

REQUEST FOR PROPOSAL
San Rafael Energy Research Center Equipment
SAN RAFAEL SPECIAL SERVICE DISTRICT

PURPOSE OF REQUEST FOR PROPOSAL

The purpose of this request for proposal (RFP) is to enter into contracts with qualified laboratory equipment supply firms (Contractor(s)) for the purchase of equipment for molten salt research and radioactive molten salt research as well as to acquire regular maintenance, servicing, and supply contracts for this equipment and any necessary installation and training.

This RFP is designed to provide interested offerors with sufficient basic information to submit proposals meeting minimum requirements. It is not intended to limit a proposal's content or exclude any relevant or essential data. Offerors are at liberty and are encouraged to expand upon the specifications to evidence service capability under any agreement.

BACKGROUND

The San Rafael Special Service District (the "Entity"), was created in 2021 under Emery County, Utah and together with the Seven County Infrastructure Coalition is furthering the construction of an Energy Research Laboratory ("Laboratory"). This Laboratory is centered around the study of molten salts used in the operation of molten salt reactors. The Laboratory will particularly focus on the purification of various types of molten salt such as lithium and beryllium fluoride and the characterization of these salts for optimizing future reactor designs. The Laboratory will possess significant quantities of radioactive materials for the analysis of the behavior of salts with dissolved radioactive material and radiation present, as well as potential extraction of radioactive material from molten salt. These radioactive materials may include Uranium, Thorium, Molybdenum, Technetium, Tellurium, Cobalt-60, and their various isotopes. The San Rafael Special Service District has ownership of the laboratory building and primary responsibility for running the laboratory and purchasing equipment. The San Rafael Special Service District will be purchasing equipment with funds from grants received from the State of Utah. The San Rafael Special Service District expects in the near future additional funds to be available for expansions of Laboratory capabilities beyond those listed in the current RFP.

SUBMITTING YOUR PROPOSAL

NOTICE: By submitting a proposal in response to this RFP, the offeror is acknowledging that the requirements, scope of work, and evaluation process outlined in the RFP are fair, equitable, not unduly restrictive, understood and agreed to. Any exceptions to the content of the RFP must be protested to the Entity prior to the closing date and time for submission of the proposal. Proposals must be received by the submission deadline of 12:00 p.m. November 29, 2021 (Mountain Standard Time/MST). Proposals received after the deadline will be late and ineligible for consideration.

All proposals should be submitted electronically in PDF format to Lynn Sitterud, Chair of the Board of Trustees, email: lynns@emery.utah.gov and Eric Johnson, Legal Counsel, email: eric@bcjlaw.net. In addition to the electronic submittal, if you so choose, you may submit one original hard copy of your proposal to:

Lynn Sitterud, Chair of the Board of Trustees

P.O. Box 629
Castle Dale, UT 84513

Selection of the Contractor or Contractors will be made by December 12, 2021, and all offerors submitting proposals will be notified immediately as to the selection results.

LENGTH OF CONTRACT

The contract resulting from this RFP will cover the initial purchase of equipment for the laboratory, and the associated service, installation and any initial training offered. The contract will be for these services only and does not guarantee renewal for future purchases of equipment or supplies. The length of service contracts for the equipment will be negotiated for each individual piece of equipment with appropriate renewal and termination provisions.

The Entity reserves the right to review the contract and negotiate price and service elements or request or refuse new additions to the contract subject to negotiation. The Entity will also enter into negotiations concerning special or optional features for equipment following receipt of bids.

STANDARD CONTRACT TERMS AND CONDITIONS

Any contract resulting from this RFP will include but not be limited to the conditions of this RFP. Exceptions and or additions to these conditions are strongly discouraged.

Exceptions and additions to the conditions must be submitted with the proposal. Exceptions, additions, service level agreements, etc. submitted after the date and time for receipt of proposals will not be considered. Website URLs, or information on website URLs must not be requested in the RFP document and must not be submitted with a proposal. URLs provided with a proposal may result in that proposal being rejected as non-responsive. URLs are also prohibited from any language included in the final contract document.

