



WATER AUTHORITY

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LAKE AGASSIZ WATER AUTHORITY

TECHNICAL ADVISORY COMMITTEE MEETING

**Advanced Engineering & Environmental Services
4170 28th Ave S
Fargo, North Dakota**

**May 12, 2016
1:00 PM**

- 1:00 p.m. I. **>Consideration of Minutes** – Al Grasser
- 1:05 p.m. II. **Implementation Plan Capital and O&M Costs** – Kip Kovar
- 3:00 p.m. III. **Hydraulics & Pumping Station Tech. Memorandum Comments** – Al Grasser
- 3:15 p.m. IV. **Other** – Al Grasser
 - A. **Next Meeting Date**
- 3:20 p.m. V. **Adjourn**

The following minutes are in draft form subject to review and approval by the Technical Advisory Committee at its next meeting.

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LAKE AGASSIZ WATER AUTHORITY
TECHNICAL ADVISORY COMMITTEE
Advanced Engineering & Environmental Services
Fargo, North Dakota

March 30, 2016

A meeting of the Lake Agassiz Water Authority (LAWA) Technical Advisory Committee was held on March 30, 2016, at Advanced Engineering & Environmental Services, Fargo, North Dakota. The meeting was called to order by Chair Grasser at 1 p.m.

MEMBERS PRESENT

Al Grasser, Chair
Tim Freije
Bruce Grubb
Gordon Johnson
Kristofer Knutson
Randy Rapacz
Bob Werkhoven
Secretary Kip Kovar

MEMBERS ABSENT

Jerry Blomeke, Vice Chair
Mike Blessum
Chris Brungardt
Rick Gillund
Steve Hansen
Gordon Johnson
Brian Reilly

OTHERS PRESENT

Garrison Diversion staff and others were present. A copy of the registration sheet is attached to the original minutes as Annex I. The meeting was recorded to assist with compilation of the minutes.

CONSIDERATION OF MINUTES

Motion by Kris Knutson to dispense with a reading of the February 26, 2016, committee minutes and approve them as distributed. Second by Tim Freije. Motion carried.

LEGAL COUNSEL UPDATE

Tami Norgard, Vogel Law Firm, provided an update on the meetings that took place with representatives of the national law firm, Brownstein Hyatt Farber Schreck, from Washington, DC, on March 1 and 2 at Garrison Diversion in Carrington. This is the firm hired by Garrison Diversion to assist with the Red River Valley Water Supply Project (RRVWSP).

Ms. Norgard stated that the representatives took the information they gathered on the project back to Washington and are currently working on a number of issues. They intend to get back to us by April 8 with work product documents.

Ms. Norgard provided a PowerPoint presentation as an overview of the discussions that were held with the national law firm and engineering team at the Carrington meetings.

CONCEPTUAL DESIGN REPORT & IMPLEMENTATION PLAN TASK ORDER

Paul Boersma, Black & Veatch Corporation, reviewed a tiered implementation plan on how to feasibly implement the RRVWSP that takes into account some of the future uncertainties.

Mr. Boersma said the implementation plan looks at how various portions of the project get built and why they get built in a particular way, what decisions, either from the user or a regulatory standpoint, play into it, and what the capital costs and operational costs will be. It basically provides the stakeholders with a road map for the implementation and decision-making process.

Chair Grasser said as these things get further refined and investigated and decisions start to be made, what is the timeline for the task order completion.

Kip Kovar, Secretary, said his initial thought is to have the report in document form and completed in a couple of months.

Motion by Bruce Grubb to recommend approval of the conceptual design report and implementation plan task order to the Lake Agassiz Water Authority board. Second by Kris Knutson. Upon voice vote, motion carried.

NAWS PROJECT WATER TREATMENT PLANT

Tim Freije, State Water Commission, provided an update on the NAWS Project regarding the Supplemental Environmental Impact Statement (SEIS) and water treatment, adding that the NEPA is complete but has not yet been approved by the court

Mr. Freije stated that the motion for summary judgement is due on April 11. The combined cross motion opposition for that is due May 13, and the State Water Commission's (SWC) reply opposition to their cross motions is due by June 17. The case will then be fully briefed. Approximately 4-6 months after that, the summary judgement is expected. The SWC did file a motion requesting to modify the injunction to allow them to begin the design work on the biota treatment facility.

