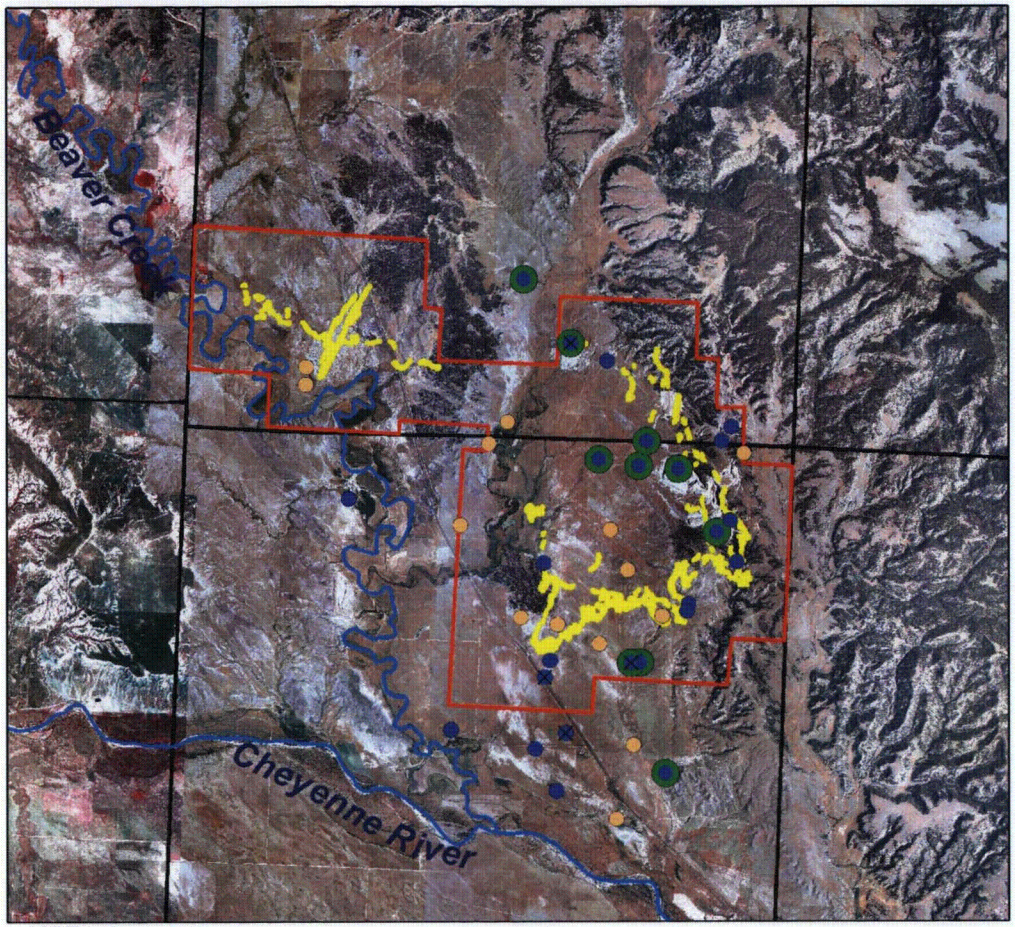
Surface Water

- **Sampling**
  - ***Upstream/downstream on Beaver Creek (monthly) and Cheyenne River (quarterly)***
    - Real-time measure stage
    - Collect grab samples at least monthly and during representative storms (24 samples)
  - ***Storm samples on intermittent streams, upstream/downstream Pass Creek and Bennett Canyon and one unnamed tributary***
    - Measure storm flows
    - Collect grab samples (12 samples maybe)
  - ***Quarterly sample representative surface water impoundments and abandon pit mine***
    - Field-measure specific conductance, temperature, turbidity, pH
    - Collect grab samples (48 samples)
  - ***Chemical analyses***
    - Same as groundwater with the addition of fecal coliform bacteria, total suspended solids, and suspended solids concentration because of Beaver Creek impairment listing

