HALEU for Fuel Development and Microreactor Demonstration at Idaho National Lab

Arthur Baker
Industry Partnerships Lead - Nuclear
August 7, 2019

INL/CON-19-54336

Purpose of Today's Meeting

- Introduce Notice of Opportunity for HALEU Material available for Microreactor Development and Testing at Idaho National Lab
- Solicit questions and feedback on the opportunity prior to release on August 21st

Agenda

9:00	NEI Safety Briefing and Logistics (E. Redmond - NEI)
9:10	Opening and Introductions (A. Baker - INL)
9:20	Overview of the opportunity (A. Baker - INL)
10:00	Material Overview (M. Patterson - INL)
10:30	Break
10:50	Siting (G. Griffith - INL)
11:20	Contracting (R. Taow - INL)
11:40	Additional Q&A and Feedback (All)
12:20	Closing Remarks (A. Baker - INL)
12:30	Adjourn

Goal

Support United States leadership in the development and demonstration of nuclear energy technologies – specifically commercially viable microreactor technologies by providing a source of High-Assay Low Enrichment Uranium and opportunities for siting demonstration microreactors on the Idaho National Laboratory (INL).

Background

INL is recovering an inventory of HALEU from used EBR-II reactor fuel. The material contains residual impurities and radioactive contamination that would require glovebox handling for fuel fabrication or would otherwise require further decontamination processing.

Assumptions

- Approximately 10 Metric tons of HALEU material could be available by 2028.
- HALEU/Fuel will remain at Idaho National Laboratory
- Successful applicants will be selected to negotiate a CRADA with the Idaho National Lab
- The applicant will fund capital and operational costs for fuel fabrication, fuel qualification, microreactor demonstration, and post-demonstration disposition.
- DOE will utilize the site use permit process to facilitate industry activities at the Idaho National Lab.
- Technical, regulatory, and other support may be provided by DOE/DOE Laboratories as needed by the applicant

Advantages

- Siting at Idaho National Lab
  - Environmental Impact Statement
  - Operational infrastructure
  - Technical infrastructure
- Licensing
- Post-demonstration material / reactor disposition
- Proximity to technical/regulatory expertise and support

Review Criteria

- Feasibility of overall approach, including design, testing, siting and licensing approach and ability to utilize the HALEU material that is being made available (45%)
- Well-defined schedule with performance milestones for development and demonstration of the microreactor design, with emphasis on timing for demonstration (25%)
- Financial plan corresponding to milestones that demonstrates the ability to fund fuel fabrication, fuel qualification, licensing-related costs, microreactor demonstration, and post-demonstration disposition activities (20%)
- Commercial deployment plan following demonstration (10%)

Content of Application

1. Microreactor development (not to exceed 10 pages)
   - Microreactor demonstration plan and objectives, including description of design and performance attributes
   - Description of fuel form, quantity of HALEU material required, fabrication process, and ability to use the material being made available by INL
   - Approach and current status for licensing / authorization
   - Siting plan and requirements for required facilities for fuel fabrication and reactor demonstration, including facility size, special requirements, and support structures
   - INL / DOE technical, infrastructure, and other support required
   - Disposition plan for facilities, reactor, and fuel (including PIE and other potential R&D activities) after demonstration.

Content of Application

2. Detailed Gantt Chart with schedule and milestones (Not to exceed 2 pages)
   - Design finalization
   - Fuel fabrication
   - Fuel qualification
   - Regulatory submissions and approval
   - Microreactor fabrication
   - Microreactor operations
   - Post-demonstration disposition

Content of Application

3. Estimated cost to perform demonstration, including fuel fabrication, fuel qualification, microreactor fabrication, licensing, microreactor demonstration and post-demonstration disposition activities and funding plan to support costs (Not to exceed 3 pages).

4. Commercialization plan for microreactor deployment after demonstration (Not to exceed 4 pages).

Time Line

- 21 Aug Issue Notice of Opportunity
- 20 Sep Applications due
- 19 Nov Selections announced

Feedback and Questions:

Please provide feedback and questions to:

Arthur L Baker

Industry Partnerships Lead – Nuclear

Idaho National Lab

arthur.baker2@inl.gov

208-526-1872

Update on HALEU Feedstock Preparations from EBR-II Used Fuel

Michael N. Patterson
Program Manager
Battelle Energy Alliance

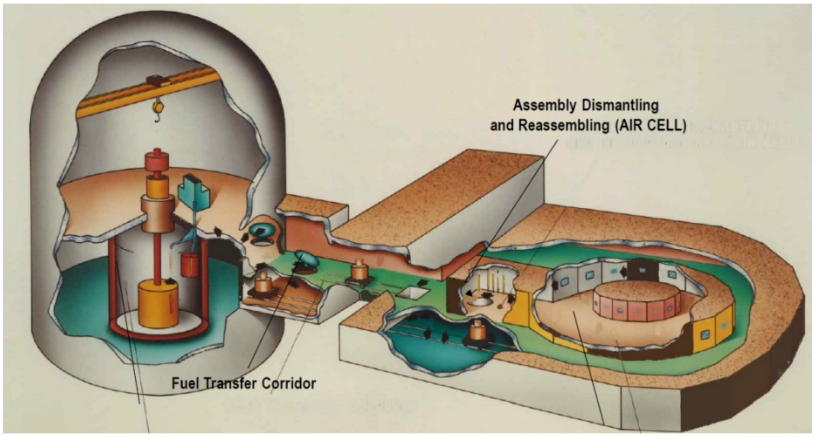
August 7, 2019

www.inl.gov

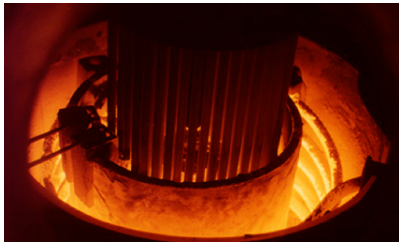
Idaho National Laboratory

Recovery of uranium from irradiated EBR-II fuel – historical perspective

- **Recovery and reuse of uranium irradiated in EBR-II successfully demonstrated from 1964 - 1969**
- **Approximately 2.4 metric tons of irradiated fuel was processed in the Fuel Conditioning Facility using a pyrometallurgical purification process called “melt refining”**
- **More than 34,000 elements were remotely fabricated and returned to EBR-II for power generation, some up to 4 times**



