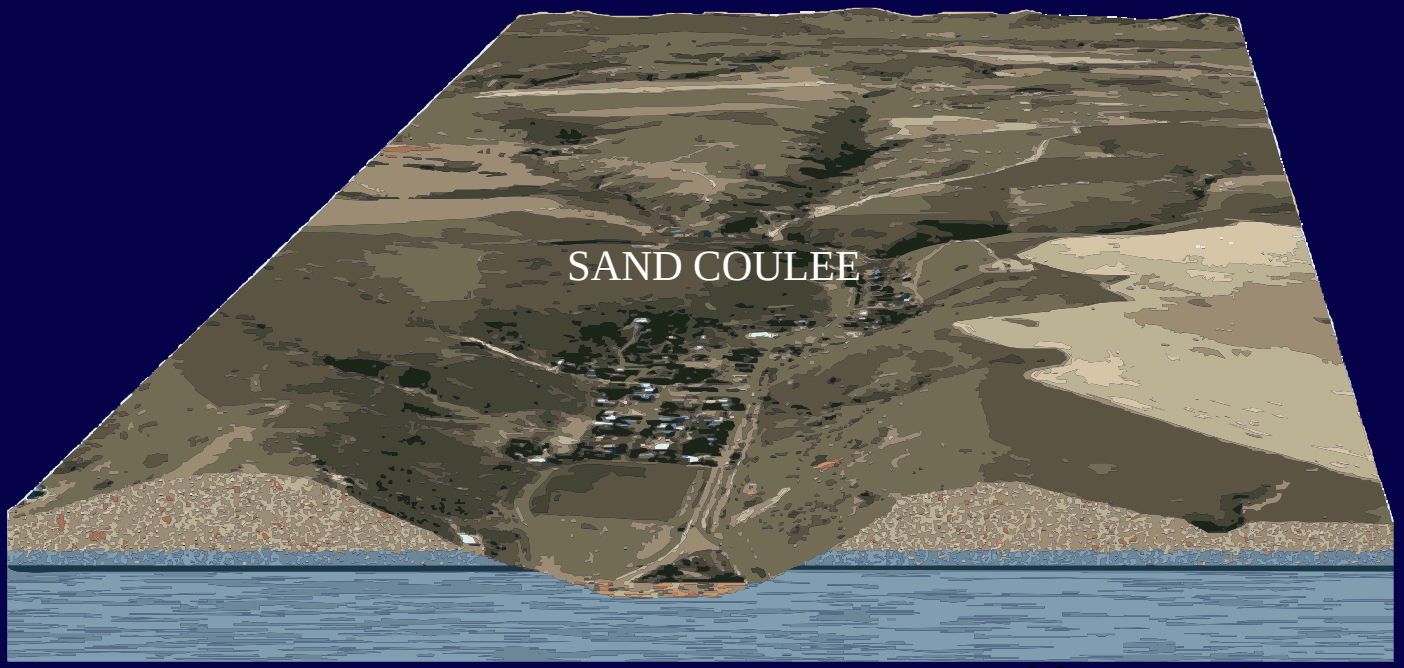
MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY

Public Meeting
Sand Coulee Public Water Supply System Restoration
June 9, 2011



Prepared for MTDEQ May 2011

Logistics

- Coffee
- Restrooms
- Meeting Schedule
  - Introductions
  - Presentation
  - Questions and Answers

Introductions

- Tom Henderson, DEQ Abandoned Mine Program Project Manager: thenderson@mt.gov
- John Koerth, DEQ Abandoned Mine Program Supervisor: jkoerth@mt.gov
- Bill Thompson, Hydrometrics, Inc. Project Manager: wthompso@hydrometrics.com

Problem Overview

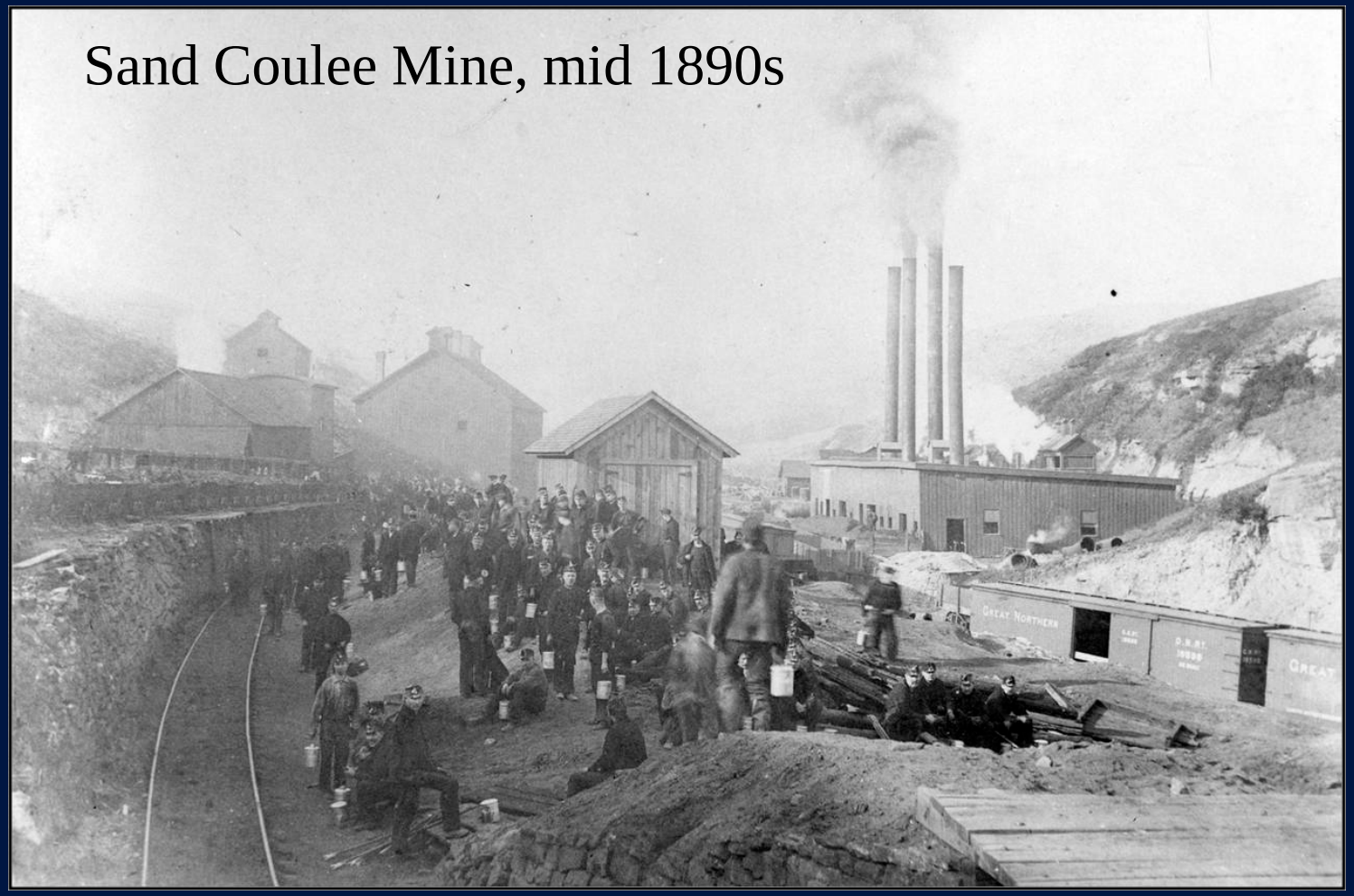
- Inadequate quantity of water available from existing Sand Coulee Water District water supply wells
- Water quality concerns due to entry of coal/coal wastes into the water distribution system
- Both of these issues are directly related to impacts associated with abandoned coal mines in the Sand Coulee area