WATER TREATMENT PLANT

Steve Burian, Advanced Engineering & Environmental Services, provided a presentation on the technical memorandums being worked on regarding water treatment. This included water treatment plant objectives, source water concerns for biota and pollutants, desired log removal and flows and operations. He also reviewed water treatment plant alternatives.

BALDHILL CREEK ANALYSIS

Jeff Hruby, Advanced Engineering & Environmental Services, reminded the committee that Baldhill Creek is being investigated as a potential alternative conveyance route at a possible significant savings for the project. A primary goal was to look at the capacity of the creek design flows and the potential impacts. Another goal was to look at potential water losses.

Mr. Hruby's presentation explained what the investigation consisted of, including limited field work, stream flow monitoring, limited cross section surveys, well installation monitoring and testing hydraulic conductivity.

Mr. Hruby also reviewed the results which revealed the impacts on stream flow, impacts on the project, drought condition impacts and cost benefits and risks.

A copy of the combined PowerPoint presentations is attached to these minutes as Annex II.

ALIGNMENT TECHNICAL MEMORANDUM

Secretary Kovar said if the committee has any comments on the Pipeline Alignment Technical Memorandum that was emailed to the committee he would like them sent to him before the next committee meeting.

OTHER BUSINESS

Next Meeting - - The next meeting will focus on project costs. A date and time in May is yet to be determined.

There being no further business to come before the committee, the meeting adjourned at 3:45 p.m.


Al Grasser, Chair

Kip Kovar, Secretary

REGISTRATION

Lake Agassiz Water Authority
 Technical Advisory Committee
 Fargo, North Dakota
 March 30, 2016

| NAME | ADDRESS |
|-------------------|--------------------------|
| Geneva Kaiser | Jamestown ND |
| Carol Siegest | LATA - City of Hunter |
| Kristofer Knutson | Moorhead Public Service |
| Ken Vem | Grand Forks |
| Lisa Schaffer | ADCO |
| Dwane DeKray | GDCO |
| Mem: Mmide | GDCO |
| Al Gresser | City of Grand Forks |
| Tami Norgard | Vogel Law Firm |
| Tim Frieze | NBSWC |
| Randy Rasmus | City of East Grand Forks |
| Kip Kowen | GDCO |
| Mike Smeed | GDCO |
| Bruce Garndt | City of Fargo |
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Red River Valley Water Supply Project

Presented to:
LAWA TAC

March 30, 2016

Summary of TAC Design Review

- Overall Meeting Context
 - January: RRVWSP Overview and HCW Aquifer Investigation
 - February: Alignment, Hydraulics, Initial WTP Concepts
 - March:
 - Summary of Legal Review
 - Adaptive Implementation Plan
 - Detailed WTP Concepts and Baldhill Creek Discharge Update
 - Addressing TM Comments

Today's Agenda


1. Summary of Legal Team Review (Tami)
2. Segmenting Plan Based on Legal Review (Paul)
3. Approvals Need by TAC (Kip)
 - Implementation Plan Based on Segmenting Approach
 - Conceptual Design Report/Segmenting Plan Scope
4. Technical Presentations
 - NAWS Update (Tim)
 - WTP Update (Part 2) (Chris/Steve)
 - Baldhill Creek (Jeff/Paul)
5. Comments on Pipeline Alignment (Kip)

1) Summary of Legal Team Review

National Legal Counsel


David Bernhardt
Larry Jensen

Brownstein Hyatt
Farber & Schreck
Washington, DC



Legal/Engineering Team Meeting

- What do we mean by “Nexus Free”?
- Communication Plan for Decision-Making



Federal Topics for Review

- EA for Intake and Outlet with Limited NEPA
- Treatment Considerations and Compliance with BWTA
- IJC Role
- Federal Permitting Required for HCW
- Review Opportunity to Transfer Federal Facilities and Water Permit
- Jurisdictional Determination
- Scope of USFWS Easements
- Initiate EA for Water Supply Contract from Canal for Central ND

VOGEL Law Firm

State Law Considerations

- State Permitting Required for HCW
- Need for NPDES Permit for Discharge
- Adequacy of existing Appropriation Permit for the HCW Option or Conventional Intake
- County Permitting Requirements for Intake or HCW
- Water District Permitting Requirements for Outlet
- Flowage Easement Requirements

VOGEL Law Firm

2) Implementation Plan

Implementation Plan

Project Implementation Depends on:

- Federal Government Willingness to Use or Transfer its McClusky Canal Assets
- Obtaining Section 404 Permit on the Missouri River
- Ultimate Requirements for Water Treatment
- Feasibility of Using Baldhill Creek as a Discharge
- Final User Commitments

Implementation Plan – Key Decisions

Use McClusky Canal?

