LMS/BRP/46958

# 2023 Inspection Report of the Burris Park, California, Site

**January 2024**

U.S. DEPARTMENT OF ENERGY | Legacy Management

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# Abbreviations

| | |
|---|---|
| CFR | *Code of Federal Regulations* |
| DOE | U.S. Department of Energy |
| ft | feet |
| FY | fiscal year |
| IC | institutional control |
| LM | Office of Legacy Management |
| LMS | Legacy Management Support |
| LTS&M | long-term surveillance and maintenance |
| mCi | millicuries |
| $^{90}Sr$ | strontium-90 |

# 1.0 Site Overview and Inspection Summary

The Burris Park, California, Site (formerly the Burris Park Field Station), is in the central part of a 57-acre park owned and maintained by Kings County Parks and Grounds Department. The site consists of a 50 × 50 foot (ft) fenced area surrounding the 42 × 42 ft decommissioned test pad, which is reinforced by concrete protective cover. This area once consisted of 6 × 6 ft soil-filled concrete plots used to test the effectiveness of removing strontium-90 ($^{90}$Sr) from the soil. University of California—Berkeley scientists applied 72 millicuries (mCi) of $^{90}$Sr evenly to the soil in the late 1950s to conduct these tests under a contract with the U.S. Atomic Energy Commission. The site was decommissioned by filling and capping the plots with metal-mesh reinforced concrete in 1963. Although no further remediation is required, the U.S. Department of Energy (DOE) Office of Legacy Management (LM) accepted maintenance-only responsibility for the site and its remaining radioactive contents in November 2014.

LM conducted its initial site maintenance in 2015 to remove fallen tree debris, perennial vegetation, and old farm equipment as well as repair the damaged fence. At the first annual site inspection conducted by LM in December 2016, the site was found to be in good condition with no immediate maintenance needs or cause for a follow-up inspection identified. Inspection team members discussed some improvements to reduce the growth of vegetation and burrowing rodents, and these concerns were scheduled to be addressed in fiscal year (FY) 2018. During the December 2017 annual inspection, the site was found to be in good condition; however, the concerns with rodent burrowing remained, reinforcing the scheduling of additional maintenance in 2018. Park maintenance staff applied herbicide throughout the year, successfully deterring vegetation growth.

In March 2018, LM conducted additional maintenance activities to deter animal burrowing and vegetation growth around the pad. Specific activities included:

- Bringing loose soil from around the fence exterior to the inside of the fenced area
- Grinding two tree stumps to 4 inches below ground surface
- Adding bottom fence rails around the entire fence perimeter, except the gate, and securing the fence to the bottom rails
- Installing a fence border made of 8 ft long, 6 × 6-inch treated wood lumber placed on top of landscape fabric and secured with rebar
- Covering soil areas between the concrete pad and the fence with landscaping fabric, then covering the fabric with river rock riprap
- Adjusting the gate so it swings outward rather than inward

Details of the 2018 maintenance work can be found in the *Landscaping and Maintenance Summary at the Burris Park, California, Site* (DOE 2018).

The February 2019 inspection found the site in good condition with no follow-up action required. As discussed in the *Burris Park, California, Site Long-Term Surveillance and Maintenance Plan* (DOE 2023) (LTS&M Plan), the frequency of inspection was altered to every 5 years following the 2019 inspection with the next inspection to occur in FY 2024.

A radiological survey of the pad was completed in 2014 and found no readings above background levels. In addition, the LTS&M Plan conveys LM will initiate radiological surveys every 5 years to ensure the pad enclosure remains protective of human health and the environment. The first regularly-occurring LM survey was completed in FY 2024.

The November 2023 (FY 2024) site inspection found the site in good condition with no follow-up action required. In addition, the radiological characterization survey conducted reaffirmed the site remains protective of human health and the environment. Refer to Section 3.0 for the further inspection results.

# 2.0 Inspection Requirements

The LTS&M Plan establishes how LM will maintain the site; ensure institutional controls (ICs) and protective measures are working effectively; and communicate schedules, plans, and outcomes of inspections with the regulator, landowner, and other interested parties.

