Figures

1. Main Office/Warehouse

ADMINISTRATION COMPOUND
(Previous Trucking Yard)

2. Previous Soil Preparation Bldg. (currently used for storage)

3. Previous Ore truck Washing Bldg. (currently used for storage)

Evaporation Pond #3

185 Acres

900 Acres

County Road 63

Highway 605

Rock Quarry (Closed)

Stockpiled Rock Cover

Large Tailings Pile

Water Towers

Old Mill Area

RO Building

Evaporation Pond #2

Evaporation Pond #1

Collection Ponds

100 Acre Center Pivot Irrigation Area

Pleasant Valley

Small Tailings Pile

Met Station

Murray Acres

Valle Verde

Broadview Acres

120 Acre Flood Irrigation Area

24 Acre Flood Irrigation Area

Felice Acres

150 Acre Center Pivot Irrigation Area

LEGEND:

Project Boundary

Aerial Source:
Bing Maps Hybrid (photo updated in November 2010; serviced by ESRI ArcGIS Online), overlaid with 2011 High Resolution Aerials from HMC.

N

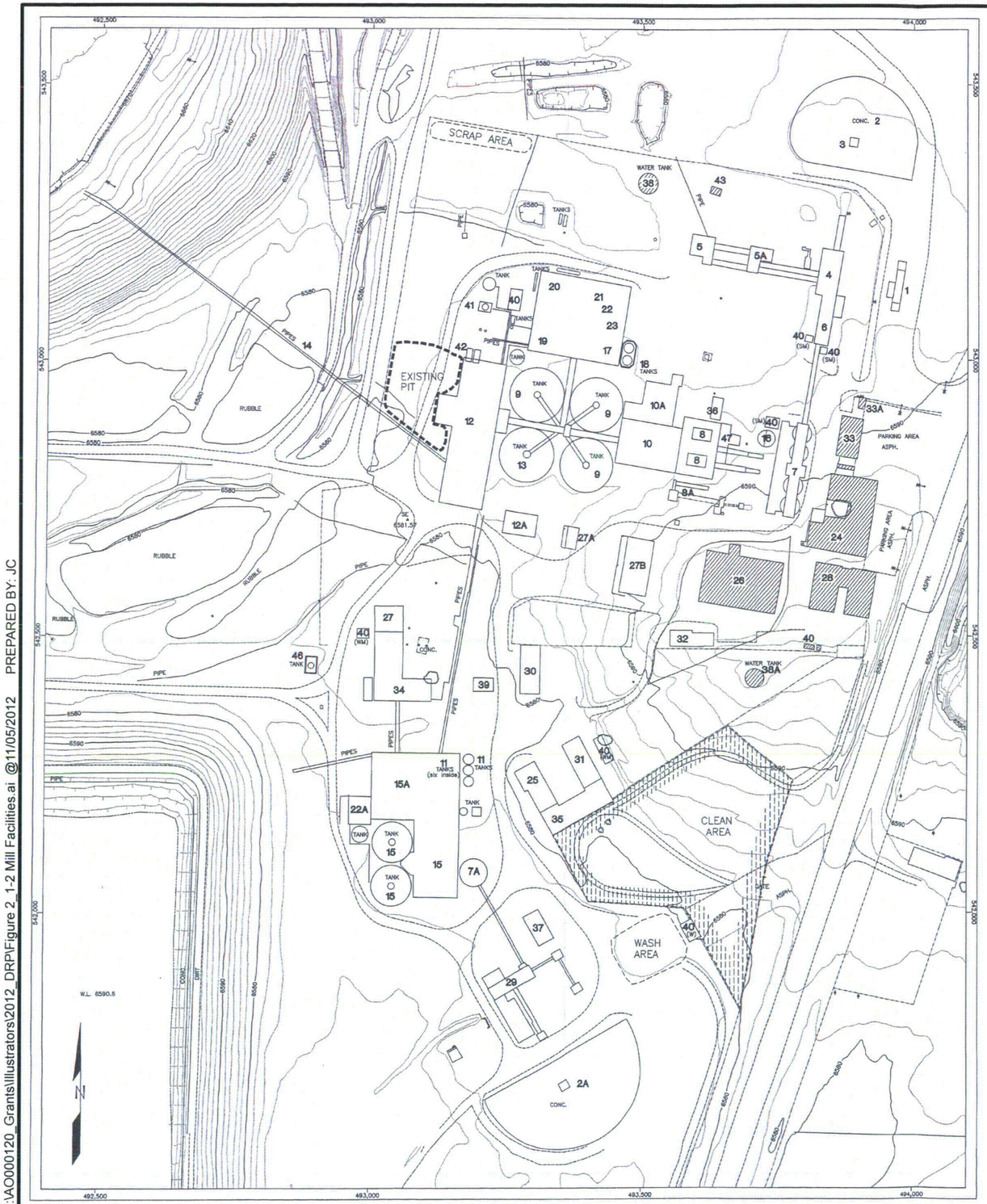
0 875 1,750 Feet

GRANTS RECLAMATION PROJECT

Updated Decommissioning and Reclamation Plan (DRP)

FIGURE 2.1-1
CURRENT FACILITIES LOCATED AT THE HMC GRANTS RECLAMATION PROJECT SITE

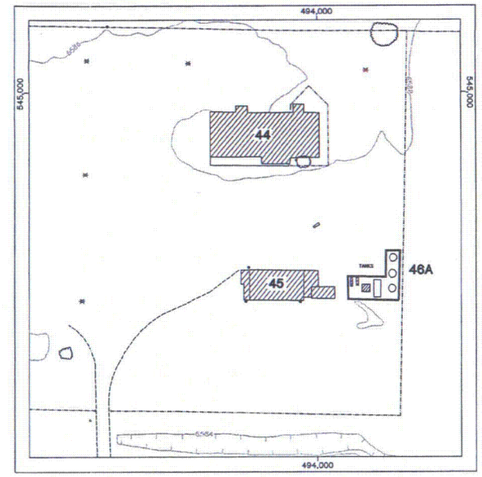
CITY: Boulder, CO DRAFTER: J. CHEN
Path: C:\Users\jchen\Documents_PROJECTS\KA0000120-Grants\GIS\ArcMaps\2012 DRP\Figure 2_1-1_Current Facilities at the Project Site.mxd



MILL AREA

MILL FACILITIES

- ORE RECEIVING SECTION
  1. ORE RECEIVING SCALE (WM)
  2. ORE STORAGE PAD (C)
  2A. ORE STORAGE PAD (C)
- CRUSHING AND SAMPLING SECTION
  3. GRIZZLY (S)
  4. CRUSHER (SM)
  5. ROTARY DRYER (SM)
  5A. BELT TRANSFER BUILDING (SM)
  6. RECIPROCATING SAMPLERS (SM)
- FINE ORE STORAGE SECTION
  7. FINE ORE BINS (RC)
  7A. FINE ORE BIN (CS)
- GRINDING SECTION
  8. BALL MILLS (SM)
  8A. ROASTER (S)
  9. THICKENER TANKS (WS)
- URANIUM LEACHING SECTION
  10. PRESSURE LEACHING AUTOCLAVES (SM)
  10A. MIXING TANKS (SM)
  11. ATMOSPHERIC LEACHING PACHUCA TANKS
  12. FILTERS (SFM)
  12A. VACUUM PUMPS (SM)
  13. SOLUTION STORAGE TANK (WS)
  14. TAILINGS SLURRY PIPELINE (S)
  15. TAILINGS POND ION EXCHANGE (SM, CWS)
  15A. ION EXCHANGE PRECIPITATION UNIT (SM)
- PRECIPITATION SECTION
  16. PREGNANT SOLUTION TANK (CWS)
  17. PRECIPITATION TANKS (CS)
  18. PRECIPITATION TANKS (CS)
  19. PRECIPITATE THICKENER TANKS (S)
- VANADIUM REMOVAL SECTION
  20. ROASTING FURNACE (S)
- PACKING–STORAGE AND SHIPPING SECTION (SM)
  21. YELLOWCAKE DRYING FURNACE (S)
  22. YELLOWCAKE PACKAGING (SM)
  22A. YELLOWCAKE PACKAGING (SM)
  23. YELLOWCAKE DRUM STORAGE AND LOADOUT
- MISCELLANEOUS STRUCTURES
  24. ADMINISTRATIVE BUILDING (CB)
  25. GARAGE (PCW)
  26. SHOP (SM)
  27. WAREHOUSE (SM)
  27A. OIL STORAGE (SM)
  27B. MAIN WAREHOUSE (SM)
  28. LABORATORY (CB)
  29. SAMPLING PLANT (SM)
  30. ELECTRIC SHOP (PCW)
  31. INSTRUMENT SHOP (PCW)
  32. CARPENTER SHOP (WM)
  33. CHANGE HOUSE (CB)
  33A. GUARD SHACK (SM)
  34. POWER HOUSE (SM)
  35. ENVIRONMENTAL LAB. (PCW)
  36. COMPRESSOR HOUSE (SM)
  37. ELECTRICAL STORAGE (PCW)
  38. WATER TANK (S)
  38A. WATER TANK (S)
  39. TRAINING BUILDING (WM)
  40. STORAGE UNIT (SEE INDIVIDUAL UNITS ON PLAN)
  41. COOLING TOWER (CS)
  42. BOILERS (S)
  43. WELL
  44. TRUCK SHOP (SM)
  45. TRUCK STORAGE (SM)
  46. FUEL TANK (S)
  46A. FUEL TANKS (S)
  47. ELECTRIC VAULT (RC)



TRUCK SHOP AREA

LEGEND

	STRUCTURES TO BE LEFT IN PLACE
	FENCE
	CLEAN AREA FOR PRE–RELEASE STORAGE OF SALVAGE
(SM)	STEEL FRAME, METAL SIDING/ROOF
(WM)	WOOD FRAME, METAL SIDING/ROOF
(C)	CONCRETE
(RC)	REINFORCED CONCRETE
(CWS)	CONCRETE PEDESTAL, WOOD BEAMS, STEEL TANK
(WS)	WOOD PILINGS AND BEAMS, STEEL TANK
(CS)	CONCRETE PEDESTAL, STEEL TANK
(S)	ALL STEEL
(SFM)	STEEL FRAME, FIBERGLASS AND METAL SIDING
(PCW)	PRE–CAST CONCRETE WALLS, WOOD FRAME ROOF
(W)	WOOD STRUCTURE
(CB)	CEMENT BLOCK WALLS, WOOD FRAME ROOF