Use Baldhill Creek For a Discharge?

Obtain a 404 Permit For Conventional Intake?

What is Required for WTP?

What are User Commitments?

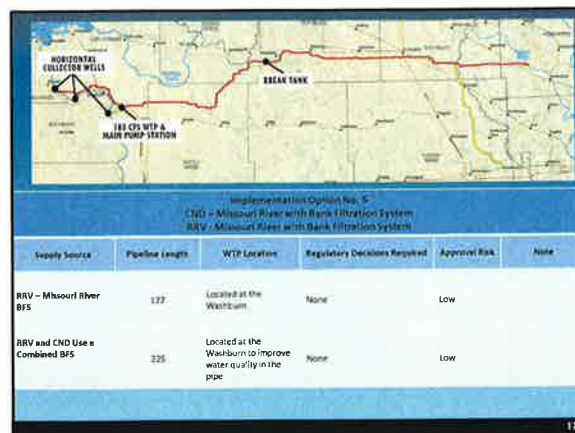
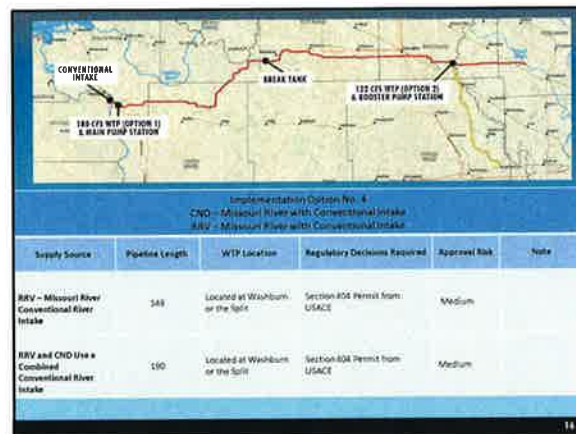
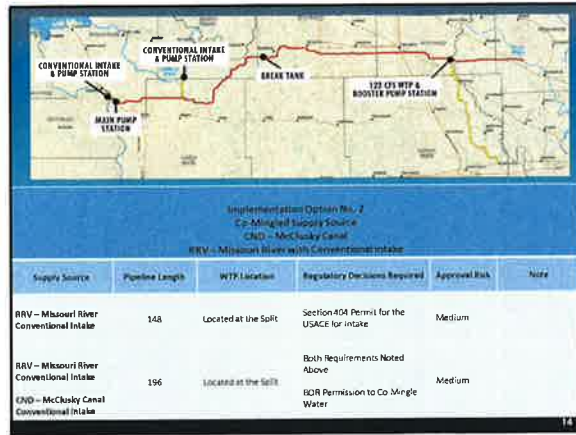
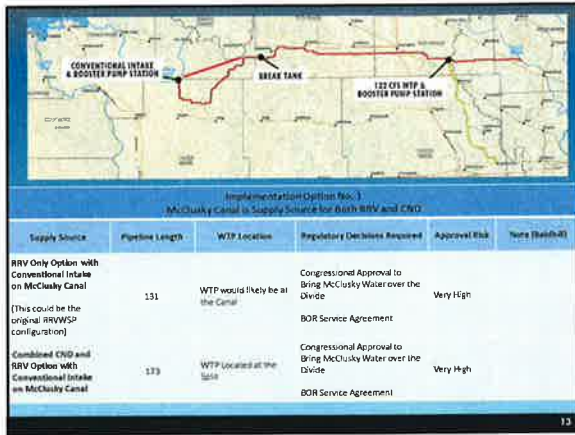
How Much Money is Available?

Implementation Plan

What is an Implementation Plan?

