



## ATTACHMENT A - SCHEDULE

### A.1 PURPOSE OF GRANT

The purpose of this Grant is to provide support to the "Texas A&M University Kingsville Integrated Assessment of Mining Impacts On Groundwater Quality and Bioremediation Effectiveness Program."

### A.2 PERIOD OF GRANT

1. The effective date of this Grant is September 30, 2010. The estimated completion date of this Grant is September 30, 2013.

2. Funds obligated hereunder are available for program expenditures for the estimated period: September 30, 2010 – September 30, 2013. Continued funding for years 2 & 3 are subject to the availability of funds.

### A. GENERAL

1. Total Estimated NRC Amount:	\$150,000.00
2. Total Obligated Amount:	\$ 50,000.00
3. Cost-Sharing Amount:	\$ 0.00
4. Activity Title:	Texas A&M University Kingsville Integrated Assessment of Mining Impacts On Groundwater Quality and Bioremediation Effectiveness Program
5. NRC Project Officer:	Tuwanda Smith, Esq.
6. DUNS No.:	868154089

### B. SPECIFIC

RFPA No.:	SDB-27-10-1119
FFS:	SBC10321
Job Code:	N7316
BOC:	4110
B&R Number:	07P-15-5C1-161
Appropriation #:	31X0200
Amount Obligated:	\$50,000.00

### A.3 BUDGET

Revisions to the budget shall be made in accordance with Revision of Grant Budget in accordance with 2 CFR 215.25.

	Year 1	Year 2	Year 3
Direct Participant Cost	\$36,367.00	\$36,296.00	\$36,224.00
Indirect Cost	<u>\$13,633.00</u>	<u>\$13,704.00</u>	<u>\$13,776.00</u>
Total	\$50,000.00	\$50,000.00	\$50,000.00

All travel must be in accordance with the Texas A&M University Kingsville Travel Regulations or the US Government Travel Policy absent Grantee's travel regulation.

#### **A.4 AMOUNT OF AWARD AND PAYMENT PROCEDURES**

1. The total estimated amount of this Award is \$150,000.00 for a three year period.
2. NRC hereby obligates the amount of \$150,000.00 for program expenditures during the period set forth above and in support of the Budget above. The Grantee will be given written notice by the Contracting Officer when additional funds will be added. NRC is not obligated to reimburse the Grantee for the expenditure of amounts in excess of the total obligated amount.
3. Payment shall be made to the Grantee in accordance with procedures set forth in the Automated Standard Application for Payments (ASAP) Procedures set forth below.

#### **Attachment B – Program Description**

##### ***BACKGROUND***

Nuclear power currently produces about 20% of electricity used in the U.S., which consumes about 57 million pounds of uranium each year. Although the U.S. currently imports over 95% of the uranium consumed, there are significant untapped domestic uranium reserves. As such, developing safe and effective uranium mining technologies is a potentially critical element in the movement towards energy independence in the U.S. In 2007, in-situ recovery (ISR) mining was responsible for about 95% of the uranium produced in the U.S. (Otten and Hall, 2008). ISR mining involves injecting dissolved oxygen into groundwater aquifers to oxidize and solubilize uranium ore deposits, and then pumping the “pregnant lixiviant” to the surface for processing by ion exchange. South Texas was the birthplace of ISR uranium mining and has been the location of the greatest number of such facilities in the U.S., with 27 closed ISR mining sites (USGS, 2009). Of the six uranium ISR mines operating in the U.S. in 2008, four were located in South Texas (U.S. EIA, 2009). There are currently 14 active and 3 pending uranium permits in South Texas (TCEQ, 2010) and 10 active uranium exploration permits (TRRC, 2010). While uranium ISR mining can significantly contribute to U.S. domestic energy security, the public has significant concerns about the potential health and environmental impacts.

##### ***PROJECT GOALS***

The proposed project encompasses integration of the following specific aims:

- 1) Protect public health and establish baseline groundwater quality in a South Texas region targeted for future uranium mining activity by surveying concentrations of uranium and other ISR restoration table constituents.
- 2) Improve the fundamental understanding of factors affecting the mobility of uranium constituents of concern at South Texas ISR sites through reactive geochemical transport modeling. Also apply radioisotope forensic approaches to differentiate between anthropogenic and natural sources of uranium and other dissolved species in groundwater.
- 3) Enhance training of Hispanic engineering students at Texas A&M University-Kingsville (TAMUK), an institution that has historically provided a significant fraction of the uranium ISR mining workforce in the South Texas.

## **NRC RELEVANCE**

### **Need for groundwater quality monitoring near proposed and closed ISR sites**

Renewed interest in domestic nuclear power has led to resurgence of the uranium mining industry. From 2007 to 2009, the NRC received eight permit applications for uranium recovery facilities, and expects to receive an additional 16 from 2010 to 2012 (U.S. NRC, 2010). Most of these permit applications are for ISR facilities. One of the more controversial aspects of permitting new uranium ISR facilities is the determination of baseline groundwater quality (TCEQ, 2009a). The NRC requires all operating uranium ISR facilities to monitor groundwater quality in surrounding regional aquifers to make "reasonably comprehensive chemical and radiochemical analyses of water samples obtained within and at locations away from the mineralized zone(s)" (p. 2-24, U.S. NRC, 2003). Regulatory agencies in Agreement States (primarily Utah, Colorado, and Texas) have similar permit requirements. Another controversial issue is the time required for post-mining groundwater monitoring (TCEQ, 2009a).