Surface Water Impoundment Sampling Sites

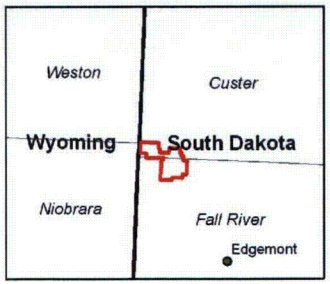


Legend

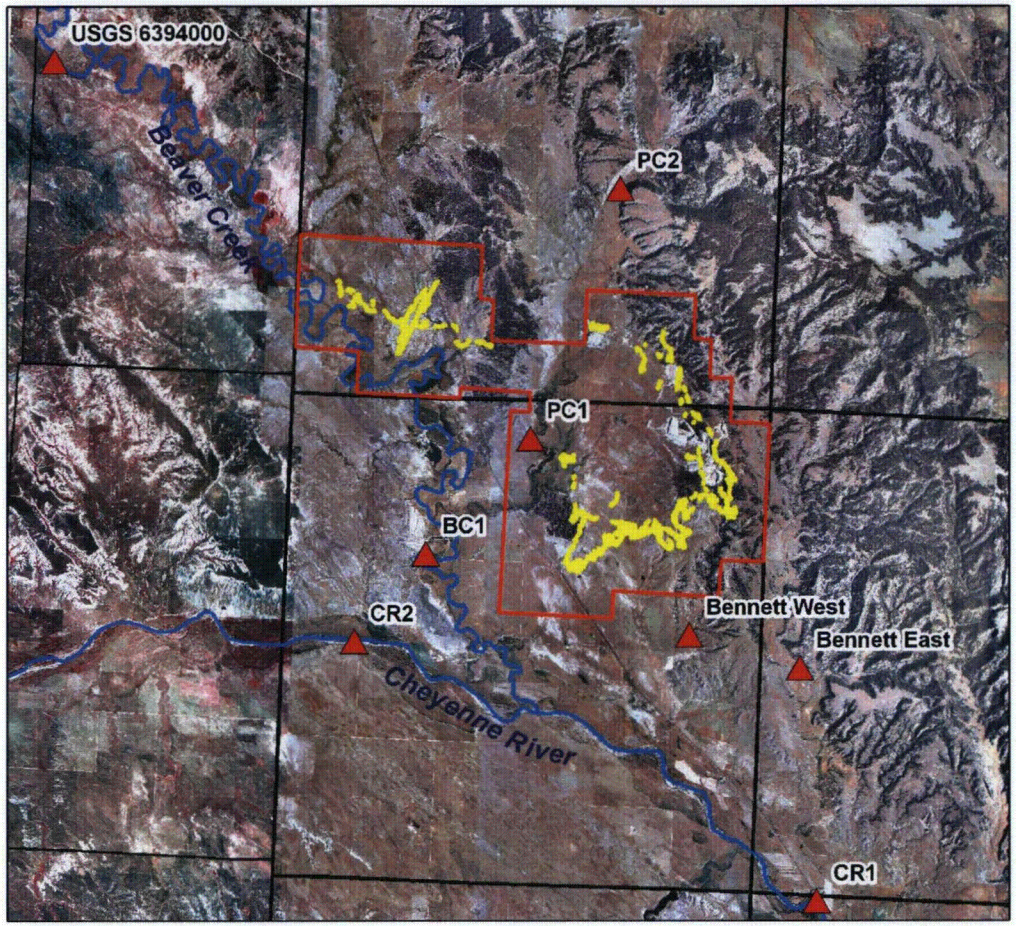
- Surface Impoundments
- Dry Impoundments
- Impoundments Influence by Springs
- Proposed Impoundment Sample Sites
- Ore Bodies
- Dewy-Burdock Boundary
- Streams

