

Appendix 1
Tungsten Queen Field Sheets

Earth MRI Mine Waste Characterization
North Carolina Geological Survey
FIELD DATA SHEET Tungsten Queen Mine, Vance County, NC, 2024
Tailings composite sample

Sample ID: NCGS-TQ-C1

Site and Sample Unit: Tungsten Queen tailings impoundment, composite sample unit 1

Date: 2/29/2024

Time: 14:30

Collected by: Heather Hanna, Katie Pelt, Jim Chapman, Garrett Thompson

Photo(s) taken: N

Description of site and sample unit: Sampling site is believed to be a separate tailings pond from the two larger ponds. Tailings appear to have been mostly removed from this pond.

Description of tailings:

Very silty to clayey sample with minimal sand. Clay from some areas rolls when sieving is attempted. Sample is moist to wet and requires drying in the lab.

Sieving notes: Attempts were made to sieve in the field, but clay in many of the subsamples rolled into balls when sieved. Sample had to be dried and sieved in lab.

Detailed site description and site notes:

Pine trees were present, especially in northerly(?) portion of sample unit and an erosional drainage was present at lowest point in sampling unit. Outcrop protrudes through any tailings that are present so country rock may be dominant influence on sample composition. Sample was unusually clay-rich compared to other composite samples, possibly since the bedrock outcrops are phyllite which weathers to clay.

Sample was collected according to USGS Mine Waste Program sampling protocols for composite samples. Two teams worked simultaneously in the sample unit, collecting the subsamples, and sieving them into a bucket. When all subsamples had been collected, the sieved material from the two teams was combined into one, labeled bucket and secured with a lid.

The weather was sunny when the sample was collected.

Sample ID: NCGS-TQ-C1

Date: 2/29/2024

Latitude/longitude of subsamples (description of how data collected and/or data collected): Location of approximate center of sample unit: 36.51571, -78.47305. Sub sample locations were pre-selected using ArcGIS imagery and noted in an ArcGIS feature class which is available from the North Carolina Geological Survey. A GPS-enabled iPad was used to identify the subsample locations in the field.

Additional data collected (paste pH, pXRF, etc.): None

Geospatial data (description of measurements if made in the field): Locations of subsamples are in an ArcGIS feature class. Sampling unit is outlined in an ArcGIS feature class. Both ArcGIS files are available from the North Carolina Geological Survey.

Earth MRI Mine Waste Characterization
North Carolina Geological Survey
FIELD DATA SHEET Tungsten Queen Mine, Vance County, NC, 2024
Tailings composite sample

Sample ID: NCGS-TQ-C2

Site and Sample Unit: Tungsten Queen tailings impoundment; composite sample unit 2

Date: 2/22/2024

Time: 15:30

Collected by: Katie Pelt, Jim Chapman, Dwain Veach, Kenneth Taylor

Photo(s) taken: N

Description of site and sample unit: The sampling unit is located on private land in the southern portion of the large southern tailings pond.

Description of tailings:

Tailings in the sampling unit are very sandy with minimal, if any, mud. Sand ranged in size from very fine to very coarse. Mineralogy is dominantly quartz. Tailings contained some moisture between the grains. Surface color ranged from white to orangish. White areas may be a compound used to process tailings; thus, subsamples were collected from 4 inches below the surface to avoid contamination. Composite sample Munsell color: 7.5YR6/6.

Sieving notes: Sample was sieved in the field to collect the <2 mm fraction.

Detailed site description and site notes:

Sample unit area is lined with trees to the southwest, though vegetation is mostly restricted to the outskirts of the tailings pond with the exception of a couple trees growing in the eastern portion of the sample unit area. A standing body of water borders the sample unit to the west, and a smaller former tailings bond borders the sample unit to the southeast. A small drainage extended from the standing water along the southwestern boundary of the sample unit near the tree line.

Sample was collected according to USGS Mine Waste Program sampling protocols for composite samples. A test pit was dug to determine how deep to collect the sample from. Two teams worked simultaneously in the sample unit, collecting the subsamples, and sieving the <2mm portion into a bucket. To ensure subsamples were of comparable size, an amount of material was collected for each that filled a trowel up to the 4-inch mark. When all subsamples had been collected, the sieved material from the two teams was combined into one, labeled bucket and secured with a lid. The weather was sunny during sample collection

Sample ID: NCGS-TQ-C2

Date: 2/22/2024

Latitude/longitude of subsamples (description of how data collected and/or data collected):

Location of approximate center of sample unit: 36.51618, -78.47369. Sub sample locations were pre-selected using ArcGIS imagery and noted in an ArcGIS feature class which is available from the North Carolina Geological Survey. A GPS-enabled iPad was used to identify the subsample locations in the field.

Additional data collected (paste pH, pXRF, etc.): None

Geospatial data (description of measurements if made in the field): Locations of subsamples are in an ArcGIS feature class. Sampling unit is outlined in an ArcGIS feature class. Both ArcGIS files are available from the North Carolina Geological Survey.

