APPENDIX A

SCOPE OF WORK FOR ADMINISTRATIVE SETTLEMENT AGREEMENT AND ORDER ON CONSENT FOR INTERIM REMOVAL ACTION FOR BLACK JACK MINES NUMBERS 1 AND 2 AND MAC MINES NUMBERS 1 AND 2

1.0 Introduction

The interim removal action for the Black Jack Mines Nos. 1 and 2 and Mac Mines Nos. 1 and 2 and associated areas ("Sites") is a time-critical removal action to investigate and mitigate actual or threatened releases of hazardous substances. This Scope of Work ("SOW") specifies actions required to be completed by Homestake Mining Company of California ("Respondent") pursuant to the Administrative Settlement Agreement and Order on Consent ("AOC"), CERCLA Docket No. 2014-06, entered into voluntarily with the United States Environmental Protection Agency ("EPA"). All terms used in this SOW shall be interpreted in a manner consistent with the definitions provided in the AOC. In the event of any conflict between this SOW and the AOC, the AOC shall control.

2.0 Areas To Be Addressed

The Sites and associated areas are shown in Attachments 1 thru 6 to this SOW. The areas to be addressed by this SOW include:

- Black Jack Nos. 1 and 2 mines as shown on Attachments 1 and 2,
- Mac Nos. 1 and 2 mines as shown on Attachments 3 and 4,
- Potential mine haul roads as shown on Attachments 5 and 6, along with their shoulders,
- Known vent holes related to the Sites,
- Washes at the Sites, and
- Known exploratory holes within the Sites.

The mine lease surface areas are approximately 33 acres for Mac No. 1, approximately 6 acres for Mac No. 2, approximately 24 acres for Black Jack No. 1, and approximately 14 acres for Black Jack No. 2.

In addition, Respondent may be required to characterize additional areas in the vicinity of the Sites (i.e., step out areas) in the field, if EPA determines that mine-related materials extend beyond the margins of the areas described above, or if additional areas of mine-related materials are identified in proximity and are attributable to the Sites. These additional areas, if any, will be identified during Phase 1 of the Work as described in Section 4.1 and set forth in the Summary Report described in Section 6.8 and will be addressed in Phase 3.

3.0 General Requirements

3.1 Priority Media: Priority media at the Sites include soils, sediments, groundwater and dust.

3.2 Potential Contaminants of Concern: The primary Potential Contaminant of Concern ("PCOC") is radium 226 ("^{226}Ra"). ^{226}Ra and its associated gamma emission is the primary risk driver associated with uranium ore extraction. Gamma radiation levels that potentially exceed background levels have been detected at the Sites. In addition to ^{226}Ra, Respondent shall analyze soil and sediment samples from selected locations for additional PCOCs frequently associated with mining activities. The contaminants for these analyses shall include ^{226}Ra, uranium, arsenic, molybdenum, selenium and vanadium. In addition, if former or existing underground or aboveground storage tanks are identified during the review of historical records or onsite field investigation activities, then samples shall be collected for total petroleum hydrocarbons.

3.3 Investigation Level: For the purposes of this Removal Site Evaluation **("**RSE"), the investigation level for ^{226}Ra is 1.24 pCi/g above background. This investigation level is based on EPA's preliminary remediation goal ("PRG") for ^{226}Ra plus daughters and represents the 10^{-4} risk level for residential exposure. Scanning measurements must meet a scan minimum detectable concentration ("MDC") of 50% of the investigation level. Investigation levels for other potential contaminants of concern shall be taken from the EPA Region 9 Regional Screening Level ("RSL") tables, available at http://www.epa.gov/region9/superfund/prg**.**

3.4 Multi-Agency Radiation Survey & Site Investigation Manual ("MARSSIM"): The activities conducted as part of this interim removal action shall be conducted in a manner consistent with MARSSIM specifications to facilitate implementation of a final status survey at the completion of all mitigation activities**.**

3.5 Notice of Fieldwork and Sampling: Respondent shall notify EPA and Navajo Nation EPA (collectively "the Agencies") not less than seven (7) days in advance of any sample collection activity, unless shorter notice is agreed to by EPA.

3.6 Quality Assurance and Sampling: All sampling and analyses performed shall conform to EPA direction, approval, and guidance regarding sampling, quality assurance/quality control ("QA/QC"), data validation, and chain of custody procedures. Respondent shall ensure that the laboratory used to perform the analyses participates in a QA/QC program that complies with the appropriate EPA guidance. Respondent shall follow, as appropriate, "Quality Assurance/Quality Control Guidance for Removal Activities: Sampling QA/QC Plan and Data Validation Procedures" (OSWER Directive No. 9360.4-01, April 1, 1990), as guidance for QA/QC and sampling. Respondent shall only use laboratories that have a documented Quality System that complies with ANSI/ASQC E-4 2004, "Quality Systems for Environmental Data and Technology Programs: Requirements with Guidance for Use" (American National Standard), and "EPA Requirements for Quality Management Plans (QA/R-2) (EPA/240/B-01/002, March 2001)," or equivalent documentation as determined by EPA. EPA may consider laboratories accredited under the National Environmental Laboratory Accreditation Program ("NELAP") as meeting the Quality System requirements.

3.7 Split Samples: Upon request from EPA, Respondent shall provide 10% splits to EPA to be analyzed by EPA's laboratory for corroboration analysis. EPA shall have the right to take any additional samples that EPA deems necessary. Upon request, EPA shall allow Respondent to take split or duplicate samples of any samples it takes as part of its oversight of Respondent's implementation of the Work.

3.8 Data Reports: Respondent shall provide all data in both electronic form and hard copy. Electronic data shall be provided as described in the Data Management Plan (Section 5.6). Maps should be provided as ArcGIS shape files.

