

TRIBAL-LED CLEANUP ACTIVITIES AT THE TAR CREEK SUPERFUND SITE

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Tribal Lands Environmental Forum

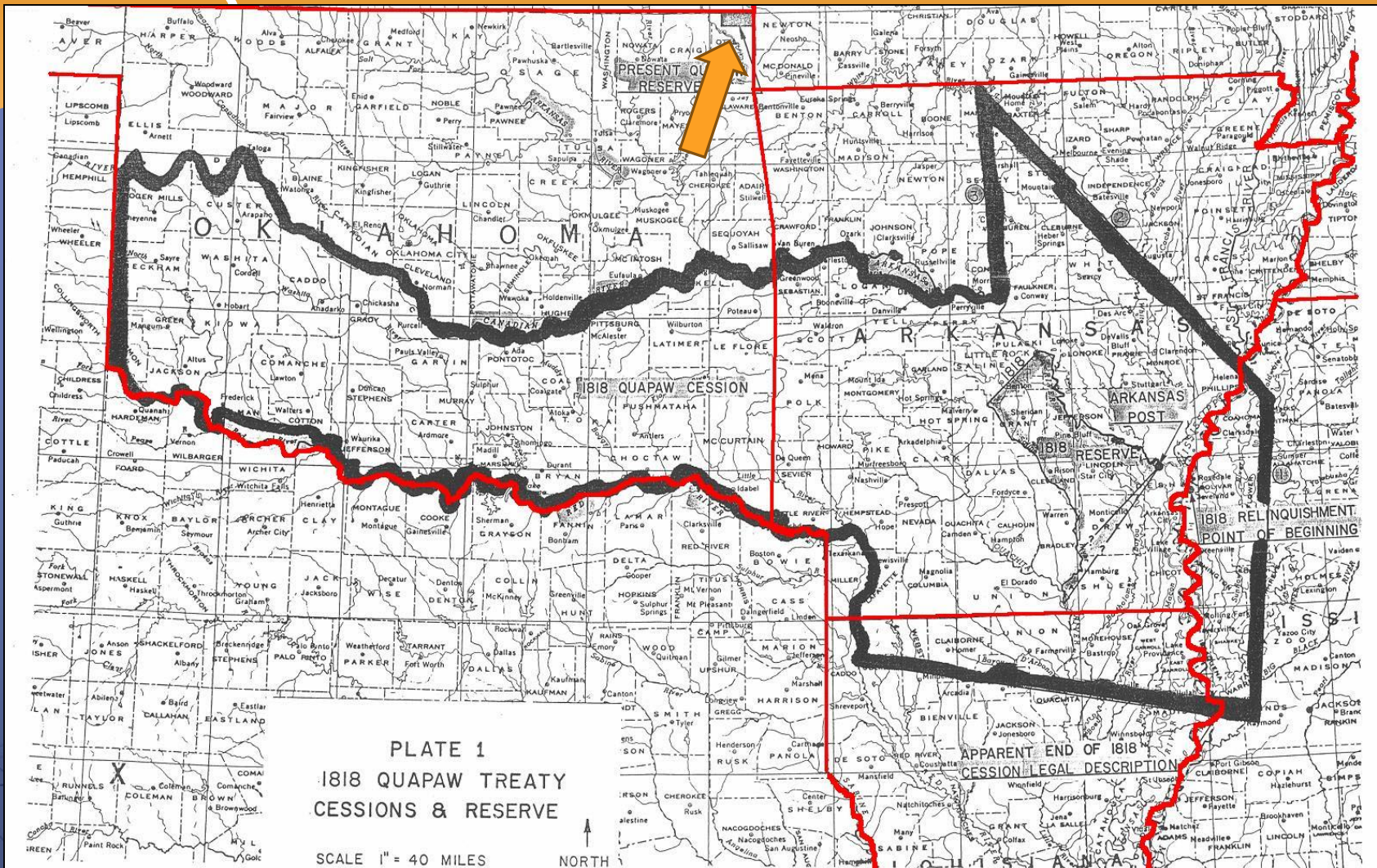
August, 2016



QUAPAW TRIBE HISTORY

- * Several hundred years ago, the Quapaw were a division of a larger group known as the Dhegiha Sioux. They split into the tribes known today as the Quapaw, Osage, Ponca, Kansa, and Omaha when they left the Ohio Valley.
- * The Quapaw moved down the Mississippi River into Arkansas. This is how the Tribe became known by other Tribes as “Ugaxpa” (“Ugakhpa”), which means (roughly) “the downstream people.”
- * They settled in the area where the Arkansas River met the Mississippi, where the meandering of the two massive rivers had deposited nutrient-rich soil conducive to farming.
- * This is where the Quapaw stayed until they were pushed out by Euro-Americans several hundred years later.