Table 1 is a crosswalk of this inspection report to the LTS&M Plan.

*Table 1. LTS&M Requirements for the Burris Park, California, Site*

| Requirement | LTS&M Plan | This Report |
|---|---|---|
| Institutional controls | Section 3.1 | Sections 2.1–2.4 |
| Management of site records | Sections 3.2, 3.4 | Section 4.0 |
| Inspections and reports every 5 years | Section 3.6 | Section 3.0 |
| Follow-up or contingency inspections | Section 3.6 and Table 1 | Section 3.0 |
| Routine maintenance and repairs | Section 3.6 and Table 1 | Sections 2.1–2.4 |

## 2.1 Institutional Controls

In DOE Policy 454.1, *Use of Institutional Controls* (DOE Policy 454.1), ICs refer to legal instruments (e.g., land-use restrictions), physical or engineering controls (e.g., fences, signs), and methods of providing information to people (e.g., fact sheets, interpretive displays) that help minimize the risk of human and environmental exposure to contaminants and maintain the remedies at a site. The following engineering and physical controls are currently associated with the site under DOE's broad application of ICs: (1) a concrete containment structure that entombs the remaining 20 mCi of the $^{90}$Sr isotope after 57 years of natural radioactive decay, (2) a bronze plaque providing historical information and secured into the southeastern corner of the concrete pad, (3) a chainlink fence with a locked gate to prevent public access to the concrete enclosure, (4) updated signs that provide current information and emergency contact numbers, and (5) an access agreement between LM and Kings County. These ICs, as well as legal instruments, public information, and dissemination mechanisms, are further detailed in the following sections.

## 2.2 Concrete Enclosure and Historical Plaque

One antique farm tractor remains on the concrete pad due to its immobility and age (Photo 1). The Kings County Parks and Grounds Department superintendent and LM site manager discussed and agreed to keep the antique farm tractor on the concrete pad to avoid damage to the concrete protective pad. If and when the tractor needs to be removed in the future, both parties will discuss and schedule accordingly.


*Photo 1. Historical Farm Tractor*

*Photo 2. Minor Surface Cracks Atop Concrete Pad*

The concrete pad has minor surface cracks that do not pose a health risk (Photo 2). In 2014 these same cracks were scanned by a radiological control technician, and no results were above background levels. During the November 2023 (FY 2024) site inspection, a radiological characterization survey was conducted reaffirming that the site remains protective of human health and the environment.

Specifically, the radiological characterization survey was performed on the concrete slab at the Burris Park site by a DOE-qualified radiological control technician using Legacy Management Support (LMS) radiological control instrumentation (i.e., a calibrated Thermo Fisher Scientific Model FH 40G surface contamination and exposure rate instrument). Sixteen static measurements were made across the concrete pad's surface, in accordance with the LMS *Radiation Protection Program Plan* (LMS/POL/S04373), *Radiological Control Manual* (LMS/POL/S04322), and numerous Radiological Control organization implementing procedures. No instrument readings were identified above the surface contamination limits identified in Title 10 *Code of Federal Regulations* Section 835 (10 CFR 835), "Occupational Radiation Protection," Appendix D, "Surface Contamination Values," for $^{90}$Sr, the radioisotope of concern.

Characterization survey results were recorded on a *Radiological Survey Map* form (LMS 1553) (refer to Attachment 1).

The historical bronze plaque on the southeast corner of the pad is legible and free of debris and remains in good condition. No maintenance or deferred maintenance are needed for this IC. Photo 3 shows the current condition of the plaque.


*Photo 3. Historical Bronze Plaque*

## 2.3 Fence

As reported in the previous inspections, fence maintenance restored this asset to a protective condition. The expected longevity of the fence is about 25 years. During the 2017 inspection, a closer look at the age of the fence revealed a replacement is necessary within the next 10 years. As such, LM planned to replace the entire fence and gate in 2025. However, in November 2023 (FY 2024) site inspectors observed that the fence remains protective and reaffirms the LTS&M approach that replacement will be deferred to FY 2039.

