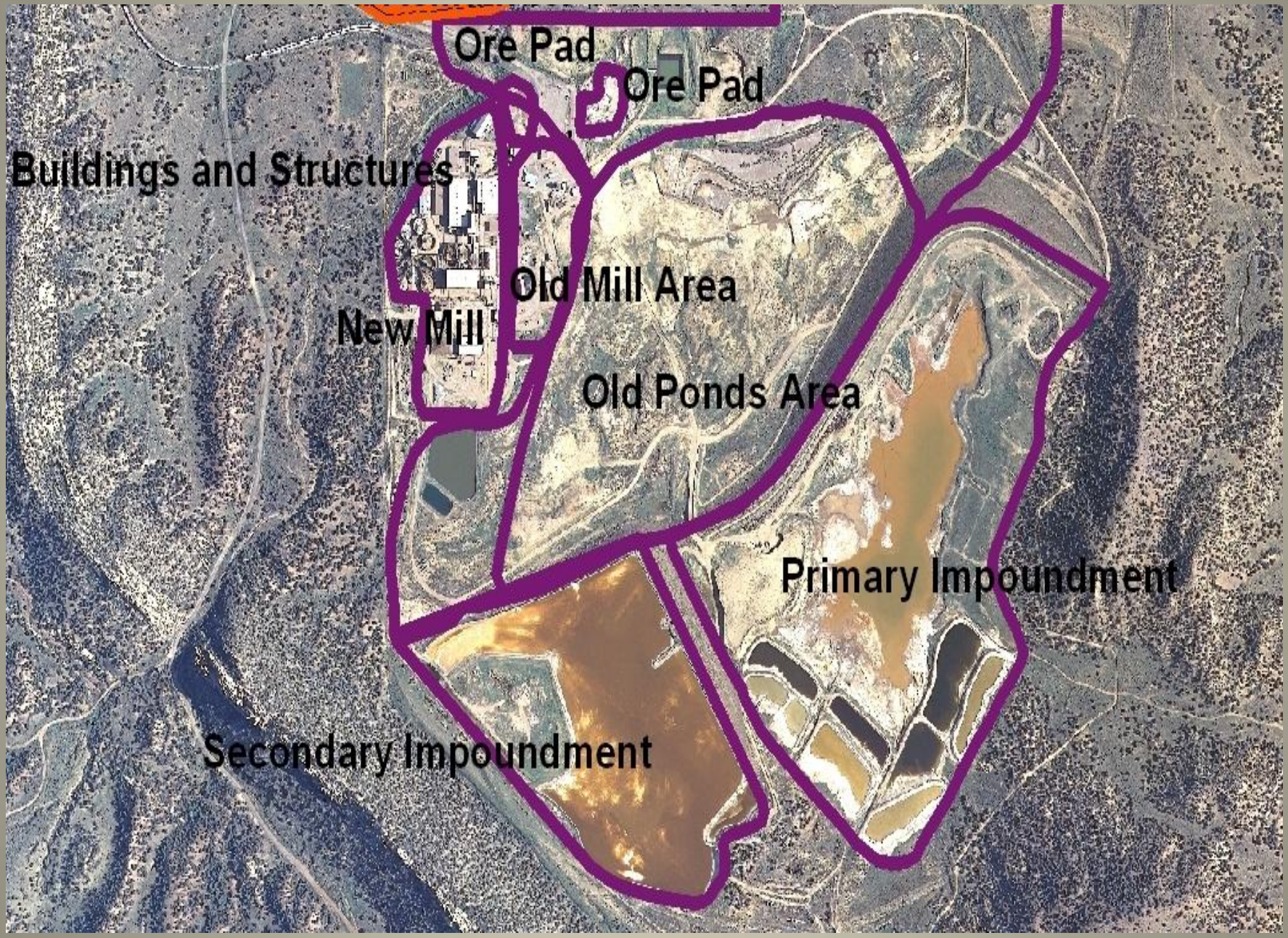
Old Pond Area

Trenching, Water Recovery, and Mass Balance

Colorado Department
of Public Health
and Environment


Ore Pad
Ore Pad
Buildings and Structures
Old Mill Area
New Mill
Old Ponds Area
Primary Impoundment
Secondary Impoundment

Old Pond Area

- During the OPA soil excavation in 2008 contaminated ground water near and at bedrock surface was found.
- Area will be further explored using trenching and drilling to characterize where near surface water is moving and where contamination is sourced.