An Approach that Adds Flexibility and Cost Savings Based on:

- 1) Available Construction Funding
- 2) Future Regulatory Decisions
- 3) Final User Participation and Water Demands



3) Approvals Needed by TAC

TAC Approvals

- Overall Implementation Plan
- Engineering Scope to Complete Conceptual Design Report/Implementation Plan

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4) Technical Presentations

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NAWS Update

NAWs Water Treatment Plant Update

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WTP – Objectives (from TM-2 and Legal Team)

- 1) Biota Removal / Inactivation
 - Log removal
 - Multi-barrier
 - Filtration, solids removal, disinfection
- 2) Water Quality Criteria In Receiving Stream
- 3) Other Considerations
 - Mitigate/control adverse impacts to Objectives 1 or 2 (e.g., dissolved iron removal)
 - Recognize O&M costs (chemicals, labor)
 - Pipeline needs

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WTP - Source Water Concerns for "Biota" (from TM-2)

| Biota | Treatment |
|---------------------------------|--|
| Aquatic Vascular Plants | • Removed by BFS or other physical separation |
| Algae | • Removed by BFS or other physical separation and chemical oxidation |
| Disease-Causing Micro-Organisms | • Removed by BFS or other physical separation and chemical oxidation |
| Aquatic Invertebrates | • Removed by BFS or other physical separation and chemical oxidation |
| Aquatic Vertebrates | • Removed by BFS or other physical separation and chemical oxidation |

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WTP – Desired Log Removal (from TM-2)

| PARAMETER | UNITS | GOAL ⁽¹⁾ |
|--|--------------------------|---------------------|
| Giardia | Log-Removal/Inactivation | 3 |
| Viruses ⁽²⁾ | Log-Removal/Inactivation | 4 |
| Cryptosporidium | Log-Removal/Inactivation | 3 ⁽³⁾ |
| Turbidity, 95 th Percentile | NTU | 1 |
| Turbidity, Maximum | NTU | 5 |

⁽¹⁾Goals are not regulatory standards but values intended to minimize the potential spread of invasive aquatic species through interbasin water transfers.

⁽²⁾"Viruses" means viruses of fecal origin which are infectious to humans by waterborne transmission.

⁽³⁾Based on LT2 ESWTR Bin 1 assignment for the Missouri River at Bismarck, ND and Mandan, ND in initial *Cryptosporidium* monitoring.

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WTP - Source Water Concerns for Pollutants (from TM-1)

| Constituent | Issues |
|-------------------------------|---|
| Low Dissolved Oxygen | <ul style="list-style-type: none"> Promotes high dissolved Fe/Mn Oxygenation precipitate Fe/Mn Anaerobic pipeline conditions |
| High Dissolved Iron/Manganese | <ul style="list-style-type: none"> Nuisance precipitation in plant Creates turbidity Impedes UV Disinfection Avoid end-of-pipe red streak |
| High Alkalinity | <ul style="list-style-type: none"> More acid/base to adjust pH Mineral scaling potential |
| High Ammonia | <ul style="list-style-type: none"> More chlorine demand (breakpoint chlorinate) & contact time |
| High Organic Carbon | <ul style="list-style-type: none"> More chlorine required Higher coagulant demand |

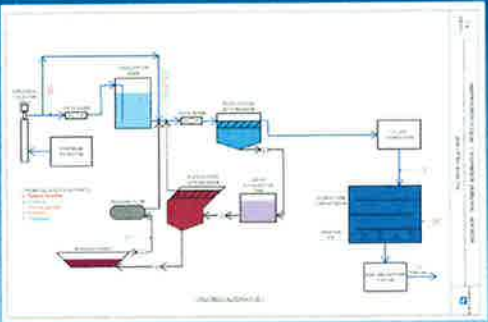
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WTP – Flows and Operations

- 4 cfs up to 180 cfs
- HCW's on / off – varied durations, seasons
- Variations in water quality expected
- Low flow = less river connectivity = poorer quality water
- Periodically cycle HCW and plant facilities