N

0 0.5 1 2 Miles



Surface Water Stream Sampling Sites

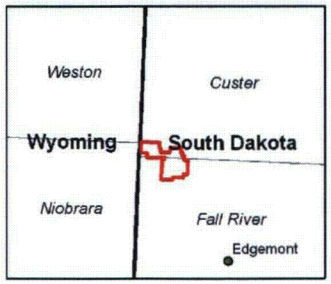


Legend

- Stream Sampling Locations
- Ore Bodies
- Dewy-Burdock Boundary
- Streams

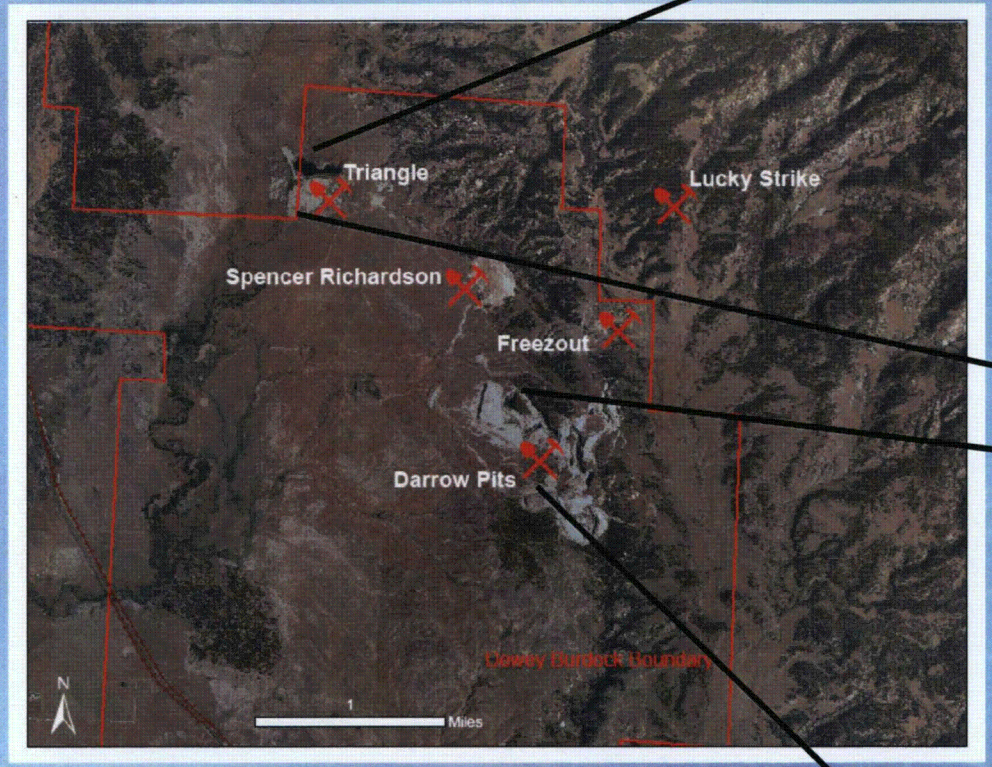
N

0 0.5 1 2 Miles



Surface Water

Pre-Existing Mine Sites



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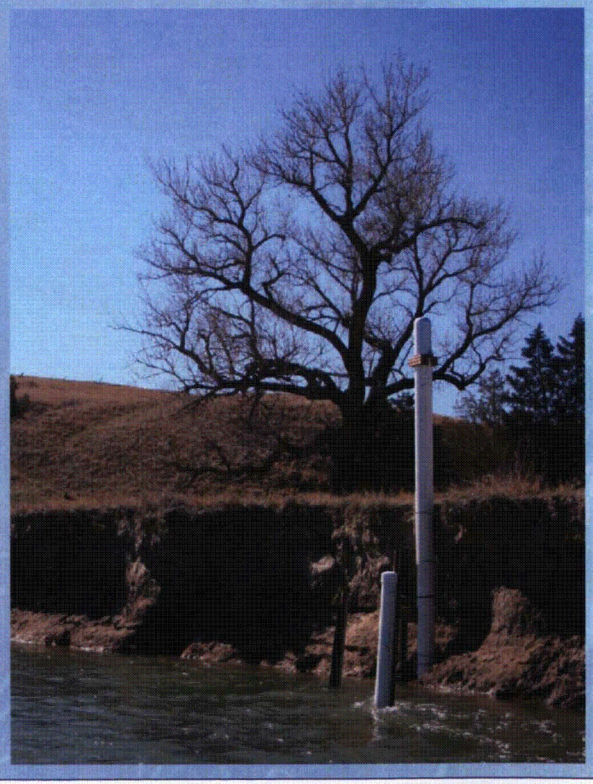
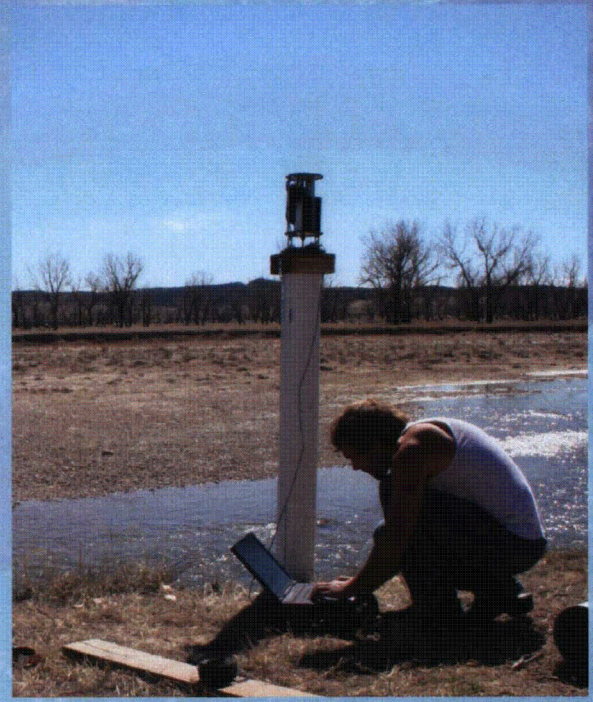
Passive Sediment Sampler With Stage Recorder





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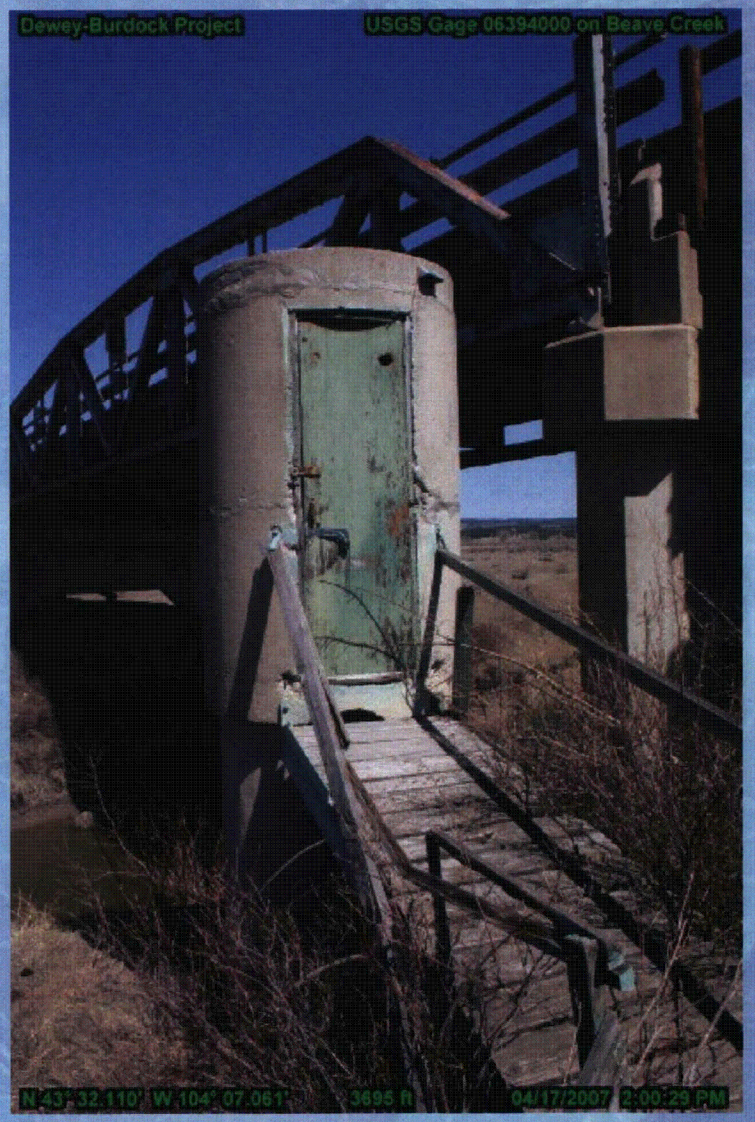
Site Sampling Locations