PMC

Impoundment Leakage Assessment

Canon City

November 2, 2011

Colorado Department of Public Health and Environment

Impoundment Assessment

- During 2003 – 2005 time frame and preliminary to License Renewal, Department had concerns about integrity of impoundment liners.
- Part of decision analysis was to have Cotter conduct an investigation as to whether impoundment has significant leakage.

Cotter Impoundments

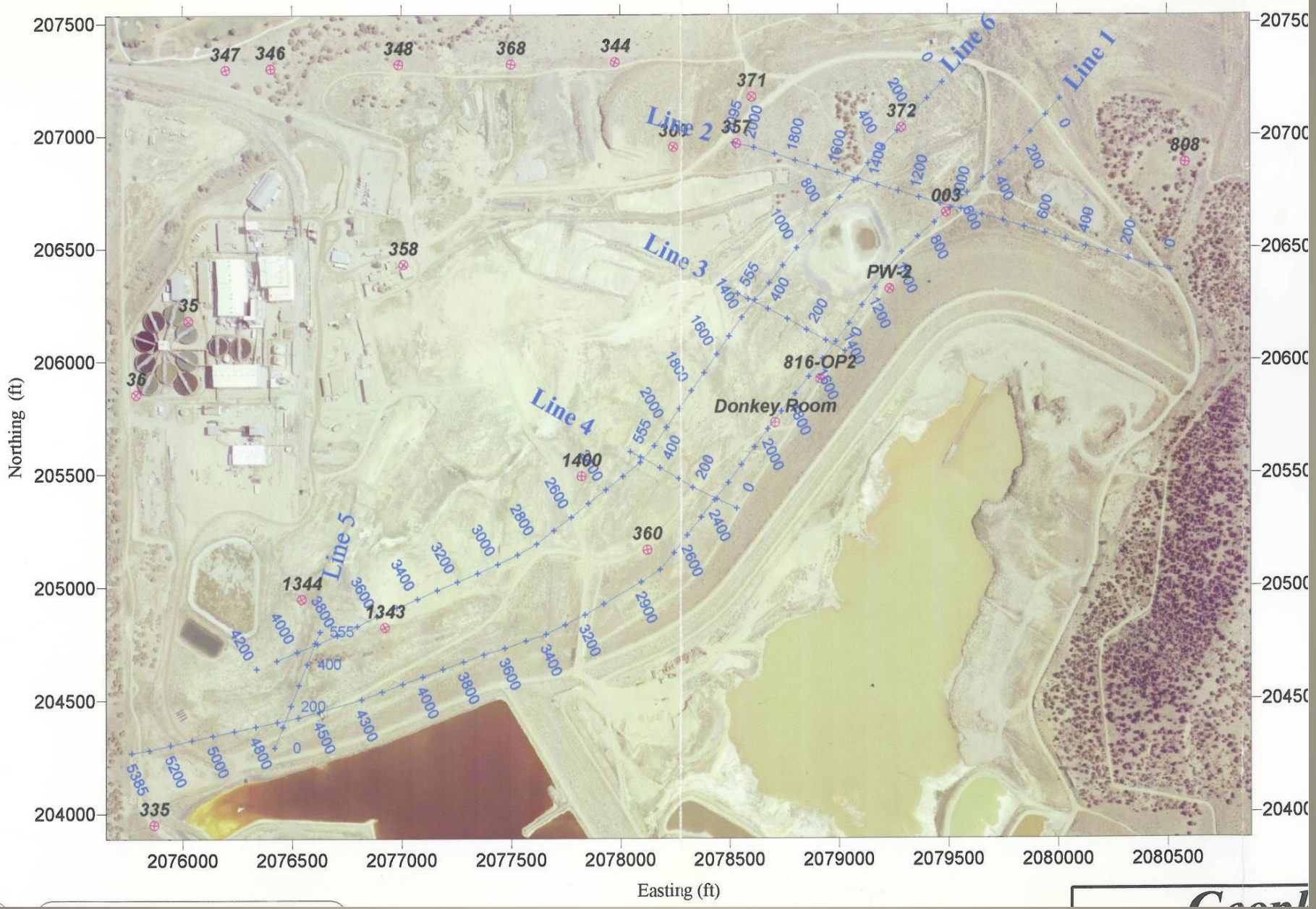
- Engineers have examined records about how impoundment liner was constructed and how construction was documented.
- Department has Cotter do quarterly monitoring of impoundment area and data is reviewed for evidence of leakage.

