

SECTION A. Project Title: Atomic Alchemy Site Characterization

SECTION B. Project Description and Purpose:

Atomic Alchemy is developing a radioisotope production facility to create abundant, affordable, radioisotopes for medical, industrial, space power, and defense uses. In 2020, Atomic Alchemy obtained an MOU from the U.S. Department of Energy to create the framework for planning, evaluation, and fabrication activities, leading to the construction and operation of their first facility, named the Meitner-1, at the Idaho National Laboratory (INL). The mission of DOE is to, “ensure America’s security and prosperity by addressing energy, environmental and nuclear challenges through transformative science and technology solutions”.

INL’s mission “...is to discover, demonstrate and secure innovative nuclear energy solutions, other clean energy options and critical infrastructure”. Siting of the Meitner-1 facility to support Atomic Alchemy’s commitment to rapid commercialization of isotope production is in direct support of mission statements for both the DOE and INL. The proposed Versatile Isotope Production Reactor is a compact, pool-type reactor capable of producing up to 15 MWth. Atomic Alchemy is currently engaged with the Nuclear Regulatory Commission with planning to submit a construction permit application for the four-reactor facility. for the four-reactor facility.

Atomic Alchemy, working with INL and DOE-ID, identified a preferred location to site the proposed Meitner-1 facility. Through the site selection process, a preferred site outside of the 31 sites previewed by INL was chosen. “Site AAI” is a 172-acre site located approximately 7 km southwest of the Materials and Fuels Complex (MFC) and north of Highway 20 (Figure 1). Site AAI is the preferred location because of the ability to have quick access to Highway 20, minimize disturbance to sagebrush and Greater sage-grouse habitat, and minimize the need for access roads. The proposed facility would only occupy an approximately 20-acre fenced portion of the 172-acre provisionally accepted site, with an operations boundary of around 5 acres.

Figure 1: Site AAI in relation to MFC. The final operations boundary will be determined by this geotechnical work. The blue rectangle represents the provisionally accepted site boundary. The cyan box represents the preferred subsite which encompasses the operational boundary.



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Atomic Alchemy is proposing to perform site characterization activities within and surrounding Site AAI's fenced boundary in preparation for construction and operation of the Meitner-1 facility and support the NRC licensing application process. All activities are intended to conform with all applicable requirements and use best management practices to limit the potential effects of any resultant ground disturbance. The following activities are proposed to support site characterization:

- Cultural Resource Survey – In anticipation that cultural resources may be present within Site AAI a pedestrian survey is proposed. The cultural resource survey is intended to review the entire proposed 172-acre Site AAI even though the initial proposal is to place the 20-acre facility footprint in the eastern portion of the 172 acres (Figure 1).

The cultural resource survey would occur across the entire AAI site. It is anticipated that the cultural surveys will be conducted by the BEA Cultural Resource Management Office. Survey activities would not require significant ground disturbance or the use of vehicles. The cultural resource survey is intended to be a pedestrian survey. There are no anticipated emissions, discharges, waste generation, waste disposal, or chemical use associated with this activity.

Figure 2: Current site characterization plans (orange circles) on current preferred subsite (purple boundary). The black boundary is the provisionally-accepted Site AAI boundary.



The BEA Natural Resources Group will be conducting Site Specific Ecological Surveys beginning early October 2024 and continuing through July 2025 to gather necessary information for inclusion in an Environmental Report (ER), NRC Licensing, and subsequent NEPA review. Site Specific Ecological Surveys will be collected on the eastern half of Site AAI and will include Bird Surveys, Winter Transect Surveys, Pygmy Rabbit Surveys, Small Mammal Surveys Acoustical Bat Surveys, Reptile/ Amphibian Surveys, and Bumblebee Surveys. These ecological surveys should be completed prior to additional ground disturbing characterization activities to avoid negatively influencing the baseline data defined in NRC RG 4.11 “Terrestrial Environmental Studies for Nuclear Power Stations.”

In addition to biological, ecological and cultural resources surveys, the following soil disturbing characterizations will be completed and are anticipated to begin late 2024.