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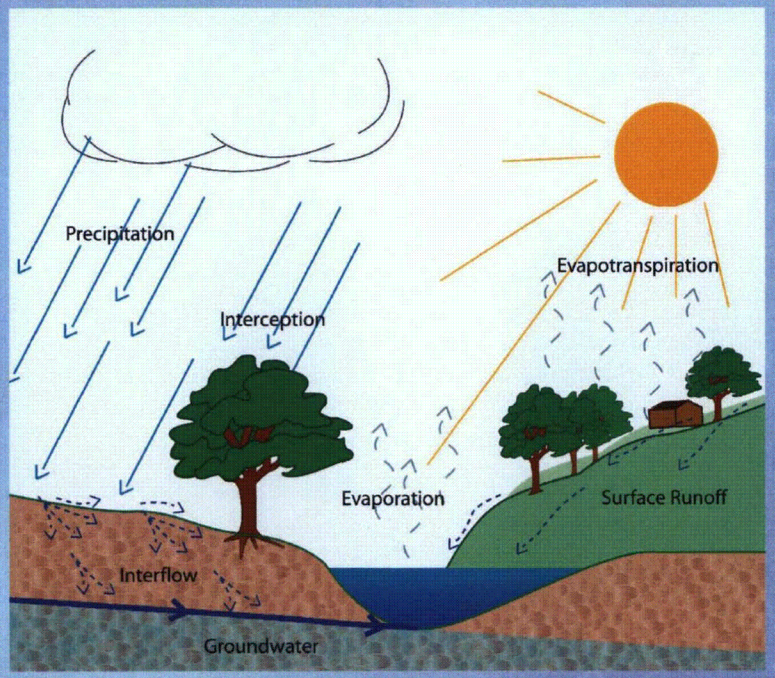
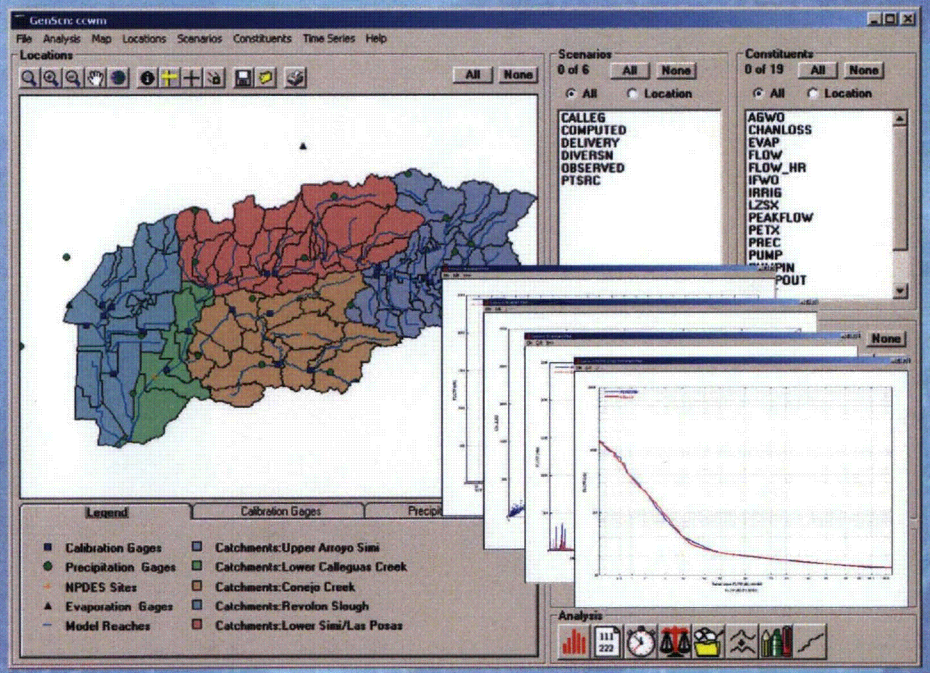
Surface Water