Resistivity Survey 2005

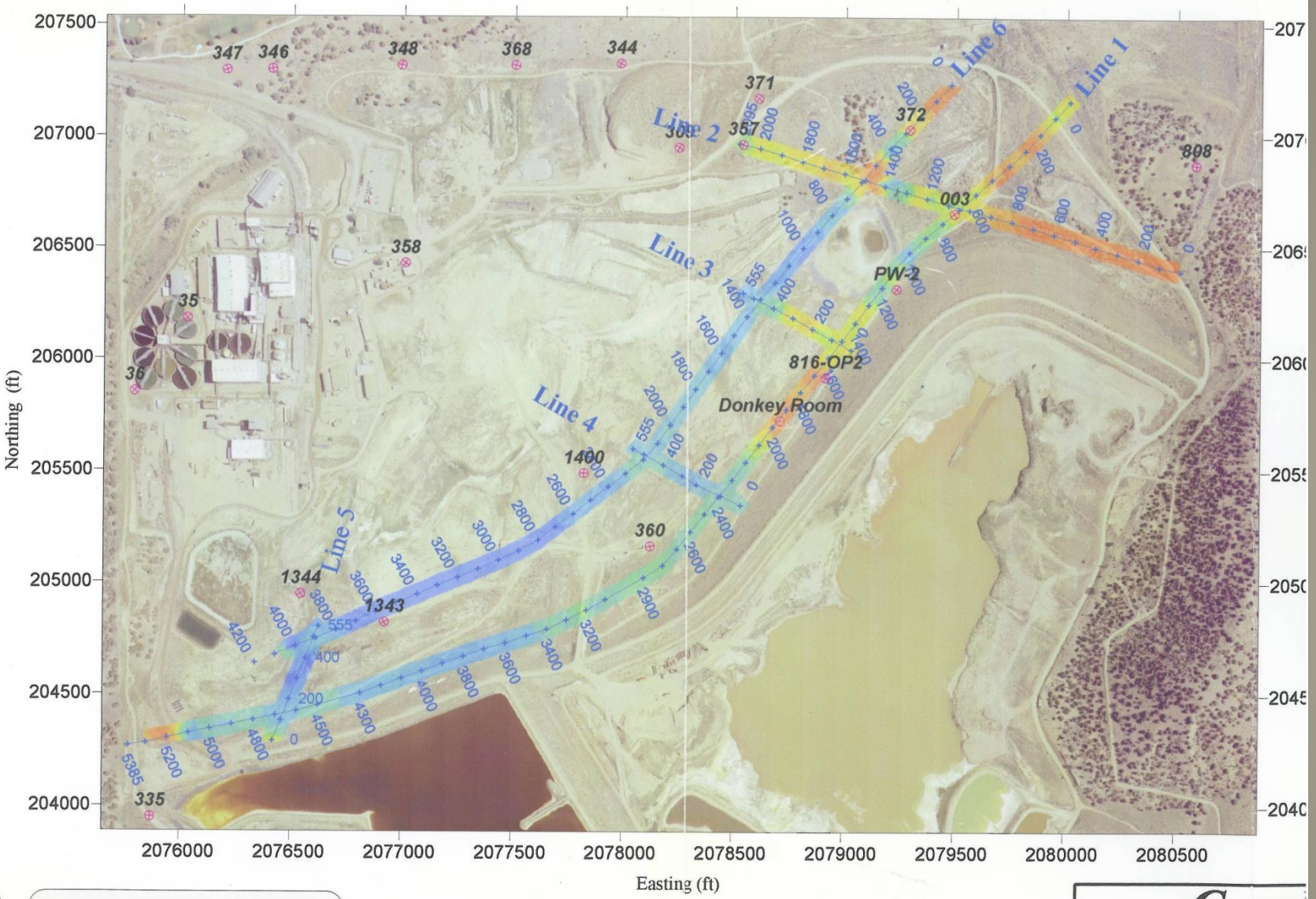
- Pole-Dipole electrical resistivity survey
- Performed by HydroGeophysics Inc
- Method is sensitive to moisture in subsurface.
- Data do not show evidence of releases from impoundments.