0 150 300 Feet

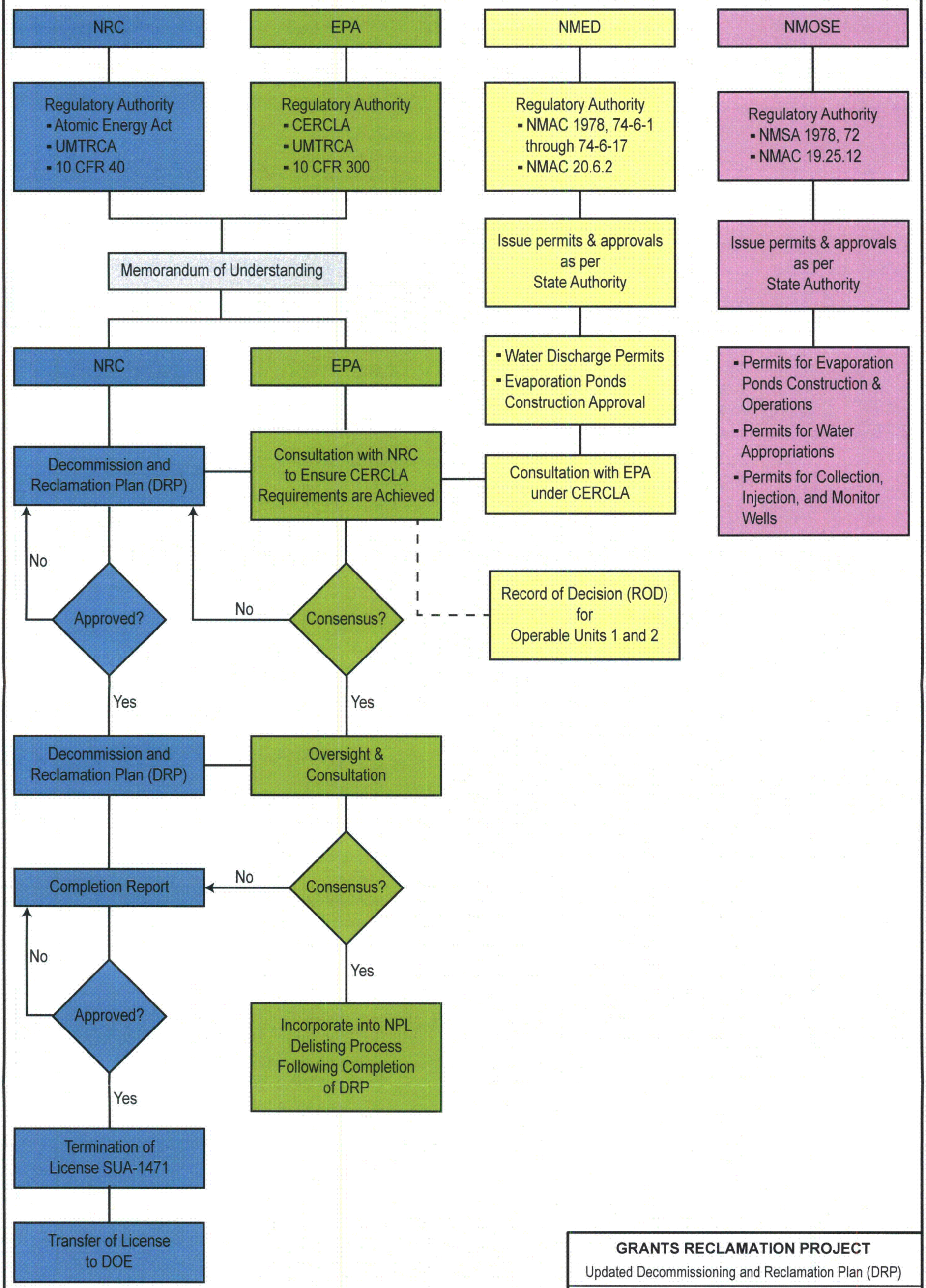
GRANTS RECLAMATION PROJECT

Updated Decommissioning and Reclamation Plan (DRP)

FIGURE 2.1-2
HMC MILL FACILITIES DURING URANIUM PRODUCTION OPERATIONS

K:\AO000120_Grants\Illustrators\2012_DRP\Figure 2_1-2 Mill Facilities.ai @11/05/2012 PREPARED BY: JC

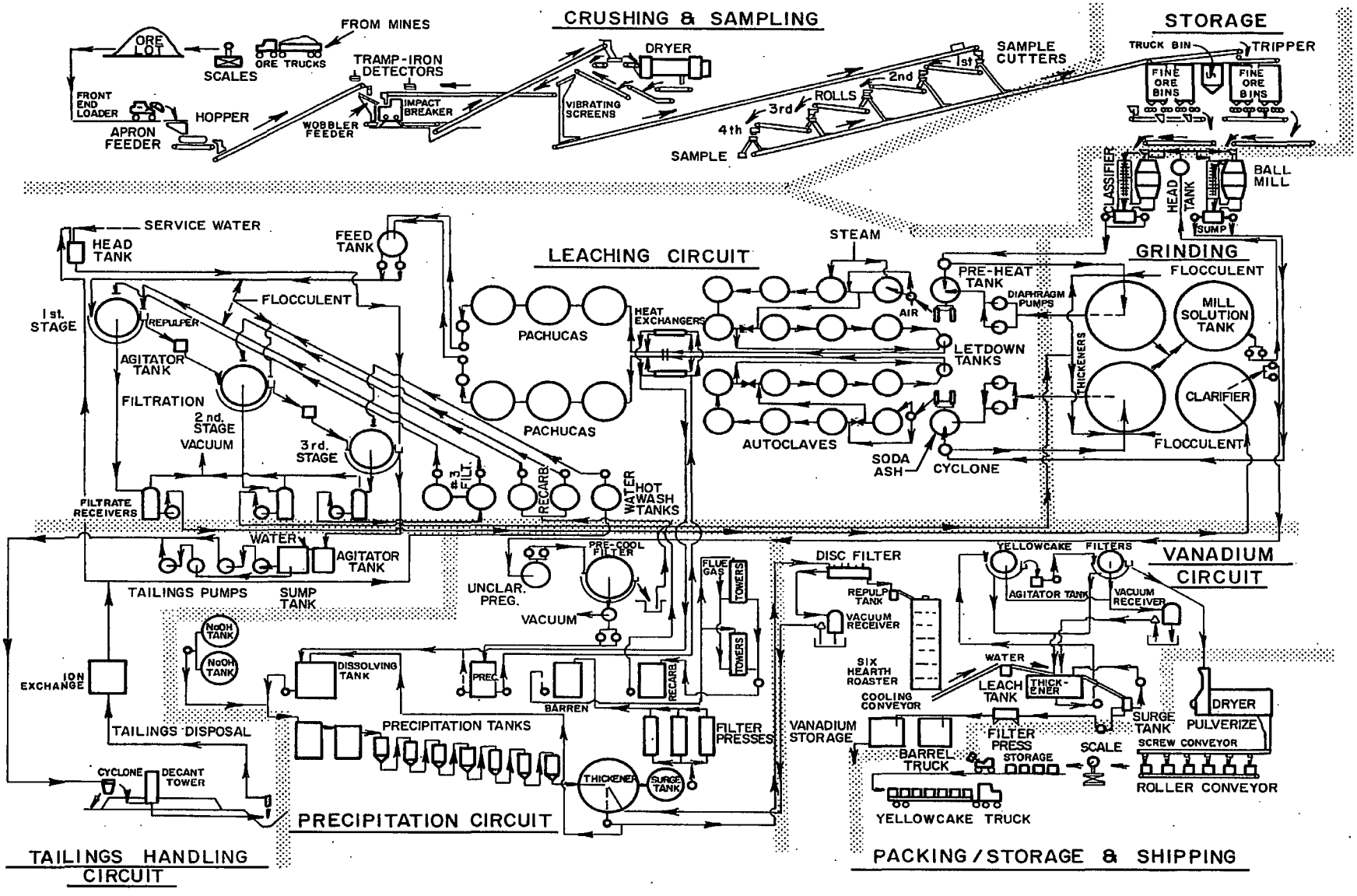
K:\AO000120_Grants\Illustrators\2012 DRP\Figure 2.1-3 Interactions of nrc epa nmed nmose.ai @ 10/23/2012 PREPARED BY: JC



GRANTS RECLAMATION PROJECT

Updated Decommissioning and Reclamation Plan (DRP)