3.9 Cultural Resources Survey: Respondent shall perform a Cultural Resources Survey and shall submit a Cultural Resources Survey Report for review and approval to the Navajo Nation Historic Preservation Department. A copy of the final report and the approval from Navajo Nation Historic Preservation Department shall be submitted to EPA. Unless required for completion of the Cultural Resources Survey, no intrusive work on the Sites shall be performed prior to Navajo Nation approval of this Report.

3.10 Biological Clearance: Respondent shall, pursuant to the Biological Resource Land Use Clearance Policies and Procedures ("RCP"), RCS-44-08 (approved September 10, 2008), request information on biological resources specific to the Sites ("Data Request"), from the Navajo Natural Heritage Program ('NNHP"). If the NNHP provides a Data Response that states there are no known or potential species of concern for the Sites, then a biological evaluation need not be prepared and Respondent can receive a biological clearance by requesting concurrence from the Navajo Nation Department of Fish & Wildlife ("NNDFW") that the Work will not affect species of concern. If NNHP identifies known or potential species of concern at the Sites, Respondent will pursue, if applicable, the process and procedures to obtain a biological clearance as set forth in the RCP for Area 3 (Less Sensitive Area) projects, before it commences Work at the Sites.

4.0 <u>Requirements for the Work</u>

Each phase of Work shall be performed pursuant to approved Work plans and may overlap to some degree. Requirements for the Work plan(s), which shall include but not be limited to the tasks specified in Sections 4.1, 4.2 and 4.3, are described in Section 5.

4.1 Phase 1 – Transect Gamma Scan, Geomorphologic Survey and Background Study

4.1.1 Transect Gamma Scan: Respondent shall conduct gamma scans of the Sites and areas described in Section 2, above. The gamma scan should be designed to identify the areal extent of mine-related material attributable to the Sites, including areas beyond the boundaries described in Section 2, if any.

4.1.2 Geomorphologic Survey: Respondent shall conduct a geomorphologic survey to characterize the existing terrain features and geomorphological stability of the Sites to evaluate active and potential erosion processes as well as existing and potential pathways for erosion of mine-related material to support closure options analysis in the future.

4.1.3 Background Study: Respondent shall conduct a background study consistent with MARSSIM. Respondent shall propose at least two reference areas based on geologically similar soils, upgradient and upwind as determined by available topographical maps and regional meteorological data, of the Sites in areas undisturbed by uranium mining. A gamma scan of the background area(s) will be performed, in addition to collection and testing of surface soil for ^{226}Ra activity, total uranium, and arsenic, molybdenum, selenium, and vanadium.

4.1.4 Sampling for Gamma Scan/Soil Concentration Correlation: Respondent shall develop a site-specific statistical correlation between gamma scan instrument responses and ^{226}Ra concentrations in soil. Respondent shall collect sufficient gamma scan data and surface soil samples in areas with elevated gamma scan results to calculate a correlation between gamma scan counts and soil concentrations of ^{226}Ra.

4.1.5 Radiation Measurements in Buildings: Radon measurements shall be taken in buildings at the Mac No. 1 Mine Site using activated charcoal adsorption devices. The measurement time will be 48 hours with the buildings closed and undisturbed during the measurement. Location(s) of the radon measurements will be determined in the Phase 1 Work Plan.

4.1.6 Open Hole at Black Jack No.1: Respondent shall backfill and grade the open hole area at the Black Jack No 1 Mine Site.

4.2 Phase 2 – Filling and Closing Holes, Vent Holes and other Surface Features; Site Signage

4.2.1 Open Hole Closure: Respondents shall assess the Sites to locate any vent holes, openings related to the mine, and other surface features that pose a physical threat to humans or animals. If any such hazards exist, Respondent shall backfill and grade such hazards, or as temporary mitigation, install fencing and signage in Phase 2 and then plug or backfill and grade in Phase 3 such hazards to remove the threat. Vent holes that are currently capped with steel plates or cement are sufficiently secured for the purposes of this this AOC. The open vent hole at Black Jack No. 1 shall be plugged or capped.

4.2.2 Site Signage: Respondent shall install bilingual (English and Navajo) signs on 200-ft spacing around the Sites. The template for the signs will be provided by EPA.

4.3 Phase 3 – Removal Site Evaluation ("RSE")

4.3.1 Characterization of Surface, Subsurface Soils and Sediments: Subject to any restrictions based on the approved Cultural Resources Survey, the filing of a Data Request with the NNHP and obtaining, if necessary, a biological

clearance at the Sites as set forth in paragraphs 3.10 and 6.3 herein, Respondent shall sample and analyze surface and subsurface soils for ^{226}Ra in the areas described in Section 2 of this SOW, as amended by the results of the Phase 1 Work. Sampling in all mine process areas and the step out areas shall include surface sampling and subsurface sampling at appropriate intervals to a depth that confirms the vertical and lateral extent of mine-related material, as determined by a field gamma meter and confirmatory soil sampling.

4.3.2 Screening for Additional Analytes at Mine Areas: Respondent shall sample and analyze surface and subsurface soil samples from a minimum of sixteen locations, four from each of the Sites, for the metals referenced in paragraph 3.2, above. Final locations shall be selected by EPA in its approval of the Phase 3 Work Plan.

4.3.3 Groundwater Sampling: Respondent shall identify and sample any accessible wells used in mine operations for uranium, ^{226}Ra, total dissolved solids, anions (carbonate, bicarbonate and sulfate), cations (sodium, calcium and manganese), arsenic, molybdenum, selenium and vanadium, provided sampling is not precluded by casing obstruction or absence of groundwater,.

4.3.4 Geotechnical Sampling: Respondent shall determine the location and characteristics of suitable soil and erosion control material for use to stabilize mine related material, if needed. The volumes of suitable materials will also be determined.

