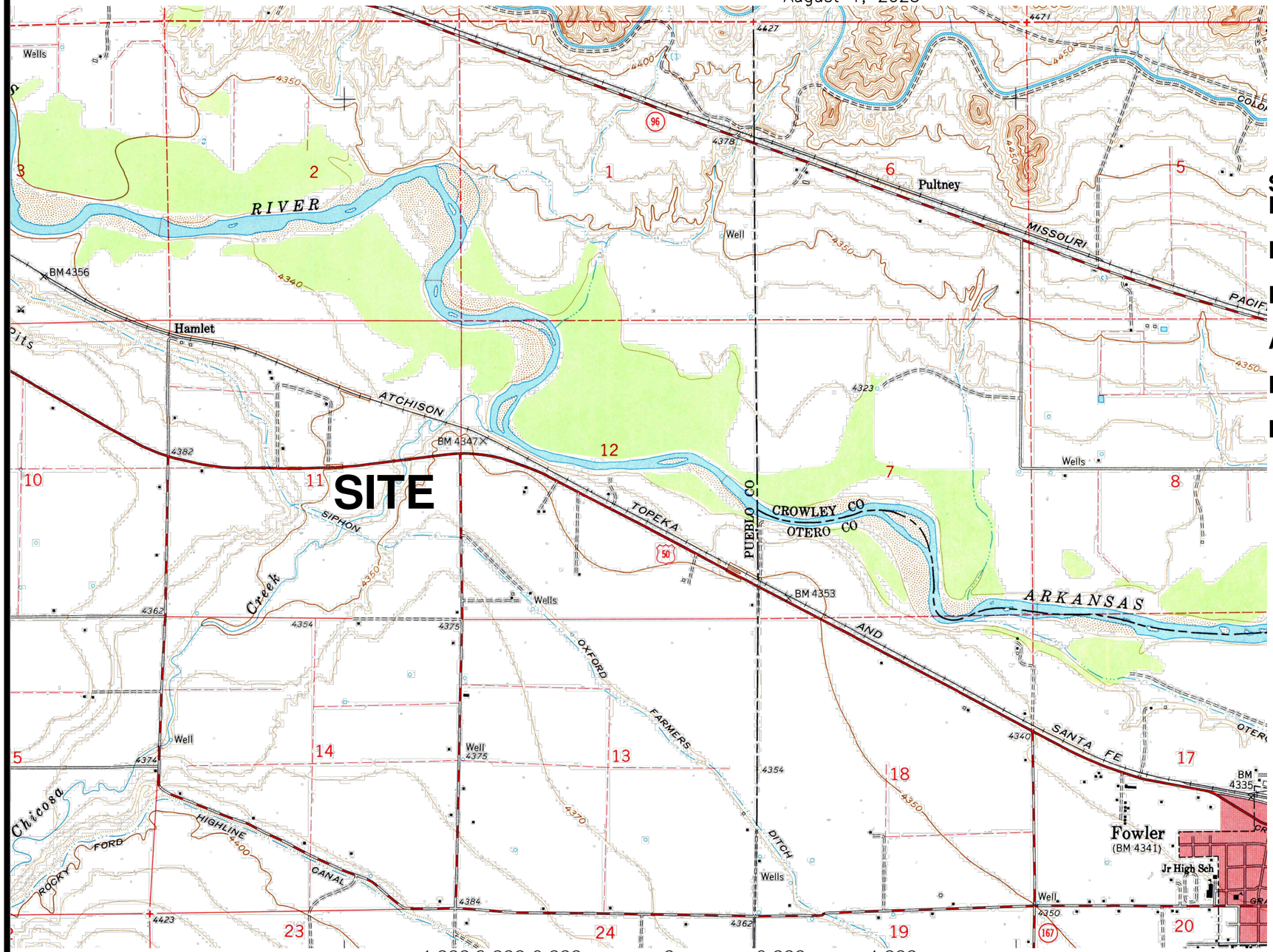
1700541	OXFORD CANAL	1931	2317	397	0	0	1230	1438	3541	3390	1621	887	1031	783	16634
1700541	OXFORD CANAL	1930	2698	1375	615	555	1976	823	1476	5443	3733	4435	1991	635	25754
1700541	OXFORD CANAL	1929	893	1904	615	555	1277	887	3007	7244	5405	4265	4058	4009	34118
1700541	OXFORD CANAL	1928	2652	573	615	2021	1855	918	3404	3842	6266	3158	887	948	27138
1700541	OXFORD CANAL	1927	2190	1172	1053	1787	1587	1474	3743	4844	5403	2785	2178	3749	31964
1700541	OXFORD CANAL	1925	843	674	609	549	1515	869	2521	4290	4280	2725	1210	1704	21791
1700541	OXFORD CANAL	1924	1325	1609	540	1170	1920	3346	6502	6036	4764	883	764	789	29647
1700541	OXFORD CANAL	1919	1529	1688	3451	2311	2725	2971	4616	4818	5048	2705	1670	1436	34969
1700541	OXFORD CANAL	1918	2561	1847	655	686	1742	2019	1684	5219	5215	1051	2416	1521	26615
1700541	OXFORD CANAL	1916	2301	2033	1101	1115	1081	2396	4509	5913	5790	5611	1603	861	34313
1700541	OXFORD CANAL	1915							3695	4719	6288	4017	4477	1801	24996
1700541	OXFORD CANAL	1914	333	556	103	1317	1781	1049	5163	4463	5044	4834	805	1464	26913
1700541	OXFORD CANAL	1913	750	1063	333		831	1503	1753	5994	3628	980	694		17530
1700541	OXFORD CANAL	1912	1726	1127	119		268	2182	4235	5424	6892	3035	2493	889	28388
1700541	OXFORD CANAL	1911			861	778	893	805	1980	7478	4794	1864	833	1141	21426
	Monthly Average, AF=		1121	862	570	724	1355	2080	3450	5051	4561	3316	1794	1373	25224

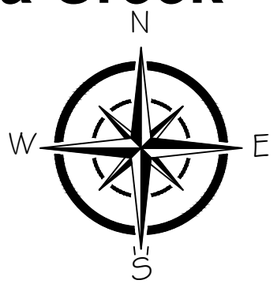
APPENDIX C

Preliminary Engineering Design

Geotechnical Investigation and Laboratory Results
for
Oxford Farmers Ditch Company - Existing Siphon on Chicosa Creek

August 1, 2023





Sheet Index:

Revision	Date

Designer: KAY
Drawn by: KAY
Checked by: JAJ
Project #:23-9492

Oxford Farmers Ditch Company

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Pueblo, Colorado
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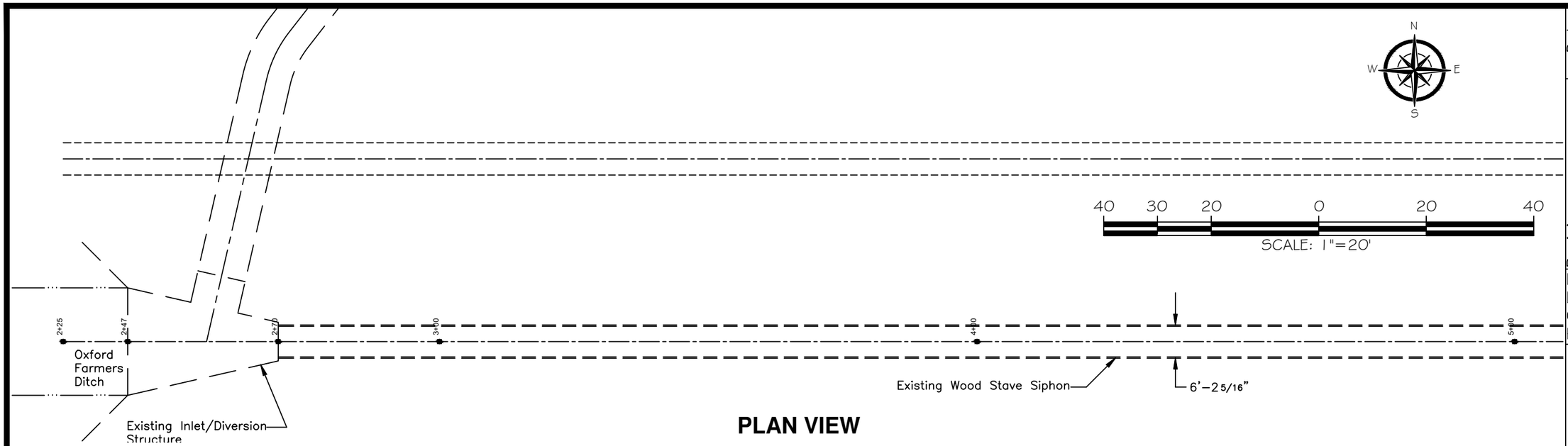
8/01/2023

Scale:
Horiz.: 1"=2,000'
Vert.:

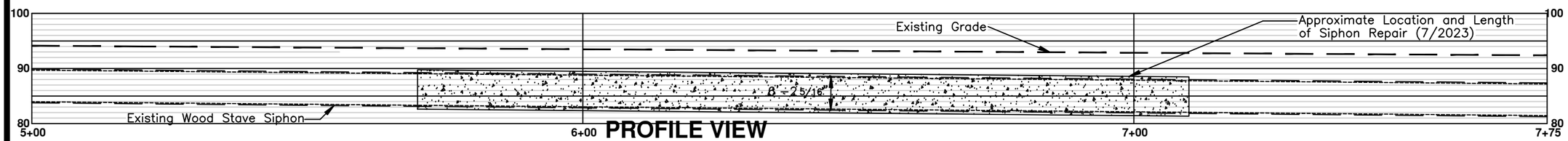
Sheet No:
Cover



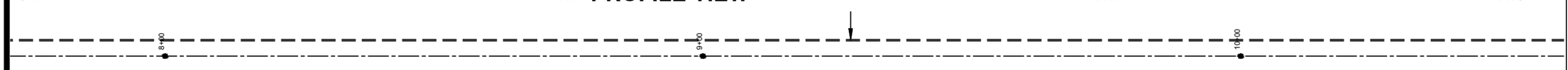
PLAN VIEW

PROFILE VIEW

PLAN VIEW



PROFILE VIEW



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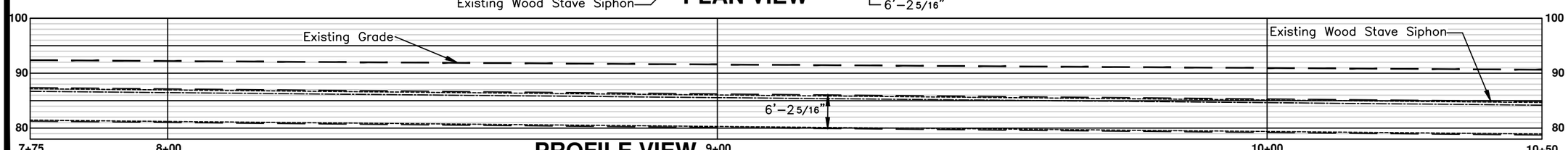

PROFILE VIEW

Revision	Date
1. Added Repair	8/1/23

Designer: KAY
Drawn by: KAY
Checked by: JAJ
Project #:23-9394

Oxford Farmers Ditch Company

Existing Siphon - Plan & Profile

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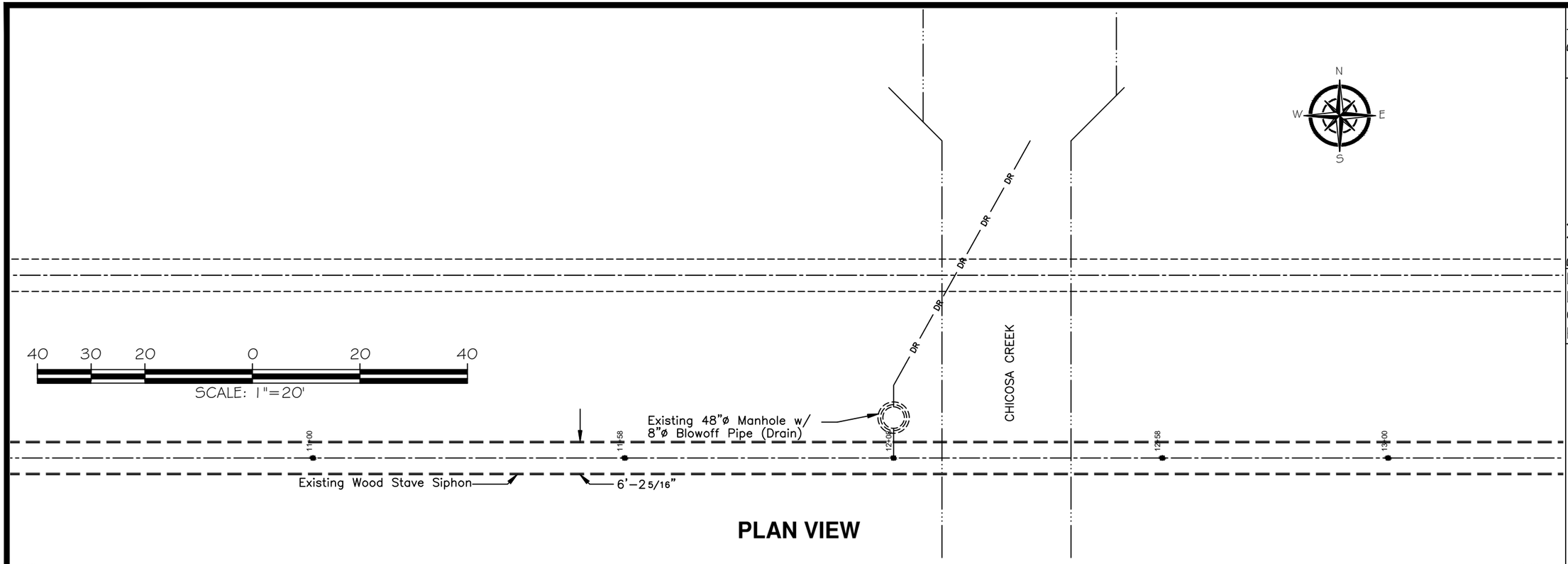
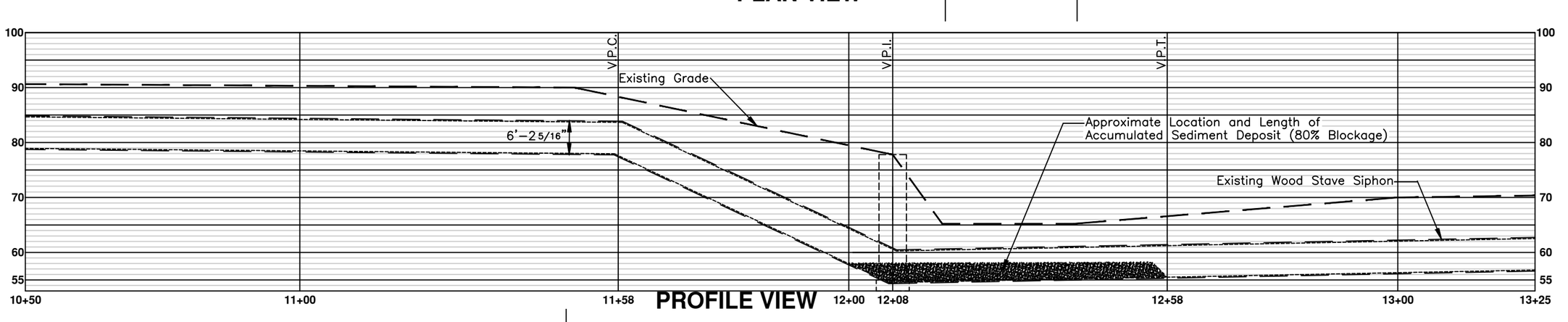
Vert.: 1"=20'

Sheet No:
PP-1

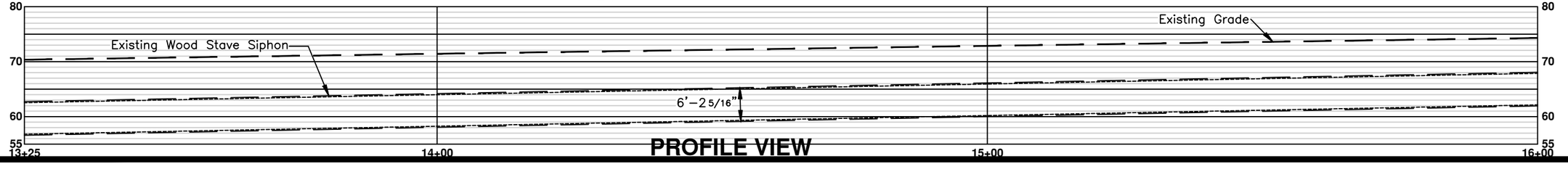


PLAN VIEW



PROFILE VIEW

PLAN VIEW



PROFILE VIEW

Revision	Date
1. Added Sed. Deposit	8/1/23

Designer: KAY
Drawn by: KAY
Checked by: JAJ
Project #:23-9394

Oxford Farmers Ditch Company

Existing Siphon - Plan & Profile

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Sheet No:
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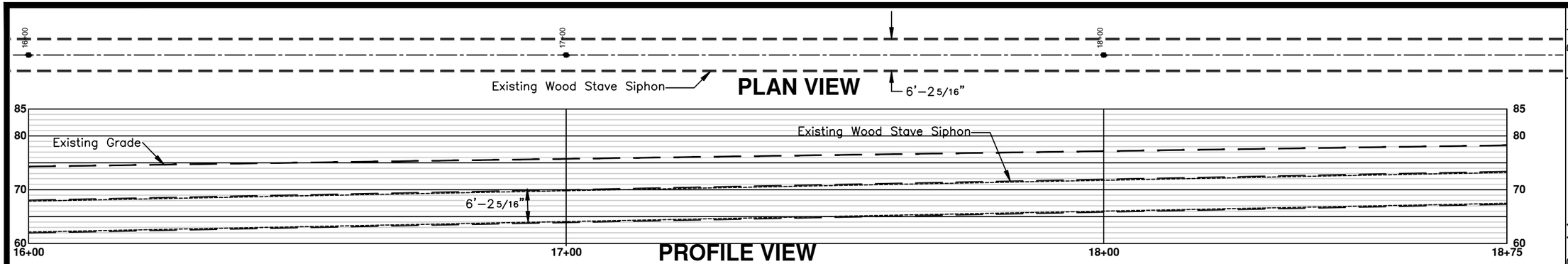
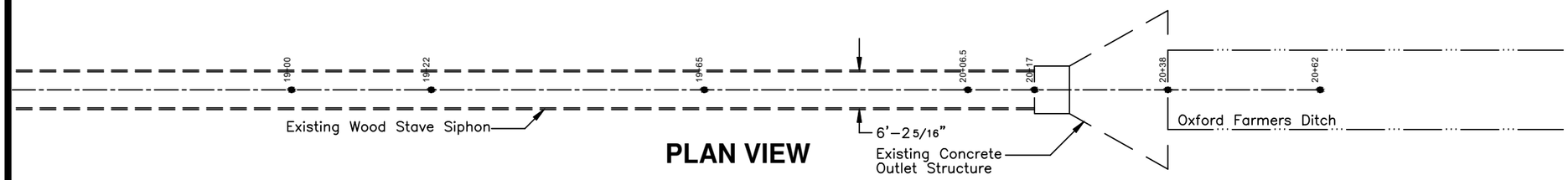
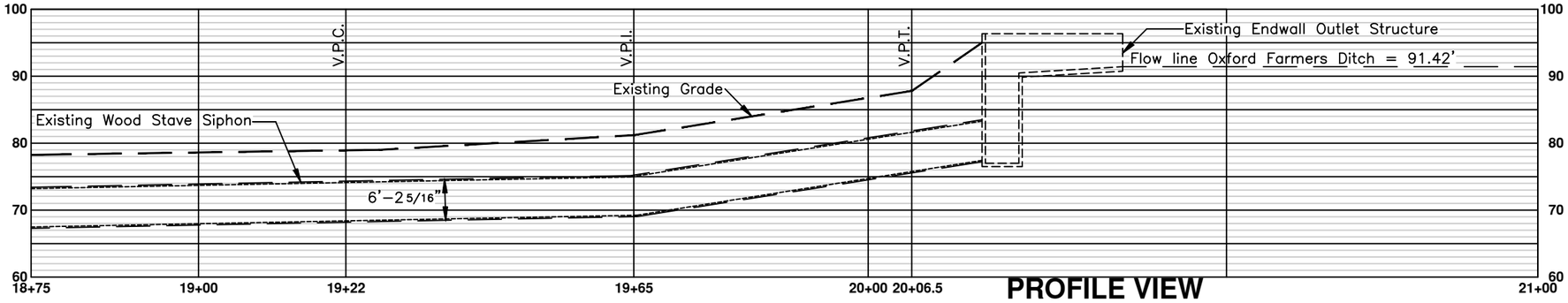
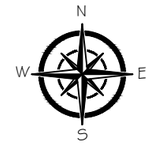
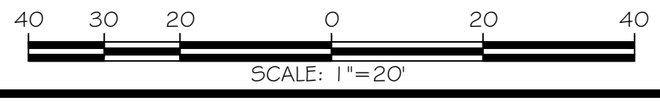