FIGURE 2.1-3
INTERACTIONS OF
THE NRC, NMED, AND NMOSE
IN THE COMPLETION OF THE DRP



PREPARED BY: JC

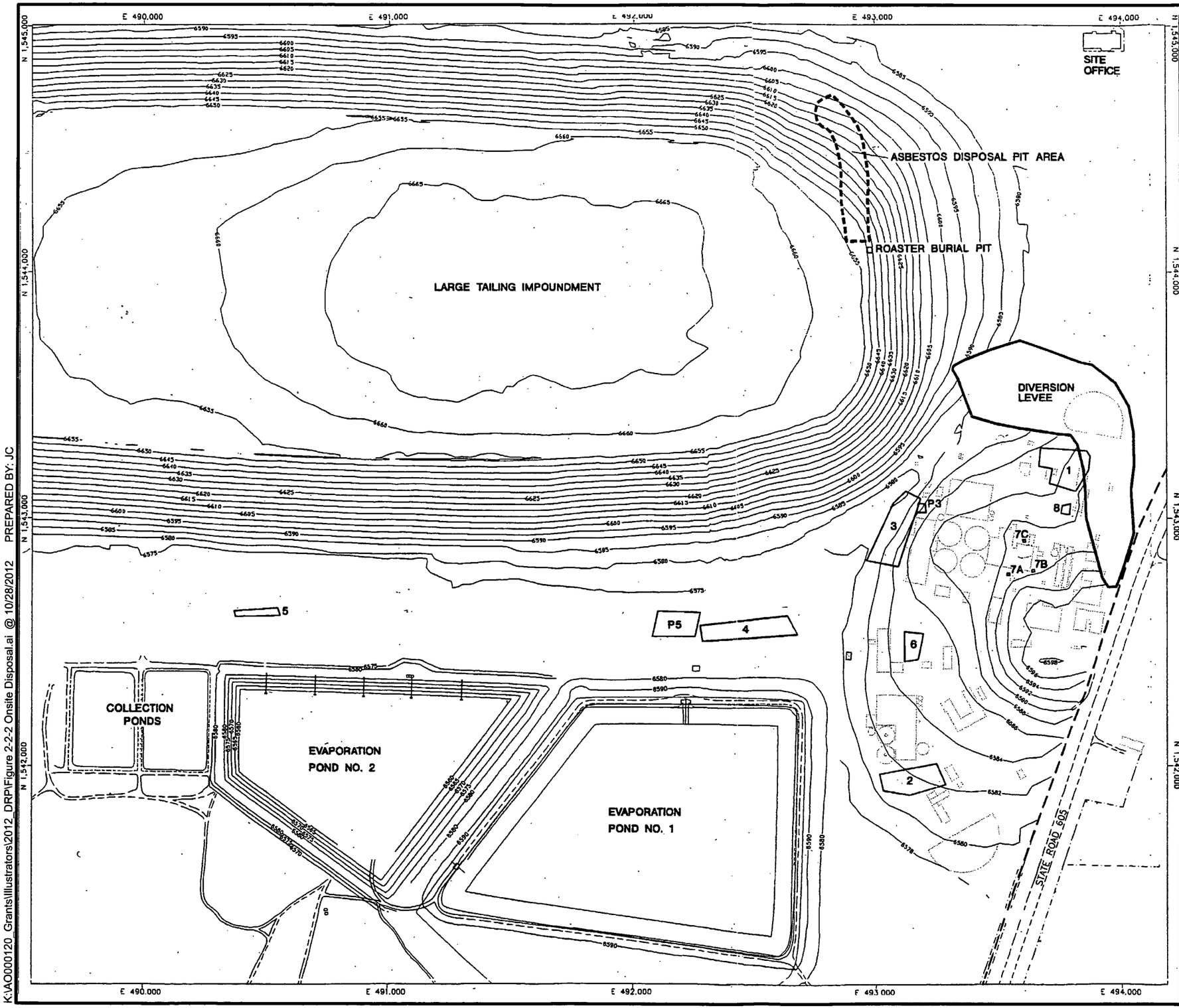
K:\AO000120-Grants\Illustrator\2012 DRP\Figure 2_2-1 Ore Processing.ai @ 10/28/2012

Source: HMC 1982b

GRANTS RECLAMATION PROJECT

Updated Decommissioning and Reclamation Plan (DRP)

FIGURE 2.2-1
HMC URANIUM ORE
PROCESSING MILL FLOW DIAGRAM



LEGEND

6590 — ELEVATION IN FEET ABOVE MSL

— — — — BOUNDARY OF LICENSED AREA

8 DEBRIS DISPOSAL PIT

MILL AREA CONTOURS FROM LAND SURVEY OF 12/95

Source: HMC 1996

N

0 300 600

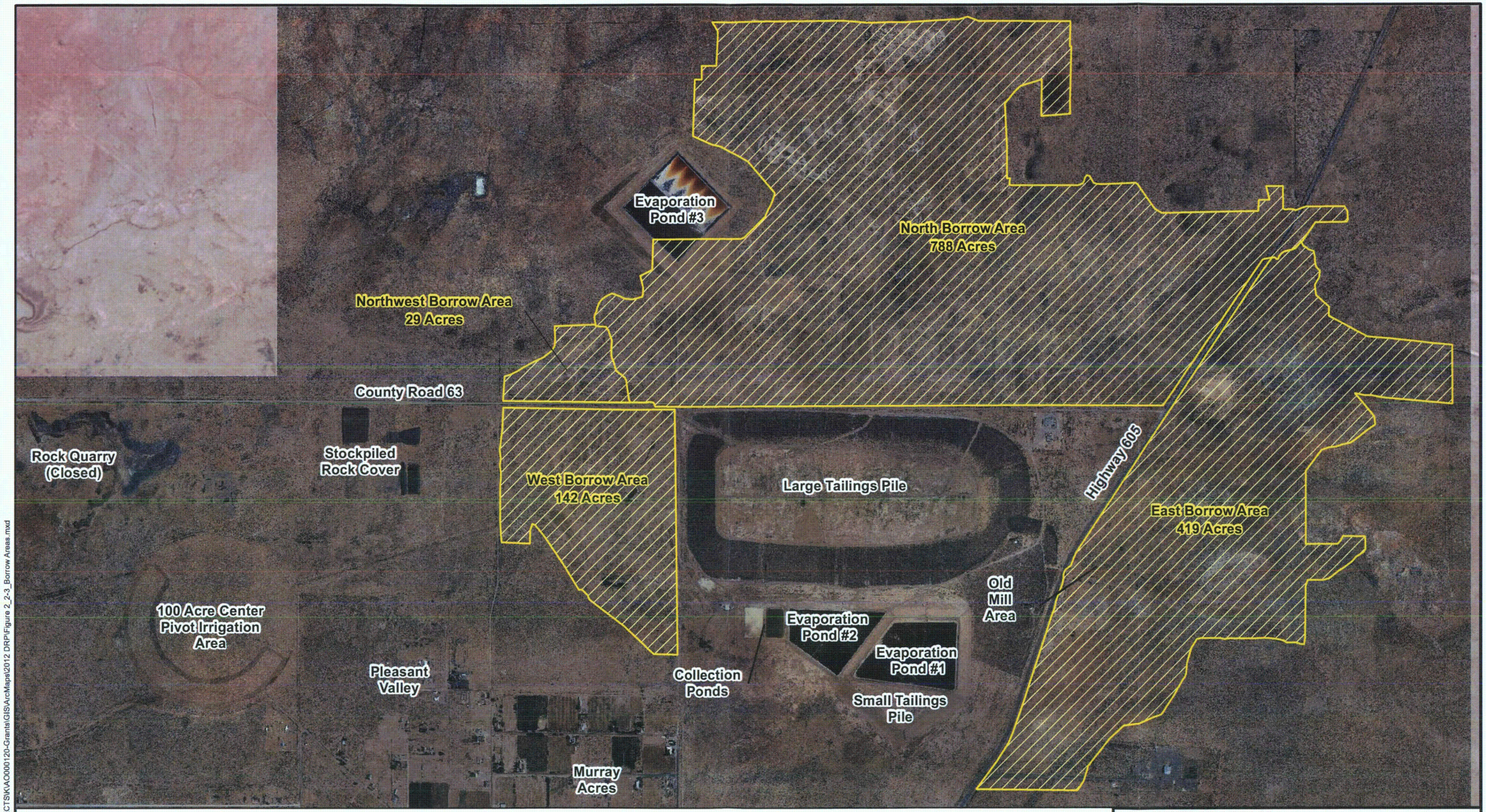
Feet

GRANTS RECLAMATION PROJECT

Updated Decommissioning and Reclamation Plan (DRP)

FIGURE 2.2-2
HMC MILL DECOMMISIONING
ONSITE DISPOSAL SITES

K:\AO000120_Grants\Illustrators\2012_DRP\Figure 2-2-2 Onsite Disposal.ai @ 10/28/2012 PREPARED BY: JC



LEGEND:

Borrow Areas

Aerial Source:
Bing Maps Hybrid (photo updated in November 2010; serviced by ESRI ArcGIS Online), overlaid with 2011 High Resolution Aerials from HMC.

