

February 18, 2010

Surendra K. Gupta, Ph.D.  
American Radiolabeled Chemicals, Inc.  
101 ARC Drive  
Saint Louis, MO 63146

SUBJECT: NRC REACTIVE INSPECTION REPORT 030-20567/09-02(DNMS) AMERICAN  
RADIOLABELED CHEMICALS, INC.

Dear Dr. Gupta:

On January 21, 2010, the U.S. Nuclear Regulatory Commission (NRC) completed a reactive inspection at the American Radiolabeled Chemicals (ARC), Incorporated facilities located in St. Louis, Missouri. The inspection included onsite activities starting October 20 through 22, 2009, and November 4 through 5, 2009, with continuing in-office review through January 21, 2010. The in-office review involved the NRC evaluation of soil samples and tests for removable contamination collected at the ARC site. The purpose of the inspection was to evaluate ARC's activities relating to characterization of soils in outdoor areas of the site and to determine if the activities were conducted safely and in accordance with NRC requirements. Specifically, inspectors reviewed your program for conducting and documenting radiological surveys of outdoor areas, performing soil excavation in known contaminated outdoor areas, and maintaining required information important to the future decommissioning and release of facilities for unrestricted use. At the conclusion of the on-site inspection on November 5, 2009, the inspectors discussed the preliminary findings with you and members of your staff. On January 21, 2010, a final exit meeting was conducted telephonically with you and members of your staff.

The inspection consisted of an examination of activities as they relate to safety and compliance with the Commission's rules and regulations. Areas examined during the inspection are identified in the enclosed report. Within these areas, the inspection consisted of a selective examination of procedures and representative records, interviews with personnel, and the conduct of independent NRC surveys.

Based on the results of the inspection, the NRC has determined that three Severity Level IV violations of NRC requirements occurred. The violations were evaluated in accordance with the NRC Enforcement Policy. The current Enforcement Policy is included on the NRC's website at <http://www.nrc.gov/about-nrc/regulatory/enforcement/enforcement-pol.html>. The violations involve your failure to: (1) to identify and evaluate the associated hazards of known contamination in outdoor areas of your site; (2) to require the use of protective clothing in a contaminated area; and (3) to ensure adequate survey of an individual's hands after performing decontamination work in one of the production buildings.

The violations are cited in the enclosed Notice of Violation (Notice) and the circumstances surrounding them are described in detail in the subject inspection report. The violations are being cited in the Notice because they were identified by the inspectors.

S. Gupta

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You are required to respond to this letter and should follow the instructions specified in the enclosed Notice when preparing your response. For your consideration and convenience, the guidance in NRC Information Notice 96-28, "Suggested Guidance Relating to Development and Implementation of Corrective Action," may be helpful. You can find the information notice on the NRC website at: <http://www.nrc.gov/reading-rm/doc-collections/gen-comm/info-notices/1996/in96028.html>. The NRC will use your response, in part, to determine whether further enforcement action is necessary to ensure compliance with regulatory requirements.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosures, and your response, will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's Agencywide Documents Access and Management System (ADAMS), accessible from the NRC website at <http://www.nrc.gov/readingrm/adams.html>. To the extent possible, your response should not include any personal privacy, Proprietary, or safeguards information so that it can be made available to the public without redaction.

Sincerely,

**/RA/**

Tamara E. Bloomer, Chief  
Materials Inspection Branch

Docket No. 030-20567  
License No. 24-21362-01

Enclosures:

1. Notice of Violation
2. Inspection Report 030-20567/09-02(DNMS)

cc w/encls: Regis Greenwood, Radiation Safety Officer  
State of Missouri

S. Gupta

-2-

You are required to respond to this letter and should follow the instructions specified in the enclosed Notice when preparing your response. For your consideration and convenience, the guidance in NRC Information Notice 96-28, "Suggested Guidance Relating to Development and Implementation of Corrective Action," may be helpful. You can find the information notice on the NRC website at: <http://www.nrc.gov/reading-rm/doc-collections/gen-comm/info-notices/1996/in96028.html>. The NRC will use your response, in part, to determine whether further enforcement action is necessary to ensure compliance with regulatory requirements.

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cc w/encls: Regis Greenwood, Radiation Safety Officer  
State of Missouri

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Letter to Surendra K. Gupta, Ph.D., from Tamara E. Bloomer, dated February 18, 2010.