Culvert Information								Inlet Control				Outlet Control						
																Tw<D	Tw>D	
From	TO	Length	Diameter	Area	Slope	Manning's n	Flow	HW/D	HW	Kp	V	R	H	Tailwater	d_c	d_c+D/2=h_o	h_o	HW
		Feet	I.D. Inches	Sq. Ft.	%	-	c.f.s.	Ratio	Feet	-	feet/sec.	Feet	Feet	Feet	Feet	Feet	Feet	Feet
-	-	1,747.00	71	27.48	-0.07%	0.014	13.4	0.50	2.99	0.0034	0.49	4.64	0.01	1.33	0.00	2.96	1.33	2.51
-	-	1,747.00	71	27.48	-0.07%	0.014	129.4	0.97	5.72	0.0034	4.71	4.64	0.96	4.15	2.96	4.44	4.15	6.28
-	-	1,747.00	36	7.07	-0.07%	0.014	129.4	29.72	89.17	0.0085	18.32	2.36	24.37	4.15	1.50	2.25	4.15	29.69
-	-	1,747.00	51	14.18	-0.07%	0.014	64.7	1.36	5.79	0.0053	4.56	3.34	1.13	3.00	2.13	3.19	3.00	5.30



DITCH FLOW vs. WATER SURFACE ELEVATION

Stage	Cross Section Area	Wetted Perimeter	Hydraulic Radius	Velocity	Q
Feet	Square Feet	Feet	Feet	Feet/Second	CFS
0.00	0.00	0.00	0.00	0.00	0.00
0.20	0.41	3.11	0.13	0.55	0.23
0.40	1.16	4.41	0.26	0.87	1.00
0.60	2.11	5.41	0.39	1.13	2.40
0.80	3.24	6.27	0.52	1.37	4.43
1.00	4.50	7.03	0.64	1.58	7.11
1.50	8.16	8.67	0.94	2.04	16.67
2.00	12.39	10.09	1.23	2.44	30.26
2.50	17.07	11.38	1.50	2.79	47.69
3.00	22.11	12.57	1.76	3.11	68.72
3.50	27.44	13.69	2.00	3.39	93.06
4.00	33.00	14.77	2.23	3.65	120.37
4.50	38.74	15.82	2.45	3.88	150.26
5.00	44.60	16.84	2.65	4.09	182.35
5.50	50.56	17.85	2.83	4.28	216.18
6.00	56.55	18.85	3.00	4.44	251.29

Revision | Date
1. Rev. Culvert Table | 8/1/23

Designer: KAY
Drawn by: KAY
Checked by: JAJ
Project #:23-9394

Oxford Farmers Ditch Company

Existing Siphon - Plan & Profile

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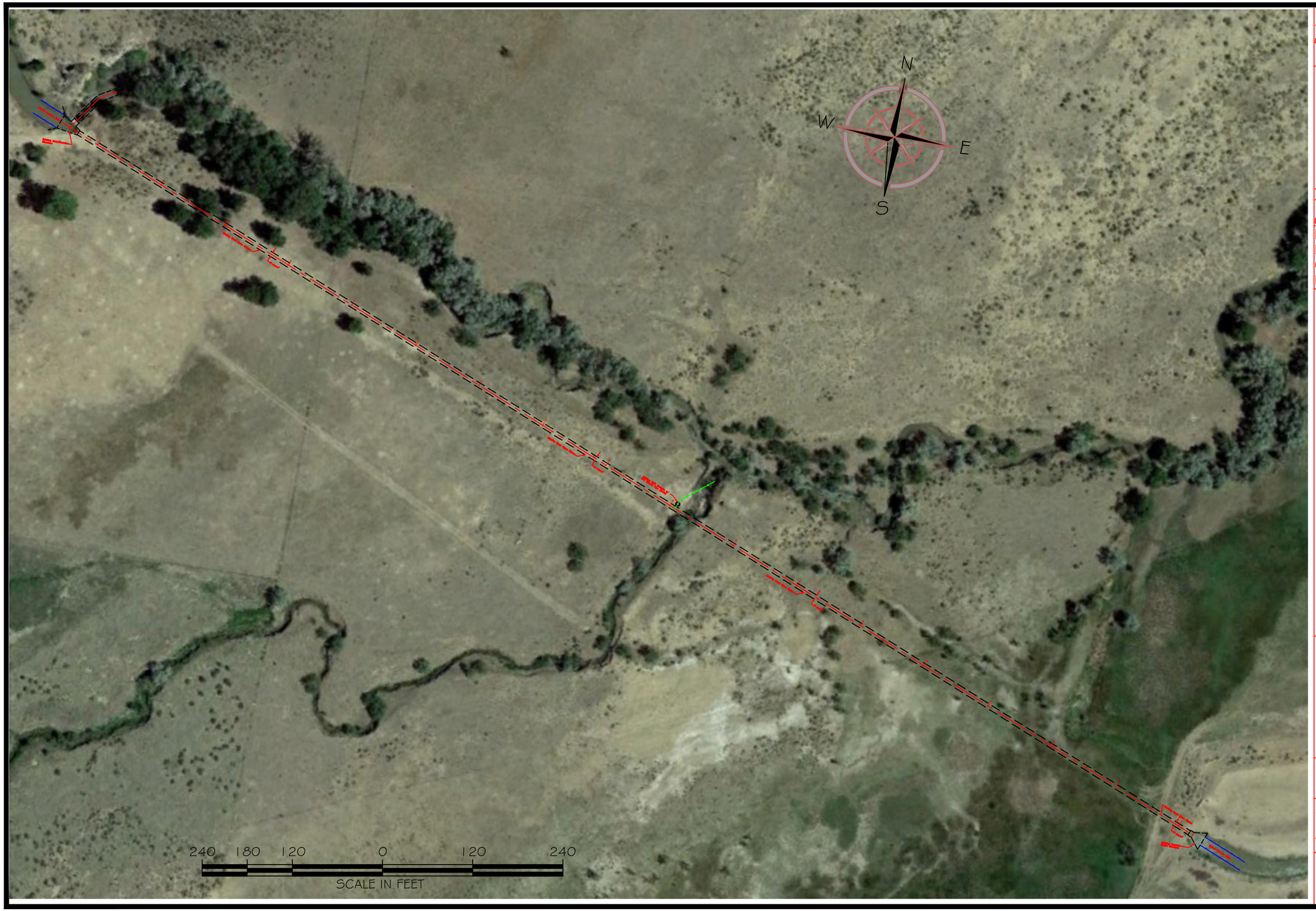
Vert.: 1"=20'

Sheet No:
PP-3



Revision	Date

Designer: KAY
Drawn by: KAY
Checked by: JAJ
Project #:23-9394

Oxford Farmers Ditch Company

Aerial Plan View - Existing Siphon

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Vert.:

Sheet No:
AV-1

RUSTED STAVE BANDS FROM REPAIRED SECTION OF SIPHON

RUSTED STAVE BANDS FROM REPAIRED SECTION OF SIPHON

RUSTED STAVE BANDS FROM REPAIRED SECTION OF SIPHON

RUSTED STAVE BANDS FROM REPAIRED SECTION OF SIPHON

RUSTED STAVE BANDS FROM REPAIRED SECTION OF SIPHON

RUSTED STAVE BANDS FROM 100-YEAR OLD INSTALLATION
CHARLESTOWN, S.C.

Revision	Date

Designer: KAY
Drawn by: KAY
Checked by: JAJ
Project #:23-9394

Oxford Farmers Ditch Company

Photographs of Existing Wood Stave Steel Bands

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7/28/2023

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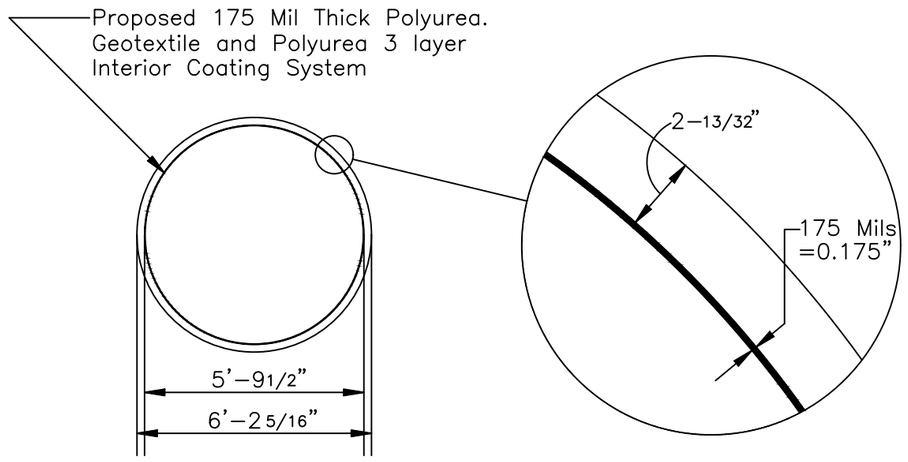
Horiz.:
Vert.:

Sheet No:
PE-1

1. All information contained on the Plan & Profile Sheets is from a Plan Entitled "OXFORD DITCH SIPHON GENERAL PLAN AND TOPOGRAPHY", by the Department of Agriculture, Soil Conservation Service, Drawing No. 6-R-11783-1(4).
2. All information contained on the Photographic Exhibits are taken from a Site Inspection, Conducted by Jesik Consulting, on Tuesday, July 18th, 2023, at which time a physical inspection was made of the siphon bands and Inlet, Outlet and Diversion Structures.
3. The original Oxford Farmers Ditch Siphon under Chicosa Creek was constructed with wood stave pipe and steel bands, circa 1868. The original siphon was replaced in 1944 with a similar type wood stave and steel band siphon. The existing 1944 siphon has recently been subjected to higher than normal flows which has caused sediment to accumulate to the extent that approximately 80% of the existing siphon cross section is plugged. This process is most likely the cause of the recent siphon failures, due to increased pressure on the wood staves and steel bands. Another likely contributing factor is due to corrosion of the steel bands. This is clearly evident from the photographs contained on Plan Sheet PE-1.
4. In order to rehabilitate the existing siphon, a combination Polyurea and Laminate Geotextile Fabric lining shall be applied to the interior of the wood staves to a final thickness of 170 to 200 Mils. This will create a smooth, strengthened siphon cross section and should eliminate failures related to corrosion of the existing steel bands. Prior to application, the existing siphon shall be inspected, cleaned and sand blasted.
5. The Oxford Ditch Company has entered into an agreement with Custom Linings of Colorado Springs, Colorado, to perform the rehabilitation work, which shall take place between November 15, 2023 and March 15, 2024.



UTILITIES

1. The lines shown on the drawing indicating existing lines and new lines, are not to be construed as the exact location of said lines, or in fact all lines that may exist. The Contractor is responsible for verifying the final location and depth of any lines affecting the project work.
2. The Contractor shall provide, at his own expense, all necessary utilities required for his Operations under the Contract. The Contractor shall provide and maintain in good order such equipment and installations to perform the work in a safe and satisfactory manner.
3. Water lines, gas lines, wire lines, service connections, meter and valve boxes, light standards, cableways and all other utility facilities within the limits of the proposed construction are to be relocated or adjusted at the Owner's expense unless otherwise provided in the Contract.
4. If utility facilities or appurtenances are found that are neither identified in the Contract, nor revealed by site investigation, the Engineer will determine whether adjustment or relocation of the utility is necessary. The Engineer will make arrangenents with either the utility owner or the Contractor to accomplish necessary adjustments or relocations when not otherwise provided for in the Contract.
5. Where the Contractors operations are adjacent to properties of telephone, power, or other utility companies, to which damage might result in considerable expense, loss, or inconvenience, work shall not commence until arrangements for the protection of the utilities have been made.
6. If water or utility services are interupted, the Contractor shall promptly notify the Owner and cooperate in the restoration of service. Repair work shall be continuous until the service is restored. Work shall not be undertaken around fire hydrants until the provisions for continued service has been approved by the local fire authority.
7. The Contractor shall comply with Article 1.5 of Title 9, CRS ("Excavation Requirements") when excavating or grading is planned in the area of underground utility facilities. The Contractor shall notify all affected utilities at least two (2) business days, prior to commencing such operations. Contact the Utility Notification Center of Colorado (UNCC) (811) to have locations of UNCC registered lines marked by member companies. All other underground facilities shall be located by contacting the respective company. Utility Service Laterals shall also be located prior to beginning excavating or grading.

CONSTRUCTION

1. The Contractor shall submit a work schedule detailing start and end dates for major portions of the Work. Schedule submittals shall be made to the Oxford Farmers Ditch Co., Attn.: Kendra Hood, Secretary/Treasurer (oxforddditch@gmail.com), Arkansas Groundwater and Reservoir Association, Daniel Tucker, Water Resources Engineer (dan@agraco.net) and Jesik Consulting, Andy Jesik, Owner (andy@jesik.us).
2. The Contractor shall be responsible for supplying all materials, manpower, machinery and equipment, utilites (such as power and water), permits and approvals to commence siphon rehabilitation work in an orderly, continuous, safe and workmanlike manner.
3. The Contractor shall be responsible for all safety issues and regulations related to entering and working within the existing siphon structure and shall provide all required safety equipment.
4. Contractor shall review and be aware of the information contained in the Geotechnical Site Investigation, prepared by Jesik Consulting, and the ramifications contained therein.
5. The Contractor shall provide all equipment necessary to perform any required dewatering during construction.
6. Any damage occuring from the Contractor's rehabilitation efforts shall be immediately reported to the Oxford Farmers Ditch Co. representatives, Mr. Tucker and Jesik Consulting. inconvenience, work shall not commence until arrangements for the protection of the utilities have been made.

Oxford Farmers Ditch Existing Siphon Proposed Liner Detail

Revision	Date
1. Liner Detail	8/1/23

Designer: KAY
Drawn by: KAY
Checked by: JAJ
Project #:23-9394

Oxford Farmers Ditch Company

Plan Notes

Jesik
800 W. 8th St.
Pueblo, Colorado
81003
(719) 582-5588
www.jesik.us

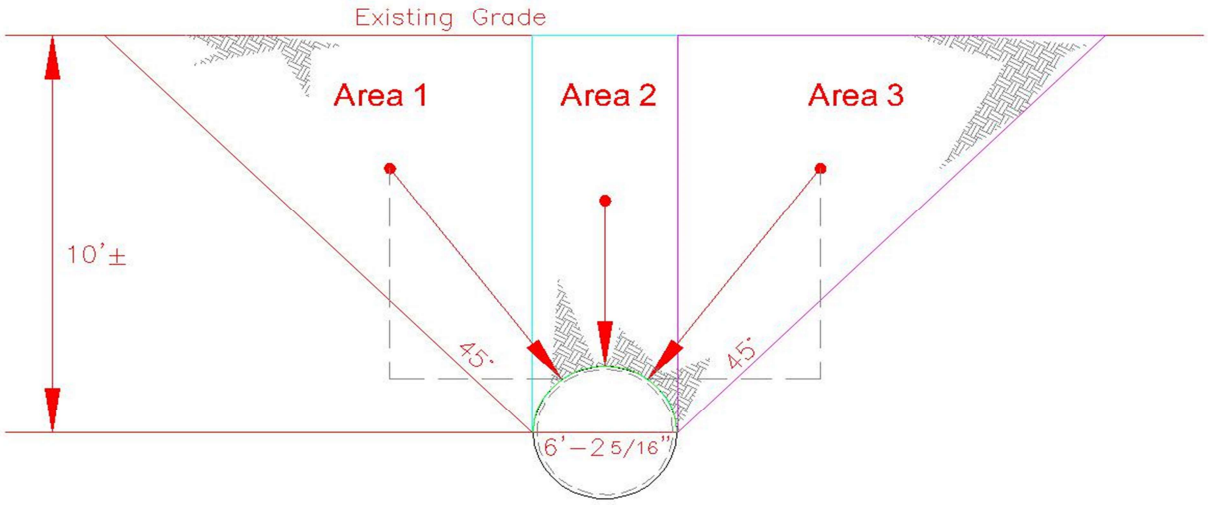
Date:
7/28/2023

Scale:
Horiz.:
Vert.:

Sheet No:
N-1

Oxford Farmers Ditch Siphon - Summary of Surcharge Load 8/31/2023

Description	Cross Section Area	Unit Weight Soil	Unit Pressure (per 1 L.F.)	Pipe Load Bearing Area	Unit Pressure (p.s.i.)
	(Sq. Ft.)	(Lbs./Cu. Ft.)	(Lbs./Cu. Ft.)	(Sq. Ft.)	
Area 1	97.58	120.00	11,709.65	9.72	8.37
Area 2	165.53	120.00	19,863.48	9.72	14.19
Area 3	165.53	120.00	19,863.48	9.72	14.19
Total			51,436.61	9.72	36.76



Oxford Farmers Ditch Existing Siphon Load Diagram

Not to Scale

800 W. 8th Street
Pueblo, Colorado 81003
(719) 582-5588
www.jesik.us

GEOTECHNICAL ENGINEERING & SITE INVESTIGATION REPORT

FOR OXFORD FARMERS DITCH SIPHON

Near 67th Lane and U.S. Highway 50
Fowler
Pueblo County, Colorado

PREPARED FOR:

Oxford Farmers Ditch Company
112 E. Cranston Avenue, Suite E
Fowler, Colorado 81039

PREPARED BY JESIK CONSULTING
PROJECT NUMBER: 23-9492

Joseph A. Jesik, P.E.

TABLE OF CONTENTS

1. INTRODUCTION

Jesik Consulting has completed a site investigation for the subject property at the request of Zach Mason, Vice President of the Oxford Farmers Ditch Company. Site investigation results and geotechnical recommendations are included. Three (3), 4-inch diameter borings were drilled 15-feet below the existing ground surface on July 24, 2023. Two boring (B1 and B2) were located west of Chicosa Creek and boring B3 was drilled near the outlet, east of the creek.

The site is generally irrigated agricultural land near the outlet side of the siphon and undeveloped land near the inlet (west side of the siphon). The existing vegetation at the siphon site consists of native grasses and weeds. It is our understanding that the siphon has experienced 4 blowouts this year and a cured in place (CIP) liner is proposed to minimize future leaks for the siphon.

The 6-foot diameter wood stave siphon was constructed in the 1940's and has been in use seasonally since that time. The steel rings were replaced in the early 1970's. Figure 1 below shows the general location of the siphon, located below Chicosa Creek.