MDEQ Abandoned Mine Land (AML) Program

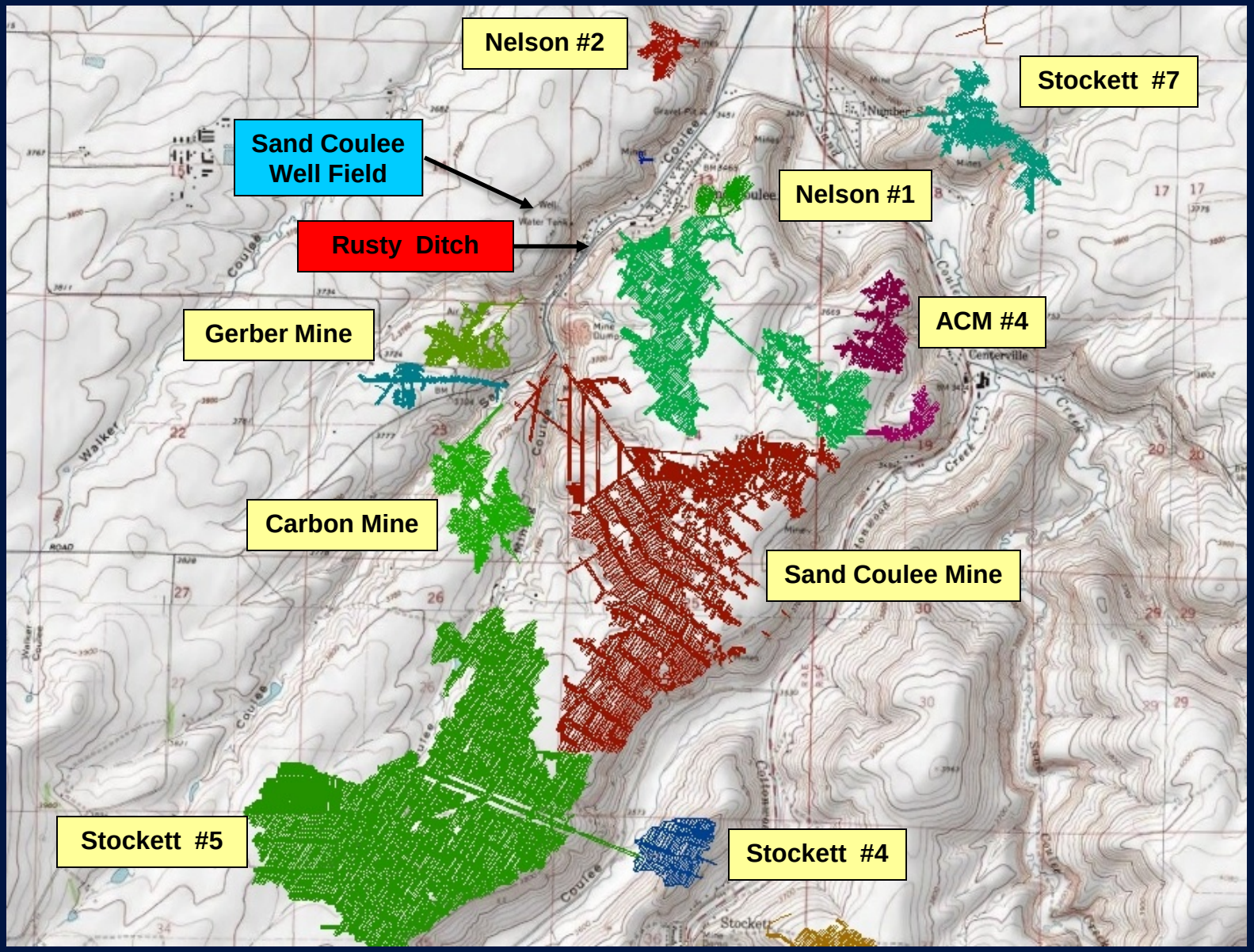
- The AML program reclaims lands impacted by past mining practices
- An abandoned mine is lands used for mining and/or mineral processing that:
  - was abandoned prior to 1977 (pre-law)
  - has no responsible party to pay for cleanup
- The State AML program is funded through a grant from the U.S. Department of the Interior, Office of Surface Mining

Pre-law Mining

Coal mining in the Great Falls Coal Field occurred between the late 1880s and the 1940s



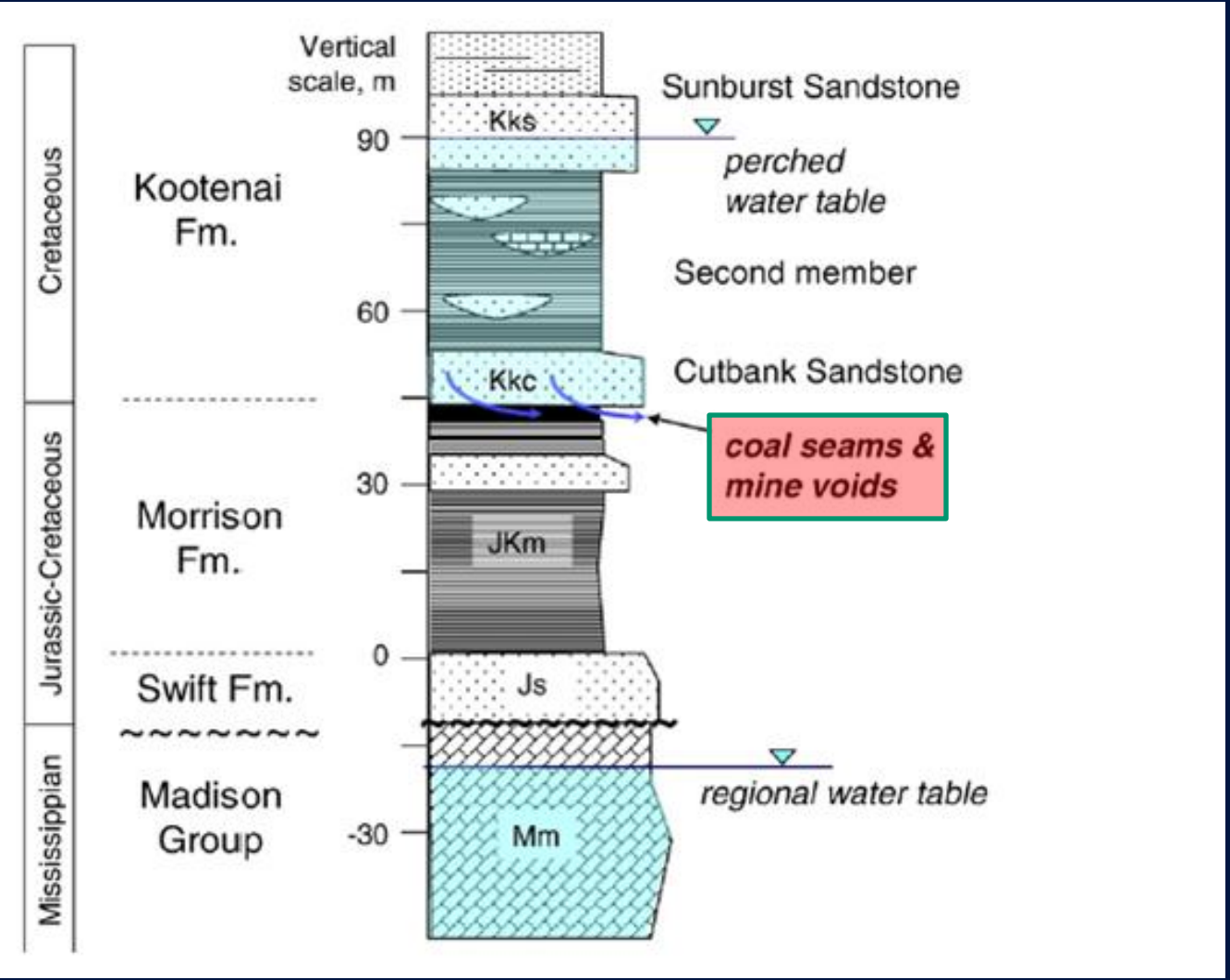
Abandoned coal mines surrounding Sand Coulee