QUAPAW TRIBE HISTORY



TAR CREEK SUPERFUND SITE

- * Tri-State Mining District
- * Began mining the area during the late 1800's, lasted until approximately 1970
- * Mining and milling of ore (primarily lead and zinc) produced more than 500 million tons of waste in area
- * Two primary types of wastes from mining processes: chat and fine tailings





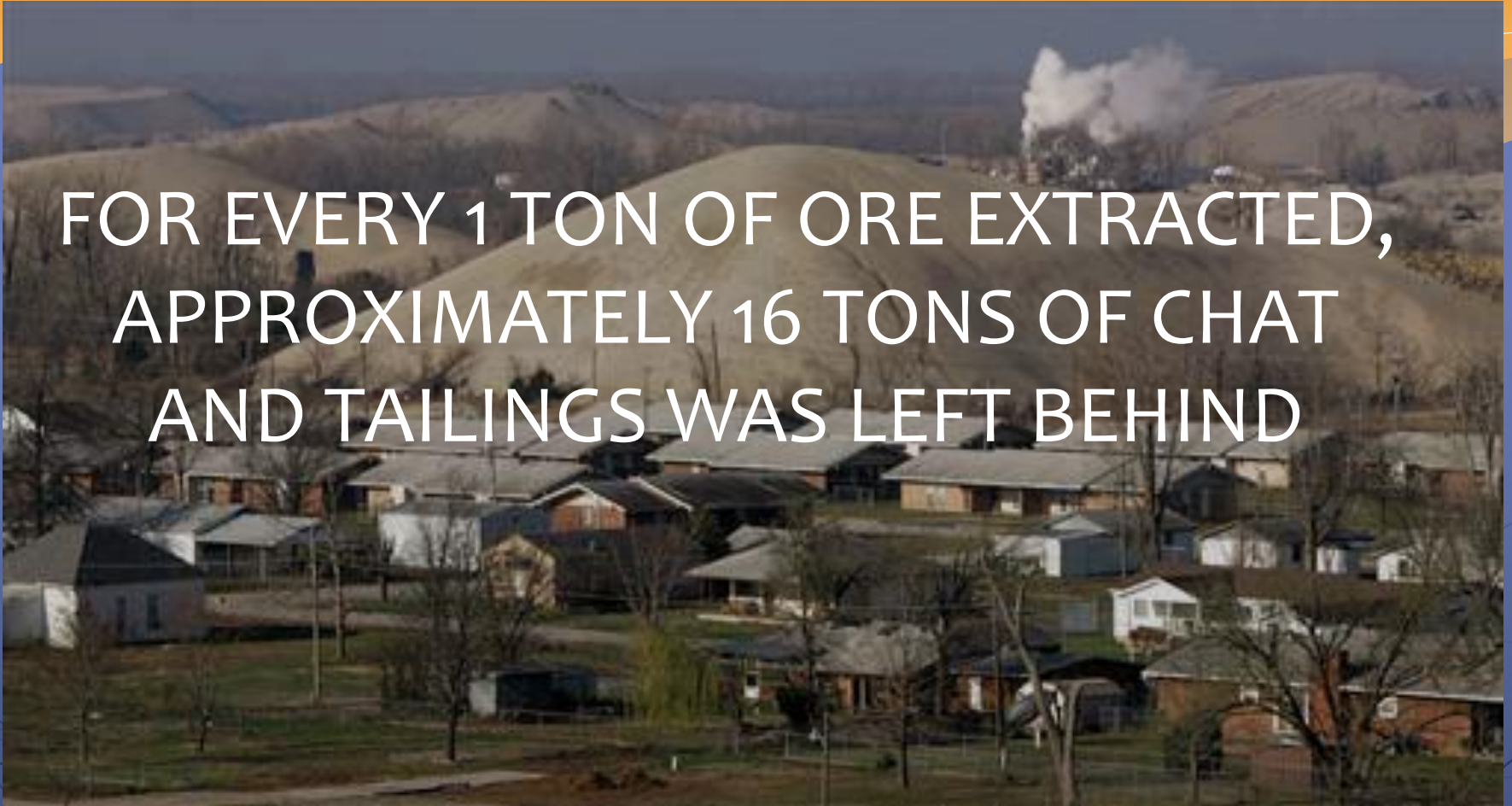


TAR CREEK SUPERFUND SITE



TAR CREEK SUPERFUND SITE

FOR EVERY 1 TON OF ORE EXTRACTED,
APPROXIMATELY 16 TONS OF CHAT
AND TAILINGS WAS LEFT BEHIND



TAR CREEK SUPERFUND SITE



QUAPAW TRIBE INVOLVEMENT AT TAR CREEK

- * Through the EPA Region 6 General Assistance Program (GAP), the Quapaw Tribe Environmental Office was established on October 1, 1997.
- * In June of 1998, the Quapaw Tribe Chairman and the EPA Region 6 Administrator signed a Tribal Environmental Agreement, which established a formal agreement between the Tribe and EPA to address the issues raised regarding the environmental protection of lands within the Quapaw Tribe's jurisdictional lands.

QUAPAW TRIBE INVOLVEMENT AT TAR CREEK

- * Currently, the Quapaw Tribe is administering an EPA Superfund management assistance grant under an existing Superfund support agency cooperative agreement.
- * The Tribe entered into this support agency cooperative agreement with EPA in 2001.
- * This management assistance grant has enabled the Tribe to have “meaningful and substantial involvement” in the decisions related to the development and implementation of remedial activities.