SUBJECT: NRC REACTIVE INSPECTION REPORT 030-20567/09-02(DNMS) AMERICAN  
RADIOLABELED CHEMICALS, INC.

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## NOTICE OF VIOLATION

American Radiolabeled Chemicals  
St. Louis, Missouri

Docket No. 030-20567  
License No. 24-21362-01

During an U.S. Nuclear Regulatory Commission (NRC) inspection conducted on October 20, 2009, through January 21, 2010, violations of NRC requirements were identified. In accordance with the NRC Enforcement Policy, the violations are listed below:

- A. Condition 22 B of NRC License No. 24-21362-01 requires, in part, that the licensee conduct its program in accordance with the statements, representations, and procedures contained in its letter to the NRC dated February 8, 2005. The letter contains the licensee's Radiation Protection Program (RPP) dated October 21, 2004. Section 4.1.3 of the RPP, "Surveys and monitoring" states, in part that "surveys shall be made as are reasonable to evaluate radiation levels, concentrations or quantities of Radioactive Material (RAM), and radiological hazards."

Contrary to the above, the licensee did not perform surveys to evaluate radiation levels, concentrations or quantities of RAM, and radiological hazards in outdoor areas. Specifically, the licensee did not survey site areas outside of the buildings prior to October 21, 2009, which resulted in a failure to identify and evaluate the associated hazards of contamination identified during the inspection in site soils under a production building downspouts, in contaminated sands under production buildings ventilation exhaust stacks, and on the exterior of the production buildings ventilation stacks.

This is a Severity Level IV violation (Supplement VI).

- B. Condition 22 B of NRC License No. 24-21362-01 requires, in part, that the licensee conduct its program in accordance with the statements, representations, and procedures contained in its letter to the NRC dated February 8, 2005. The letter contains the licensee's RPP dated October 21, 2004. Section 4.2.2.1 "Requirements for Protective Outer Garments," states in part, that "appropriate outer garments shall be worn (e.g. lab coats, and/or shoe covers, and/or gloves) if the surfaces you may contact have loose contamination levels in excess of 1,000 dpm/100 cm<sup>2</sup> for any beta or gamma emitting radionuclides."

Contrary to the above, on October 21, 2009, the licensee did not provide or require protective outer garments in areas that had loose contamination above the stated limits. Specifically, the licensee allowed three individuals to access a production building area that had radiological contamination limits exceeding 1,000 dpm/100 cm<sup>2</sup>, and did not require the use of appropriate protective clothing. As a result of this failure, the shoes of the individuals accessing the contaminated area became contaminated in excess of 1,000 dpm/100 cm<sup>2</sup>.

This is a Severity Level IV violation (Supplement VI).

- C. Condition 22 B of NRC License No. 24-21362-01 requires, in part, that the licensee conduct its program in accordance with the statements, representations, and procedures contained in its letter to the NRC dated February 8, 2005. The letter contains the licensee's RPP dated October 21, 2004. Section 5.2.3 of the RPP requires, in part, that individuals survey their hands upon leaving the laboratory.

Contrary to the above, on October 22, 2009, a licensee individual did not survey their hands upon leaving the laboratory. Specifically, the individual did not perform an adequate survey of his hands and failed to identify 350,000 dpm of beta contamination on the palm of one hand.

This is a Severity Level IV violation (Supplement VI)

Pursuant to the provisions of 10 CFR 2.201, American Radiolabeled Chemicals is hereby required to submit a written statement or explanation to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001, with a copy to the Regional Administrator, Region III, within 30 days of the date of the letter transmitting this Notice of Violation (Notice). This reply should be clearly marked as a "Reply to a Notice of Violation" and should include for each violation: (1) the reason for the violation, or, if contested, the basis for disputing the violation or severity level; (2) the corrective steps that have been taken and the results achieved; (3) the corrective steps that will be taken to avoid further violations; and (4) the date when full compliance will be achieved. Your response may reference or include previous docketed correspondence, if the correspondence adequately addresses the required response. If an adequate reply is not received within the time specified in this Notice, an order or a Demand for Information may be issued as to why the license should not be modified, suspended, or revoked, or why such other action as may be proper should not be taken. Where good cause is shown, consideration will be given to extending the response time.

If you contest this enforcement action, you should also provide a copy of your response, with the basis for your denial, to the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, and Washington, DC 20555-0001.