Graphite crucible coated with ZrO_2, similar to what was used in melt refining



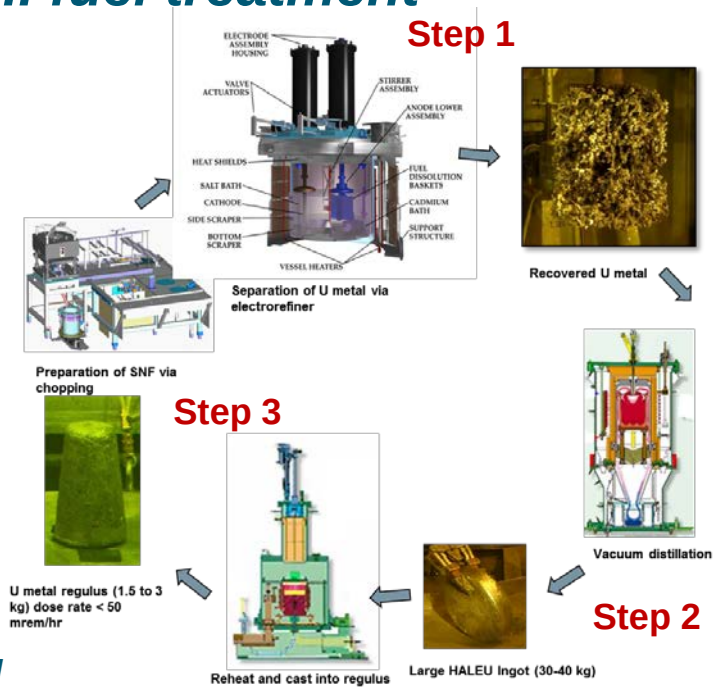
Highly Enriched Uranium pins formed via injection casting

Uranium recovery evolved to electrochemical separations process and is currently being applied to EBR-II fuel treatment

The process is a batch type that separates and recovers uranium metal from used HEU nuclear fuel and down-blends to HALEU

- **Step 1 – Irradiated HEU EBR-II fuel is prepared and placed into a high temperature molten salt electrorefiner which facilitates separation of U metal from fission products**
- **Step 2 – Recovered uranium undergoes vacuum distillation to remove electrorefiner salt and is down-blended to <20% U-235**
- **Step 3 – The recovered uranium metal is configured to serve as HALEU feedstock by reheating and casting into low-dose uranium metal ingots**

January 2019 - DOE determined that use of the HALEU stored at INL had no significant impact on the environment and is an important tool for advancing safe, economical, low carbon nuclear energy.



Casting enhancement facilitates production of HALEU feedstock

The EBR-II Used Fuel Treatment Program recently initiated a revision to the process with the goal of producing high assay low enriched uranium from the recovered EBR-II uranium. Outcomes of the revision included:

- **Production of low dose rate, metallic uranium capable of supporting fuel fabrication within minimally shielded gloveboxes**
- **Identification of an optimal physical size of metallic ingot compatible with routine handling within a glovebox**
- **Minimization of additional waste stream contributions**

Enhancements initiated February 2019, producing more than 150 kg of regulus to date. Target for 2019 is 600 kg

Uranium metal dendrite recovered during fuel treatment

Traditional large metallic ingot

2 part graphite crucible

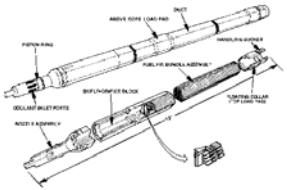
Multi-function furnace

Low dose rate, small size U metal ingot

Potential HALEU Feedstock produced from INL EBR-II Inventory

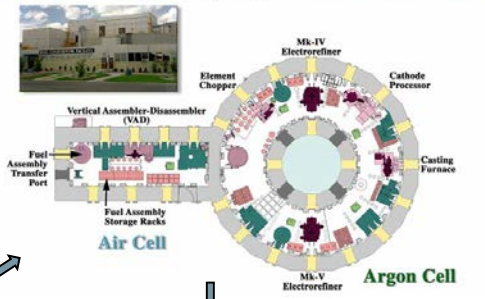
- **Through July 2019 more than 1.5MT of irradiated <u>HEU</u> fuel has been treated to facilitate disposition, resulting in the production of 4 MT of potential HALEU feedstock**

- Continuous treatment of irradiated fuel ongoing
- Recasting operations integrated with treatment
- Utilization of legacy material in conjunction with newly treated material anticipated to produce 9.5MT HALEU

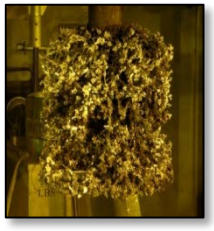


- 3.0 MT HEU fuel irradiated in EBR-II 1963 – 1994
- 0.830 MT U-10Zr treated '96- '07
- 0.670 MT U-5Fs treated '13 - current

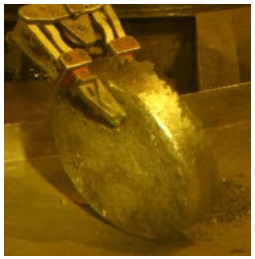
- 0.250 MT HEU irradiated in FFTF
- Treated 0.218 MT in FY2011
- Remaining reserved for research



- Electrometalurgical treatment (EMT) equipment separates U metal from sodium, fission products, and minor actinides
- Recovers U metal, downblends HEU to LEU



- More than 4.0 MT of potential HALEU feedstock produced to date
- Recovered HALEU can be fabricated into new fuel elements



Description of Chemical and Isotopic Composition of Typical Regulus Ingots

Analyte	Units[b]	Weighted Average	Minimum	Maximum		Analyte	Units[b]	Weighted Average	Minimum	Maximum
Total U	wt. %	99.90	99.89	99.92		Cs135	ppm	ND	ND	ND
Zr	ppm	200	200	200		Mn54	ppb	ND	ND	ND
Si	ppm	ND	ND	ND		Co60	ppt	ND	ND	ND
Y	ppm	126	36	215		Nb95	ppb	ND	ND	ND
Fe	ppm	170	91	267		Zr95	ppb	ND	ND	ND
Cr	ppm	31	17	41		Rh106	ppb	ND	ND	ND
Ni	ppm	109	67	150		Ru106	ppb	ND	ND	ND
Mo	ppm	302	286	333		Sb125	ppt	ND	ND	ND
Mn	ppm	276	261	290		Cs134	ppt	ND	ND	ND
Ru	ppm	ND	ND	ND		Cs137	ppb	22	10	29
Cd	ppm	ND	ND	ND		Ce144	ppb	ND	ND	ND
Al	ppm	100	100	100		Eu154	ppt	ND	ND	ND
Tc	ppm	ND	ND	ND		Eu155	ppt	ND	ND	ND
Li	ppm	ND	ND	ND		Am241	ppb	ND	ND	ND
K	ppm	ND	ND	ND		U234	wt. % U	0.18	0.18	0.18
Na	ppm	55	55	55		U235	wt. % U	19.45	19.21	19.80
Ba	ppm	ND	ND	ND		U236	wt. % U	0.53	0.52	0.55
Sr	ppm	ND	ND	ND		U238	wt. % U	79.84	79.47	80.09
Sr90	ppb	ND	ND	ND		Np237	ppm	60	57	64
Nd	ppm	ND	ND	ND		Pu239	ppm	82	73	95
Sm	ppm	ND	ND	ND		Pu240	ppm	ND	ND	ND
Tc99	ppm	ND	ND	ND		Total Pu	ppm	NM	NM	NM