To address erosion and animal burrowing concerns at the site, LM installed a bottom fence rail around the entire fence perimeter, except the gate, and secured the fence bottom to the rails during the March 2018 maintenance activities. To further strengthen the life of the fence to prevent the riprap from pushing on the fence bottom, 4 × 4 timbers were placed inside the fence line. These timbers will be replaced on the same schedule as the fence replacement.

## 2.4 Signage

Signs on each side of the fenced area were present and found to be in good condition with no maintenance needs or cause for a follow-up inspection identified (Photo 4). However, it is recommended that signage be replaced with a modern version. Signs will be sent to Kings County to install.

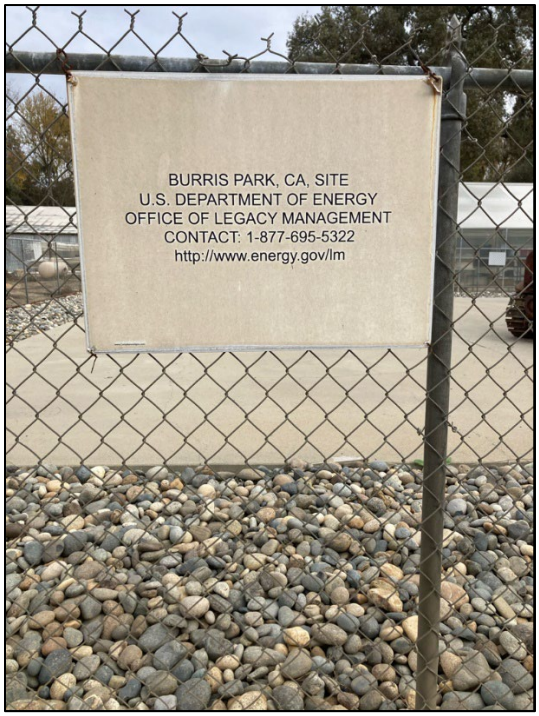


*Photo 4. Signage Posted on All Sides of Fencing*

# 3.0 Site Inspection Results and Report

The *2023 Inspection Checklist, Burris Park, California, Site* was developed as a tool to ensure that all aspects of the site were evaluated and results documented. The completed checklist is in Appendix A. Major items, requirements, and actions in the checklist are protocols for notification of affected parties, ensuring site access, addressing the inspection requirements mandated by the LTS&M Plan, and providing the existing condition and any required maintenance conducted or follow-up work needed before or during the next inspection.

The inspection of the site was conducted November 30, 2023. Attendees included:

Kathleen Whysner, former LM Site Manager

Michelle Franke, newly assigned LM Site Manager

Michele Miller, LMS Site Lead

Tom Maveal, LMS Radiological Technician

Natalie Brinson, Kings County Parks and Grounds Supervisor

Nathaniel Killebrew, Kings County custodian for Burris Park

The Plan of the Day/Plan of the Week and Job Safety Analysis were discussed and corresponding forms were signed before the site inspection started. These documents are presented in Appendix B.

Overall, the site was found to be in good condition. Park maintenance custodians have deterred vegetation growth by applying herbicide as needed around the pad year-round. While animal burrowing was noted near the site, no burrow holes were noted within the fenced area. In addition, no soil erosion or subsidence was noted. No new surface cracks or gouges in the concrete pad were found.

Future site maintenance activities will include:

- Managing the physical condition of the site
  - Removal or deterrence of vegetation with herbicide application by the park maintenance staff; application of herbicide or pesticide as warranted
  - Replacement of fence, gate, and signs, as warranted
- Maintaining integrity of concrete pad
  - Conducting periodic radiological surveys to confirm the protectiveness of human health and the environment
  - Using fillers, sealants, or resurfacing agents to reseal the cap seams to ensure continued protection when warranted

While there are no zoning changes planned for the area adjacent to the site, Kings County has expanded use of the park for an outdoor education program for students inclusive of the new greenhouse built in 2019. The Parks and Grounds Department estimates that 2,000 students are expected yearly. The County also plans to build an amphitheater on the other side of the museum (south of the site). LM requested a copy of the park's master plan document. Parks and Grounds officials indicated they would compile and send electronic files to LM.