4.3.5 Radiation Measurements in Buildings: Respondent shall collect alpha wipe samples over 100 cm^2 areas in mining operation buildings on the Sites. The spacing of measurement locations shall be determined in the Phase 3 Work Plan. In addition, direct measurements with a scintillation detector, capable of simultaneous measurement of alpha and beta radiation, shall be collected within the building interiors at common locations but prior to collection of the alpha wipe samples. Specifically, the Mac No. 1 Mine Site buildings with radon concentrations greater than 4 pCi/L, as determined by Phase 1 measurements, will be measured with track etch type detectors over a 90 day period during Phase 3 of the Work.

4.3.6 Open Hole Closure: Respondent shall plug or backfill and grade hazard areas identified in Section 4.2.1 that were not backfilled and graded in 2014.

4.3.7 Testing of Solid Waste: Respondent shall test or gamma scan solid waste, such as old fencing materials, old piping, concrete debris, etc., at the Sites. The volume of such solid waste shall be estimated at each of the Sites until a final determination is made following issuance of the Final Report as to the manner of disposal of such material. The material inside the buildings at Mac No. 1 shall remain locked inside the buildings and not be disposed of.

5.0 Work Plans

Respondent is required to develop the following work plans and to submit them for EPA review and approval, in consultation with Navajo Nation, or approval with modifications, consistent with the AOC.

5.1 Removal Action Work Plan: This plan shall cover the overall SOW. The Overall Removal Work Plan may be broken into individual work plans for Phases 1, 2, and 3 with each submitted separately or together.

5.1.1 Quality Assurance Project Plan (QAPP): This plan shall document the planning, implementation, and assessment procedures for a particular project, as well as any specific quality assurance and quality control activities. This plan shall be prepared in accordance with "EPA Requirements for Quality Assurance Project Plans (QA/R-5)" (EPA/240/B-01/003, March 2001), and "EPA Guidance for Quality Assurance Project Plans (QA/G-5)" (EPA/600/R-98/018, February 1998).

5.1.2 Field Sampling Plan/Quality Assurance Sampling and Analysis Plan (FSP/QASP): This plan shall address vertical and lateral characterization and verification sampling. Respondent shall utilize an appropriate statistical approach and a sufficient radiological scanning approach to develop this plan. The FSP/QASP will be provided in the Overall Removal Work Plan (Work Plan). In addition, Respondent should use an approach consistent with MARSSIM. Respondent can use Visual Sampling Plan software to properly document that soil sampling approach is statistically representative.

5.1.3 Construction Work Plan: This plan shall specify how all construction activities will be implemented, including adit and vent hole closures. This plan is not required if EPA determines that no construction is necessary.

5.1.4 Data Management Plan: This plan shall present a framework for the generation, validation, and distribution of the removal assessment data deliverables. At a minimum, the Data Management Plan will address the following topics: (1) a description of the data management process, including the data management team and management of new, historical and monitoring data; (2) a description of the data management system, including databases, software and specification of electronic data deliverable (EDD); and (3) a description of the management and administration of the data management system, including access, security and data backup.

5.2 In addition to the above Work Plan elements, Respondent shall also prepare and submit a Health and Safety Plan. This plan shall identify all hazards and include both directives and specific operating procedures that will be used to mitigate those hazards to ensure the protection of the public health and safety during performance of on-Site work under the AOC and this SOW. This plan shall be prepared in accordance with EPA's Standard Operating Safety Guide (PUB 9285.1-03, PB 92963414, June 1992). In addition, this plan shall comply with all currently applicable Occupational Safety and Health Administration ("OSHA") regulations found at 29 C.F.R. Part 1910. If EPA determines that it is appropriate, this plan shall also include contingency planning.

6.0 Schedule

The Work to be performed pursuant to the AOC and this SOW shall be performed in compliance with the following schedule, unless otherwise agreed by the parties or excused by a Force Majeure. The parties understand and acknowledge that any delays in obtaining access to any of the Sites on lands allotted to individual members of the Navajo Nation or from the Bureau of Indian Affairs – Crownpoint Realty Office or on lands subject to grazing permits, or in obtaining a biological clearance at the Sites may affect the remainder of the schedule and deliverables under this SOW.

6.1 Access Approvals – Use best efforts to work with the Navajo Nation to obtain property access approvals within fifteen (15) days of the effective date of the AOC.

6.2 Cultural Resources – Hire a Cultural Resource Survey contractor approved by the Navajo Nation within 14 days from the effective date of the AOC. Any field work for the Survey shall begin within 7 days of obtaining property access approvals. Submit the Survey Report to the Navajo Nation Department of Historic Preservation with a copy to EPA within 45 days from obtaining property access approvals.

6.3 Natural Resources –File a Data Request with the NNHP concerning the proposed Work at the Sites within 14 days from the effective date of the AOC. If NNHP determines that there are known or potential species of concern at the Sites, within 14 days of such determination, Respondent shall begin the process to obtain a biological clearance.

6.4 Work Plan for Phase 1 – Submit a draft Work Plan for Phase 1 within 45 days of the effective date of the AOC. Respondent will require access to the Sites to prepare the Work Plan.

6.5 Work Plan for Phase 2 – Submit a draft Work Plan for Phase 2 within 45 days from approval of Phase 1 Summary Report. Respondent will require access to the Sites to prepare the Work Plan.

6.6 Work Plan for Phase 3 – Submit a draft Work Plan for Phase 3 within 60 days from approval by EPA of the Phase 2 Summary Report. Respondent will require access to the Sites to prepare the Work Plan.