HRR Base Map

(underlying aerial image of Cotter Corp. Uranium Facility)



(underlying aerial image of Cotter Corp. Uranium Facility)



E

to

= 600 feet

oordinates:
NAD 27 - Central (ft)
July 8, 2003

IENT

HRR
ed Geosciences
Super Sting R8
Pole-Pole
5 foot
Stainless Steel

LEGEND

Survey Station

Line Location

Well Location

Apparent Resistivity (Ohm-m)

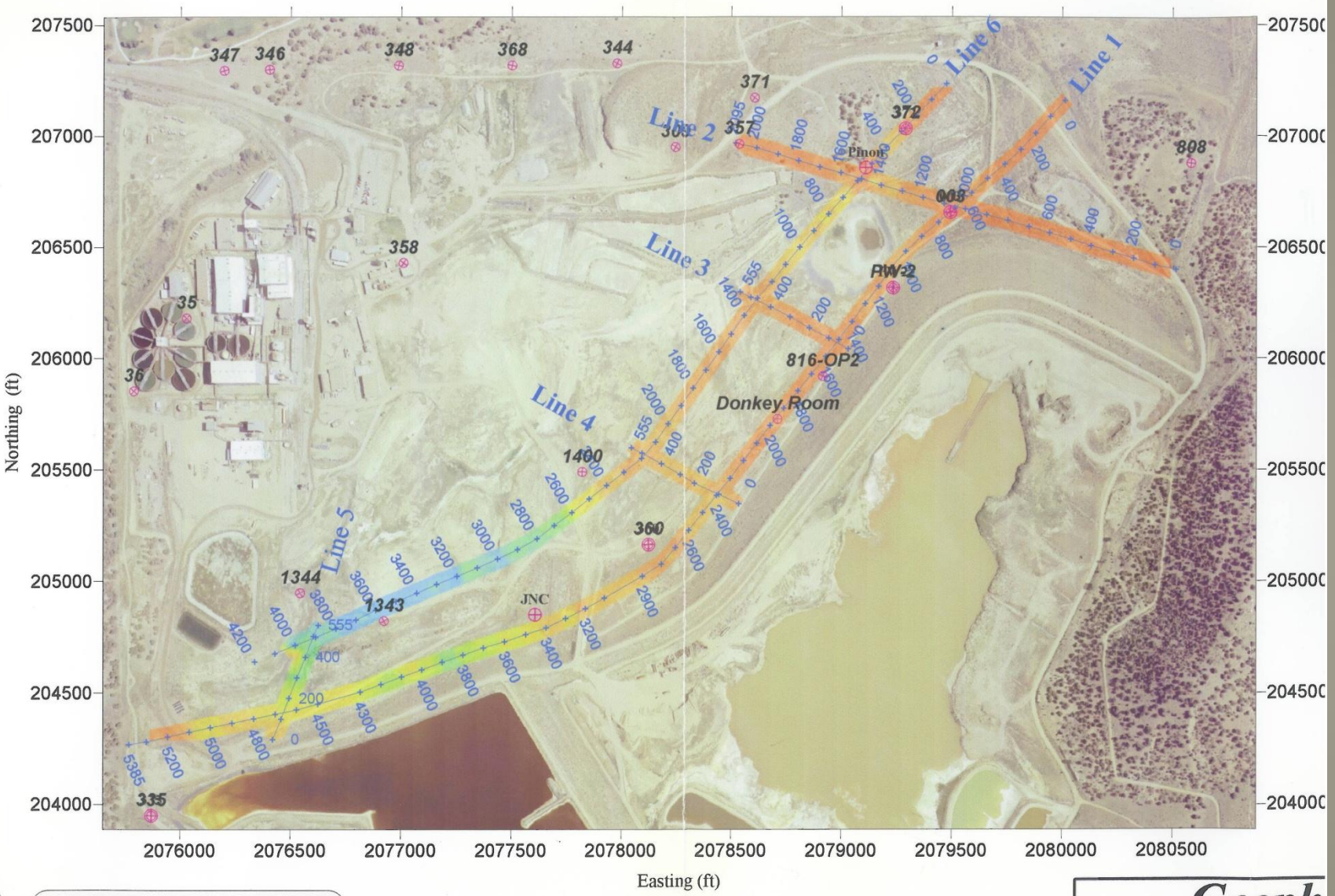
5 10 15 20 25 30 35 40 45 50 55

conductive *resistive*

Geopl

HRR Depth Slice (moderate depth ~ 37 ft)

(underlying aerial image of Cotter Corp. Uranium Facility)