QUAPAW TRIBE INVOLVEMENT AT TAR CREEK

- * Working together with EPA and other stakeholders on Tar Creek issues over the past 15 years has enabled the Quapaw Tribe Environmental Office to develop the technical capacity required to administer a remedial response cooperative agreement.
- * Consequently, in 2013, the Tribe negotiated a remedial response cooperative agreement with EPA Region 6 to self-perform the remediation of an historic and culturally significant tribal property known to the Quapaw as the “Catholic 40.”

TRIBAL-LED REMEDIAL ACTION ACTIVITIES

CATHOLIC 40

- * “Catholic 40”
- * Tribal Trust Land
- * 40-acre parcel owned by the Quapaw Tribe of Oklahoma and was set aside in 1892 to the Catholic Church for religious and education purposes. In that same year, St. Mary’s of the Quapaw, a Catholic Church, a cemetery, and a boarding school was established.
- * St. Mary’s operated up until 1927, following abandonment, the church leased the property for mining in 1937.
- * In 1975, the Catholic Church deeded the property back to the Quapaw Tribe of Oklahoma.



TRIBAL-LED REMEDIAL ACTION ACTIVITIES

CATHOLIC 40

Heritage Study of Tar Creek/Picher Field, Ottawa County, Oklahoma

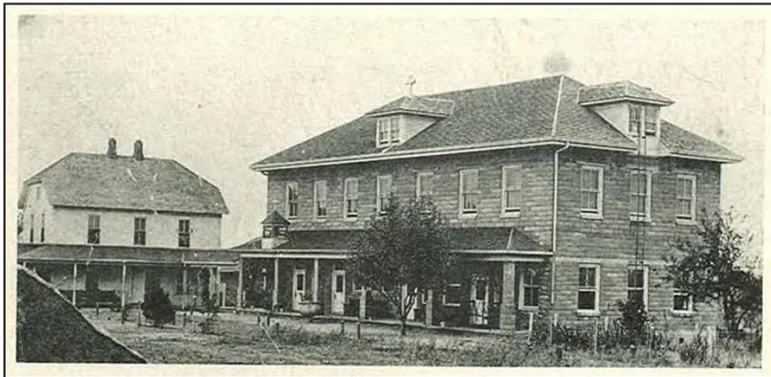


Figure A-5: St. Mary's of the Quapaw School, post-1915
NOTE THE LARGE CHATCRETE STRUCTURE CONSTRUCTED 1915 (PHOTO FROM NIEBERDING 1953).