The Entity retains the right to refuse to negotiate on exceptions should the exceptions be excessive or not in the best interest of the Entity, or if the negotiations could result in excessive costs to the Entity or could adversely impact existing time constraints.

The procurement shall be conducted subject to the provisions of *Utah Code* 63G-6a-701-711.

DISCUSSIONS WITH OFFERORS (ORAL PRESENTATION)

At the sole discretion of the Entity, an oral presentation may be requested by the selection committee to clarify a proposal. However, the Entity may award a contract based on the initial proposals received without discussion with the offeror. If oral presentations are requested, they will be scheduled following the submission of proposals. Oral presentations will be made at the offerors' expense.

DETAILED SCOPE OF WORK

A. EQUIPMENT LIST

The Contractor shall perform the following engagements for the Entity.

1. Equipment – Preferred suppliers will provide a portion or all of the following core laboratory equipment, including installation and related services, to the San Rafael Energy Research Center's laboratory located at 1230 N. Coal Haul Rd., Orangeville, Utah 84537. All equipment must be sufficient grade to uphold a laboratory ISO 17025 and NQA1 standard and facilitate the necessary quality assurance audits. The interior environment of the Laboratory will be maintained at appropriate temperatures and humidity. The equipment list below should be followed except in situations where a superior alternative is available from the Contractor or if there is sufficient reason that a substitute would adequately serve, conditional upon the agreement of SRERC. All equipment should be listed with relevant supporting equipment including dedicated computer systems where necessary.
 - a. Thermal analyzer that will be used for simultaneous thermal analysis involving the application of thermogravimetry and differential scanning calorimetry and the capability to be fitted into an argon gas glove box. The thermal analyzer will be used for the determination of melting point, heat capacity, crystallinity, phase transitions, decomposition and volatility of different salts. The thermal analyzer should be fitted with a compatible Quadrupole Mass Spectrometer for evolved gas analysis. Temperature range must be approximately room temperature to 1400°C or more. Automatic sample changer is desirable. Temperature resolution must be 0.001 K. Balance resolution must be approximately 0.025µg. Maximum sample load of 5000 mg is desired. Differential scanning calorimeter should maintain an accuracy of around 2% from true value for most materials.
 - b. Light Flash Temperature Measurement Apparatus with the capability to be fitted into an argon glove box. The Apparatus must be capable of making thermal conductivity measurements between room temperature and 1400°C and a furnace temperature of 1400°C or more. Accuracy in measuring thermal diffusivity must be approximately 3% or less for most materials. Integrated automatic sample changer is desirable.
 - c. Dilatometer for calculating volume along a temperature range and the capability to be fitted in an argon glove box. The dilatometer must be capable of operating at temperatures from RT to 1400°C and capable of being used with kinetic model software. Measurement resolution should be approximate plus or minus 0.1% with constant resolution along its measuring range. The Dilatometer should also monitor temperature with a resolution of approximately 0.001 K.
 - d. Thermochemical Analyzer for measurement of displacement under force. Analyzer must be capable of measuring properties such as expansion with forces up to approximately 4 N or more. Temperature range must be up to 1400°C considering all configurations. Total measuring range must be up to 5000 µm with a resolution of 1.25 nm. Force resolution should be less than

0.01mN. Analyzer must be capable of applying modulated force at customizable frequencies.