# 4.0 Site Records and Public Information

LM maintains a webpage and fact sheet for the site; both are updated annually and are current. A formal access agreement between LM and Kings County has been in place since December 5, 2016. All inspections, maintenance actions, and correspondence are documented and maintained as records. LM complies with National Archives and Records Administration records archiving and destruction protocols.

# 5.0 References

10 CFR 835. U.S. Nuclear Regulatory Commission, "Occupational Radiation Protection," *Code of Federal Regulations*.

DOE (U.S. Department of Energy), 2018. *Landscaping and Maintenance Summary at the Burris Park, California, Site*, LMS/BRP/S19612, Office of Legacy Management, June.

DOE (U.S. Department of Energy), 2023. *Burris Park, California, Site Long-Term Surveillance and Maintenance Plan*, LMS/BRP/S12974, Office of Legacy Management, September.

DOE Policy 454.1 Chg 1 (Admin Chg), *Use of Institutional Controls*, U.S. Department of Energy, December 7, 2015.

*Radiation Protection Program Plan*, LMS/POL/S04373, continually updated, prepared by the LMS contractor for the U.S. Department of Energy Office of Legacy Management.

*Radiological Control Manual*, LMS/POL/S04322, continually updated, prepared by the LMS contractor for the U.S. Department of Energy Office of Legacy Management.

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# Appendix A

# 2023 Inspection Checklist, Burris Park, California, Site

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# 2023 INSPECTION CHECKLIST
# BURRIS PARK, CALIFORNIA, SITE

Research and remediation was conducted by the University of California, Berkeley (UC Berkeley) on behalf of the U.S. Department of Energy (DOE, formerly the U.S. Atomic Energy Commission) at the Burris Park, California, Site (BPS) in the early 1960's. The site requires long-term surveillance and maintenance, specifically for residual strontium-90 (Sr-90) located in the soil beneath the 42 x 42 ft concrete protective barrier. The Burris Park Long-Term Surveillance and Maintenance Plan (LTS&M) defines how the DOE Office of Legacy Management will maintain the institutional controls and protective measures. DOE uses the checklist below to complete BPS inspections. Any significant actions required will be scheduled to be completed prior to or during the next inspection.

| No. | ITEM | REQUIREMENTS | ACTION |
|---|---|---|---|
| 1 | Protocols | Notify the following of the date of the inspection:<br>• Kings County Parks and Grounds – Natalie Brinson<br>• California Department of Public Health Radiation Protection – Gonzalo Perez<br>• UC Berkeley, Environmental Safety and Health – Jim DeZetter | Inspection arrangements were made with Natalie in October and date confirmed 10/12/2023. Notifications were made via email on 11/20/2023 to both Gonzalo and Jim of the inspection occurring 11/30/2023. |
| 2 | Access | Access to the site is restricted.<br>The formal access agreement between the DOE and Kings County Parks and Grounds Division has been finalized. | • The formal access agreement dated December 5, 2016, remains in effect.<br>• Adhere to the Burris Park visitor requirements and follow the instructions of our escort. |
| 3 | LTS&M Plan | Current LTS&M Plan (September 2023):<br>• Managing site records<br>• Responding to stakeholder inquiries | The LTS&M plan was reviewed, revised then reissued in September 2023.<br><br>Both the Burris Park LM webpage and the site fact sheet are reviewed and updated annually. Both were reviewed November 2022. |