Heritage Study of Tar Creek/Picher Field, Ottawa County, Oklahoma



Figure A-3: St. Mary's of the Quapaw School, undated. Note the same 2-story building as in the previous figure and small building that may have been John Quapaw's school.
(Photo from Quapaw Pow-wow Program, 1990)



Figure A-4: St. Mary's of the Quapaw School photo showing the reverse side of the same buildings as the previous photo (photo courtesy of the Dodson Museum, Ottawa County Historical Society).



Figure A-6: St. Mary's of the Quapaw School, post-1915. View of the school toward the south showing the 1915 three story building and two-story frame building (photo courtesy of the Dodson Museum, Ottawa County Historical Society).

TRIBAL-LED REMEDIAL ACTION ACTIVITIES

CATHOLIC 40

- * The Quapaw Tribe Environmental Office, retained the services of a consulting engineering firm to assist in generating plans and specifications, and other pre-construction documents.
- * Remedial Action began in December 2013 and involved: excavation, hauling, and disposal of approximately 107,000 tons of source material (chat).



TRIBAL-LED REMEDIAL ACTION ACTIVITIES

CATHOLIC 40



TRIBAL-LED REMEDIAL ACTION ACTIVITIES

CATHOLIC 40



TRIBAL-LED REMEDIAL ACTION ACTIVITIES

CATHOLIC 40

- * Transition Zone (TZ) Sampling and Analysis
- * 5 aliquots from each grid homogenized into one sample sent to lab for analyses (0-6 and 6-12 inch sample depths)
- * Analyses included Tar Creek Contaminants of Concern: Cadmium, Lead, and Zinc



TRIBAL-LED REMEDIAL ACTION ACTIVITIES

CATHOLIC 40

- * Soil amendments added to TZ soils to reduce Bioavailability of Metals
 - * Agricultural Lime
 - * Chicken Litter, and
 - * Mushroom Compost
- * Native Grass Seeding
 - * Fescue
 - * Rye
 - * Bermuda



TRIBAL-LED REMEDIAL ACTION ACTIVITIES

DISTAL 6a

- * SE Distal Zone, Distal 6a
- * Unrestricted Property
- * State-led project, with the request that the Tribe do the remediation work as the “contractor” through an intra-agency agreement.
- * Adjacent to “Catholic 40” property



TRIBAL-LED REMEDIAL ACTION ACTIVITIES

DISTAL 6a



TRIBAL-LED REMEDIAL ACTION ACTIVITIES

DISTAL 6a



TRIBAL-LED REMEDIAL ACTION ACTIVITIES

DISTAL 6a

- * Remedial Action began in June 2014 and involved: excavation, hauling, and disposal of approximately 82,000 tons of source material (chat).
- * The source material was disposed of in a large collapsed feature in the northern portion of the Tar Creek Site.



TRIBAL-LED REMEDIAL ACTION ACTIVITIES

DISTAL 6a



Same soil amendment activities as conducted at
“Catholic 40”