6.7 Health & Safety Plan – Submit a draft Health & Safety Plan within 45 days of the effective date of the AOC.

6.8 Field Work for Phase 1 (Gamma Scanning and Background Data Collection) – Subject to final approval of the Cultural Resources Survey Report by the Navajo Nation Historic Preservation Department, the filing of a Data Request with the NNHP and obtaining, if necessary, a biological clearance at the Sites as set forth in paragraphs 3.10 and 6.3 above concerning the proposed Work at the Sites, begin field work for Phase 1 within 30 days from approval of the Work Plan for Phase 1, provided property access approvals to enter the Sites have been deemed sufficient by the Navajo Nation.

6.9 Phase 1 Summary Report – Submit Phase 1 Summary Report within 60 days from completion of field work for Phase 1 and receipt of all validated laboratory data for Phase 1.

6.10 Field Work for Phase 2 – Subject to final approval of the Cultural Resources Survey Report by the Navajo Nation Historic Preservation Department, the filing of a Data Request with the NNHP and obtaining, if necessary, a biological clearance at the Sites as set forth in in paragraphs 3.10 and 6.3 above concerning the proposed Work at the Sites, begin field work to address physical hazards for Phase 2 within 30 days from EPA's approval of the Work Plan for Phase 2, provided property access approvals to enter the Sites have been deemed sufficient by the Navajo Nation. Install signs within 30 days from EPA's approval of the Work Plan for Phase 2.

6.11 Phase 2 Summary Report – Submit Phase 2 Summary Report within 60 days from the completion of the field work for Phase 2.

6.12 Work for Phase 3 (RSE) – Subject to the prior final approval of the Cultural Resources Survey Report by the Navajo Nation Historic Preservation Department, the filing of a Data Request with the NNHP and obtaining, if necessary, a biological clearance at the Sites as set forth in paragraphs 3.10 and 6.3 above concerning the proposed Work at the Sites, begin field work for Phase 3 within 45 days from approval of the Work Plan or by May 15, 2015 if the Work Plan approval is more than 45 days before May 15, 2015, provided property access approvals to enter the Sites have been deemed sufficient by the Navajo Nation.

6.13 Final Report (includes RSE Report) – Submit the Final Report within 90 days of completion of all field work and receipt of all validated analytical data. The Final Report shall include all the data collected during the investigations, an estimate of the total volume of contaminated soil, a report on all construction work completed, and a summary of the cost of the work.

7.0 Reporting

7.1 Weekly Technical Calls: Respondent shall, as needed, participate in weekly technical conference calls with EPA's project manager, EPA's consultants and Navajo Nation representatives. On the weekly call, Respondent's representatives shall provide updates

on all tasks and raise issues that may need to be resolved in order to expedite completion of the Work.

7.2 Monthly Reporting: Respondent shall provide a Monthly Report to the OSC/RPM and Navajo Nation representatives via email, no later than the last day of the first full month following the Effective Date of the AOC, and include in each report a complete update on all field, analytic and planning activities.

7.3 Laboratory Results: A copy of all laboratory results shall be provided to EPA within 5 days of Respondent's, or Respondents' consultants, receipt of such results. Laboratory results need not be validated for this submittal.

7.4 Final Report: The Final Report shall integrate all data used and collected into a single coherent characterization report deliverable. This report shall be provided as specified in the AOC.

7.5 Potential Engineering Evaluation/Cost Analysis: Upon approval of the Final Report, EPA shall determine whether to direct Respondent to develop and write an Engineering Evaluation/Cost Analysis (EE/CA). The EE/CA shall be based on the Final Report and evaluate response action alternatives for mine related materials at the Sites determined to require management, disposal or both. The EE/CA shall be consistent with the National Contingency Plan, 40 C.F.R. Part 300 and EPA's "Guidance on Conducting Non-Critical Removal Actions Under CERCLA" (Aug. 1993). Within 120 days of any direction by EPA to write an EE/CA, Respondent shall submit a work plan providing the general outline of the EE/CA including a list of proposed alternatives for analysis and proposed approach for conducting the risk assessment to determine removal action goals. Respondent shall submit a draft EE/CA for review to EPA within 90 days of EPA's approval of the work plan. Within 30 days of receiving EPA's comments, Respondent shall respond to comments and issue a new draft. This process will repeat until EPA approves a final EE/CA.