Mining Impacts

- Acid mine drainage (AMD)
  - Pyrite nodules present in the coal exposed to air and water
  - Ongoing mine discharges contaminate surface water and groundwater
- Aquifer dewatering
  - Area mines discharge 350 gallons per minute (gpm) to over 1,500 gpm
- Coal wastes
  - Were present in abundance when the water distribution system was installed around 1959

Aquifer Dewatering



Gammons et al., *Chemical Geology*, 2010

Acid Mine Drainage

Mt Oregon AMD discharge

Impact to Kate's Coulee

Photos taken May 17, 2011

Previous DEQ Work

- 1980s – Multiple AML reclamation projects completed – Sand Coulee dump, Mining Coulee , coal fires
- 1983-1987 –Water sampling confirmed poor water quality in AMD discharges, streams, and shallow groundwater
- 1987 - DEQ extended the public water system to service residents at the south end of Sand Coulee
- 1990s - Passive AMD treatment technologies implemented, but were not effective

Recent History

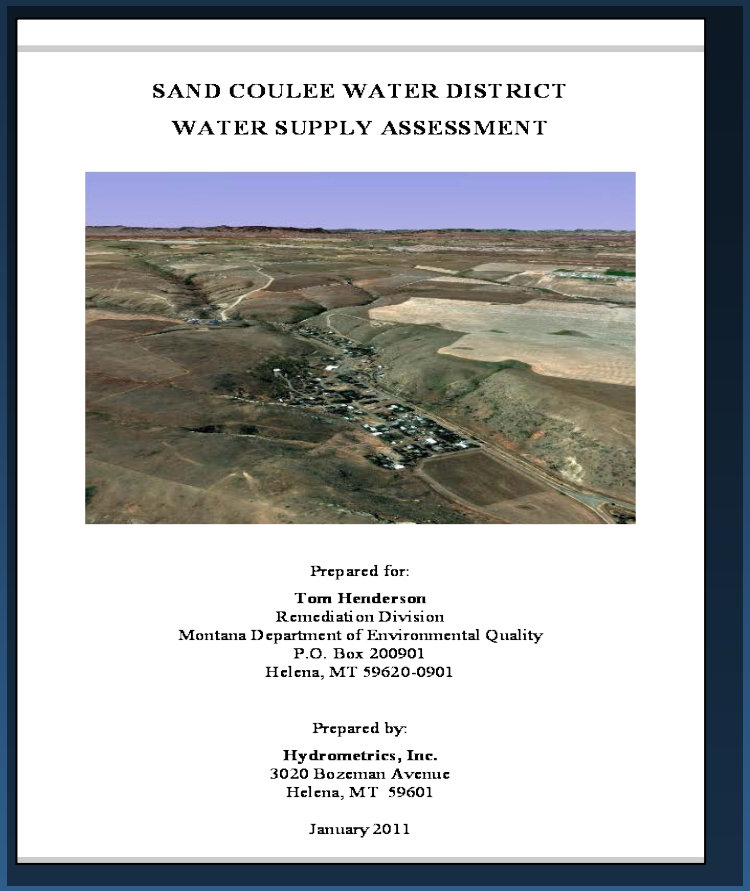
- 2008 – Emergency water hauling performed by Sand Coulee Water Users Association
- 2008 – Well #4 brought into service
- 2010 – Sand Coulee Water District contracts to have Preliminary Engineering Report completed
- 2010 - DEQ Water Supply Assessment completed to investigate water quantity problems and evaluate alternatives for new water sources

Potential Sources of Potable Water Local Limitations

- Surface Water – contaminated by acid mine discharge
- Aquifer in valley sediments - contaminated by acid mine discharge
- Bedrock aquifers above the coal mines - partially dewatered by the abandoned mines
- Bedrock aquifers below the coal mines

DEQ Water Supply Alternatives Evaluation

- Investigate conditions limiting the quantity of water produced from existing water supply wells
- Identify alternatives for new sources of potable groundwater for Sand Coulee Water District
- Anticipate technical and regulatory issues associated with each alternative
- Bill Thompson – Hydrometrics, Inc. Project Manager


SAND COULEE WATER DISTRICT
WATER SUPPLY ASSESSMENT

Prepared for:

Tom Henderson
Remediation Division
Montana Department of Environmental Quality
P.O. Box 200901
Helena, MT 59620-0901

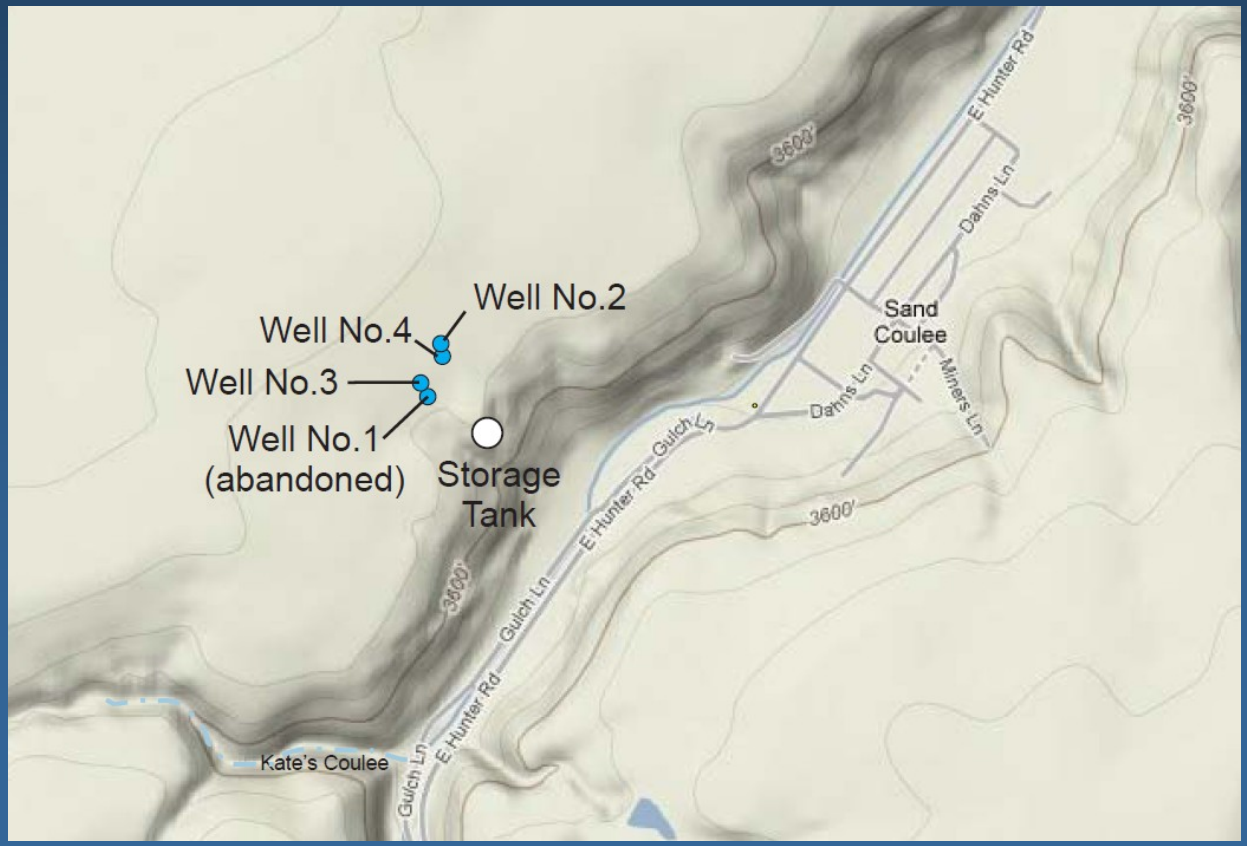
Prepared by:

Hydrometrics, Inc.
3020 Bozeman Avenue
Helena, MT 59601

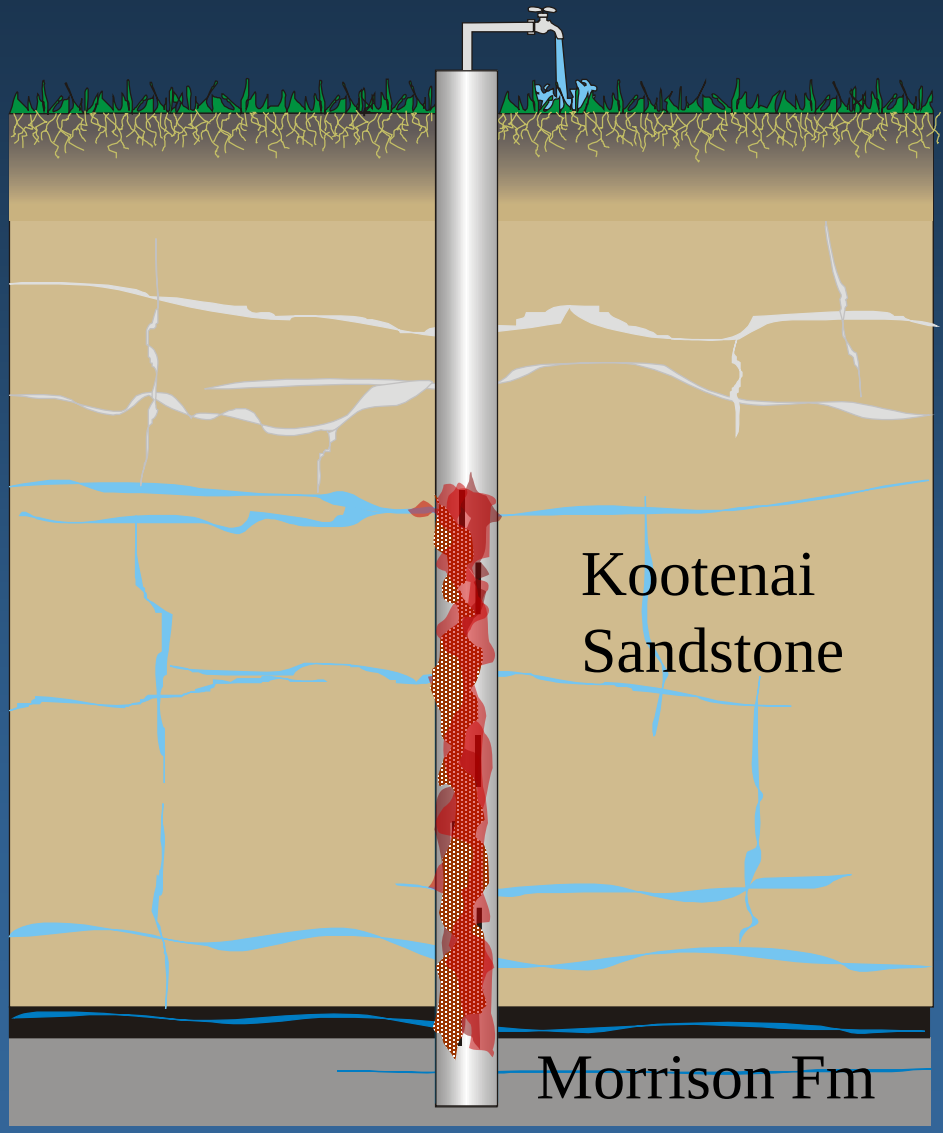
January 2011

Hydrometrics conducted an assessment of water supply options for the community of Sand Coulee.

The study examined the Water Districts existing wells and options for improving the quantity and quality of the groundwater supply



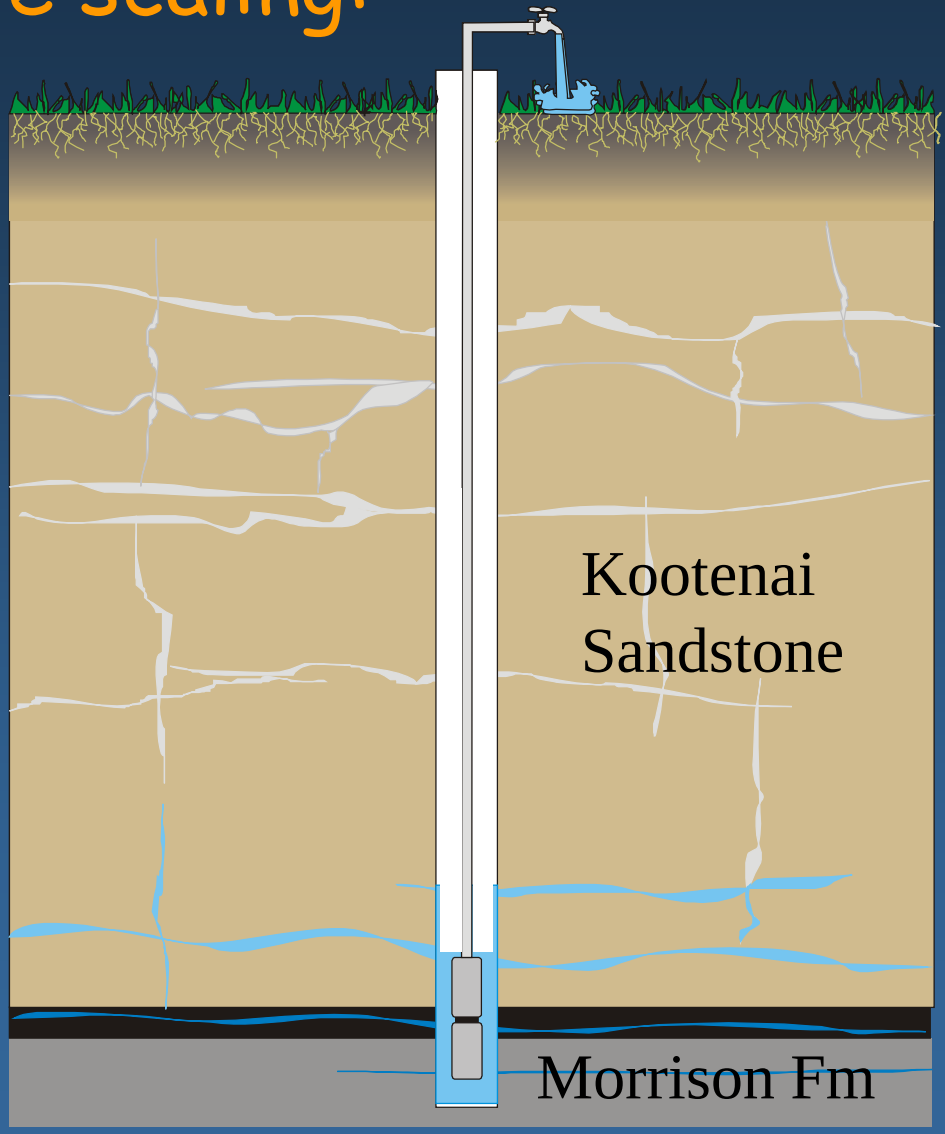
Why do the Water District's wells have problems with declining yields?