Because your response will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's Agencywide Documents and Access Management System (ADAMS), accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> to the extent possible, it should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the public without redaction. If personal privacy or proprietary information is necessary to provide an acceptable response, then please provide a bracketed copy of your response that identifies the information that should be protected and a redacted copy of your response that deletes such information. If you request withholding of such material, you must specifically identify the portions of your response that you seek to have withheld and provide in detail the bases for your claim of withholding (e.g., explain why the disclosure of information will create an unwarranted invasion of personal privacy or provide the information required by 10 CFR 2.390(b) to support a request for withholding confidential commercial or financial information). If safeguards information is necessary to provide an acceptable response, please provide the level of protection described in 10 CFR 73.21.

In accordance with 10 CFR 19.11, you may be required to post this Notice within two working days.

Dated this 18th day of February 2010

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket No.: 030-20567

License No.: 24-21362-01

Report No.: 030-20567/09-02 (DNMS)

Licensee: American Radiolabeled Chemicals, Inc.

Facility: 101 ARC Drive  
St. Louis, Missouri

Inspection Dates: October 20 through 22, 2009, and November 4  
through 5, 2009 (on-site), with continuing in-office  
review through January 20, 2010

Preliminary Exit Meeting: November 5, 2009

Final Exit Teleconference: January 21, 2010

Inspectors: Mike McCann, Senior Health Physicist  
Katie Streit, Health Physicist

Approved By: Tamara E. Bloomer, Chief  
Materials Inspection Branch  
Division of Nuclear Materials Safety

## EXECUTIVE SUMMARY

### American Radiolabeled Chemicals, Inc. NRC Inspection Report 030-20567/09-02(DNMS)

American Radiolabeled Chemicals, Inc. (ARC) is a manufacturing and distribution licensee. The ARC license authorizes the licensee to approve individuals as authorized users of licensed materials, and to manufacture, synthesize, and re-distribute radiolabeled chemicals for distribution to specific licensees. The ARC site occupies approximately four to five acres and contains four buildings (identified as 100, 200, 300, and 400).

This inspection was performed to evaluate ARC's activities relating to characterization of soils in outdoor areas of the site. The licensee was characterizing the site in response to an U.S. Nuclear Regulatory Commission (NRC) Unresolved Inspection Item (URI) 03020567/08-01-02 that is discussed in an April 23, 2008, NRC Inspection Report No. 03020567/08-01, documenting concerns regarding radiological contamination in outdoor areas of the ARC site. The focus of the NRC inspection was to observe and evaluate the licensee's documentation of data, performance of radiological survey and sampling activities, and to perform NRC confirmatory measurements.

#### Site Characterization and Soil Excavation

- The NRC inspectors concluded that the licensee's activities to perform site characterization were compliant with the licensee's NRC approved site characterization plan. The inspectors also determined that the site soils were radiologically impacted, with radiological levels greater than the NRC unrestricted use concentration limit for surface soils. The licensee agreed to submit a license amendment to incorporate operational controls, and perform periodic characterization of the site soils. (Section 1)
- The inspectors identified an Open Item that is under continuing NRC review regarding issues associated with authorized use of licensed materials. Upon completion of the review of the Open Item, the conclusion will be documented in a separate correspondence. (Section 1)

#### Radiation Surveys and Contamination Control

- The inspectors identified three violations of License Condition 22 B of NRC License No. 24-21362-01: 1) involving the licensee's failure to perform surveys to evaluate radiation levels, concentrations or quantities of radioactive materials identified in outdoor areas of the licensee's site; 2) the licensee's failure to insure the use of protective clothing in a contaminated area; and 3) the failure to perform an adequate survey of an individual's hands upon exiting a contaminated area. The inspectors also identified one URI regarding the modification and adequacy of the licensee's laboratories exhaust systems. (Section 2)

### Closure of Unresolved Inspection Items

- The inspection also reviewed two open URIs remaining from the inspection conducted from January 22, 2008, through March 26, 2008. The URI involving implementation and adequacy of the licensee's site characterization efforts was closed. A second URI involving the licensee's Emergency Spill and Incident Investigation Procedures was also closed (Section 3)

## Report Details

### **1 Site Characterization and Soil Excavation**

#### **1.1 Inspection Scope**

The inspectors evaluated the licensee's site characterization activities by interviewing the Radiation Safety Officer (RSO) and licensee staff, and by observing licensee characterization surveys and soil sampling activities in outdoor areas of the site. The U.S. Nuclear Regulatory Commission (NRC) inspectors also evaluated the licensee's characterization activities by performing independent radiological surveys, collecting three random split soil samples from locations as described by the American Radiolabeled Chemicals, Inc. (ARC) Site Characterization Plan dated August 3, 2009, and collecting one biased soil sample from under a Building 100 rain downspout. The NRC's contract laboratory, Oak Ridge Institute for Science and Education (ORISE), conducted a radiological analysis on the soil samples. The ORISE analytical results included analysis for carbon-14 and hydrogen-3.