8.0 List of Attachments

Attachment 1 – Site Boundary Map of Black Jack No. 1 Mine

Attachment 2 – Site Boundary Map of Black Jack No. 2 Mine

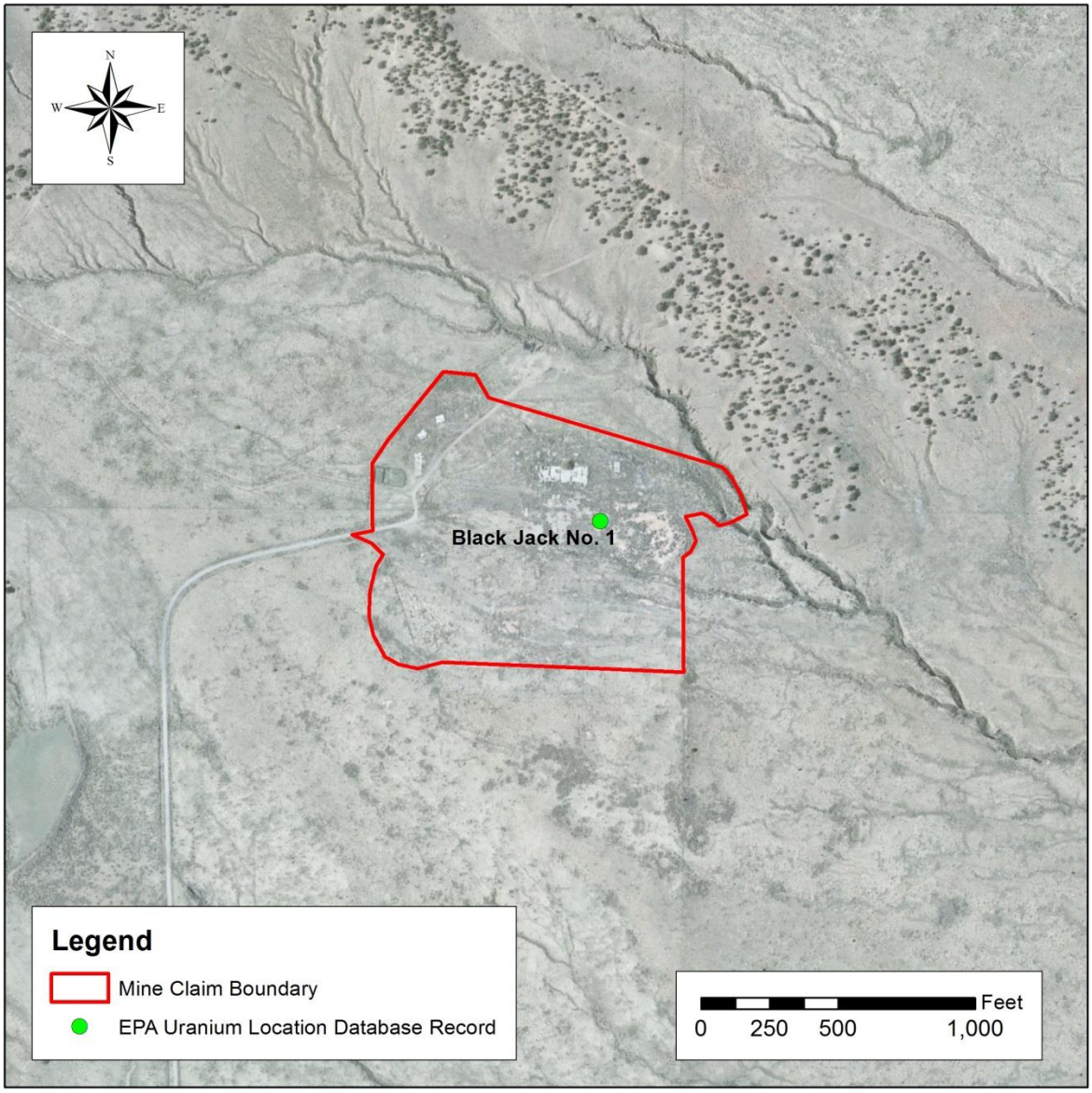
Attachment 3 – Site Boundary Map of Mac No. 1 Mine

Attachment 4 – Site Boundary Map of Mac No. 2 Mine

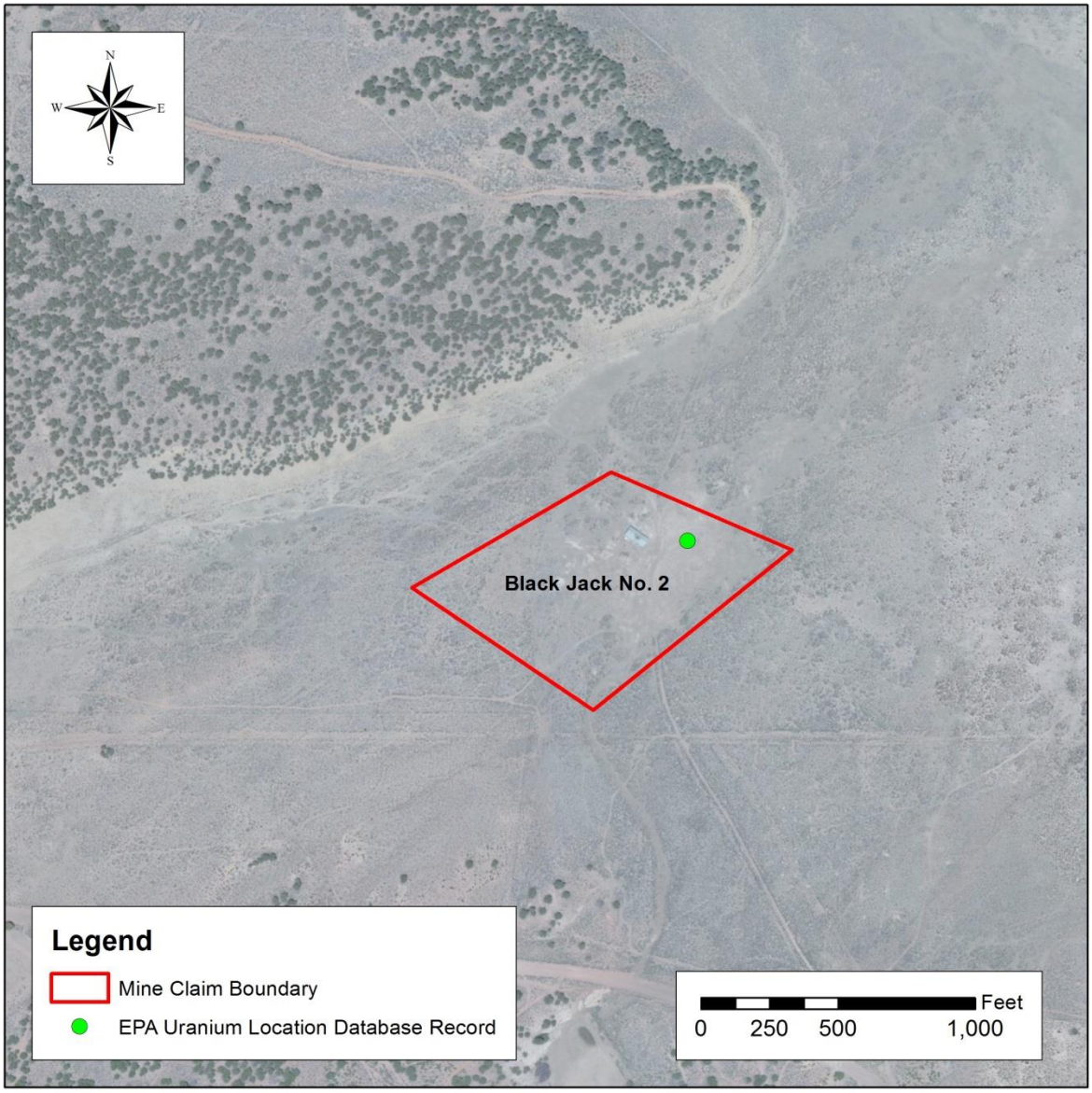
Attachment 5 – Map of Black Jack No.1 Mine and Associated Areas