| No. | ITEM | REQUIREMENTS | ACTION |
|---|---|---|---|
| | | • Managing institutional controls<br>• Annual Inspection- annual for first 3 years, and on a rolling 5-year schedule, thereafter. | No stakeholder inquires to since the last site visit in December 2022.<br><br>Visually observe the three institutional controls that are captured as Facilities Information Management System (FIMS) assets: the protective concrete pad, the fence with signage, and the bronze plaque. |
| 4 | Inspection of Specific Site Surveillance Features | **<u>Site Area</u>**<br>A concrete containment structure with a 42 x 42 ft protective concrete cap entombs the remaining 20 millicuries of Sr-90.<br><br>Pad will be cleaned as necessary, and inspected for cracks and integrity of structure. A radiological survey will be conducted every 5 years.<br><br>Soil area extending beyond fence-line has been returned to within the fence line during the March 2018 improvements. Tree stumps have been ground down and any vegetation within fence area will be removed.<br><br>Riprap subsidence was observed in December 2022 along the outer perimeter of the protective barrier but within the fence. In April 2023 additional stone was placed atop the subsidence per MWT BRP23-001. | Perform a walkover of the site area. Look for any integrity issues, (e.g., cracks, ponding water, burrowing animals.).<br><br>Visually inspect the protective concrete barrier to ensure that:<br>• The pad does not contain deep cracks or concrete fragments.<br>• The corners of the pad are intact.<br><br>Visually evaluate the soil area around the pad to ensure that:<br>• Soil is not eroding or subsiding,<br>• No overgrown or deep-rooted, perennial vegetation is present.<br>• No rodent holes are within the fenced area.<br><br>Conduct the radiological survey of the protective concrete barrier to reaffirm protectiveness. |

| No. | ITEM | REQUIREMENTS | ACTION |
|---|---|---|---|
| | | **<u>Site Perimeter Fence</u>**<br>The barbed-wire was removed from atop the fence and the fence and entrance gate were repaired in March 2018. A lock is installed on the gate to limit access.<br><br>**<u>Site Information Plaque and Signs</u>**<br>The historical plaque was cleaned and checked to ensure it is secured to the pad. Existing signs along the fence were replaced by signs containing DOE's contact information.<br>Locations:<br>• 1 information plaque describing the content of the containment, and<br>• 8 signs, 2 on each side of fence. | Visually inspect the 50 x 50 ft perimeter fence:<br>• Fence condition: good, average, or poor.<br>• The gate opens and closes easily and is not bent or tilted.<br>• Area outside the fence: no clutter, no objects leaning against or attached to the fence.<br>• Check and note the condition of the lock.<br><br>Visually inspect the signage:<br>• Information plaque is present, secure, and legible. |

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# Appendix B

## *Plan of the Day/Plan of the Week* and *Job Safety Analysis*

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# Plan of the Day/Plan of the Week

☐ Plan of the Day/ ☒ Plan of the Week

**Site name:** Burris Park, California

**Date(s) Work Authorized:** November 30 and December 1, 2023

**Work authorized by:** Michele Miller
Site lead (print name)

MICHELE MILLER (Affiliate)
Digitally signed by MICHELE MILLER (Affiliate)
Date: 2023.11.27 15:26:31 -05'00'
Site lead (signature)

**1. Authorized Activities**

| Item No. | Work Type | Activity Description [1] | Work Control Reference[2] | PIC[3] | |
|---|---|---|---|---|---|
| | | | | Printed Name | Initials[4] |
| 1 | ☒ SBA ☐ PBA ☐ MWT ☐ PAE | Travel to Fresno, California then drive to the Burris Park Site on November 30, 2023 | JSA-BRP-001 | Michele Miller | MLM 11/27 |
| 2 | ☒ SBA ☐ PBA ☐ MWT ☐ PAE | Conduct Safety Briefing followed by the site inspection which includes a walkdown the area using the prepared checklist. | JSA-BRP-001 | Michele Miller | MLM 11/27 |
| 3 | ☐ SBA ☒ PBA ☐ MWT ☐ PAE | Conduct the radiological characterization survey of the concrete protective cover atop the SR-90 test pad. | LMS Radiation Protection Program Plan (LMS/POL/S04373), Radiological Control Manual (LMS/POL/S04322), and numerous Radiological Control Organization implementing procedures | Tom Maveal | TM 11/27 |
| 4 | ☒ SBA ☐ PBA ☐ MWT ☐ PAE | Post job debriefing, return travel on December 1, 2023 | JSA-BRP-001 | Michele Miller | MLM 11/27 |
| | ☐ SBA ☐ PBA ☐ MWT ☐ PAE | | | | |
| | ☐ SBA ☐ PBA ☐ MWT ☐ PAE | | | | |