E

0 feet

dinates:
D 27 - Central (ft)
8, 2003

NT

HRR
Geosciences
per Sting R8
Pole-Pole

LEGEND

Survey Station

Line Location

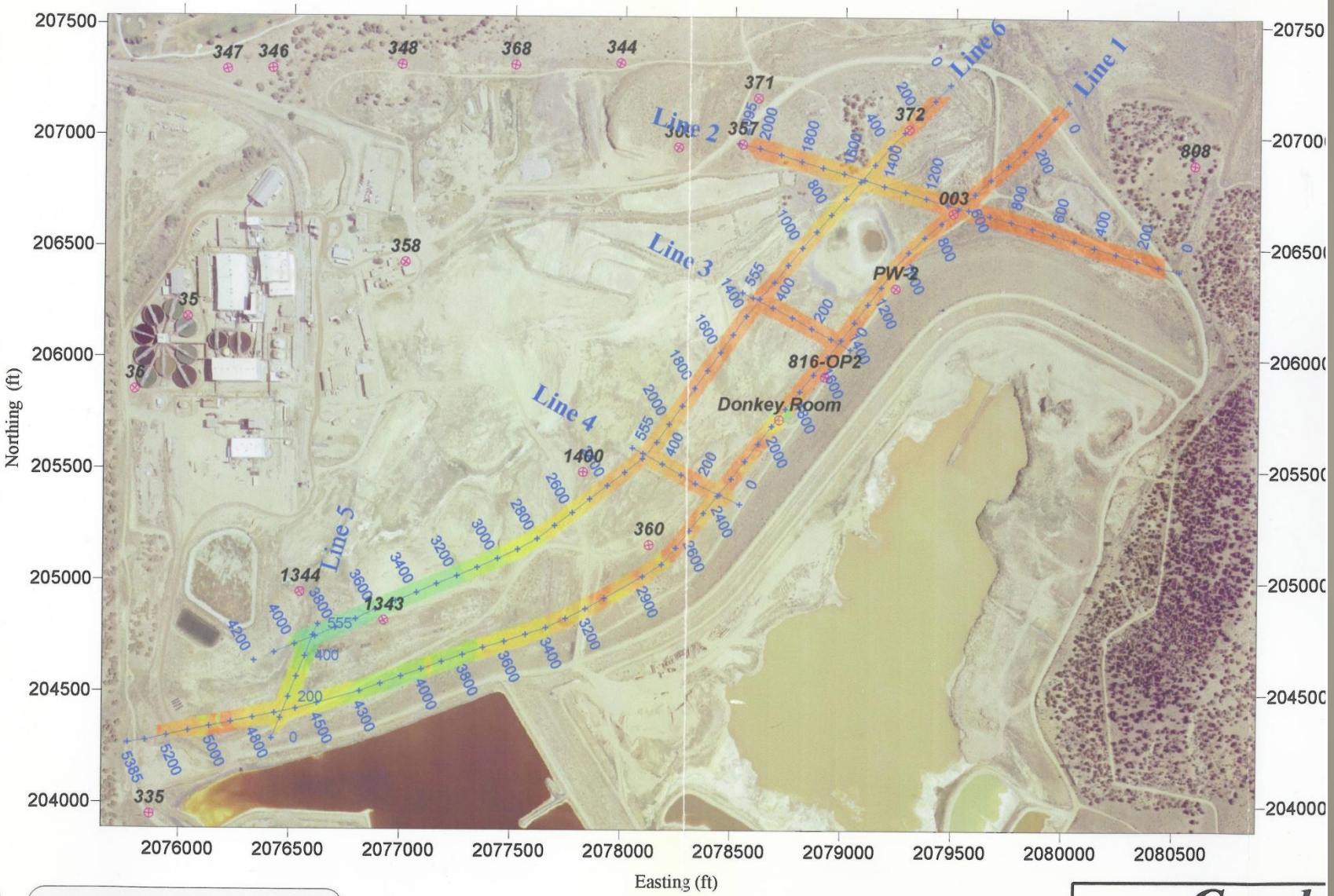
Apparent Resistivity (Ohm-m)

5 10 15 20 25 30 35 40 45 50 55

Geoph

HRR Depth Slice (deeper depth ~50 ft)

(underlying aerial image of Cotter Corp. Uranium Facility)



0 feet

dinates:
D 27 - Central (ft)
8, 2003

NT

HRR
Geosciences
ber Sting R8

LEGEND

Survey Station

Line Location

Apparent Resistivity (Ohm-m)