Targeted production rate for HALEU feedstock from EBR-II material

Year	Production Rate (kg/yr)	Cumulative Availability (kg)
2019	600	600
2020	1000	1600
2021	1000	2600
2022	1200	3800
2023	1200	5000
2024	950	5950
2025	950	6900
2026	950	7850
2027	950	8800
2028	700	9500

Further contaminant reduction is possible: EBR II Polishing Process Flow

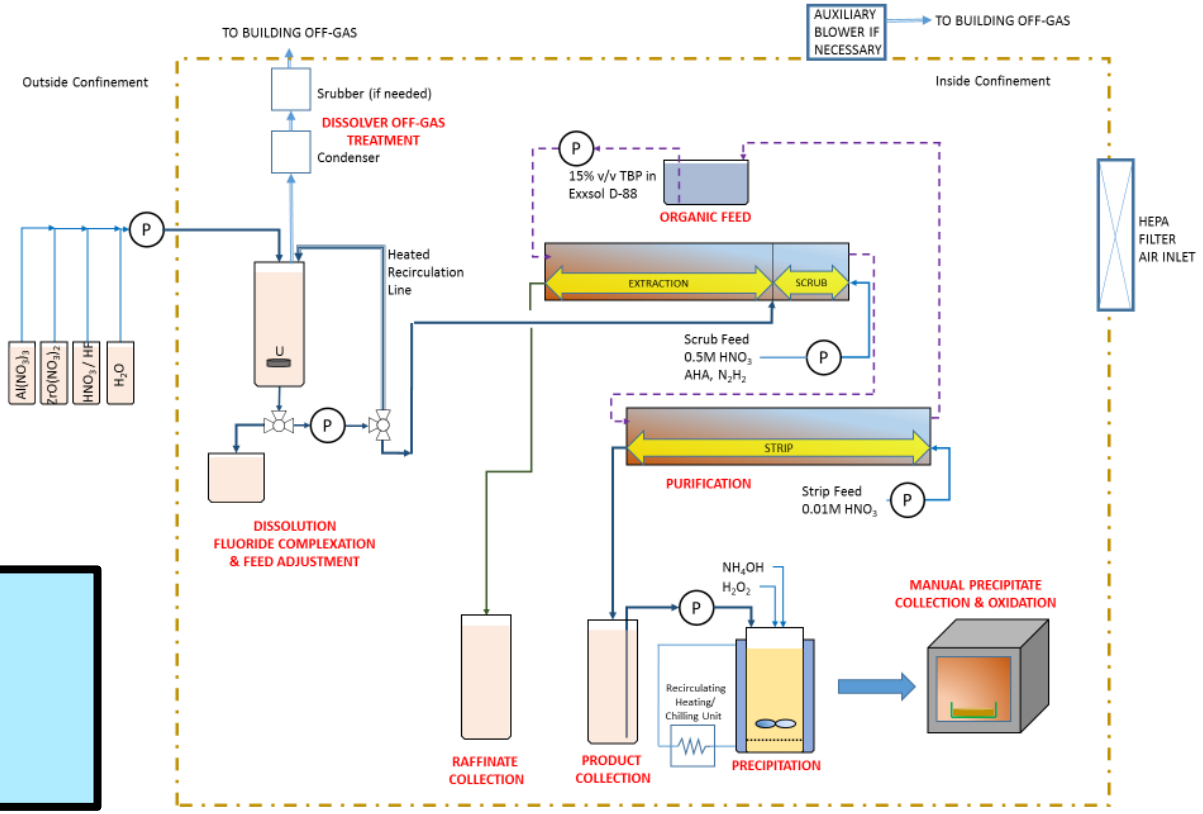
Goal:

Provide small HALEU quantities for researchers by Fall, 2019

Process:

1. Dissolve 1.5 kg EBR II product
2. Separate via solvent extraction
3. Precipitate uranium and calcine to generate U_xO_y

Polished product meets fast and thermal fuel specifications for impurities and boron equivalencies. Uranium isotopic distribution is unchanged.




COLLABORATIVE COMPUTING CENTER
TRANSIENT REACTION TEST FACILITY
CYBERCORE INTEGRATION CENTER
INL
Idaho National Laboratory

Reactor Siting at INL

George W. Griffith, Ph.D.
SMR Lead

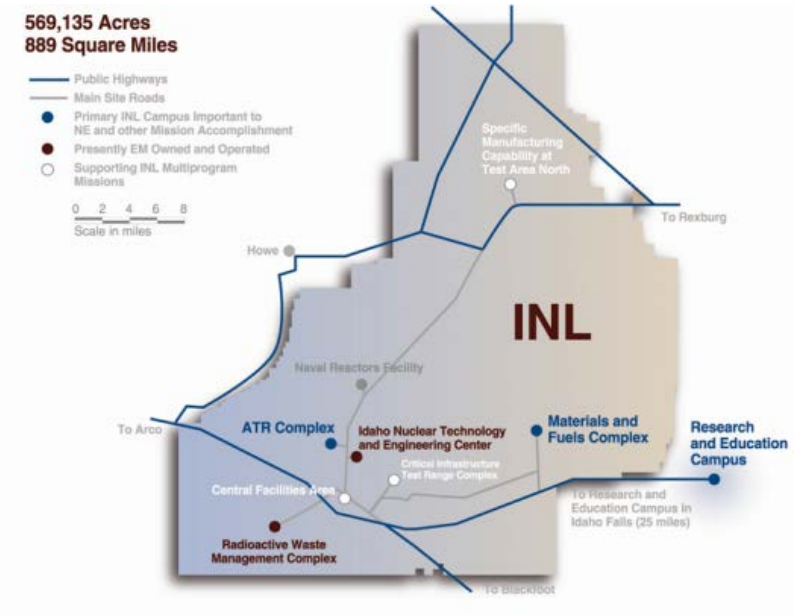
August 7, 2019
HALU Industry Day

www.inl.gov

Idaho National Laboratory

INL Mission

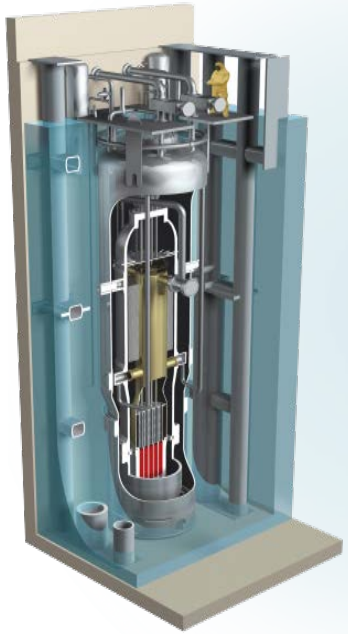
- **INL is the nation's lead laboratory for nuclear energy research, development, demonstration and deployment**
- **Our mission is to discover, demonstrate and secure innovative nuclear energy solutions, other clean energy options and critical infrastructure.**
- **Since 1949 INL has hosted 52 reactors and has 4 reactor operating now.**
- **Currently working to host multiple new reactors.**
- **Supporting additional technology development.**
- **Upgrades are on-going to improve siting.**