A recent application for an ISR permit in Goliad County, Texas, provides an example of the controversy associated with background groundwater quality near proposed uranium ISR sites. The Texas Commission on Environmental Quality (TCEQ) required that the mining company install 20 regional water quality wells within the proposed permit area and, furthermore, that all private water wells within a one-kilometer radius of the permit area be sampled to establish baseline water quality conditions. When 15 wells near the permit area were found to have high gross alpha concentrations, the County filed a federal lawsuit contending that the determined baseline concentrations for the site were artificially elevated due to groundwater contamination caused during the exploration process, which involved the drilling of about 600 boreholes (Semenza, 2008). A federal judge ultimately dismissed the case, citing (among other reasons) a formal statement issued by the TCEQ that contamination of the aquifer due to UEC's drilling activities was impossible. Nonetheless, numerous stakeholder groups are now strongly focused on the need for accurate determination of the pre-existing, pre-exploratory groundwater quality at proposed ISR sites, with no bias towards sampling water that could have potentially been contaminated by exploratory drilling. In addition, these stakeholder groups are opposed to existing TCEQ rules that allow all groundwater sampling to be performed by the ISR permit applicants with no oversight by the agency, and are advocating that all domestic wells in the geographic area of proposed ISR facilities be sampled and analyzed by independent entities prior to any permitted exploratory drilling (STOP, 2008; Meridian Institute, 2009; TFB, 2010).

### **Need for improved reactive transport models adapted to ISR conditions**

The processes controlling transport of uranium and other redox-sensitive constituents in the subsurface are very complex, involving coupled hydrologic properties, sorption reactions, mineral co-precipitation reactions, and abiotic and biotic redox reactions (Long *et al.*, 2008). Geochemical models incorporating these factors have been developed (e.g., Luo *et al.*, 2007; Yabusaki *et al.*, 2007), but they have been almost exclusively applied to DOE sites, not uranium ISR sites. ISR sites have many fundamental differences from DOE sites, including greater depths, pressures and *in-situ* temperatures. In addition, bioremediation efforts at uranium ISR sites generally entail re-reducing sediments in confined aquifers that became oxidized during the mining process, as opposed to reducing sediments *de novo* in unconfined aquifers that were originally oxidizing, as is the case at most DOE sites. In this regard, bioremediation may conceivably have more potential as a viable groundwater restoration technology at ISR sites than at DOE sites. Adapting existing reactive transport models to simulate ISR bioremediation

conditions will greatly improve the computational tools available for field restoration system design and groundwater restoration data analysis.

### **Need for forensic tools for assessing sources of radionuclides in groundwater**

Although uranium and its decay progeny occur naturally in the environment, it is common for the public to automatically incriminate uranium mining operations when these constituents are found in drinking water supplies. This is particularly true in South Texas, where three public water supplies within 35 miles of TAMUK (City of Riviera, City of Ben Bolt, and the English Acres Colonia), as well as numerous private wells, have uranium above the drinking water standard of 30 ppb (Powell, 2006; De La Rosa, 2008a; UTBEG, 2008; De La Rosa, 2008b). This has created significant public anxiety about the environmental and public health impacts of existing and proposed ISR facilities; for example, a recent TCEQ public hearing regarding a new proposed ISR operation attracted hundreds of people strongly opposed to uranium mining (Lone Star Chapter Sierra Club, 2009). The visceral public opposition to uranium mining is understandable given that there have been approximately 110 uranium mines located in South Texas over the last 50 years (U.S. EPA, 2007). However, public perception is at odds with a recent NRC staff assessment that concluded that licensed ISR operations have not adversely impacted regional groundwater quality (U.S. NRC, 2009b). Given the public controversy surrounding the detection of uranium in regional drinking water supplies, as well as proposed and existing uranium ISR operations, the development of geochemical and radioisotope forensic approaches for distinguishing between naturally elevated concentrations of uranium and its progeny in groundwater and anthropogenic contamination would be extremely useful.

### **Need for training of engineers in South Texas with ISR expertise**

South Texas, a predominantly Hispanic region of the country undergoing rapid NAFTA-driven population growth, has been the location of over 30 ISR operations in the last several decades. However, due to very low uranium prices between 1988 and 2006 (UxC, 2010) and associated absence of new uranium ISR operations, few young people were hired into the ISR workforce. Now, with dozens of new nuclear reactors being built in China and elsewhere, and a concomitant surge in uranium mining activity as energy companies seek to secure long-term uranium supplies, employment in the uranium mining industry increased by 48% between 2007 and 2008 alone, and by 443% since 2003 (U.S. EIA, 2009). Consequently, the ISR industry is facing an acute shortage of skilled professionals, exacerbated by a significant decline in recent graduates from mining, geological and metallurgical programs (NRI, 2010). Similarly, the Texas Railroad Commission, the agency responsible for regulating uranium exploration activity in Texas, recently identified personnel recruitment as one of "the key obstacles that impairs the agency's ability to achieve its objectives" (TRRC, 2009). The TCEQ has also been actively filling positions in its recently reformed Radioactive Materials Division (Jablonski, 2008).

## ***PROJECT SCOPE OF WORK***

### **1. Groundwater quality monitoring near future and closed ISR mining sites**

One of the most controversial issues related to permitting uranium ISR operations in Texas, as elsewhere, is the determination of baseline groundwater quality (TCEQ, 2009a; TCEQ, 2009b). Citizen groups have claimed that in more than twenty years of in-situ mining operations in Texas, not one site has had groundwater restored completely to baseline conditions (ALTURA, 2009). An independent assessment of groundwater quality in areas targeted for future ISR

mining operations could be a significant step towards improving public confidence in the regulatory process. TAMUK researchers are currently conducting a survey of groundwater quality in Kleberg County, Texas, in areas near the Kingsville Dome ISR operation (Figure 1a). Groundwater samples are being analyzed for all 26 parameters listed on the facility's restoration table, as well as radon and thoron. Of 21 wells sampled to date, 4 have had uranium concentrations above the EPA drinking water standard of 30 ppb, while 10 have had radon concentrations above the proposed lower alternative drinking water standard of 300 pCi/L (U.S. EPA, 2009). No correlation between distance/direction from the mining site and uranium/radon concentrations has been observed. Where possible, current concentrations are being compared to those listed in the National Uranium Resource Evaluation (NURE) database (Figure 1b) for samples collected in the late 1970s (USGS, 2009) to characterize any trends