5 10 15 20 25 30 35 40 45 50 55

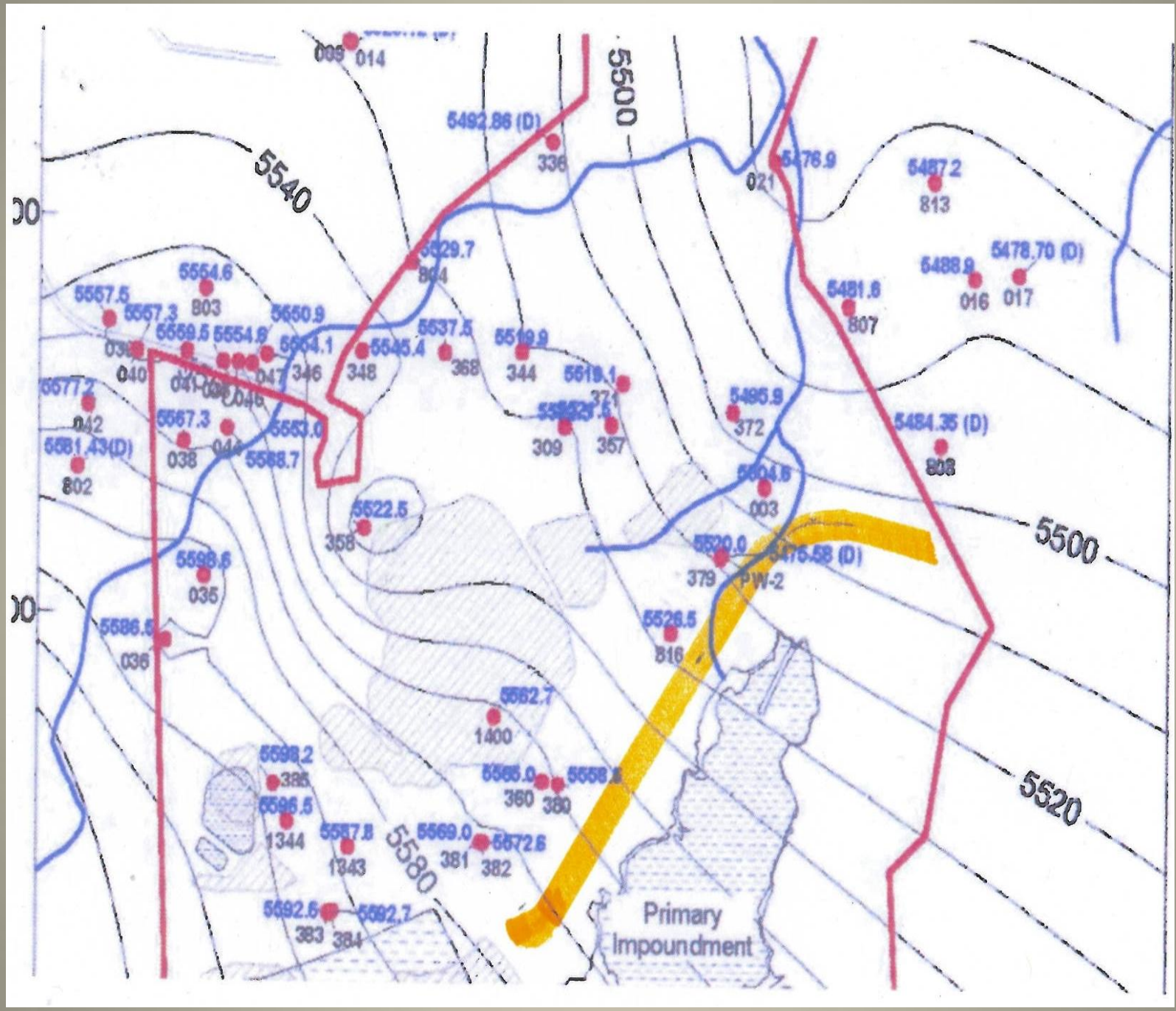
Geoph

Impoundment Evaluation

- If there is release from impoundment it will impact both hydrology and geochemistry of adjacent ground water.
- Evaluation of whether impoundment is breached is based on these two metrics.