Attachment 6 – Map of Black Jack No. 2 and Mac Nos. 1 and 2 Mines and Associated Areas

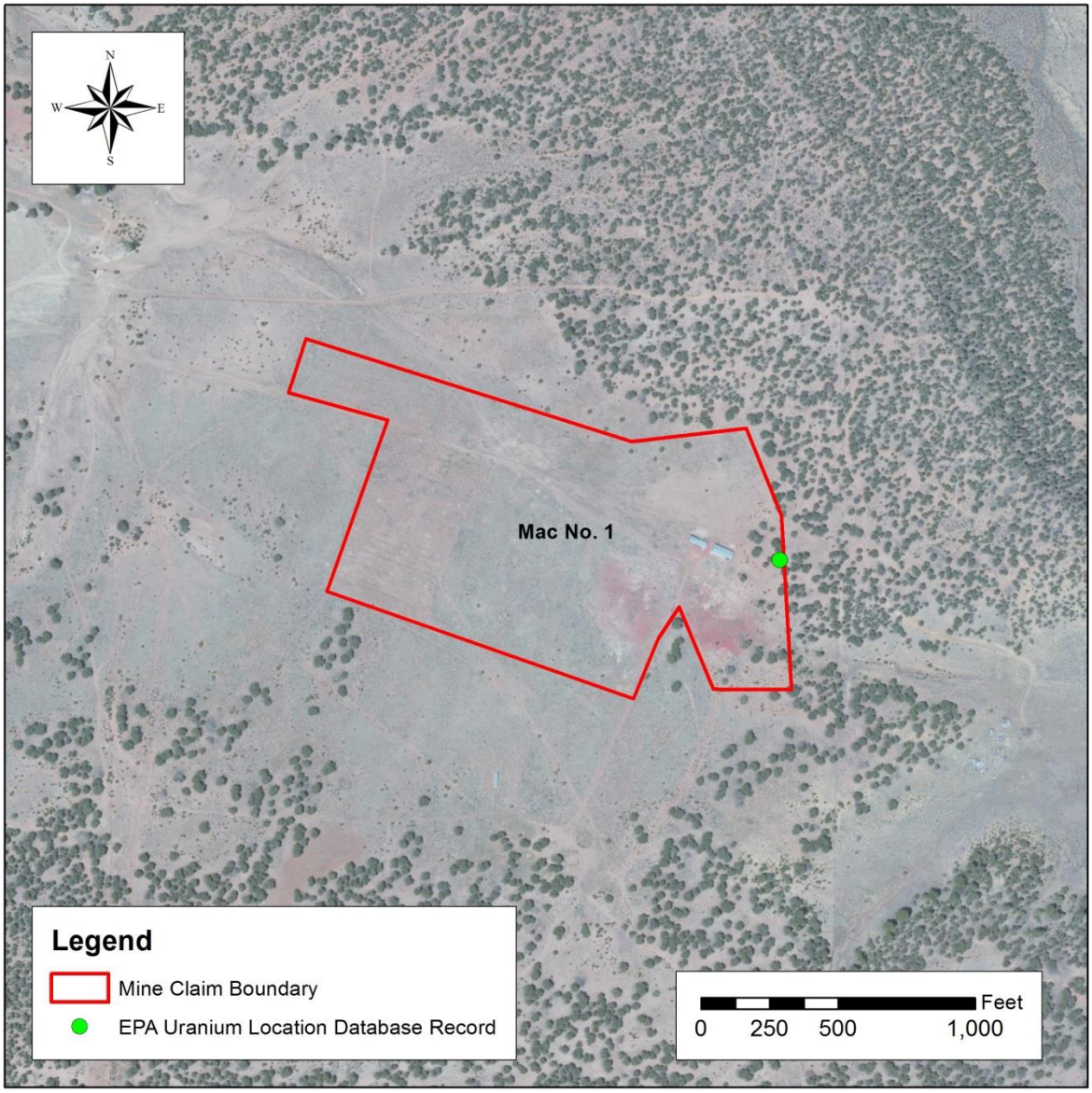
Attachment 1 – Site Boundary Map of Black Jack No. 1 Mine