#### **1.2 Observations and Findings**

The licensee collected 64 soil samples from locations consistent with the licensee's Site Characterization Plan, which had been approved in NRC License Amendment No. 40, dated October 29, 2009. This license amendment expanded the licensee's Item 9 "Authorized Use" to include "Possession incident to radiological site characterization, collection, and analysis of water and soil samples containing residual contamination." The licensee employed personnel protective equipment, decontaminated sampling tools, documented sample information and followed sample chain-of-custody activities according to the licensee's approved procedures.

The licensee's contract laboratory reported that the sample results ranged from Minimum Detectable Activity (MDC) to 516 picocuries per gram (pCi/g) for hydrogen-3, and from MDC to 103 pCi/g for carbon-14. The NRC unrestricted use concentrations for surface soils are specified in NUREG-1757, Table B.2 "Interim Screening Values (pCi/g) of Common Radionuclides for Soil Surface Contamination Levels." The screening values are 110 pCi/g for hydrogen-3 and 12 pCi/g for carbon-14.

The licensee personnel under the direct observation of the NRC inspectors, collected soil from three sample locations for split samples. For each sample location, the soil was individually mixed prior to splitting into sampling bags, one for the licensee and one for the NRC. The analytical results from ORISE (ML100141266) and ARC for the 3 split soil samples are listed in the table below.

Sample Number	1	2	3
Site Characterization plan sample location	Unit 03 #03	Survey Unit 03 #05	Survey Unit 04 #04
ARC H-3 Results (pCi/g)	52.6 ± 2.74	29.3 ± 2.08	17.3 ± 1.7
ARC C-14 (pCi/g)	12.5 ± 1.12	0.46 ± 0.74	8.57 ± 0.92
NRC H-3 Results (pCi/g)	108 ± 30	95 ± 26	45 ± 13
NRC C-14 Results (pCi/g)	24.4 ± 2.8	3.5 ± 1.8	18.8 ± 2.5

The NRC randomly selected 6 samples from the 64 samples analyzed by the licensee's contract laboratory for independent analysis by ORISE. These results will be issued in a separate letter report. The NRC also collected one biased soil sample under a Building 100 downspout. ORISE reported results for the biased sample as 1,390 and 978 pCi/g for hydrogen-3 and carbon-14, respectively.

During discussions between the NRC inspectors and the licensee's RSO, the RSO agreed that the outdoor areas were radiologically impacted. The licensee's RSO agreed to submit to the NRC a license amendment addressing this site contamination issue. The RSO indicated that the amendment would incorporate operational controls that would address the following: 1) a commitment to periodically perform site environmental monitoring of site soils and other effluent discharges that could impact the outdoor areas of the site; and 2) a commitment to not disturb site soils without prior NRC review.

The inspectors continue to review an issue associated with soil excavation prior to site characterization. The issue includes a review of the licensee's authorized use of licensed materials. Therefore, the issue is an Open Item. Upon completion of the review of the Open Item, the conclusions will be documented in a separate correspondence.

### 1.3 Conclusions

NRC inspectors concluded that the licensee's activities to perform site characterization were compliant with the licensee's NRC approved site characterization plan. The inspectors also determined that the site soils were radiologically impacted, with radiological levels greater than the NRC license termination unrestricted use concentration limit for surface soil. The licensee agreed to submit a license amendment to incorporate operational controls, and perform periodic characterization of the site soils. The inspectors also identified an Open Item associated with authorized use of licensed materials.

## 2 **Radiation Surveys and Contamination Control**

### 2.1 Inspection Scope

The inspectors reviewed the licensee's radiation survey and contamination control activities by interviewing the RSO and staff, and reviewing licensee survey records. The inspectors toured the licensee's approved facilities, and outdoor unrestricted areas in the

company of licensee personnel. During the tour, the inspectors observed the licensee's safety practices employed in these areas. The NRC inspectors also performed independent radiological surveys, and collected wipe tests for removable contamination in one building of the licensee's facility, and collected a number of soil and sand samples from out-door areas of the licensee's site.