N

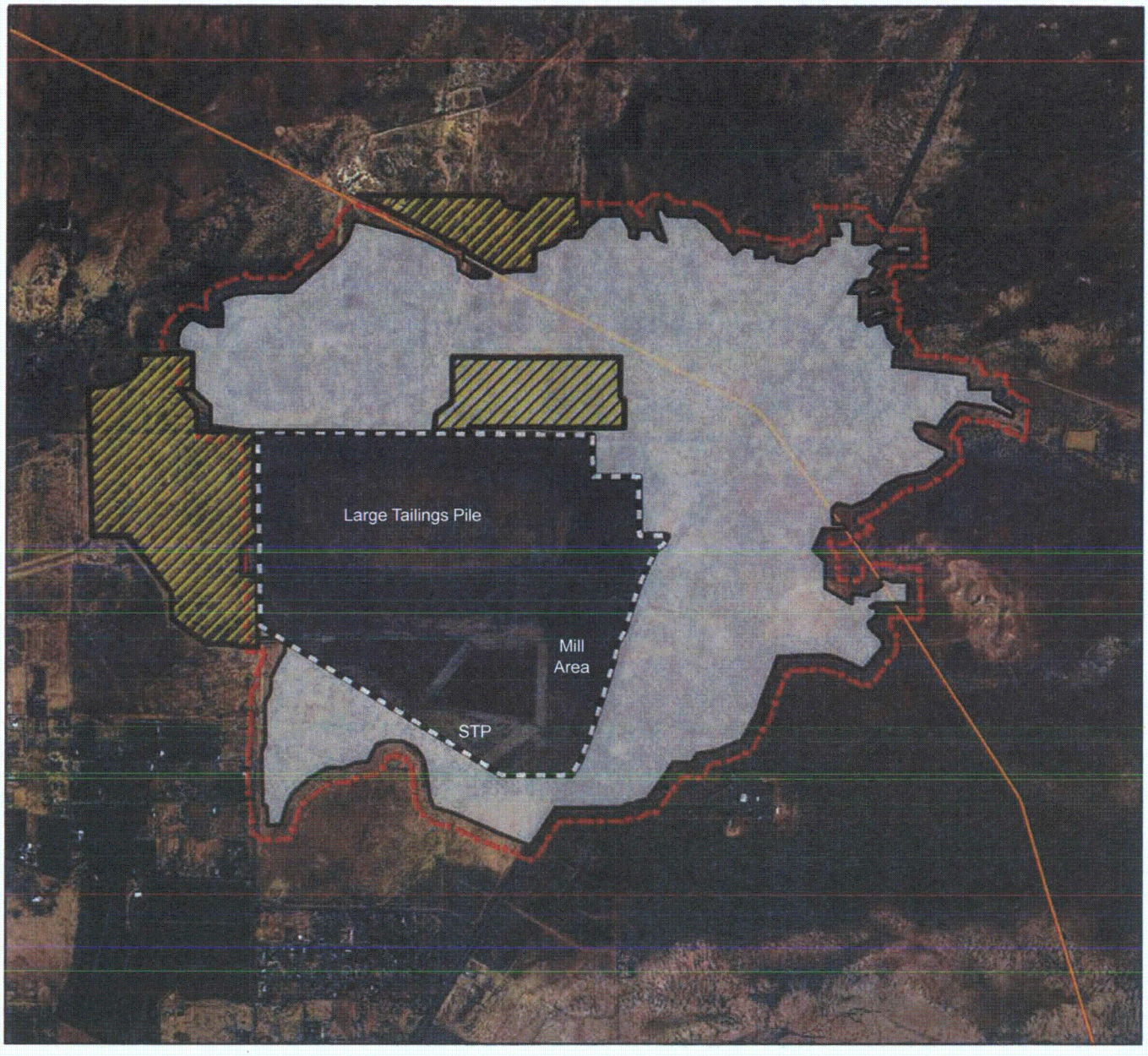
0 650 1,300 Feet

GRANTS RECLAMATION PROJECT

Updated Decommissioning and Reclamation Plan (DRP)

FIGURE 2.2-3
PRIMARY BORROW AREAS AT GRANTS SITE

CITY: Boulder, CO DRAFTER: J. CHEN
Path: C:\Users\jchen\Documents_PROJECTS\KAO000120-Grants\GIS\ArcMaps\2012 DRP\Figure 2_2-3_Borrow Areas.mxd



Soil Excavation and Cleanup Verification Zones

- Inner Zone Area
- Outer Zone Area
- Borrow Area Activities
- Scraped Area Boundary Offset
- Transwestern Pipeline

STP = Small Tailings Pile

The Inner and Outer Zones Used for Soil Verification

N

0 2,500 5,000 Feet

Prepared by:
Anderson Engineering Co. , Inc.
10/20/1995 FIG 3-2.DWG

Source: ERG 1995

GRANTS RECLAMATION PROJECT
Updated Decommissioning and Reclamation Plan (DRP)

FIGURE 2.2-4
HMC PROJECT AREAS OF SOIL EXCAVATION AND CLEANUP VERIFICATION ZONES

BOULDER/[redacted]O000120-Grants\GIS\ArcMaps\2012 DRP\Figure 9_2-1_South Triangle Area.mxd - 12/16/2012 11:52:32 AM [redacted]BY: jchen

LEGEND:

- Small Tailings Pile
- South Triangle Area

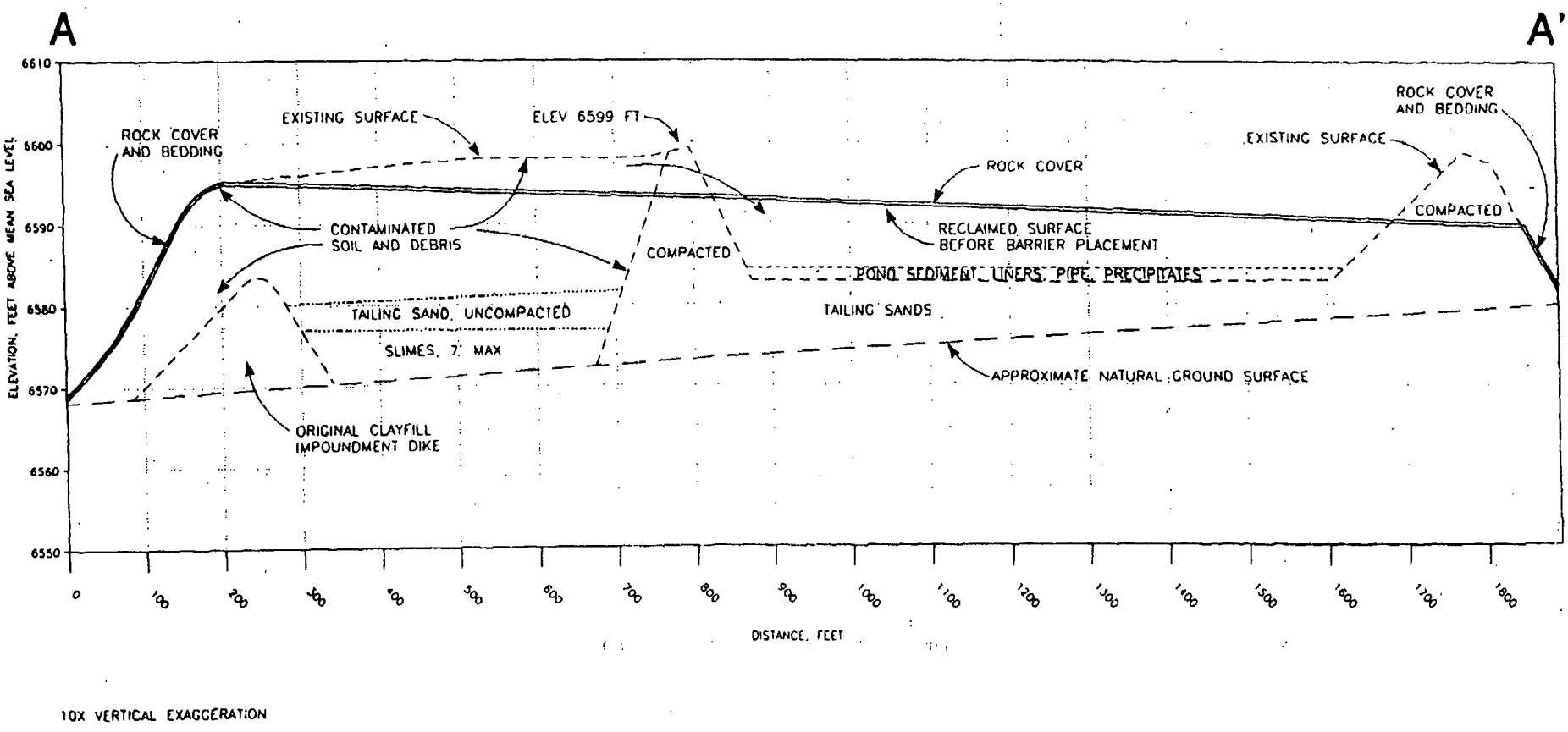
Aerial Source:
2011 High Resolution Aerials from HMC.

N

0 300 600 Feet

GRANTS RECLAMATION PROJECT
Updated Decommissioning and Reclamation Plan (DRP)

FIGURE 2.2-5
PONDS SOUTH OF LARGE TAILINGS PILE



10X VERTICAL EXAGGERATION

Source: Figure 3-2 in FINAL RADON BARRIER DESIGN FOR THE SMALL TAILINGS PILE, Environmental Restoration Group, Inc. and AK GeoConsult Inc 1996.

GRANTS RECLAMATION PROJECT
Updated Decommissioning and Reclamation Plan (DRP)

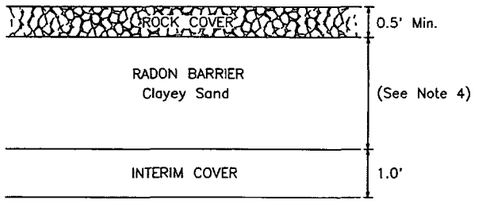
FIGURE 2.2-6
CROSS SECTION DESIGN OF RECONTOURED SMALL TAILINGS PILE

FORMATTED BY: JC

K:\AO00012O-Grants\Illustrator\2012 DRP\Figure 2_2-6 CS Desgin of Recontoured STP.ai @ 10/28/2012

Typical Cross Section of Soil and Rock Cover on Top of Tailings Piles

(Not to Scale)

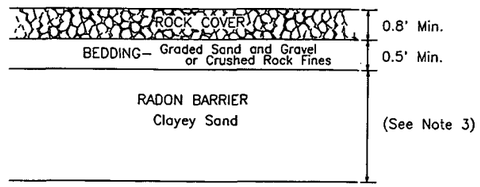


NOTES:

1) COVER SOIL TO BE COMPACTED TO AT LEAST 95% DENSITY PER ASTM D-698.
2) ROCK COVER CONSTRUCTED OF BASALT WITH d_{50} NOT LESS THAN 1.0 INCHES.
3) INTERIM COVER IS SANDY SOIL (SM, SP, OR SC).
4) RADON BARRIER THICKNESSES SRE THOSE CONTAINED IN LICENSE AMENDMENT NO. 22 (LICENSE CONDITIONS 37A AND 37b) OF 10/10/95. ACTUAL THICKNESSES BASED ON ADDITIONAL FIELD TESTING AND ANALYSES.

Typical Cross Section of Soil and Rock Cover on Side Slopes of Tailings Piles

(Not to Scale)

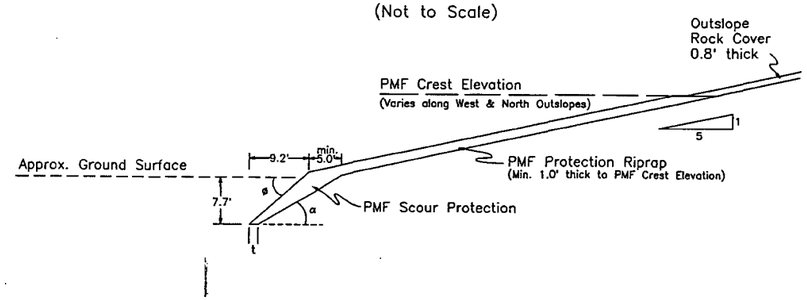


NOTES:

1) COVER SOIL TO BE COMPACTED TO AT LEAST 95% MAXIMUM DENSITY PER ASTM D-698.
2) ROCK COVER OF NOT LESS THAN 0.80 FEET OF BASALT WITH $d_{50} \geq 4.7$ INCHES OVER BEDDING LAYER OF GRADED SAND AND GRAVEL OR CRUSHED ROCK FINES.
3) RADON BARRIER THICKNESSES SRE THOSE CONTAINED IN LICENSE AMENDMENT NO. 22 (LICENSE CONDITIONS 37A AND 37b) OF 10/10/95. ACTUAL THICKNESSES BASED ON ADDITIONAL FIELD TESTING AND ANALYSES.