Figure 1 – Site Location

2. EXECUTIVE SUMMARY

Soils encountered in our borings generally consisted of undisturbed silt underlain by loose, wet silty sand. Sand was fine to medium with increasing grain sizes with depth and proximity to the creek. The silt is soft and saturated at depths ranging from 4 to 5-feet BGS. The sand is loose to medium dense and wet.

Bedrock was not encountered to the maximum depth drilled, 15-feet below the existing ground surface.

The existing silty soils have low bearing capacities. It is not known if portions of the existing siphon have settled. An inspection of the siphon should be completed prior to repair. If there are indications of settlement, siphon subgrade should be stabilized before completing repairs. The siphon has been in use many decades with and has performed satisfactorily and indicates the existing soils can support the structure, however movement should be expected, and the proposed liner system should be flexible enough to allow some movement without damage to the liner.

Ground water was encountered at depths ranging from 4 to 5-feet below the ground surface (BGS) during drilling.

Detailed subsurface conditions and select laboratory test results are presented on the boring logs in Appendices B and C.

3. CORROSITIVITY

Corrosion of metal is an electrochemical process that involves oxidation (anodic) and reduction (cathodic) reactions on metal surfaces. Corrosion occurs because of contact with soluble chloride salts found in the soil. Water is required to form a solution of these salts. Several key factors that influence the severity and rate of metal corrosion include: the amount of water available to make a solution, the conductivity of the solution, the pH of the solution, particle-size distribution, and how aerated the soils are. Organic content can also influence corrosion in soil. Furthermore, chloride ions from salt-enriched waters, soil, or even from anti-icing salts can lead to corrosion of steel reinforcement in concrete and steel structures by dissolving the protective layer of oxides present on the steel surface.

Generally, the higher the resistivity, the lower the rate of corrosion. A resistivity value for soil less than 1,500 ohm-cm indicates the presence of high quantities of soluble salts and a higher propensity for corrosion. Soils with higher than 1,500 ohm-cm of resistivity and pH higher than 5.5 are considered non-corrosive.

For structural elements, a site is considered corrosive if one or more of the following conditions exist for the representative soil samples taken at the site:

- Chloride concentration is 500 ppm or greater,

• Sulfate concentration is 1500 ppm (0.15%) or greater
• pH is 5.5 or less.

The most corrosive soils contain large concentrations of soluble sulfates, chlorides, and bicarbonates, and usually are characterized as being very acidic or highly alkaline.

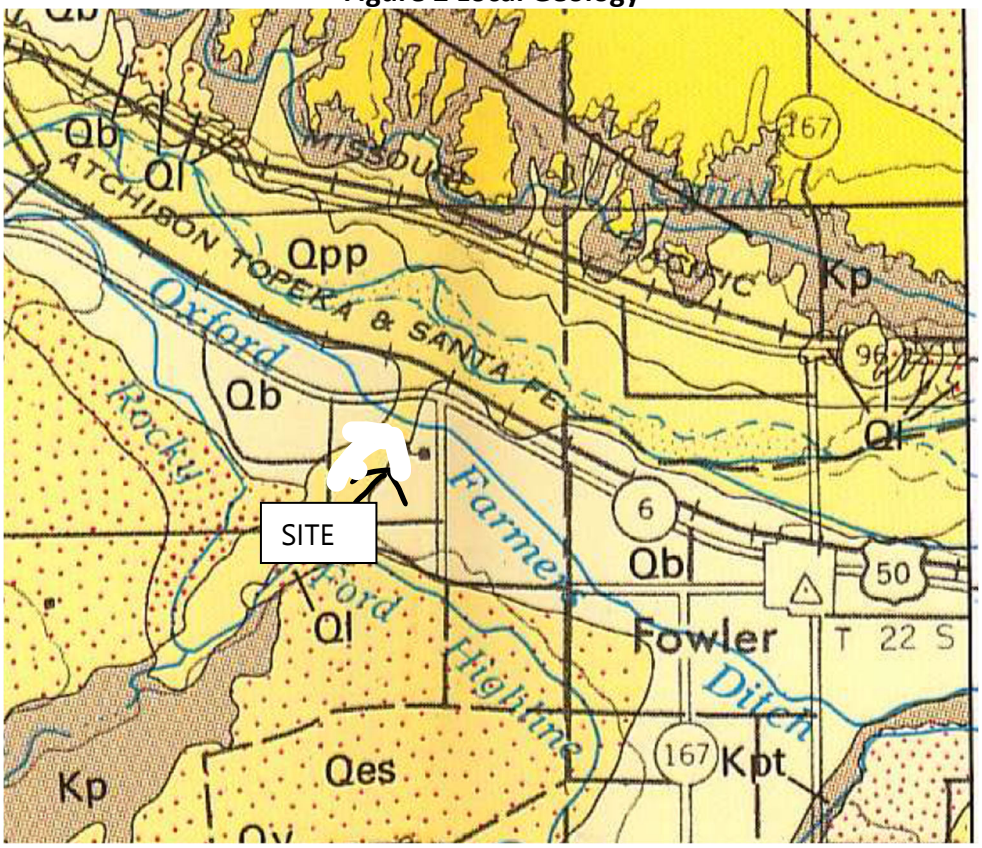
Boring B2 (Closest to the west side of the creek) shows high sulfate concentrations corrosive to concrete. Other test results do not show highly corrosive soils along the siphon alignment.

4. LOCAL GEOLOGY

Most of the siphon is located within the Post-Piney Creek (Qpp) alluvium along Chicosa Creek floodplains with the inlet and outlet in the Broadway Alluvium (Qb).

The Post-Piney Creek alluvium is described as sandy to gravelly alluvium along large streams. The Broadway alluvium is described as thin gravelly deposits on terraces above streams on the plains on the *Geologic Map of the Pueblo Quadrangle, 1978* by the United States Geological Survey. The site is shown on a portion of the map in Figure 2.

Figure 2 Local Geology



5. EXCAVATIONS

We believe the surficial materials found in our bores can be excavated using conventional excavation equipment. Excavations should be sloped or shored to meet local, state, and federal safety regulations. Based on our investigation and Occupational Safety and Health Administration (OSHA) standards, we believe the fill and natural soils classify as Type B. Type B soil requires temporary excavation side slopes no steeper than 1:1, in dry conditions. Excavation slopes specified by OSHA are dependent upon soil types and ground water conditions encountered. The contractor's "competent person" should identify the soils encountered in the excavation and refer to OSHA standards to determine appropriate slopes. Stockpiles of soils and equipment should not be placed within a horizontal distance equal to one-half the excavation depth, from the edge of excavation. A professional engineer should design excavations deeper than 20 feet.

We recommend trench backfill be moisture conditioned and compacted to 90% of the maximum dry density (MDD) and within 3% of the optimum moisture content (OMC) as determined by the standard proctor test (ASTM D698) when located in remote areas. Backfill should be 95% of the MDD in areas where structures or pavements could be built. Placement and compaction of trench backfill should be observed and tested by a trained soils technician.

6. FIELD AND LABORATORY ANALYSIS

Three borings were drilled in the project area at the approximate location shown on the Site Map in Appendix A using a truck-mounted solid stem auger. Borings were stopped at depths ranging from 15 feet BEG.

Soil and rock are visually logged during drilling by our personnel. Logs include soil and rock classification, density/consistency or hardness, weathering, moisture conditions, color, and other observations that may impact the design or construction. Changes in soil/rock types and properties are noted along with groundwater conditions encountered during drilling.

The driller collects soil samples from different depths to determine subsurface conditions and properties. A 2-inch O.D. brass liner is placed inside of a split-barrel sampler to retrieve the samples. The sample barrel is driven into the ground by a 140-pound hammer free falling 30 inches. Drill cuttings and bulk samples may also be collected where liner samples are not retrieved. Samples are taken to our laboratory for testing and analysis.

Laboratory testing may consist of moisture content, dry density, swell/ consolidation potential, water soluble sulfate, and particle size distribution.

Our project engineer then reviews field logs and laboratory test results. Subsurface conditions presented in the report are based upon drilling, observations, laboratory testing, and our experience in the area.

7. SEISMIC CONSIDERATIONS

The following seismic considerations are based on risk category II and soil class DE.

Table 7.1 – Seismic Considerations

Code	Site Classification
2021 International Building Code (IBC)	B
Mapped Spectral Acceleration for Short Periods, S_s[2]	0.16
Mapped Spectral Acceleration for a 1-second period, S_1[2]	0.044

1. In general accordance with the *2021 International Building Code* and *ASCE 7-22*
2. USGS Seismic Hazard Curves

8. CONCRETE

Concrete exposed to injurious concentrations of sulfates from soil and water should be made with sulfate-resisting cement. The soils on this site are deemed to have a sulfate severity of severe and corresponding exposure class of S2. Concrete exposed to this type of soil should therefore incorporate sulfate resistant cementitious material. Furthermore, the concrete should have a maximum water-to-cement ratio of 0.45, a minimum compressive strength of 4,500 psi and be entrained with air.

9. LIMITATIONS

In any subsurface investigation, limited data is available from which to formulate soil descriptions and generate recommendations for foundations and related construction components. The samples taken are indicative of the subsurface materials at the time and at the location the samples were taken. Precipitation, seasonal changes, and excavating are just a few of the factors that may create changes in the subsurface conditions of the site. If conditions are encountered which vary significantly different from those described in this report, contact this office before proceeding.

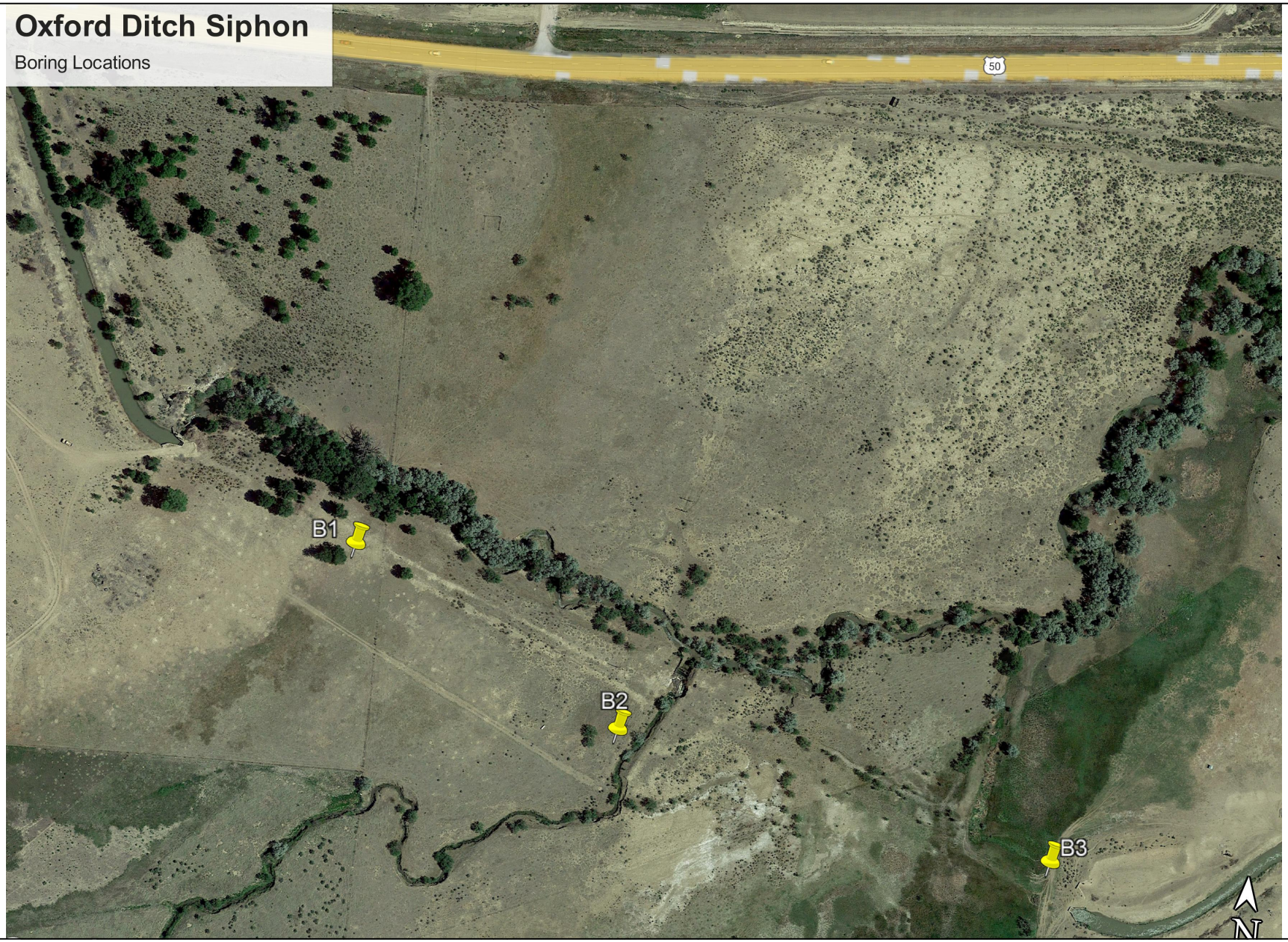
By acceptance of this report all parties agree that the purpose of this report is to provide geotechnical data and foundation recommendations only and does not address nor was intended to address any environmental issues, hazardous materials, mold issues, toxic waste issues or other subsurface situations or conditions other than those described within this report. This report is intended for the sole use of the above-named client and their approved agents. This office cannot be responsible for any conclusions or recommendations made by other parties based upon the data contained herein.

No warranty expressed or implied is made.

APPENDIX A: MAP

Oxford Ditch Siphon

Boring Locations



GENERAL NOTES

BORINGS DRILLED JULY 24, 2023
ALL MEASUREMENTS ARE APPROXIMATE

N

0 50 125 250
1" = 250'

No.	Revision/Issue	Date
JJ	Rev. 0	

Jesik
800 W. 8th Street
Pueblo, Colorado 81003
(719) 582-5588
www.jesik.us

SITE INVESTIGATION PLAN FOR:

OXFORD DITCH SIPHON
67TH LANE & HWY 50
FOWLER
PUEBLO COUNTY, COLORADO

PROJECT NUMBER:	SHEET:
23-9492	SP-1
DATE: 7/27/2023	
SCALE: 1" = 250'	

APPENDIX B: BORING LOGS

Project: **Oxford Ditch Siphon** Project Location: **67th & Hwy 50** Project Number: **23-9492**	**Jesik Consulting** 800 W. 8th Street Pueblo, CO 81003 (719) 582-5588	Log of Boring B1 **Sheet 1 of 1**

Date(s) Drilled **07-24-23**	Logged By **CL**	Checked By **AJ**
Drilling Method **Solid Stem Auger**	Drill Bit Size/Type **4" / Carbide**	Total Depth of Borehole **15 feet bgs**
Drill Rig Type **Giddings 25**	Drilling Contractor **Jesik**	Approximate Surface Elevation **---**
Groundwater Level and Date Measured **4' Drill**	Sampling Method(s) **Bulk, Modified California**	Hammer Data **140 lbs / 30"**
Borehole Backfill **None**	Location **38.14621, -104.086**	

Depth (feet)	Sample Type	Sampling Resistance, blows/ft	Material Type	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	Percent Fines	Uniformity Coefficient	LL, %	PI, %	Swell/Consolidation, %	Comments
0			SM		SAND, some silt to silty with depth, fine grained, non-plastic, medium dense to very loose, moist to wet, brown.								
		11-4				3.3		15					
		1-1				18.5		39		NL	NP		Drill ▽
5													
													pH = 8.35 ORP = 43 mV Sulfate = 0.13% Chloride = 59 ppm Resistivity = 1,300 Ohm-cm
10													
15					Total Depth Drilled								
20													
25													
30													

C:\Users\landy\OneDrive - Jesik Consulting\Projects\23-XXXX\23-9492_OXFORD FARMERS DITCH\Engineering\Geotechnical\Borings.bg4\Jesik Borings Template 2022.tpl

Figure B-1

Project: **Oxford Ditch Siphon** Project Location: **67th & Hwy 50** Project Number: **23-9492**	**Jesik Consulting** 800 W. 8th Street Pueblo, CO 81003 (719) 582-5588	Log of Boring B2 **Sheet 1 of 1**

Date(s) Drilled **07-24-23**	Logged By **CL**	Checked By **AJ**
Drilling Method **Solid Stem Auger**	Drill Bit Size/Type **4" / Carbide**	Total Depth of Borehole **15 feet bgs**
Drill Rig Type **Giddings 25**	Drilling Contractor **Jesik**	Approximate Surface Elevation **---**
Groundwater Level and Date Measured **5' Drill**	Sampling Method(s) **Bulk, Modified California**	Hammer Data **140 lbs / 30"**
Borehole Backfill **None**	Location **38.1457, -104.08708**	

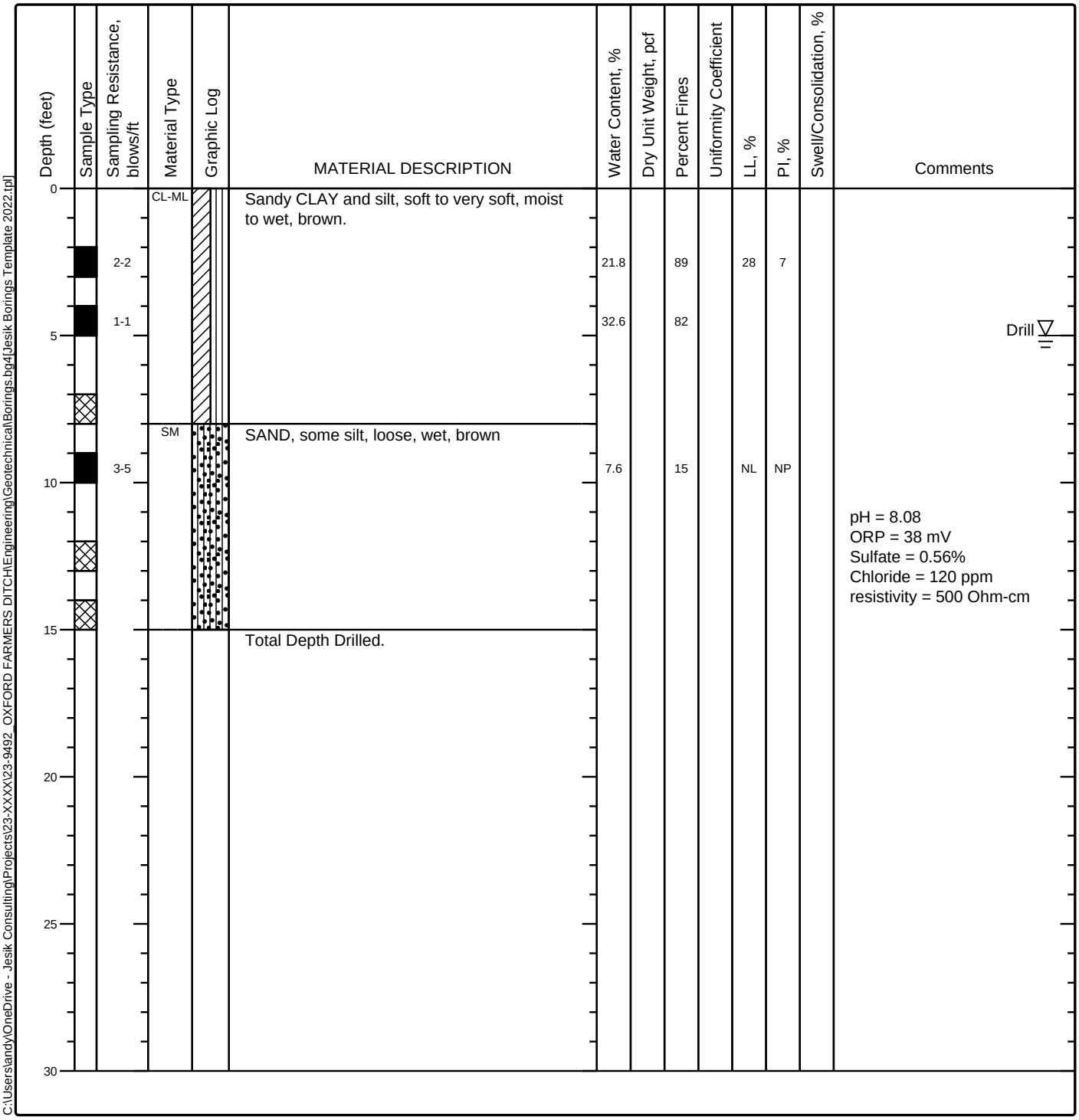


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Figure B-2

Project: **Oxford Ditch Siphon** Project Location: **67th & Hwy 50** Project Number: **23-9492**	**Jesik Consulting** 800 W. 8th Street Pueblo, CO 81003 (719) 582-5588	Log of Boring B3 **Sheet 1 of 1**