Earth MRI Mine Waste Characterization
North Carolina Geological Survey
FIELD DATA SHEET Tungsten Queen Mine, Vance County, NC, 2024
Tailings composite sample

Sample ID: NCGS-TQ-C3

Site and Sample Unit: Tungsten Queen tailings impoundment; composite sample unit 3

Date: 1/25/2024

Time: 14:30

Collected by: Katie Pelt, Jim Chapman, Dwain Veach, Heather Hanna, Kate Campbell, Bob Seal

Photo(s) taken: N

Description of site and sample unit: The sample unit is located on private land in the central portion of the large southern tailings pond.

Description of tailings:

Tailings in the sample unit are very sandy with minimal, if any, mud. Sand ranged in size from very fine to very coarse. Mineralogy is dominantly quartz. Tailings were fairly wet due to rain that day. Surface color ranged from white to orangish. White areas may be a compound used to process tailings; thus, subsamples were collected from 2 inches below the surface to avoid contamination. Composite sample Munsell color: 7.5YR5/6.

Sieving notes: Sample was sieved in the field to collect the <2 mm fraction.

Detailed site description and site notes:

Sample unit is in middle of southern pond, with very minimal vegetation along a portion of the southern edge. Sanding water in the tailings pond is located <100 ft east of the sample unit.

Sample was collected according to USGS Mine Waste Program sampling protocols for composite samples. A test pit was dug to determine how deep to collect the sample from. Two teams worked simultaneously in the sample unit, collecting the subsamples, and sieving the <2mm portion into a bucket. To ensure subsamples were of comparable size, an amount of material was collected for each that filled a trowel up to the 4-inch mark. When all subsamples had been collected, the sieved material from the two teams was combined into one, labeled bucket and secured with a lid.

It was raining during sample collection.

Sample ID: NCGS-TQ-C3

Date: 1/25/2024

Latitude/longitude of subsamples (description of how data collected and/or data collected): Location of approximate center of sample unit: 36.51685, -78.47281. Sub sample locations were pre-selected using ArcGIS imagery and noted in an ArcGIS feature class which is available from the North Carolina Geological Survey. A GPS-enabled iPad was used to identify the subsample locations in the field.

Additional data collected (paste pH, pXRF, etc.): None

Geospatial data (description of measurements if made in the field): Locations of subsamples are in an ArcGIS feature class. Sampling unit is outlined in an ArcGIS feature class. Both ArcGIS files are available from the North Carolina Geological Survey.

Earth MRI Mine Waste Characterization
North Carolina Geological Survey
FIELD DATA SHEET Tungsten Queen Mine, Vance County, NC, 2024
Tailings composite sample

Sample ID: NCGS-TQ-C4

Site and Sample Unit: Tungsten Queen tailings impoundment; composite sample unit 4

Date: 2/22/2024

Time: 10:00

Collected by: Katie Pelt, Jim Chapman, Dwain Veach, Kenneth Taylor

Photo(s) taken: N

Description of site and sample unit: The sampling unit is located on private land in the eastern portion of the large southern tailings pond.

Description of tailings:

Tailings in the sampling unit are very sandy with minimal, if any, mud. Sand ranged in size from very fine to very coarse. Mineralogy is dominantly quartz. Tailings contained some moisture between the grains. Surface color ranged from white to orangish. White areas may be a compound used to process tailings; thus, subsamples were collected from 3 inches below the surface to avoid contamination. Composite sample Munsell color: 7.5YR6/6.

Sieving notes: Samples were sieved in the field to collect the <2 mm fraction.

Detailed site description and site notes:

Sample unit area is lined with trees to the north and south, though vegetation is restricted to the outskirts of the tailings pond. An ~5 ft high scarp is present in the tailings in the southern portion of the sample area where NCGS-TQ-G2 and NCGS-TQ-G3 were collected.

Sample was collected according to USGS Mine Waste Program sampling protocols for composite samples. A test pit was dug to determine how deep to collect the sample from. Two teams worked simultaneously in the sample unit, collecting the subsamples, and sieving the <2mm portion into a bucket. To ensure subsamples were of comparable size, an amount of material was collected for each that filled a trowel up to the 4-inch mark. When all subsamples had been collected, the sieved material from the two teams was combined into one, labeled bucket and secured with a lid.

The weather was sunny during sample collection

Sample ID: NCGS-TQ-C4

Date: 2/22/2024

Latitude/longitude of subsamples (description of how data collected and/or data collected): Location of approximate center of sample unit: 36.51684, -78.47192. Sub sample locations were pre-selected using ArcGIS imagery and noted in an ArcGIS feature class which is available from the North Carolina Geological Survey. A GPS-enabled iPad was used to identify the subsample locations in the field.

Additional data collected (paste pH, pXRF, etc.): None

Geospatial data (description of measurements if made in the field): Locations of subsamples are in an ArcGIS feature class. Sampling unit is outlined in an ArcGIS feature class. Both ArcGIS files are available from the North Carolina Geological Survey.