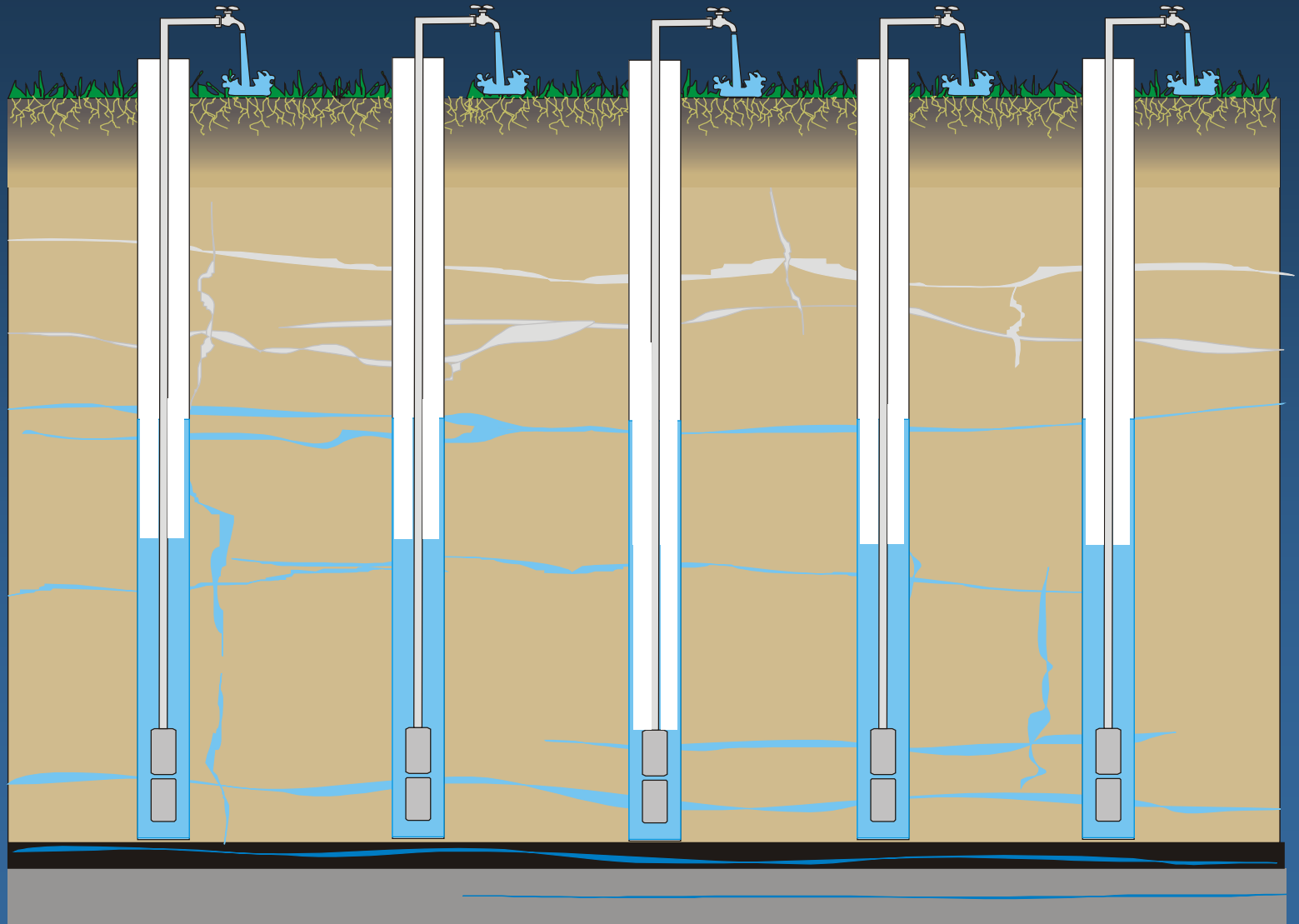
Why is the scaling problem so severe?

Factors that promote scaling:

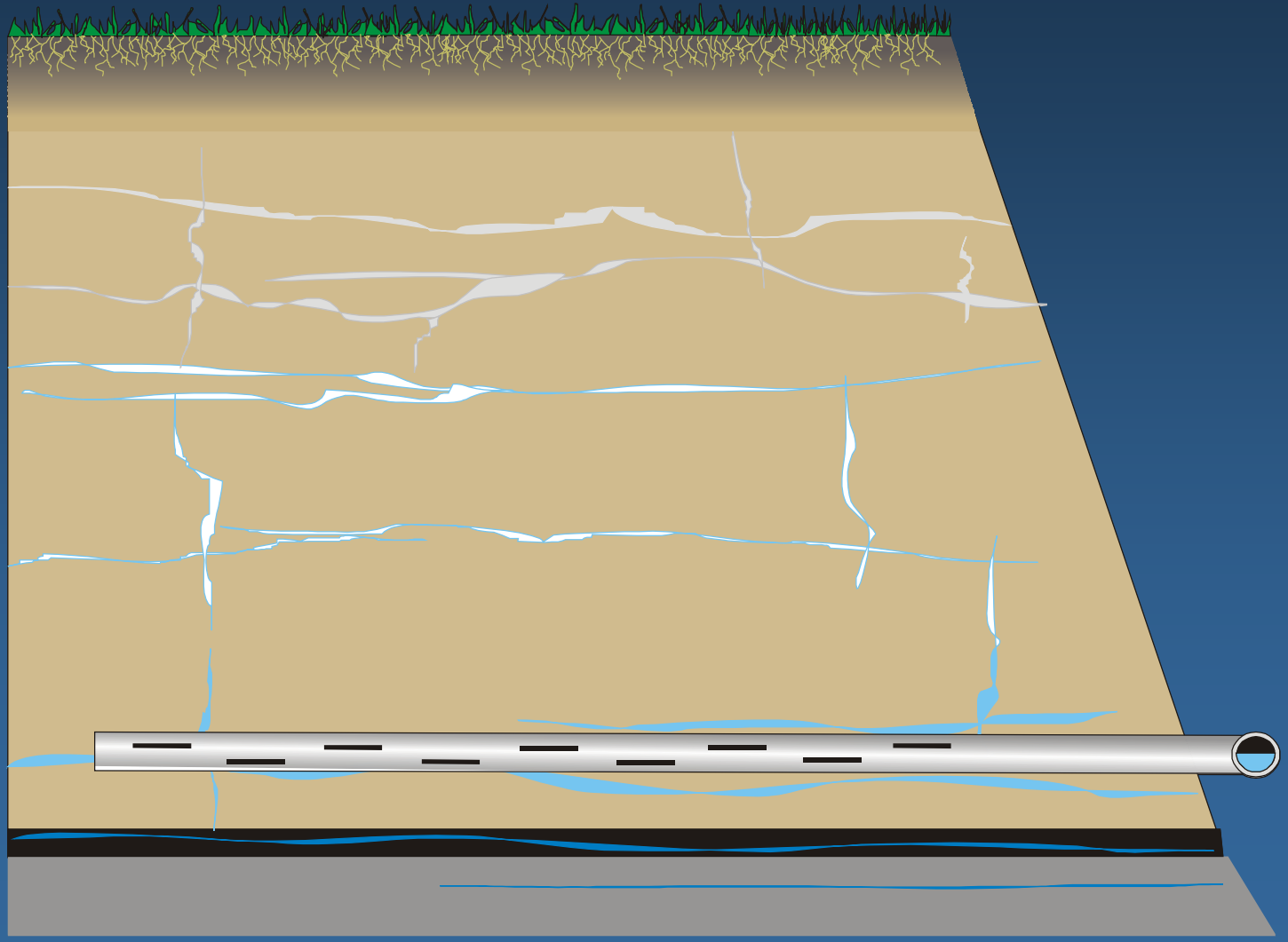
- ☑ Water Chemistry
- ☑ Cascading water
- ☑ High entrance velocities
- ☑ Excessive turbulence in well
- ☑ Mixing of different waters