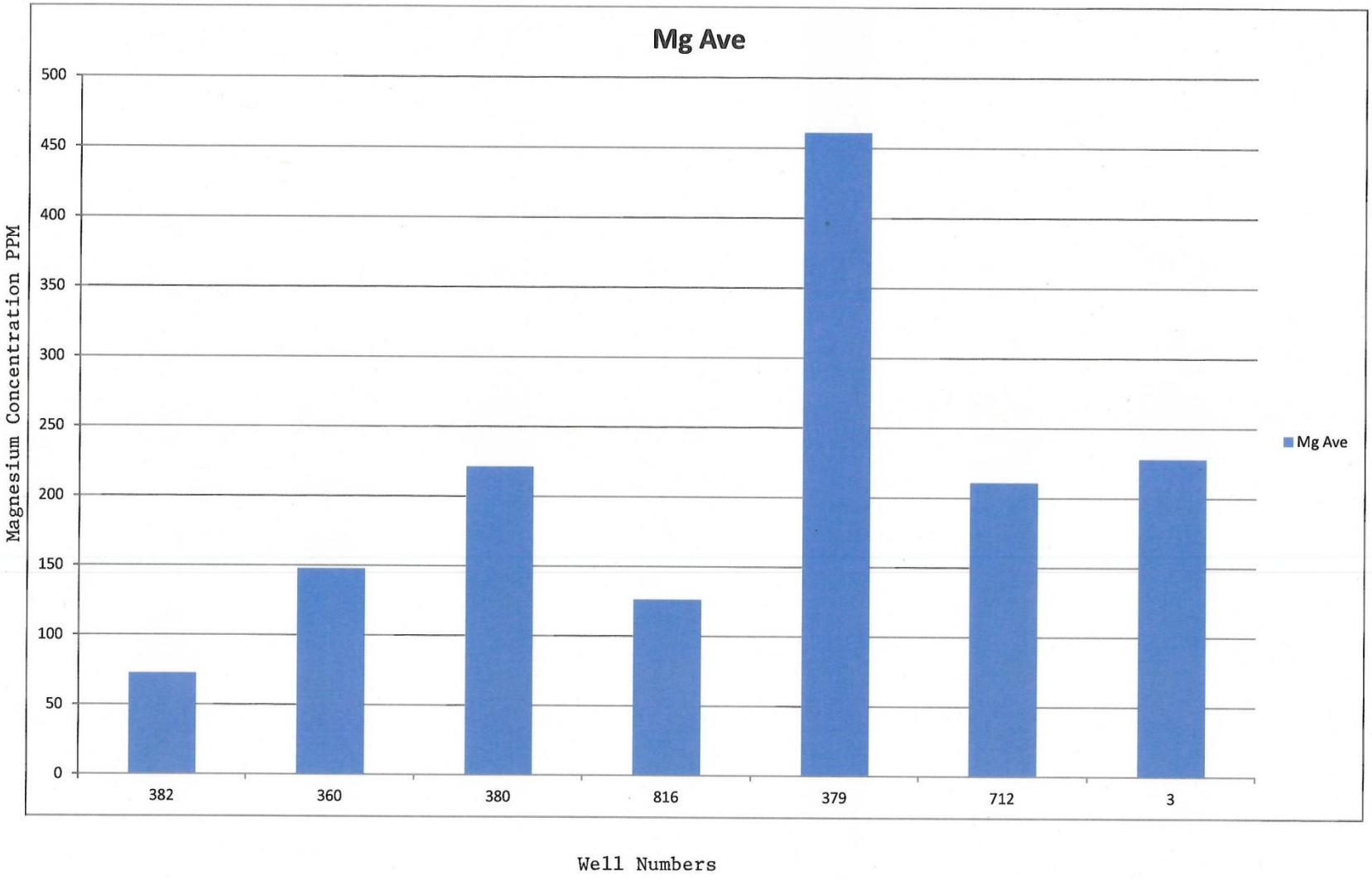
Hydrology

- Ground water surface and direction of flow.
- Well locations


5540
5500
5580
5520
5492.86 (D)
5529.7
5554.6
5557.5
5557.3
5559.5
5554.9
5550.9
5564.1
5545.4
5537.5
5519.9
5519.1
5577.2
5567.3
5553.0
5568.7
5581.43(D)
5522.5
5598.6
5586.6
5562.7
1400
5598.2
5596.5
1344
5587.8
1343
5569.0
5572.6
5565.0
5558.8
5592.6
5592.7
5526.5
5495.9
5484.35 (D)
5604.6
5520.0
5475.58 (D)
PW-2
5476.9
5487.2
813
5488.9
5478.70 (D)
016
017
5481.8
807
808
Primary
Impoundment

Geochemistry

- Total Quality Environmental Management Report (TQEM) issued in 1995 looked at many environmental indicators associated with impoundments.
- A principal characteristic that distinguishes impoundment waters from other site waters is magnesium concentration.
- Average magnesium in primary impoundment during the last year is 60,000PPM.
- Average magnesium in the OPA is about 200 PPM.
- This is the key chemical indicator.