Side Slope Scour Protection and Riprap Design

(Not to Scale)

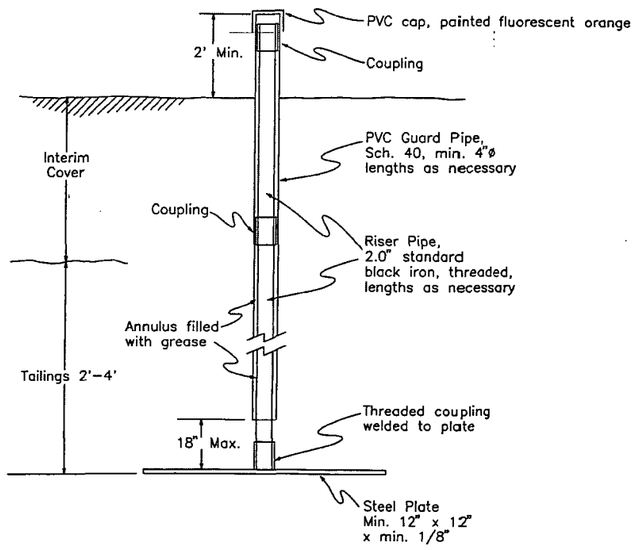


NOTES:

1) SCOUR PROTECTION ROCK DUMPED IN EXCAVATED TRENCH TOP WIDTH MINIMUM 5.0 FEET AND BOTTOM WIDTH MINIMUM 1.0 FEET; TRENCH BACKFILLED AFTER ROCK PLACEMENT.
2) $d_{50} \geq 4.7$ INCHES FOR OUTSLOPE COVER, RIPRAP, AND SCOUR PROTECTION.
3) ϕ = NATURAL ANGLE OF REPOSE OF ANGULAR ROCK; ASSUMED = 40°(CONSERVATIVE). α = 30° OR LESS. t = 2.0 FEET.
4) ROCK SIZES WILL BE INCREASED, IF NECESSARY, TO SATISFY OVERSIZING STANDARDS RELATED TO DURABILITY SCORES.
5) RADON BARRIER THICKNESSES SRE THOSE CONTAINED IN LICENSE AMENDMENT NO. 22 (LICENSE CONDITIONS 37A AND 37b) OF 10/10/95. ACTUAL THICKNESSES BASED ON ADDITIONAL FIELD TESTING AND ANALYSES.

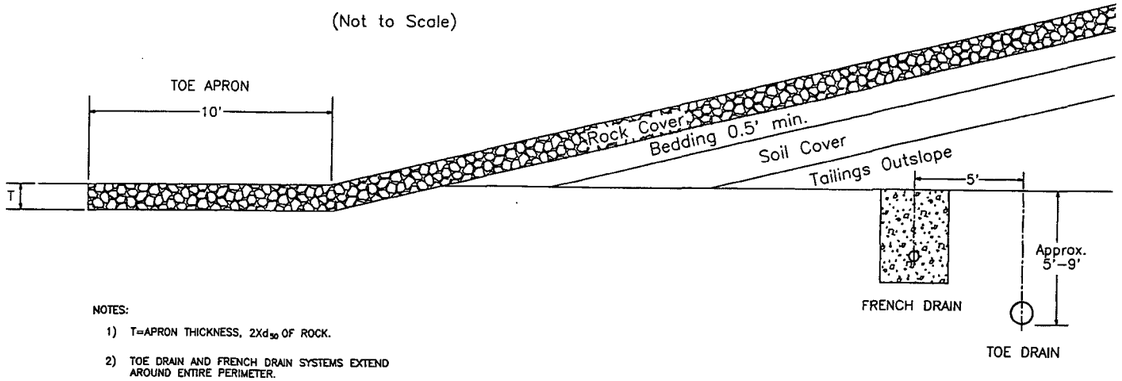
Settlement Monitoring Point

(Not to Scale)



Side Slope Toe Detail

(Not to Scale)



NOTES:

1) T=APRON THICKNESS, $2Xd_{50}$ OF ROCK.
2) TOE DRAIN AND FRENCH DRAIN SYSTEMS EXTEND AROUND ENTIRE PERIMETER.
3) FRENCH DRAIN TO INSTALLED IN 1993, 2" DIA. PVC SLOTTED PIPE 4 TO 6 FEET DEEP IN TRENCH FILLED WITH GRADED SAND AND GRAVEL.
4) TOE DRAIN INSTALLED IN 1992, 6" DIA. CORRUGATED HDPE SLOTTED PIPE WITH FILTER CLOTH.

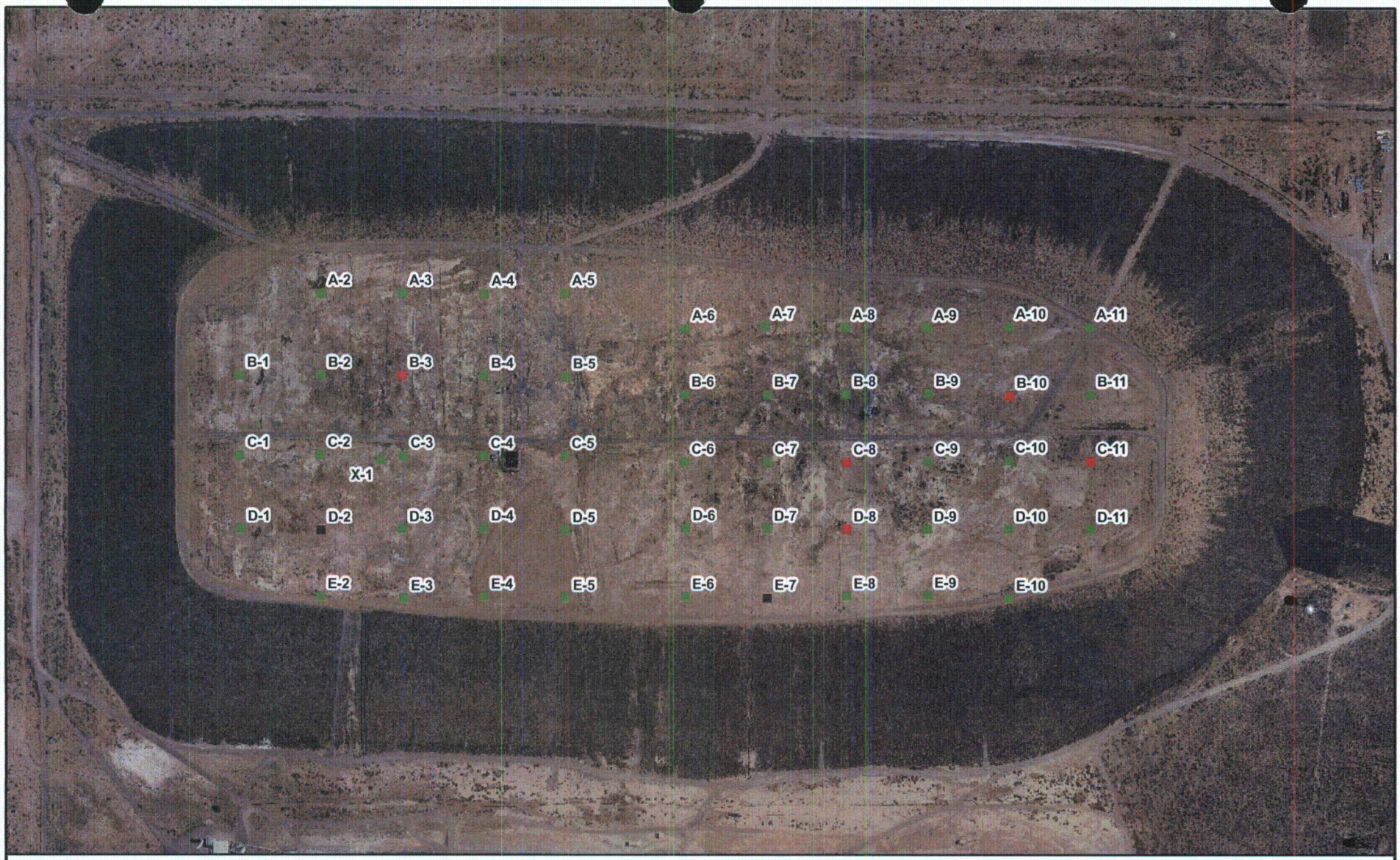
Prepared by AK GeoConsult, Inc.
Revised 08/2011.

GRANTS RECLAMATION PROJECT

Updated Decommissioning and Reclamation Plan (DRP)

FIGURE 2.2-7
DESIGN DETAILS
RECLAMATION PLAN
LARGE TAILINGS PILE

K:\AO000120_Grants\Illustrators\2012_DRP\Figure 2_2-7 Design Details of Reclamation Plan - LTP.ai @ 10/29/2012 FORMATTED BY: JC



LEGEND:

Status

- Operating
- Damaged
- Destroyed

Aerial Source:
2011 High Resolution Aerials from HMC.