Earth MRI Mine Waste Characterization
North Carolina Geological Survey
FIELD DATA SHEET Tungsten Queen Mine, Vance County, NC, 2024
Tailings composite sample

Sample ID: NCGS-TQ-C5

Site and Sample Unit: Tungsten Queen tailings impoundment; composite sample unit 5

Date: 2/22/2024

Time: 13:30

Collected by: Katie Pelt, Jim Chapman, Dwain Veach, Kenneth Taylor

Photo(s) taken: N

Description of site and sample unit: The sampling unit is located on private land along the eastern edge of the large southern tailings pond by the remains of the old gravity separator.

Description of tailings:

Tailings in the sampling unit are very sandy with minimal, if any, mud. Sand ranged in size from very fine to very coarse. Mineralogy is dominantly quartz. Tailings contained minimal moisture between the grains. Surface color ranged from white to orangish. White areas may be a compound used to process tailings; thus, subsamples were collected from 1 inch below the surface to avoid contamination. Composite sample Munsell color: 7.5YR6/6.

Sieving notes: Samples were sieved in the field to collect the <2 mm fraction.

Detailed site description and site notes:

Sample unit area is lined with trees northern, eastern, and southern sides, with some vegetation extending into the tailings pond. Some eroded intermittent drainages are present and lined with mica eroded from the rip rap that stabilizes the adjacent slope. These tailings were not collected during composite sampling but were examined under a hand lens. NCGS-TQ-G5 was collected within this unit.

Sample was collected according to USGS Mine Waste Program sampling protocols for composite samples. A test pit was dug to determine how deep to collect the sample from. Two teams worked simultaneously in the sample unit, collecting the subsamples, and sieving the <2mm portion into a bucket. To ensure subsamples were of comparable size, an amount of material was collected for each that filled a trowel up to the 4-inch mark. When all subsamples had been collected, the sieved material from the two teams was combined into one, labeled bucket and secured with a lid. The weather was sunny during sample collection

Sample ID: NCGS-TQ-C5

Date: 2/22/2024

Latitude/longitude of subsamples (description of how data collected and/or data collected): Location of approximate center of sample unit: 36.51744, -78.47280. Sub sample locations were pre-selected using ArcGIS imagery and noted in an ArcGIS feature class which is available from the North Carolina Geological Survey. A GPS-enabled iPad was used to identify the subsample locations in the field.

Additional data collected (paste pH, pXRF, etc.): None

Geospatial data (description of measurements if made in the field): Locations of subsamples are in an ArcGIS feature class. Sampling unit is outlined in an ArcGIS feature class. Both ArcGIS files are available from the North Carolina Geological Survey.

Earth MRI Mine Waste Characterization
North Carolina Geological Survey
FIELD DATA SHEET Tungsten Queen Mine, Vance County, NC, 2024
Tailings composite sample

Sample ID: NCGS-TQ-C6

Site and Sample Unit: Tungsten Queen tailings impoundment; composite sample unit 6

Date: 1/25/2024

Time: 12:30

Collected by: Katie Pelt, Jim Chapman, Dwain Veach, Heather Hanna, Kate Campbell, Bob Seal

Photo(s) taken: N

Description of site and sample unit: The sample unit is located on private land in the northeastern portion of the large southern tailings pond.

Description of tailings:

Tailings in the sample unit are very sandy with minimal, if any, mud. Sand ranged in size from very fine to very coarse. Mineralogy is dominantly quartz. Tailings were fairly wet due to rain that day. Surface color ranged from white to orangish. White areas may be a compound used to process tailings; thus, subsamples were collected from 4 inches below the surface to avoid contamination. Composite sample Munsell color: 7.5YR6/6.

Sieving notes: Sample was sieved in the field to collect the <2 mm fraction.

Detailed site description and site notes:

Sample unit is along northeastern edge of large southern pond, with abundant trees along the northern and northeastern edge of the sample unit and scattered trees within sample unit. Sanding water in the tailings pond is located ~50 ft east. The sample unit is topographically higher than composite sample unit 3 by ~2 ft.

Sample was collected according to USGS Mine Waste Program sampling protocols for composite samples. A test pit was dug to determine how deep to collect the sample from. Two teams worked simultaneously in the sample unit, collecting the subsamples, and sieving the <2mm portion into a bucket. To ensure subsamples were of comparable size, an amount of material was collected for each that filled a trowel up to the 4-inch mark. When all subsamples had been collected, the sieved material from the two teams was combined into one, labeled bucket and secured with a lid. It was raining during sample collection.

Sample ID: NCGS-TQ-C6

Date: 1/25/2024

Latitude/longitude of subsamples (description of how data collected and/or data collected): Location of approximate center of sample unit: 36.51744, -78.47280. Sub sample locations were pre-selected using ArcGIS imagery and noted in an ArcGIS feature class which is available from the North Carolina Geological Survey. A GPS-enabled iPad was used to identify the subsample locations in the field.

Additional data collected (paste pH, pXRF, etc.): None

Geospatial data (description of measurements if made in the field): Locations of subsamples are in an ArcGIS feature class. Sampling unit is outlined in an ArcGIS feature class. Both ArcGIS files are available from the North Carolina Geological Survey.