Table 1: Comprehensive characterization plan highlighting activities and general locations.

Planned Location	Number and Type of Explorations	Planned Exploration Depth (feet)
Primarily in building areas	8 Borings	50 – 80
	10 Borings	30 – 50
	16 Borings	25 feet or refusal on basalt
	17 Borings	10 feet or refusal on basalt
	2 Shear Wave Velocity	---
Primarily in parking lot and access road areas	14 Test Pits	10 feet or refusal on basalt
	18 Depth to Rock Probes	15 feet or refusal on basalt

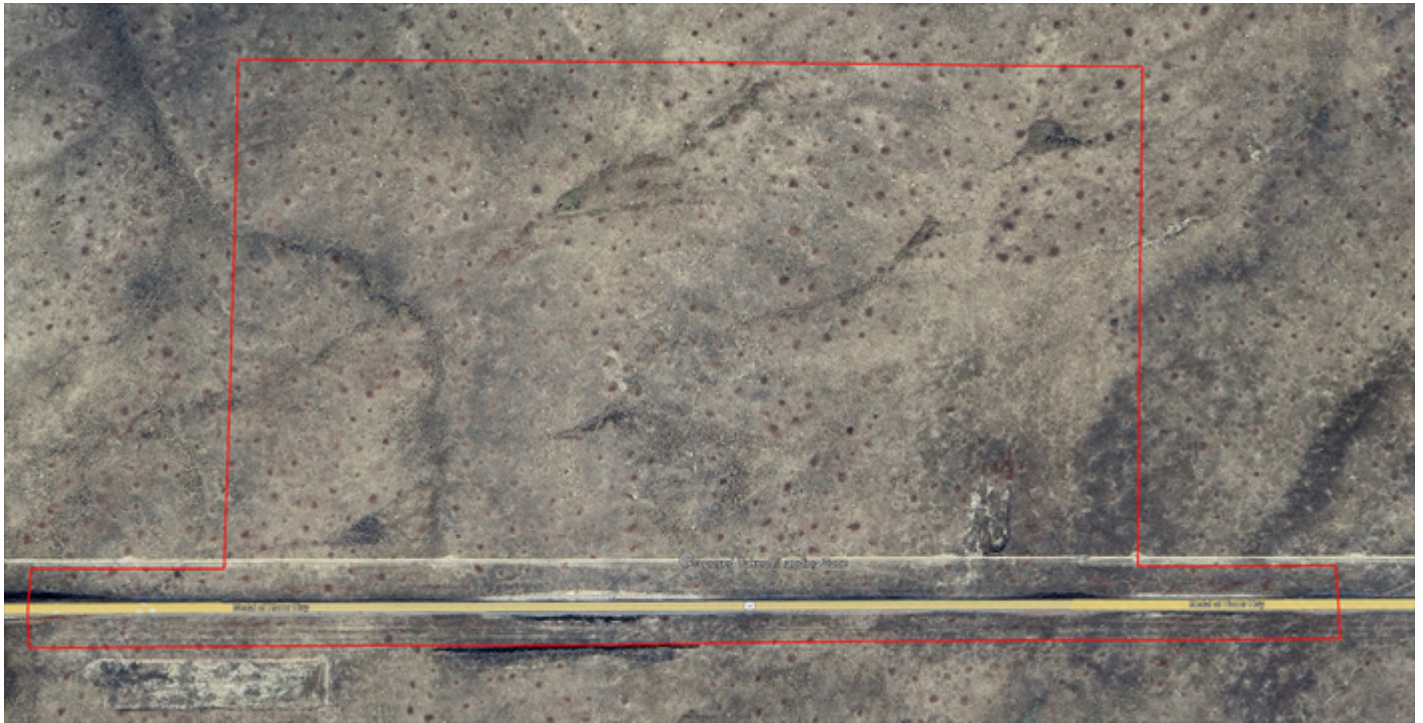
The soil samples and deep boreholes would be performed in parallel. Dust suppression will be implemented as needed. Emissions from operation of heavy equipment are not regulated as stationary sources, and thus, it is anticipated that no emission reporting is required. Any waste generated during activities would be disposed of by the contractor as required by Waste Generator Services using established plans and procedures. Additionally, any chemical use (i.e., bentonite) would be used per the manufacturer instructions and reported as required by INL Chemical Services. There are no anticipated long-term emissions, discharges, waste generation, waste disposal, or chemical use associated with these activities. The use of testing equipment with any radiological source will need to be cleared through the appropriate BEA representative.