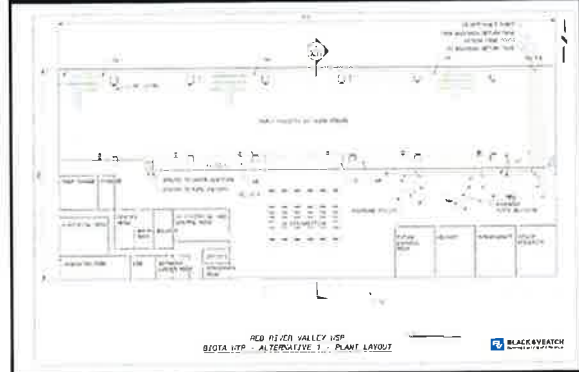
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WTP Alternative 1

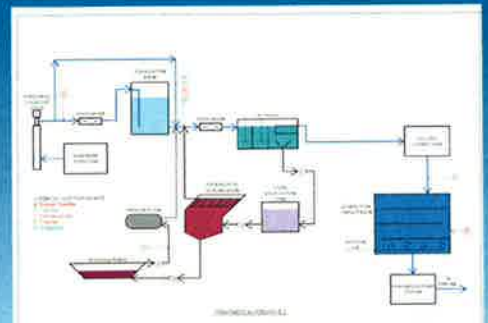


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WTP Alternative 1

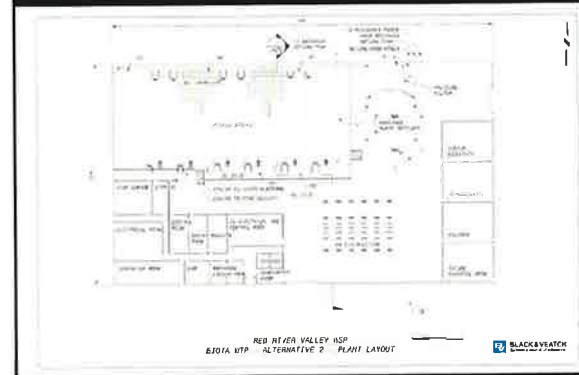


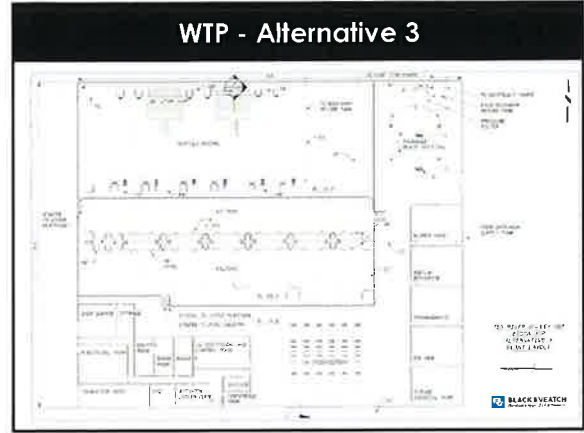
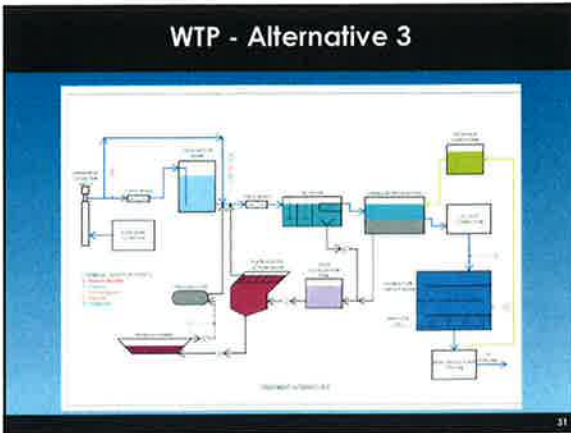
WTP - Alternative 2



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WTP - Alternative 2





Baldhill Creek Investigation

Goals:

- Flooding Impacts
- Water Loss Impacts

Investigation:

- Stream Flow Monitoring
- Limited Cross Section Survey
- Monitoring Well Installation
- Hydraulic Conductivity Testing

The diagram shows a cross-section of the creek bed and surrounding soil. It labels the 'Stream Bed', 'Water Table', and 'Monitoring Well'. A 'Stream Stage' is also indicated.