## 2.2 Observations and Findings

The inspectors performed direct survey measurements using calibrated radiation survey meters, sensitive to beta radiation, in unrestricted out-door areas adjoining the licensee's production Buildings 100 and 300. The direct scan surveys identified contamination on the exterior surface of elbow bends of both Building 100 and 300 exhaust stacks. The contamination appeared to be a result of liquid leaking from the stacks. The direct surveys identified contamination of 1,907,640 disintegrations per minute per 100 centimeters squared (dpm/100 cm<sup>2</sup>) on the Building 100 stack, and 1,256,040 dpm/100 cm<sup>2</sup> on the Building 300 stack. The NRC inspectors collected one wipe test for removable contamination from the Building 300 exhaust stack, which was analyzed by ORISE, who reported the results of the test to be 5,640 dpm/100 cm<sup>2</sup> of hydrogen-3 and 1,086 dpm/100 cm<sup>2</sup> of carbon-14. The NRC lists radiological screening values that may be used by licensees when evaluating their facilities and sites to determine their suitability for unrestricted use in NUREG 1757, Vol. 1 "Consolidated NMSS Decommissioning Guidance." NUREG 1757, Table B.1 "Acceptable License Termination Screening Values of Common Radionuclides for Building-Surface Contamination," specifies screening values for hydrogen-3 and carbon-14 as 12,000,000 and 3,700,000 dpm/100 cm<sup>2</sup>, respectively. The licensee's Standard Operating Procedure, SOP-16, "Radioactive Contamination Control Program" specifies a radiological action level for unrestricted areas for investigation purposes as, "Any statistically significant difference above background. If contamination is found that exceeds the action levels, the survey should be expanded to determine the extent of the contamination and, where possible, its origin."

The inspectors performed direct survey measurements that identified contamination in the soil beneath downspouts of Building 100, ranging from 806,005 dpm/100 cm<sup>2</sup> to 429,021 dpm/100 cm<sup>2</sup>. The inspectors collected a soil sample located directly under a downspout on the backside of Building 100 that was analyzed by ORISE, who reported the results as 1,390 pCi/g of hydrogen-3 and 978 pCi/g of carbon-14. The licensee's RSO informed the NRC inspectors that the Company had not surveyed the residual radioactivity discharges, nor was there a specific frequency established to check the radiological levels or build-up in the soils resulting from the drainage of rain run-off into the soils beneath the Buildings downspouts. The licensee took action to mitigate any further contamination to the soil beneath the Building downspouts by placing water collection barrels under the downspouts. The NRC collected two water samples from the barrels that were analyzed by ORISE who reported the following results: 1.70E-4 and 2.38E-3 microcuries per milliliter (μCi/mL) of hydrogen-3 and 1.66E-6 and 8.43E-6 μCi/mL of carbon-14.

The inspectors observed that the licensee had placed boxes of sand below each of the Buildings exhaust stacks. The licensee was using these sand filled boxes to collect liquid released from the stack. The licensee was aware that the sand was routinely contaminated from operational discharges and that they disposed of the sand as radiological waste when the sand in the boxes became dirty or saturated. The licensee's

RSO informed the NRC inspectors that they did not have a procedure for monitoring or surveying the residual radioactivity or exhaust stack liquid discharges, nor was there a specific frequency established to check the boxes to ascertain radiological levels or build-up in the sands resulting from the drainage of the liquids into the sand. The sand boxes under the exhaust stacks sat in the open with access to the contaminated sand. The inspectors noted animal tracks in the sand of the box located under the Building 300 stack. After identification of this issue by the NRC inspectors, the licensee erected woven wire fences around each Building's stack sand box to prevent access. Based on the inspectors' radiological field measurements, the quantity of material in the sand was estimated to be below NRC posting requirements. Following the NRC surveys, the licensee replaced the sand under each Building stack.

The NRC inspectors performed direct survey measurements on the sand pits identifying contamination at 135,606 dpm/100 cm<sup>2</sup> under the Building 100 exhaust stack and 616,656 dpm/100 cm<sup>2</sup> under the Building 300 exhaust stack. The NRC inspectors collected a sand sample from the sand pit directly below the Building 300 stack. The sand sample was analyzed by ORISE who reported radiological results of 212,000 pCi/g of hydrogen-3 and 59,900 pCi/g of carbon-14.