As part of this project, TAMUK researchers will expand the ongoing groundwater survey to include all of neighboring Kenedy County (Figure 1b). At least one uranium mining company is currently prospecting in this county, and the Kenedy Ranch Foundation has recently requested that TAMUK provide advice on the potential impacts of uranium mining. As evident in Figure 1b, there are very few groundwater quality data records for Kenedy County in the USGS NURE database, and the PIs are not aware of any other comprehensive public groundwater quality databases for the County. Groundwater samples will be collected and preserved (or analyzed in the field) following published protocols (USGS, 2010a). The samples will be analyzed for calcium, magnesium, sodium, potassium, arsenic, cadmium, iron, lead, manganese, selenium, vanadium, radium, molybdenum, and uranium by inductively coupled plasma-mass spectrometry (ICP-MS), sulfate, chloride, fluoride, nitrate, and phosphate by ion chromatography (IC), ammonia, pH, total dissolved solids, conductivity, and alkalinity by standard methods, and radon and thoron using a field detector. In the last three years, TAMUK has acquired a new ICP-MS, a new ion chromatograph, and a new radon detector, allowing for state-of-the-art groundwater quality analyses. A detailed QA/QC program will be implemented following published protocols (Eaton *et al.*, 1995). TAMUK will coordinate with the Kenedy County Groundwater Conservation District (KCGCD) in conducting this groundwater survey and communicating the results to area stakeholders, including the communities of Sarita and Armstrong and area ranchers.

## **2. Development of coupled reactive transport model and radioisotope forensic methods**

The PI has been communicating with personnel from the Pacific Northwest National Lab (PNNL) and USGS about incorporating the geochemical data collected at a hydrogen injection ISR bioremediation site into ongoing modeling DOE and USGS modeling efforts (Yabusaki, Davis, Fuhrmann, 2010). Towards developing a better fundamental understanding of the geochemical factors that control fate and transport of uranium species in groundwater systems, the geochemical and reactive transport processes that have been observed at the field site will be incorporated into a modeling framework based on PHREEQC (USGS, 2010b). PHREEQC simulates the equilibrium geochemistry that controls aqueous and surface complexation, redox reactions, and mineral precipitation and dissolution. Groundwater flow will be modeled as one-dimensional.

With regard to assessing potential slow migration of uranium and its progeny away from ISR sites, one idea that is receiving interest from the research community is to use short-lived uranium progeny as reactive tracers. In particular, radon ( $^{222}\text{Rn}$ ) and thoron ( $^{220}\text{Rn}$ ) have half-lives of 3.8 days and 55 seconds, respectively. Furthermore, radon and thoron are noble gases, which do not precipitate or adsorb to solid phases, and thus their concentrations in groundwater are controlled by rapid *in situ* decay and alpha-recoil supply from radium decay within the host aquifer material. In contrast, the parent radium isotopes ( $^{226}\text{Ra}$  and  $^{224}\text{Ra}$ , respectively) are

readily removed from groundwater by water-rock interactions, and are thus rapidly depleted as groundwater flows through an aquifer. Consequently, radon and thoron will rapidly disappear due to radioactive decay unless more radon and thoron is continuously supplied from radium isotopes within the host aquifer (Kraemer and Genereux, 1998). Since radon and thoron in groundwater are usually “unsupported”, meaning they accumulate without their immediate progenitors ( $^{226}\text{Ra}$  and  $^{224}\text{Ra}$ ) at appreciable concentrations, the detection of these short-lived radioisotopes in drinking water indicates that a radium source zone is located in the immediate vicinity. As described above, TAMUK is already measuring many  $^{238}\text{U}$  and  $^{232}\text{Th}$  decay-series radioisotopes as part of the ongoing water well survey in Kleberg County. Through model development and application, the practicality of exploiting these radiogenic isotopes in geochemical forensic studies to distinguish between naturally elevated concentrations of uranium and its progeny in groundwater and anthropogenic contamination will be investigated.

### 3. Recruitment of Hispanic engineers interested in nuclear-related employment

In 2008, Texas A&M University-Kingsville (TAMUK) was the seventh leading producer of Hispanic college graduates with STEM (science, technology, engineering and math) degrees in the U.S., and was recently identified as an “Exemplar for Latino STEM Education” (Dowd *et al.*, 2009). Enrollment at TAMUK reflects regional demographics, with 62% Hispanic, 27% white, 5% African American, and 6% international. In 2002, the TAMUK Department of Environmental Engineering initiated the only doctoral engineering program in Texas south of San Antonio. The department has grown rapidly in the eight years since, and now has an enrollment of over 70 graduate students. In 2008, *U.S. News and World Report* ranked the TAMUK Environmental Engineering program 45<sup>th</sup> in the nation. In the spring of 2009, the department initiated a bachelors program in Environmental Engineering, with Geo-environmental Engineering being one of four focus areas. The department is currently participating in developing an interdisciplinary graduate program in Environmental Management. Both of these new programs will provide ample opportunity for recruiting students interested in careers with the NRC, other Federal agencies, Texas agencies responsible for regulating uranium ISR operations (TCEQ and TRRC), and nuclear-related industry. TAMUK has been the primary institution of higher education providing trained workers for the uranium ISR industry in South Texas (in the last three years alone, three of the PI’s graduates have worked for the uranium ISR industry). A primary focus of the proposed project will be actively recruiting enthusiastic students (graduate and undergraduate) and preparing them for careers related to the uranium ISR industry.