Date(s) Drilled **07-24-23**	Logged By **CL**	Checked By **AJ**
Drilling Method **Solid Stem Auger**	Drill Bit Size/Type **4" / Carbide**	Total Depth of Borehole **15 feet bgs**
Drill Rig Type **Giddings 25**	Drilling Contractor **Jesik**	Approximate Surface Elevation **---**
Groundwater Level and Date Measured **4' Drill**	Sampling Method(s) **Bulk, Modified California**	Hammer Data **140 lbs / 30"**
Borehole Backfill **None**	Location **38.14502, -104.08157**	

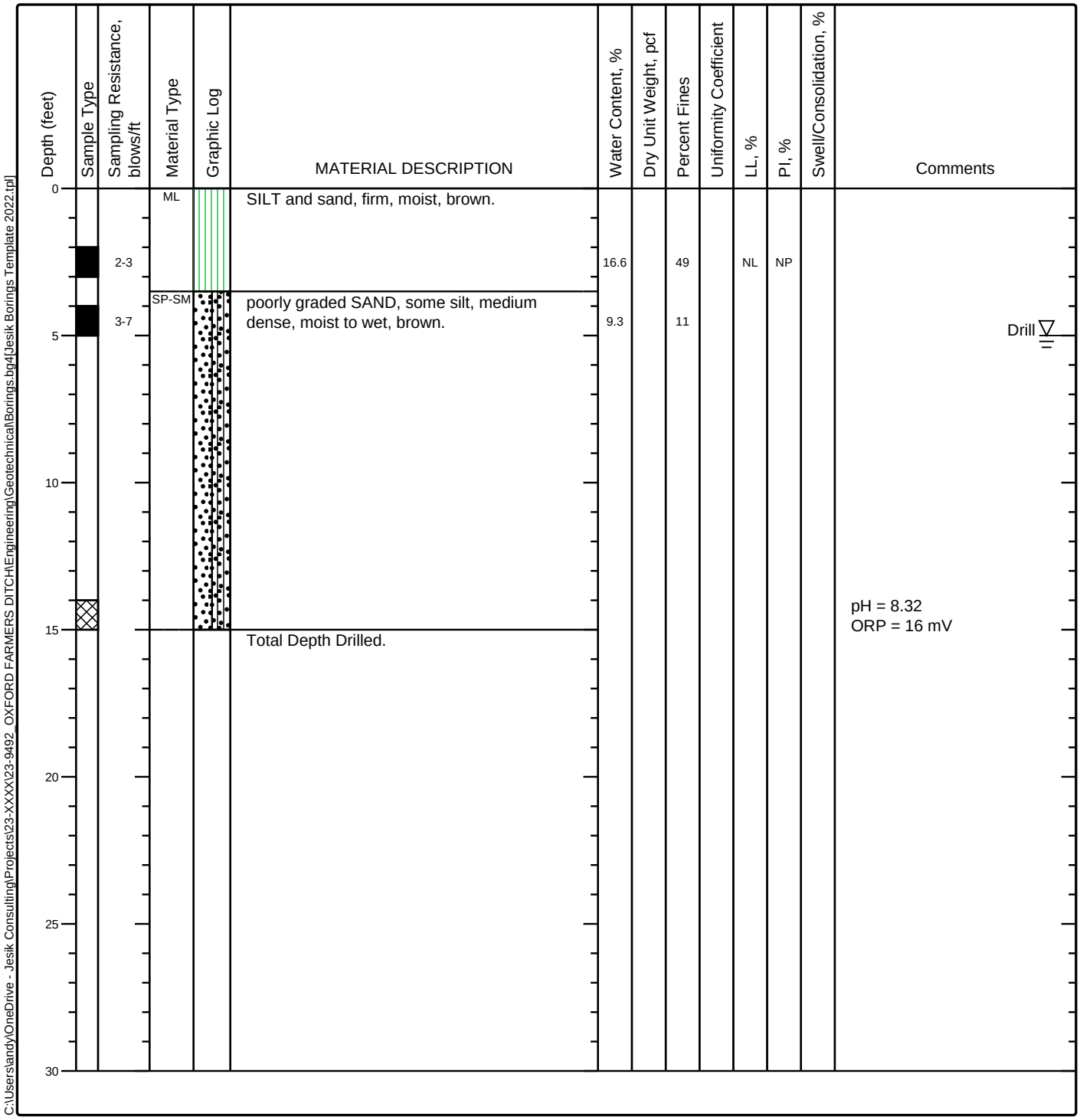

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Figure B-3

Project: **Oxford Ditch Siphon** Project Location: **67th & Hwy 50** Project Number: **23-9492**	**Jesik Consulting** 800 W. 8th Street Pueblo, CO 81003 (719) 582-5588	Boring Log Key

Depth (feet)	Sample Type	Sampling Resistance, blows/ft	Material Type	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	Percent Fines	Uniformity Coefficient	LL, %	PI, %	Swell/Consolidation, %	Comments
1	2	3	4	5	6	7	8	9	10	11	12	13	14

COLUMN DESCRIPTIONS

1. Depth (feet): Depth in feet below the ground surface.
2. Sample Type: Type of soil sample collected at the depth interval shown.
3. Sampling Resistance, blows/ft: Number of blows to advance driven sampler one foot (or distance shown) beyond seating interval using the hammer identified on the boring log.
4. Material Type: Type of material encountered.
5. Graphic Log: Graphic depiction of the subsurface material encountered.
6. MATERIAL DESCRIPTION: Description of material encountered. May include consistency, moisture, color, and other descriptive text.
7. Water Content, %: Water content of the soil sample, expressed as percentage of dry weight of sample.
8. Dry Unit Weight, pcf: Dry weight per unit volume of soil sample measured in laboratory, in pounds per cubic foot.
9. Percent Fines: The percent fines (soil passing the No. 200 Sieve) in the sample. WA indicates a Wash Sieve, SA indicates a Sieve Analysis.
10. Uniformity Coefficient: Sieve Uc
11. LL, %: Liquid Limit, expressed as a water content.
12. PI, %: Plasticity Index, expressed as a water content.
13. Swell/Consolidation, %: Swell/Consolidation
14. Comments: Comments and observations regarding drilling or sampling made by driller or field personnel.

FIELD AND LABORATORY TEST ABBREVIATIONS

CHEM: Chemical tests to assess corrosivity
COMP: Compaction test
CONS: One-dimensional consolidation test
LL: Liquid Limit, percent
PI: Plasticity Index, percent
SA: Sieve analysis (percent passing No. 200 Sieve)
UC: Unconfined compressive strength test, Qu, in ksf
WA: Wash sieve (percent passing No. 200 Sieve)

MATERIAL GRAPHIC SYMBOLS

SILTY CLAY (CL-ML)
SILT, SILT w/SAND, SANDY SILT (ML)
Silty SAND (SM)
Poorly graded SAND with Silt (SP-SM)

TYPICAL SAMPLER GRAPHIC SYMBOLS

Bulk Sample
2.5-inch-OD Modified California w/ brass liners

OTHER GRAPHIC SYMBOLS

Water level (at time of drilling, ATD)
Water level (after waiting, AW)
Minor change in material properties within a stratum
Inferred/gradational contact between strata
Queried contact between strata

GENERAL NOTES

1: Soil classifications are based on the Unified Soil Classification System. Descriptions and stratum lines are interpretive, and actual lithologic changes may be gradual. Field descriptions may have been modified to reflect results of lab tests.
2: Descriptions on these logs apply only at the specific boring locations and at the time the borings were advanced. They are not warranted to be representative of subsurface conditions at other locations or times.
3: Blow counts of 6-12 indicate that it took 6 blows to drive the sampler the first 6 inches into the ground and 12 blows to drive the sampler the second 6 inches into the ground for a total of 12 inches.
4: Blow counts of 50/8 indicate that it took 50 blows to drive the sampler into the ground a total of 8 inches.

Figure B-4

APPENDIX C: LABORATORY TEST RESULTS

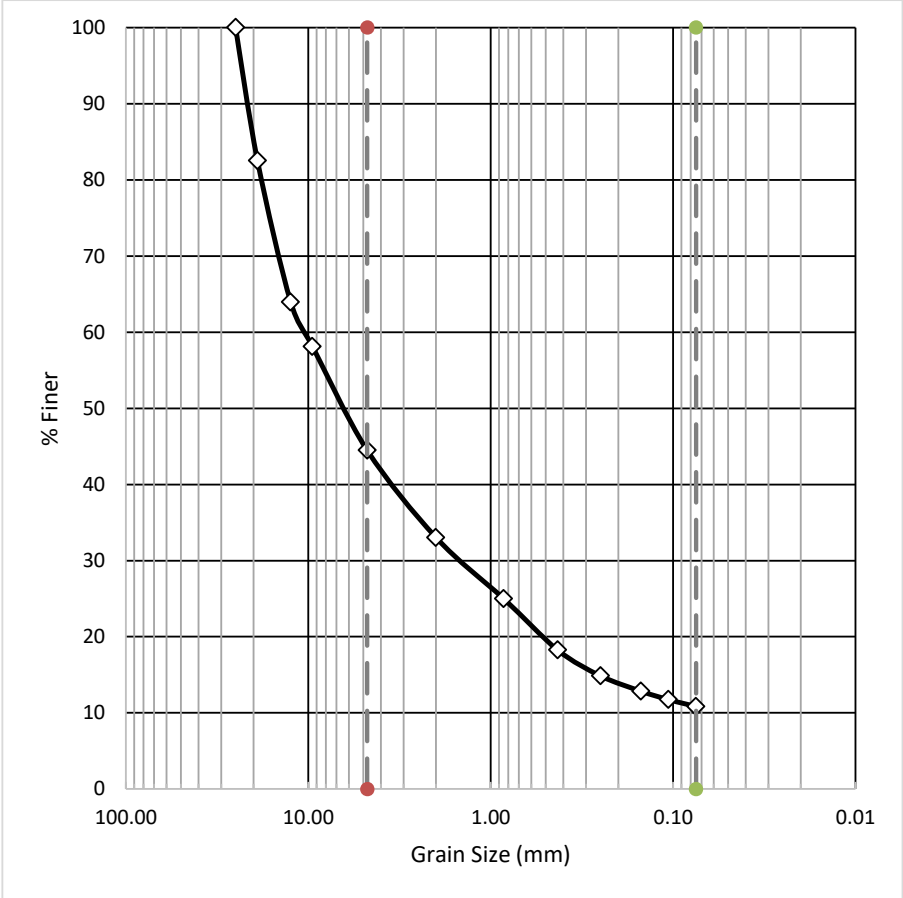
Particle Size Distribution of Soils
ASTM D6913

800 W. 8th Street
Pueblo, Colorado 81003
(719) 582-5588
www.jesik.us

Project Name:	Oxford Siphon	Tested By:	CL	Date:	7/28/2023
Source/Boring:	B3	Checked By:	AJ	Date:	7/28/2023
Depth/Sample No:	4	Test Number:	1	Project No:	23-9492
Sample Time:	-	Delivery Date:	7/23/2023	Sample Date:	7/23/2023

Sieve No.	Dia (mm)	% Passing
1"	25.00	100%
3/4"	19.00	83%
1/2"	12.50	64%
3/8"	9.50	58%
#4	4.75	44%
#10	2.00	33%
#20	0.85	25%
#40	0.43	18%
#60	0.25	15%
#100	0.15	13%
#140	0.11	12%
#200	0.075	10.8%

% Gravel:	56%
% Sand:	34%
% Clay/Silt:	10.8%



D_{10}: -
D_{30}: 1.6
D_{50}: 6.5
D_{60}: 11

C_u: -
C_c: -

Natural Moisture Content (%): 9.3%

Liquid Limit, Plastic Limit, and Plasticity Index of Soils
ASTM D4318

Jesik
800 W. 8th Street
Pueblo, Colorado 81003
(719) 582-5588
www.jesik.us

Project Name:	Oxford Siphon	Tested By:	CL	Date:	7/27/2023
Source/Boring:	B1	Checked By:	AJ	Date:	7/28/2023
Depth/Sample No:	4	Test Number:	1	Project No:	23-9492
Sample Time:	-	Delivery Date:	7/23/2023	Sample Date:	7/23/2023

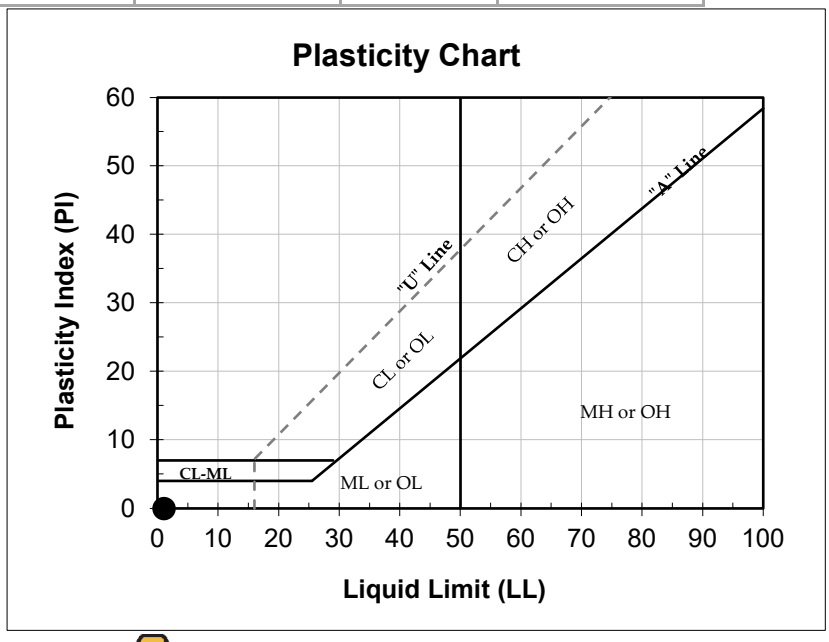
LIQUID LIMIT

Container No.:					
Container mass (g):	-				
Wet soil + can mass (g):	-				
Dry soil + can mass (g):	-				
Blow count, N:	-				
Dry soil mass (g):					
Water mass (g):					
Water content:					
PLASTIC LIMIT					
Container No.:					
Container mass (g):	-				
Wet soil + container mass (g):	-				
Dry soil + container mass (g):	-				
Dry soil mass (g):					
Mass of moisture (g):					
Water content:					

LIQUID LIMIT. LL = NL
PLASTIC LIMIT, PL = NP
PLASTICITY INDEX, PI = NP

SAMPLE DESCRIPTION:

Rolling Device: Hand
Liquid Limit Device: Manual
Grooving Tool: Plastic



Form Revision March 2021

AASHTO ACCREDITED

Liquid Limit, Plastic Limit, and Plasticity Index of Soils
ASTM D4318

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Pueblo, Colorado 81003
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Project Name:	Oxford Siphon	Tested By:	CL	Date:	7/27/2023
Source/Boring:	B2	Checked By:	AJ	Date:	7/28/2023
Depth/Sample No:	2	Test Number:	2	Project No:	23-9492
Sample Time:	-	Delivery Date:	7/23/2023	Sample Date:	7/23/2023

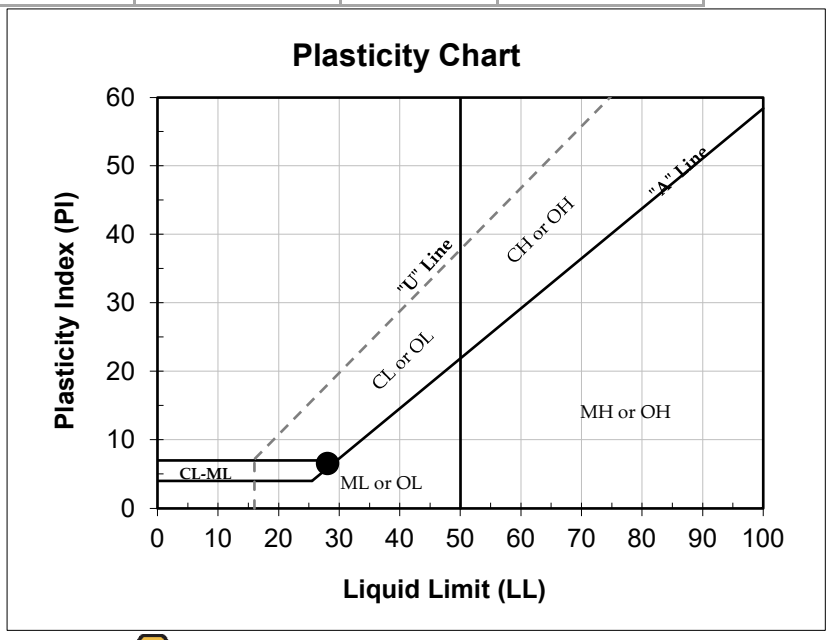
LIQUID LIMIT

Container No.:	E	K	CC		
Container mass (g):	13.60	13.63	14.29		
Wet soil + can mass (g):	24.06	22.73	21.20		
Dry soil + can mass (g):	21.76	20.75	19.67		
Blow count, N:	26.00	20	18		
Dry soil mass (g):	8.16	7.12	5.38		
Water mass (g):	2.30	1.98	1.53		
Water content:	28.2%	27.8%	28.4%		
PLASTIC LIMIT					
Container No.:	QQ	VV			
Container mass (g):	14.89	13.54			
Wet soil + container mass (g):	18.81	18.37			
Dry soil + container mass (g):	18.04	17.62			
Dry soil mass (g):	3.15	4.08			
Mass of moisture (g):	0.77	0.75			
Water content:	24.4%	18.4%			

LIQUID LIMIT. LL = 28
PLASTIC LIMIT, PL = 21
PLASTICITY INDEX, PI = 7

SAMPLE DESCRIPTION:

CLAY and SILT



Rolling Device: Hand
Liquid Limit Device: Manual
Grooving Tool: Plastic

Liquid Limit, Plastic Limit, and Plasticity Index of Soils
ASTM D4318

Jesik
800 W. 8th Street
Pueblo, Colorado 81003
(719) 582-5588
www.jesik.us

Project Name:	Oxford Siphon	Tested By:	CL	Date:	7/27/2023
Source/Boring:	B3	Checked By:	AJ	Date:	7/28/2023
Depth/Sample No:	2	Test Number:	3	Project No:	23-9492
Sample Time:	-	Delivery Date:	7/23/2023	Sample Date:	7/23/2023