# Plan of the Day/Plan of the Week

| | | | | | |
|---|---|---|---|---|---|
| | ☐ SBA ☐ PBA<br>☐ MWT ☐ PAE | | | | |
| | ☐ SBA ☐ PBA<br>☐ MWT ☐ PAE | | | | |

[1] A description of the authorized work scope that is sufficient to define the operational envelope.
[2] This may be a brief verbal description, an MWT reference number, a procedure title or number (and step reference, if needed to define the work scope), a PAE title (and step reference, if needed to define the work scope), or a Job Safety Analysis (JSA) title or number.
[3] The LMS Person in Charge of the activity and directing the work/workers at the activity level. Example PICs include: Construction Site Supervisor, Project lead, Operations lead or designee.
[4] Application of initials indicates PIC understanding of authorized work and their responsibility for work performance.

SBA = Skill-Based Activity, MWT = Minor Work Task, PBA = Procedure Based Activity, PAE = Project or Activity Evaluation, PIC = Person in Charge

## 2. Safety, Radiological, and Environmental Precautions

a) *This section is used to document the dissemination of information to site personnel. This section may contain safety share topics; discussion of prior day/week lessons learned; formal lessons-learned review; timely orders, new or revised site-wide procedures, or JSAs (specify by listing or as a full brief of the document); review of field changes made to procedures or JSAs; required-reading list updates; or other general briefings the site lead deem appropriate. Note relevant changes in site conditions (e.g., weather extremes, visitors, abnormal conditions, new employees, new or non-routine activities).*
b) *All workers have, and are expected to use, **pause** and **stop work authority**.*
c) *All workers should notify their supervisor or Safety and Health representative of abnormal events, such as changed site conditions, vandalism, or discovery of cultural resources in the work area, etc.*
d) *All workers must notify their supervisor and/or PIC immediately of any injury or potential injury, regardless of how minor it may appear at the time.*

*Safety and Health must be contacted prior to entry into **any** permit required confined space.*

No radiological concerns

## 3. Site and Project Contact Information—Names and Phone Numbers

## Plan of the Day/Plan of the Week

Michele Miller -LMS Burris Park Site Lead- 412-818-7015

# Plan of the Day/Plan of the Week

| 4. Emergent Work | | | | | |
|---|---|---|---|---|---|
| *Emergent work is new or additional work activities that are identified for performance. Emergent work requires the same level of planning and authorization as normally approved activities. Emergent work cannot be performed unless it is authorized by the site lead.* | | | | | |
| **Item No.** | **Work Type and Activity Description[1]** | **Work Control Reference[2]** | **PIC[3]** | | **Authorization** |
| | | | Printed Name | Initials[4] | |
| | ☐ SBA ☐ PBA ☐ MWT ☐ PAE | | | | |
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| | ☐ SBA ☐ PBA ☐ MWT ☐ PAE | | | | |

[1] A description of the authorized work scope that is sufficient to define the operational envelope.

[2] This may be a brief verbal description, an MWT reference number, a procedure title or number (and step reference, if needed to define the work scope), a PAE title (and step reference, if needed to define the work scope), or a Job Safety Analysis (JSA) title or number.

[3] The LMS Person in Charge of the activity and directing the work/workers at the activity level. Example PICs include: Construction Site Supervisor, Project lead, Operations lead or designee.

[4] Application of initials indicates PIC understanding of authorized work and their responsibility for work performance.