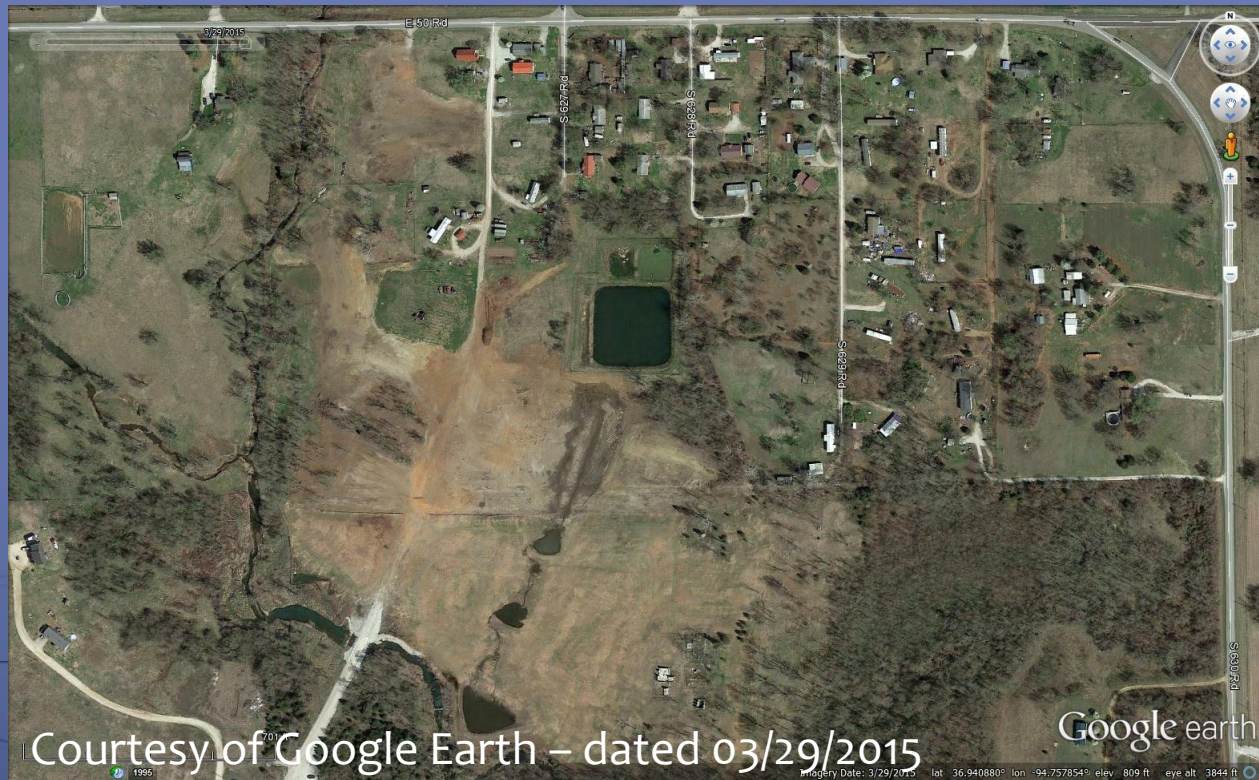
TRIBAL-LED REMEDIAL ACTION ACTIVITIES

BEFORE AND AFTER



TRIBAL-LED REMEDIAL ACTION ACTIVITIES

BEFORE AND AFTER



TRIBAL-LED REMEDIAL ACTION ACTIVITIES

Distal 13

- * Remedial Action began in October 2015 and involves: excavation, hauling, and disposal of approximately 600,000 tons of source material (chat).
- * Marketable and Unmarketable chat present
- * The source material is being disposed of at the Central Mill Tailings Repository.