Temporary restrooms may be needed during drilling activities. These activities would potentially lightly disturb vegetation via creation of temporary two-track access paths from vehicle operation. Clearing of vegetation at the borehole location in order for truck mounted boring equipment to reach the desired location may occur, but the specific borehole will be moved several inches if it avoids the need to clear vegetation. Any temporary ground disturbance would be restored, to the best ability, to pre-activity conditions.

If soil disturbing characterization activities are required during or before Site Specific Ecological Surveys, then Atomic Alchemy will coordinate closely with BEA’s Natural Resource Group to mitigate those impacts to the greatest extent possible.

A drone (approximately 810×670×430 mm and 7.97 kg with batteries and lidar payload) will be utilized for surveying the 172 acres of the project over a 4 to 6 hour period. The takeoff and landing zone is noted in Figure 3.

Figure 3: Takeoff and landing zone



The following control will be set by type (See Figure 4):

- 4 primary control points (30" long 5/8" rebar with a red plastic cap marked "SF Lands Control", 3' lath with point description and flagging).
 - Control point monuments will remain in the ground; 3' lath can be removed if requested.
 - Also marked as aerial target for the flight (see aerial target markings below) then the markings will be removed after the flight.
- 12 aerial targets (8-12" long wooden hubs or 6" long spikes marked as an aerial target, 3' lath with point description and flagging).
 - ALL materials will be removed after the flight including monument, aerial target markings and lath.

Figure 4: Proposed Control Points



Figure 5: Example aerial target



SECTION C. Environmental Aspects or Potential Sources of Impact:

Air Emissions

Dust suppression will be implemented as needed. Emissions from operation of heavy equipment are not regulated as stationary sources, and thus, it is anticipated that no emission reporting is required.

Discharging to Surface-, Storm-, or Ground Water

NA

Disturbing Cultural or Biological Resources

There is the potential for this work to impact vegetation and for project personnel to interact with various wildlife species. A Biological Resource Review will be arranged within two weeks prior to the initiation of any activities that might disturb soil or vegetation and again following completion of project activities. A nesting bird survey is included with the Biological Resource Review for actions occurring between April 1 - October 1 per compliance with the Migratory Bird Treaty Act. Bat surveys are also included with the Biological Resource Review in accordance with the INL Bat Protection Plan.

Cultural: A Section 106 review was completed under CRMO project number (BEA-25-001) and resulted in No Historic Properties Affected.

Generating and Managing Waste

Any waste generated during activities would be disposed of by the contractor as required by Waste Generator Services using established plans and procedures. Additionally, any chemical use (i.e., bentonite) would be used per the manufacturer instructions and reported as required by INL Chemical Services.

Releasing Contaminants

When chemicals are used during the project there is the potential for spills that could impact the environment (air, water, soil).

Using, Reusing, and Conserving Natural Resources

NA

Environmental Justice

According to the CEQ Climate and Economic Justice Screening Tool, the INL site as well as the Research and Education Campus in Idaho Falls, ID are located in U.S. Census tracts that are identified as disadvantaged communities. Census tracts identified as disadvantaged meet or exceed socioeconomic, environmental, health, or demographic thresholds identified by CEQ. Given that activities analyzed in this document will happen within the boundaries of existing DOE/INL land and/or facilities where there are no permanent residents, any impacts to Environmental Justice in surrounding communities are anticipated to be negligible.