Earth MRI Mine Waste Characterization
North Carolina Geological Survey
FIELD DATA SHEET Tungsten Queen Mine, Vance County, NC, 2024
Tailings composite sample

Sample ID: NCGS-TQ-C7

Site and Sample Unit: Tungsten Queen tailings impoundment; composite sample unit 7

Date: 2/29/2024

Time: 10:15

Collected by: Heather Hanna, Katie Pelt, Jim Chapman, Garrett Thompson

Photo(s) taken: N

Description of site and sample unit: The sampling unit is located on private land in the southeastern portion of the northernmost tailings pond near the central dam.

Description of tailings:

Tailings in the sampling unit are very sandy with minimal, if any, mud. Sand ranged in size from very fine to very coarse. Mineralogy is dominantly quartz. Tailings contained some moisture between the grains. Surface color ranged from white to orangish. White areas may be a compound used to process tailings; thus, subsamples were collected from 4 inches below the surface to avoid potential contamination. Composite sample Munsell color: 7.5YR6/4.

Sieving notes: Sample was sieved in the field to collect the <2 mm fraction.

Detailed site description and site notes:

Sample unit area was lined with trees, but did not have trees growing amongst the tailings. A small drainage is located on the eastern edge of the sampling unit.

Sample was collected according to USGS Mine Waste Program sampling protocols for composite samples. A test pit was dug to determine how deep to collect the sample from. Two teams worked simultaneously in the sample unit, collecting the subsamples, and sieving the <2mm portion into a bucket. To ensure subsamples were of comparable size, an amount of material was collected for each that filled a trowel up to the 4-inch mark. When all subsamples had been collected, the sieved material from the two teams was combined into one, labeled bucket and secured with a lid.

The weather was sunny during sample collection, and vegetation is restricted to the outskirts of the tailings pond.

Sample ID: NCGS-TQ-C7

Date: 2/29/2024

Latitude/longitude of subsamples (description of how data collected and/or data collected): Location of approximate center of sample unit: 36.51897, -78.47486. Sub sample locations were pre-selected using ArcGIS imagery and noted in an ArcGIS feature class which is available from the North Carolina Geological Survey. A GPS-enabled iPad was used to identify the subsample locations in the field.

Additional data collected (paste pH, pXRF, etc.): None

Geospatial data (description of measurements if made in the field): Locations of subsamples are in an ArcGIS feature class. Sampling unit is outlined in an ArcGIS feature class. Both ArcGIS files are available from the North Carolina Geological Survey.

Earth MRI Mine Waste Characterization
North Carolina Geological Survey
FIELD DATA SHEET Tungsten Queen Mine, Vance County, NC, 2024
Tailings composite sample

Sample ID: NCGS-TQ-C8

Site and Sample Unit: Tungsten Queen tailings impoundment; composite sample unit 8

Date: 2/29/2024

Time: 11:45

Collected by: Heather Hanna, Katie Pelt, Jim Chapman, Garrett Thompson

Photo(s) taken: N

Description of site and sample unit: The sampling unit is located on private land in the western portion of the northern tailings pond near the central dam.

Description of tailings:

Tailings in the sampling unit are very sandy in the southeastern portion but had areas with higher mud content in the central and northwestern portion. Sand ranged in size from very fine to very coarse. Mineralogy is dominantly quartz. Tailings contained some moisture between the grains. Surface color ranged from white to orangish. White areas may be a compound used to process tailings; thus, subsamples were collected from 1 inch below the surface to balance the need to avoid potential contamination with the potential for thin tailings cover in some northern areas of the sample unit. Composite sample Munsell color: 7.5YR7/4.

Sieving notes: Sample was sieved in the field to collect the <2 mm fraction.

Detailed site description and site notes:

Sample unit area is lined with trees, though vegetation is mostly restricted to the outskirts of the tailings pond. Tailings were sandy in the southeastern portion but contained muddy, swampy areas toward the central and northwestern portion. A moderately-sized (~70 ft wide) area of standing water was present in the central portion of the sample unit.

Sample was collected according to USGS Mine Waste Program sampling protocols for composite samples. A test pit was dug to determine how deep to collect the sample from. Two teams worked simultaneously in the sample unit, collecting the subsamples, and sieving the <2mm portion into a bucket. To ensure subsamples were of comparable size, an amount of material was collected for each that filled a trowel up to the 4-inch mark. When all subsamples had been collected, the

sieved material from the two teams was combined into one, labeled bucket and secured with a lid. The weather was sunny during sample collection

Sample ID: NCGS-TQ-C8

Date: 2/29/2024

Latitude/longitude of subsamples (description of how data collected and/or data collected): Location of approximate center of sample unit is 36.51895, -78.4765. Sub sample locations were pre-selected using ArcGIS imagery and noted in an ArcGIS feature class which is available from the North Carolina Geological Survey. A GPS-enabled iPad was used to identify the subsample locations in the field.