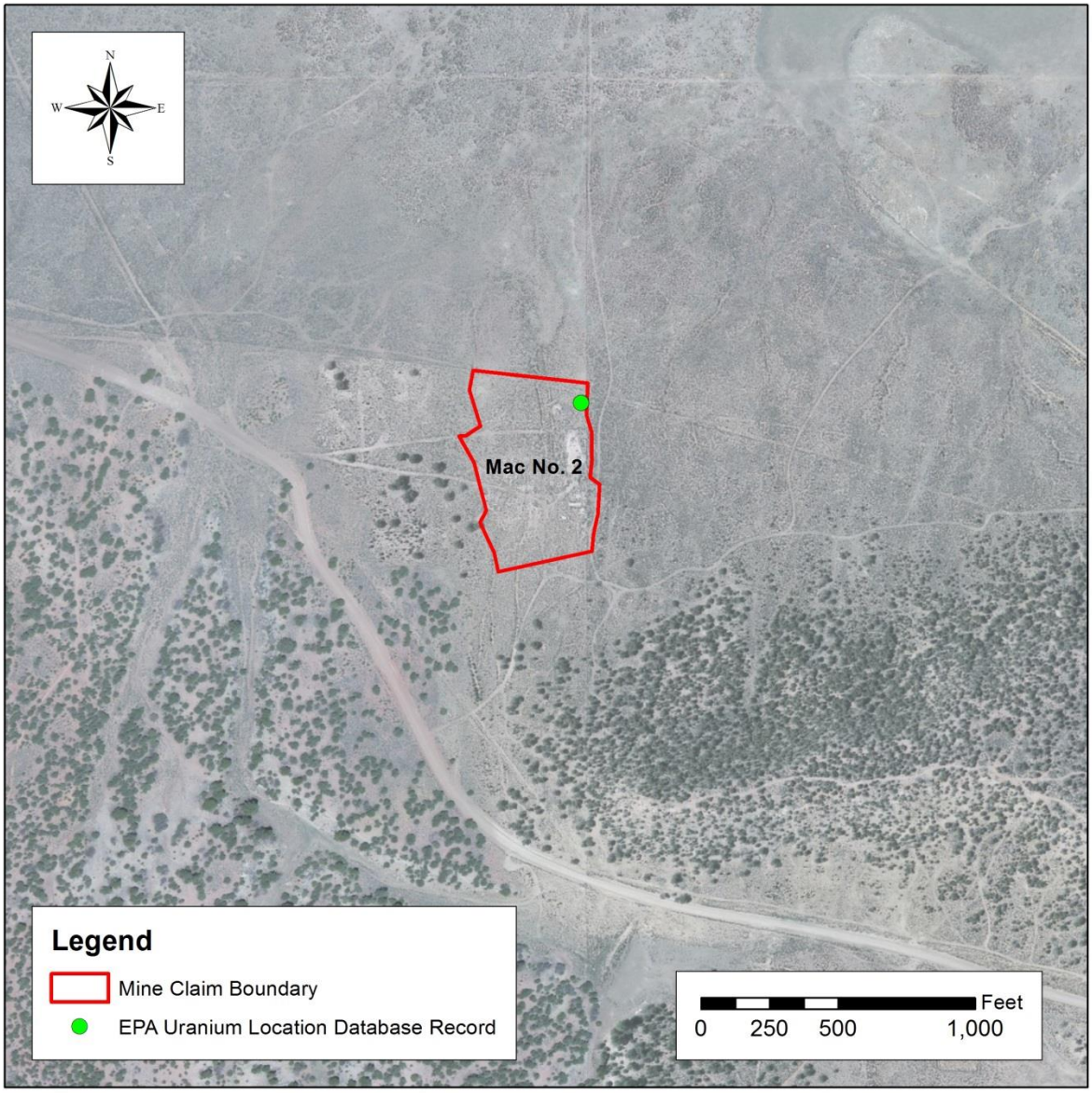
Attachment 2 – Site Boundary Map of Black Jack No. 2 Mine