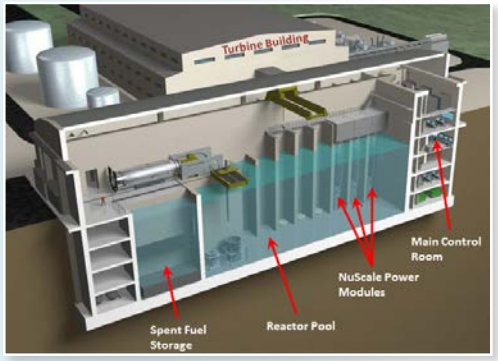


Enabling New Reactors

- **INL works with all vendors**
- **INL works with industry on technology development and deployment**
- **INL is supporting DOE in deploying new reactors**

- **SMR Example**
  - UAMPS entered a site use agreement with DOE with intent to build a NuScale SMR on the INL site
  - Utah Associated Municipal Power Systems (UAMPS) is a not-for-profit group of 45 community owned power systems in 8 western states
  - DOE-ID discussing a Power Purchase Agreement (PPA)
  - Joint Use Modular Plant (JUMP) to enable accelerated demonstration, validation, and wide-scale deployment

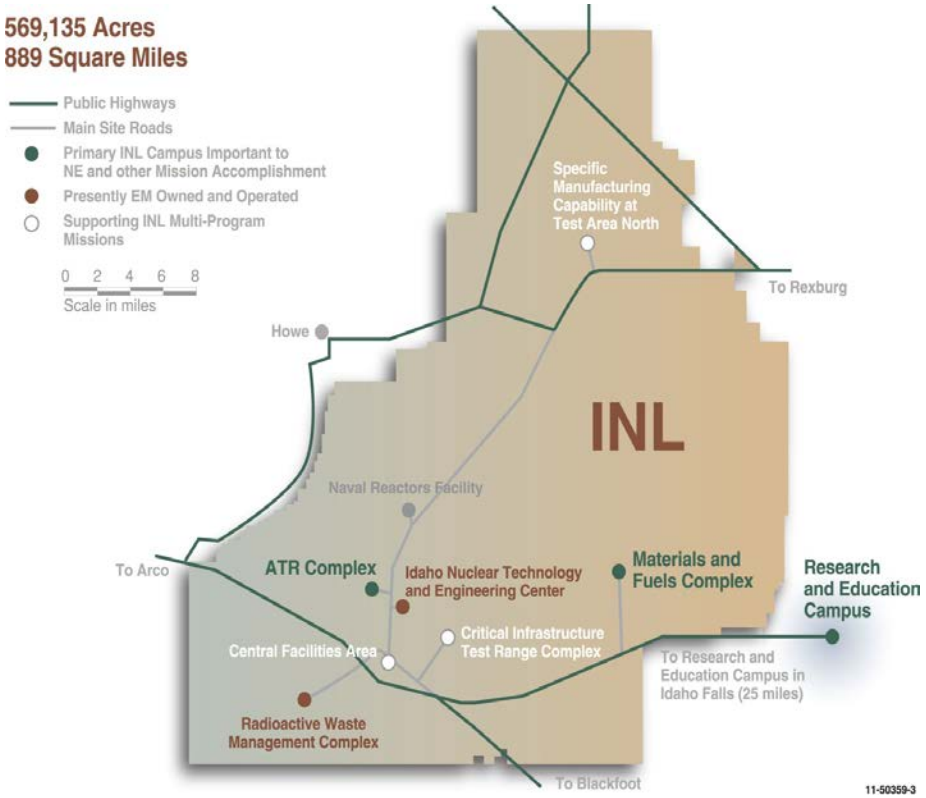




3-D view of Six NuScale Modules

INL Site

- INL has a variety of sites for new reactors
- Unique requirements can be accommodated.
- Technology demonstration sites are being evaluated
- Micro-Reactor sites are being evaluated
- Established locations can be rapidly developed
- Opportunity to have separate operations
- VTR EIS started