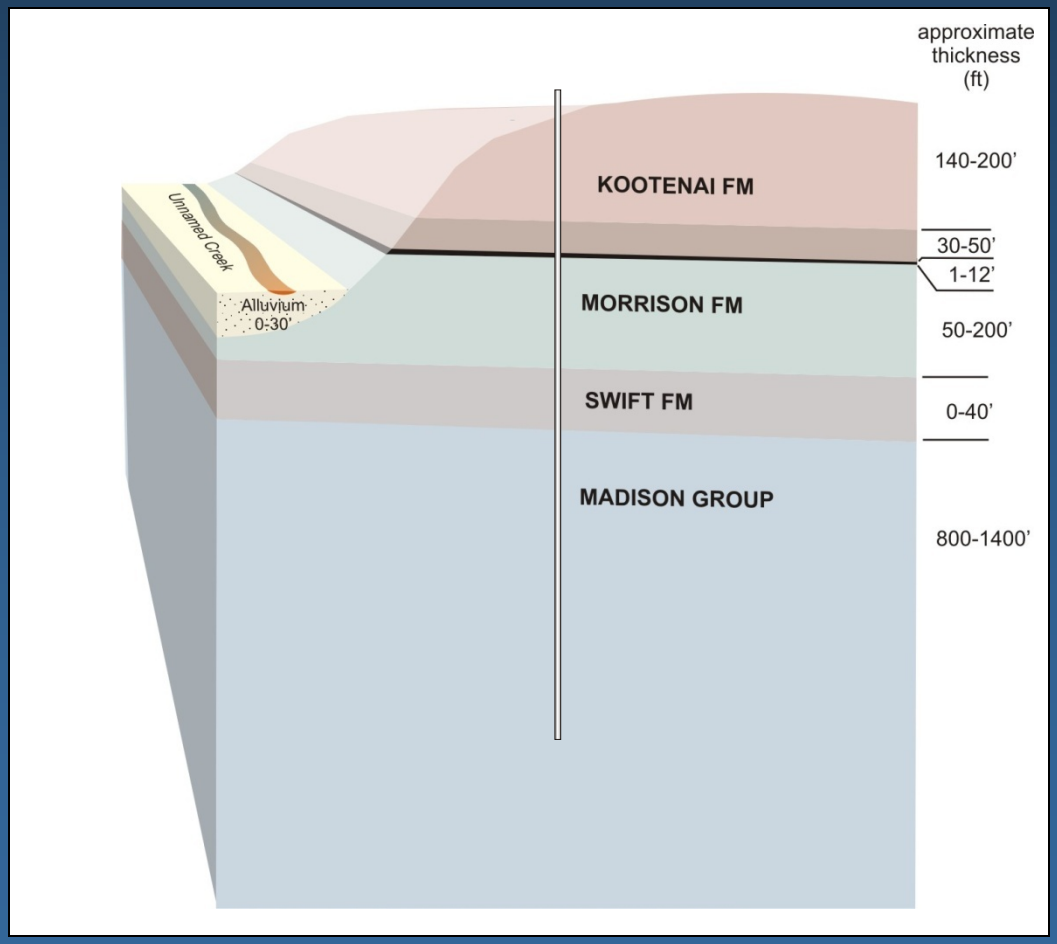
OPTION 1 - INSTALL MORE KOOTENAI FORMATION WELLS