Additional data collected (paste pH, pXRF, etc.): None

Geospatial data (description of measurements if made in the field): Locations of subsamples are in an ArcGIS feature class. Sampling unit is outlined in an ArcGIS feature class. Both ArcGIS files are available from the North Carolina Geological Survey.

Earth MRI Mine Waste Characterization
North Carolina Geological Survey
FIELD DATA SHEET Tungsten Queen Mine, Vance County, NC, 2024
Tailings grab sample

Sample ID: NCGS-TQ-G1

Site and Sample Unit: Tungsten Queen tailings impoundment; grab sample 1

Date: 1/25/2024

Time: 13:00

Collected by: Heather Hanna and Bob Seal

Photo(s) taken: N

Description of site and sample unit: The sample was collected from private land within the boundaries of NCGS-TQ-C6.

Description of tailings:

Tailings in the sampling area are very sandy with minimal, if any, mud. Sand ranged in size from very fine to very coarse. Mineralogy is dominantly quartz and a dark mineral which gives the sample a salt and pepper look. Tailings contained moisture between the grains due to rain that day. Sample was collected from a hard shelf of tailings ~4 inches below the surface. Munsell color: 7.5YR6/1.

Sieving notes: Sample was not sieved.

Detailed site description and site notes:

Sample was collected from ~80 ft south of the tree line. There is no standing water or streams nearby. Sample was collected according to USGS Mine Waste Program sampling protocols. A clean sampling implement was used to scoop the sample into a labeled bag. The weather was rainy during sample collection.

Latitude/longitude of subsamples (description of how data collected and/or data collected): 36.51723, -78.47224. A GPS-enabled iPad was used to record latitude and longitude of sample location.

Additional data collected (paste pH, pXRF, etc.): None

Geospatial data (description of measurements if made in the field): Location of sample is in an ArcGIS feature class available from the North Carolina Geological Survey.

Earth MRI Mine Waste Characterization
North Carolina Geological Survey
FIELD DATA SHEET Tungsten Queen Mine, Vance County, NC, 2024
Tailings grab sample

Sample ID: NCGS-TQ-G2

Site and Sample Unit: Tungsten Queen tailings impoundment; grab sample 2 (profile)

Date: 2/22/2024

Time: 11:10 to 13:50

Collected by: Heather Hanna

Photo(s) taken: Y

Description of site and sample unit: The profile samples were collected from private land within the boundaries of composite sample NCGS-TQ-C4.

Description of tailings:

Twelve samples were collected from an ~5 ft high profile that had been exposed within the tailings by weathering. Tailings in the profile were mostly sand with some intervals of mud, especially near the top of the profile. Sand ranged in size from very fine to very coarse and was dominantly quartz. Tailings contained some moisture between the grains. Sample intervals were determined based on changes in lithology and/or color.

Sieving notes: Samples were not sieved.

Detailed site description and site notes:

Sample was collected from ~40 ft northeast of the tree line. There is no standing water or streams nearby. A pipe was visible in the eroded area southeast of the profile. Sample was collected according to USGS Mine Waste Program sampling protocols. A clean sampling implement was used to scoop the sample into a labeled bag. The weather was sunny during sample collection.

Latitude/longitude of subsamples (description of how data collected and/or data collected): 36.51629, -78.47194. A GPS-enabled iPad was used to record latitude and longitude of sample location.

Additional data collected (paste pH, pXRF, etc.): None

Geospatial data (description of measurements if made in the field): Location of sample is in an ArcGIS feature class available from the North Carolina Geological Survey.

Earth MRI Mine Waste Characterization
North Carolina Geological Survey
FIELD DATA SHEET Tungsten Queen Mine, Vance County, NC, 2024

Tailings grab sample

Sample ID: NCGS-TQ-G3

Site and Sample Unit: Tungsten Queen tailings impoundment; grab sample 3 (profile)

Date: 2/22/2024

Time: 14:10

Collected by: Heather Hanna

Photo(s) taken: Y

Description of site and sample unit: The profile samples were collected from private land within the boundaries of composite sample NCGS-TQ-C4 and ~10 to 15 ft west of NCGS-TQ-G2.

Description of tailings:

Two samples were collected from an ~5 ft high profile that had been exposed within the tailings by weathering. The 13 to 17 in depth sample was mostly sand composed dominantly of quartz and a dark mineral giving the sample a salt and pepper look. Tailings contained some moisture between the grains. The 28 to 30 in depth sample was a horizon of mud within the profile.

Sieving notes: Samples were not sieved.

Detailed site description and site notes:

Sample was collected from ~40 ft northeast of the tree line. There is no standing water or streams nearby. A pipe was visible in the eroded area southeast of the profile. Sample was collected according to USGS Mine Waste Program sampling protocols. A clean sampling implement was used to scoop the sample into a labeled bag. The weather was sunny during sample collection.

Latitude/longitude of subsamples (description of how data collected and/or data collected): 36.51630, -78.47193. A GPS-enabled iPad was used to record latitude and longitude of sample location.

Additional data collected (paste pH, pXRF, etc.): None

Geospatial data (description of measurements if made in the field): Location of sample is in an ArcGIS feature class available from the North Carolina Geological Survey.