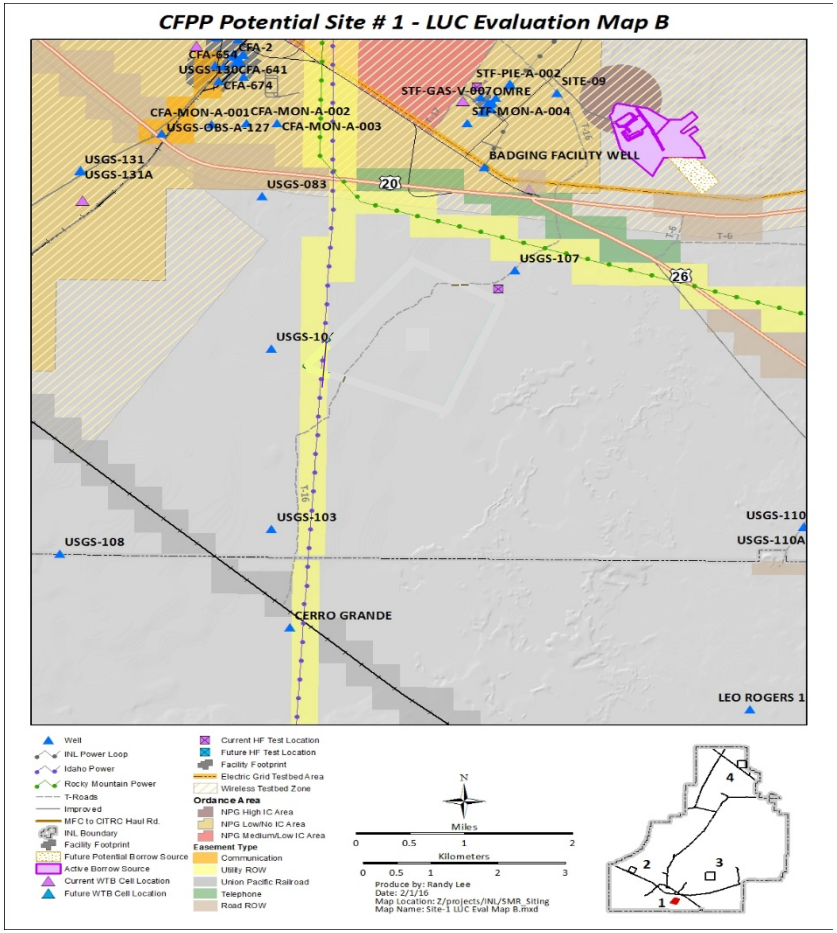
Site data

Requirements, go/no-go in regulation, how much effort to mitigate

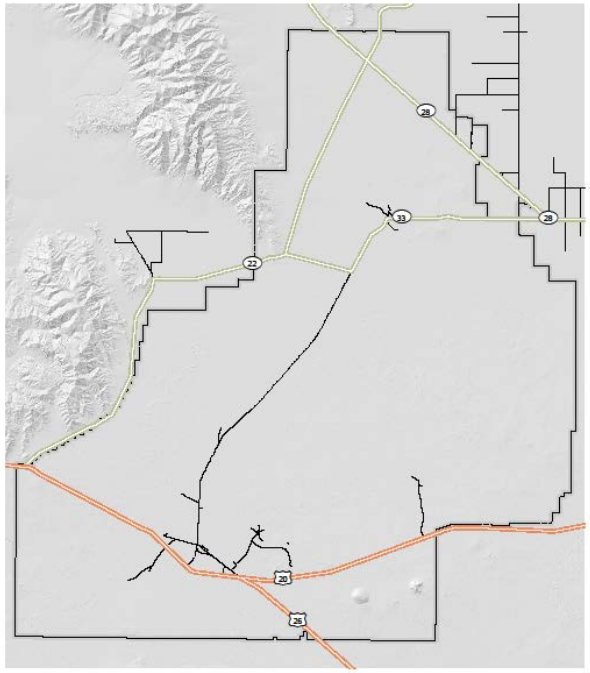
- **Go/No-Go examples**
  - >10 miles from an airport, <0.5 Peak Ground Acceleration, >5 miles from surface faults and capable tectonic structures, away from population center (>25,000 people), >5 miles from hazardous sites, >1mile from rail line
- **Weighted information**
  - **Seismic data**- faults, age, depth, history
  - **Flooding**- history, severity
  - **Volcanic**- hazards, criteria
  - **Environmental**- wildlife, botany, grouse leks, song bird breeding, wetlands, on-going sampling sites, snake hibernaculum
  - **Hydrology**- aquifer depth, water quality, yield, contaminates, discharge, water rights
  - **Cultural**- historic peoples, historic homesteads
  - **INL missions**– electronic quiet areas, geologic power plans, event effects on operations, historic operations, Navel Research Laboratory, complex project organization, explosive test range
  - **Logistics**- Power lines, rail access, highway access, infrastructure investment, construction support, site area

INL General Characteristics

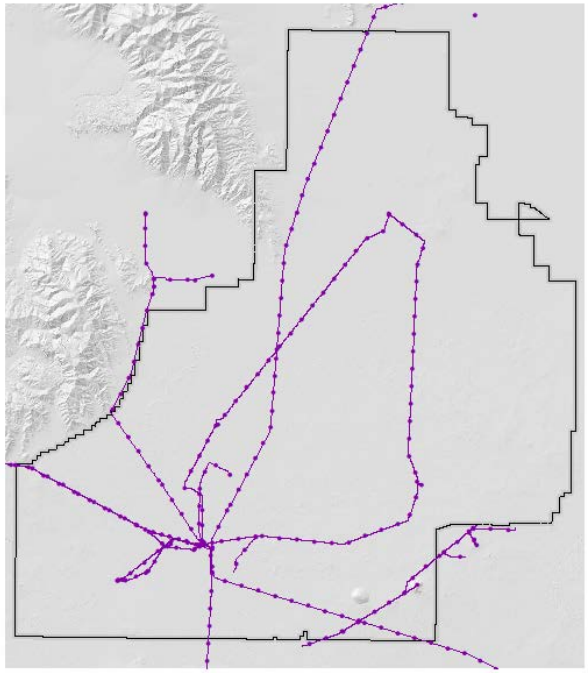
- **INL has an active GIS Geospacial Information System**
- **INL has works directly with NOAA, USGS**
  - Large amounts of data are available publically and on the web.
- **INL has GIS data on ~250 site characteristics**
  - Water, topography, infrastructure, cultural, environmental…..
  - Long term studies
  - Most data easily accessed
  - Multiple reactor sites, licenses and studies
- **Established procedure allows INL/DOE to evaluate new reactor proposals**
- **"INL Site Conditions and Properties", INL/EXT-15-36721**



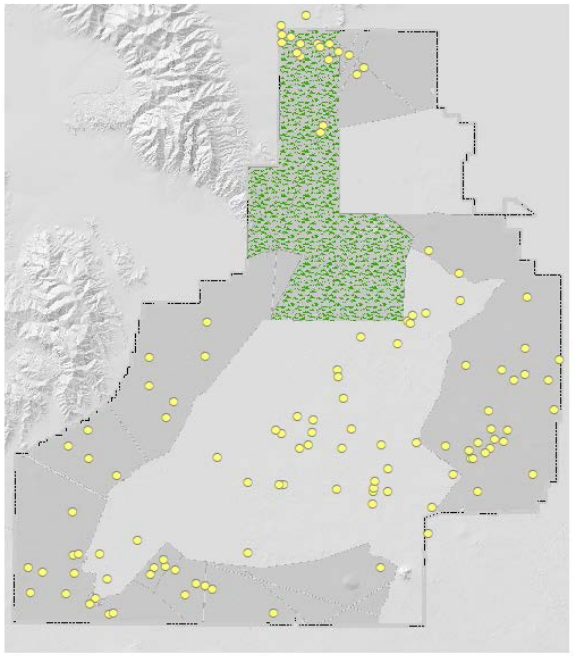
Small Modular Reactor Siting - Transporation