OPTION 2. REPLACE EXISTING WELLS WITH HORIZONTAL WELLS



OPTION 3. INSTALL DEEP WELLS INTO THE MADISON AQUIFER



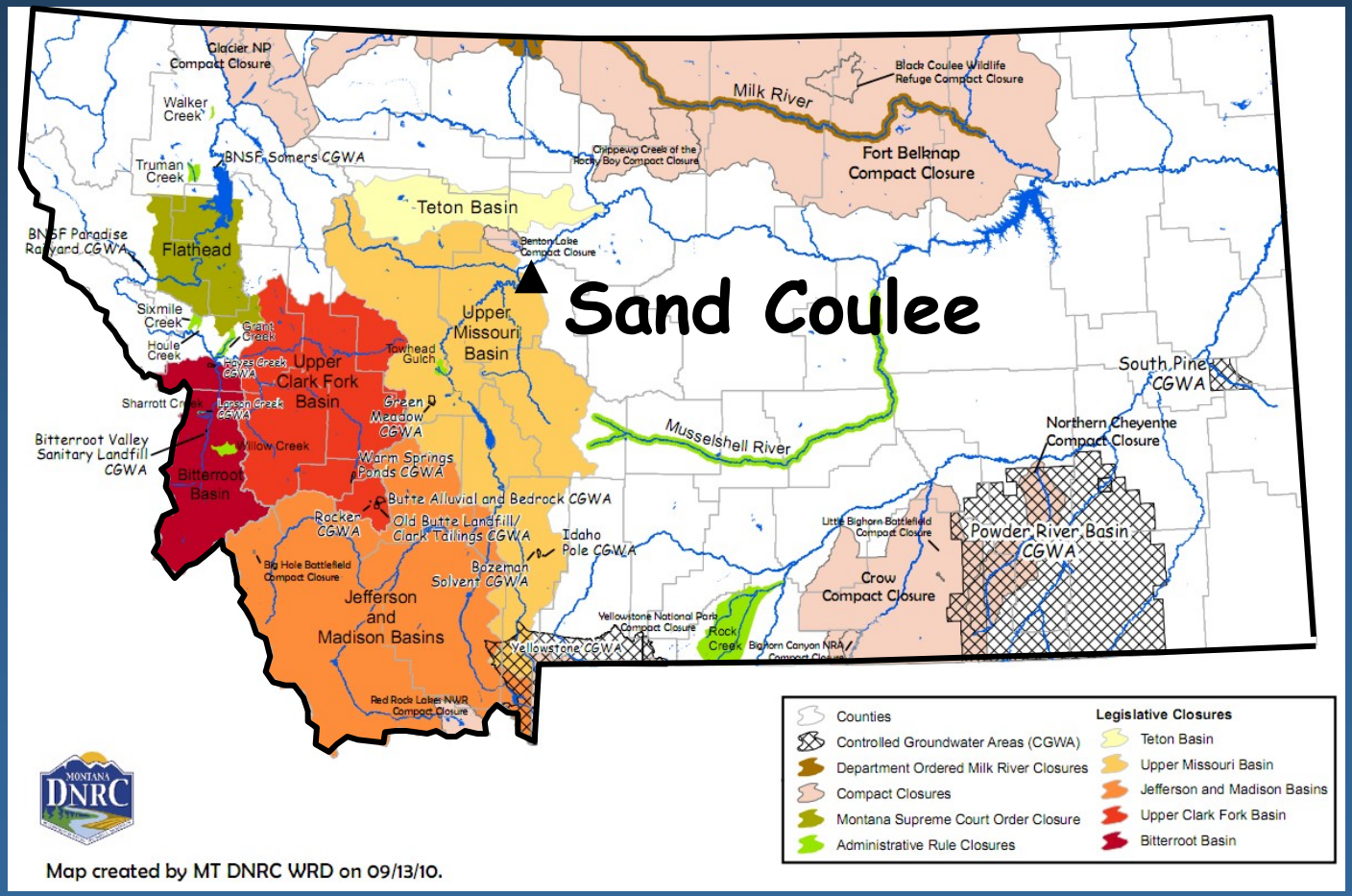
PERMITTING ISSUES

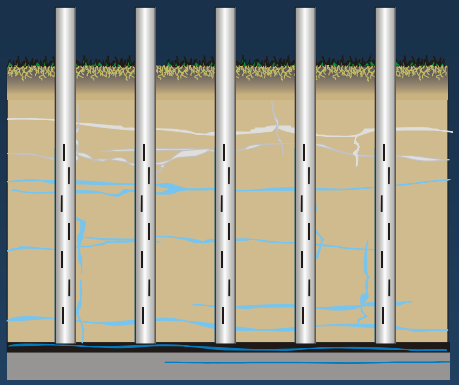
DEQ - Public Water Supply Permitting

DNRC - Water Rights

- Exempt Wells - 10 Acre ft/35 gpm
- Replacement Well Permitting
- Change in Use or New Appropriation

Quantification of Historical Use Basin Closure – Mitigation for Surface Water Depletion





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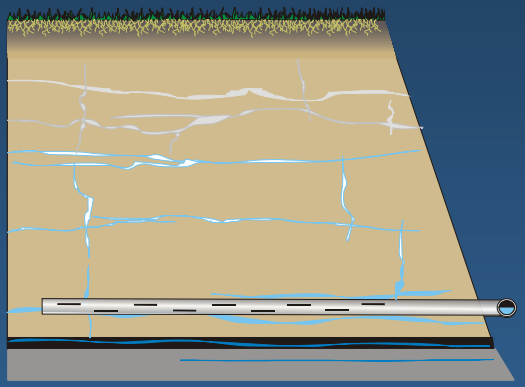

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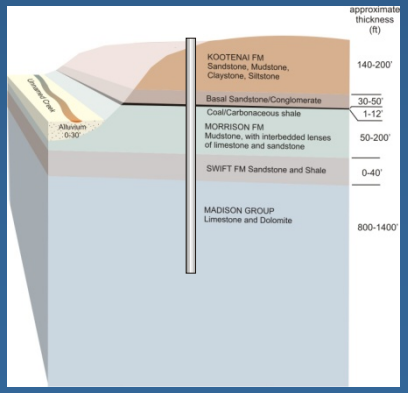

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RECOMMENDED OPTION

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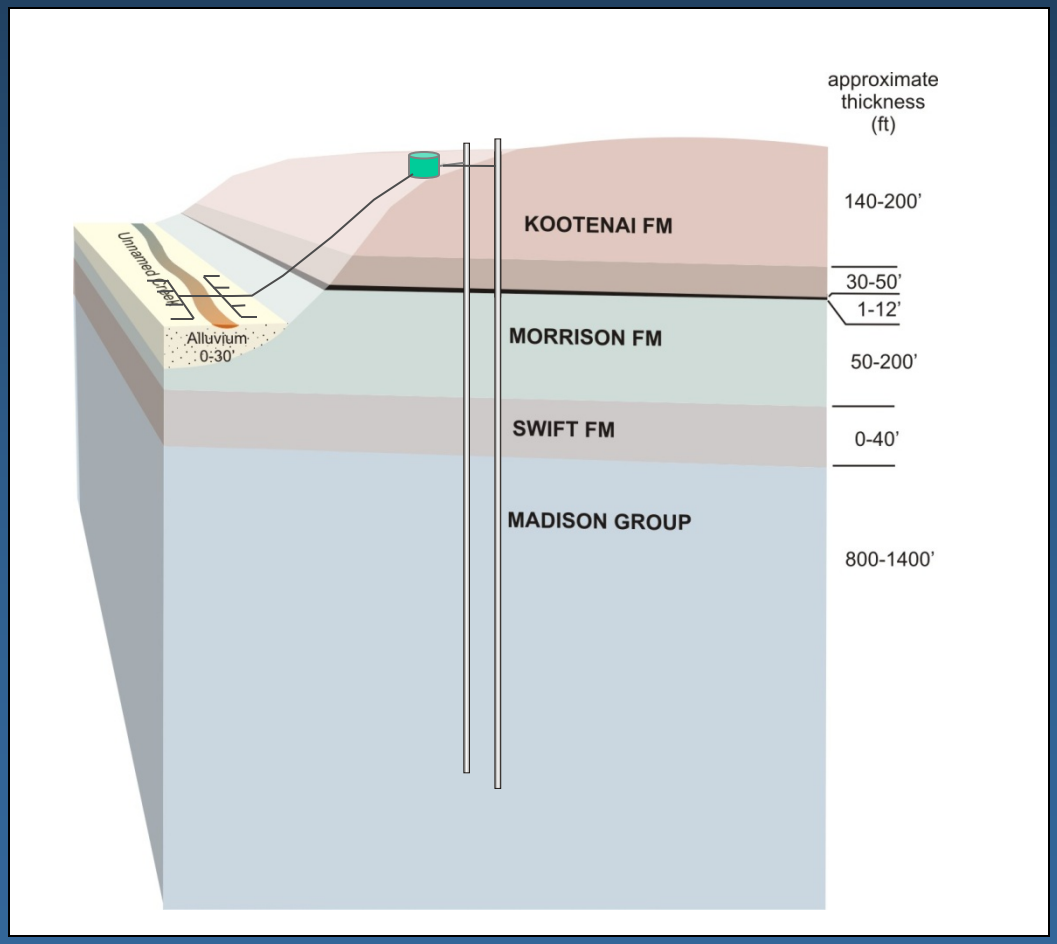


AML Project Overview

- Assess water quality in the Madison Aquifer
- Drill, test, and complete a deep water well in the Madison Aquifer
- Replace the existing distribution system utilizing DEQ- compliant construction
- Remove coal wastes so that the distribution system does not contact these materials.