Condition 22 B of NRC License No. 24-21362-01 requires, in part, that the licensee conduct its program in accordance with the statements, representations, and procedures contained in its letter to the NRC dated February 8, 2005. The letter contains the licensee's Radiation Protection Program (RPP) dated October 21, 2004. Section 4.1.3 of the RPP, "Surveys and monitoring" states, in part that "surveys shall be made as are reasonable to evaluate radiation levels, concentrations or quantities of radioactive material (RAM), and radiological hazards." The licensee's failure to survey for contamination in outdoor areas identified in: site soils under the building downspouts; in contaminated sands under the Building stacks; and on stack piping resulting from liquid discharges are examples of a violation of Condition 22. This is a Severity Level IV violation (VIO 030-20567/09-02 -01).

During a tour of the licensee's production Buildings on October 21, 2009, the NRC inspectors entered the "connector area" between Building 100 and the "Decon Room." Prior to entering the area the inspectors asked the RSO if any protective clothing was required to enter the area, and were informed that no protective equipment was required. Upon exiting the area, the inspectors measured contamination on their footwear ranging from approximately 2,000 dpm to greater than 20,000 dpm. The licensee's "Daily, Survey Wipe and Scan," performed by the licensee's health physics technician on October 20, 2009, identified 1,826 dpm/100 cm<sup>2</sup> removable contamination in the connector area. The NRC inspectors collected four tests for removable contamination that were analyzed by ORISE, who reported the total removable contamination in the area ranging from approximately 2,300 to 6,700 dpm/100 cm<sup>2</sup>. The licensee's RSO informed the inspectors that he had not had the opportunity to review the "Daily, Survey Wipe and Scan" report, and was not aware that the contamination levels were elevated. Following the identification of contamination in the area, a maintenance staff mopped the area and the RSO re-instituted the use of protective shoe covers.

Condition 22 B of NRC License No. 24-21362-01 requires, in part, that the licensee conduct its program in accordance with the statements, representations, and procedures contained in its letter to the NRC dated February 8, 2005. The letter contains the licensee's RPP dated October 21, 2004. Section 4.2.2.1 "Requirements for Protective

Outer Garments,” states in part, that Appropriate outer garments shall be worn (e.g. lab coats, and/or shoe covers, and/or gloves) if the surfaces you may contact have loose contamination levels in excess of 1,000 dpm/100 cm<sup>2</sup> for any beta or gamma emitting radionuclides. The licensee’s failure to ensure the use of appropriate protective clothing by personnel entering an area exceeding 1,000 dpm/100 cm<sup>2</sup> violation of Condition 22. This is a Severity Level IV violation (VIO 030-20567/09-02-02).

Following an October 22, 2009, interview of the maintenance staff that had performed the mopping of the Building 100 connector area, the NRC inspectors requested permission to survey the individual’s hands. A direct survey of the individual’s hands identified contamination of approximately 350,000 dpm/ 15 cm<sup>2</sup> on the palm of one hand. The individual indicated that he had worked earlier that day in a laboratory and surveyed his hands upon exiting. The individual was unaware of the contamination on his hands. The licensee’s RSO was informed, and the RSO proceeded to decontaminate the individual’s hands, and indicated that the potential exposure would be evaluated.

Condition 22 B of NRC License No. 24-21362-01 requires, in part, that the licensee conduct its program in accordance with the statements, representations, and procedures contained in its letter to the NRC dated February 8, 2005. The letter contains the licensee’s RPP dated October 21, 2004. Section 5.2.3 of the RPP requires, in part, that individuals survey their hands upon leaving the laboratory. The individual’s failure to adequately survey his hands before leaving the laboratory is a violation of Condition 22 B. This is a Severity Level IV violation (VIO 030-20567/09-02 -03)

The NRC inspectors noted that the description of the licensee’s Buildings 100 and 300 laboratory exhaust systems and proposed uses, currently tied down in the ARC license, was described in a letter dated August 19, 2003 (ML093350491). The NRC inspectors determined that the licensee had made modifications and changes to its Buildings’ exhaust systems. In light of the stack modifications and the extent of contamination identified by the NRC in site soil samples, soil located under drain spouts, roof water run off, on sides of exhaust stack piping, and the sand boxes, the modification of the licensee’s laboratory exhaust systems and the adequacy of the exhaust system is an NRC concern and will remain under NRC review. This issue is being treated as an unresolved inspection Item (URI 030-20567/09-02-01) pending completion of further NRC review.