Small Modular Reactor Siting - Transmission



Small Modular Reactor Siting - Important Species/Habitat



Project Development

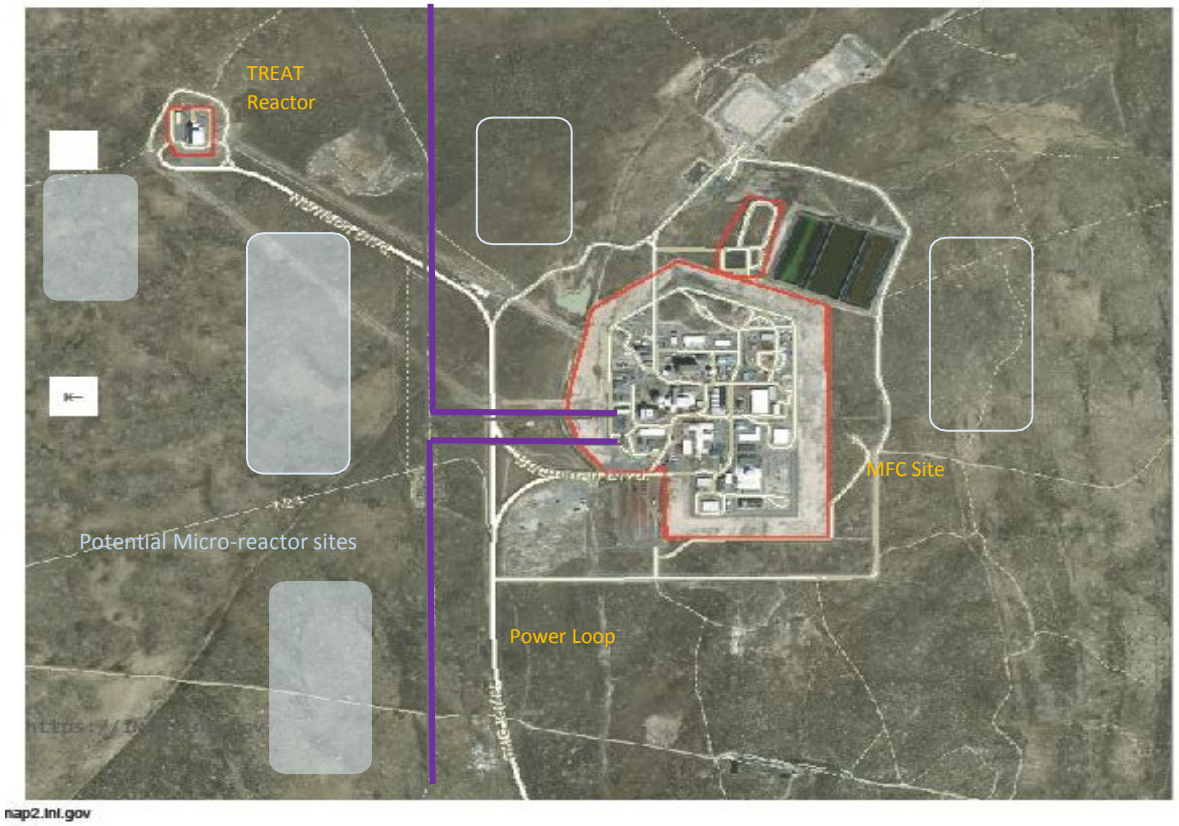
- **GAIN Web Site**

  https://gain.inl.gov/SitePages/SitePermitProcess.aspx

- **Request Reaches DOE-ID**
- **Established DOE-ID Procedure to evaluate project**
  - Mission, support, business plan, costs, export control, technology maturity, licensing strategy, NEPA strategy
  - Evaluated for development of Site Use Permit
- **Site Use Permit**
  - Provides access and use of land on the INL site
  - Use of the site
  - Requirements and regulation
  - Liabilities
  - Operation
  - Oversite, NRC or DOE
- **Basic site data available in public document**

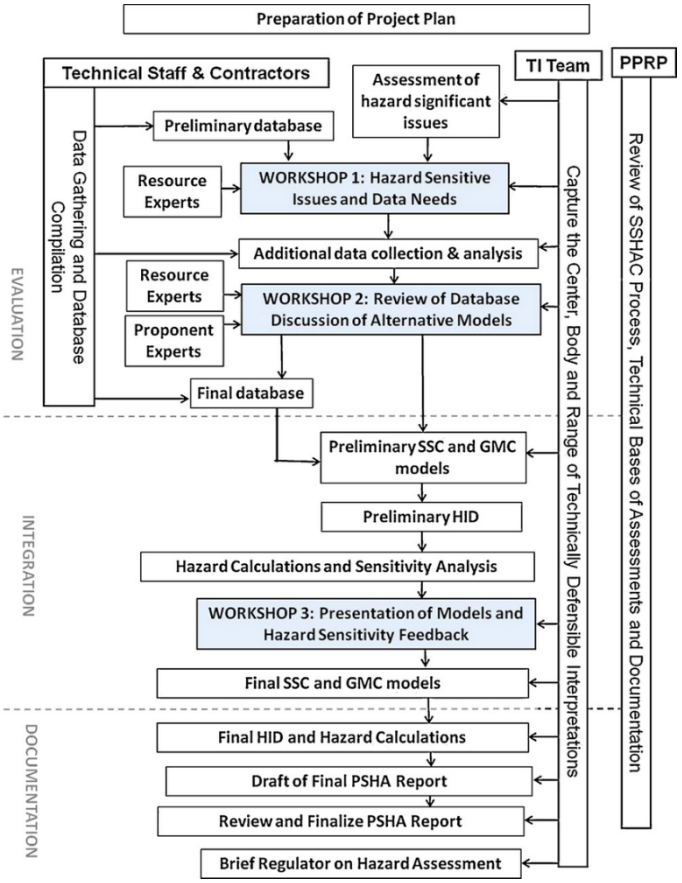
MFC Map with potential sites

- **Multiple potential sites exist near MFC.**
- **Multiple resources available**



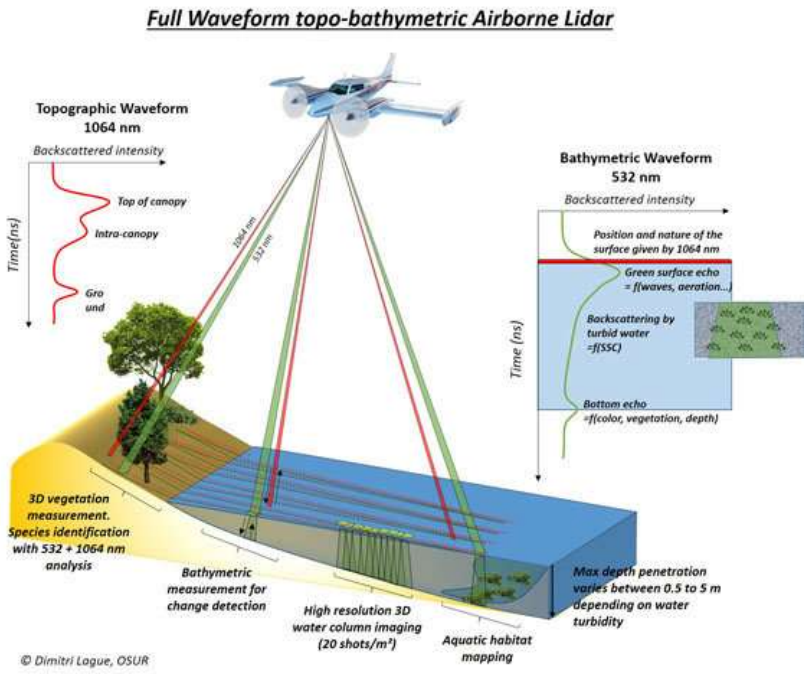
DOE Site Development

- **Senior Seismic Hazard Analysis Committee Level 3 (SSHAC) Analysis**
  - Establish the INL Probabilistic Seismic Hazard Analysis (PSHA)
  - General INL site upgrade that is a long lead item in reactor deployment
  - NRC approved seismic evaluation
  - Takes diverse geologic data and creates NQA-1 data
  - Allows lower level updates for follow on analysis



LiDAR

- Site wide laser topography measurements
- Started June 6
- Completed at the end of the year
- Informs multiple analysis
  - Volcanology and flooding
  - Cultural artifacts



Site Wide NEPA

- Connecting NEPA analysis across the site
- Directly allows for project cross effects
- Simplifies and speeds NEPA evaluations
- Potential source for partner NEPA evaluations
- Early step toward NRC Early Site Permit