Earth MRI Mine Waste Characterization
North Carolina Geological Survey
FIELD DATA SHEET Tungsten Queen Mine, Vance County, NC, 2024

Tailings grab sample

Sample ID: NCGS-TQ-G4

Site and Sample Unit: Tungsten Queen tailings impoundment; grab sample 4

Date: 2/22/2024

Time: 14:30

Collected by: Heather Hanna

Photo(s) taken: Y

Description of site and sample unit: The sample was collected from private land within the boundaries of NCGS-TQ-C5.

Description of tailings:

Tailings in the sampling area are dominantly mud with lesser amounts of sand. Sand ranged in size from very fine to very coarse. Sand mineralogy is dominantly quartz. Tailings contained minimal moisture between the grains. Sample was collected from a slope that was a noticeably different color than the rest of the tailings pond. Munsell color: 2.5Y5/8.

Sieving notes: Sample was not sieved.

Detailed site description and site notes:

Sample was collected from ~20 ft west of the tree line. There is no standing water or streams nearby. Sample was collected according to USGS Mine Waste Program sampling protocols. A clean sampling implement was used to scoop the sample into a labeled bag. The weather was sunny during sample collection.

Latitude/longitude of subsamples (description of how data collected and/or data collected): 36.51606, -78.47113. A GPS-enabled iPad was used to record latitude and longitude of sample location.

Additional data collected (paste pH, pXRF, etc.): None

Geospatial data (description of measurements if made in the field): Location of sample is in an ArcGIS feature class available from the North Carolina Geological Survey.

Earth MRI Mine Waste Characterization
North Carolina Geological Survey
FIELD DATA SHEET Tungsten Queen Mine, Vance County, NC, 2024
Tailings grab sample

Sample ID: NCGS-TQ-G5

Site and Sample Unit: Tungsten Queen tailings impoundment; grab sample 5

Date: 2/29/2024

Time: 13:00

Collected by: Heather Hanna and Garrett Thompson

Photo(s) taken: N

Description of site and sample unit: The sample was collected from private land within the boundaries of NCGS-TQ-C7.

Description of tailings:

Tailings in the sampling area are very sandy with minimal, if any, mud. Sand ranged in size from very fine to very coarse. Mineralogy is dominantly quartz and a dark mineral which gives the sample a salt and pepper look. Tailings contained minimal moisture between the grains. Sample was collected from an area of noticeably different color ~3 inches below the surface that was noted during composite sample collection. Munsell color: 7.5YR5/1.

Sieving notes: Sample was not sieved.

Detailed site description and site notes:

Sample was collected from ~150 ft west of the tree line. There is no standing water nearby although a small drainage is located ~100 ft to the east. Sample was collected according to USGS Mine Waste Program sampling protocols. A clean sampling implement was used to scoop the sample into a labeled bag. The weather was sunny during sample collection.

Latitude/longitude of subsamples (description of how data collected and/or data collected): 36.51879, -78.47504. A GPS-enabled iPad was used to record latitude and longitude of sample location.

Additional data collected (paste pH, pXRF, etc.): None

Geospatial data (description of measurements if made in the field): Location of sample is in an ArcGIS feature class available from the North Carolina Geological Survey.

Earth MRI Mine Waste Characterization
North Carolina Geological Survey
FIELD DATA SHEET Tungsten Queen Mine, Vance County, NC, 2024

Tailings grab sample

Sample ID: NCGS-TQ-G6

Site and Sample Unit: Tungsten Queen tailings impoundment; grab sample 6

Date: 4/30/2024

Time: 15:00

Collected by: Heather Hanna and Katherine Pelt

Photo(s) taken: N

Description of site and sample unit: The sample was collected from private land at the base of the central dam on the southern side.

Description of tailings:

Tailings in the sampling area are very sandy with minimal, if any, mud. Sand ranged in size from very fine to very coarse. Mineralogy is dominantly quartz. Tailings contained moisture between the grains. Sample was collected from the surface of a pile of tailings at the base of the central dam. Munsell color: 7.5YR6/6.

Sieving notes: Sample was not sieved.

Detailed site description and site notes:

Sample was collected from ~30 ft west of the tree line along the edge of the body of standing water. Sample was collected according to USGS Mine Waste Program sampling protocols. A clean sampling implement was used to scoop the sample into a labeled bag. The weather was sunny during sample collection.

Latitude/longitude of subsamples (description of how data collected and/or data collected): 36.51795, -78.47386. A GPS-enabled iPad was used to record latitude and longitude of sample location.

Additional data collected (paste pH, pXRF, etc.): None

Geospatial data (description of measurements if made in the field): Location of sample is in an ArcGIS feature class available from the North Carolina Geological Survey.

Earth MRI Mine Waste Characterization
North Carolina Geological Survey
FIELD DATA SHEET Tungsten Queen Mine, Vance County, NC, 2024
Sonic Drill Core

Sample ID: NCGS-TQ-D1

Site and Sample Unit: Tungsten Queen tailings impoundment; sonic core 1

Date: 4/30/2024

Time: 7:45

Collected by: Heather Hanna and Katherine Pelt

Photo(s) taken: Core photos are in Appendix 2 of report.

