

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

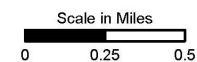


LEGEND

- 2019 Observed
Uranium Plume Extent
(0.16 mg/L)
- 1999 Observed
Uranium Plume Extent
(0.16 mg/L)
- NRC License Boundary
- Large & Small Tailings
Piles

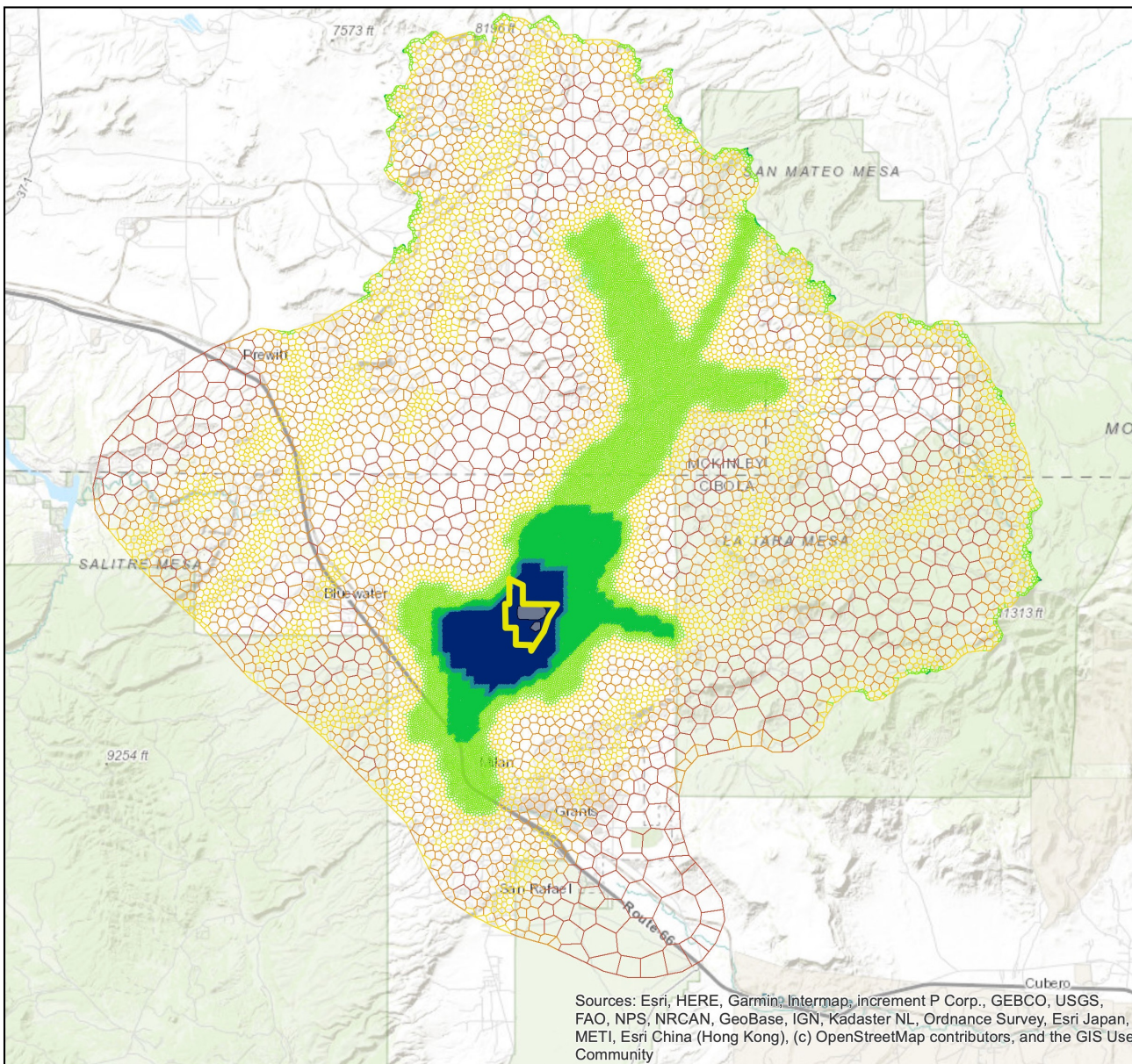
Notes:


1. Projection: North American Datum 1927 New Mexico State Plane West (Feet)
2. The GRP Groundwater Protection Standard for the alluvial aquifer is 0.16 mg/L.



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Figure 3.1-1
Alluvial Aquifer Uranium
Plume Extent - 1999 vs. 2019





LEGEND

NRC License Boundary

Large & Small Tailings Piles

Equivalent Square Grid Cell Length (feet)

53 - 89

90 - 133

134 - 240

241 - 625

626 - 1,250

1,251 - 2,142

2,143 - 2,773

Notes:

1. Projection: North American Datum 1927 New Mexico State Plane West (Feet)

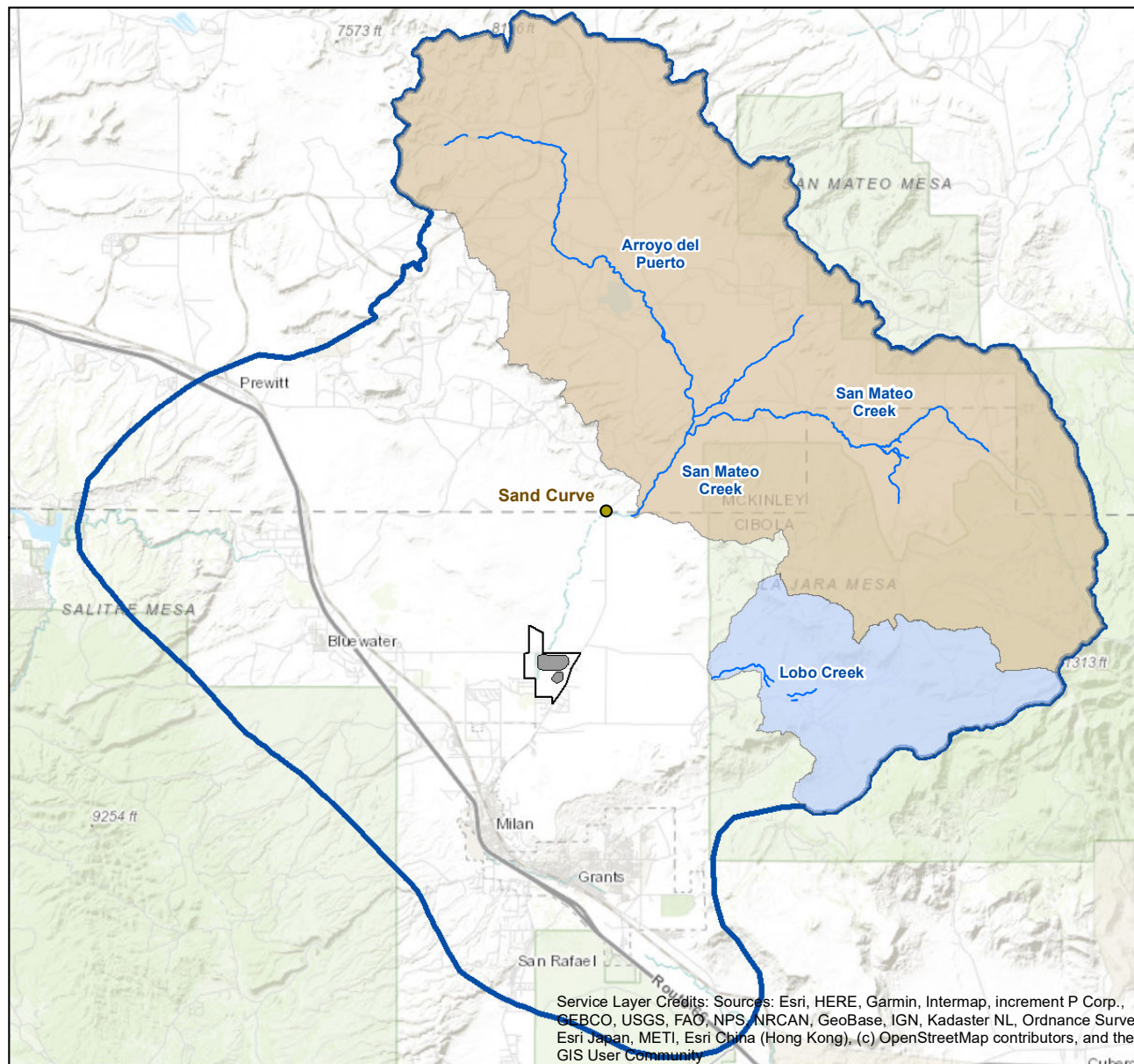
Scale in Miles

0 0.5 1



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Figure 3.1-2
Groundwater Model Voronoi
Polygon Unstructured Grid



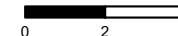
LEGEND

- Sand Curve
- Active Model Domain
- Second Order Stream Networks - San Mateo Creek Basin above Sand Curve and Lobo Creek Watershed
- San Mateo Creek Watershed Above Sand Curve
- Lobo Canyon Watershed
- NRC License Boundary
- Large & Small Tailings Piles

Notes:

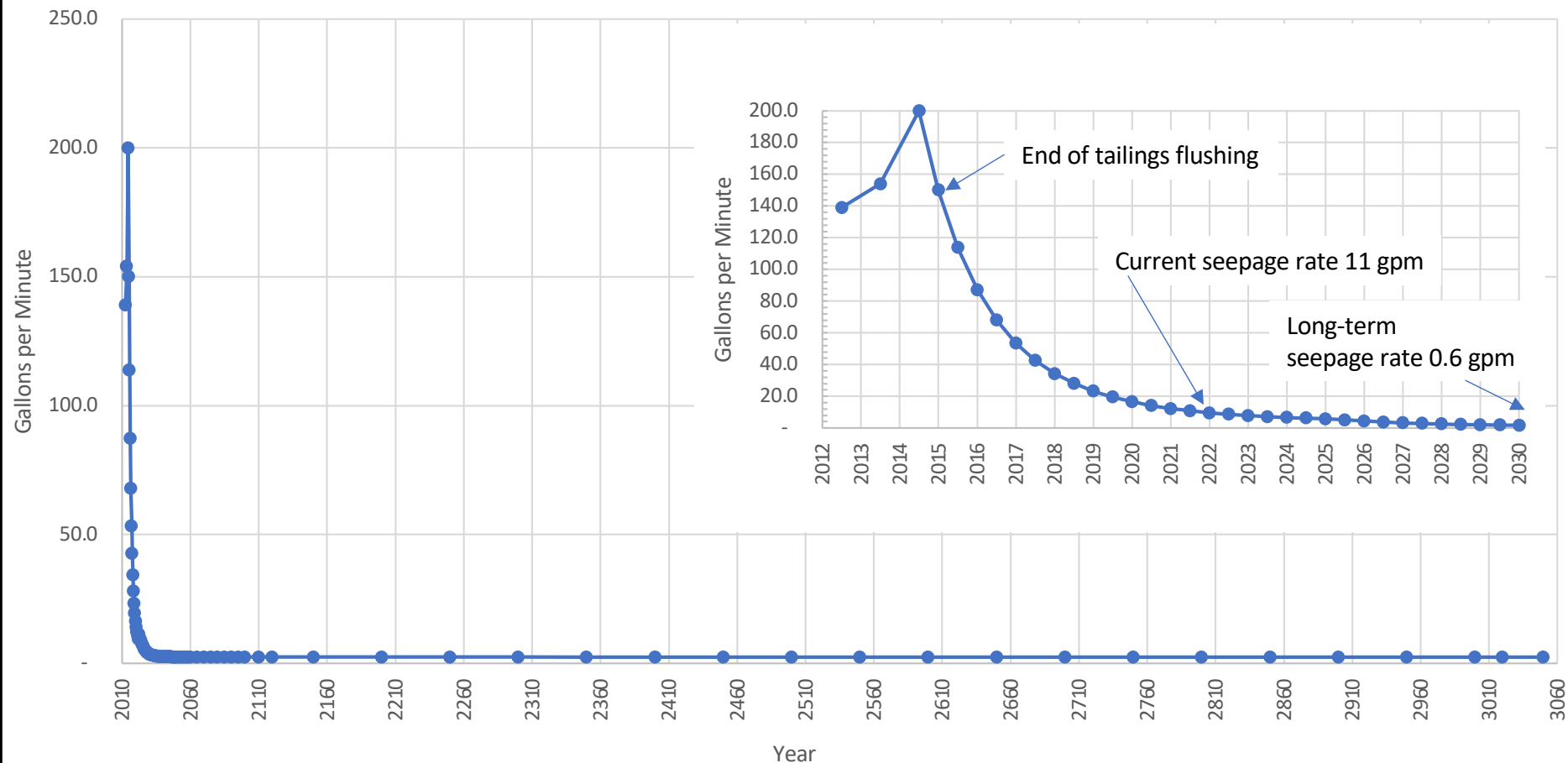
1. Projection: North American Datum 1927 New Mexico State Plane West (Feet)
2. Stream order based upon National Hydrography Dataset classification.