TRIBAL-LED REMEDIAL ACTION ACTIVITIES

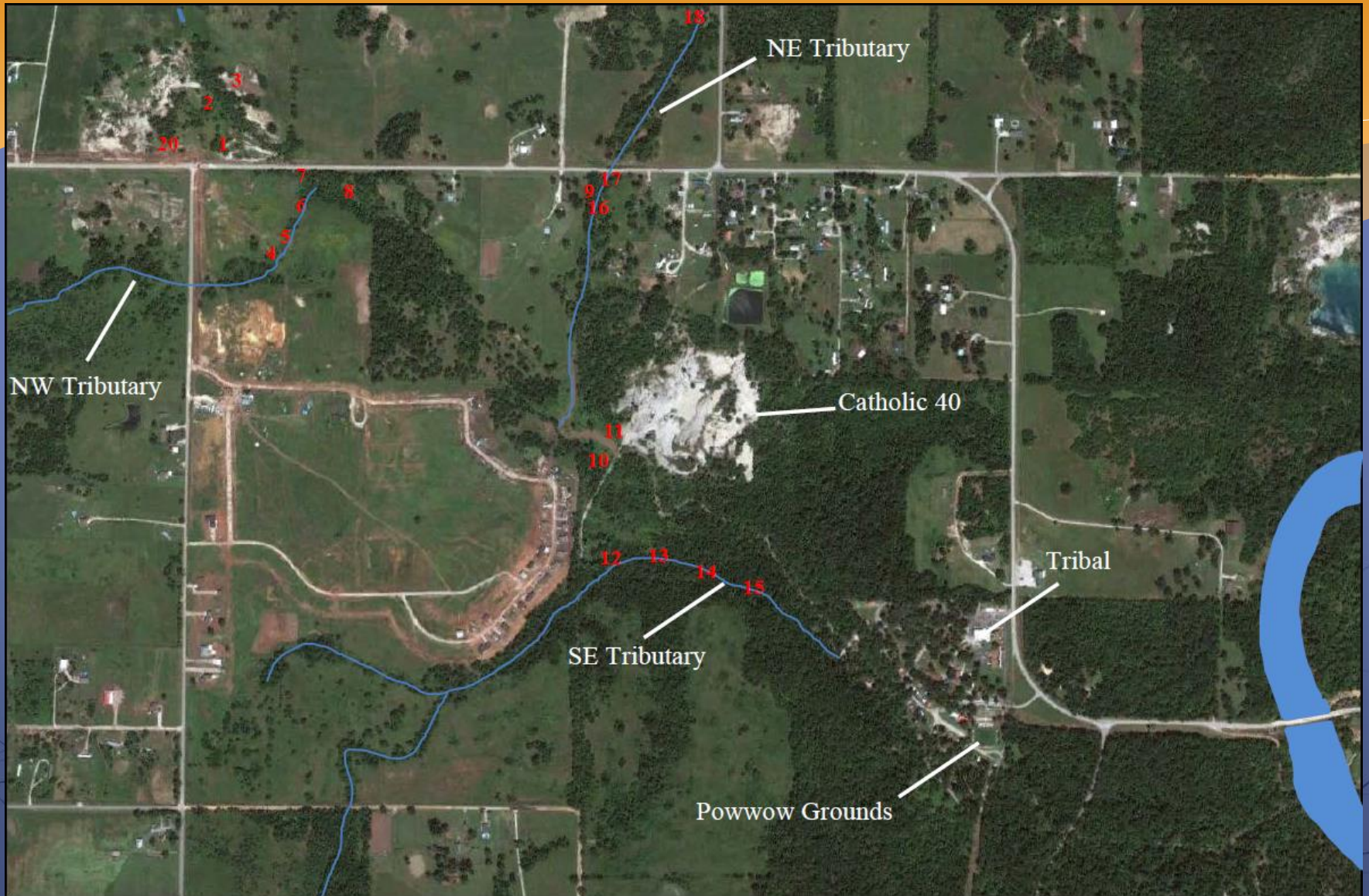
Distal 13



Catholic 40 SOIL Amendments

- * TZ Soil Amendments to Improve Soil Conditions and bind up metals in soil matrix.
- * Performance Measures Related to Remedial Action Objectives
 - * Total Vegetative Ground Cover – Daubenmire Cover Class Method
 - * Dissolved Metals in Surface Water
 - * Storm Water BMPs
- * Performance Measures Related to the Use of Soil Amendments
 - * Total Organic Matter/Organic Carbon
 - * Phosphate – Mehlich 3
 - * Soil pH
 - * Nitrate/Nitrite and Phosphate in Surface Water

TPM – Surface Water Sampling



CATHOLIC 40 BEFORE AND AFTER



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CATHOLIC 40 BEFORE AND AFTER



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© 2014 Google

Google earth

Imagery Date: 4/23/2013 15 S 343389.76 m E 4089619.90 m N elev 798 ft eye alt 4243 ft

1995

743 ft



3/29/2015

E 50 Rd

S 627 Rd

S 628 Rd

S 629 Rd

S 630 Rd

880 ft

Google earth

1995

Imagery Date: 3/29/2015 lat 36.939933° lon -94.758286° elev 805 ft eye alt 4637 ft



LONG-TERM PERFORMANCE MEASURES

- * Using Catholic 40 soil amendments as a pilot study, look at correlation between total metal levels in soil and companion measures of metals bioavailability to receptors (plants and animals).
- * Objective will be to collect representative data (soil, plants, and animal tissue) over time.
- * Result of the pilot study may indicate an amendment to the ROD is necessary to change RAOs in order to improve the remedy (may be possible to allow higher levels of metals in transition soils and thereby preserve topsoil)

FUTURE WORK AT SITE

- * Based on the Tribe's performance at the Catholic 40 and at subsequent RA sites, the Tribe is now performing all remediation at the site.
- * Elm Creek Watershed
 - * Within the next 3-5 yrs, the Tribe is projected to remediate over 1.7 million tons of mine waste concentrating on the Elm Creek watershed (represents close to \$30 million of EPA funding).
 - * Operable Unit 5 (sediments) in the RI process. Tribe anticipates having the same leadership roll in remediation of OU5



THANK YOU!!

- * QUESTIONS and/or COMMENTS???
- * CONTACT INFO:
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