### **PROJECT TIMETABLE FOR INTEGRATED RESEARCH TASKS**

The schedule for the integrated research tasks is presented in Table 1. The groundwater survey and modeling tasks will be performed over the duration of the three-year project. One Ph.D. student and one M.S. student will be recruited to perform the research during the first few months of the project.

Table 1. Projected timetable for research tasks.

Task	Project Months					
	6	12	18	24	30	36
1. Groundwater survey of Kenedy County, Texas	■	■	■	■	■	■
2a. Coupled reactive transport modeling	■	■	■	■	■	■
2b. Radiogenic isotope forensic modeling	■	■	■	■	■	■
3. Recruitment of Hispanic engineers	■					

## Attachment C – Standard Terms and Conditions

### The Nuclear Regulatory Commission's Standard Terms and Conditions for U.S. Nongovernmental Grantees

#### Preface

This award is based on the application submitted to, and as approved by, the Nuclear Regulatory Commission (NRC) under the authorization 42 USC 2051(b) pursuant to section 31b and 141b of the Atomic Energy Act of 1954, as amended, and is subject to the terms and conditions incorporated either directly or by reference in the following:

- Grant program legislation and program regulation cited in this Notice of Grant Award.
- Restrictions on the expenditure of Federal funds in appropriation acts, to the extent those restrictions are pertinent to the award.
- Code of Federal Regulations/Regulatory Requirements - 2 CFR 215 Uniform Administrative Requirements For Grants And Agreements With Institutions Of Higher Education, Hospitals, And Other Non-Profit Organizations (OMB Circulars), as applicable.

To assist with finding additional guidance for selected items of cost as required in 2 CFR 220, 2 CFR 225, and 2 CFR 230 these URLs to the Office of Management and Budget Cost Circulars are included for reference:

A-21 (now 2CFR 220):	<a href="http://www.whitehouse.gov/omb/circulars/a021/print/a021.html">http://www.whitehouse.gov/omb/circulars/a021/print/a021.html</a>
A-87 (now 2CFR 225):	<a href="http://www.whitehouse.gov/omb/circulars/a087/print/a087-all.html">http://www.whitehouse.gov/omb/circulars/a087/print/a087-all.html</a>
A-122 (now 2 CFR 230)	<a href="http://www.whitehouse.gov/omb/circulars/a122/print/a122.html">http://www.whitehouse.gov/omb/circulars/a122/print/a122.html</a>
A-102, SF 424:	<a href="http://www.whitehouse.gov/omb/circulars/a102/print/a102.html">http://www.whitehouse.gov/omb/circulars/a102/print/a102.html</a>
Form 990:	<a href="http://www.irs.gov/pub/irs-pdf/i990-ez.pdf">http://www.irs.gov/pub/irs-pdf/i990-ez.pdf</a>

Any inconsistency or conflict in terms and conditions specified in the award will be resolved according to the following order of precedence: public laws, regulations, applicable notices published in the Federal Register, Executive Orders (EOs), Office of Management and Budget (OMB) Circulars, the Nuclear Regulatory Commission's (NRC) Mandatory Standard Provisions, special award conditions, and standard award conditions.

By drawing funds from the Automated Standard Application for Payment system (ASAP), the recipient agrees to the terms and conditions of an award.

Certifications and representations. These terms incorporate the certifications and representations required by statute, executive order, or regulation that were submitted with the SF424B application through Grants.gov.

#### **I. Mandatory General Requirements**

The order of these requirements does not make one requirement more important than any other requirement.

##### **1. Applicability of 2 CFR Part 215**

a. All provisions of 2 CFR Part 215 and all Standard Provisions attached to this grant/cooperative agreement are applicable to the Grantee and to sub-recipients which meet the definition of "Grantee" in Part 215, unless a section specifically excludes a sub-recipient from coverage. The Grantee and any sub-recipients must, in addition to the assurances made as

part of the application, comply and require each of its sub-awardees employed in the completion of the project to comply with Subpart C of 2 CFR 215 Part 180 and include this term in lower-tier (subaward) covered transactions.

b. Grantees must comply with monitoring procedures and audit requirements in accordance with OMB Circular A-133. <  
[http://www.whitehouse.gov/omb/circulars/a133\\_compliance/08/08toc.aspx](http://www.whitehouse.gov/omb/circulars/a133_compliance/08/08toc.aspx) >

## **2. Award Package**

### **Grant Performance Metrics:**

The Office of Management and Budget requires all Federal Agencies providing funding for educational scholarships and fellowships as well as other educational related funding to report on specific metrics. These metrics are part of the Academic Competitiveness Council's (ACC) 2007 report and specifically relates to Science, Technology, Engineering, and Mathematics (STEM) curricula.

### **§ 215.41 Grantee responsibilities.**

The Grantee is obligated to conduct such project oversight as may be appropriate, to manage the funds with prudence, and to comply with the provisions outlined in 2 CFR 215.41. Within this framework, the Principal Investigator (PI) named on the award face page, Block 11, is responsible for the scientific or technical direction of the project and for preparation of the project performance reports. This award is funded on a cost reimbursement basis not to exceed the amount awarded as indicated on the face page, Block 16., and is subject to a refund of unexpended funds to NRC.

The standards contained in this section do not relieve the Grantee of the contractual responsibilities arising under its contract(s). The Grantee is the responsible authority, without recourse to the NRC, regarding the settlement and satisfaction of all contractual and administrative issues arising out of procurements entered into in support of an award or other agreement. This includes disputes, claims, protests of award, source evaluation or other matters of a contractual nature. Matters concerning violation of statute are to be referred to such Federal, State or local authority as may have proper jurisdiction.