Scale in Miles



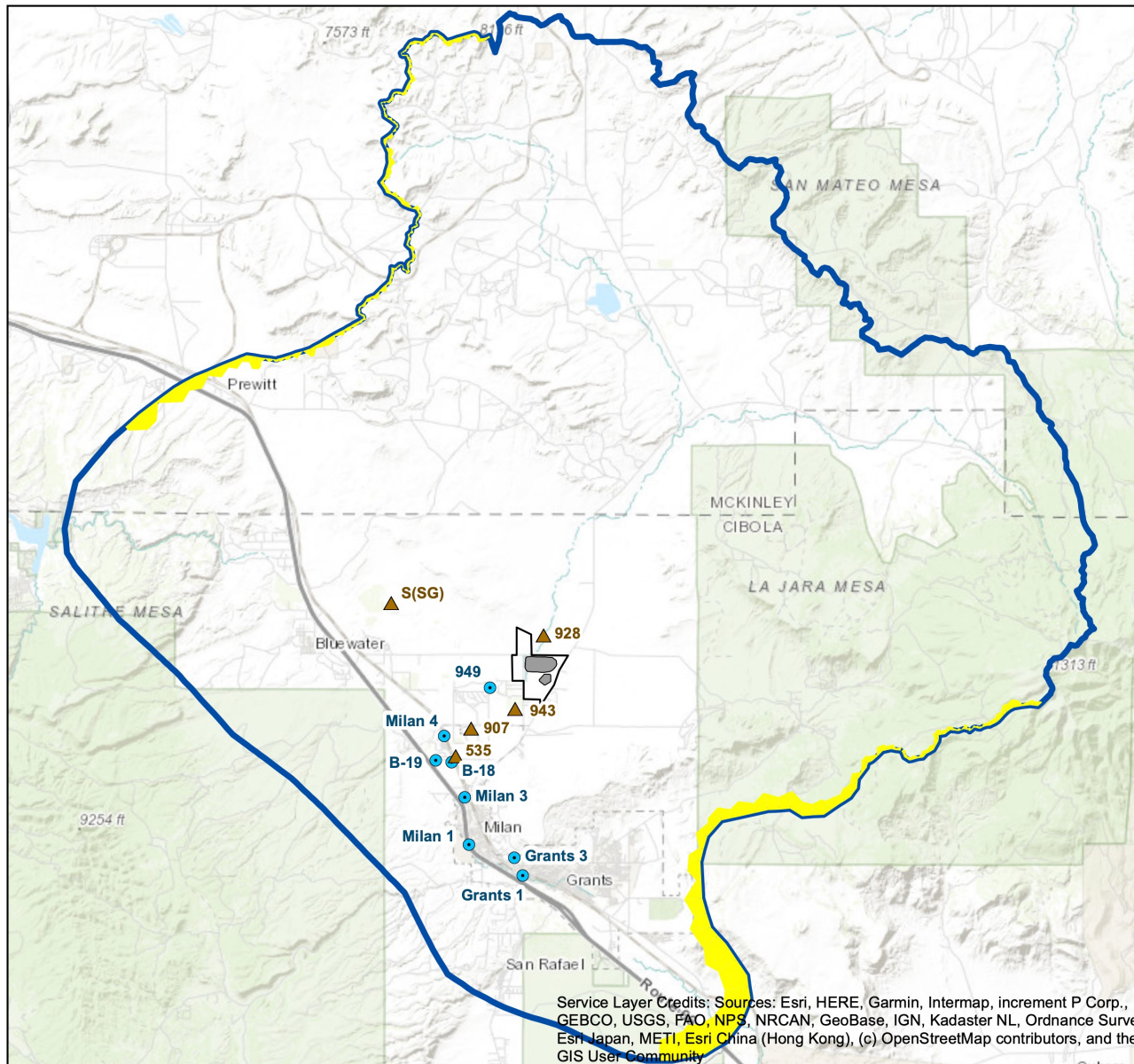
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Figure 3.1-3
Subwatersheds and Second Order
Stream Networks









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Figure 3.1-4
Large Tailings Pile
Predicted Seepage Rates

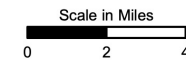


LEGEND

-  San Andres Monitoring Wells For Water Level Trend Analyses
-  San Andres/Glorieta Municipal or Industrial Pumping Wells
-  NRC License Boundary
-  Large & Small Tailings Piles
- General Head Boundaries**
-  San Andres - Glorieta Aquifer General Head Boundaries
-  Active Model Domain

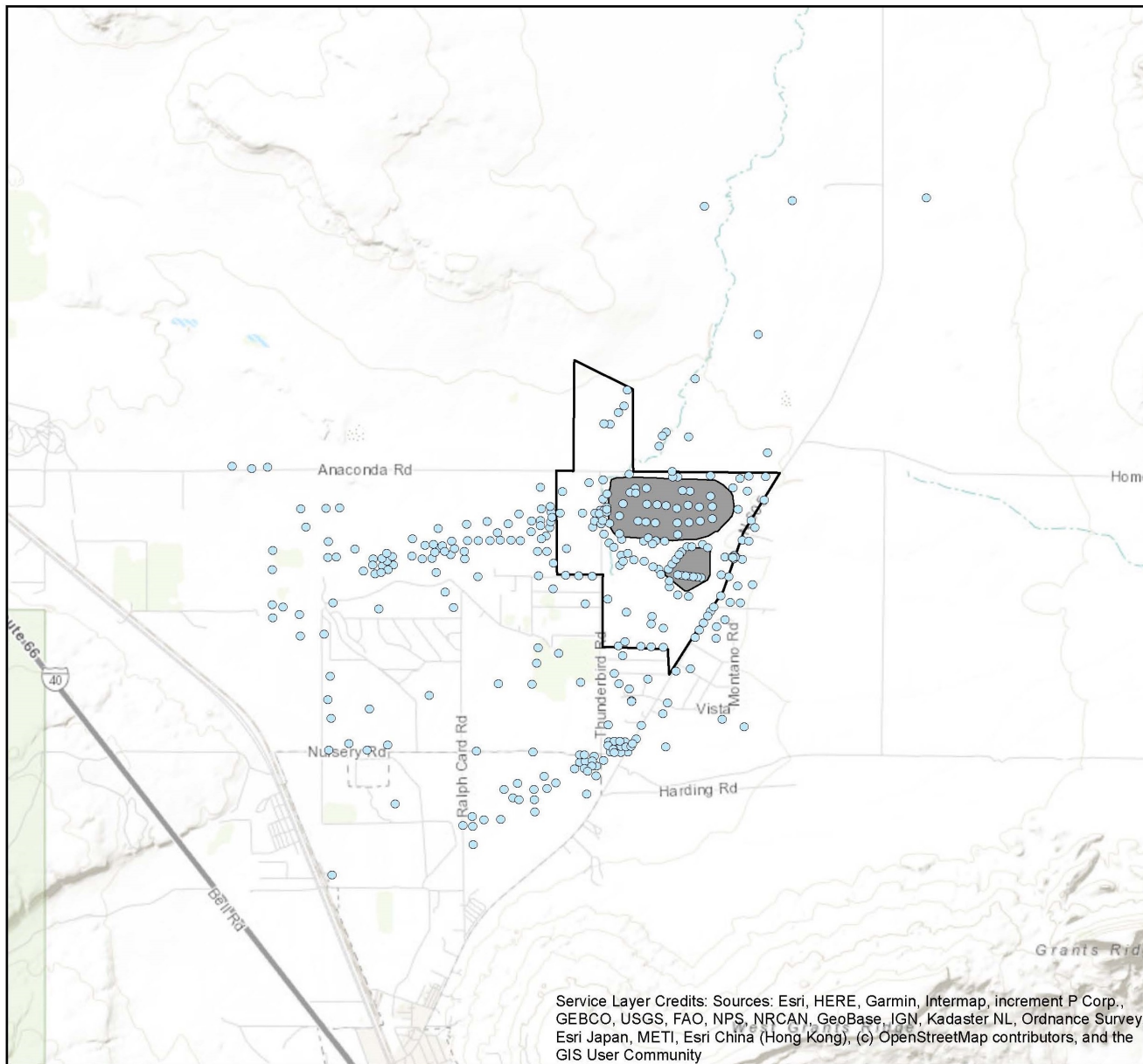
Notes:

1. Projection: North American Datum 1927 New Mexico State Plane West (Feet)



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Figure 3.1-5
General Head Boundaries
San Andres - Glorieta Aquifer



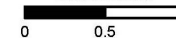
LEGEND

- Alluvial Aquifer Groundwater Elevation Target
- NRC License Boundary
- Large & Small Tailings Piles

Notes:

1. Projection: North American Datum 1927 New Mexico State Plane West (Feet)
2. Well locations without names are shown to represent target coverage within the alluvial aquifer. Well locations with name labels are provided on each simulated vs. observed hydrograph in Appendix B.

Scale in Miles

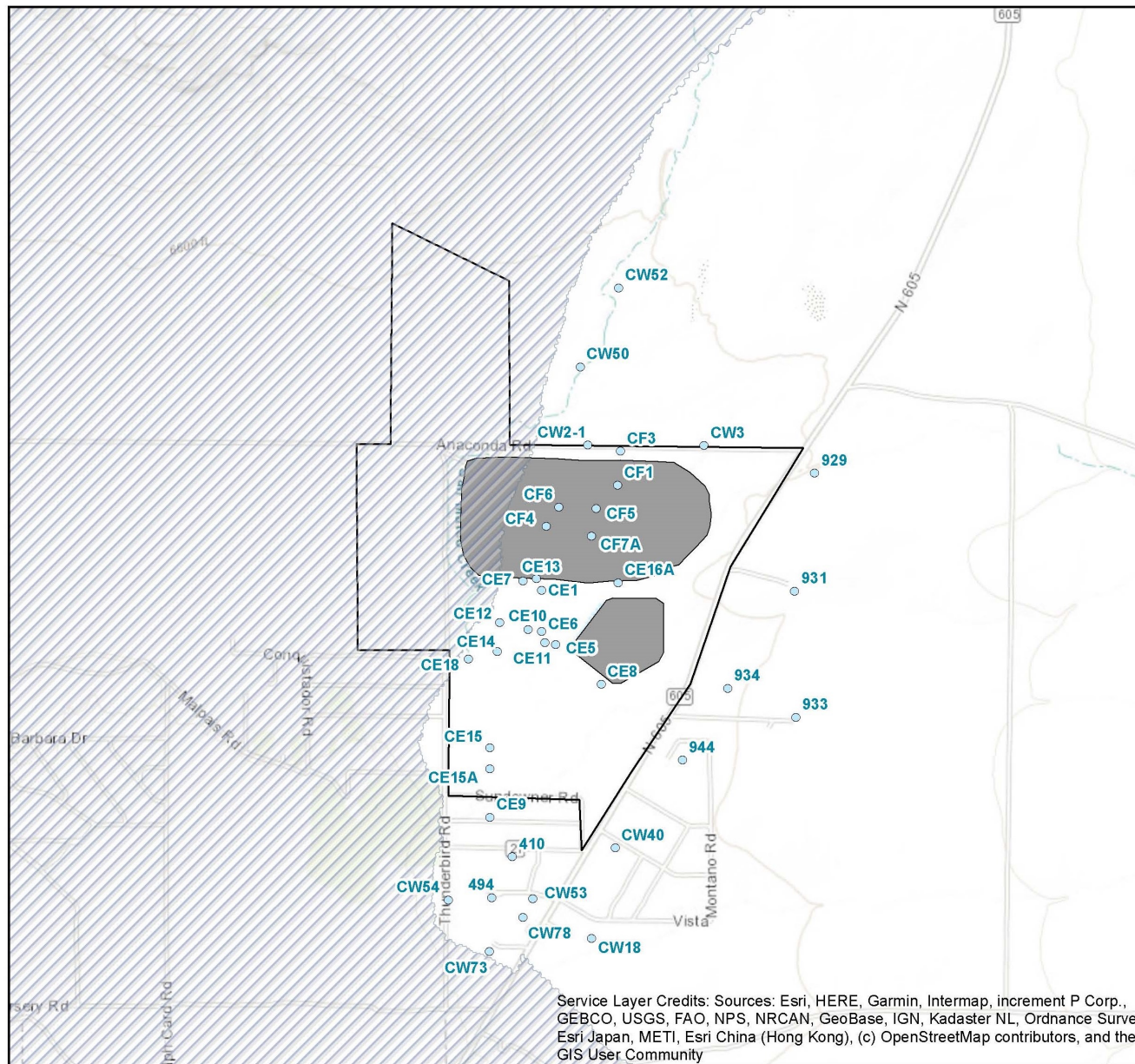


Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community



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Figure 3.1-6
Alluvial Groundwater
Elevation Target Locations



Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community



LEGEND

-  Upper Chinle Water Yielding Unit Groundwater Elevation Target
-  Simulated Pinchout Area (Not Active)
-  NRC License Boundary
-  Large & Small Tailings Piles

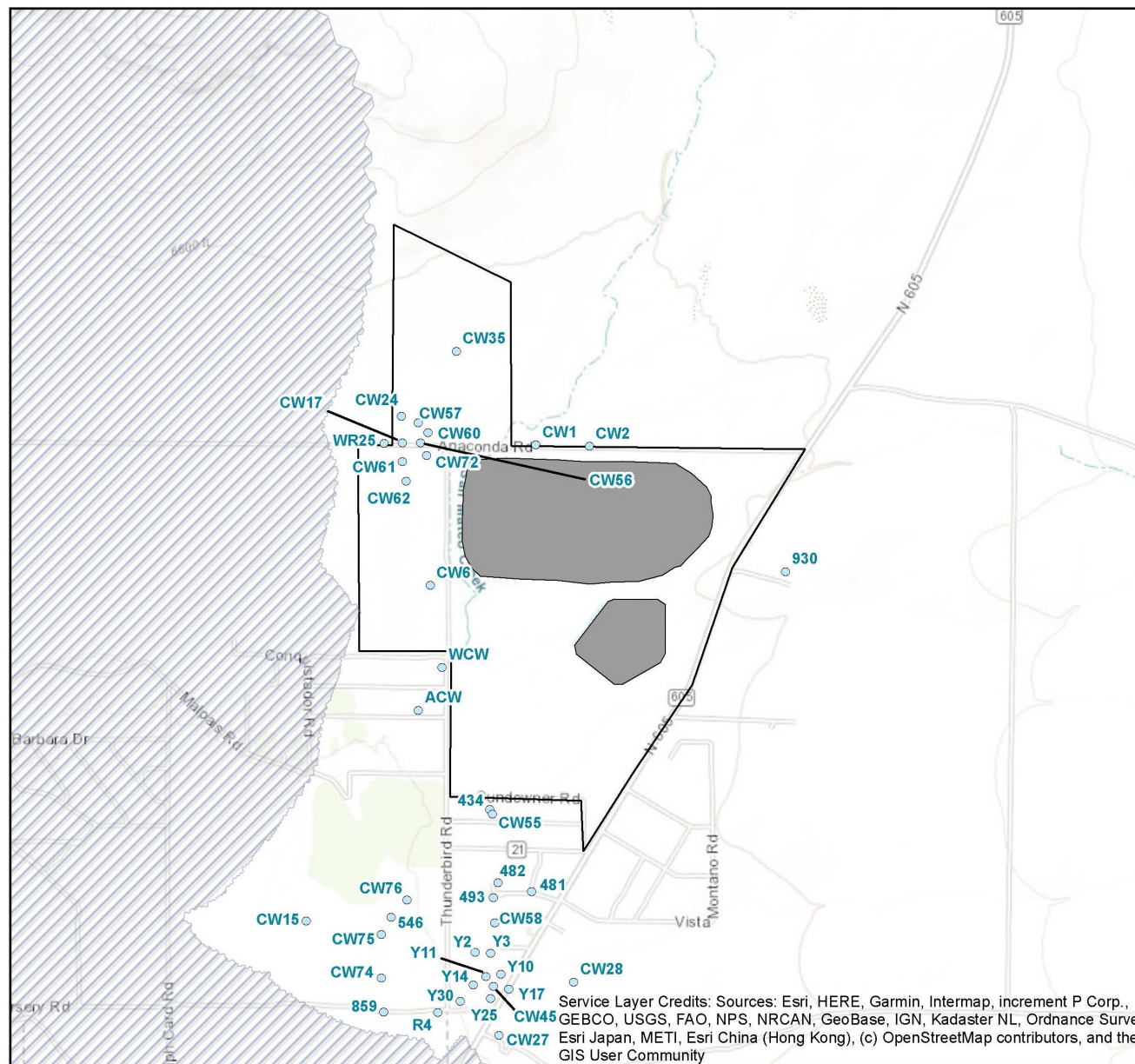
Notes:

1. Projection: North American Datum 1927 New Mexico State Plane West (Feet)



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Figure 3.1-7
Upper Chinle Groundwater
Elevation Target Locations



N

LEGEND

- Middle Chinle Water Yielding Unit Groundwater Elevation Target
- Simulated Pinchout Area (Not Active)
- NRC License Boundary
- Large & Small Tailings Piles

Notes:

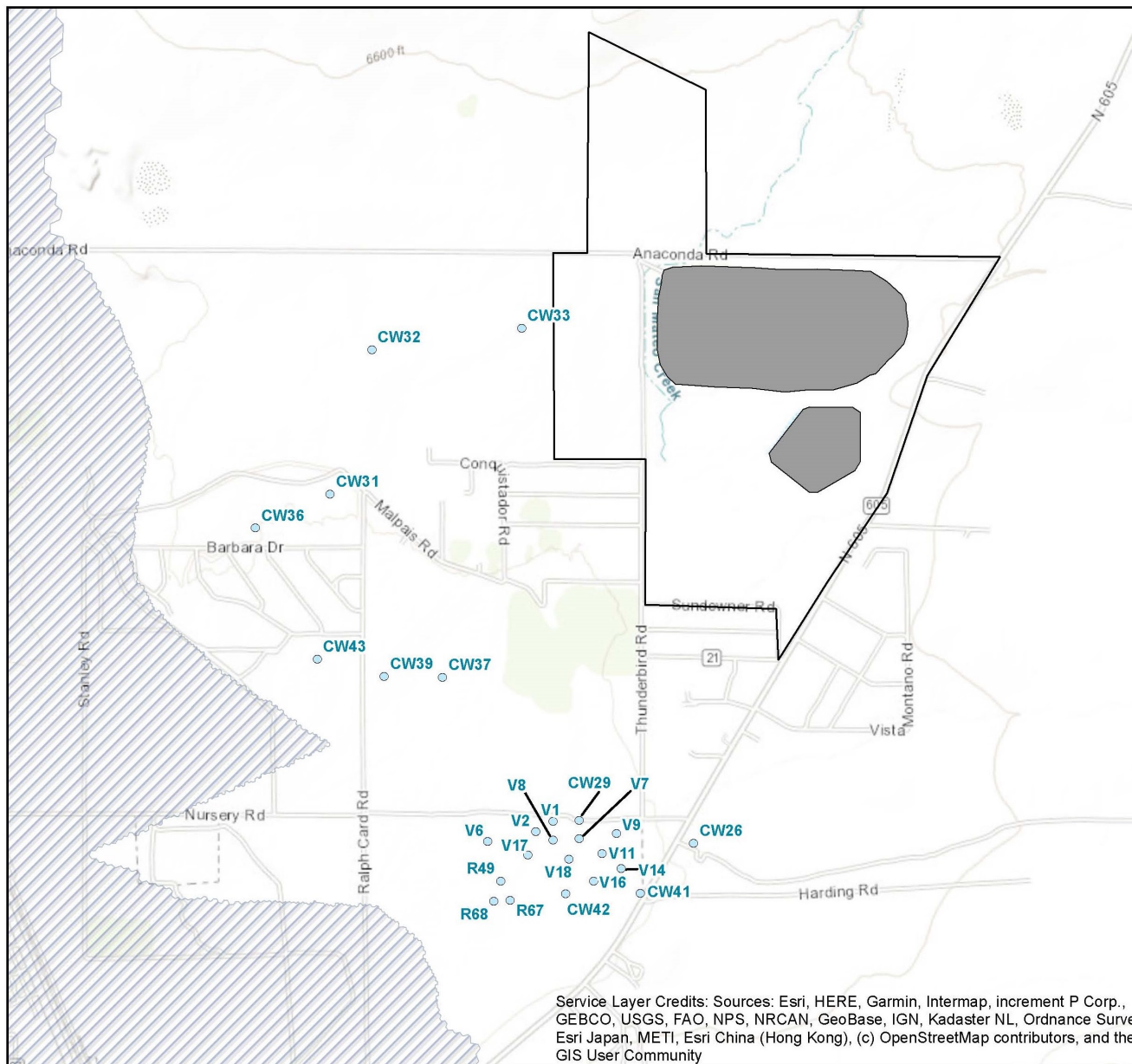
1. Projection: North American Datum 1927 New Mexico State Plane West (Feet)


Miles

0 0.25 0.5

Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

Figure 3.1-8
Middle Chinle Groundwater
Elevation Target Locations





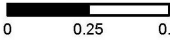
LEGEND

- Lower Chinle Water Yielding Unit Groundwater Elevation Target
- Simulated Pinchout Area (Not Active)
- NRC License Boundary
- Large & Small Tailings Piles


Notes:

1. Projection: North American Datum 1927 New Mexico State Plane West (Feet)

Miles



0 0.25 0.5



Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

Figure 3.1-9
Lower Chinle Groundwater
Elevation Target Locations

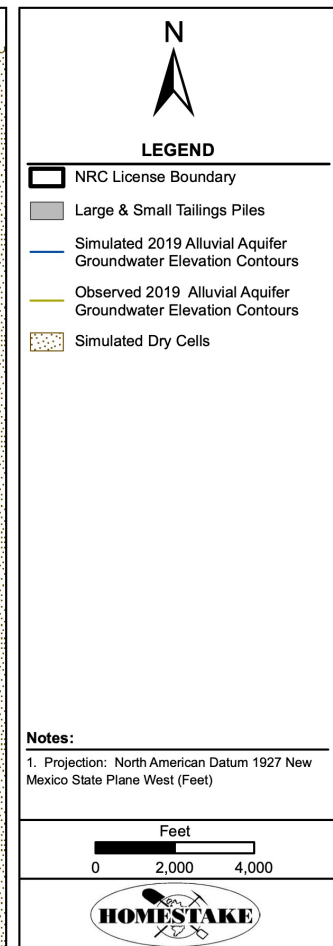
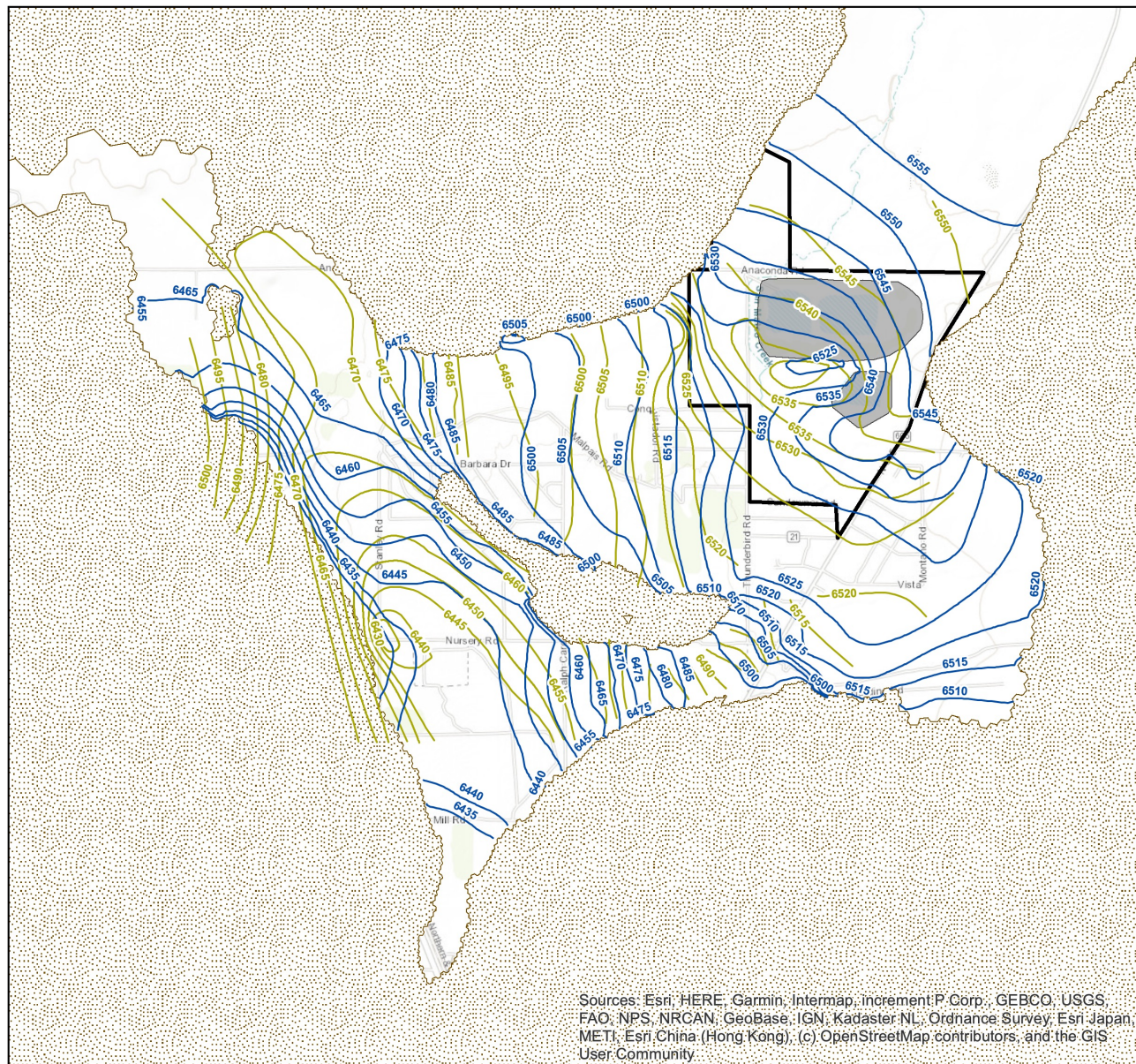


Figure 3.1-10
Alluvial Aquifer Simulated vs Observed
2019 Groundwater Elevation Contours