Description of site and sample unit: The core was collected from private land within the boundaries of NCGS-TQ-C7. NCGS-TQ-G5 was collected ~50 ft south of core location.

Description of tailings:

Tailings in the core are dominantly sand with lesser amounts of mud. Sand ranged in size from very fine to very coarse. Mineralogy is dominantly quartz. Tailings were wet from drilling, so core had to be dried in lab.

Sieving notes: Core samples were sieved in lab to recover the <2 mm fraction.

Detailed site description and site notes:

Sample was collected from ~200 ft west of the tree line. There is no standing water nearby although a small drainage is located ~150 ft to the east. Core runs were extruded into plastic sleeves which were then placed in labeled core boxes. The weather was sunny during sample collection.

Latitude/longitude of subsamples (description of how data collected and/or data collected): 36.51894, -78.47507. A GPS-enabled iPad was used to record latitude and longitude of sample location.

Additional data collected (paste pH, pXRF, etc.): None

Geospatial data (description of measurements if made in the field): Location of core is in an ArcGIS feature class available from the North Carolina Geological Survey.

Earth MRI Mine Waste Characterization
North Carolina Geological Survey
FIELD DATA SHEET Tungsten Queen Mine, Vance County, NC, 2024
Sonic Drill Core

Sample ID: NCGS-TQ-D2

Site and Sample Unit: Tungsten Queen tailings impoundment; sonic core 2

Date: 4/30/2024

Time: 9:30

Collected by: Heather Hanna and Katherine Pelt

Photo(s) taken: Core photos are in Appendix 2 of report.

Description of site and sample unit: The core was collected from private land within the boundaries of NCGS-TQ-C3.

Description of tailings:

Tailings in the core are dominantly sand with lesser amounts of mud. Sand ranged in size from very fine to very coarse. Mineralogy is dominantly quartz. Tailings were wet from drilling, so core had to be dried in lab.

Sieving notes: Core samples were sieved in lab to recover the <2 mm fraction.

Detailed site description and site notes:

Sample was collected <100 ft east of the body of standing water in the large southern pond. No trees or vegetation were nearby. Core runs were extruded into plastic sleeves which were then placed in labeled core boxes. The weather was sunny during sample collection.

Latitude/longitude of subsamples (description of how data collected and/or data collected): 36.51717, -78.47345. A GPS-enabled iPad was used to record latitude and longitude of sample location.

Additional data collected (paste pH, pXRF, etc.): None

Geospatial data (description of measurements if made in the field): Location of core is in an ArcGIS feature class available from the North Carolina Geological Survey.

Earth MRI Mine Waste Characterization
North Carolina Geological Survey
FIELD DATA SHEET Tungsten Queen Mine, Vance County, NC, 2024
Sonic Drill Core

Sample ID: NCGS-TQ-D3

Site and Sample Unit: Tungsten Queen tailings impoundment; sonic core 3

Date: 4/30/2024

Time: 10:30

Collected by: Heather Hanna and Katherine Pelt

Photo(s) taken: Core photos are in Appendix 2 of report.

Description of site and sample unit: The core was collected from private land within the boundaries of NCGS-TQ-C2.

Description of tailings:

Tailings in the core are dominantly sand with lesser amounts of mud. Sand ranged in size from very fine to very coarse. Mineralogy is dominantly quartz. Tailings were wet from drilling, so core had to be dried in lab.

Sieving notes: Core samples were sieved in lab to recover the <2 mm fraction.

Detailed site description and site notes:

Sample was collected ~50 ft east of the body of standing water in the large southern pond. No trees or vegetation were nearby. Core runs were extruded into plastic sleeves which were then placed in labeled core boxes. The weather was sunny during sample collection.

Latitude/longitude of subsamples (description of how data collected and/or data collected): 36.51660, -78.47395. A GPS-enabled iPad was used to record latitude and longitude of sample location.

Additional data collected (paste pH, pXRF, etc.): None

Geospatial data (description of measurements if made in the field): Location of core is in an ArcGIS feature class available from the North Carolina Geological Survey.

Earth MRI Mine Waste Characterization
North Carolina Geological Survey
FIELD DATA SHEET Tungsten Queen Mine, Vance County, NC, 2024
Sonic Drill Core

Sample ID: NCGS-TQ-D4

Site and Sample Unit: Tungsten Queen tailings impoundment; sonic core 4

Date: 4/30/2024

Time: 11:15

Collected by: Heather Hanna and Katherine Pelt

Photo(s) taken: Core photos are in Appendix 2 of report.

Description of site and sample unit: The core was collected from private land within the boundaries of NCGS-TQ-C2.

Description of tailings:

Tailings in the core are dominantly sand with lesser amounts of mud. Sand ranged in size from very fine to very coarse. Mineralogy is dominantly quartz. Tailings were wet from drilling, so core had to be dried in lab.