### **Subgrants**

#### **Appendix A to Part 215—Contract Provisions**

Sub-recipients, sub-awardees, and contractors have no relationship with NRC under the terms of this grant/cooperative agreement. All required NRC approvals must be directed through the Grantee to NRC. See 2 CFR 215.180 and 215.41.

### **Nondiscrimination**

(This provision is applicable when work under the grant/cooperative agreement is performed in the U.S. or when employees are recruited in the U.S.)

No U.S. citizen or legal resident shall be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under any program or activity funded by this award on the basis of race, color, national origin, age, religion, handicap, or sex. The Grantee agrees to comply with the non-discrimination requirements below:

Title VI of the Civil Rights Act of 1964 (42 USC §§ 2000d et seq)  
Title IX of the Education Amendments of 1972 (20 USC §§ 1681 et seq)  
Section 504 of the Rehabilitation Act of 1973, as amended (29 USC § 794)  
The Age Discrimination Act of 1975, as amended (42 USC §§ 6101 et seq)  
The Americans with Disabilities Act of 1990 (42 USC §§ 12101 et seq)  
Parts II and III of EO 11246 as amended by EO 11375 and 12086.  
EO 13166, "Improving Access to Services for Persons with Limited English Proficiency."  
Any other applicable non-discrimination law(s).

Generally, Title VII of the Civil Rights Act of 1964, 42 USC § 2000e et seq, provides that it shall be an unlawful employment practice for an employer to discharge any individual or otherwise to discriminate against an individual with respect to compensation, terms, conditions, or privileges of employment because of such individual's race, color, religion, sex, or national origin. However, Title VII, 42 USC § 2000e-1(a), expressly exempts from the prohibition against discrimination on the basis of religion, a religious corporation, association, educational institution, or society with respect to the employment of individuals of a particular religion to perform work connected with the carrying on by such corporation, association, educational institution, or society of its activities.

#### **Modifications/Prior Approval**

NRC prior written approval may be required before a Grantee makes certain budget modifications or undertakes particular activities. If NRC approval is required for changes in the grant or cooperative agreement, it must be requested of, and obtained from, the NRC Grants Officer in advance of the change or obligation of funds. All requests for NRC prior approval must be made, in writing (which includes submission by e-mail), to the designated Grants Specialist and Program Office no later than 30 days before the proposed change. The request must be signed by both the PI and the authorized organizational official. Failure to obtain prior approval, when required, from the NRC Grants Officer may result in the disallowance of costs, termination of the award, or other enforcement action within NRC's authority.

#### **Lobbying Restrictions**

The Grantee will comply, as applicable, with provisions of the Hatch Act (5 U.S.C. §§1501-1508 and 7324-7328) which limit the political activities of employees whose principal employment activities are funded in whole or in part with Federal funds.

The Grantee shall comply with provisions of 31 USC § 1352. This provision generally prohibits the use of Federal funds for lobbying in the Executive or Legislative Branches of the Federal Government in connection with the award, and requires disclosure of the use of non-Federal funds for lobbying.

The Grantee receiving in excess of \$100,000 in Federal funding shall submit a completed Standard Form (SF) LLL, "Disclosure of Lobbying Activities," regarding the use of non-Federal funds for lobbying within 30 days following the end of the calendar quarter in which there occurs any event that requires disclosure or that materially affects the accuracy of the information contained in any disclosure form previously filed. The Grantee must submit the SF-LLL, including those received from sub-recipients, contractors, and subcontractors, to the Grants Officer.

**§ 215.13 Debarment And Suspension.**

The Grantee agrees to notify the Grants Officer immediately upon learning that it or any of its principals:

- (1) Are presently excluded or disqualified from covered transactions by any Federal department or agency;
- (2) Have been convicted within the preceding three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State, or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, tax evasion, receiving stolen property, making false claims, or obstruction of justice; commission of any other offense indicating a lack of business integrity or business honesty that seriously and directly affects your present responsibility;
- (3) Are presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State, or local) with commission of any of the offenses enumerated in paragraph (1)(b); and
- (4) Have had one or more public transactions (Federal, State, or local) terminated for cause or default within the preceding three years.

b. The Grantee agrees that, unless authorized by the Grants Officer, it will not knowingly enter into any subgrant or contracts under this grant/cooperative agreement with a person or entity that is included on the Excluded Parties List System (<http://epls.arnet.gov>).

The Grantee further agrees to include the following provision in any subgrant or contracts entered into under this award:

'Debarment, Suspension, Ineligibility, and Voluntary Exclusion

The Grantee certifies that neither it nor its principals is presently excluded or disqualified from participation in this transaction by any Federal department or agency. The policies and procedures applicable to debarment, suspension, and ineligibility under NRC-financed transactions are set forth in 2 CFR Part 180.'

**Drug-Free Workplace**

The Grantee must be in compliance with The Federal Drug Free Workplace Act of 1988. The policies and procedures applicable to violations of these requirements are set forth in 41 USC 702.

**Implementation of E.O. 13224 -- Executive Order On Terrorist Financing**

The Grantee is reminded that U.S. Executive Orders and U.S. law prohibits transactions with, and the provision of resources and support to, individuals and organizations associated with terrorism. It is the legal responsibility of the Grantee to ensure compliance with these Executive Orders and laws. This provision must be included in all contracts/sub-awards issued under this grant/cooperative agreement.

Award Grantees must comply with Executive Order 13224, Blocking Property and Prohibiting Transactions with Persons who Commit, Threaten to Commit, or Support Terrorism. Information about this Executive Order can be found at: [www.fas.org/irp/offdocs/eo/eo-13224.htm](http://www.fas.org/irp/offdocs/eo/eo-13224.htm).