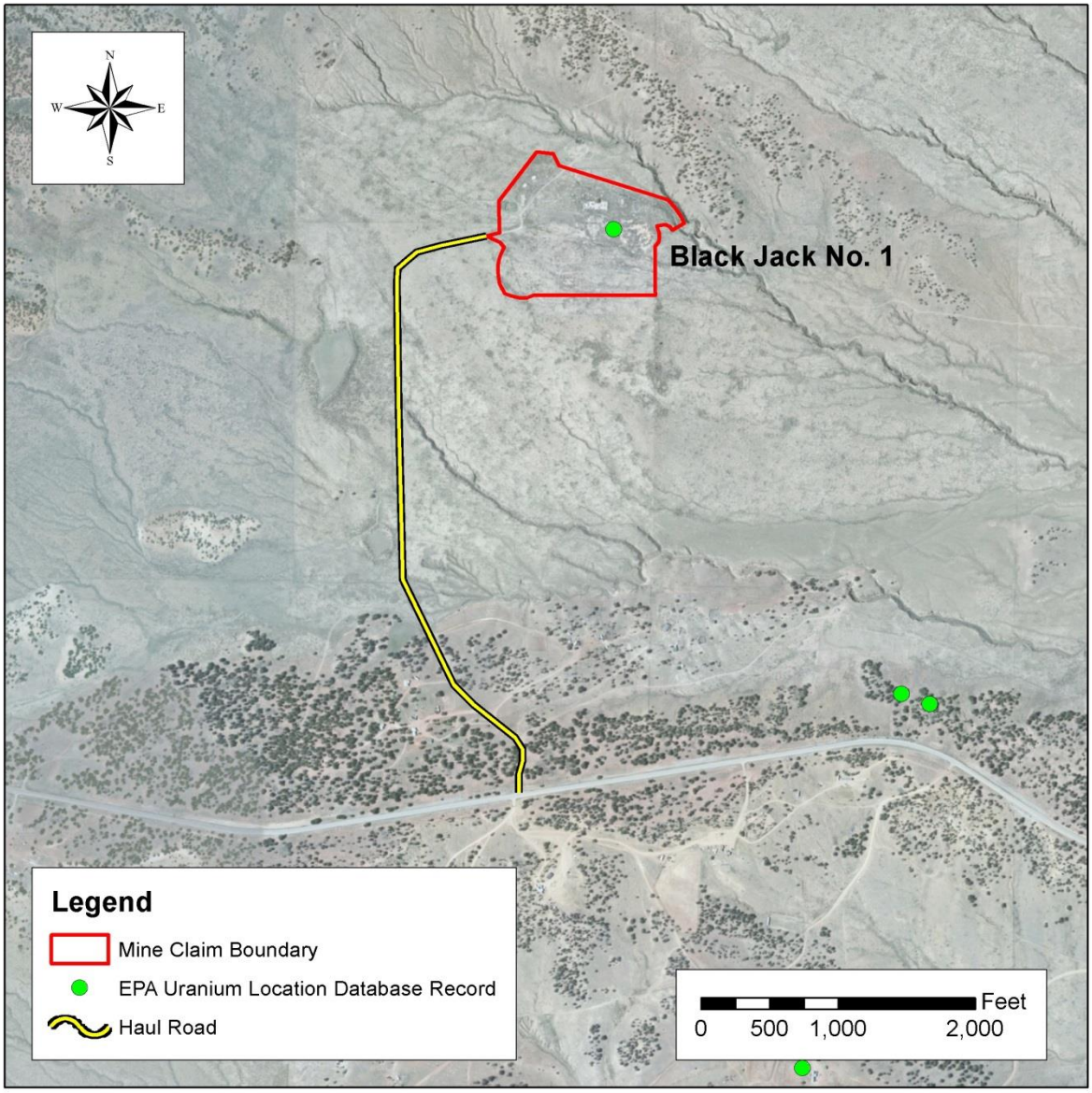
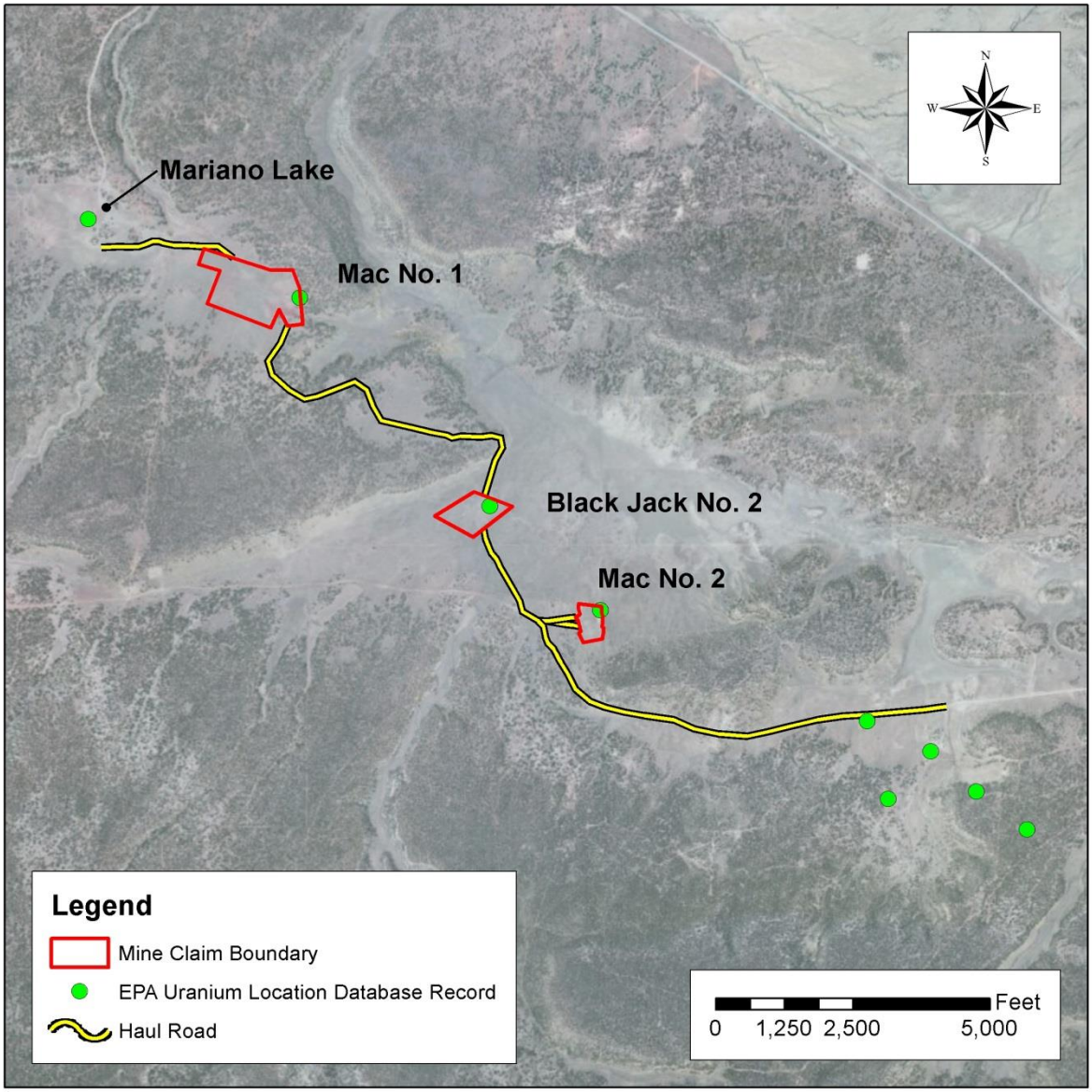
Attachment 3 – Site Boundary Map of Mac No. 1 Mine



Attachment 4 – Site Boundary Map of Mac No. 2 Mine



Attachment 5 – Map of Black Jack No.1 Mine and Associated Areas



Attachment 6 – Map of Black Jack No. 2 and Mac Nos. 1 and 2 Mines and Associated Areas