SBA = Skill-Based Activity, MWT = Minor Work Task, PBA = Procedure Based Activity, PAE = Project or Activity Evaluation, PIC = Person in Charge

# Attachment 1

# Radiological Survey Map

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# Radiological Survey Map

**Radiological Survey Number:** 231130-002 **Page** 1 **of** 4

Purpose: Radiological Survey of the Burris Park Concrete Pad Truck #: N/A Trailer #: N/A

RWP number: N/A Time: 12:30 PM Date: 11/30/2023

Site name: Burris Park Location: Concrete pad

RCT (printed): Tom Maveal Reviewer signature: SCOTT NEWSOM (Affiliate) Digitally signed by SCOTT NEWSOM (Affiliate) Date: 2023.12.04 09:29:35 -07'00' Date:

| Counting Instruments: | Instrument 1 | Instrument 2 | Instrument 3 | Radiation Instruments: | Instrument 4 |
|---|---|---|---|---|---|
| Instrument/probe model: | | | FH40G-L, FHZ732GM | Instrument/probe model: | FH40G-L |
| Instrument serial number: | | | 15500 | Instrument serial number: | 15500 |
| Probe serial number: | | | 02835 | Probe serial number: | 15500 |
| Calibration due: | | | 8/17/2024, 3/6/2024 | Calibration due: | 8/17/2024 |
| Efficiency: | α β | α β | α β 0.43 | Background (dose rate): | 19 µR/hr |
| Background (cpm): | α β | α β | α β 100 | Other info (as needed): | |
| $S_C$ (dpm/100cm$^2$): | α β | α β | α β 373 | Background was taken on contact with concrete surface located just outside the entrance gate of Burris Park | |
| Area probe correction factor: | | | 6.5 | | |

**Surface Contamination and Radiation Survey Results**

| Item Surveyed / Map Location | Counting Inst. No. Used | Smear Survey (Instrument 1 or 2) | | | | | | Direct Survey (Instrument 3) | | | | | | Exposure Rate Survey |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Gross Counts | | Net Counts | | Activity | | Gross Counts | | Net Counts | | Activity | | |
| | | Alpha cpm | Beta/gamma cpm | Alpha cpm | Beta/gamma cpm | Alpha dpm/100cm$^2$ | Beta/gamma dpm/100cm$^2$ | Alpha cpm | Beta/gamma cpm | Alpha cpm | Beta/gamma cpm | Alpha dpm/100cm$^2$ | Beta/gamma dpm/100cm$^2$ | |
| 1 | 3 | | | | | | | | 104 | | 4.0 | | < Sc | 18 |
| 2 | 3 | | | | | | | | 135 | | 35.0 | | 529 | 25 |
| 3 | 3 | | | | | | | | 99 | | -1.0 | | < Sc | 19 |
| 4 | 3 | | | | | | | | 79 | | -21.0 | | < Sc | 17 |
| 5 | 3 | | | | | | | | 99 | | -1.0 | | < Sc | 11 |
| 6 | 3 | | | | | | | | 114 | | 14.0 | | < Sc | 17 |
| 7 | 3 | | | | | | | | 108 | | 8.0 | | < Sc | 15 |
| 8 | 3 | | | | | | | | 112 | | 12.0 | | < Sc | 13 |
| 9 | 3 | | | | | | | | 88 | | -12.0 | | < Sc | 20 |
| 10 | 3 | | | | | | | | 102 | | 2.0 | | < Sc | 15 |
| 11 | 3 | | | | | | | | 100 | | 0.0 | | < Sc | 13 |
| 12 | 3 | | | | | | | | 103 | | 3.0 | | < Sc | 18 |
| 13 | 3 | | | | | | | | 98 | | -2.0 | | < Sc | 17 |
| 14 | 3 | | | | | | | | 99 | | -1.0 | | < Sc | 19 |
| 15 | 3 | | | | | | | | 103 | | 3.0 | | < Sc | 19 |
| 16 | 3 | | | | | | | | 113 | | 13.0 | | < Sc | 10 |

RCT signature: THOMAS MAVEAL (Affiliate) Digitally signed by THOMAS MAVEAL (Affiliate) Date: 2023.12.04 06:45:52 -07'00'