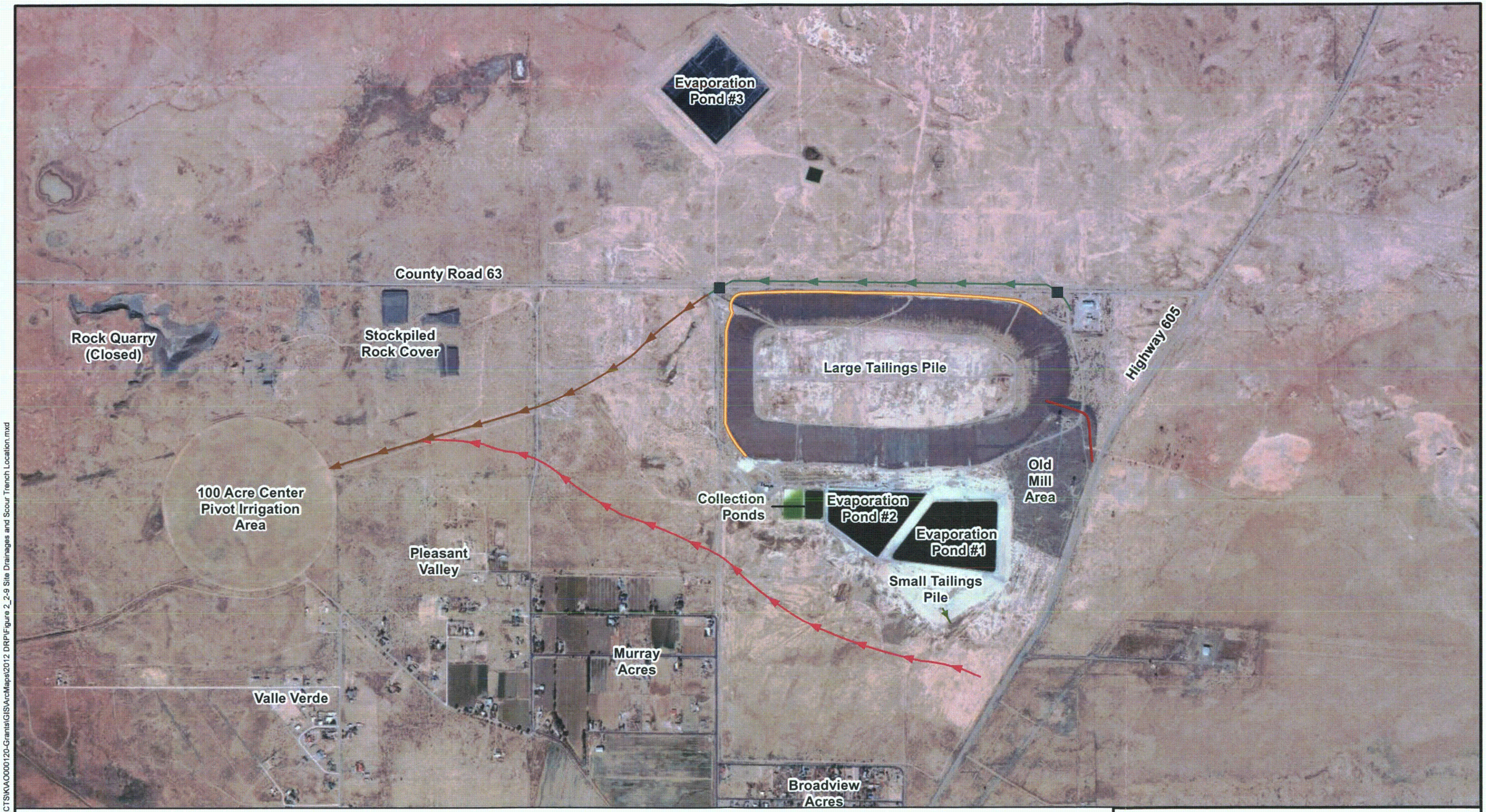
N

0 250 500 Feet

GRANTS RECLAMATION PROJECT

Updated Decommissioning and Reclamation Plan (DRP)

FIGURE 2.2-8
SETTLEMENT MONITORING POINT LOCATIONS



LEGEND:

- County Road 63 Drainage Crossing
- Diversion Levee
- Scour Trench
- West Drainage Channel
- North Drainage Channel
- Proposed South Drainage Channel
- Small Tailings Pile Drainage Channel

Aerial Source:
Bing Maps Hybrid (photo updated in November 2010; serviced by ESRI ArcGIS Online).

N

0 650 1,300 Feet

GRANTS RECLAMATION PROJECT

Updated Decommissioning and Reclamation Plan (DRP)

FIGURE 2.2-9
SITE DRAINAGES AND SCOUR TRENCH LOCATIONS

CITY: Boulder, CO| DR:AFTER: J. CHEN
Path: C:\Users\jchen\Documents_PROJECTS\KA0000120-Grants\GIS\ArcMaps\2012 DRP\Figure 2_2-9 Site Drainages and Scour Trench Location.mxd

BOULDER/CO K:\AO000120-Grants\GIS\ArcMaps\2012 DRP\Figure 2_2-10_100 Year Floodplain Map.mxd - 3/7/2013 4:06:29 PM SAVED BY: jchen

LEGEND:

- Project Boundary
- 100 Year Floodplain

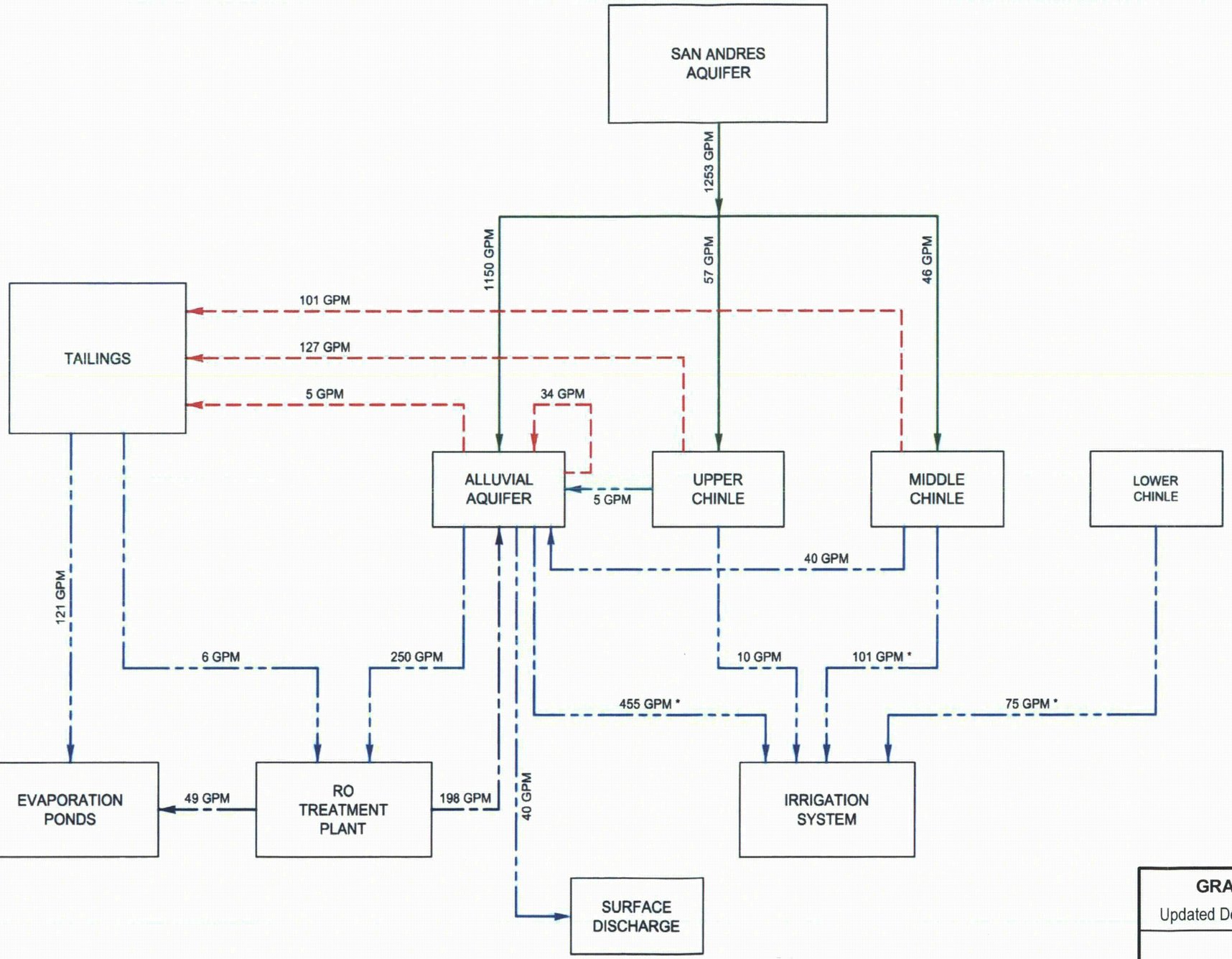
Aerial Source:
Bing Maps Aerial (photo updated in November 2010; serviced by ESRI ArcGIS Online), overlaid with 2011 High Resolution Aerials from HMC.