- e. Rheometer for characterization of sample shear, stress, shear rate, etc. of molten salt chemicals for a temperature range of at approximately room temperature to 1000°C or more considering all configurations. Preferably to be fitted in an argon glovebox. Must have ability to perform Oscillatory Rheometry. Must be capable of determining viscosity accurate within 2.5% of the true value.
- f. Two Potentiostat chassis with approximately 16 slots and 4 Potentiostat chassis with 6 slots for electrochemical analysis with range of with a combination of EIS capable and ultra-low current capable electrometers. Must be capable of 10A currents with a booster. These will be used for electrochemical analysis of molten salts with a high impedance of greater than 10^{12} ohms.
- g. Inductively Coupled Plasma Mass spectrometer (icp-ms) with Inert Kit and tandem mass spectrometer operation. The mass spectrometer must be capable of high-purity materials analysis and detection of trace metals in concentrations of less than 1 ppm in aqueous samples. The ability to handle complex samples composed of many elements is essential. Should also come with microwave digestive water bath for sample prep on both ICPs.
- h. A system for the detection of oxygen content using inert gas fusion as an alternative to electrochemical analysis in the determination of oxygen content of molten salts. Detection of hydrogen content is also a desirable feature.
- i. One Scanning Electron Microscope with a resolution of less than 10 nm and with Energy Dispersive X-ray analysis. The System must also be capable of performing Focused Ion Beam precision tooling.
- j. carbon coater with tooling for vacuum coating for preparation of samples for Field Emission Scanning Electron Microscope observation.
- k. Four glove boxes, each composed of 3 modules that are 4ft wide, for the purifying and characterization of high purity molten salts in an argon, airless environment that is purified to less than 1 ppm oxygen content and 1 ppm water content. Each glove box module must have working gloves on both sides. Each 3-module glovebox will be equipped with a cooling system to provide temperature control while working with high temperature molten salts and a gas purifier. A furnace will be placed into the 3rd module of each glovebox mounted below the module in a well to maximize glovebox space and to heat the molten salts to the desired temperature up to 1200°C.
- l. Six precision balances with a weighing capacity of over 1 kg and an accuracy of 1 milligram with high stability and repeatability. The balance must have built-in quality assurance monitoring to support data integrity and compliance and the ability to connect to peripheral devices. The balance should be equipped with an easily usable interface.
- m. Beryllium detection kit for the detection of beryllium through optical fluorescence or a method of similar convenience.

- n. Two respirators for working with beryllium.
- o. One approximately 60" width Radioisotope Fume Hoods with
 - i. Acid resistant storage cabinet
 - ii. Spring loaded sash stop
 - iii. Audible fume hood alarm
 - iv. Spill trays for metal acid base
 - v. Approximate fan capacity of 1933 CFM at 1.12" SP
 - vi. Appropriate filtration for radioisotope and molten salt work.
- p. One approximately 60" width Chemical high performance Fume Hoods with
 - i. Acid resistant storage cabinet
 - ii. Spring loaded sash stop
 - iii. Audible fume hood alarm
 - iv. Spill trays for metal acid base
 - v. Approximate fan capacity of 1933 CFM at 1.12" SP
 - vi. Appropriate filtration for molten salt work/acid cleaning/laboratory chemical protection.
- q. Two rolling tool cabinets with top cabinets and locking drawers and doors
- r. One safe for salt storage of 20 cubic feet capacity with a combination lock
- s. 3 under-sink catch basins
- t. A kit assembled 3D printer with a heat bed and removable print sheets, automatic mesh bed leveling, filament sensor, and possible power loss recovery.
- u. Two 3D metal printers capable of printing with a range of materials such as Inconel, stainless steel and copper. The printer should use fused filament fabrication or technology that can obtain similar or better results in strength and accuracy. A Z-layer resolution of 50 – 125 μm is desirable.
- v. Six portable eyewash stations with 1 gallon cartridge capacity
- w. One Dot matrix printer for printing on paper and continuous labels for documentation of results
- x. Lab writer label makers for convenient creation of labels in the lab.

- y. Two lockout tagout kits
- z. Two large safety bottle tote carriers for ½ and 1 gallon jars
- aa. Two small safety bottle tote carriers for 500 ml and 1000 ml bottles
- bb. Twelve Clear Standard Vacuum and ionized Wide Mouth ½ gallon bottles
- cc. Twelve Clear Standard Vacuum and ionized wide mouthed quart bottles
- dd. Twelve clear standard vacuum and ionized wide mouthed pint bottles
- ee. Four 25x28mm platinum crucibles for heating molten salts with 10 ml capacities and two lids.
- ff. Four platinum crucibles for electron microscopy with 50 ml capacity, 41 mm height and 30 mm base with two lids
- gg. Four 57x51mm Platinum crucibles with 100 ml capacity and two lids
- hh. Four 33mm diameter nickel crucibles with 10 ml capacity and two lids.
- ii. Four 46mm diameter nickel crucibles and 55 ml capacity with two lids
- jj. Four 59mm diameter nickel crucibles with 100 ml capacity and two lids
- kk. Four 82mm diameter nickel crucibles with 250 ml capacity and two lids
- ll. Four 101mm diameter nickel crucibles with 500 ml capacity and two lids
- mm. Four 14mm diameter glassy carbon crucibles with 7 ml capacity and two lids.
- nn. Four 24mm diameter, 160mm height glassy carbon crucibles with 30 ml capacity and two lids
- oo. Four 73mm diameter and 85mm height glassy carbon crucibles with 260ml capacity and two lids
- pp. Four 57mm diameter and 195mm height glassy carbon crucible with 400 ml capacity and two lids
- qq. Four 33mm diameter and 53 mm height alumina crucibles with 50 ml capacity and one lid
- rr. Four 95mm diameter alumina conical crucible with 250 ml capacity and one lid
- ss. Zirconium crucibles in the following sizes
 - i. 25ml, 45mm diameter and 23mm height
 - ii. 55ml, 46mm diameter and 35mm height