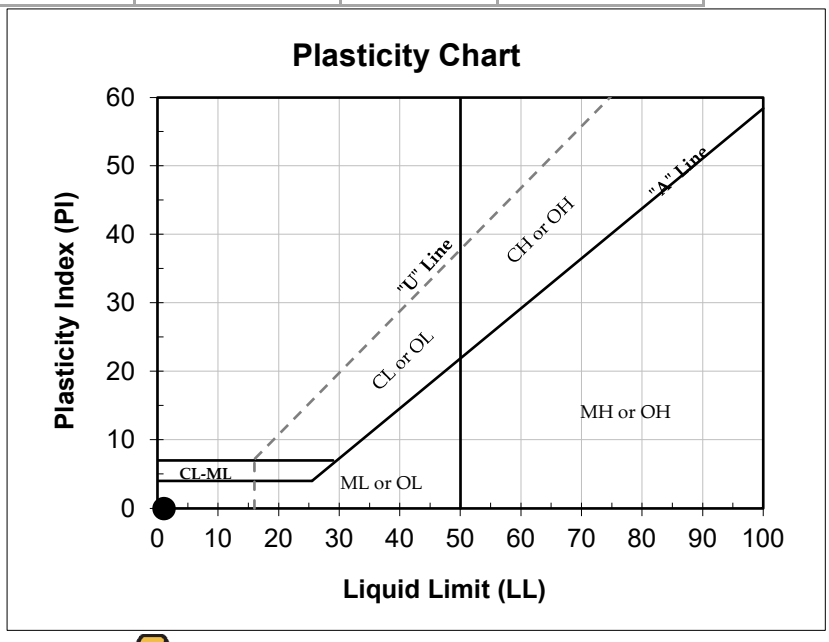
LIQUID LIMIT

Container No.:					
Container mass (g):	-				
Wet soil + can mass (g):	-				
Dry soil + can mass (g):	-				
Blow count, N:	-				
Dry soil mass (g):					
Water mass (g):					
Water content:					
PLASTIC LIMIT					
Container No.:					
Container mass (g):	-				
Wet soil + container mass (g):	-				
Dry soil + container mass (g):	-				
Dry soil mass (g):					
Mass of moisture (g):					
Water content:					

LIQUID LIMIT. LL = NL
PLASTIC LIMIT, PL = NP
PLASTICITY INDEX, PI = NP

SAMPLE DESCRIPTION:

Rolling Device: Hand
Liquid Limit Device: Manual
Grooving Tool: Plastic



Liquid Limit, Plastic Limit, and Plasticity Index of Soils
ASTM D4318

Jesik
800 W. 8th Street
Pueblo, Colorado 81003
(719) 582-5588
www.jesik.us

Project Name:	Oxford Siphon	Tested By:	CL	Date:	7/27/2023
Source/Boring:	B2	Checked By:	AJ	Date:	7/28/2023
Depth/Sample No:	9	Test Number:	4	Project No:	23-9492
Sample Time:	-	Delivery Date:	7/23/2023	Sample Date:	7/23/2023

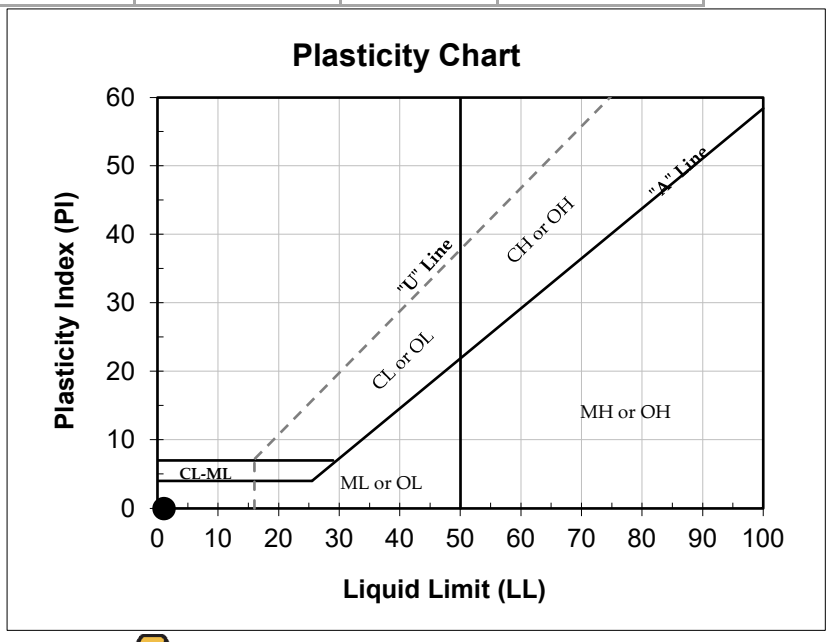
LIQUID LIMIT

Container No.:					
Container mass (g):	-				
Wet soil + can mass (g):	-				
Dry soil + can mass (g):	-				
Blow count, N:	-				
Dry soil mass (g):					
Water mass (g):					
Water content:					
PLASTIC LIMIT					
Container No.:					
Container mass (g):	-				
Wet soil + container mass (g):	-				
Dry soil + container mass (g):	-				
Dry soil mass (g):					
Mass of moisture (g):					
Water content:					

LIQUID LIMIT. LL = NL
PLASTIC LIMIT, PL = NP
PLASTICITY INDEX, PI = NP

SAMPLE DESCRIPTION:

Rolling Device: Hand
Liquid Limit Device: Manual
Grooving Tool: Plastic



Project Name: Oxford Siphon

Project No. 23-9492

pH, Redox, Resistivity, Chloride, Sulfate, Sulfide

Sample No.	Temp (F)	pH	ORP (Redox) (mV)	Sulfide Presence	Water Sol. Sulfate (ppm)	Chloride (ppm)	Resistivity (Ω-cm)
B1@7-13	70.5	8.35	43		1,300	59	1,300
B2@12-15	70.5	8.08	38		5,600	120	400
B3@15	70.5	8.32	16				

APPENDIX D

Colorado Water Conservation Board Loan Application

(Submitted through Online Portal)

Amortization Schedule

Amortization Table

The following table is based on the information entered in the calculator form.

Principal Amount: $1,414,000.00
Interest Rate: 1.9 %
Term: 30 Years
Annual Payment: $62,270.19

Year	Interest	Principal	Balance
2023	$26,866.00	$35,404.19	$1,378,595.81
2024	$26,193.32	$36,076.87	$1,342,518.94
2025	$25,507.86	$36,762.33	$1,305,756.61
2026	$24,809.38	$37,460.82	$1,268,295.79
2027	$24,097.62	$38,172.57	$1,230,123.22
2028	$23,372.34	$38,897.85	$1,191,225.37
2029	$22,633.28	$39,636.91	$1,151,588.46
2030	$21,880.18	$40,390.01	$1,111,198.45
2031	$21,112.77	$41,157.42	$1,070,041.03
2032	$20,330.78	$41,939.41	$1,028,101.61
2033	$19,533.93	$42,736.26	$985,365.35
2034	$18,721.94	$43,548.25	$941,817.10
2035	$17,894.52	$44,375.67	$897,441.44
2036	$17,051.39	$45,218.80	$852,222.63
2037	$16,192.23	$46,077.96	$806,144.67
2038	$15,316.75	$46,953.44	$759,191.23
2039	$14,424.63	$47,845.56	$711,345.67
2040	$13,515.57	$48,754.62	$662,591.05
2041	$12,589.23	$49,680.96	$612,910.09
2042	$11,645.29	$50,624.90	$562,285.19
2043	$10,683.42	$51,586.77	$510,698.41
2044	$9,703.27	$52,566.92	$458,131.49
2045	$8,704.50	$53,565.69	$404,565.80
2046	$7,686.75	$54,583.44	$349,982.36
2047	$6,649.66	$55,620.53	$294,361.83
2048	$5,592.87	$56,677.32	$237,684.51
2049	$4,516.01	$57,754.19	$179,930.33
2050	$3,418.68	$58,851.52	$121,078.81
2051	$2,300.50	$59,969.69	$61,109.12
2052	$1,161.07	$61,109.12	$0.00

APPENDIX E

Financial Statements and Budgets for 2020, 2021, 2022

THE OXFORD FARMERS' DITCH COMPANY

Report of the Secretary/Treasurer

For Fiscal Period: November 1, 2019 to October 31, 2020

Checking Balance - November 1, 2019		**$77,937.69**
Receipts:		
Regular Assessment @ $109	$130,364.00	
2nd Assessment @ $80	$95,680.00	
		$226,044.00
Checking Acct. Interest	$429.36	
Late Payment Penalties	$1,639.12	$2,068.48
Dividends & Reimburse Exp	$269.00	
Stock Transfer Fees	$221.04	
Accounts Receivable	-$0.60	
Total Receipts:		**$228,601.92**
Total Funds:		**$306,539.61**
Disbursements:		
Dues:		
Ark. Valley Ditch Assn.	$700.00	
CWPDA	$976.50	
Other	$0.00	
Total Dues:		**$1,676.50**
Salaries:		
Kendra Hood	$6,500.00	
Kirk Lamphier	$39,999.96	
Director Fees	$90.00	
Undeposited Director Fees	-18	
Total Salaries:		**$46,571.96**
Engineering Fees		**$679.50**
Finance Charges		**$0.00**

Disbursements Continued:		
Canal Maintenance	$12,632.45	
Fuel	$5,955.21	
Equipment Maintenance	$4,865.30	
Vehicle Repair		
Total Canal Maintenance		**$23,452.96**
Insurance:		
Workers Comp.	$2,083.00	
Liability Ins.	$6,813.00	
Total Insurance:		**$8,896.00**
Office Supplies		**$957.13**
Licenses		**$751.74**
Annual Meeting		**$212.58**
Loan – JD Excavator		**$5,963.85**
Interest Expense		**$550.59**
Rent		**$3,600.00**
Telephone		**$1,283.92**
Legal Fees		**$0.00**
Taxes:		
Pueblo County	$127.03	
Payroll Taxes	$3,059.98	
Total Taxes:		**$3,187.01**
Utilities - Electric		**$13,821.55**
Water Purchased:		
Well Ag return flow	$6,585.25	
Pueblo Water Works	$98,500.00	
Ag Project Water 1800 af * $15.89	$25,405.15	
Winter Water 2231.96af * $3.80	$8,481.45	
Total Water Purchased		**$138,971.85**
Total Disbursements:		**$250,577.14**
Checking Balance - October 31, 2020		**$55,969.56**
Total Funds:		**$306,539.61**

THE OXFORD FARMERS' DITCH COMPANY

Report of the Secretary/Treasurer

For Fiscal Period: November 1, 2020 to October 31, 2021

Checking Balance - November 1, 2020			**$55,960.92**
Receipts:			
	Regular Assessment @ $	$130,364.00	
	2nd Assessment @ $80	$0.00	
			$130,364.00
	Checking Acct. Interest	$183.58	
	Late Payment Penalties	$882.06	$1,065.64
	Dividends & Reimburse	$193.00	
	Stock Transfer Fees	$220.00	
	Accounts Receivable		
	Rent Chicosa	$0.00	
Total Receipts:			**$131,842.64**
Total Funds:			**$187,803.56**
Disbursements:			
	Dues:		
	Ark. Valley Ditch Assn	$790.61	
	CWPDA	$750.00	
	Engineering Fees	$150.00	
	Total Dues:		**$1,690.61**
	Salaries:		
	Kendra Hood	$6,500.00	
	Kirk Lamphier	$39,999.96	
	Director Fees	$90.00	
	Non Deposited Director fe	-18	
	Total Salaries:		**$46,571.96**
	Finance Charges		**$0.00**

Disbursements Continued:			
	Canal Maintenance	$10,058.22	
	Fuel	$4,876.94	
	Equipment Maintenance	$2,597.14	
	Vehicle Repair		
	Total Canal Maintenance		**$17,532.30**
	Insurance:		
	Workers Comp.	$1,044.00	
	Liability Ins.	$6,746.00	
	Total Insurance:		**$7,790.00**
	Office Supplies		**$265.76**
	Licenses		**$78.02**
	Annual Meeting		**$74.93**
	Loan – JD Excavator Paid in Full		**$5,798.07**
	Interest Expense		**$179.56**
	Rent		**$3,600.00**
	Telephone		**$1,082.67**
	Legal Fees		**$0.00**
	Taxes:		
	Pueblo County	$127.23	
	Payroll Taxes	$3,060.00	
	Total Taxes:		**$3,187.23**
	Utilities - Electric		**$10,465.02**
	Water Purchased:		
	Well Ag Water 351.86af	$17,090.00	
	Pueblo Water Works	$0.00	
	Ag Project Water 360af *	$5,450.40	
	Winter Water 1670.42af	$6,347.61	
	Total Water Purchased		**$28,888.01**
Total Disbursements:			**$127,504.14**
Checking Balance - October 31, 2021			**$60,264.39**
Total Funds:			**$187,803.56**

THE OXFORD FARMERS' DITCH COMPANY

Report of the Secretary/Treasurer

For Fiscal Period: November 1, 2021 to October 31, 2022

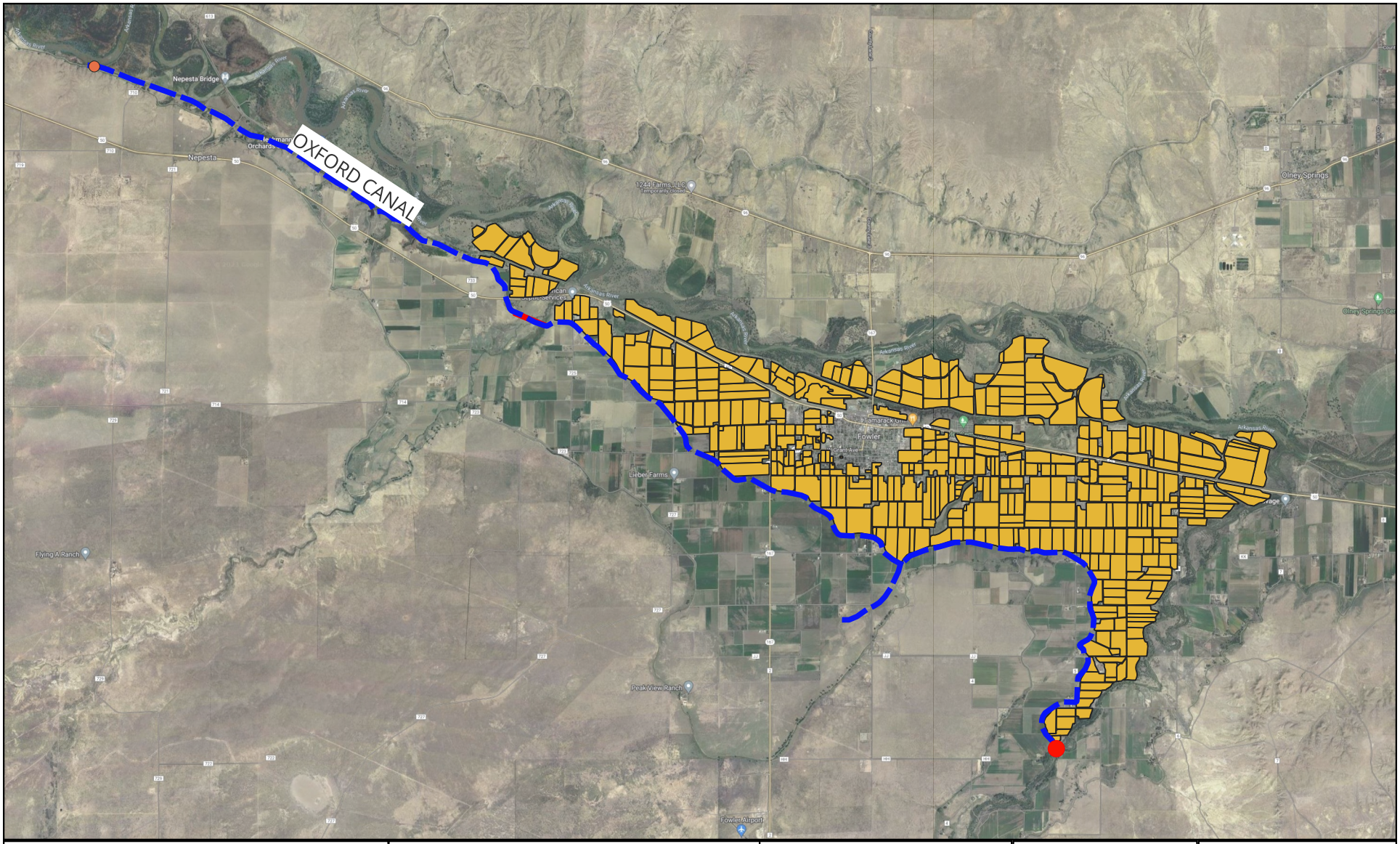
Checking Balance - November 1, 2021		**$52,726.79**
Receipts:		
Regular Assessment	$132,756.00	
2nd Assessment @ $	0	
		$132,756.00
Checking Acct. Inter	$339.74	
Late Payment Penalties		
Dividends & Reimbu	$232.00	
Stock Transfer Fees	$120.00	
Total Receipts:		**$133,447.74**
Total Funds:		**$186,174.53**
Disbursements:		
Dues:		
Ark. Valley Ditch A	$2,981.22	
AGRA (CWPDA)	$750.00	
SOS Filling Fee	$20.00	
Total Dues:		**$3,751.22**
Salaries:		
Kendra Hood	$6,825.00	
Kirk Lamphier	$42,460.96	
Director Fees	$90.00	
Total Salaries:		**$49,375.96**
Finance Charges		**$0.00**

Disbursements Continued:		
Canal Maintenance	$4,417.86	
Fuel	9489.66	
Equipment Maintenance	$4,524.16	
Vehicle Repair		
Total Canal Maintenance		**$18,431.68**
Insurance:		
Workers Comp.	$1,584.00	
Liability Ins.	$6,771.00	
Total Insurance:		**$8,355.00**
Office Supplies		**$937.60**
Licenses		**$420.57**
Annual Meeting		**$237.93**
Rent		**$3,600.00**
Telephone		**$1,424.75**
Legal Fees		**$1,167.52**
Taxes:		
Pueblo County	$155.66	
Payroll Taxes	$3,248.26	
Total Taxes:		**$3,403.92**
Utilities - Electric		**$11,253.88**
Water Purchased:		
Well Ag Water 385af Tier 1 $48.74/af	$18,765.00	
Pueblo Water Works	$0.00	
Ag Project Water 595af * $15.14	$9,008.30	
Winter Water 1841.28af * $3.80	$6,996.86	
Total Water Purchased		**$34,770.16**
Total Disbursements:		**$137,130.19**
Checking Balance - October 31, 2022		**$49,944.84**
Total Funds:		**$186,174.53**

APPENDIX F

Oxford Farmer's Ditch Company

Service Area Map



Appendix F.
Figure 1
Service Area of the Oxford Farmer's Ditch Company

- Oxford Headgate
- Oxford Canal Return
- Oxford Farmer's Ditch
- Oxford Irrigated Lands - 2021

Google Hybrid

0 4,000 8,000 ft

Date: 7/25/2023
Coordinate System: NAD83/State Plane Colorado South, feet
Sources:

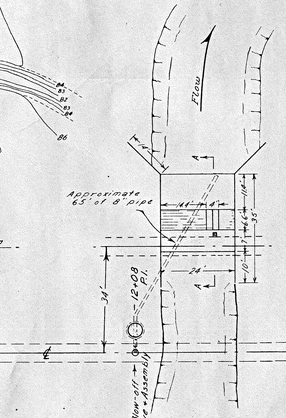
Created by: Daniel Tucker, PE, AGRA

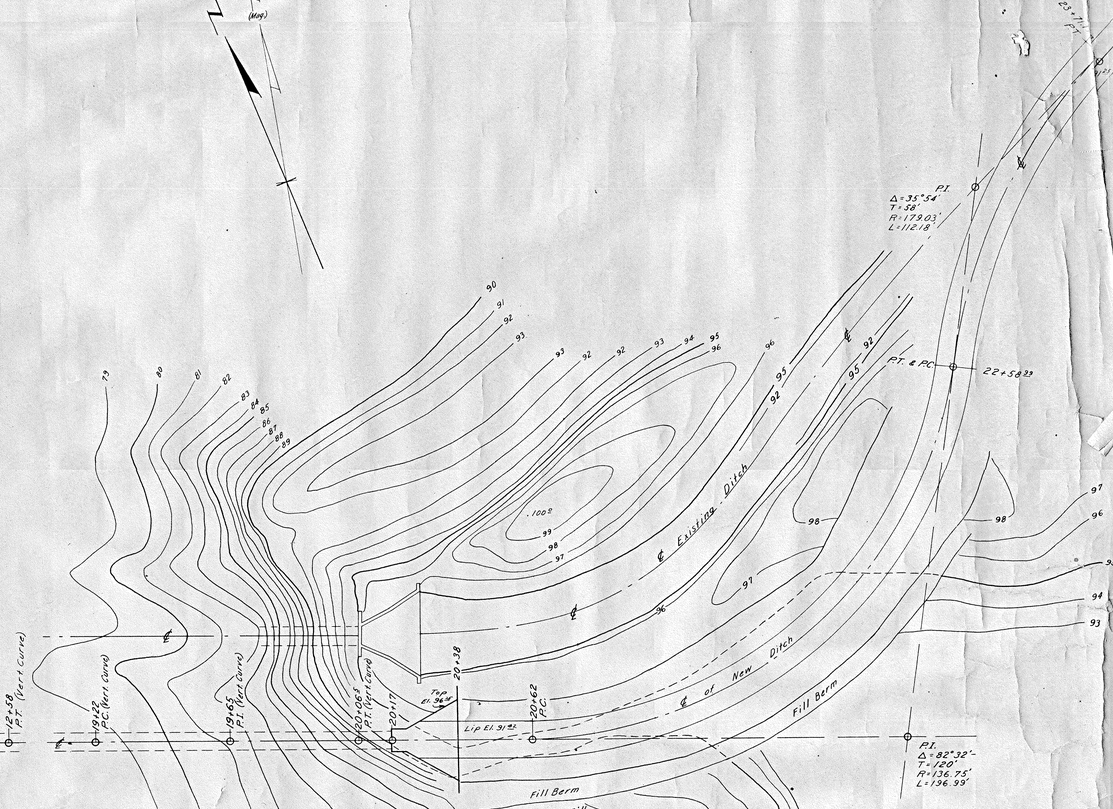
APPENDIX G

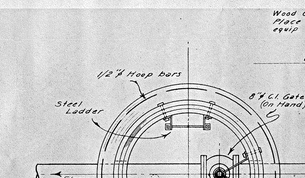
Oxford Farmer's Ditch Company

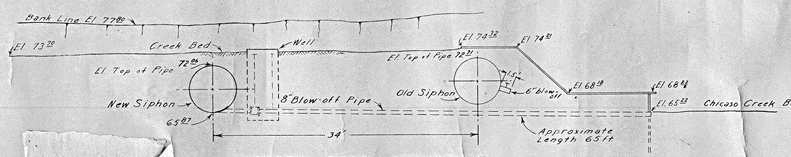
SCS Chicosa Creek Siphon Construction Drawing

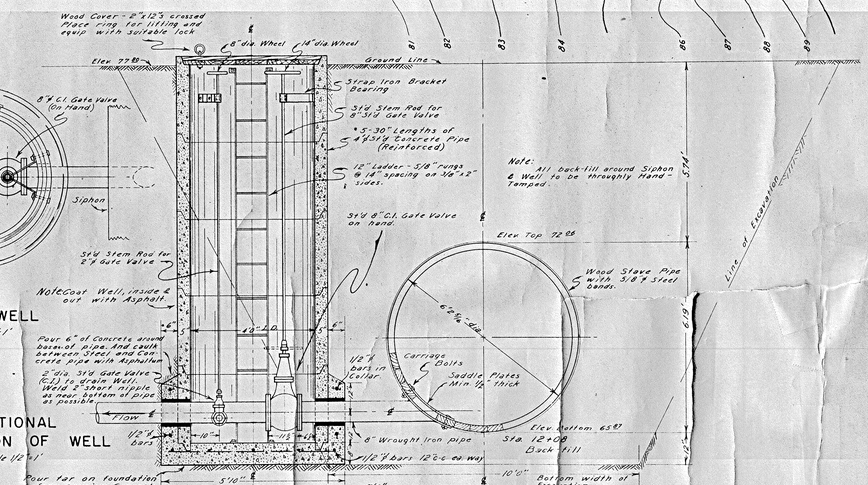
Note See dwg. 6-R-11,783-4 for Profile on new Sluiceway.











Reference:

Inlet Structure	R-11,783-2
Outlet "	R-11,783-3
Profile	R-11,783-4

OXFORD DITCH SIPHON
GENERAL PLAN AND TOPOGRAPHY

WORK GROUP NO. 17 — REGION 6
PUEBLO, COLORADO

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Approved: J. J. Kennedy — Scale: 1" = 20'

SURVEY	TRACING	REVISED	DATE	DWG. NO.
Grove	Evans	2-1-44	1/14	6-R-11783-1(4)

APPENDIX H

Custom Linings

Polyurea Spray-On Lining Product Materials

Custom LININGS
Mining Support Systems

14 July, 2023

Oxford Farmers Ditch Company
Fowler, CO
POC: Zach Mason
719-248-6941

Subject: Proposal – Oxford Ditch (OD) Siphon Rehab (Fowler, CO)

After performing a site visit to the siphon (along with additional information provided by you), I am pleased to provide this proposal to line and rehabilitate your 60" wooden siphon (X 1800'), with our composite polyurea lining system.

The provided cost data includes the following:

Mobilize Working Project Manager to siphon site upon dewatering, to work with OD team to monitor shut down process, siphon low point drain and ventilation/egress/equipment access point cut outs, prior to full Custom Linings Rehab Team arrival on site.

Equipment Mobilization to site, surface cleaning/prep equipment, use of lining equipment, all materials for lining siphon, daily safety meetings, project Quality Control (QC) plan, and fire watch during powered equipment use.

Removal of debris from siphon (rocks, organics, sand) utilizing several techniques.

Cleaning and drying of pipe interior (use of various methods). Reimbursement at actual cost for rental equipment and diesel fuel used in drying pipe is authorized to supplement Custom Linings equipment for drying of siphon, if required.

Survey of siphon interior to identify and remedy heavily worn/damaged areas and water inflow areas.

Installation and application of internal siphon lining, bonded directly to the wooden substrate. Process will include use of geotextile systems, trowel on patches, metal patches, and mechanical fastening, as required to accomplish task.

Detailed liner termination point installation, at inlet and outlet of siphon along with detail work at drain valves and maintenance access points installed for lining.

Warranty of 10 years against defects in materials and workmanship. Includes annual warranty walk through for 5 years to inspect siphon to ensure liner is functioning (and then for 5 follow on years, available to come to site for inspection should a trouble spot or questionable spot be identified by OD) to identify any areas that require warranty work. This is to be accomplished at the time of water turn off for the season so that warranty repair can be coordinated prior to siphon being placed back into service.

Full demobilization from site

Assumptions and Stakeholder responsibilites:

OD to dewater and lock out water intake to siphon (with lock out box available for Custom Linings to place a lock for safety).

OD to make a low point drain in siphon assembly (directly off the bottom of the pipe) in as many low spots of siphon as needed to allow for removal of water and debris in the pipe. OD to provide catch basin and assist in removal of debris from catch basin adjacent to pipe during clean out activity with pumps and other mechanical means (such as an excavator to empty catch basin as it fills with debris).

OD to provide replacement valve assembly with mounting plate to cover low point drain/drains during lining process. Existing drain assembly in wall of siphon will be abandoned and lined over.

NOTE: If OD would like Custom Linings to fabricate a patch plate with the valve assembly/assemblies attached, we can do that and invoice separately, as appropriate. OD should source the valve assembly regardless of who fabricates the patch plate assembly.

OD to make a 12" X 12" (minimum) opening every 250 linear feet of siphon, with every other opening being at least 24" X 24" (minimum). 12" openings will be for equipment access, with the 24" openings for ventilation and emergency egress.

OD will assist in cut out access areas replacement by aiding in exterior siphon work as needed.

NOTE: Custom Linings will patch access area patches with sealant and siphon lining system from interior of siphon, while outside of siphon work is primarily facilitated by OD.

OD will provide a staff member on site or on call for site support (heavy equipment operation) and QC sign offs required during project.

OD will make access available to jobsite from 5am to 10pm to facilitate project activities.

OD will provide secure storage area for equipment and supplies if jobsite is not considered a secure area.

Liner color to be tan/sand.

Custom Linings will document and provide daily safety meetings and QC documentation of liner project and get sign off from OD representative, at least weekly.

Custom Linings will provide OD with proof insurance and have OD named on insurance documents prior to start of project. Please provide full official company name and address:_____

_____.

Custom Linings will provide copies of all technical data sheet/safety data sheets for products to be used onsite and maintain copies at jobsite at all times during project.

Custom Linings will provide supplies (11 g. sheet metal, fabrics, adhesives, mechanical fasteners, etc.) to facilitate any anticipated repairs onsite during project.

Custom Linings will have all equipment onsite to provide services related to pipe lining with nominal thickness of 150 mils for all lining system configurations used in the pipe.

Anticipated time to complete project is estimated at 10 weeks (this allows for and includes potential weather delays and shutdowns for Thankgiving and Christmas holidays as may occur.

Time Period for Project:

It is understood that the siphon has a Hard Water Turn Off Date of 15 November, 2023, with a Hard Water Turn On date of 15 March, 2024.

We anticipate project completion not later than 1 February, 2024.

Cost Data:

First Mobilization to ensure site logistics are addressed and Ventilation Equipment Set up	$750
Second Mobilization for full crew and additional equipment, and project related materials	$1500
Team Per Diem (Full team to have accommodations as close to job site as possible)	$1250 per night
Use of Custom Linings High Volume Compressors and Pipe Drying Equipment	Included
Rental Equipment, if deemed necessary, with OD approval at cost	Reimbursement
Diesel Fuel required for High Volume Compressors (provided or reimbursement at cost)	TBD
Geo Composite Fabric for Siphon Lining (if any leftover is returnable, reduction in cost, $30 per lin ft)	$54,000 est
Siphon Cleaning to include: drying, residual/organics/rocks debris removal, surface profiling (abrasive blast) based on assumption that there will be smooth/polished surfaces, hand grinding-blending-patching of damaged or deteriorated wood- high/low spots, water inflow correction on the interior of the wooden siphon, required prior to lining ($30 per linear foot)	$54,000 est
Full Lining of Wooden Siphon Pipe to include: Use of patches as required, use of geo fabric lining as required, use of fillers as required, use of bonding primers as required, with final application of 150mils nominal throughout the entire siphon with Custom Linings seamless liner system. Special attention provided to bridging gaps, patches, liner overlaps, valve bodies-covered or placed, replaced access panels and inlet/outlet works. Estimate of cost at an average of $550 per linear foot of pipe.	$990,000

Cost Notes: Adjustments from less than expected damage/patch work, level of required cleaning, faster than expected wood dry out time, less than expected water inflow repairs, will translate to lower than estimated total cost/final invoice. We will monitor this and work with OD to determine if return of materials not used and lower labor costs justify a reduction in costs for final invoicing.

Custom Linings does not anticipate scope creep that would cause an increase in final bill. If substantial unforseen damage is discovered where a large amount of additional work outside anticipated scope is found in the structural condition of the pipe, and we are unable to address with our standardized processes and absorb the cost associated with a particular siphon structural issue, there would not be any increase in cost without your team viewing the problem and agreeing to the appropriate rehab action. Rehab action could involve both

Custom Linings or OD teams. This statement is intended to provide guidance in the event of unforseen siphon structural damage, not yet identified.

Final Cost Estimate:

Anticipated not to exceed $645 per linear foot all-inclusive.

Deposit:

Deposit for this project is $100,000.

Payment Terms:

Net 15 for all invoices.

Contingency Plans and Costs:

Stand by days (if asked to stop work due to conditions beyond Custom Linings control) may be assessed at an additional cost if OD and Custom Linings agree to remain onsite until work can resume.

Any work outside of established project scope will incur a charge as agreed, prior to start of additional work.

Custom Linings has tentatively scheduled this project for beginning on 15 November, 2023.

Custom Linings- Colorado Springs, Colorado. POC: Mark Swarny, 719-966-9376, mark@customlinings.com

Proposal Accepted and Authorization to Invoice Oxford Ditch Company $100,000 and schedule work to begin on 15 November 2023.

By (print and sign):_____ Date:_____

For the Oxford Ditch Company

Agreed to by Mark Swarny:_____ Date:_____

For Custom Linings

CUSTOM LININGS® 911-PL

Two Component Polyurea Coating

Designed Exclusively For Use With The Custom Linings Automated Pipelining System

DESCRIPTION

Custom Linings® 911-PL is a fast setting, rapid curing, 100% solids, flexible, two component spray polyurea that has been designed specifically to work with the Custom Linings Automated Pipelining System. 911-PL can be applied to suitably prepared concrete and metal surfaces. Its extremely fast gel time makes it suitable for applications down to -20°F. It may be applied in single or multiple applications without appreciable sagging and is relatively insensitive to moisture and temperature allowing application in most temperatures. Custom Linings® 911-PL offers a tack free time of less than sixty seconds and exhibits 450% elongation upon curing with 50 Shore D hardness.

FEATURES

- ❖Zero VOC (100% Solids)
- ❖Potable Water Approved
- ❖Excellent Thermal Stability
- ❖Low Temperature Flexibility
- ❖Good Chemical Resistance
- ❖Seamless
- ❖Abrasion Resistant
- ❖Odorless
- ❖Meets USDA Criteria
- ❖Coats Carbon or Mild Steel Metals without Primer
- ❖Installed With or Without Reinforcement in Transitional Areas

TYPICAL USES

- ❖Fresh Water Pipelines
- ❖Storm Water Run-off
- ❖Mining Operat
- ❖Conduit Under Roadways
- ❖Salt Water Environments
- ❖Secondary Containment
- ❖Storm Drains
- ❖Storm Pipes
- ❖Landfill Containment
- ❖Primary Containment
- ❖Manhole Restoration
- ❖Existing Pipe Repairs
- ❖Water and Waste Water Treatment
- ❖Industrial and Manufacturing Facilities

COLORS

Black-Tan-Red. Custom colors are available upon request. Color Packs, when used, must be added to Part-B.

PACKAGING

100 gallon kit: 50 gallons Part-A (Isocyanate side) and 50 gallons Part-B (Resin side).

COVERAGE

Custom Linings® 911-PL may be applied at any rate to achieve desired thickness. Theoretical coverage for 1 mil thickness is one gallon per 1600 sq. ft.

SURFACE PREPARATION & COATING APPLICATIONS

For project-specific questions, contact Custom Linings at 1-719-395-4414 or 1-888-POLYUREA.

WARNING

This product contains Isocyanates and Curative Material.

TECHNICAL DATA

Mix Ratio by Volume	1A : 1B
Pot Life @ 150°F	4 - 8 secs
Tack Free Time (thickness & substrate temperature dependent)	45 - 60 secs
Recoat Time	0 - 6 hours
Viscosity at 150-160°F (66.5-71°C), Brookfield:	
Part-A	50 ± 20 cps
Part-B	50 ± 20 cps
Density (Side A & B Combined)	8.81 lbs/gal
Flash Point	> 200°F
Hardness, ASTM D-2240	50 ± 5 D
Tensile, ASTM D-412*	3500 ± 200 psi
Elongation, ASTM D-412*	450% ± 50%
Tear, ASTM D-412*	450 ± 50 pli
Service Temperature	-40°F to 250°F
Water Vapor Permeability, ASTM E-96	0.361 perm-inch
VOC Content	0 gm/lit
Recommended Applied Thickness	> 2 mm/60 mils
Return to Service: Foot Traffic	1 - 4 hours
Return to Service: Full Service	> 24 hours
Taber Abrasion Resistance, ASTM D4060 (CS17 wheel, 1000 cycles, 1 kg load) (maximum)	6 mg loss
Water Absorption, ASTM D471 (maximum 23°C, 24 hours)	< 0.5%
Crack Bridging, ASTM C836 (-25°C, 1.6mm crack, 25 cycles)	Pass
Impact Resistance @ 25°C (ASTM G14)	> 200 lbs
Pull-Off Strength (minimum), ASTM D4541:	
Inter-Coat Adhesion (within recoat time)	Excellent
Concrete (Shot blasted profile), substrate failure occurred	> 500 psi
Concrete (Primed), substrate failure occurred	> 500 psi
Steel (90 um blast profile)	> 900 psi
Lineal Shrinkage	1 - 2%
Flexibility (1/8" 3mm Mendrel Bend Test), ASTM D1737	Pass
Resistance to Weathering, ASTM G-23 (Type QUV Weatherometer-3000 hrs exposure)	No cracking or blistering. Color change, gloss reduction & chalking are noted.

15790 Fairway Drive ◆ Buena Vista, CO 81211 USA ◆ Tel: (719) 395-4414 ◆ Fax: (719) 395-4416 ◆ www.customlinings.com ◆

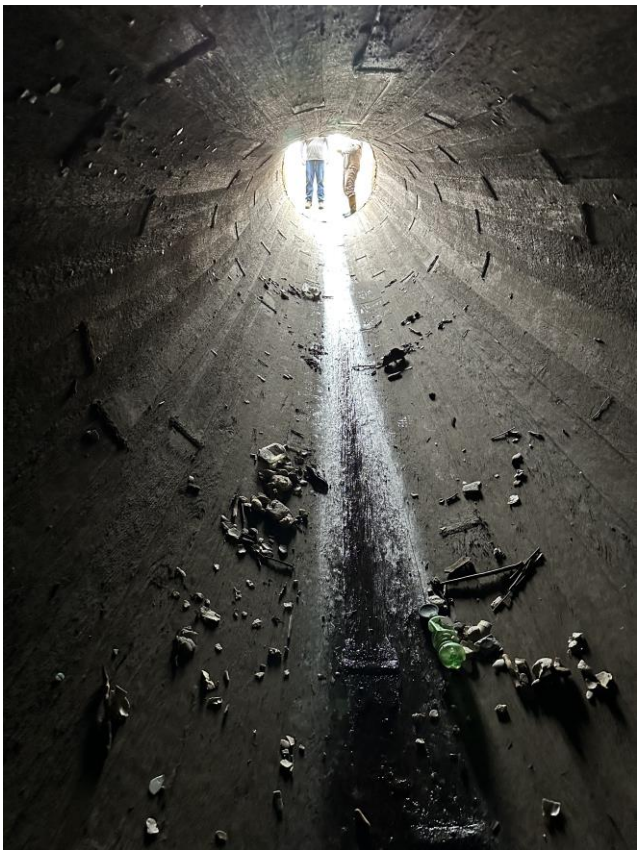
Custom Linings
1960 Victor Place
Colorado Springs, CO 80915
719-374-8785

28 July 2023

Subject: Site Visit-Oxford Ditch Siphon Rehab (Fowler, CO)

This is data that was sent to Oxford prior to our meeting to discuss how Custom Linings processes can support the rehab and provide substantial life extension of the siphon assembly.

After viewing the site, leaving you samples and having a chat, I would like to provide the following for your review, prior to our question and answer session on Monday, 10 July, 2023.