N

0 1,250 2,500 Feet

GRANTS RECLAMATION PROJECT
Updated Decommissioning and Reclamation Plan (DRP)

FIGURE 2.2-10
100-YEAR FLOODPLAIN (FEMA 2010) MAP FOR HMC PROJECT AREA

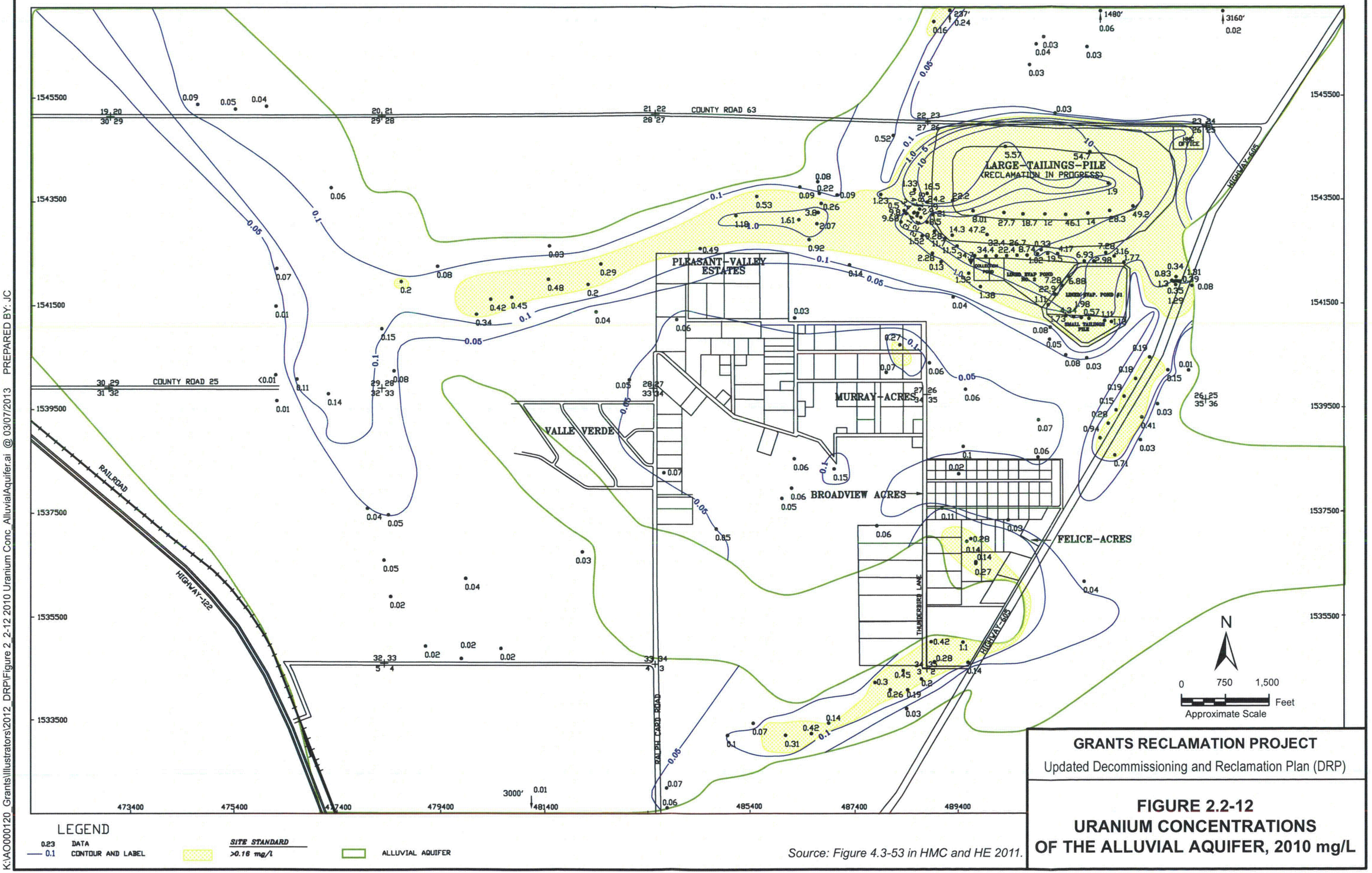


K:\AO000120_Grants\Illustrators\Figure 2_2-11 Flow Diagram-GW CAP.ai @ 03/07/2013 PREPARED BY: JC

GRANTS RECLAMATION PROJECT

Updated Decommissioning and Reclamation Plan (DRP)

FIGURE 2.2-11
HMC PROJECT
FLOW DIAGRAM FOR
2006 GROUNDWATER CAP



K:\AO000120_Grants\Illustrators\2012_DRP\Figure 2_2-12 2010 Uranium Conc_AlluvialAquifer.ai @ 03/07/2013 PREPARED BY: JC

Source: Figure 4.3-53 in HMC and HE 2011.

GRANTS RECLAMATION PROJECT

Updated Decommissioning and Reclamation Plan (DRP)

FIGURE 2.2-12
URANIUM CONCENTRATIONS OF THE ALLUVIAL AQUIFER, 2010 mg/L

PREPARED BY: JC

K:\AO000120_Grants\Illustrators\2012_DRP\Figure 2_2-13 2010 Selenium Conc_AlluvialAquifer.ai @ 03/07/2013

COUNTY ROAD 63

COUNTY ROAD 25

PLEASANT-VALLEY ESTATES

VALLE VERDE

MURRAY-ACRES

BROADVIEW ACRES

FELICE-ACRES

LARGE-TAILINGS-PILE
(RECLAMATION IN PROGRESS)

HMC OFFICE

COLLECTION POND

LINED EVAP. POND NO. 1

LINED EVAP. POND #2

SMALL TAILINGS PILE

RAILROAD

HIGHWAY-122

HIGHWAY-605

RALPH CARD ROAD

THUNDERBIRD LANE

1545500

1543500

1541500

1539500

1537500

1535500

1533500

473400

475400

477400

479400

481400

485400

487400

489400

N

0 750 1,500 Feet

Approximate Scale

LEGEND

0.07 DATA

0.10 CONTOUR AND LABEL

SITE STANDARD >0.32 mg/l

ALLUVIAL AQUIFER

Source: Figure 4.3-70 in HMC and HE 2011.

GRANTS RECLAMATION PROJECT

Updated Decommissioning and Reclamation Plan (DRP)

FIGURE 2.2-13
SELENIUM CONCENTRATIONS OF THE ALLUVIAL AQUIFER, 2010 mg/L

--LEGEND--

- UPGRADIENT COLLECTION, ALLUVIAL
- COLLECTION, ALLUVIAL
- COLLECTION FOR REINJECTION, ALLUVIAL
- COLLECTION, UPPER & MIDDLE CHINLE
- IRRIGATION SUPPLY
- COLLECTION, TAILINGS
- COLLECTION, TOE DRAIN
- R.O. SYSTEM
- FRESH-WATER INJECTION SUPPLY
- POINTS OF COMPLIANCE
- INFILTRATION LINE
- UNUSED INFILTRATION LINE
- REINJECTION, ALLUVIAL
- INJECTION, R.O. PRODUCT
- INJECTION, FRESH WATER

LINED EVAP. POND #3

COUNTY ROAD 63

COUNTY ROAD 25

100 ACRE CENTER PIVOT

150 AC CENTER PIVOT

174 AC CENTER PIVOT AND FLOOD IRRIGATION

FLOOD IRRIGATION 120 AC FLOOD

PLEASANT-VALLEY ESTATES

VALLE VERDE

MURRAY-ACRES

BROADVIEW ACRES

FELICE-ACRES

LARGE-TAILINGS-PILE (RECLAMATION IN PROGRESS)

TOE DRAIN

SMALL TAILINGS PILE

LINED EVAP. POND #1

LINED EVAP. POND #2

RAILROAD

HIGHWAY-122

HIGHWAY-605

RALPH CARD ROAD

THUNDERBIRD LANE

MINE OFFICE

S LINE

D LINE

K LINE

G LINE

J LINE

L LINE

M LINE

WR LINE

S INJ. LINE

X LINE

Y LINE

Approximate Scale: 0 750 1,500 Feet

Source: Figure 2.1-1 in HMC and HE 2011.

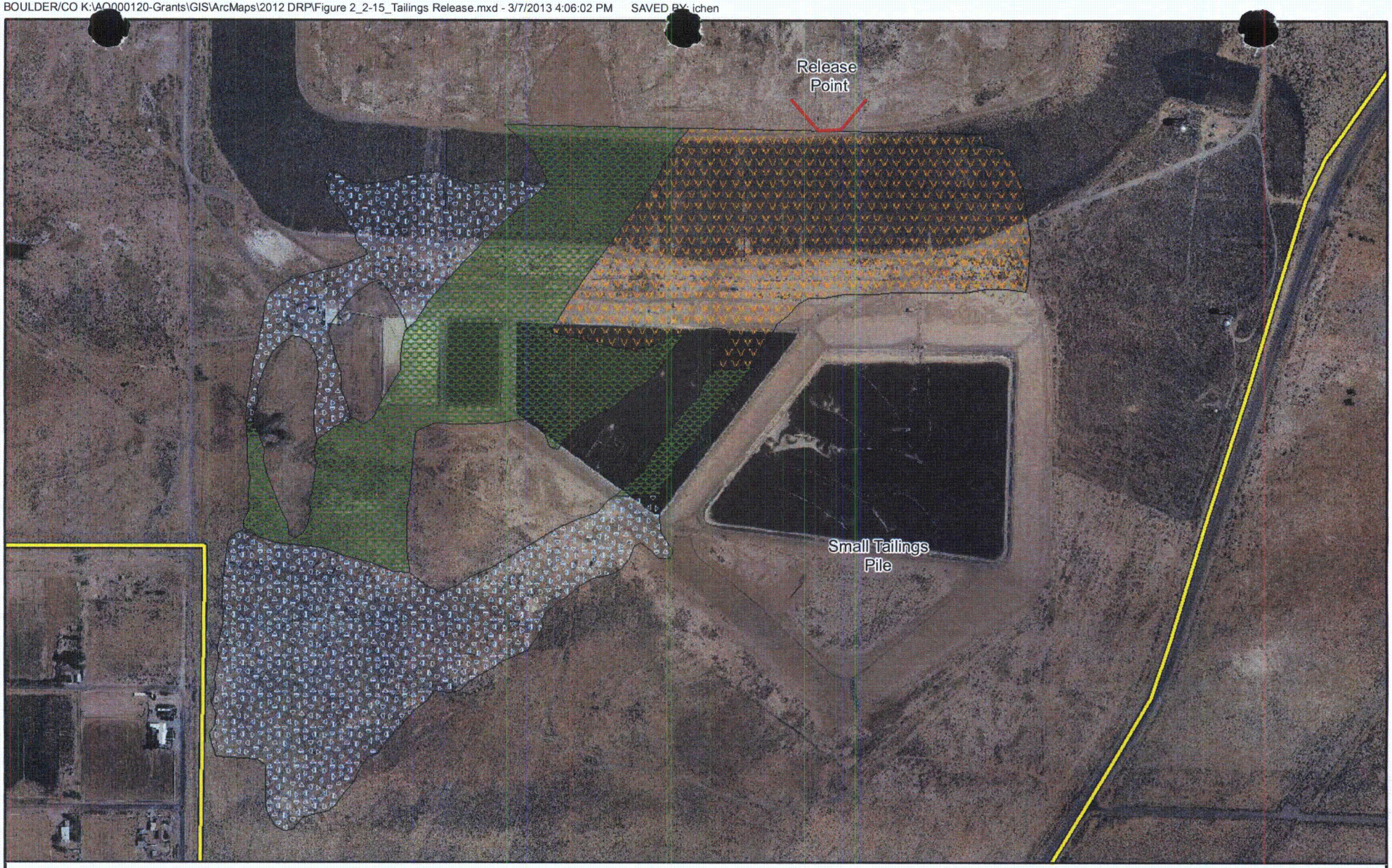
GRANTS RECLAMATION PROJECT

Updated Decommissioning and Reclamation Plan (DRP)

FIGURE 2.2-14
LOCATION OF CURRENT INJECTION AND COLLECTION SYSTEMS WITH START OF OPERATION DATES, 2012

K:\AO000120_Grants\Illustrators\2012_DRP\Figure 2_2-14 Present Injection and Collection System.ai @ 03/07/2013 PREPARED BY: JC

BOULDER/CO K:\AQ000120-Grants\GIS\ArcMaps\2012 DRP\Figure 2_2-15_Tailings Release.mxd - 3/7/2013 4:06:02 PM SAVED BY: ichen



LEGEND:

Tailings Spill Key

- No Spill
- Sand-Slimes
- Slimes
- Solutions

Project Boundary

Aerial Source:
2011 High Resolution Aerials from HMC.