- iii. 100ml, 59mm diameter and 46mm height
- iv. 250ml, 82mm diameter and 60mm height
- v. 500ml, 102mm diameter and 66mm height
- tt. Four support stands with clamps with 21x16 cm base weighing approximate 2 kg with a height of 50 cm
- uu. Four metalware sets including base, rod, clamp, and retort ring
- vv. Four large gas cylinder supports for gas cylinders up to 11 inches.
- ww. Six 9" tall iron-ring tripods for use with Bunsen burners
- xx. Twelve burette clamps with a jaw opening of 10 to 35mm
- yy. Ten Bunsen burners with venturi tube for thorough mixing of air and gas, and adjustable air shutter and gas orifices for complete combustion
- zz. Six hot plate stirrers with temperature range from ambient to 550°C. Accuracy for temperature must be approximately within 2°C and stirring speeds within 5% selected speed.
- aaa. Six hot plates without stirrers with temperature range from ambient to 550°C. Accuracy for temperature must be approximately within 2°C
- bbb. Eight 2000 ml Pyrex beakers
- ccc. Twelve 1000 ml Pyrex beakers
- ddd. Twelve 600 ml Pyrex beakers
- eee. Twelve 250 ml Pyrex beakers
- fff. Twenty-four 100 ml Pyrex beakers
- ggg. Twenty-four 30 ml Pyrex beakers

2. Installation and Other Matters – The Contractors shall provide installation for equipment unless there is no installation necessary.

3. Training – The Contractors shall provide initial instruction on how to use the provided equipment along with all necessary manuals containing instructions necessary for operating, servicing, supplying, and maintaining the equipment along with other pertinent technical information.

4. Servicing and Supplying – The Contractor shall present potential servicing and supply contracts for the equipment where appropriate.

5. Calibration –The Contractor shall present appropriate calibration services for equipment.

6. Deadlines – Installation of the equipment must be completed within a reasonable timeline according to industry standards.

PROPOSAL REQUIREMENTS

Interested offerors should include the following information in their proposal.

A. Profile of the Contractor

Provide general background information which includes:

1. The organization and size of the offeror, whether it is local, regional, national or international in operations.
2. The location of the office that will serve as primary contact as well as information to best reach out with questions or clarification on the response to RFP.
3. A positive statement that the following mandatory criteria are satisfied:
 - (a) An affirmation that the contractor is willing to comply with the requirements of the RFP.
 - (b) An affirmation that the offeror understands that it may be required to negotiate additional terms and conditions, including additional administrative fees.
 - (c) An affirmation that the Contractor's proposal will be firm and binding for thirty (30) days from the proposal opening date.

B. Contractor's Qualifications

1. Describe your knowledge and experience in providing goods and services similar to those required in this RFP.
2. Describe your knowledge and experience in providing equipment for laboratories studying molten salt purification and character analysis for possible use in molten salt reactor technology. Also describe your knowledge and experience in providing equipment for laboratories handling radioactive materials and their associated safety requirements.
2. Provide contact information for the point of contact when negotiating terms of the contract as well as instructions on how to order equipment. If equipment lines are updated during the course of the RFP process Contractor will notify the Entity immediately and provide all relevant technical and operating information on the updates as well as associated costs.
2. Describe the extent to which subcontractors will be used to comply with contract requirements. Include each position providing service, and provide a detailed description of how the subcontractors are anticipated to be involved under the contract. Include description of how the Offeror will ensure that all subcontractors and their employees will meet all Scope of Work requirements.