JUMP to Demonstrate Integrate Energy Sources

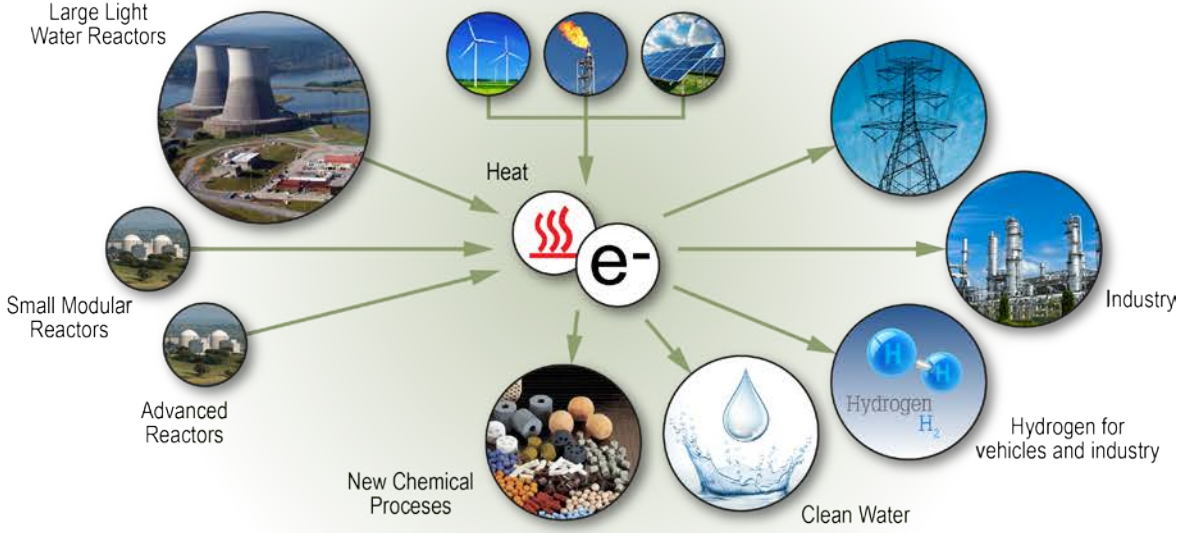
Establishes non-electric nuclear options licensing

Today

Electricity-only focus

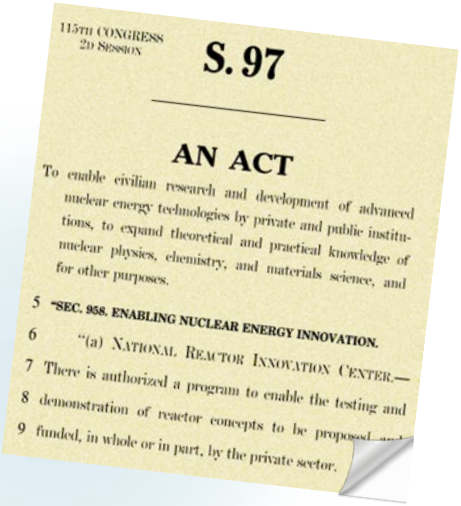
Future

Integrated grid system that leverages contributions from nuclear fission beyond electricity sector



Flexible generators, Advanced processes, Revolutionary design

The National Reactor Innovation Center (NRIC) at Idaho National Laboratory


115TH CONGRESS
2D SESSION

S. 97

AN ACT

To enable civilian research and development of advanced nuclear energy technologies by private and public institutions, to expand theoretical and practical knowledge of nuclear physics, chemistry, and materials science, and for other purposes.

"SEC. 958. ENABLING NUCLEAR ENERGY INNOVATION.

"(a) NATIONAL REACTOR INNOVATION CENTER.—There is authorized a program to enable the testing and demonstration of reactor concepts to be proposed and funded, in whole or in part, by the private sector.

S.97 NUCLEAR ENERGY INNOVATION AND CAPABILITIES ACT OF 2017

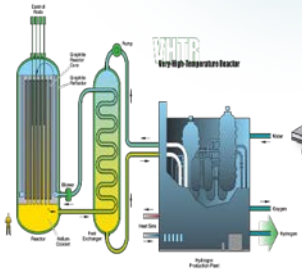
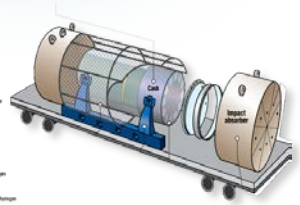
- enable civilian research and development of advanced nuclear energy technologies by private and public institutions, to expand theoretical and practical knowledge of nuclear physics, chemistry, and materials science. Reestablish INL
- National Reactor Testing Station

S.3422 - Nuclear Energy Leadership Act

- provide for a versatile, reactor-based fast neutron source,
- make available high-assay, low-enriched uranium for research, development, and demonstration of advanced nuclear reactor concepts, and for other purposes.







Idaho National Laboratory

Agreement Management

Rachel Taow
Research & Development Agreement Specialist

August 7, 2019

www.inl.gov

Idaho National Laboratory

What is a CRADA?

A Cooperative Research and Development Agreement (CRADA) is a collaborative agreement that that allows the Federal Government, through its laboratories, and non-federal partners (Participants) to:

- optimize resources,
- share technical expertise in a protected environment,
- access intellectual property emerging from the effort; and
- advance the commercialization of federally developed technologies.

CRADA Parties

- “Contractor” means the DOE Facility Contractor/Laboratory Operator.
- “Participant” means the non-federal party to the CRADA.
- Both Contractor and Participant are CRADA “Parties”
- Battelle Energy Alliance, LLC, (BEA) is the Management and Operating Contractor of Idaho National Laboratory (INL, Contractor)
- Department of Energy (DOE) reviews and approves CRADAs, but is not a Party to the CRADA

CRADA Characteristics

- BEA and the Department of Energy (DOE) benefit from collaborative research supporting DOE missions and program objectives.
- The CRADA Participant benefits from access to INL's unique technologies, capabilities, materials, and expertise.
- What distinguishes a CRADA from other partnership mechanisms is the collaborative nature of the work. Through a CRADA, the Participant and BEA will work together as collaborators.
- Under a CRADA, the Participant does not (necessarily) need to pay full cost recovery for DOE's contributions.

CRADA Benefits

Executing a CRADA with BEA can allow Participants to:

- Access INL's unique technologies, processes, capabilities, and technical know-how
- Access HALEU material and INL sites for fuel fabrication and reactor design
- Negotiate a license to BEA-developed Intellectual Property
- Protect commercially valuable information developed jointly under a CRADA
  - Data generated as part of a CRADA effort can potentially be treated as a trade secret for up to five years and is not subject to the Freedom of Information Act for up to five years.
- Negotiate patent license in Subject Inventions with Contractor

CRADA Funding

- Participant may provide funds-in to Contractor or in-kind contributions which may include personnel, services, facilities, equipment, intellectual property or other resources.
  - For HALEU CRADA, capital and operational cost of fuel fabrication, fuel qualification, microreactor demonstration, and microreactor post-demonstration disposition are expected to be borne by the Participant
- BEA is not allowed to provide funds directly to the Participant.
- **Funds-In:** Cash payments made by the Participant to pay for CRADA work.
- **In-Kind:** Participant's non-cash contributions of labor, property, or services used in support of the CRADA effort. As previously noted, in-kind contributions include personnel, personal property (equipment and supplies) and capital equipment.