Model

HEC-HMS and HEC RAS - Flood Plain Model





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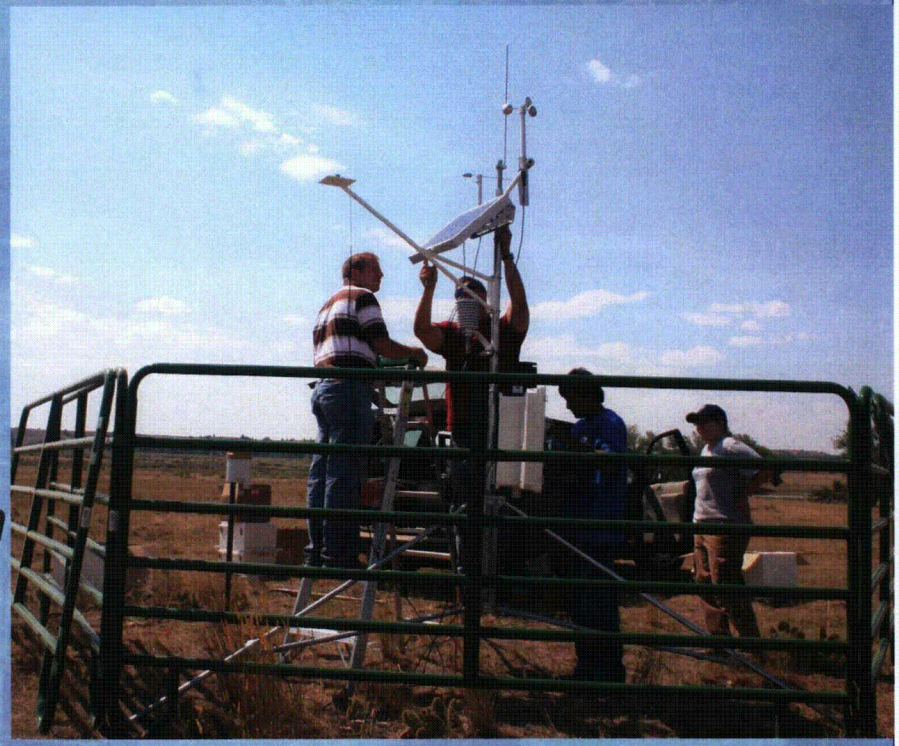
Meteorology

- **In Cooperation with South Dakota State climatologist Dr. Dennis Todey**
- **Full MET station**
  - *Wind speed/direction*
  - *Solar radiation*
  - *Humidity*
  - *Temperature*
  - *Year-round precipitation*
  - *Evaporation*
  - *Soil temperature*



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Radiological Baseline Study

- Establish Environmental Monitoring Stations
- Collect Baseline Samples/Radiological Analysis
- Deploy Radon and Direct Radiation Detectors

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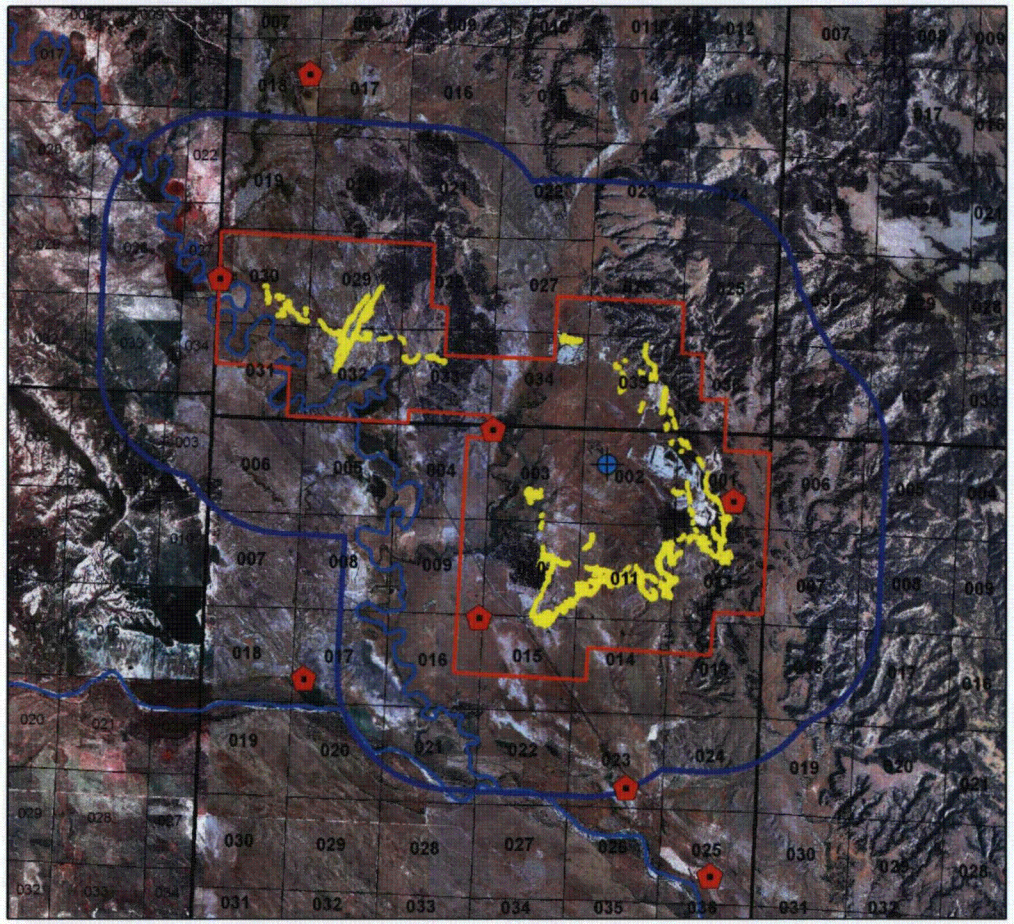
Meteorological and Radiological Air Quality Sampling Sites

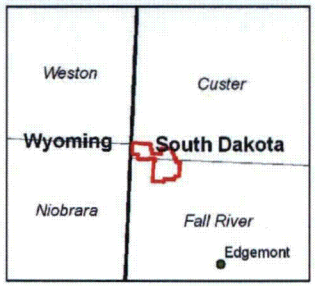


Legend

- Met_Station
- Air Sampling Sites
- Ore Bodies
- 2 km Dewey-Burdock Boundary Buffer
- Dewy-Burdock Boundary
- Streams