**Procurement Standards. § 215.40**

Sections 215.41 through 215.48 set forth standards for use by Grantees in establishing procedures for the procurement of supplies and other expendable property, equipment, real property and other services with Federal funds. These standards are furnished to ensure that such materials and services are obtained in an effective manner and in compliance with the provisions of applicable Federal statutes and executive orders. No additional procurement standards or requirements shall be imposed by the Federal awarding agencies upon Grantees, unless specifically required by Federal statute or executive order or approved by OMB.

**Travel**

Travel is an appropriate charge to this award and prior authorization for specific trips are not required, as long as the trip is identified in the Grantee's original program description and original budget. All other travel, domestic or international, must not increase the total estimated award amount. Trips that have not been identified in the approved budget require the written prior approval of the Grants Officer.

Travel will be in accordance with the US Government Travel Regulations at: [www.gsa.gov/federaltravelregulation](http://www.gsa.gov/federaltravelregulation) and the per diem rates set forth at: [www.gsa.gov/perdiem](http://www.gsa.gov/perdiem).

Travel costs to the grant must be consistent with provisions as established in Appendix A to 2 CFR 220 (J.53)

**Property Management Standards**

Property standards of this award shall follow provisions as established in 2 CFR 215.30.

**Equipment** procedures shall follow provision established in 2 CFR 215.34.

**Procurement Standards**

Procurement standards of this award shall follow provisions as established in 2 CFR 215.40.

**Intangible and Intellectual Property**

Intangible and intellectual property of this award shall generally follow provisions established in 2 CFR 215.36.

**Inventions Report** - The Bayh-Dole Act (P.L. 96-517) affords Grantees the right to elect title and retain ownership to inventions they develop with funding under an NRC grant award ("subject inventions"). In accepting an award, the Grantee agrees to comply with applicable NRC policies, the Bayh-Dole Act, and its Government-wide implementing regulations found at Title 37, Code of Federal Regulations (CFR) Part 401. A significant part of the regulations require that the Grantee report all subject inventions to the awarding agency (NRC) as well as include an acknowledgement of federal support in any patents. NRC participates in the trans-government Interagency Edison system (<http://www.iedison.gov>) and expects NRC funding Grantees to use this system to comply with Bayh-Dole and related intellectual property reporting requirements. The system allows for Grantees to submit reports electronically via the Internet. In addition, the invention must be reported in continuation applications (competing or non-competing).

**Patent Notification Procedures-** Pursuant to EO 12889, NRC is required to notify the owner of any valid patent covering technology whenever the NRC or its financial assistance Grantees, without making a patent search, knows (or has demonstrable reasonable grounds to know) that technology covered by a valid United States patent has been or will be used without a license from the owner. To ensure proper notification, if the Grantee uses or has used patented technology under this award without license or permission from the owner, the Grantee must notify the Grants Officer. This notice does not necessarily mean that the Government authorizes and consents to any copyright or patent infringement occurring under the financial assistance.

**Data, Databases, and Software** - The rights to any work produced or purchased under a NRC federal financial assistance award are determined by 2 CFR 215.36. Such works may include data, databases or software. The Grantee owns any work produced or purchased under a NRC federal financial assistance award subject to NRC's right to obtain, reproduce, publish or otherwise use the work or authorize others to receive, reproduce, publish or otherwise use the data for Government purposes.

**Copyright** - The Grantee may copyright any work produced under a NRC federal financial assistance award subject to NRC's royalty-free nonexclusive and irrevocable right to reproduce, publish or otherwise use the work or authorize others to do so for Government purposes. Works jointly authored by NRC and Grantee employees may be copyrighted but only the part authored by the Grantee is protected because, under 17 USC § 105, works produced by Government employees are not copyrightable in the United States. On occasion, NRC may ask the Grantee to transfer to NRC its copyright in a particular work when NRC is undertaking the primary dissemination of the work. Ownership of copyright by the Government through assignment is permitted under 17 USC § 105.

**Records retention and access requirements** for records of the Grantee shall follow established provisions in 2 CFR 215.53.

#### **Organizational Prior Approval System**

In order to carry out its responsibilities for monitoring project performance and for adhering to award terms and conditions, each Grantee organization shall have a system to ensure that appropriate authorized officials provide necessary organizational reviews and approvals in advance of any action that would result in either the performance or modification of an NRC supported activity where prior approvals are required, including the obligation or expenditure of funds where the governing cost principles either prescribe conditions or require approvals.

The Grantee shall designate an appropriate official or officials to review and approve the actions requiring NRC prior approval. Preferably, the authorized official(s) should be the same official(s) who sign(s) or countersign(s) those types of requests that require prior approval by NRC. The authorized organization official(s) shall not be the principal investigator or any official having direct responsibility for the actual conduct of the project, or a subordinate of such individual.

**Conflict Of Interest Standards** of this award shall follow provisions as established in 2 CFR 215.42 Codes of Conduct.

#### **Dispute Review Procedures**

a. Any request for review of a notice of termination or other adverse decision should be addressed to the Grants Officer. It must be postmarked or transmitted electronically no later

than 30 days after the postmarked date of such termination or adverse decision from the Grants Officer.

b. The request for review must contain a full statement of the Grantee's position and the pertinent facts and reasons in support of such position.

c. The Grants Officer will promptly acknowledge receipt of the request for review and shall forward it to the Director, Office of Administration, who shall appoint a review committee consisting of a minimum of three persons.

d. Pending resolution of the request for review, the NRC may withhold or defer payments under the award during the review proceedings.

e. The review committee will request the Grants Officer who issued the notice of termination or adverse action to provide copies of all relevant background materials and documents. The committee may, at its discretion, invite representatives of the Grantee and the NRC program office to discuss pertinent issues and to submit such additional information as it deems appropriate. The chairman of the review committee will insure that all review activities or proceedings are adequately documented.

f. Based on its review, the committee will prepare its recommendation to the Director, Office of Administration, who will advise the parties concerned of his/her decision.