CRADA Elements

- Terms and Conditions
- Statement of Work (Annex A)
- Background Intellectual Property (Annex B)

Generally, all of the above are not considered or protected as Proprietary Information.

Statement of Work (SOW) – Annex A of CRADA

- A well-written SOW can prevent disagreement, misunderstanding, and potential disputes between the Parties as to the expectations of the work to be performed.

What makes a well written SOW?

- Clear roadmap of the project
- Identify the explicit services to be provided and key deliverables
- Identify specific services into separate tasks
- List the estimated duration of tasks and services to be performed
- Document the expectation of the Parties
- Clearly and concisely answer **Who, What, Why, When, and Where**
- Define all acronyms
- Provide definitions for any technical or unique terms

Statement of Work Template

Appendix A
Statement of Work
Title
SPP or CRADA No.

1. BACKGROUND AND PURPOSE

[Provide background and purpose here.]

2. POINTS OF CONTACT

Technical Representative	
Contractor	Sponsor/Participant
Principal Investigator (PI)	PI
PI Title	PI Title
Battelle Energy Alliance, LLC	Company Name
2525 N. Fremont Avenue	Street Address
Idaho Falls, ID 83415-Mail Stop	City, State, Zip
E-mail: PI email	E-mail: PI email
Telephone: PI phone#	Telephone: PI phone#
Facsimile: PI fax#	Facsimile: PI fax#
Cell: PI cell phone#	Cell: PI cell phone#

Contracting Representative	
Contractor	Sponsor/Participant
Name	Name
Title	Title
Battelle Energy Alliance, LLC	Company Name
2525 N. Fremont Avenue	Street Address
Idaho Falls, ID 83415-Mail Stop	City, State, Zip
E-mail:	E-mail:
Telephone:	Telephone:
Facsimile:	Facsimile:
Cell:	Cell:

Accounting Representative	
Contractor	Sponsor/Participant
Name	Name
Title	Title
Battelle Energy Alliance, LLC	Company Name
2525 N. Fremont Avenue	Street Address
Idaho Falls, ID 83415-Mail Stop	City, State, Zip
E-mail:	E-mail:
Telephone:	Telephone:
Facsimile:	Facsimile:

3. SCOPE OF WORK

3.1 Overview

[Provide an overview of the Scope of Work here.]

3.2 Tasks

[Provide detailed descriptions of tasks here]

Task No.	Tasks	Contractor Role/Responsibilities	Participant/Sponsor Role/Responsibilities	Task Start / Finish
1	Task 1 summary	Contractor's roles	Participant's roles	XX/XX/XX - XX/XX/XX
2	Task 2 summary	"	"	XX/XX/XX - XX/XX/XX
3	Task 3 summary	"	"	XX/XX/XX - XX/XX/XX

* Task Start/Finish dates listed in months from the date of execution of this agreement.

4. REPORTS, DATA AND OTHER DELIVERABLES

Background Intellectual Property – Annex B

- “Background Intellectual Property” means the Intellectual Property identified by the Parties in Annex B, Background Intellectual Property, which was in existence prior to or is first produced outside of the CRADA, except that in the case of inventions in those identified items, the inventions must have been conceived outside of this CRADA and not first actually reduced to practice under this CRADA to qualify as Background Intellectual Property.

Background Intellectual Property – Annex B

- Background Intellectual Property typically includes:
  - Patents
  - Trademarks
  - Copyrights mask works
  - Protected CRADA Information
  - Other forms of comparable property rights protected by Federal law and foreign counterparts

- Background Intellectual Property does not include trade secrets or patented/unpatented inventions that have not actually been reduced to practice outside of CRADA SOW.

Confidentiality

- “Proprietary Information” means information, including data, which is developed at private expense outside of this CRADA, is marked as Proprietary Information, and embodies (i) trade secrets or (ii) commercial or financial information which is privileged or confidential under the Freedom of Information Act (5 U.S.C. 552 (b)(4)).

- Information properly marked and provided by the Participant as “Proprietary Information” under the CRADA is generally to be treated by BEA as confidential, subject to the applicable terms and conditions.

- Period protection for Proprietary Information is negotiable under the CRADA. However, unlimited duration is not likely to be acceptable to Contractor.

Protected CRADA Information

- “Generated Information” means information, including data, produced in the performance of this CRADA.
- “Protected CRADA Information” means Generated Information which is marked as being Protected CRADA Information by a Party to the CRADA and which would have been Proprietary Information had it been obtained from a non-Federal entity.
- Each Party may designate and mark as Protected CRADA Information any Generated Information produced by its employees and, with the agreement of the other Party, so designate any Generated Information produced by the other Party’s employees.
- Protected CRADA Information can be subject to limited confidentiality for up to statutory maximum of 5 years.

Subject Inventions

- “Subject Invention” means any invention of the Contractor or Participant conceived or first actually reduced to practice in the performance of work under the CRADA.
- Patentable inventions made solely by the Participant under the CRADA may be pursued and owned by the Participant if the Participant provides appropriate and timely notification to DOE of its intent to elect title.
- Patentable inventions made only by BEA employees may be elected by BEA.
- Jointly invented patentable inventions may be elected by both BEA and the Participant and then jointly owned.

Licensing Subject Inventions

- CRADA Participants are given an option to negotiate up to an exclusive field-of-use license to inventions made under the CRADA for reasonable compensation subject to the following Government-retained rights:
  - DOE retains “March-in Rights” to grant licenses to Intellectual Property in exceptional circumstances (health, safety, failure to comply with law, etc.)
  - The US Government retains a non-exclusive, irrevocable, paid-up license to all Subject Inventions resulting from the CRADA for Governmental purposes.

U.S. Competitiveness

- A purpose of the CRADA is to provide substantial benefit to the U.S. economy.
- Products embodying any Intellectual Property developed under the CRADA shall be manufactured substantially in the United States.
- Processes, services, and improvements thereof which are covered by Intellectual Property developed under the CRADA shall be incorporated into the Participant's manufacturing facilities in the United States either prior to or simultaneously with implementation outside the United States. Such processes, services, and improvements, when implemented outside the United States, shall not result in reduction of the use of the same processes, services, or improvements in the United States.

Indemnification

- A CRADA includes a disclaimer of express or implied warranty as to conditions of research or any intellectual property, information or items generated thereby.
- It also includes provisions requiring a Participant to indemnify the US Government and BEA from costs related to personal injury or property damage that may result from the Participant's commercialization or use of a product, process or service resulting from research under the CRADA.
- Exceptions to Product Liability:
  - Public liability arising from a nuclear incident and for which a nuclear hazards indemnity is provided by the Government as per the Price Anderson Act 42 USC 2210, and
  - Any liability resulting from any negligent acts, willful misconduct or omissions of the Contractor and the Government.

Questions…

Idaho National Laboratory