N

0 0.5 1 2 Miles



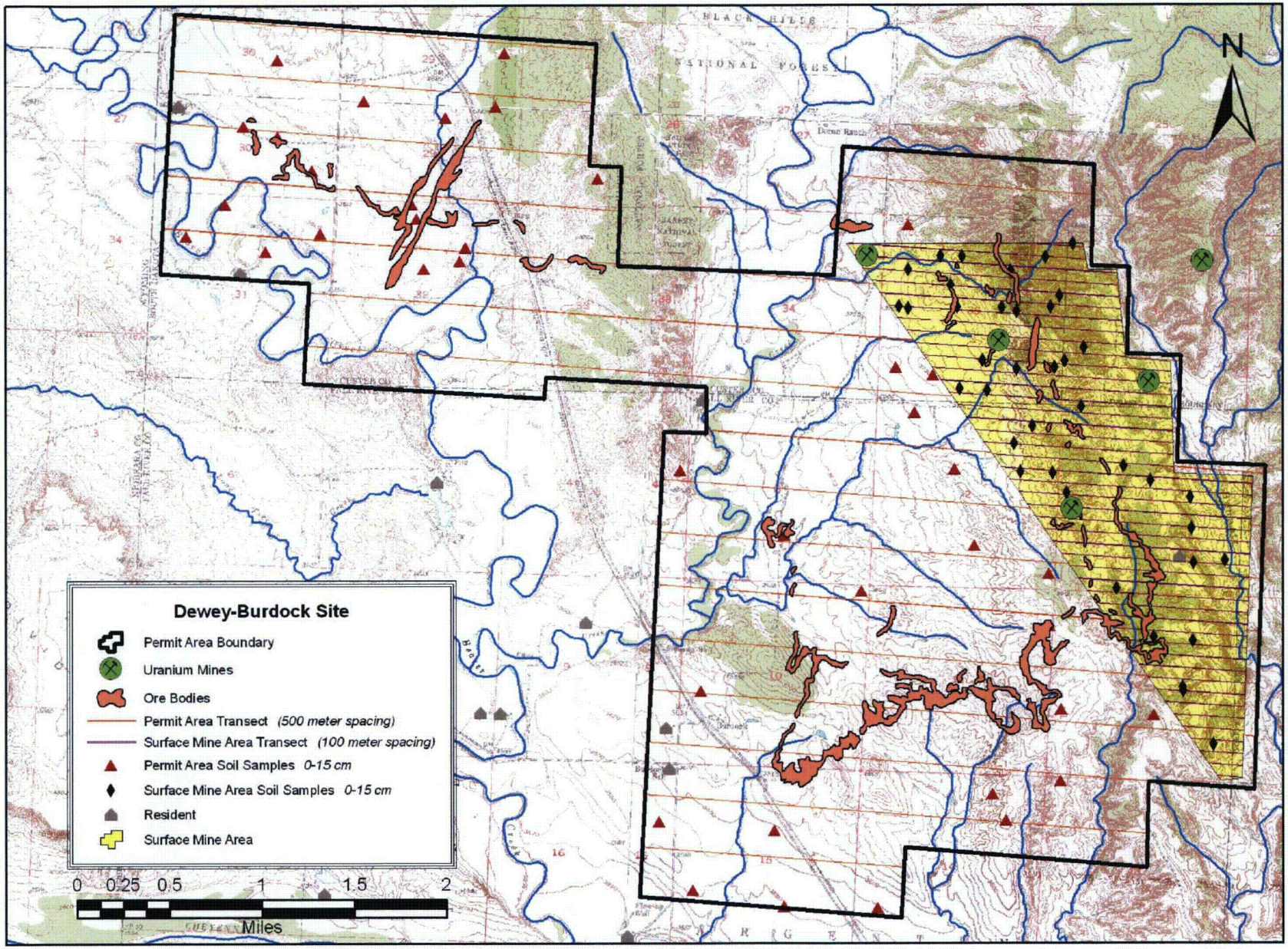


Figure 4.1 Surface Soil Sampling Locations and Gamma Survey Transects

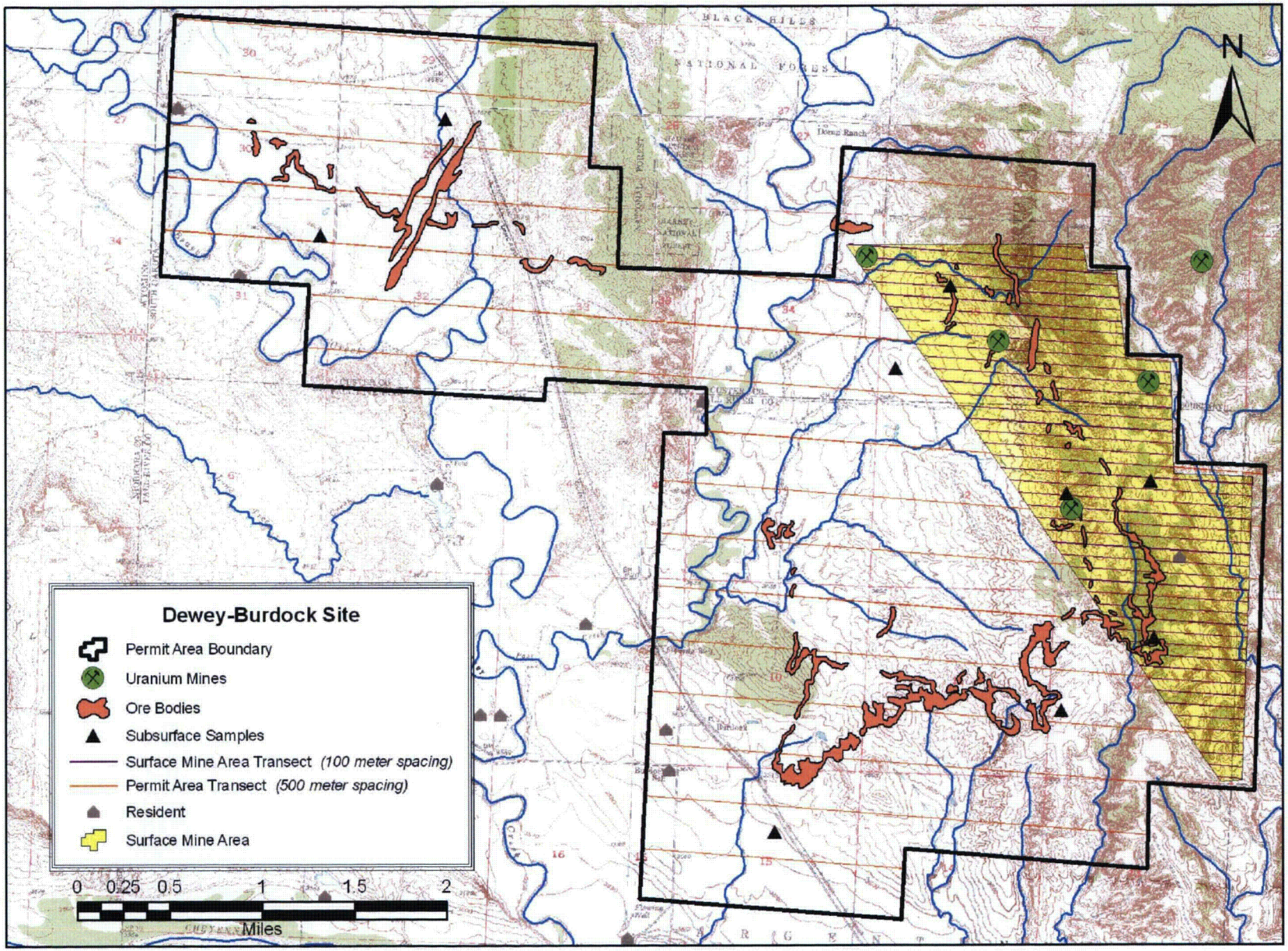


Figure 4.2 Subsurface Soil Sampling Locations and Gamma Survey Transects

Baseline Radiation

- **Radiological measurements and samples**
  - *Air particulate concentrations at 8 hi-vol monitoring station locations*
  - *Mine Area: 40 soil samples at 0-15 cm; GPS gamma survey at 100m intervals; direct gamma measurements at 40 soil sampling locations*
  - *Remaining Area: 40 soil samples at 0-15cm; GPS gamma survey at 500m intervals; direct gamma measurements at 40 soil sampling locations*
  - *Surface soils at 0-5cm at hi-vol stations*
  - *Subsurface soil composites (9 random locations) at 15-30cm & 30-100cm depths*

Baseline Radiation

- **Radiological measurements and samples**
  - *Ambient radon in air concentrations (8 + 8)*
  - *Direct radiation (8 TLD at hi-vol locations + HPIC exposure rate measurements)*
  - *Radon flux (9 measurements x 3 months)*
  - *Surface water and sediment*
  - *Vegetation (3 times), food (once), and fish (4 times – per GFP requirement)*
  - *Laboratory analysis per Reg Guide 4.14*