Sieving notes: Core samples were sieved in lab to recover the <2 mm fraction.

Detailed site description and site notes:

Sample was collected ~150 ft east of the body of standing water in the large southern pond. The tree line was ~100 ft east of the core location. Core runs were extruded into plastic sleeves which were then placed in labeled core boxes. The weather was sunny during sample collection.

Latitude/longitude of subsamples (description of how data collected and/or data collected): 36.51625, -78.47349. A GPS-enabled iPad was used to record latitude and longitude of sample location.

Additional data collected (paste pH, pXRF, etc.): None

Geospatial data (description of measurements if made in the field): Location of core is in an ArcGIS feature class available from the North Carolina Geological Survey.

Earth MRI Mine Waste Characterization
North Carolina Geological Survey
FIELD DATA SHEET Tungsten Queen Mine, Vance County, NC, 2024
Sonic Drill Core

Sample ID: NCGS-TQ-D5

Site and Sample Unit: Tungsten Queen tailings impoundment; sonic core 5

Date: 4/30/2024

Time: 11:45

Collected by: Heather Hanna and Katherine Pelt

Photo(s) taken: Core photos are in Appendix 2 of report.

Description of site and sample unit: The core was collected from private land within the boundaries of NCGS-TQ-C3.

Description of tailings:

Tailings in the core are dominantly sand which ranged in size from very fine to very coarse. Mineralogy is dominantly quartz. Tailings were wet from drilling, so core had to be dried in lab.

Sieving notes: Core samples were sieved in lab to recover the <2 mm fraction.

Detailed site description and site notes:

Sample was collected in the middle of the large southern pond away from trees and standing water. Core runs were extruded into plastic sleeves which were then placed in labeled core boxes. The weather was sunny during sample collection.

Latitude/longitude of subsamples (description of how data collected and/or data collected): 36.51693, -78.47255. A GPS-enabled iPad was used to record latitude and longitude of sample location.

Additional data collected (paste pH, pXRF, etc.): None

Geospatial data (description of measurements if made in the field): Location of core is in an ArcGIS feature class available from the North Carolina Geological Survey.

Earth MRI Mine Waste Characterization
North Carolina Geological Survey
FIELD DATA SHEET Tungsten Queen Mine, Vance County, NC, 2024
Sonic Drill Core

Sample ID: NCGS-TQ-D6

Site and Sample Unit: Tungsten Queen tailings impoundment; sonic core 6

Date: 4/30/2024

Time: 13:00

Collected by: Heather Hanna and Katherine Pelt

Photo(s) taken: Core photos are in Appendix 2 of report.

Description of site and sample unit: The core was collected from private land near the boundary between NCGS-TQ-C4 and NCGS-TQ-C3.

Description of tailings:

Tailings in the core are dominantly sand which ranged in size from very fine to very coarse. Mineralogy is dominantly quartz. Tailings were wet from drilling, so core had to be dried in lab.

Sieving notes: Core samples were sieved in lab to recover the <2 mm fraction.

Detailed site description and site notes:

Sample was collected ~100 ft south of the tree line. There are no drainages or standing water nearby. Core runs were extruded into plastic sleeves which were then placed in labeled core boxes. The weather was sunny during sample collection.

Latitude/longitude of subsamples (description of how data collected and/or data collected): 36.51714, -78.47197. A GPS-enabled iPad was used to record latitude and longitude of sample location.

Additional data collected (paste pH, pXRF, etc.): None

Geospatial data (description of measurements if made in the field): Location of core is in an ArcGIS feature class available from the North Carolina Geological Survey.

Earth MRI Mine Waste Characterization
North Carolina Geological Survey
FIELD DATA SHEET Tungsten Queen Mine, Vance County, NC, 2024
Sonic Drill Core

Sample ID: NCGS-TQ-D7

Site and Sample Unit: Tungsten Queen tailings impoundment; sonic core 7

Date: 4/30/2024

Time: 14:00

Collected by: Heather Hanna and Katherine Pelt

Photo(s) taken: Core photos are in Appendix 2 of report.

Description of site and sample unit: The core was collected from private land within the boundaries of NCGS-TQ-C7 ~80 ft north of the base of the central dam.

Description of tailings:

Tailings in the core are dominantly sand ranging in size from very fine to very coarse. Mineralogy is dominantly quartz. Tailings were wet from drilling, so core had to be dried in lab.

Sieving notes: Core samples were sieved in lab to recover the <2 mm fraction.

Detailed site description and site notes:

Sample was collected near the middle of that portion of the pond ~150 ft away from either tree line. There is no standing water nearby although a small drainage is present ~150 ft to the east. Core runs were extruded into plastic sleeves which were then placed in labeled core boxes. The weather was sunny during sample collection.

Latitude/longitude of subsamples (description of how data collected and/or data collected): 36.51838, -78.47490. A GPS-enabled iPad was used to record latitude and longitude of sample location.

Additional data collected (paste pH, pXRF, etc.): None

Geospatial data (description of measurements if made in the field): Location of core is in an ArcGIS feature class available from the North Carolina Geological Survey.