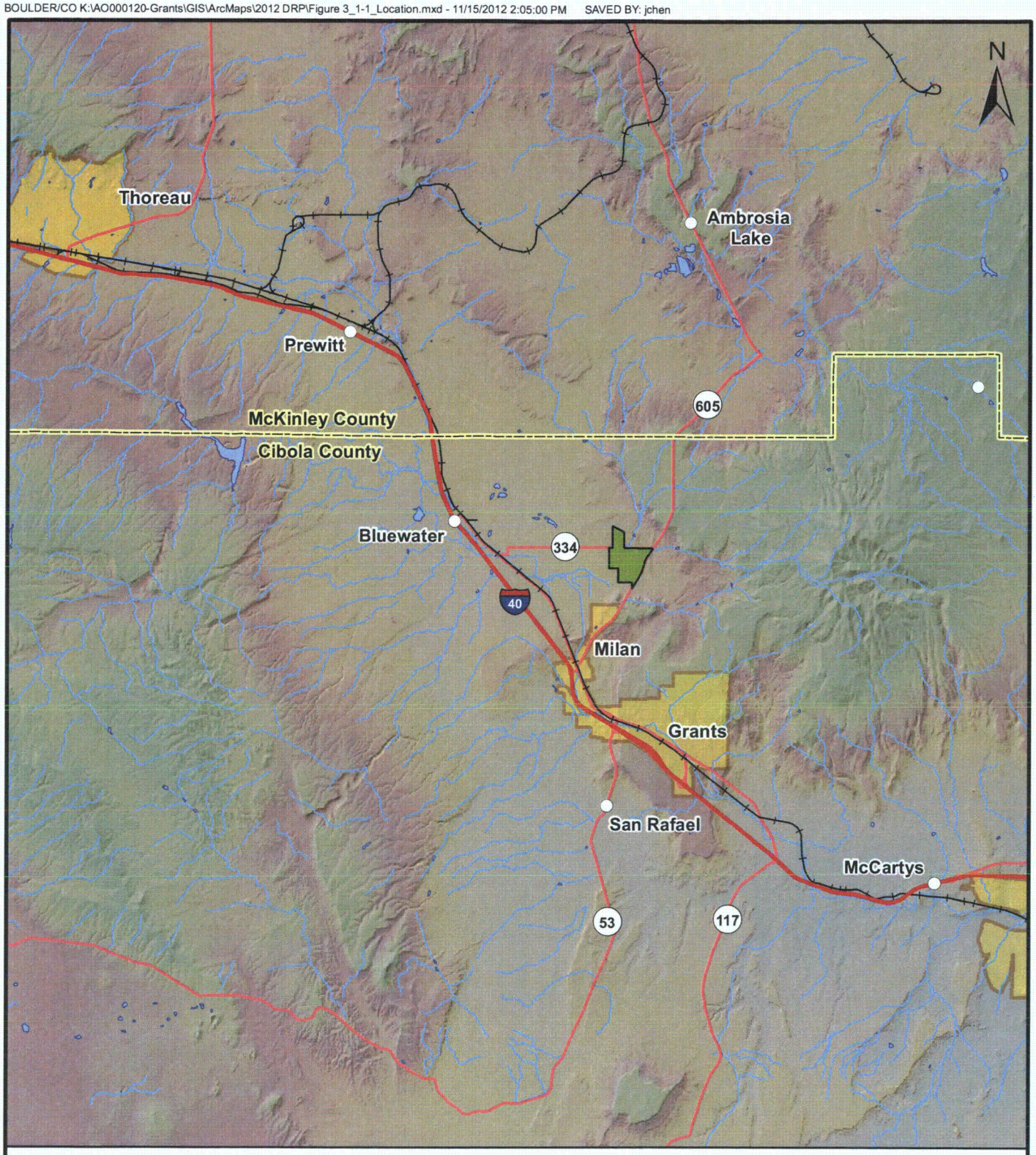
N

0 300 600 Feet

GRANTS RECLAMATION PROJECT
Updated Decommissioning and Reclamation Plan (DRP)

FIGURE 2.2-15
RELEASE OF TAILINGS FROM HMC LARGE TAILINGS PILE IN 1977

BOULDER/CO K:\AO000120-Grants\GIS\ArcMaps\2012 DRP\Figure 3_1-1_Location.mxd - 11/15/2012 2:05:00 PM SAVED BY: jchen



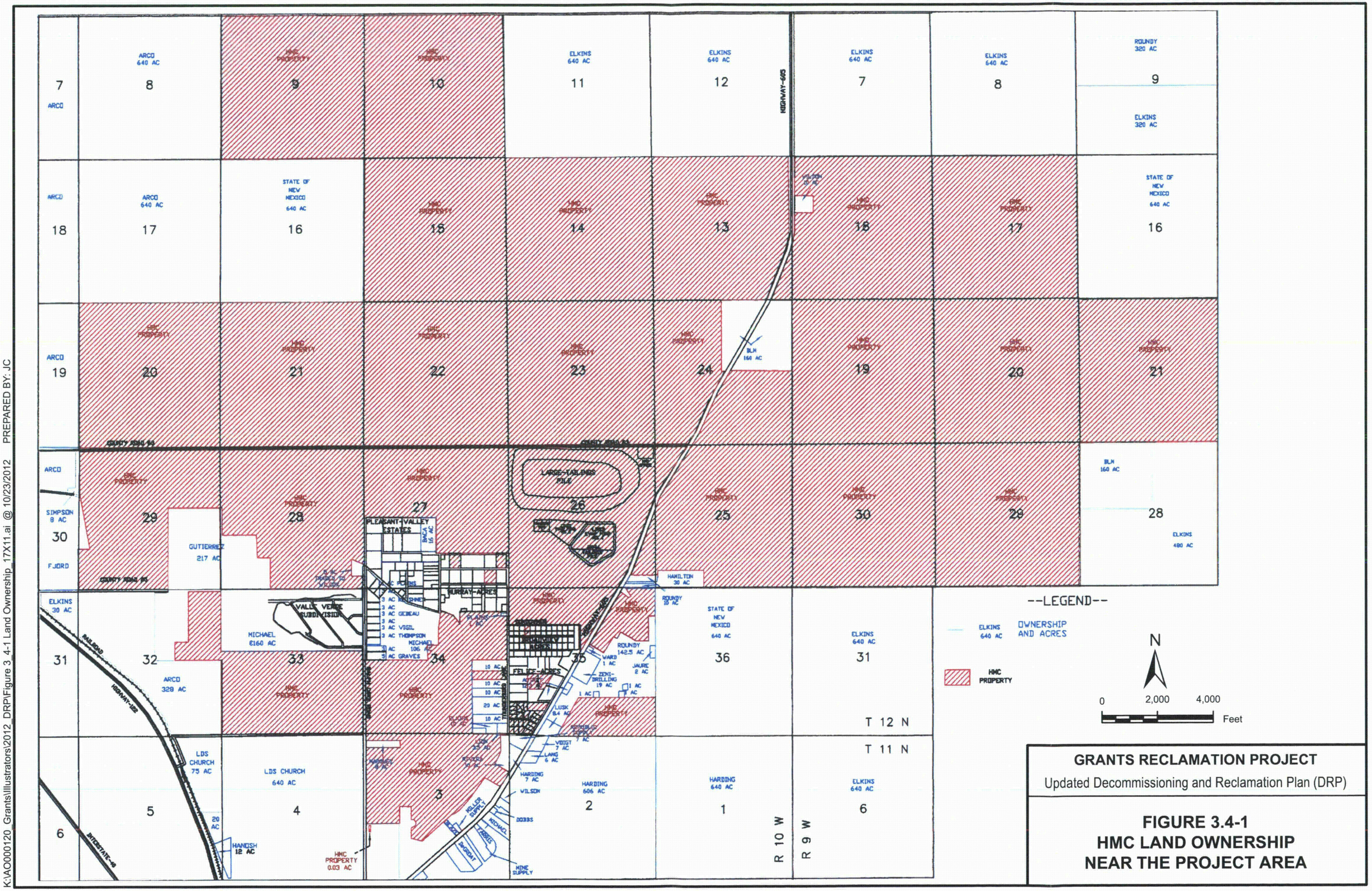
LEGEND:

- Project Boundary
- Interstate
- Highway
- Railroad
- City Limits
- County Boundary

0 2.5 5 Miles

GRANTS RECLAMATION PROJECT
Updated Decommissioning and Reclamation Plan (DRP)

FIGURE 3.1-1
LOCATION OF HMC PROJECT



PREPARED BY: JC

K:\AO000120_Grants\Illustrators\2012_DRP\Figure 3_4-1 Land Ownership_17X11.ai @ 10/23/2012

GRANTS RECLAMATION PROJECT

Updated Decommissioning and Reclamation Plan (DRP)

FIGURE 3.4-1
HMC LAND OWNERSHIP
NEAR THE PROJECT AREA