Private Well Sampling

- Sample existing private water wells drilled into Madison Aquifer
- Sample 12-13 wells in June/July 2011 for metals and isotopes
- Coordinate with Kent Luoma / Sand Coulee Water District
- Consent for sampling form

Consent for Sampling

- Sampling will be performed between 8:00 AM and 5:00 PM unless an alternate time is agreed to
- 24 hours notice to the Owner prior to sampling
- Owner may terminate Consent by giving written notice at any time
- Consent expires 2 months from the date of authorization
- DEQ will supply a copy of the well sampling results to Owner upon receipt from the laboratory

CONSENT FOR WATER SAMPLING

I/We, _____,

the Owner of the property located at:

_____

Do hereby grant to the Montana Department of Environmental Quality Abandoned Mine Lands program (DEQ), their employees and contractors (Authorized Parties) the right to enter upon the above –described property for the purpose of water sampling. Information obtained from the sampling will be used in the assessment of water supply options for the Sand Coulee Water Supply District.

The DEQ has contracted Hydrometrics, Inc. (Hydrometrics) of Helena, MT to conduct the water sampling. Well water will be collected from an outside spigot after letting water run for up to 15 minutes, or sampled from an inside faucet with the Owner present if no outside faucet is available. Hydrometrics will give notice to the Owner at least 24 hours in advance of the scheduled time of the sampling. Authorized Parties will take reasonable steps not to interfere with the Owner's activities at the property during the sampling activities. Sampling will be performed between the hours of 8:00 AM and 5:00 PM unless an alternate time has been agreed to by the Owner.

This Consent for Water Well Sampling shall expire 2 months from the date of authorization. Owner may terminate this Consent by giving written notice at any time. DEQ will supply a copy of the well sampling results derived from this investigation to the Owner upon receipt from the laboratory.

Dated this _____day of _____, 20_____.

_____ _____

Owner of Record (Printed) Owner of Record (Signature)

_____ _____

Owner of Record (Printed) Owner of Record (Signature)

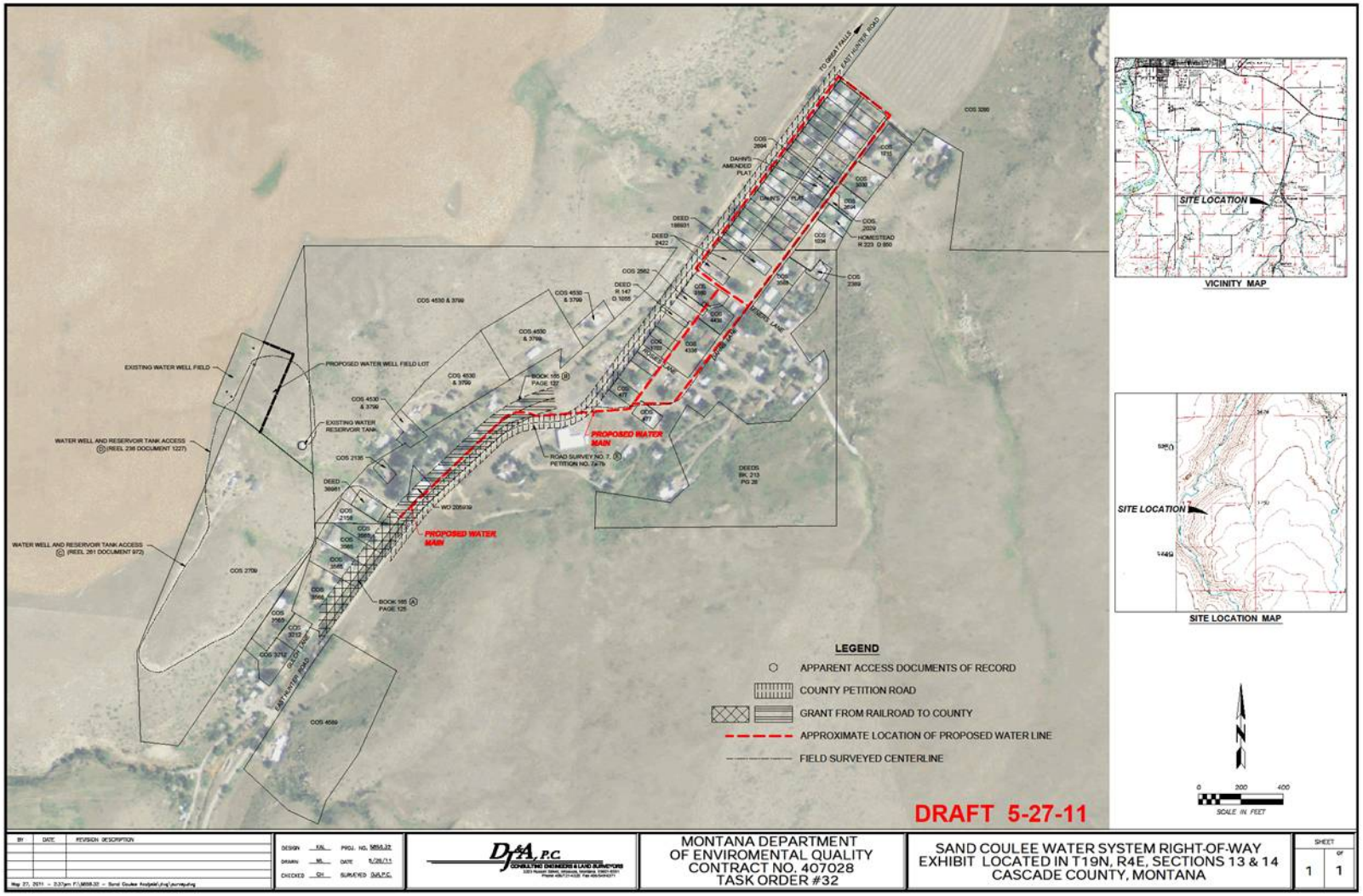
Water Well Drilling

- Drill one test well into Madison Aquifer to evaluate water yields and quality
- Connect well to existing distribution system
- Limit pumping to 35 gpm and 10 acre-feet/yr
- Anticipate well drilling late summer 2011
- Perform DNRC permitting/appropriation process assisted by water rights specialist

Water Distribution System

- DEQ anticipates implementing general layout presented in Preliminary Engineering Report
- Develop final system design and specifications
- Obtain title reports and conduct field surveys for the properties adjoining the waterline location
- Obtain consent of entry from land owners
- Develop waterline easements for the Sand Coulee Water District

Preliminary System Layout



Sand Coulee Public Water Supply System Restoration

- Project Funding
  - Office of Surface Mining: MT AML Program
  - DNRC RDG : Montana Reclamation and Development Grants Program
  - TSEP: Treasure State Endowment Program

Sand Coulee Public Water Supply System Restoration

- Documents available online at:

http://deq.mt.gov/AbandonedMines/CurrentProjects.mcpx

  - Great Falls Coal Field: Historic Overview
  - Water Supply Assessment
  - Preliminary Engineering Report

- Copies of all documents available at MDEQ, 1100 North Last Chance Gulch in Helena

MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY

Sand Coulee Public Water Supply System Restoration Public Comment

- Official comments must be submitted in writing to:

MDEQ Remediation Division
Attn: Tom Henderson
PO Box 200901
Helena, MT 59620
Or
Email: thenderson@mt.gov

Tom Henderson, MDEQ Project Manager
Phone (406) 841-5052

MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY

Sand Coulee Public Water Supply System Restoration Public Comment

Comment Period

Friday June 10 – Friday July 1, 2011

MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY

Questions

Contact:
Tom Henderson
Montana DEQ
thenderson@mt.gov
(406) 841-5052