## 2.3 Conclusions

The inspectors identified three violations of License Condition 22 B of NRC License No. 24-21362-01, involving the licensee’s failure to perform surveys to evaluate radiation levels, concentrations or quantities of radioactive materials identified in outdoor areas of the licensee’s site, the licensee’s failure to insure the use of protective clothing in a contaminated area, and the licensee’s failure to survey his hands before leaving the laboratory. The inspectors also identified one URI regarding the modification and adequacy of the licensee’s laboratories exhaust systems.

## 3 **Closure of Unresolved Item(s)**

(Closed) URI 03020567/08-01-02: Implementation and adequacy of the licensee’s site characterization. On October 29, 2009, the NRC issued License Amendment 40, approving the licensee’s Site Characterization Plan. The inspectors verified during this

inspection that the licensee had adequately perform activities to characterize the outdoor areas of the ARC site. This item is closed.

(Closed) URI 03020567/08-01-03: The full scope and adequacy of the licensee's implementation of its Emergency Spill and Incident Investigation Procedures. During 2009, the licensee submitted a license renewal application. The licensee attached spill and accident procedures to the renewal application. The scope and implementation of the licensee's procedures will be evaluated during the licensee's license renewal. This item is closed.

#### **4 Exit Meeting**

At the completion of the onsite inspection, the inspectors discussed the preliminary inspection findings in this report with licensee management during an exit meeting. The licensee did not identify any information reviewed during the inspection as proprietary in nature. A final telephone exit meeting was conducted on January 21, 2010.

ATTACHMENT: SUPPLEMENTAL INFORMATION

## **SUPPLEMENTAL INFORMATION**

### **PARTIAL LIST OF PERSONS CONTACTED**

- # Kamal Das, Ph.D., Vice President
- # \* Regis Greenwood, RSO
- # Surendra Gupta, President
- # April Jeffries, Health Physics Technician
- Ganesh Sadras, Group Leader, Analytical Service
- # Janardhanam Selvasekaran, Ph.D., Vice President
  
- # participated in onsite exit meeting on November 20, 2009
- \* contacted by telephone on January 21, 2010, for final exit meeting

### **LIST OF PROCEDURES USED**

- |          |                                  |
|----------|----------------------------------|
| IP 83890 | Closeout Inspections and Surveys |
| IP 83822 | Radiation Protections            |

### **LIST OF ACRONYMS USED**

- |        |                                    |
|--------|------------------------------------|
| ALARA  | As Low As Is Reasonably Achievable |
| CAL    | Confirmatory Action Letter         |
| CFR    | Code of Federal Regulations        |
| CPM    | Counts per Minute                  |
| DPM    | Disintegrations per Minute         |
| LSC    | Liquid Scintillation Counter       |
| mCi    | Millicuries                        |
| MDC    | Minimum Detectable Contamination   |
| NRC    | Nuclear Regulatory Commission      |
| pC/g   | Picocuries per gram                |
| µCi/mL | Microcuries per milliliter         |
| RPP    | Radiation Protection Program       |
| RSC    | Radiation Safety Committee         |
| RSO    | Radiation Safety Officer           |
| SOP    | Standard Operating Procedure       |

### **PARTIAL LIST OF DOCUMENTS REVIEWED**

Licensee documents reviewed and utilized during the course of this inspection are specifically identified in the "Report Details" above.

## ITEMS OPENED, CLOSED, AND DISCUSSED

### Opened

<u>Opened</u>	<u>Type</u>	<u>Summary</u>
VIO 030-20567/09-02 -01	VIO	Failure to perform surveys and evaluate hazards pursuant to RPP
VIO 030-20567/09-02 -02	VIO	Failure to wear protective clothing pursuant to RPP.
VIO 030-20567/09-02 -03	VIO	Failure to perform an adequate survey on an employee's hands after exiting a contaminated area.

### Closed

URI 03020567/08-01-02		Implementation and adequacy of the licensee's site characterization
URI 03020567/08-01-03		Adequacy of the licensee's implementation of its Emergency Spill and Incident Investigation Procedures

### Discussed

License Amendment		Actions to address on-site soil contamination.
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