Observations

- Approximately 1800 linear feet in length
- 60” in Diameter
- 2.5” X 6” Wooden Construction
- Sound Structural Condition
- Interior of pipe (observed) is more structurally solid with less loose debris in pipe than anticipated
- Ideal Candidate for Lining to extend Service Life another 100 years +
- Use existing structural integrity of pipe with our ultra-strong lining to create an assembly that will resist pipe leaks and blow outs that are associated with aging infrastructure

Proposed Rehab Methodology (After siphon is removed from service for the season)

Access Points of 12" X 12" put into top of pipe every 250 linear feet
(for ventilation and to pass lining equipment though)
Every other Access point in lieu of 12" access point, place 24" or larger (based on board size) for Emergency Egress and for more substantial air flow to dry pipe out
Utilize Low Point Drain to Fully Drain Siphon
Remove water and debris from Siphon (in conjunction with your team as agreed prior to start)
Dry out with use of mechanical engineered air movement (multiple 10,000 cfm fans)
Evaluate and Survey Siphon to validate and remedy any aggressive high and low spots (wear in wood), previously unknown damage and water intrusion areas that require attention beyond the standard surface prep prior to lining
Line as per agreed process (Lining to wood, laminate geo fabric, line interior of pipe to specified thickness)

Discussion Items supplement

Clean out of rock debris from pipe

Water removal from pipe

Drying of pipe using high volume forced air

Addressing water inflow
Use of composite or steel patch material with adhesive to fully seal and bridge from dry area of pipe to dry area. Use of ratchet style brackets to hold in place while drying

Application direct to wood or with composite fabric system
Due to wear of wood, composite fabric system will yield strongest solution.
Liner will bond direct to wood substrate
Testing validates wood and concrete failure before liner failure

Thickness of Liner
125 mils is standard on smooth steel pipe
150 mils is standard on rough concrete pipe

100-150 mils is standard on fabric underlayment

It takes 50 mils of material to bond fabric to substrate (I will provide samples at meeting)

Suggested thickness of liner
Total system of liner, fabric, liner is 175-200 mils thick

Expected performance
Material strength by itself is 3500 psi of tensile strength
HDPE at 100 mils is 210 psi (for comparison)

Material strength with Geo Textile fabric underlayment is 4800 psi

Puncture resistance tested at 125 mils, zero reinforcement is 2750 psi
HDPE at 100 mils is 180 psi (for comparison)

Testing (Real World) of system proposed for your pipe

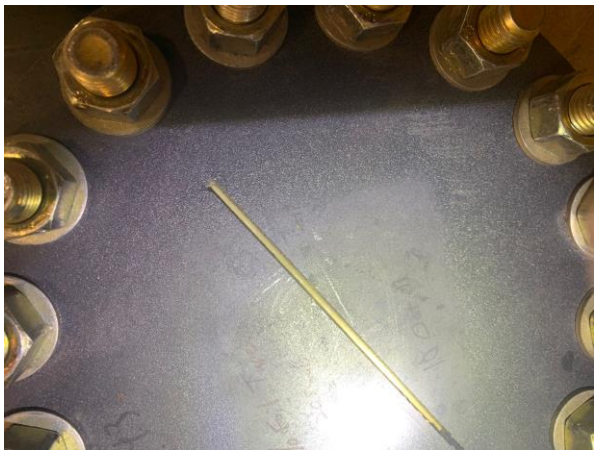
Life of system

90 year accelerated life cycle testing on material bonded to wood

Validation of bonding direct to wood

When bonded to wood, liner penetrates wood and increases the integrity of the substrate. When wood is broken away, the penetration of the liner is observed. See Samples brought.

Pressure Testing of system over fully exposed void




1/8” void, with 100 mils of liner spray over, pressured to 2000 psi since 2011, still under pressure

Expected pressure in pipe to be less than 9 psi

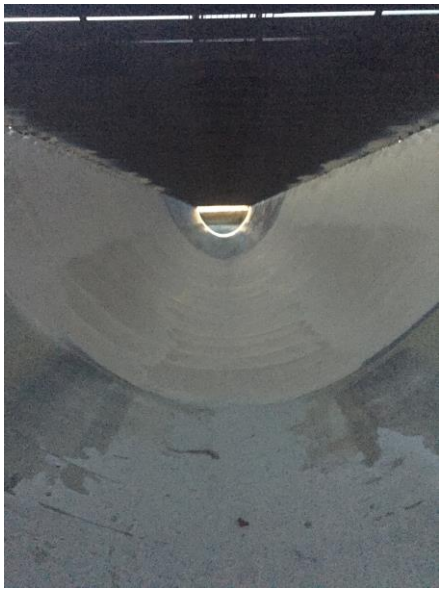
Validation of bonding to proposed fabric
See samples

Examples of large projects


600,000 sq ft, 300,000,000 gallon water storage reservoir


Bottom of 2000’ deep Uranium Shaft

1800 Vertical feet of 36’ diameter shaft X2 in Canada



Metal Flume crossing ditch

Hydro Power Plant in Seattle old and new wood application

Anticipated time to complete project

TBD but anticipate 2 months

Cost Data:

$600-650 per linear foot All inclusive

Technical Point of Contact: Mark Swarny, 719-966-9376, mark@customlinings.com

Mark Swarny
For Custom Linings
1960 Victor Place
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mark@customlinings.com

7 August 2020

Subject: Electron Flume Site Visit and Performance Evaluation

POC: Adam Cleveland and Thom Fischer

Site Location: Electron Flume, Near Orting, WA

History

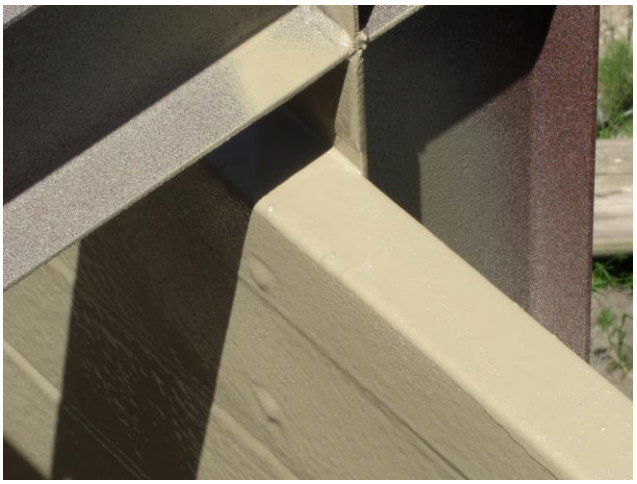
In June, 2008, Custom Linings participated in the lining of the feed flume at the Electron Power Plant, owned by PSE.

Custom Linings specified the Primer to seal the Alaskan Yellow Cedar, the filler used for fixing substantial voids in the wooden substrate and the Polyurea Material (NSF 61-Potable Water Compliant) at 250 Mils on all surfaces. The NSF system was important since fish often enter the flume, and it was an important consideration per the client that no potential hazards are created by the lining system.

The first view of the Flume Lining Project in June of 2008.

Unlined Cedar. Note that large voids were filled with a rapid dry filler and the wood was primed with a roll on primer to ensure proper bond of the 250 Mil spray applied Liner. Also note in the photo at the end of the lining material that there is an abraded surface, to ensure bond of the next layer of material. This photo was taken at the beginning of a new day of lining and is important due to some observed issues with the liner 12 years post install.

This stretch of the lined flume shows the uniform appearance of the liner.
Note: It also shows, in the lower left of the photo, some patch material that was applied during the Quality Control Check of the liner. It is not known if the patch material sealed a hole in the liner or just filled a void that could not be determined if there was a pathway to the wood. This area would be topcoated with the flume lining material, using accepted application practices of 2008. This is an important reference after the inspection in Aug of 2020.



Note that the top lip of the wooden part of the flume was lined to prevent an exposed leading edge that could allow water to migrate behind the liner. This photo was taken in 2008

Following Photos represent current flume condition 12 years post installation.

Photo Taken Aug 2020 of top cap. Completely sealed and protected the top edge of the wooden flume. Zero Deterioration or loss of integrity noted. There are stains in the flume caused by UV and the water line.

Flume 12 years post application. The above photos shows section that dumps into the settling pond and a further upstream. Small delamination from concrete at base of flume (approx. 2 feet wide). Some organic growth noted on walls. No wear noted on any flume walls. Very minor wear on floor. Observed loss on floor of flume is anticipated to be less than 25 mils, based on original thickness of 250 mils, covering all bolts. No bolt heads exposed. Unable to identify bolt locations on floor except for bolt matching bolt locations on walls. No observed cracking of liner. Client says lined area is water tight with no observed leaks in 12 year old liner.

Conclusion: The liner application 12 years ago is wearing very well, and I expect many more maintenance free years of service.

The performance of the liner is impressive and provided exactly what was demanded by the client: Complete Sealing of the flume, protection of wooden substrate from abrasion and full saturation that would result in integrity loss and making the area of the flume lined, a maintenance free part of the hydropower system.

Additional records for this project are held at Custom Linings and available for review.

Inspector: Mark Swarny, President
Custom Linings, Inc.
26 years with Custom Linings
Consulting, Equipment Sales and Material Sales
www.customlinings.com
1-877-POLYUREA
mark@customlinings.com
Mobile: 719-966-9376
Office: 719-374-8785

Prepared by Mark Swarny

CUSTOM LININGS
1960 Victor Place, Colorado Springs, CO 80915
(719) 374-8785 / www.customlinings.com

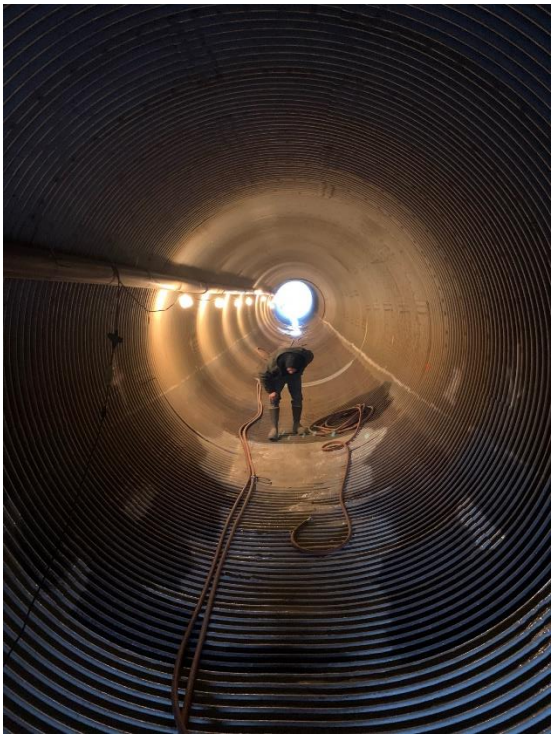
Statement of Qualifications
Title: CMP Canal Water Way Rehab (concrete, wood, steel) Experience

Submitted by: Mark Swarny, President
Custom Linings, Inc.
mark@customlinings.com
www.customlinings.com
719-374-8785

Custom Linings 911PL Polyurea Pipe Rehabilitation System

1. A. Surface Prep-Prior to application of Custom Linings Pipe Rehabilitation System, the metal pipe surface shall be cleaned of all debris, and abrasive blasted (system to blast the pipe is based on substrate material, and cleaning level required to properly rehab). We use both Vapor Blasting (high pressure water with slurry media to clean and profile the pipe to a 2-3 mil profile without creating dust) or a dry system (using copper slag which produces a 3-4 mil profile) in the host pipe. Abrasive Blasting can take place manually with an individual controlling the nozzle of the surface prep equipment or via Custom Linings Automated Blast Equipment that is controlled outside the pipe. All media used can be easily collected for reuse or disposal.

B. Not all pipes require full 360 degree lining. Many pipes only require rehabilitation on the invert, often up to the typical high water mark. When 70-90% of the pipe looks brand new, which on large diameter CMP is very often the case, we only surface clean the area that requires cleaning prior to application of our liner.



C. Above shows where we will surface prep for the rehab. Above shows spot blasting to get the worst parts of the pipe prior to final blast just before lining. 2 runs through the pipe with the blaster is SOP.

D. Void Fill Material (if needed)- Custom Linings Pipe Rehabilitation System uses several materials to produce the most complete rehab possible, based on the condition of the storm pipe assembly.

a. If there are voids in the pipe (rust through) with any level of erosion, after surface prep is accomplished, **Custom Linings Structural Foam** can be injected in the void to fill and secure the pipe in place, while providing for a solid substrate to have the pipe liner bridge those previously exposed gaps.
b. If the voids are deep/large, coarse gravel and layers of structural foam can be applied to restore the surrounding base that is holding the pipe in place.
c. The compressive strength of the structural foam is 500psi, well above the compressive strength of compacted soil at 25psi.
d. Technical Data Attached.

E. Lining Material-All pipe rehab projects are accomplished with Custom Linings 911. Custom Linings 911 is a fast setting, rapid curing, 100% solids, strong substrate bond, exclusive blend of Polyurea that is NSF61 and is proven in the most aggressive industrial applications, to include:

Pipe, invert only, Mt Crested Butte, CO, by pass pumping of water through pipe on the upper left of picture, from the prep picture section 3B above. This Pipe was 220' Invert Only at $75,000.

Hydro Power Plant Flume Application 2008, base of Mt Rainier at the Electron Power Plant (Puget Sound Energy)
8' X 8' Wooden Flume- Project Value $400,000

Above is picture 10 years Post Application

Application from rig on top of flume 2008

Above is original application from 2008

This is the Flume 12 years post liner install, not clean but in perfect condition after 24/7 operation that entire time. Note high water mark. Rock, Silt, Sand and wood travel this flume.

Photo from Dec 2020, next phase prior to an additional multi mile stretch

Client: Toll House Energy-CEO-Thom Fisher, Cel 360-739-9999

CDOT CMP Rehab, Highway 24/285 Completed 2013

24” X 100’ Full Reline-$40,000

100’ section of CMP under asphalt on busy State Hwy. Project was completed in three working days without traffic interruption despite flash flood. Corroded invert was addressed with rust removal, structural fill & additional coating to protect and improve water flow. Pipe was lined with 125 mil of CL911 Lining and erosion stabilization done with CL Structural Foam. Pipe was back in service immediately upon completion.

This photo is from Oct 2020 (over 7 years post application).

Note: Zero Wear, Zero Corrosion, Although there is damage to the pipe from outside impact, no damage to interior liner

South East Metro Storm Water Authority (installation 2014)

80’ Long, 13’ Invert only $30,000

During Inspection and Cleaning Prior to lining

Lined to 6” above high water line

Re-inspection of pipe November 2020, perfect condition with no wear or damage (near Park Meadows Mall)

I would be available to meet at two CMP rehabs near Park Meadows for review. Mark 719-966-9376

Uranium Mine Shaft Lining, Rim of Grand Canyon, April 2018
18’ X 12’ X 30’: 2000’ Underground- Cost not Disclosed due to Contract Agreement

400 Vertical Feet of Salt Mine Shaft, Northern Saskatchewan, Canada
36’ in Diameter Shaft: 3000’ Underground with Project Value of $3,500,000

We closed our shop in Colorado and took our entire company to Canada for 2 months to spray this 36’ diameter mine shaft. The mine had a huge problem with the shafts being 100% Salt. Nothing the that mining company had tried for the previous 5 years had worked, so a mining engineering company called and asked for our opinion on the project. After 2 onsite tests of our system in the mine shaft, 3000’ underground, we were specified to accomplish the task. As of mid January, 2021, BHP Billiton (the mines owner) is thrilled with the work and will notify us when the mine is fully developed and they are ready for support in the production areas. Value of this project was $3.5mm.

F. Technical Data Attached – Custom Linings 911-PL and Custom Linings Structural Foam Pipestabil

G. Liner Application Equipment-Trailer mounted equipment with 300' range. Self Contained and no louder than a pick up truck idling. Zero impact on the surrounding community.

2. Custom Linings Company Owner, Project Manager and Project Superintendent: Mark Swarny
    a. Mark Developed the concept for Custom Linings while serving on active duty in the USAF. He started the company in 1995 (Oklahoma City) and operated the company on a part time basis in the evenings after work for a year while still serving on active duty in the USAF, providing industrial coating projects at a small rented shop. In January 1996 his company was awarded its first Government contract and Mark was discharged from the military with an honorable discharge after 9 years of service.

       Mark served as a Project Manager with CACI (military contracting firm) from 1996 to 1999, while continuing to operate Custom Linings, aiding in the development of processes for reverse engineering of aircraft parts that were considered "throw away", then developing the testing protocols that would allow for those parts to be reused on active military aircraft.

       Mark and Custom Linings moved operations to Buena Vista, CO in 2003, where industrial coatings materials and processes were developed for supporting mining operations and municipal infrastructure.

       Custom Linings sells industrial coating equipment/materials, trains new applicators in the application of Custom Linings Product to industrial clients worldwide, performs applications at its Corporate Headquarters in Co Spgs, and has 3 mobile rigs to perform applications in the field anywhere in the world.

       In 2018 Custom Linings Relocated its operations to Colorado Springs, where it is presently located. Custom Linings is an SBA Certified SDVOSB (Service Disabled Veteran Owned Small Business).

We have a contracted partner that is a Native Owned 8(a) company that services exclusively Government Agencies.

b. Notable Projects in addition to the ones listed above: (very small sampling)
2006-300,000,000 gallon potable water storage reservoir, Sedalia, CO $1mm

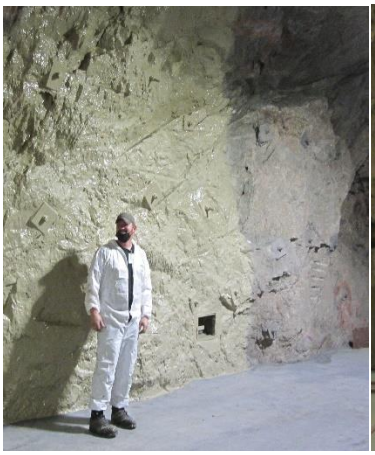


2008 Henderson Mine Ore Storage Structural Steel Protection Project, $300,000


2010 Irrigation Canal Lining Project, Buena Vista, CO 2 miles $150,000


2011 Climax Mine Reopening Project (ore processing equipment lining) $4mm over 18 months


2020 Cheyenne Mountain Airforce Station (formerly know as NORAD) Ongoing Contract.



3. Current Projects under Contract
    a. Roche/Englewood Public Schools-Storm Water Detention Project -$50K-Weather Hold
    b. CDOT-Winter Park-24" CMP rehab X 120'-$59K-Weather Hold
    c. CDOT-Rangely-60" CMP rehab, invert only X 100'-$40K-Weather Hold
    d. Cheyenne Mountain AFS Ground Support Second Phase $180,000-Awaiting PO
    e. Northern Water Ditch Company-8th Phase-$75K-Weather Hold
    f. Riverside Ditch Company-3rd Phase of Dam Face Linings-Value TBD-Weather Hold
    g. City of Colorado Springs-Fleet Vac Truck Project-10th Truck scheduled $6k each

Additional Note: Custom Linings developed our CMP rehab capability in conjunction with Contech Engineered Solutions after working with them on Mining projects. I spoke to the lead engineer at Contech/Quikcrete Corporate Offices : Darrell Sanders 513-939-5312 and he welcomes a phone call for validation of our company performance and processes.

Additional Support Data Available upon Request to mark@customlinings.com or 719-374-8785 (office) or 719-966-9376 mobile.

Custom LININGS
Pipelining Systems

CUSTOM LININGS® 911-PL

Two Component Polyurea Coating

Designed Exclusively For Use With The Custom Linings Automated Pipelining System

DESCRIPTION

Custom Linings® 911-PL is a fast setting, rapid curing, 100% solids, flexible, two component spray polyurea that has been designed specifically to work with the Custom Linings Automated Pipelining System. 911-PL can be applied to suitably prepared concrete and metal surfaces. Its extremely fast gel time makes it suitable for applications down to -20°F. It may be applied in single or multiple applications without appreciable sagging and is relatively insensitive to moisture and temperature allowing application in most temperatures. Custom Linings® 911-PL offers a tack free time of less than sixty seconds and exhibits 450% elongation upon curing with 50 Shore D hardness.