C. Equipment Quotes

Submit quotes with appropriate contingencies to match the scope defined in these guidelines. The proposed equipment, service, and installation items should demonstrate the offeror's understanding of the nuclear molten salt research community. The quotes should designate specific prices along. The prices should show breakdowns for each separate component and the relevant add-ons. It is estimated that the laboratory will begin partial operation by early spring of 2022 and be ready for full scale operation in the summer of 2022. The planned use of subcontractors or specialists, if any, should also be specified.

D. Time Requirements

Quotes should describe estimated delivery times as well as the length of any prolonged installation or first-user training programs.

E. Comprehensive Not-To-Exceed Fee

If installation, training, service rates, or other rates are charged by billable hour or at a variable rate please supply the billing rates, estimated number of billable hours, other billable expenses and a comprehensive "not-to-exceed" fee for the proposal, inclusive of travel, per diem and all other out-of-pocket expenses.

CONTRACTUAL ARRANGEMENTS

A resulting contract agreement may include, but is not limited to:

- A. Contractor Error – Equipment or Supplies which are unacceptable because of quality problems, duplicated shipments, outdated product, breakage, or other issues related to Contractor or product performance shall be returned at Contractor's expense within five business days after receipt of notification from the Ordering Entity. If the original packaging cannot be utilized for the return, Contractor must supply the Ordering Entity with appropriate return packaging. Transportation must be paid by Contractor and Contractor will assume the risk of loss in transit. The returned product shall either be replaced with acceptable equipment or supplies, or the Ordering Entity must receive a credit or refund for the purchase price, at the Ordering Entity's discretion.
- B. Order Entity Error – Standard stock equipment and supplies ordered in error by Ordering Entities will be returned for credit within fifteen days of receipt, at the Ordering Entity's expense. Product must be in resalable condition (original container, unused). There shall be no restocking fee if returned products are resalable.
- C. Other Significant Contract Provisions –
 1. Immediately inform the Entity regarding any indication of fraud, errors, or illegal acts that may come to their attention in connection with the proposal.
 2. The Contractor must hold an exit conference with the Entity.
 3. Notify the Entity, in writing, prior to changes of partner, manager, supervisor or senior personnel listed in the proposal.
 4. Provide the Entity with Letters of Engagement in accordance with professional standards to specify the responsibilities of the Contractor and the Entity as they relate to the

provision of services. The terms of the Letters of Engagement shall be consistent with the terms of the Contract. In the event there are inconsistencies, the terms of the Contract shall govern and control.

5. Carry and maintain liability insurance, add the Entity as an additional insured, and provide proof of this insurance to the Entity.

EVALUATION OF PROPOSALS

A committee will evaluate proposals against the following weighted criteria:

% OF SCORING WEIGHT	EVALUATION CRITERIA
Mandatory	Meet basic equipment requirements, appropriately licensed, and ability to meet RFP and laboratory set-up deadlines.
20%	Technical Experience of the Firm – Considering experience with equipment for research of nuclear and molten salts, as well as size and structure of the firm.
20%	Qualifications of Staff
25%	Responsiveness of the proposal in clearly stating an understanding of the services to be performed: (1) Appropriateness and adequacy of proposed procedures. (2) Reasonableness of time estimates (3) Appropriateness of recommended equipment, installation, service, and training plans.
35%	Overall cost of the Proposal and related contingency costs.

Right to Reject—The Entity reserves the right to reject any and all proposals submitted and to request additional information from all offerors. Any contract awarded will be made to the offeror who, based on evaluation of all responses (applying all criteria and oral interviews if necessary), is determined to be the best to perform the services.

CONTACT INFORMATION

The individual listed below may be contacted for information.

Eric Johnson
801-520-5333
eric@bcjlaw.net

OR

Lynn Sitterud, Chair of the Board of Trustees
lynns@emery.utah.gov