SECTION D. Determine Recommended Level of Environmental Review, Identify Reference(s), and State Justification: Identify the applicable categorical exclusion from 10 Code of Federal Regulation (CFR) 1021, Appendix B, give the appropriate justification, and the approval date.
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For Categorical Exclusions (CXs), the proposed action must not: (1) threaten a violation of applicable statutory, regulatory, or permit requirements for environmental, safety, and health, or similar requirements of Department of Energy (DOE) or Executive Orders; (2) require siting and construction or major expansion of waste storage, disposal, recovery, or treatment or facilities; (3) disturb hazardous substances, pollutants, contaminants, or Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)-excluded petroleum and natural gas products that pre-exist in the environment such that there would be uncontrolled or unpermitted releases; (4) have the potential to cause significant impacts on environmentally sensitive resources (see 10 CFR 1021). In addition, no extraordinary circumstances related to the proposal exist that would affect the significance of the action. In addition, the action is not "connected" to other action actions (40 CFR 1508.25(a)(1)) and is not related to other actions with individually insignificant but cumulatively significant impacts (40 CFR 1608.27(b)(7)).

References: B3.1 "Site characterization and environmental monitoring", B3.2 "Aviation activities"

Justification: Based on the purpose and need and description of the proposed action and potential environmental impacts, the proposed action fits within the class of actions that is listed in Appendix B CX B3.1 and B3.2. There are no extraordinary circumstances related to the proposed action that may affect the significance of the environmental effects of the proposal. The proposed action has not been segmented to meet the definition of a categorical exclusion. This proposal is not connected to other actions with potentially significant impacts (40 CFR 1508.25(a)(1)), is not related to other actions with individually insignificant but cumulatively significant impacts (40 CFR 1508.27(b)(7)) and is not precluded by 40 CFR 1506.1 or 10 CFR 1021.211 concerning limitations on actions during preparation of an environmental impact statement.

Authorizing the proposed action will not (1) threaten a violation of applicable statutory, regulatory, or permit requirements for environment, safety, and health, including DOE and/or Executive orders; (2) require siting of new facilities or expansion of existing facilities; (3) disturb hazardous substances, pollutants, or contaminants; (4) adversely affect environmentally sensitive resources; or (5) involve genetically engineered organisms, synthetic biology, governmentally designated noxious weeds, or invasive species.

B3.1 Site characterization and environmental monitoring. Site characterization and environmental monitoring (including, but not limited to, siting, construction, modification, operation, and dismantlement and removal or otherwise proper closure (such as of a well) of characterization and monitoring devices, and siting, construction, and associated operation of a small-scale laboratory building or renovation of a room in an existing building for sample analysis). Such activities would be designed in conformance with applicable requirements and use best management practices to limit the potential effects of any resultant ground disturbance. Covered activities include, but are not limited to, site characterization and environmental monitoring under CERCLA and RCRA. (This class of actions excludes activities in aquatic environments. See B3.16 of this appendix

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for such activities.) Specific activities include, but are not limited to: Geological, geophysical (such as gravity, magnetic, electrical, seismic, radar, and temperature gradient), geochemical, and engineering surveys and mapping, and the establishment of survey marks. Seismic techniques would not include large-scale reflection or refraction testing; Installation and operation of field instruments (such as stream-gauging stations or flow-measuring devices, telemetry systems, geochemical monitoring tools, and geophysical exploration tools); Drilling of wells for sampling or monitoring of groundwater or the vadose (unsaturated) zone, well logging, and installation of water-level recording devices in wells; Aquifer and underground reservoir response testing; Installation and operation of ambient air monitoring equipment; Sampling and characterization of water, soil, rock, or contaminants (such as drilling using truck- or mobile-scale equipment, and modification, use, and plugging of boreholes); Sampling and characterization of water effluents, air emissions, or solid waste streams; Installation and operation of meteorological towers and associated activities (such as assessment of potential wind energy resources); Sampling of flora or fauna; and Archeological, historic, and cultural resource identification in compliance with 36 CFR part 800 and 43 CFR part 7.

B3.2 Aviation activities. Aviation activities for survey, monitoring, or security purposes that comply with Federal Aviation Administration regulations.

Is the project funded by the American Recovery and Reinvestment Act of 2009 (Recovery Act) Yes No

Approved by Robert Douglas Herzog, DOE-ID NEPA Compliance Officer on: 11/22/2024