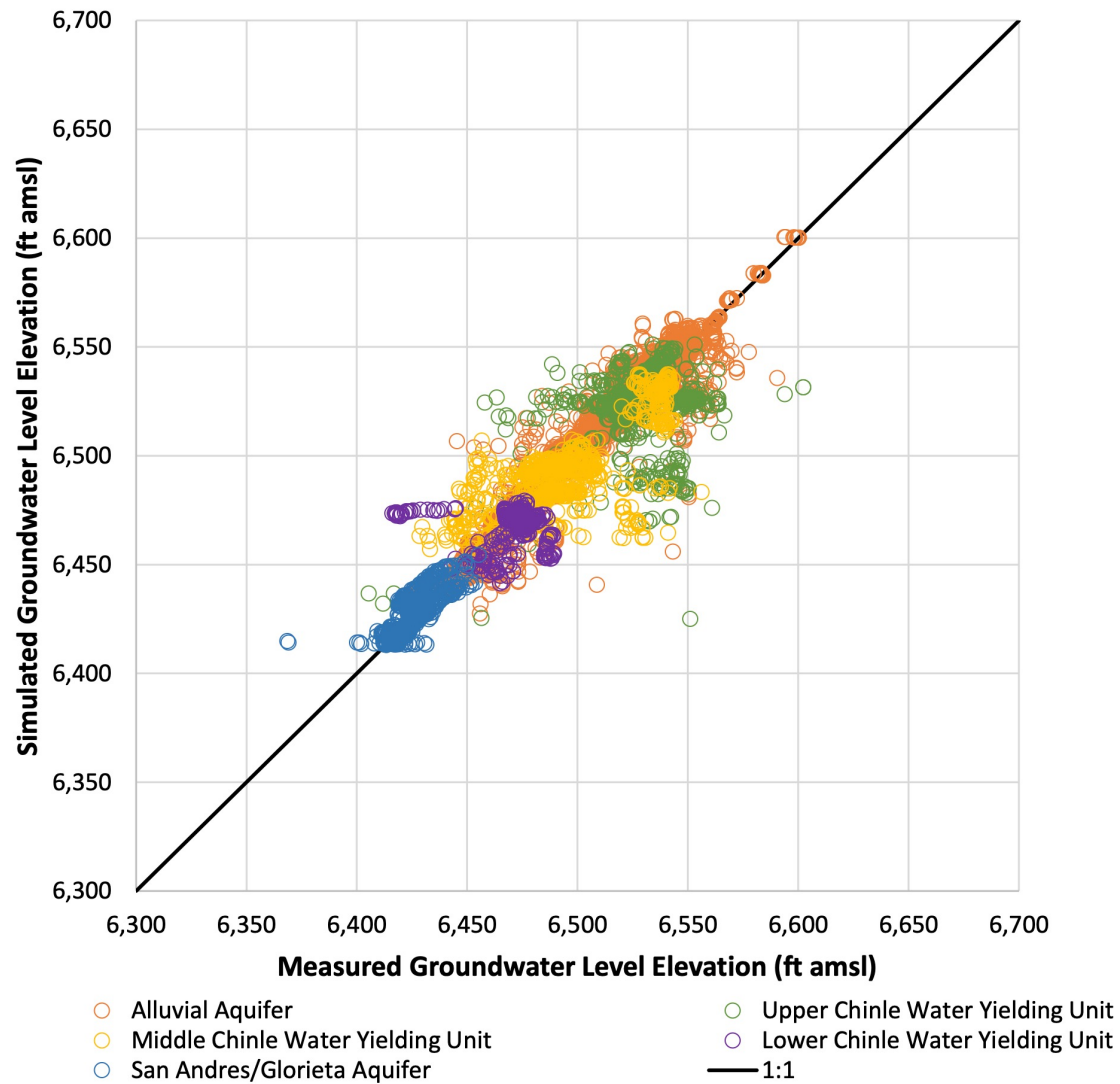
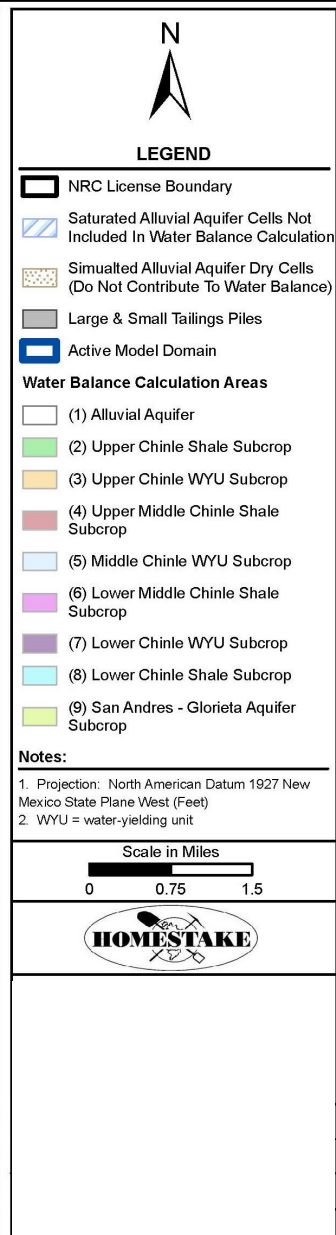
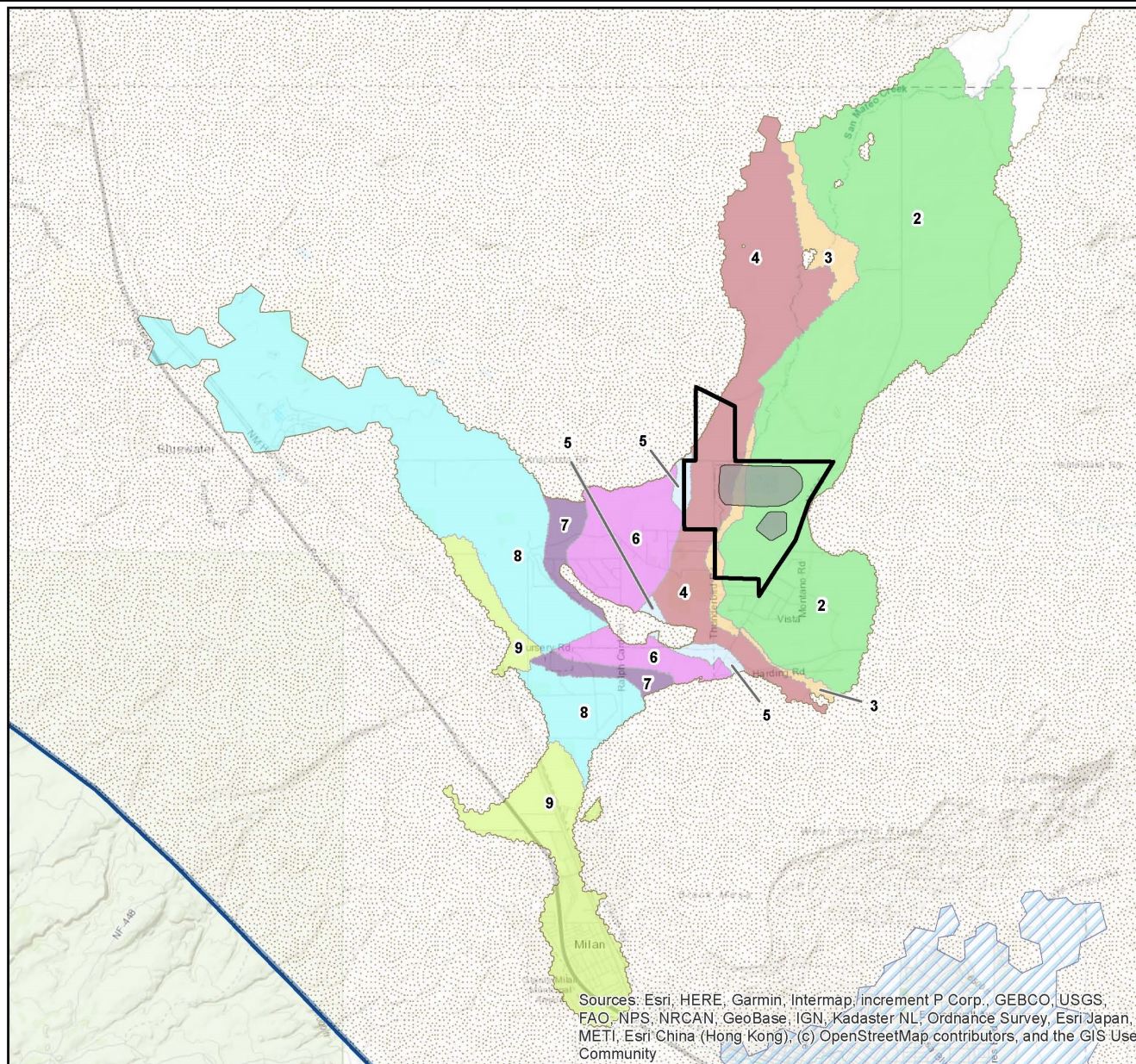


Figure 3.1-11
Simulated versus Measured
Groundwater Elevations



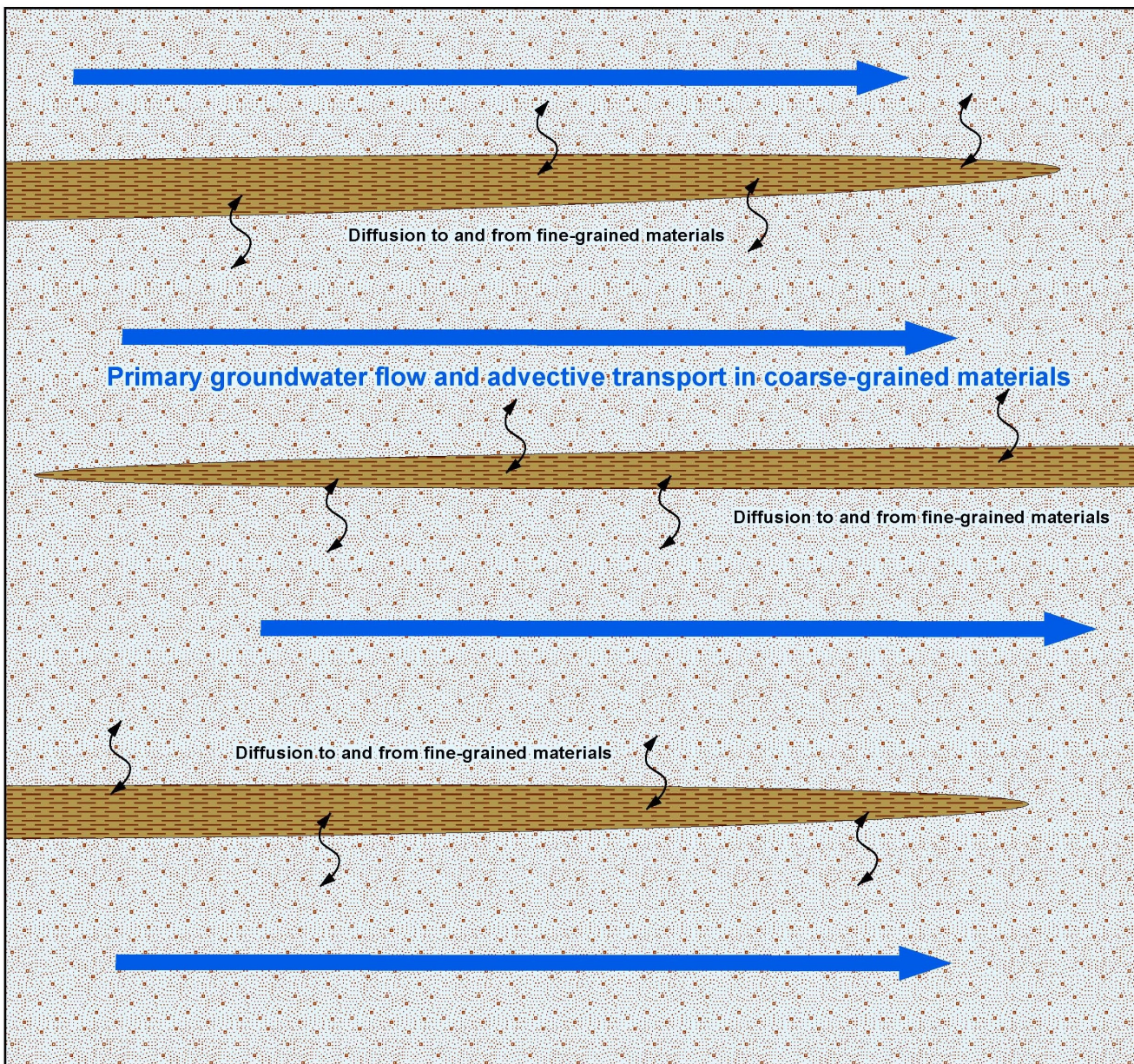


Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community





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Figure 3.1-12
Alluvial Aquifer Water Balance
Calculation Area and Subcrops



LEGEND

-  Coarse-Grained Materials
-  Fine-Grained Materials

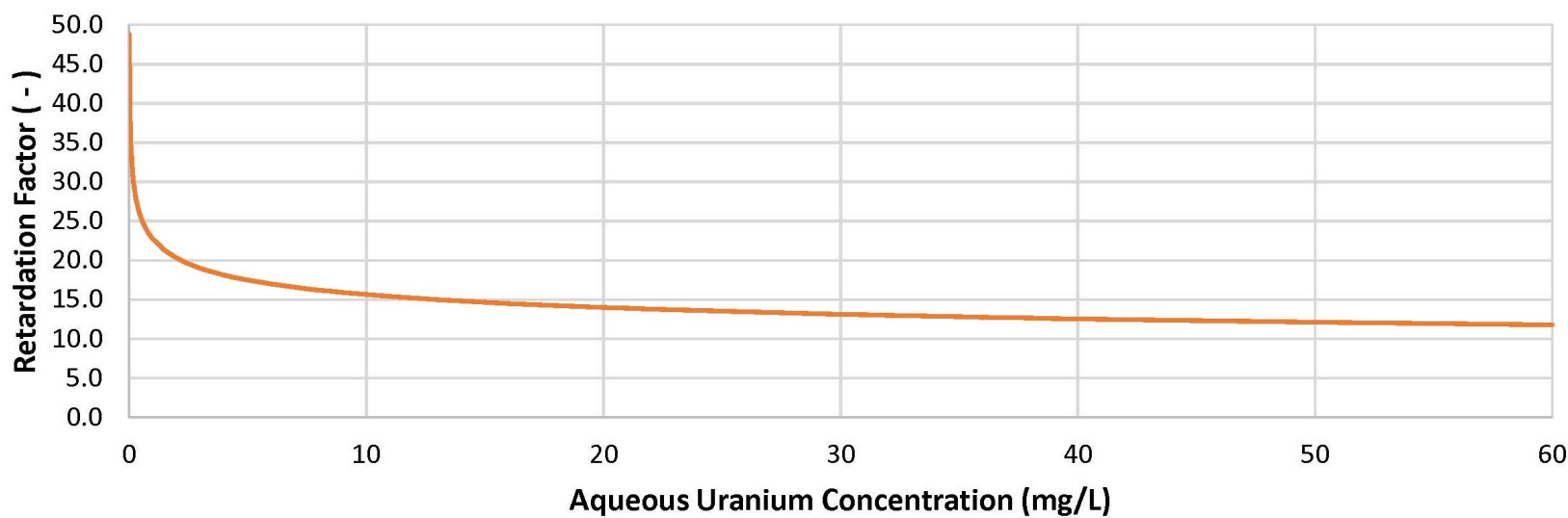
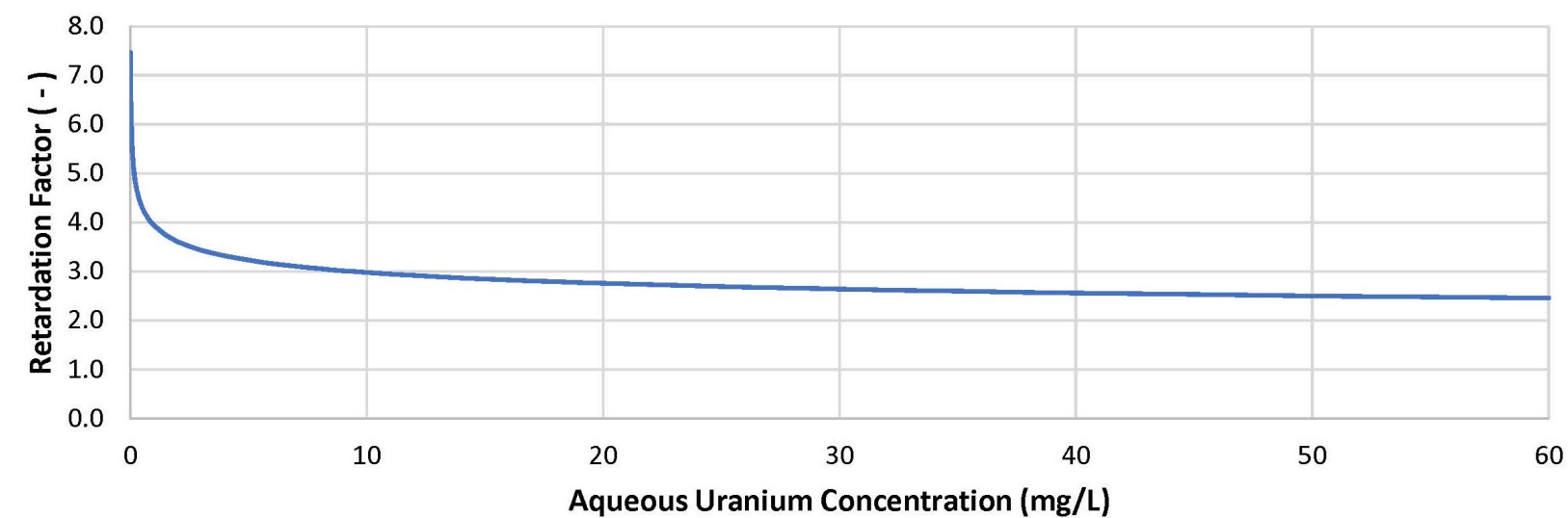
Notes:

Not to Scale



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Figure 3.1-13
Conceptual Dual-Porosity
Transport in Alluvium