**Termination and Enforcement.** Termination of this award by default or by mutual consent shall follow provisions as established in 2 CFR 215.60.

### **Monitoring and Reporting § 215.51**

a. Grantee Financial Management systems must comply with the established provisions in 2 CFR 215.21

- Payment – 2 CFR 215.22
- Cost Share – 2 CFR 215.23
- Program Income – 2 CFR 215.24
  - Earned program income, if any, shall be added to funds committed to the project by the NRC and Grantee and used to further eligible project or program objectives.
- Budget Revision – 2 CFR 215.25
  - In accordance with 2 CFR 215.25(e), the NRC waives the prior approval requirement for items identified in sub-part (e)(1-4).
  - The Grantee is not authorized to rebudget between direct costs and indirect costs without written approval of the Grants Officer.
  - Allowable Costs – 2 CFR 215.27

### **b. Federal Financial Reports**

Effective October 1, 2008, NRC transitioned from the SF-269, SF-269A, SF-272, and SF-272A to the Federal Financial Report (SF-425) as required by OMB:

[http://www.whitehouse.gov/omb/fedreg/2008/081308\\_ffr.pdf](http://www.whitehouse.gov/omb/fedreg/2008/081308_ffr.pdf)

[http://www.whitehouse.gov/omb/grants/standard\\_forms/ffr.pdf](http://www.whitehouse.gov/omb/grants/standard_forms/ffr.pdf)

[http://www.whitehouse.gov/omb/grants/standard\\_forms/ffr\\_instructions.pdf](http://www.whitehouse.gov/omb/grants/standard_forms/ffr_instructions.pdf)

The Grantee shall submit a "Federal Financial Report" (SF-425) on a quarterly basis for the periods ending 3/31, 6/30, 9/30, and 12/31 or any portion thereof, unless otherwise specified in a special award condition. Reports are due no later than 30 days following the end of each reporting period. A final SF-425 shall be submitted within 90 days after expiration of the award.

**Period of Availability of Funds 2 CFR § 215.28**

- a. Where a funding period is specified, a Grantee may charge to the grant only allowable costs resulting from obligations incurred during the funding period and any pre-award costs authorized by the NRC.
- b. Unless otherwise authorized in 2 CFR 215.25(e)(2) or a special award condition, any extension of the award period can only be authorized by the Grants Officer in writing. Verbal or written assurances of funding from other than the Grants Officer shall not constitute authority to obligate funds for programmatic activities beyond the expiration date.
- c. The NRC has no obligation to provide any additional prospective or incremental funding. Any modification of the award to increase funding and to extend the period of performance is at the sole discretion of the NRC.
- d. Requests for extensions to the period of performance shall be sent to the Grants Officer at least 30 days prior to the grant/cooperative agreement expiration date. Any request for extension after the expiration date shall not be honored.

**Automated Standard Application For Payments (ASAP) Procedures**

Unless otherwise provided for in the award document, payments under this award will be made using the Department of Treasury's Automated Standard Application for Payment (ASAP) system < <http://www.fms.treas.gov/asap/> >. Under the ASAP system, payments are made through preauthorized electronic funds transfers, in accordance with the requirements of the Debt Collection Improvement Act of 1996. In order to receive payments under ASAP, Grantees are required to enroll with the Department of Treasury, Financial Management Service, and Regional Financial Centers, which allows them to use the on-line method of withdrawing funds from their ASAP established accounts. The following information will be required to make withdrawals under ASAP: (1) ASAP account number – the award number found on the cover sheet of the award; (2) Agency Location Code (ALC) – 31000001; and Region Code. Grantees enrolled in the ASAP system do not need to submit a "Request for Advance or Reimbursement" (SF-270), for payments relating to their award.

**Audit Requirements**

Organization-wide or program-specific audits shall be performed in accordance with the Single Audit Act Amendments of 1996, as implemented by OMB Circular A-133, "Audits of States, Local Governments, and Non-Profit Organizations." <http://www.whitehouse.gov/omb/circulars/a133/a133.html> Grantees are subject to the provisions of OMB Circular A-133 if they expend \$500,000 or more in a year in Federal awards.

The Form SF-SAC and the Single Audit Reporting packages for fiscal periods ending on or after January 1, 2008 must be submitted online.

1. Create your online report ID at <http://harvester.census.gov/fac/collect/ddeindex.html>
2. Complete the Form SF-SAC

3. Upload the Single Audit
4. Certify the Submission
5. Click "Submit."

Organizations expending less than \$500,000 a year are not required to have an annual audit for that year but must make their grant-related records available to NRC or other designated officials for review or audit.

### **III. Programmatic Requirements**

#### **Performance (Technical) Reports**

- a. The Grantee shall submit performance (technical) reports electronically to the NRC Project Officer and Grants Officer as specified in the special award conditions in the same frequency as the Federal Financial Report unless otherwise authorized by the Grants Officer.
- b. Unless otherwise specified in the award provisions, performance (technical) reports shall contain brief information as prescribed in the applicable uniform administrative requirements 2 CFR §215.51 which are incorporated in the award.
- c. The submission for the six month period ending March 31<sup>st</sup> is due by April 30<sup>th</sup>. The submission for the six month period ending September 30<sup>th</sup> is due by October 31<sup>st</sup>.

#### **Unsatisfactory Performance**

Failure to perform the work in accordance with the terms of the award and maintain at least a satisfactory performance rating or equivalent evaluation may result in designation of the Grantee as high risk and assignment of special award conditions or other further action as specified in the standard term and condition entitled "Termination".