FEATURES

- Zero VOC (100% Solids)
- Potable Water Approved
- Excellent Thermal Stability
- Low Temperature Flexibility
- Good Chemical Resistance
- Seamless
- Abrasion Resistant
- Odorless
- Meets USDA Criteria
- Coats Carbon or Mild Steel Metals without Primer
- Installed With or Without Reinforcement in Transitional Areas

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- Storm Water Run-off
- Mining Operat
- Conduit Under Roadways
- Salt Water Environments
- Secondary Containment
- Storm Drains
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- Water and Waste Water Treatment
- Industrial and Manufacturing Facilities

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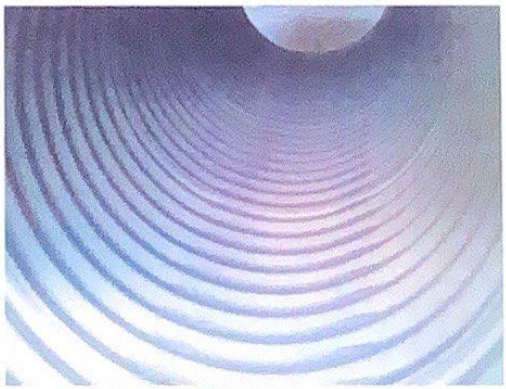
Recoat Time	0 - 6 hours
Viscosity at 150-160°F (66.5-71°C), Brookfield:	
Part-A	50 ± 20 cps
Part-B	50 ± 20 cps
Density (Side A & B Combined)	8.81 lbs/gal
Flash Point	> 200°F
Hardness, ASTM D-2240	50 ± 5 D
Tensile, ASTM D-412*	3500 ± 200 psi
Elongation, ASTM D-412*	450% ± 50%
Tear, ASTM D-412*	450 ± 50 pli
Service Temperature	-40°F to 250°F
Water Vapor Permeability, ASTM E-96	0.361 perm-inch
VOC Content	0 gm/lit
Recommended Applied Thickness	> 2 mm/60 mils
Return to Service Foot Traffic	1 - 4 hours
Return to Service Full Service	> 24 hours
Taber Abrasion Resistance, ASTM D4060 (CS17 wheel, 1000 cycles, 1 kg load) (maximum)	6 mg loss
Water Absorption, ASTM D471 (maximum 23°C, 24 hours)	< 0.5%
Crack Bridging, ASTM C836 (-25°C, 1.6mm crack, 25 cycles)	Pass
Impact Resistance @ 25°C (ASTM G14)	> 200 lbs
Pull-Off Strength (minimum), ASTM D4541	
Inter-Coat Adhesion (within recoat time)	Excellent
Concrete (Shot blasted profile), substrate failure occurred	> 500 psi
Concrete (Primed), substrate failure occurred	> 500 psi
Steel (90 um blast profile)	> 900 psi
Lineal Shrinkage	1 - 2%
Flexibility (1/8" 3mm Mendrel Bend Test), ASTM D1737	Pass
Resistance to Weathering, ASTM G-23 (Type QUV Weatherometer-3000 hrs exposure)	No cracking or blistering. Color change, gloss reduction & chalking are noted.



15790 Fairway Drive • Buena Vista, CO 81211 USA • Tel: (719) 395-4414 • Fax: (719) 395-4416 • www.customlinings.com •

Custom LININGS
Industrial Coatings

STRUCTURAL FOAM

CRACKFILL™ / PIPESTABIL™

Hydrophobic, Injectable, Sprayable Polymer System

DESCRIPTION

Structural Foam™ is a two-component polymer that forms a strong, rigid, closed cell foam of hydrophobic polyurethane. Designed as a water cut-off and to fill large voids and cracks in stone, concrete, asphalt, metals, composites and pipe joints. Structural Foam™ is also used as a sprayable system to prime damaged and worn surfaces to provide a solid sustrate for Custom Linings Polyurea Coating Systems.

FEATURES

- Quick Recoat Window
- Prevents Water Infiltration
- Adheres to Damp Surfaces
- Sprayable
- Injectable
- Hand-Mixable

TYPICAL USES

- Pipe Joints & Voids
- Tunnels
- Subways
- Reservoirs
- Soil Stabilizer
- Remedial Water Stop
- Sewers
- Seawalls
- Manholes
- Mineshafts
- Tieback Anchors
- Sub-Grade Structures

PACKAGING

10 gallon kit: One 5 gallon pail of Part-A and One 5 gallon pail of Part-B.
100 gallon kit. One 50 gallon drum of Part-A and One 50 gallon drum of Part-B.

MIXING

The volume mixing ratio is 1 part Part-A to 1 part Part-B.

Structural Foam™ may not be diluted under any circumstances.

Before application, thoroughly mix Part-B with air driven power equipment until a homogeneous mixture and color is obtained. All equipment used to mix the material must be dry to prevent the Structural Foam™ from reacting.

APPLICATION

Both Part-A and Part-B materials should be preconditioned higher than 65°F before application.

Structural Foam™ should be applied using plural component, 1:1, High Pressure or Low Pressure mixing equipment, where Part-A and Part-B are pumped separately to a static mixing tube.

Contact Custom Linings at 1-877-POLYUREA for further information.

CURING

Structural Foam™ will harden in 30-180 seconds at temperatures above 60°F.

TECHNICAL DATA

Appearance,	
Part-A	Dark Brown
Part-B	Clear
Density ASTM D-1638,	
Part-A	10.2 lb/gal
Part-B	8.65 lb/gal
Viscosity at 75°F (24°C), ASTM D-1638,	
Part-A	50 ± 10 cps
Part-B	80 ± 20 cps
Mixing Ratio by Volume	1A : 1B
Solubility in Water	Not Soluble
Density Free Rise	12 ± 1 pfc
Expansion Rate (sprayed)	10:1
Induction Time, approximately	20-30 sec
Gel Time, approximately	50-60 sec
Tack Free Time	75-80 sec
Service Temperature	250°F
Application Temperature (sprayed)	140-160°F
R-Value	<2"= R5 per in. >2"= R6 per in.
Compressive Strength	500 psi

EQUIPMENT CLEANUP

Equipment should be cleaned with an environmentally safe solvent, as permitted under local regulations, immediately after use.

STORAGE

Structural Foam™ has a shelf life of one (1) year from date of manufacture in original, factory-sealed containers when stored indoors at a temperature between 60-95°F (15-35°C).

WARNING

This product contains Isocyanates.

15790 Fairway Drive - Buena Vista, CO 81211 USA - TEL: (719) 395-4414 / FAX (719) 395-4416 - www.customlinings.com -

OFFICE OF THE SECRETARY OF STATE
OF THE STATE OF COLORADO

CERTIFICATE OF FACT OF GOOD STANDING

I, Jena Griswold, as the Secretary of State of the State of Colorado, hereby certify that, according to the records of this office,

CUSTOM LININGS, INC.

is an entity formed or registered under the law of OKLAHOMA , has complied with all applicable requirements of this office, and is in good standing with this office. This entity has been assigned entity identification number 20091484922 .

This certificate reflects facts established or disclosed by documents delivered to this office on paper through 04/08/2020 that have been posted, and by documents delivered to this office electronically through 04/09/2020 @ 15:11:11 .

I have affixed hereto the Great Seal of the State of Colorado and duly generated, executed, and issued this official certificate at Denver, Colorado on 04/09/2020 @ 15:11:11 in accordance with applicable law. This certificate is assigned Confirmation Number 12220890 .

Jena Griswold

Secretary of State of the State of Colorado

**********End of Certificate**********

Notice: A certificate issued electronically from the Colorado Secretary of State's Web site is fully and immediately valid and effective. However, as an option, the issuance and validity of a certificate obtained electronically may be established by visiting the Validate a Certificate page of the Secretary of State's Web site, http://www.sos.state.co.us/biz/CertificateSearchCriteria.do entering the certificate's confirmation number displayed on the certificate, and following the instructions displayed. Confirming the issuance of a certificate is merely optional and is not necessary to the valid and effective issuance of a certificate. For more information, visit our Web site, http://www.sos.state.co.us/ click "Businesses, trademarks, trade names" and select "Frequently Asked Questions."

Updated 2 November 2020

Custom LININGS
1-877-POLYUREA

Statement of Qualifications (Mining Support Services)

Custom Linings, Inc. is pleased to present this Statement of Qualifications that outlines our capabilities and experience, over the last 27 years, in providing high performance coatings and support to the Mining Industry.

Base Operations:
Custom Linings, Inc.
1960 Victor Place
Colorado Springs, CO 80915
719-374-8785

Key Team Members:

President/Mining Lead	Mark Swarny	719-966-9376 Mobile
Field Lead	Chris Caton	719-232-4102 Mobile
Contract Support	Megan Helus	816-262-1680 Mobile

Services:
Industrial Coatings for high wear environments (metal, concrete and composite substrates)
Geo Technical Installation of Structural Foam Fill For Void and Water Stop Applications
Industrial Surface Protection for Corrosion Protection of Steel in Mill Environments
Pipe and Duct Lining (shop and field service)
Corrosion Removal/Surface Prep Services
Containment Systems (Primary and Secondary) over concrete, metal and composites
Polymer Ground Support (Thin Spray Liners and Sprayable Ground Support Systems)
Shaft Lining (Spray in Place with thickness from 4-20mm)
Consultant Services w/site visit (tank, containment, ground support, sump and shaft lining)

QA/QC:
Check List Systems with validated QA/QC procedures to ensure quality workmanship

Training:
24 and 40 Hour MSHA Current
MSHA LOTOTO (Lockout, Tagout, Tryout), PPE, Confined Space, Scaffolding, Fall Protection

Safety Record:
Perfect-NO MSHA Reportables-NO OSHA Reportables
Company Safety Procedures Validated by ISNetworld with a Grade of A+ (Current 12-19)

Onsite Equipment:
Palletized Equipment for Underground Use (diesel and shore electric powered)
Trailer mounted equipment for surface applications
Flammable Storage Cabinets on all portable/mobile equipment and a supply of spare parts on every project to ensure complete redundancy, allowing for immediate onsite equipment repairs, if required.
Secondary Containment of all Equipment and Supplies

Shop Applications:
Our Shop or third party locations

How Can We Serve you? Please forward project details to mark@customlinings.com

Custom LININGS®
Mining Support Systems

January 5, 2012

Darrell Sanders
Contech, CPI
West Chester, OH

Subject: Testing Update-Bonded Monolithic Polymer Seal (BMPS)-Contech

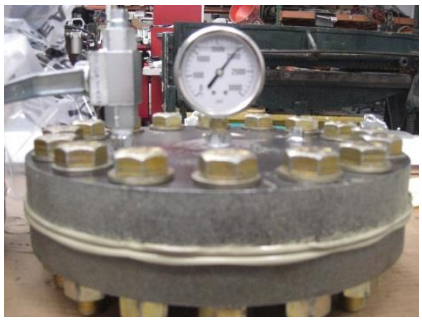
The testing on the BMPS is yielding great data. Below are several bullet points outlining the processes and testing relevant to high pressure sealing of below grade steel structures:

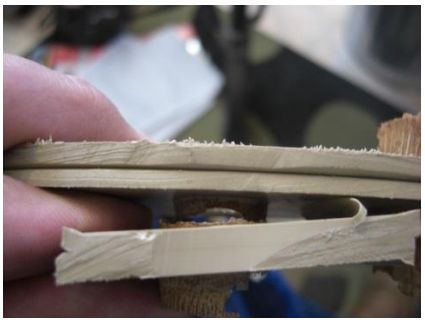
Adhesion Testing: Using 3 mil blast profiles on steel substrate, BMPS yields consistent adhesion results over 1300 psi. After testing over 12 specialty epoxy products to assist in adhesion testing, we have yet to make a sample of the Seal fail. Test equipment failure (epoxy bond release, with best performing epoxy) at 1300-1350 psi. Never a Seal failure.

Small Test Fixtures: Used to provide data on Bonded Seal performance with current application methodologies:

1. Testing of BMPS to act as a high pressure seal when bolted Seal to Steel.
2. Testing of BMPS to act as high pressure seal when bolted to another BMPS surface.
3. Testing of BMPS when used in conjunction with Custom Linings Chemical Seal Weld to turn two BMPS surfaces into a monolithic seal.
4. Testing of Push Through Strength of BMPS material (when bridging gap of 1/8")
5. Testing of Push Through Strength of various Seal thickness' and how special techniques can effect seal strength.


Test fixtures with seals applied


Test fixture under pressure


Performance of Chemical Weld

Small Test Fixture Test Results:

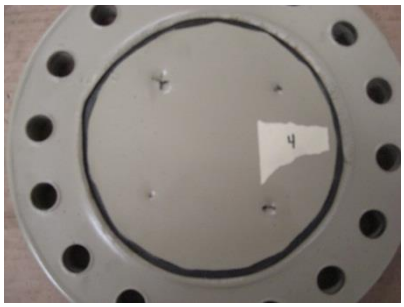
1a. Seal to Steel yielded poor results at less than 80 mils. Seal at 125 mils to smooth steel surface 1500psi+.
2a. Seal to Seal 2000psi hold (current testing in progress with no signs of failure)
3a. Seal chemical weld to seal proven in 3 tests with one test currently in progress with no signs of failure
4a. Push through test, pressures up to 2500psi with no failure, currently sitting at 2000psi for long term evaluation

Custom Linings, Inc. 27995 Cty Rd 317 – Buena Vista, CO – 81211 719-395-4414 1-877-POLYUREA

5a. Tests yielded variety of results from 750psi to 2500psi with holes from ¼" up to 1" with fluid filled pressurized vessel. Very extreme test. Data will be compiled from various thicknesses ranging from 150-300 mils to show how the product performs based on thickness of seal in a pressurized vessel when the structural integrity of the vessel in service fails in the field.

200 mils failed with 1" hole at 1100 psi of fluid pressure

200 mils with mesh reinforcement 1" hole failure at 2200 psi

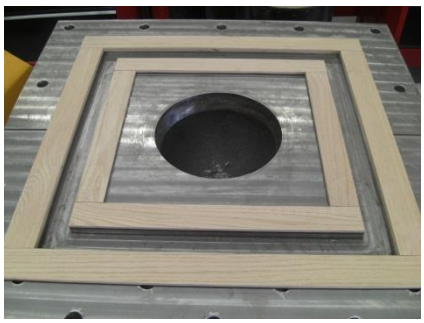


Each plate tested with 1", 3/4", ½" and ¼" holes

<u>Large Test Fixture:</u>

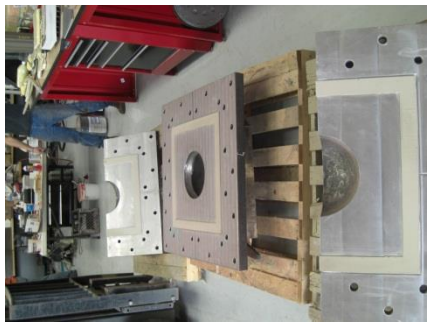
Test fixture assembled

Test fixture groove



Test fixture seal area

QC tool to ensure proper seal install



Bonded Monolithic Polymer Seal

Large vessel pressurized 63 days todate

Testing Notes for Large test vessel, for sealing Contech Multi-Plate Mine Shaft Liners:

1. Large test vessels have recessed area for installation of Bonded Monolithic Polymer Seal (BMPS)
2. Surface prepped with 3 mil surface blast to obtain proper profile for proven adhesion
3. Seal applied using high pressure application equipment mixing polymer seal compound at 3000psi
4. Seal can be shop or field applied, however there is a 72 hour cure time
5. Seal will cure at any temperature, however cure time may be extended in cold weather up to 10 days
6. Thickness of seal is dependent on several design and engineering variables from 125 to 250 mils thick
7. Seal may be installed in seal recess up to one year prior to installation in the field (without need for Chemical Weld at installation)

8. On flanged installations where a waterproof seal is required, BMPS may be applied on the interior or exterior of the Multi-Plate assembly, creating a surface protection system that may cover part of or all of the exposed metal, depending on engineering specs
9. The lining system created on a surface with the BMPS material may be used in conjunction with an approved covering like an epoxy or other approved system for surface protection, but not part of the waterproofing system, nor can it be installed within 6" of the seal that is created when 2 or more plates come together creating a joint or when bridging two plates in a high pressure waterproofing application
10. Although not required on all applications, Chemical Weld can/may be applied in the field within 1 hour of installation to ensure complete monolithic bonding of two plates (with seals installed on both plates)
11. Any seal older than 12 months must have Chemical Weld installed prior to installation
12. Bonded Monolithic Polymer Seals have been proven to seal with and without Chemical weld in flat and right angle installations, as pictured above
13. Temperature at time of installation for assemblies with a BMPS does not affect the performance of the seal after installation, although Chemical Weld is recommended in applications where contaminants such as water or dirt are present or when the temperature is below 32F

<u>Large Test Fixture Results:</u>

1. The BMPS works by eliminating the problems caused with traditional gaskets in that compression is not what creates the seal with the BMPS system
2. The seal is bonded to the Multi-Plate assembly and when the Chemical Weld is applied to the seal surface prior to installation, the two seals become bonded at a molecular level, creating a seamless bonded seal locking both steel assemblies together as one, eliminating the ability for water to transfer from one side of the assembled shaft liner to the other, at pressures currently , proven up to 2000psi

Test fixture bolted together and pressurized day 1

Notice the increase in the gap of the fixture under Pressure for 63 days without compromise of the seal

3. Currently there are 2 high pressure vessels in test with the BMPS, holding 2000 psi, one with and one without the use of Chemical Weld
4. There have been no leaks of any kind other than test fixture valving, corrected as identified
5. Testing will continue to develop thresholds not yet observed at pressures beyond 2000 psi as dictated by Contech or Contech clients requirements

Any client of Contech, with an active NDA or Contract in place with Contech or Custom Linings may visit our testing facility in Buena Vista, Colorado to validate and view in more detail any test process and result or methodology to validate these systems are applicable for a particular use.

APPENDIX I

Chicosa Creek Siphon Replacement

Engineer's Opinion of Probable Costs (EOPC)

Oxford Farmers Ditch Company - Chicosa Creek Siphon Replacement - Single RCP Siphon Engineer's Estimate 8/1/2023

Item No.	Units	Material Cost	Construction Cost	Quantity	Description	Total Cost
2.03	CY	$0.00	$15.00	6,400	Excavation for Siphon Installation	$96,000.00
5.01	LF	$382.10	$200.00	1,800	58"x91" Elliptical RCP Siphon	$1,047,780.00
2.03	CY	$20.00	$65.00	1,600	Select Imported Backfill	$136,000.00
2.03	CY	$0.00	$65.00	1,600	Native Backfill	$104,000.00
5.01	CY	$150.00	$125.00	480	Concrete Inlet & Outlet Works	$132,000.00
-	LF	$50.00	$225.00	800	Oxford Ditch Re-alignment	$220,000.00
Sub-Total						$1,735,780.00
Contingency (15%)						$260,367.00
GRAND TOTAL						$1,996,147.00

Oxford Farmers Ditch Company - Chicosa Creek Siphon Replacement - Dual RCP Siphon Engineer's Estimate 8/1/2023

Item No.	Units	Material Cost	Construction Cost	Quantity	Description	Total Cost
2.03	CY	$0.00	$15.00	14,800	Excavation for Siphon Installation	$222,000.00
5.01	LF	$290.00	$150.00	1,800	43"x68" Elliptical RCP Siphon	$792,000.00
2.03	CY	$20.00	$65.00	4,800	Select Imported Backfill	$408,000.00
2.03	CY	$0.00	$65.00	10,000	Native Backfill	$650,000.00
5.01	CY	$150.00	$125.00	540	Concrete Inlet & Outlet Works	$148,500.00
-	LF	$50.00	$225.00	800	Oxford Ditch Re-alignment	$220,000.00
Sub-Total						$2,440,500.00
Contingency (15%)						$366,075.00
GRAND TOTAL						$2,806,575.00