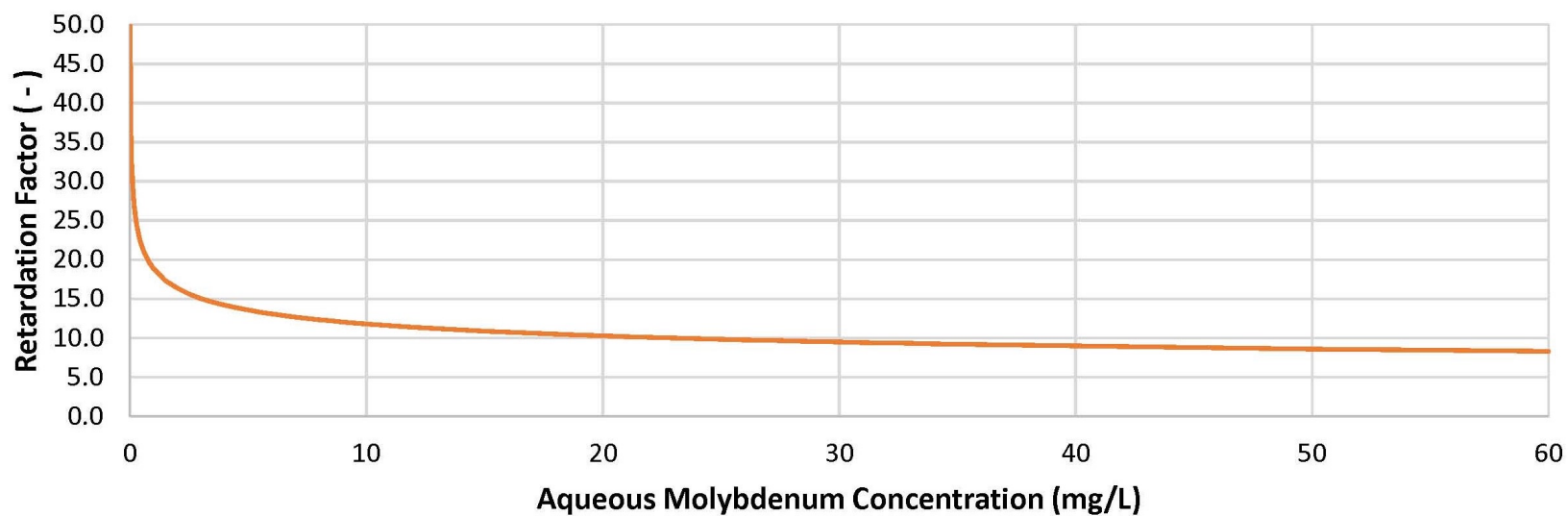
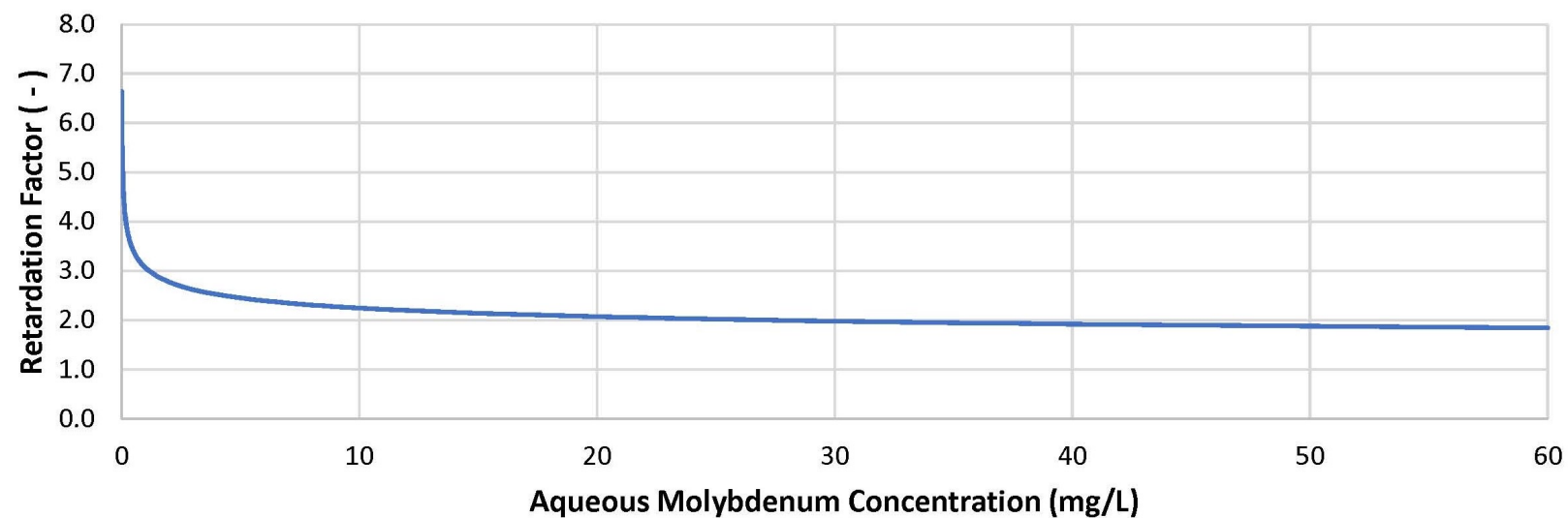
— Alluvium — Water-Yielding Bedrock Units



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Corrective Action Program

Source: Brown and Caldwell Calibration Report, 2021

Figure 3.1-14
Simulated Retardation and Aqueous
Uranium Concentration Relationships



— Alluvium

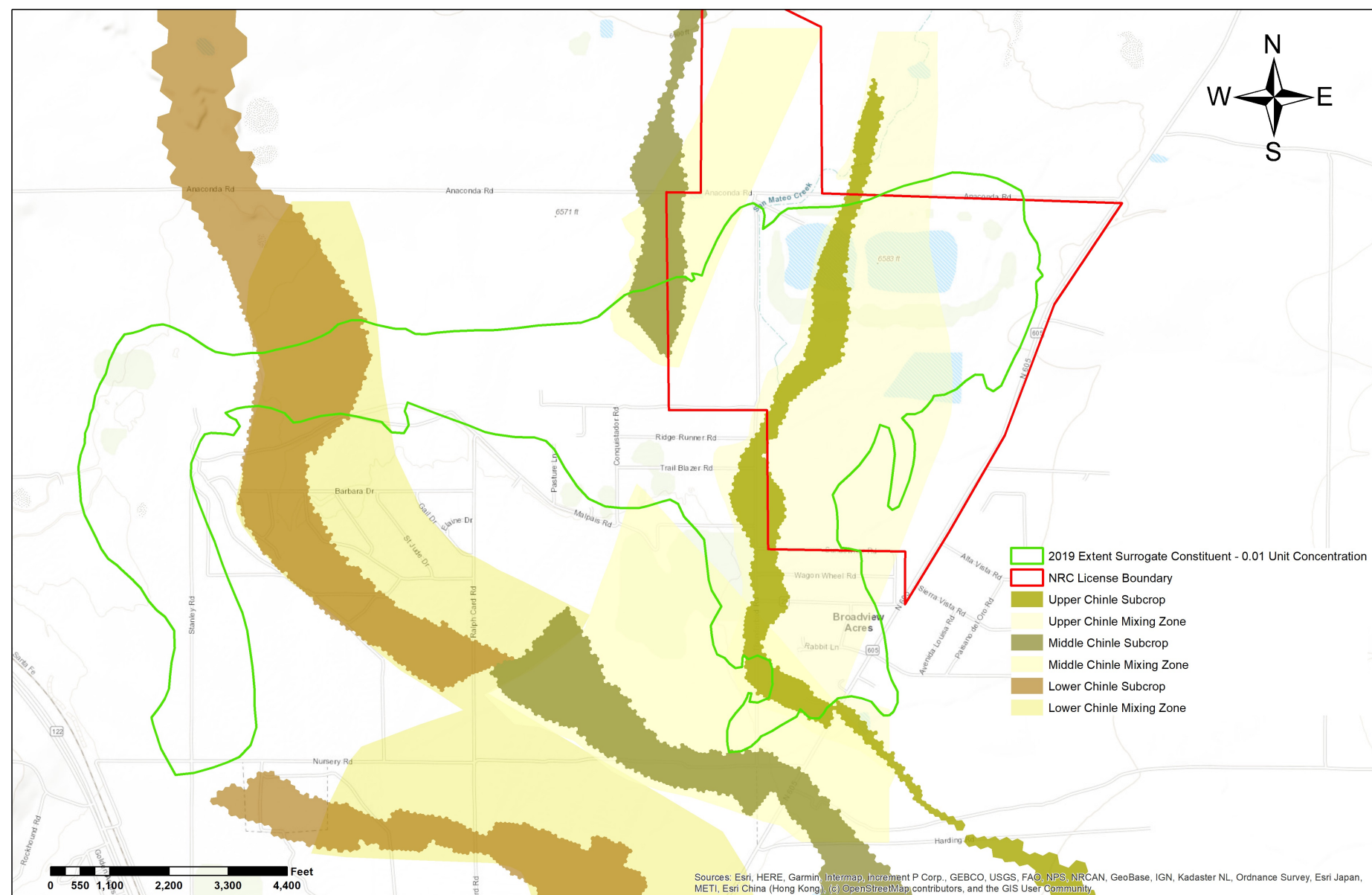
— Water-Yielding Bedrock Units

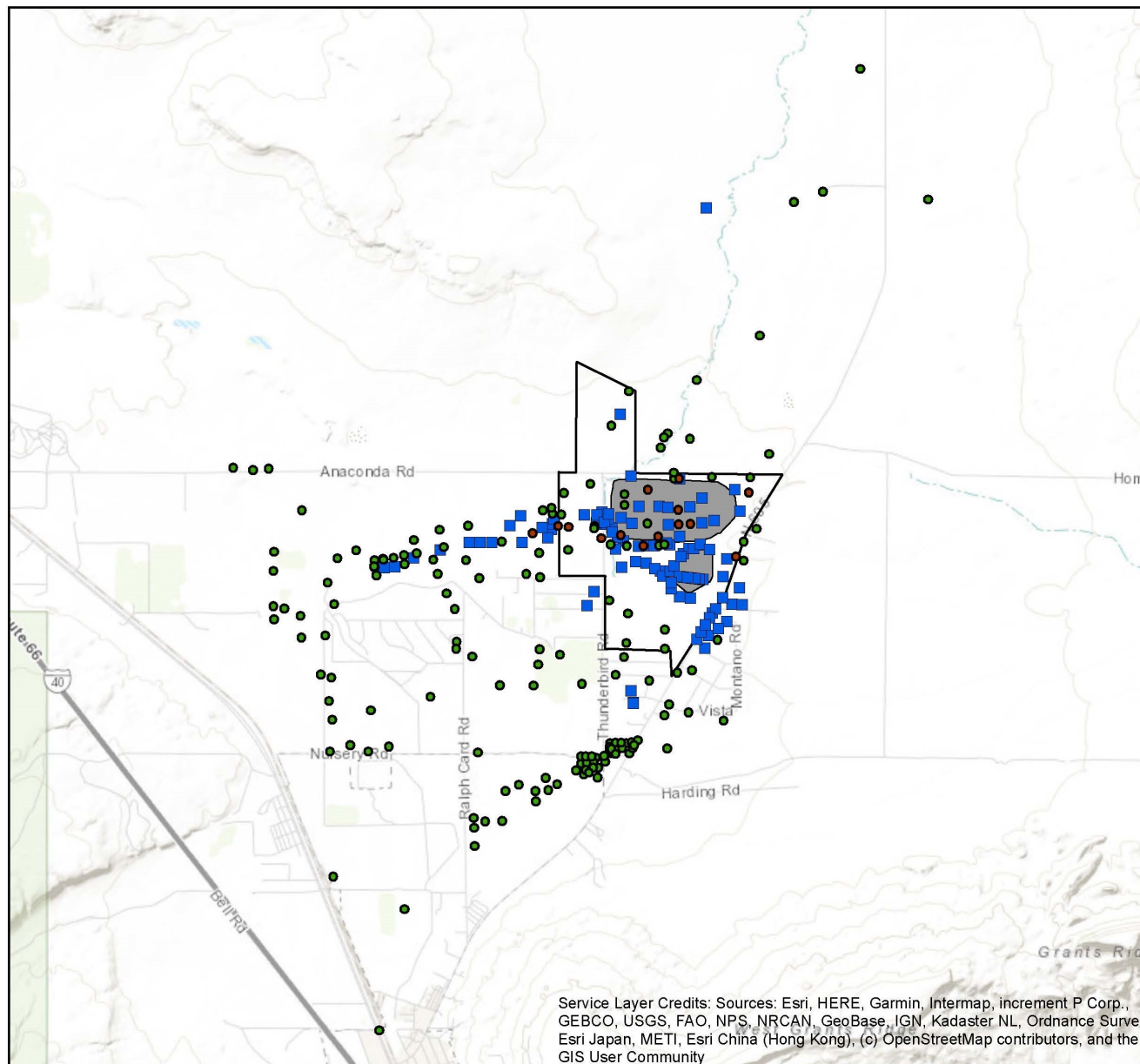


Grants Reclamation Project
Corrective Action Program

Source: Brown and Caldwell Calibration Report, 2021

Figure 3.1-15
Simulated Retardation and Aqueous
Molybdenum Concentration Relationships





Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community



LEGEND

Alluvial Aquifer Concentration Targets

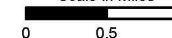
- Uranium and Molybdenum Targets
- Uranium Only Targets
- Molybdenum Only Targets

- NRC License Boundary
- Large & Small Tailings Piles

Notes:

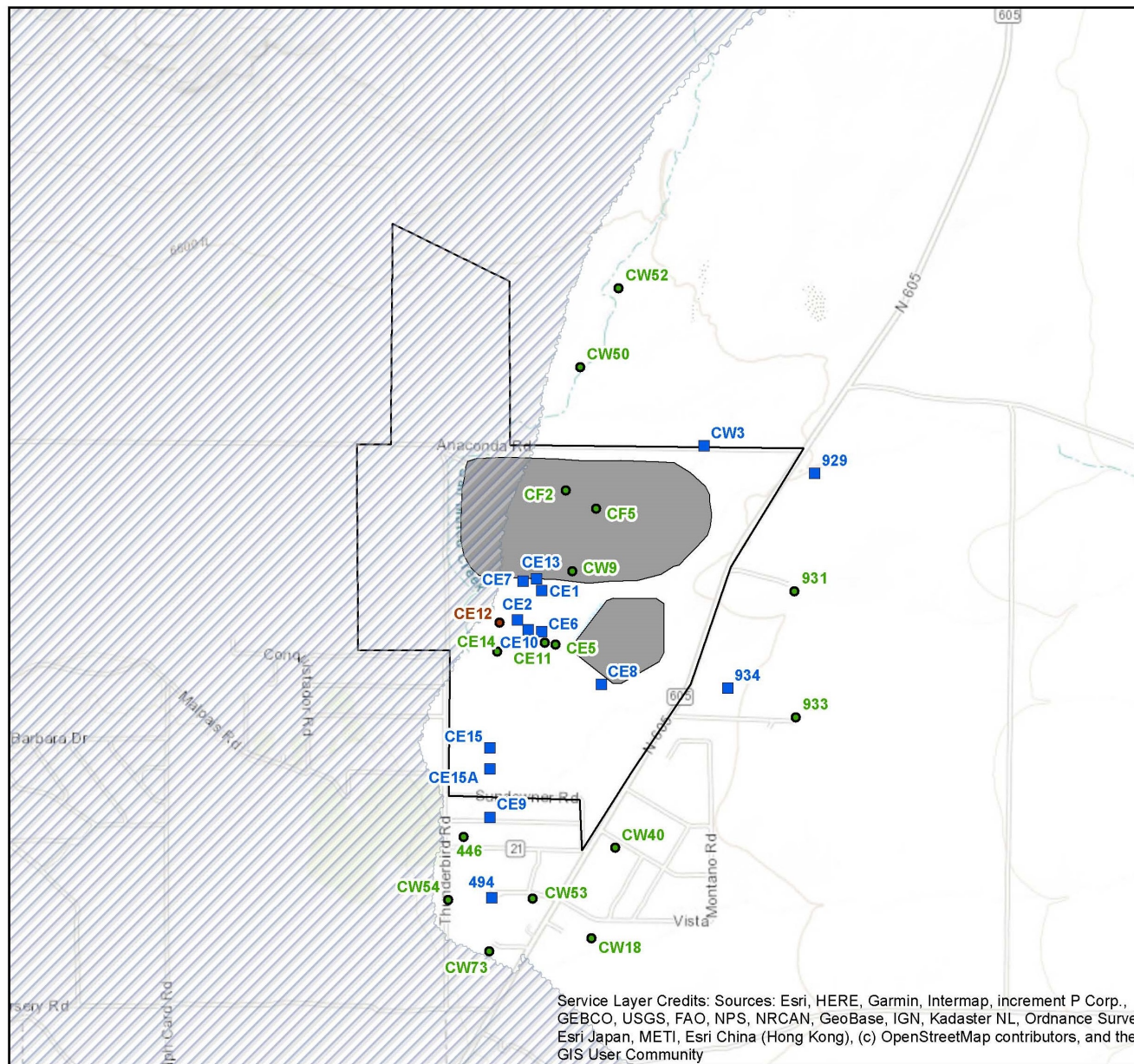
1. Projection: North American Datum 1927 New Mexico State Plane West (Feet)
2. Well locations without names are shown to represent target coverage within the alluvial aquifer. Well locations with name labels are provided on each simulated vs. observed chemograph in Appendix D.


Scale in Miles



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Figure 3.3-1
Alluvial Groundwater Constituent
Concentration Target Locations
(Layer 1)



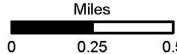

LEGEND

Upper Chinle Water Yielding Unit Concentration Targets

- Uranium and Molybdenum Targets
- Uranium Only Targets
- Molybdenum Only Targets
- Simulated Pinchout Area (Not Active)
- NRC License Boundary
- Large & Small Tailings Piles

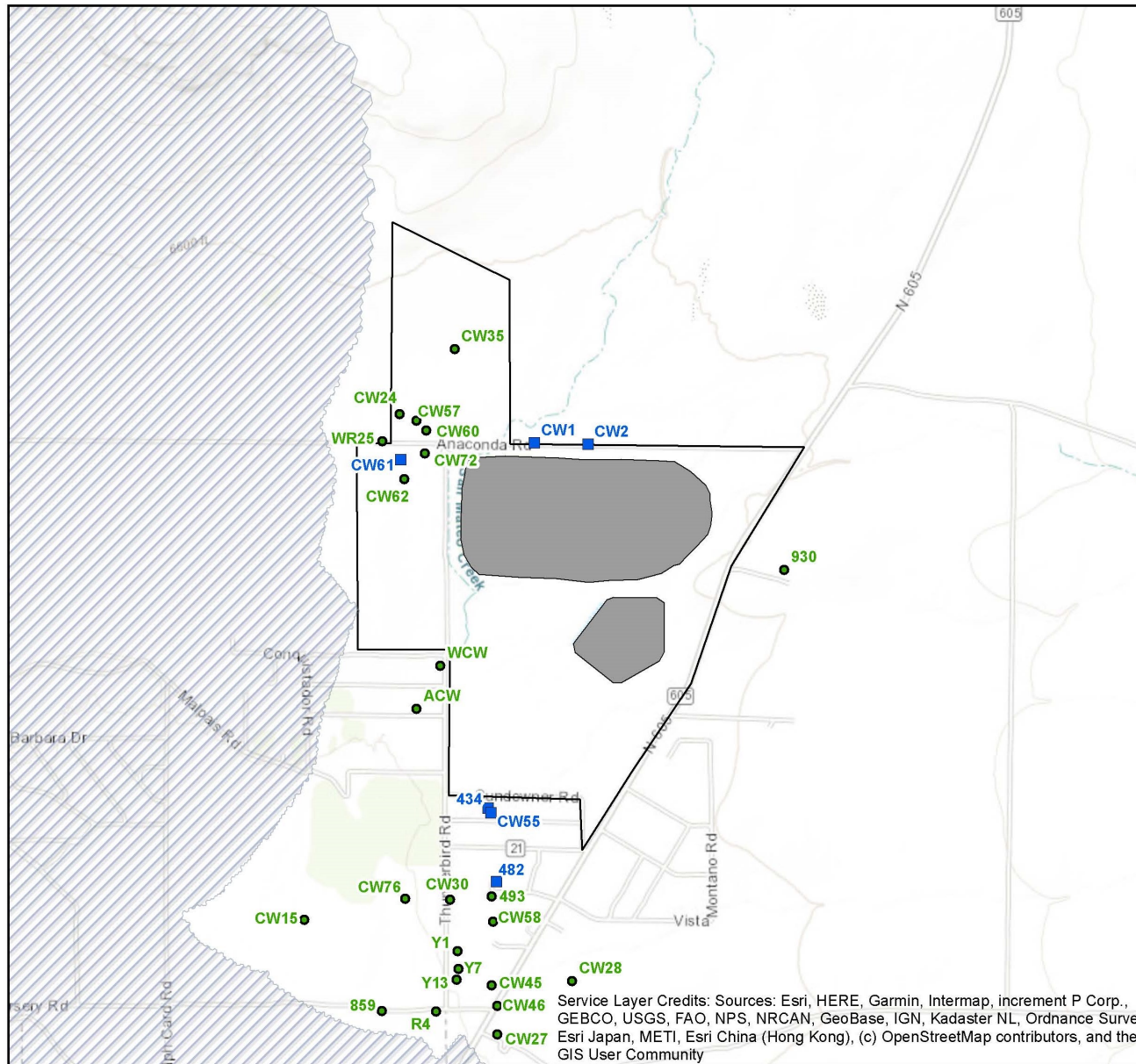
Notes:

1. Projection: North American Datum 1927 New Mexico State Plane West (Feet)


 Miles
 0 0.25 0.5

Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

Figure 3.3-2
 Upper Chinle Groundwater Constituent
 Concentration Target Locations
 (Layer 4)



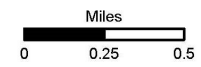
LEGEND

Middle Chinle Water Yielding Unit Concentration Targets

- Uranium and Molybdenum Targets
- Uranium Only Targets
- Simulated Pinchout Area (Not Active)
- NRC License Boundary
- Large & Small Tailings Piles

Notes:

1. Projection: North American Datum 1927 New Mexico State Plane West (Feet)

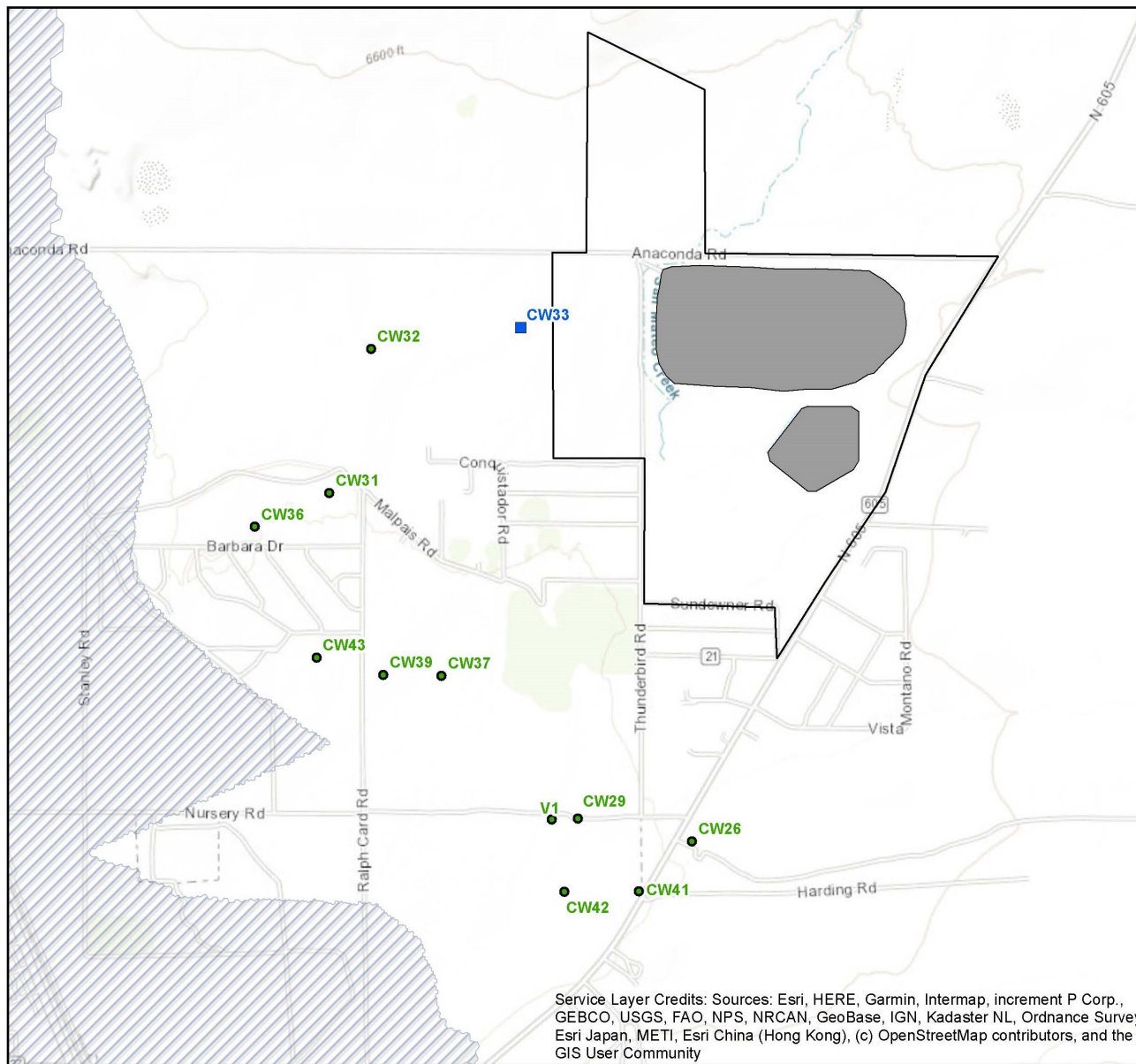


Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community



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Figure 3.3-3
Middle Chinle Groundwater Constituent
Concentration Target Locations
(Layer 6)



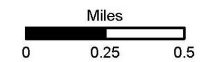
LEGEND

Lower Chinle Water Yielding Unit Concentration Targets

- Uranium and Molybdenum Targets
- Uranium Only Targets
- Simulated Pinchout Area (Not Active)
- NRC License Boundary
- Large & Small Tailings Piles

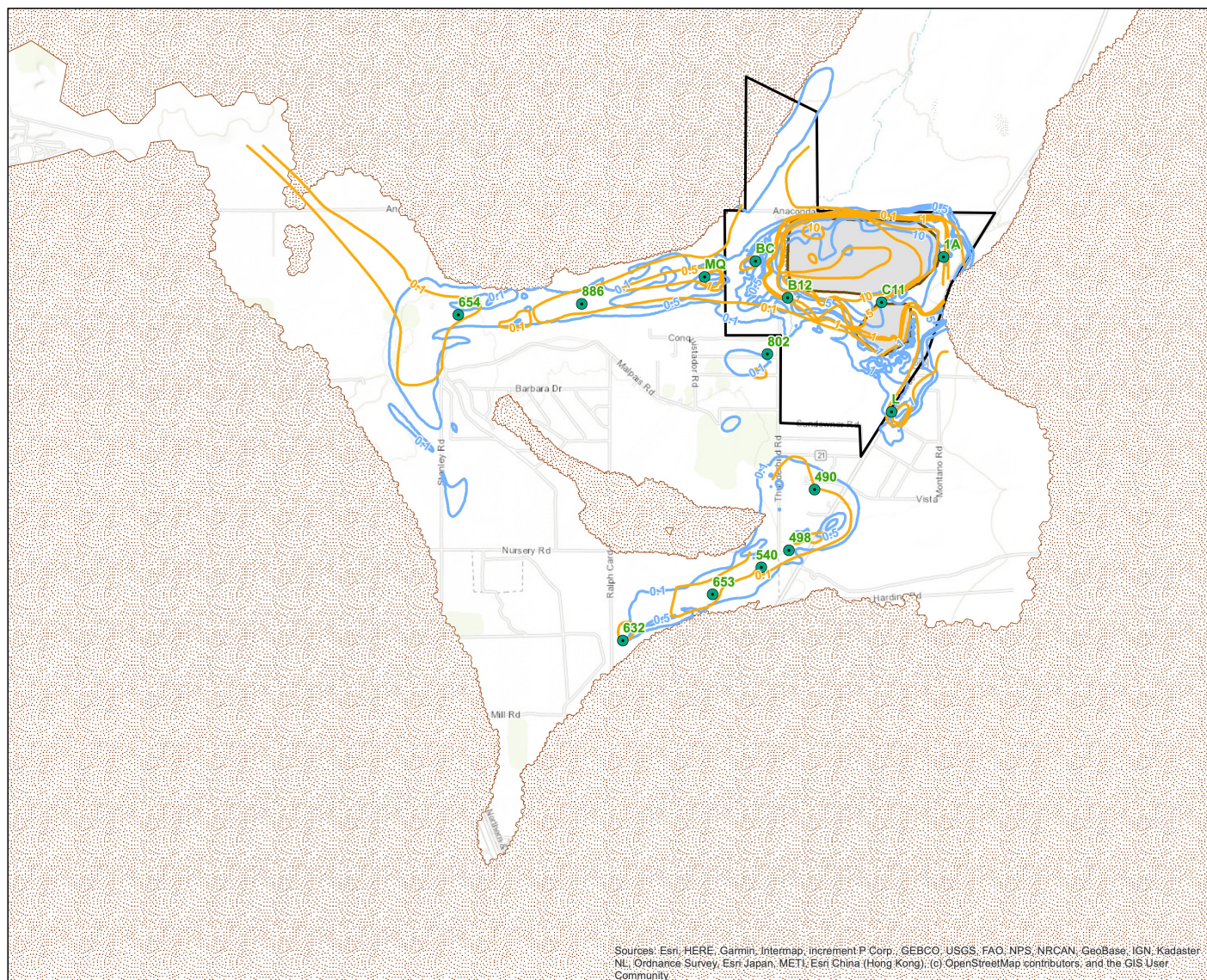
Notes:

1. Projection: North American Datum 1927 New Mexico State Plane West (Feet)



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Figure 3.3-4
Lower Chinle Groundwater Constituent
Concentration Target Locations
(Layer 8)



LEGEND

- NRC License Boundary
- LTP and STP Footprints
- Simulated Dry Cells
- Observed Alluvial Aquifer U Concentration Contours - 2019 Annual Report (mg/L)
- Simulated 2019 Alluvial Aquifer U Concentration Contours (mg/L)
- Selected Uranium Target with Chemograph

Notes

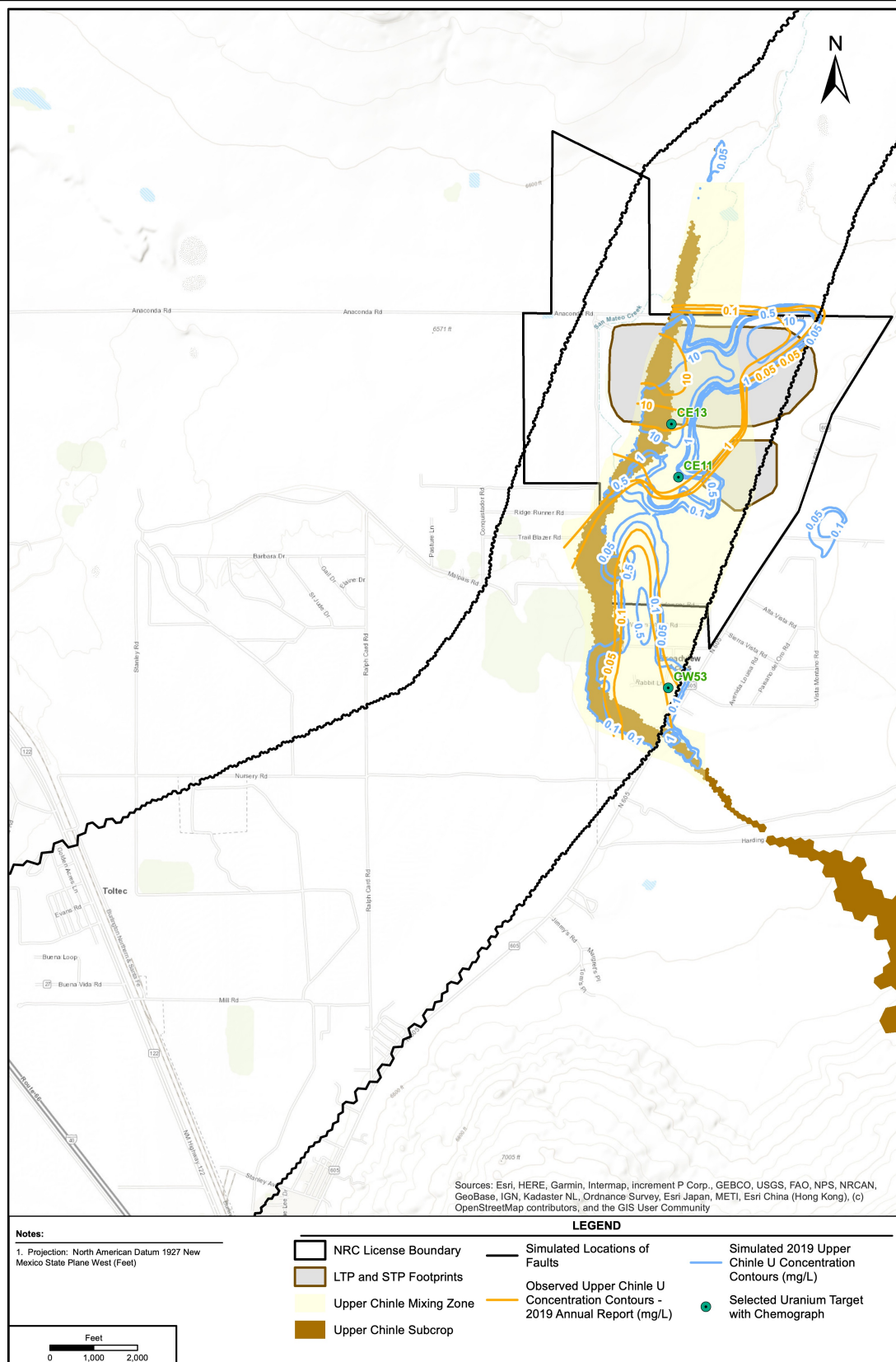
1. Projection: North American Datum 1927 New Mexico State Plane West (Feet)

0 1,000 2,000 4,000 Feet



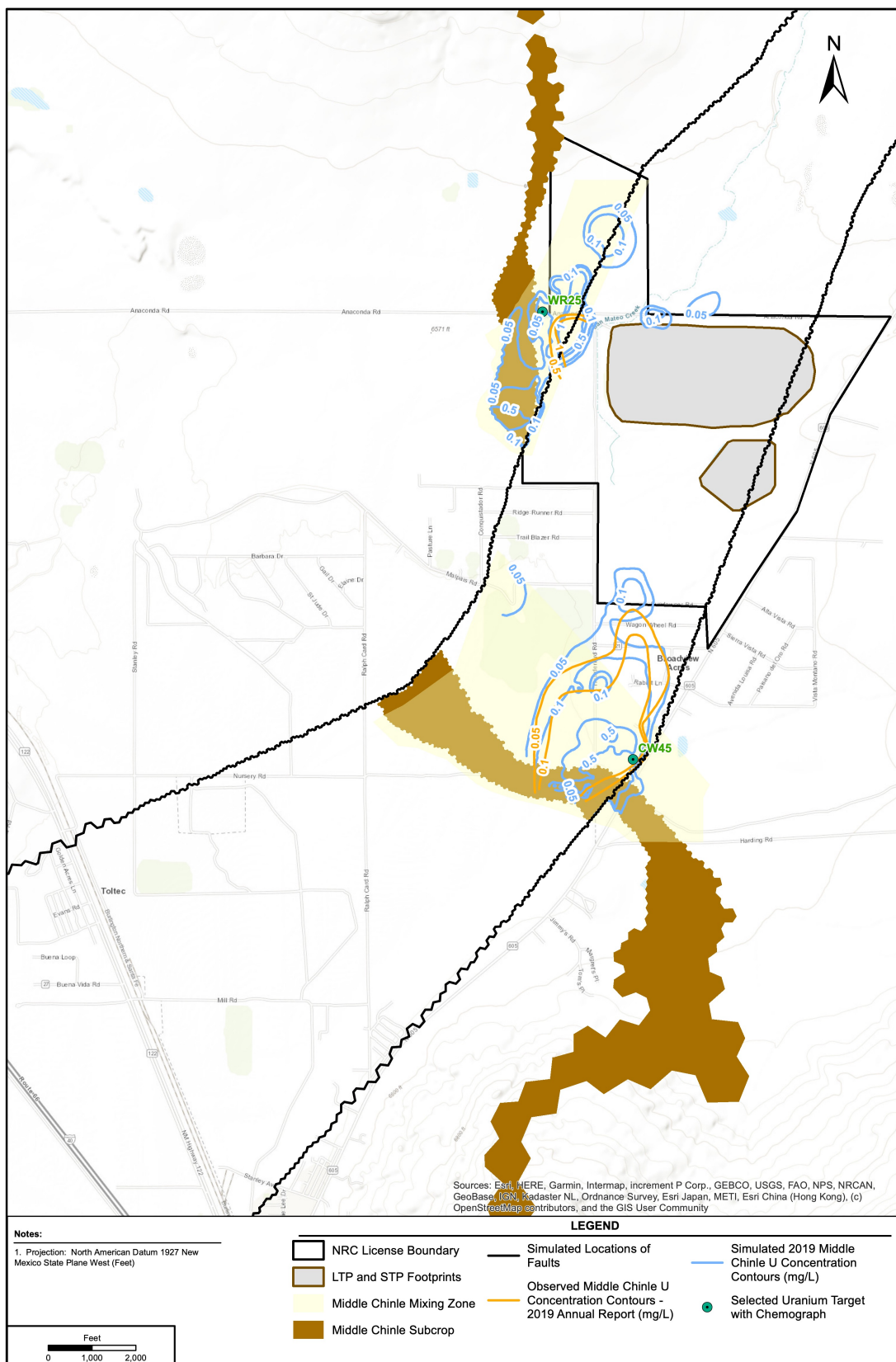
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Figure 3.3-5
Alluvial Aquifer Simulated versus
Observed 2019 Groundwater
Uranium Concentrations



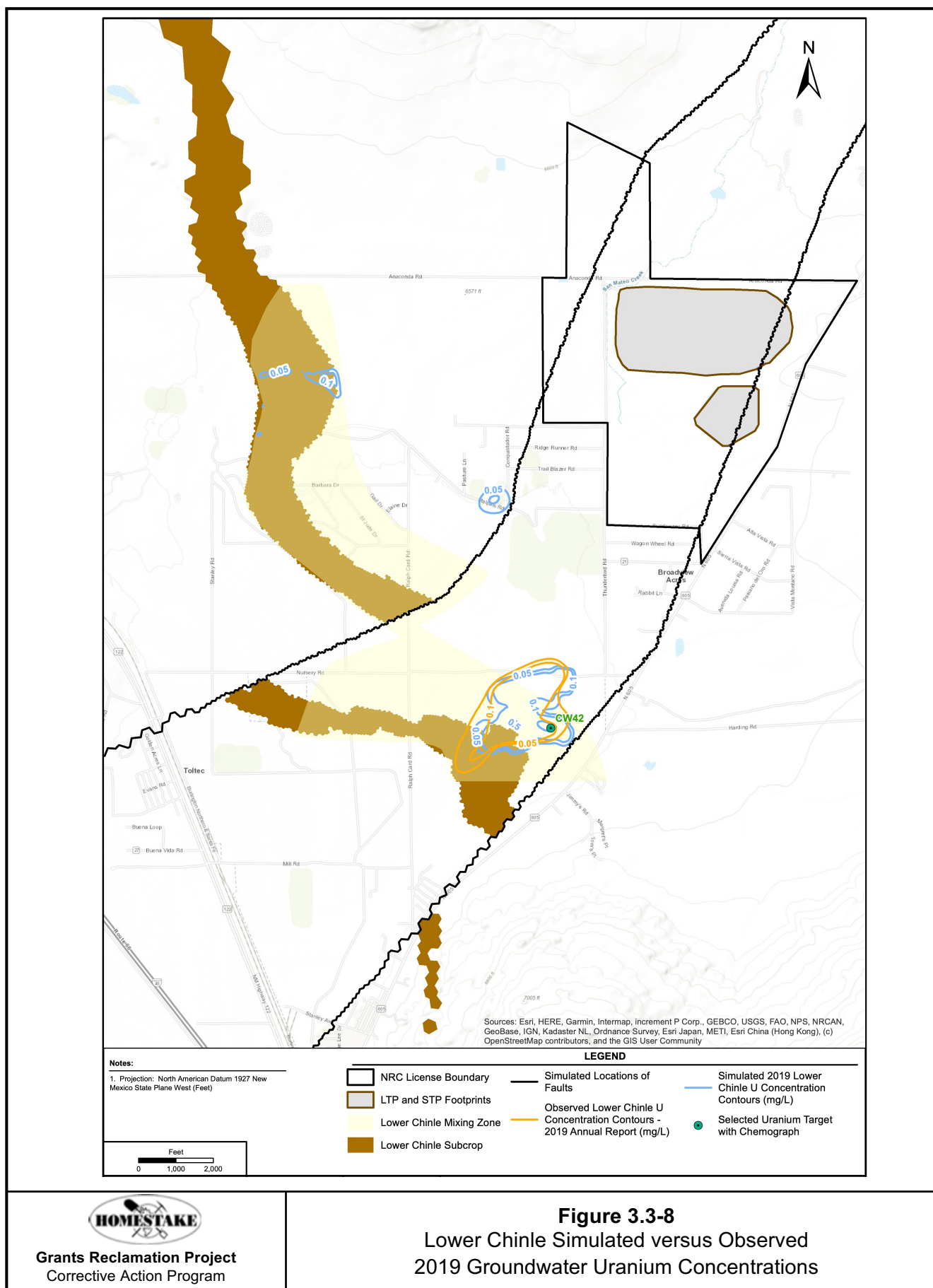
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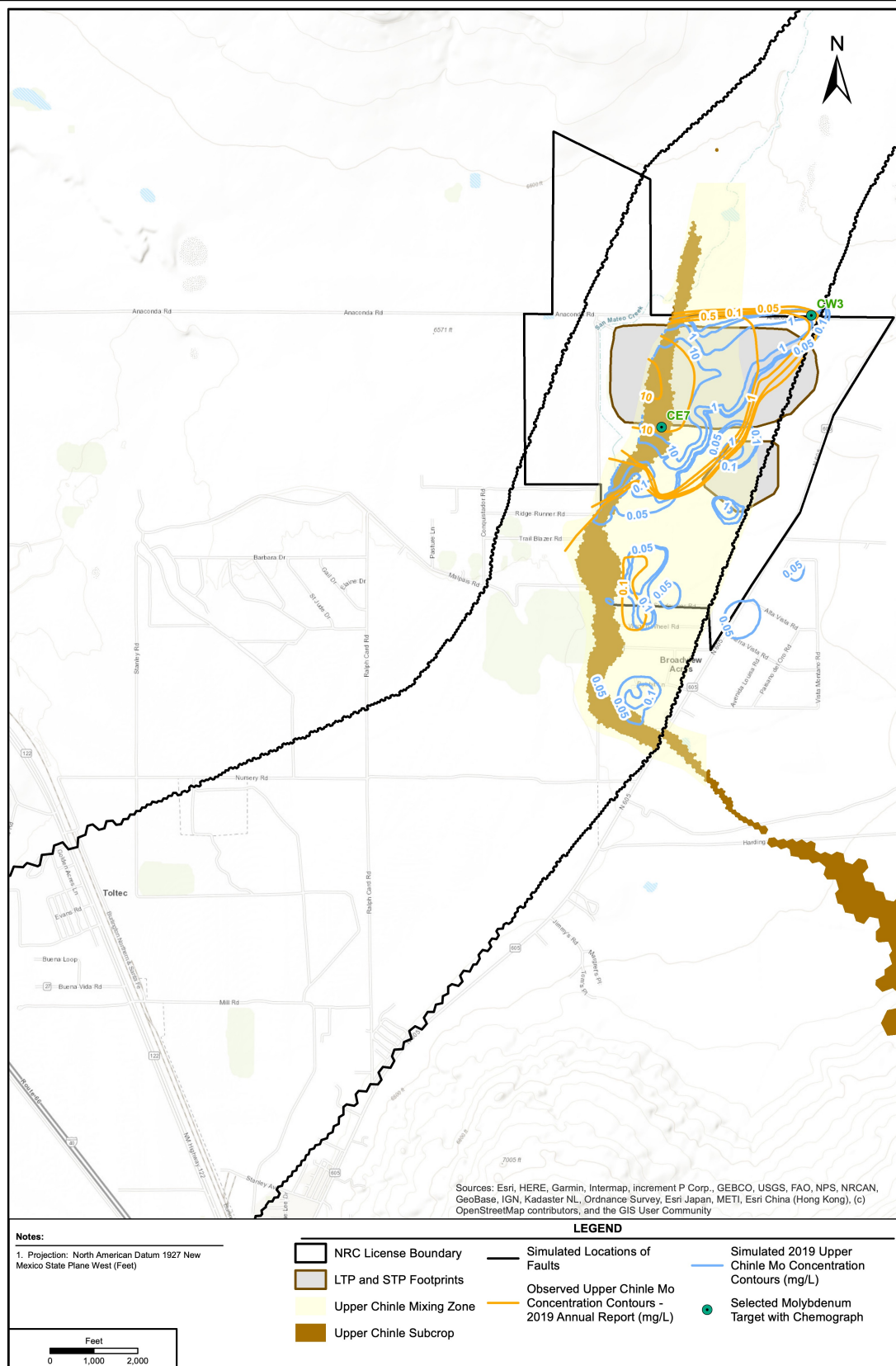
Figure 3.3-6
Upper Chinle Simulated versus Observed
2019 Groundwater Uranium Concentrations