Failure to comply with any or all of the provisions of the award may have a negative impact on future funding by NRC and may be considered grounds for any or all of the following actions: establishment of an accounts receivable, withholding of payments under any NRC award, changing the method of payment from advance to reimbursement only, or the imposition of other special award conditions, suspension of any NRC active awards, and termination of any NRC award.

#### **Other Federal Awards With Similar Programmatic Activities**

The Grantee shall immediately provide written notification to the NRC Project Officer and the Grants Officer in the event that, subsequent to receipt of the NRC award, other financial assistance is received to support or fund any portion of the program description incorporated into the NRC award. NRC will not pay for costs that are funded by other sources.

#### **Prohibition Against Assignment By The Grantee**

The Grantee shall not transfer, pledge, mortgage, or otherwise assign the award, or any interest therein, or any claim arising thereunder, to any party or parties, banks, trust companies, or other financing or financial institutions without the express written approval of the Grants Officer.

#### **Site Visits**

The NRC, through authorized representatives, has the right, at all reasonable times, to make site visits to review project accomplishments and management control systems and to provide

such technical assistance as may be required. If any site visit is made by the NRC on the premises of the Grantee or contractor under an award, the Grantee shall provide and shall require his/her contractors to provide all reasonable facilities and assistance for the safety and convenience of the Government representative in the performance of their duties. All site visits and evaluations shall be performed in such a manner as will not unduly delay the work.

#### **IV. Miscellaneous Requirements**

##### **Criminal and Prohibited Activities**

- a. The Program Fraud Civil Remedies Act (31 USC §§ 3801-3812), provides for the imposition of civil penalties against persons who make false, fictitious, or fraudulent claims to the Federal government for money (including money representing grant/cooperative agreements, loans, or other benefits.)
- b. False statements (18 USC § 287), provides that whoever makes or presents any false, fictitious, or fraudulent statements, representations, or claims against the United States shall be subject to imprisonment of not more than five years and shall be subject to a fine in the amount provided by 18 USC § 287.
- c. False Claims Act (31 USC 3729 et seq), provides that suits under this Act can be brought by the government, or a person on behalf of the government, for false claims under federal assistance programs.
- d. Copeland "Anti-Kickback" Act (18 USC § 874), prohibits a person or organization engaged in a federally supported project from enticing an employee working on the project from giving up a part of his compensation under an employment contract.

##### **American-Made Equipment And Products**

Grantees are hereby notified that they are encouraged, to the greatest extent practicable, to purchase American-made equipment and products with funding provided under this award.

##### **Increasing Seat Belt Use in the United States**

Pursuant to EO 13043, Grantees should encourage employees and contractors to enforce on-the-job seat belt policies and programs when operating company-owned, rented or personally-owned vehicle.

##### **Federal Employee Expenses**

Federal agencies are generally barred from accepting funds from a Grantee to pay transportation, travel, or other expenses for any Federal employee unless specifically approved in the terms of the award. Use of award funds (Federal or non-Federal) or the Grantee's provision of in-kind goods or services, for the purposes of transportation, travel, or any other expenses for any Federal employee may raise appropriation augmentation issues. In addition, NRC policy prohibits the acceptance of gifts, including travel payments for Federal employees, from Grantees or applicants regardless of the source.

##### **Minority Serving Institutions (MSIs) Initiative**

Pursuant to EOs 13256, 13230, and 13270, NRC is strongly committed to broadening the participation of MSIs in its financial assistance program. NRC's goals include achieving full participation of MSIs in order to advance the development of human potential, strengthen the Nation's capacity to provide high-quality education, and increase opportunities for MSIs to

participate in and benefit from Federal financial assistance programs. NRC encourages all applicants and Grantees to include meaningful participations of MSIs. Institutions eligible to be considered MSIs are listed on the Department of Education website:  
<http://www.ed.gov/about/offices/list/ocr/edlite-minorityinst.html>

### **Research Misconduct**

Scientific or research misconduct refers to the fabrication, falsification, or plagiarism in proposing, performing, or reviewing research, or in reporting research results. It does not include honest errors or differences of opinions. The Grantee organization has the primary responsibility to investigate allegations and provide reports to the Federal Government. Funds expended on an activity that is determined to be invalid or unreliable because of scientific misconduct may result in a disallowance of costs for which the institution may be liable for repayment to the awarding agency. The Office of Science and Technology Policy at the White House published in the Federal Register on December 6, 2000, a final policy that addressed research misconduct. The policy was developed by the National Science and Technology Council (65 FR 76260). The NRC requires that any allegation be submitted to the Grants Officer, who will also notify the OIG of such allegation. Generally, the Grantee organization shall investigate the allegation and submit its findings to the Grants Officer. The NRC may accept the Grantee's findings or proceed with its own investigation. The Grants Officer shall inform the Grantee of the NRC's final determination.

### **Publications, Videos, and Acknowledgment of Sponsorship**

Publication of the results or findings of a research project in appropriate professional journals and production of video or other media is encouraged as an important method of recording and reporting scientific information. It is also a constructive means to expand access to federally funded research. The Grantee is required to submit a copy to the NRC and when releasing information related to a funded project include a statement that the project or effort undertaken was or is sponsored by the NRC. The Grantee is also responsible for assuring that every publication of material (including Internet sites and videos) based on or developed under an award, except scientific articles or papers appearing in scientific, technical or professional journals, contains the following disclaimer:

"This [report/video] was prepared by [Grantee name] under award [number] from [name of operating unit], Nuclear Regulatory Commission. The statements, findings, conclusions, and recommendations are those of the author(s) and do not necessarily reflect the view of the [name of operating unit] or the US Nuclear Regulatory Commission."