# Radiological Survey Map

**Radiological Survey Number:** 231130-002 **Page** 2 **of** 4

**Surface Contamination and Radiation Survey Results**

| Item Surveyed / Map Location | Counting Inst. No. Used | Smear Survey (Instrument 1 or 2) | | | | | | Direct Survey (Instrument 3) | | | | | | Exposure Rate Survey |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Gross Counts | | Net Counts | | Activity | | Gross Counts | | Net Counts | | Activity | | |
| | | Alpha cpm | Beta/gamma cpm | Alpha cpm | Beta/gamma cpm | Alpha dpm/100cm$^2$ | Beta/gamma dpm/100cm$^2$ | Alpha cpm | Beta/gamma cpm | Alpha cpm | Beta/gamma cpm | Alpha dpm/100cm$^2$ | Beta/gamma dpm/100cm$^2$ | |
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**Applicable Surface Contamination Limits**

Check one for alpha, one for beta.

Alpha (removable/total) ☐ 1000/5000 ☐ 200/1000 ☐ 20/500

Beta (removable/total) ☐ 1000/5000 ☐ 200/1000

**Activity Equation**

Gross count minus BKGD count = Net count

Net count/Eff = dpm

Dpm x Area Probe Correction Factor (APCF) = dpm/100cm$^2$

**APCE**

44-9 = 6.5

FHZ 732 (GM) = 6.5

43-10-1 = 1

Remarks:

Both direct frisk (static measurements) and exposure rate surveys were taken directly on contact with concrete surface. Surface contamination limit for the concrete pad is 1000 dpm/100cm$^2$ by frisk.

# Radiological Survey Map

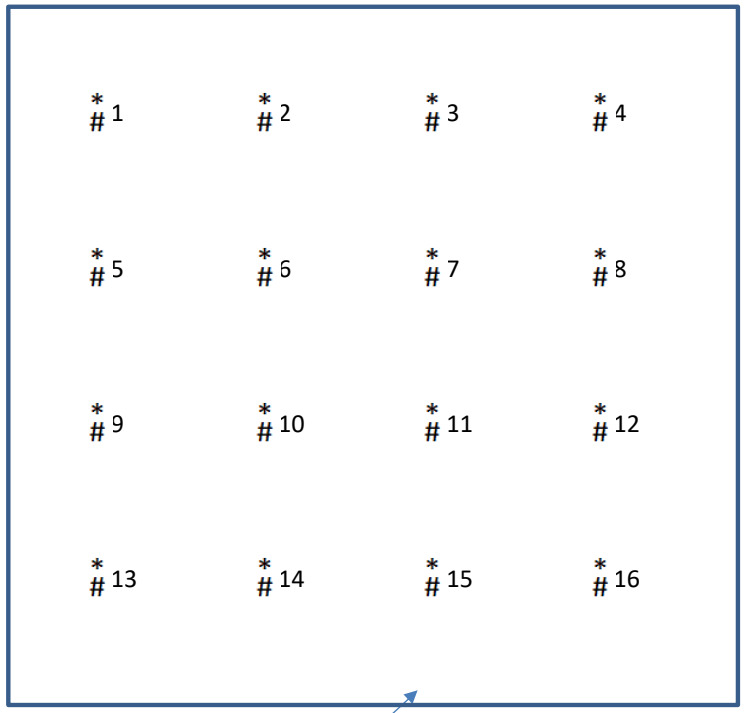
**Radiological Survey Number:** 231130-002 **Page** 3 **of** 4

**Contamination and Radiation Survey Figure**

**Standardized Map Symbols**

- ○ = Smear/wipe (no. inside)
- △ = Air sample (no. inside)
- **6.3** = General area exposure rate (result in μR/hr)
- ✱ = Contact exposure rate (result beside, in μR/hr)
- # = Direct frisk (count rate) (result beside)
- ☆ = Direct gamma (count rate) (e.g., 2"x2" NaI) (result beside)

**Note**: Note units used if not identified above.




(Place figure in this area.)

Remarks:

One minute beta/gamma static counts performed or at each survey location. Results are identified on page 1.

# Radiological Survey Map

**Radiological Survey Number:** 231130-002 **Page** 4 **of** 4

| **Contamination and Radiation Survey Continuation Sheet** |
|---|
| **Use this sheet to document or record radiological survey information (in addition to page 1 of the form)** |
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