Additional Radiological Tasks

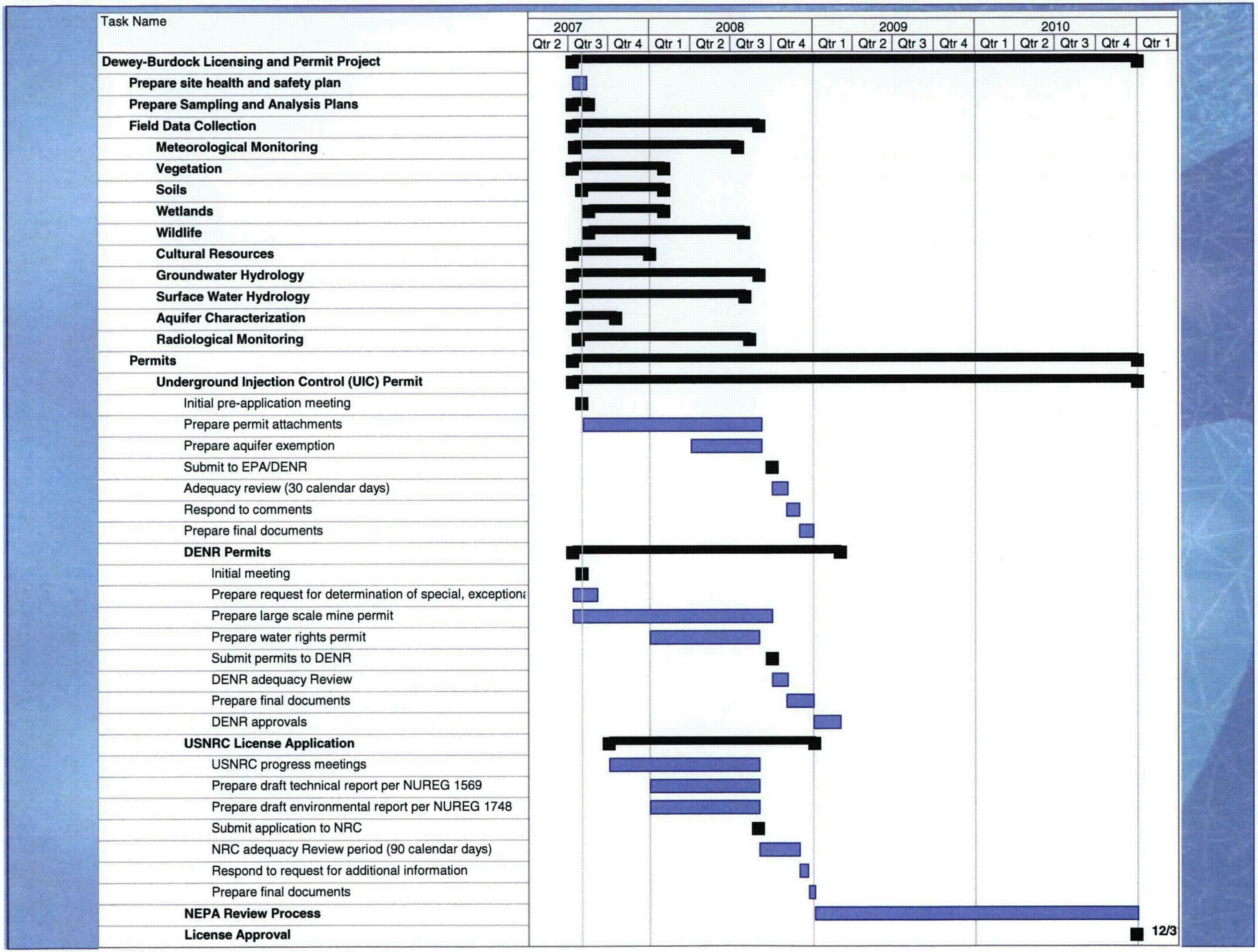
- Develop HPIC/surface soil Ra-226 correlation
- Develop GPS gamma/HPIC correlation
- Convert GPS gamma to Ra-226 and exposure rate for risk assessment
- MILDOS-AREA modeling
  - → *Off-site dose assessment*
- Worker dose assessment
- Radiation protection plan
- Environmental monitoring plan
- Accident scenario/assessment
- Decommissioning plan

Baseline Ecology

- **Vegetation**
  - *Historical data review*
  - *Tree & shrub density cover sampling*
  - *Dominant vegetation community sampling*
  - *Threatened and Endangered Survey*
- **Soils**
  - *Review historical soil mapping*
  - *Conduct soil survey/sampling*
  - *Complete soil mapping*
- **Wetlands**
  - *National wetland inventory review*
  - *Delineate wetland areas*
  - *Prepare mapping*

Baseline Ecology

- **Wildlife Surveys**
  - ***Threatened and Endangered Species***
  - ***Upland game birds***
  - ***Breeding birds***
  - ***Big game species***
  - ***Raptors***
  - ***Fisheries/Invertebrates***
  - ***Small mammal trapping***
  - ***Stream Characterization***


Task Name
2007
2008
2009
2010
Qtr 2
Qtr 3
Qtr 4
Qtr 1
Qtr 2
Qtr 3
Qtr 4
Qtr 1
Qtr 2
Qtr 3
Qtr 4
Qtr 1
Qtr 2
Qtr 3
Qtr 4
Qtr 1
Dewey-Burdock Licensing and Permit Project
Prepare site health and safety plan
Prepare Sampling and Analysis Plans
Field Data Collection
Meteorological Monitoring
Vegetation
Soils
Wetlands
Wildlife
Cultural Resources
Groundwater Hydrology
Surface Water Hydrology
Aquifer Characterization
Radiological Monitoring
Permits
Underground Injection Control (UIC) Permit
Initial pre-application meeting
Prepare permit attachments
Prepare aquifer exemption
Submit to EPA/DENR
Adequacy review (30 calendar days)
Respond to comments
Prepare final documents
DENR Permits
Initial meeting
Prepare request for determination of special, exceptiona
Prepare large scale mine permit
Prepare water rights permit
Submit permits to DENR
DENR adequacy Review
Prepare final documents
DENR approvals
USNRC License Application
USNRC progress meetings
Prepare draft technical report per NUREG 1569
Prepare draft environmental report per NUREG 1748
Submit application to NRC
NRC adequacy Review period (90 calendar days)
Respond to request for additional information
Prepare final documents
NEPA Review Process
License Approval
12/3

Summary

- Hired experienced team to support licensing/permitting efforts with USNRC, USEPA and SD DENR
- Environmental baseline monitoring program is ongoing
- Powertech desires to maintain routine contact with USNRC URB staff
- Submit Source Materials License application in 3rd or 4th quarter 2008