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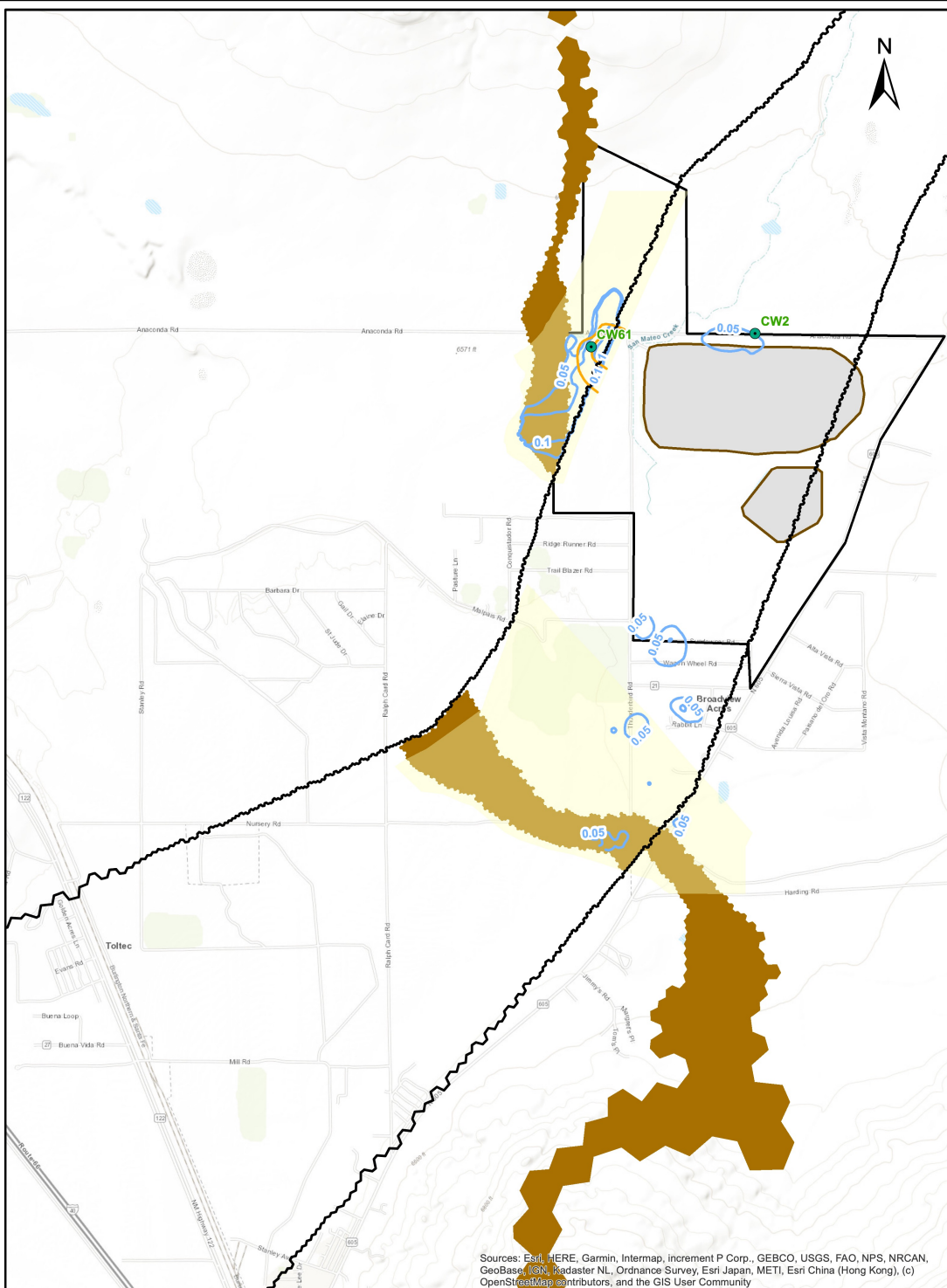
Figure 3.3-7
Middle Chinle Simulated versus Observed
2019 Groundwater Uranium Concentrations





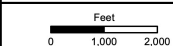
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Figure 3.3-10
Upper Chinle Simulated versus Observed
2019 Groundwater Molybdenum Concentrations



Notes:

1. Projection: North American Datum 1927 New Mexico State Plane West (Feet)



LEGEND

- NRC License Boundary
- LTP and STP Footprints
- Middle Chinle Mixing Zone
- Middle Chinle Subcrop
- Simulated Locations of Faults
- Observed Middle Chinle Mo Concentration Contours - 2019 Annual Report (mg/L)
- Simulated 2019 Middle Chinle Mo Concentration Contours (mg/L)
- Selected Molybdenum Target with Chemograph



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Figure 3.3-11
Middle Chinle Simulated versus Observed
2019 Groundwater Molybdenum Concentrations

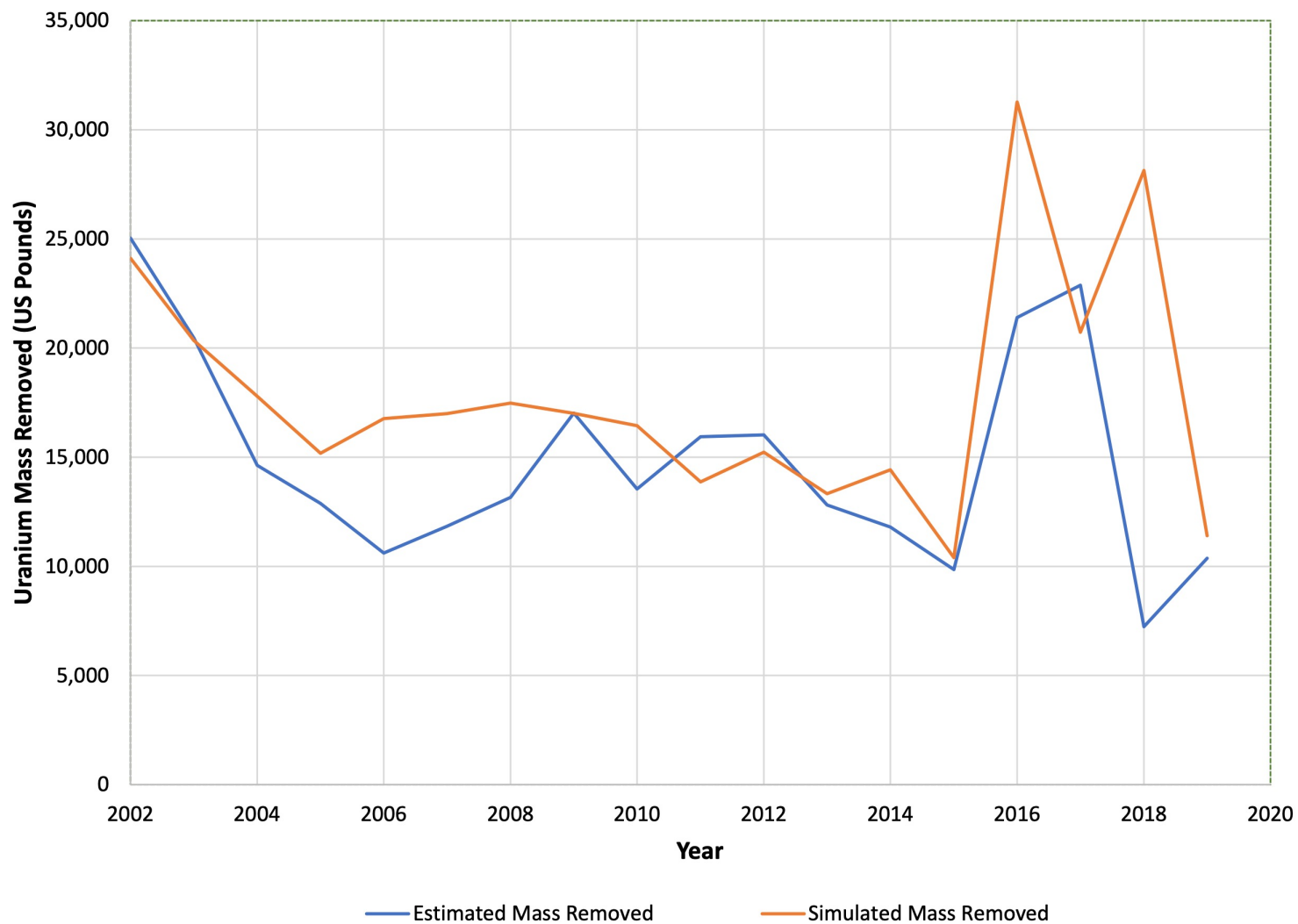


Figure 3.3-12
Simulated versus Estimated Uranium Mass
Removal By Year

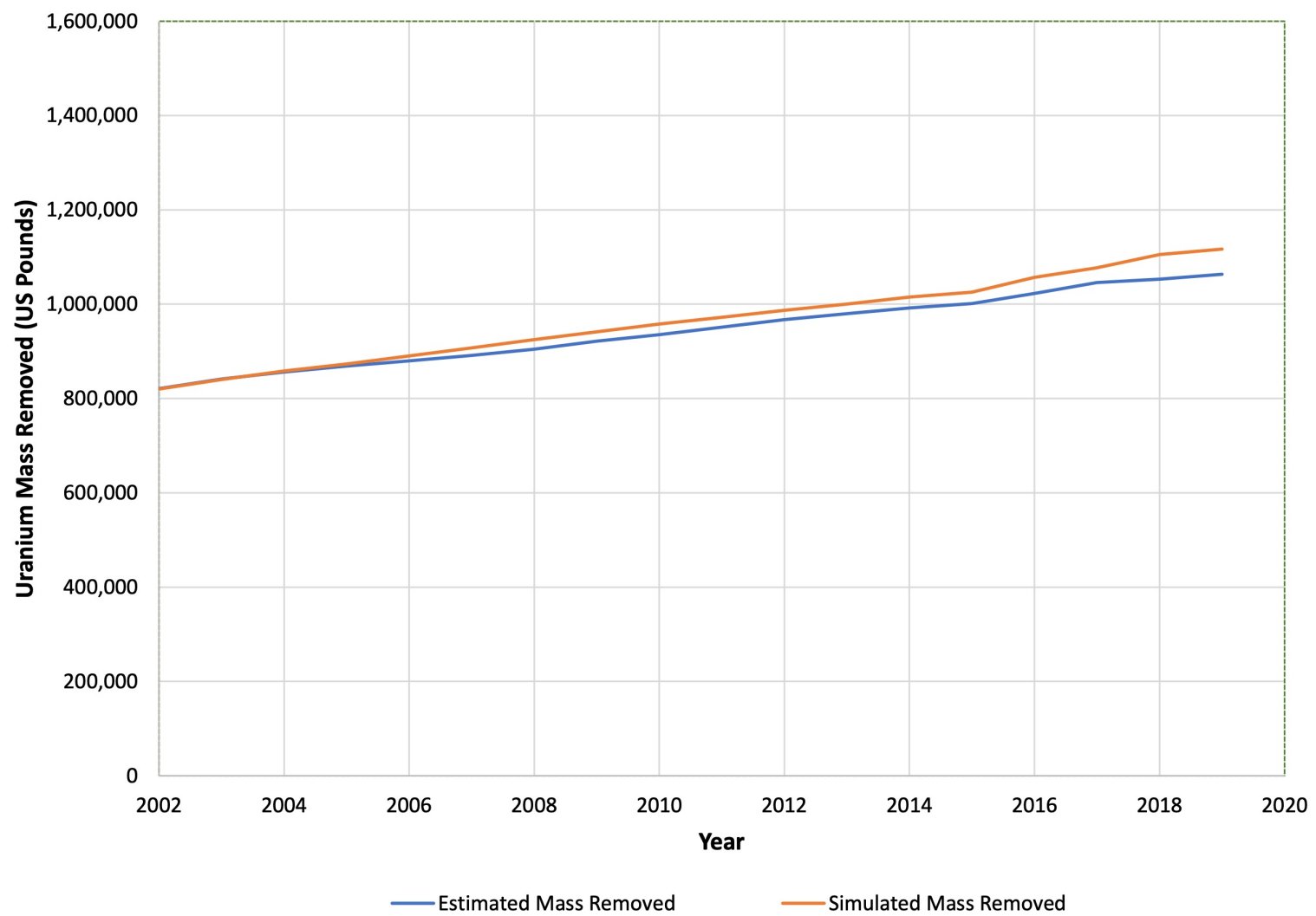


Figure 3.3-13
Cumulative Simulated versus Estimated
Uranium Mass Removal