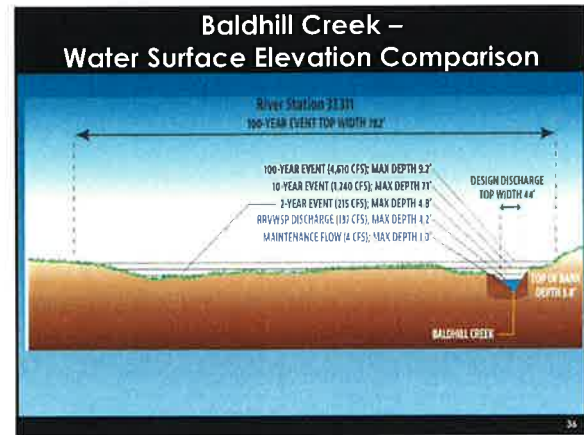
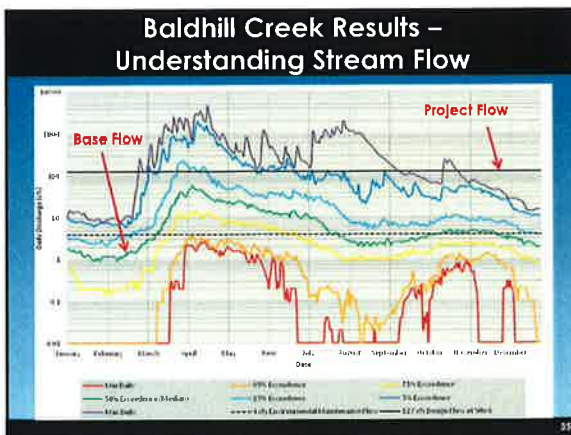
Baldhill Creek Analysis

Analysis of Flooding:

- Analysis of Stream Flow
- Hydraulic Modeling

Analysis of Water Loss:

- Literature Review of Regional Geology
- Groundwater Modeling to Assess Water Losses



Baldhill Creek Results – Impacts on Stream Flow

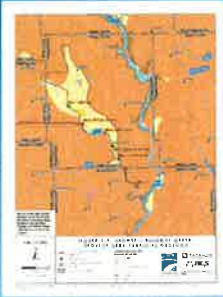
- Base Flow Increases from 3-6 cfs to 122 cfs.
- The 122 cfs Flow Stays in Bank – Limited Flooding
- Water Surface Elevations will Rise During Wet Events – Unless RRVWSP is Turned Off/Down
- Additional Risks for Bank Erosion, Sediment Loss, Localized Flooding with Ice.

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Baldhill Creek Results – Impacts on Project

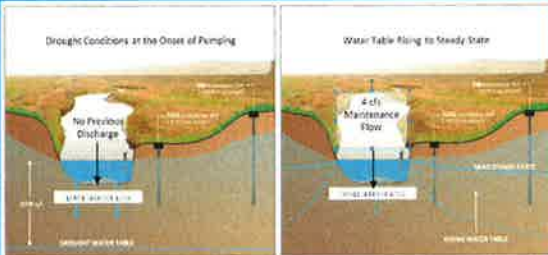
Water Loss: May Lose Approximately 15 cfs to Seepage, Evapo-transpiration

- Need to Increase Sizing of Rest of Project Assets to Compensate
- Need 4 cfs Maintenance Flows to Maintain Groundwater Level



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Baldhill Creek Results – Drought Condition Impacts



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Baldhill Creek – Cost/Benefit

| | |
|---|--|
| <p>Benefits</p> <ul style="list-style-type: none"> • Save \$40-\$45 million in pipeline costs | <p>Costs/Risks</p> <ul style="list-style-type: none"> • Added Capital and O&M Costs for Increased Pumping • Need for Ongoing Stream Monitoring • GDCD Assumes Risk of Future Stream Erosion, Ice Dams, Landowner Concerns • Potential Need for Flood Easements • Discharge Permit May be More Difficult Due to Ecological Impacts on Creek |
|---|--|

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5) Wrap Up

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Schedule for Conceptual Design TMs

- Horizontal Pipeline Alignment – in TAC Review
- Hydraulics and Pump Station – in TAC Review
- Baldhill Creek Discharge – TAC Review mid April
- Horizontal Collector Wells – TAC Review mid-April
- Water Treatment Plant – TAC Review mid-April
- Conceptual Design Report – end of May

Note – based on legal team recommendations, TMs evaluating additional options

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