Mg Ave
500
450
400
350
300
250
200
150
100
50
0
Magnesium Concentration PPM
382
360
380
816
379
712
3
Well Numbers
Mg Ave

Findings

- Department used three different lines of evidence to assess impoundments and found no significant leakage or release.
- There is some evidence to support assumption of minor leak at or near well 379.

Leak Evidence

- Because there is a gradient change and a distinct increase in magnesium content above average at well 379, the conservative assumption is that there is a leak. Additional data can change that assumption.
- If it is a leak, it calculates at between 6 and 120 gallons per day. (Dupuit Eqn.)
- Ground water flow in OPA drainage runs approximately 10,000 gallons/day

EPA Superfund Update
Lincoln Park NPL Site

November 2, 2011

Superfund Update – Laws

- State of Colorado Radiation Control Act duties and responsibilities (NRC – Agreement State)
- Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) duties and responsibilities
- Integration of authorities
- Final cleanup must be protective of human health and the environment and comply with all Applicable or Relevant and Appropriate Federal and State Requirements

Superfund Update – Timeline

- Sep. 8, 1983 – Proposed to NPL
- Dec. 9, 1983 – State files complaint against Cotter Corp. for NRD (CERCLA)
- Sep. 21, 1984 – Final listing on NPL
- Apr. 2, 1986 – State and EPA sign Memorandum of Agreement to delineate roles and responsibilities
- Apr. 4,1988 – State and Cotter sign final Consent Decree and Remedial Action Plan

Superfund Update – Integration

- Radiation Control Act activities (State)
- Consent Decree/Remedial Action Plan activities (State & EPA)
- CERCLA Actions (EPA)
  - Record(s) of Decision
  - Deletion from NPL

Superfund Update – 5-Year Review

- Required at least every 5 years by the Superfund law
- A check-up on a site that has been cleaned up at least partly
- To make sure that the cleanup continues to protect human health and the environment
- A chance for you to tell EPA about site conditions and any concerns you may have

Superfund Update – 5-Year Review

- 3 steps
  - Develop plan
  - Collect information including community interviews
  - Announce findings and publish report

Superfund Update

- Questions?
- Contacts:
  - Steve Wharton, Unit Chief, Superfund Remedial Response Program, US EPA Region 8, 303-312-6935
  - Frances Costanzi, Remedial Program Manager, Superfund Remedial Response Program, US EPA Region 8, 303-312-6571

Lincoln Park Public Health Assessment

Agency for Toxic Substances Disease Registry

Steve Tarlton, CDPHE

November 2, 2011

Colorado Department of Public Health and Environment

Conclusions

- ATSDR concludes that drinking water from contaminated private wells could harm people's health. This is a public health hazard.
- The U.S. EPA has withdrawn its classification for carcinogenicity for uranium
- In conclusion, children who drink water containing high concentrations of molybdenum could be at increased risk of adverse health effects such as gout-like symptoms. However, molybdenum is not stored at high levels in the body, so it is unlikely that children will suffer long-term health effects once the exposure is stopped. In healthy people, excess molybdenum is not associated with adverse health outcomes

Conclusions

- ATSDR concludes that accidentally eating or touching soil and sediment in Lincoln Park will not harm people's health.
- ATSDR concludes that there is not enough information to determine if accidentally eating or touching soils on residential properties immediately north and west of Cotter Mill will harm people's health.
- This area is directly downwind of the former New Jersey Zinc/College of the Canyons lead smelter.

Conclusions

- ATSDR concludes that people who eat more homegrown fruits and vegetables than is average could be at risk for harmful health effects. The people at risk irrigate their crops with contaminated private well water and eat 4 times more homegrown fruits and vegetables than the average person.
- Since most people don’t eat that many homegrown fruits and vegetables, their health will not be harmed.
- Therefore, adverse health effects are not expected in infants, children or the above-average consumer.

Conclusions

- ATSDR concludes that ambient air emissions of particle bound radionuclides have not resulted in exposures to the public at levels known to cause adverse health outcomes.
- Radon decay product concentration off-site did not appear to be related to releases from the site. Radon and its decay products appear to be from natural background and do not represent any health threat at the reported concentrations.

Conclusions

- No adverse health effects are expected to occur as a result of exposure to manganese or to molybdenum in surface waters.