



October 19, 2022

Mr. Patrick Murphy
Facilities Manager
Biomedical Research Foundation (BRF)
P.O. Box 38050
Shreveport, Louisiana 71133

Re: **Analysis of Brownfields Cleanup Alternatives-Preliminary Evaluation**
Former S&P Property/Bell Street
Section 2, Township 17 North, Range 14 West
Latitude 32°29'5.09" North and Longitude 93°46'5.84" West
Shreveport, Caddo Parish, Louisiana 71103

Mr. Murphy:

Jones Environmental, Inc. (JEI) is pleased to submit an Analysis of Brownfields Cleanup Alternatives (ABCA) for the Former Sklar & Phillips (S&P) property at Bell Street, Shreveport, Louisiana. Based on the information gathered during investigation activities, JEI recommends completing soil excavation at the facility to remove Naturally Occurring Radioactive Material (NORM) impacted soils determined to present during Phase II Environmental Site Assessment (ESA) activities completed at the location.

Should you have any questions, comments, or require any additional information, please do not hesitate to contact this office at (318) 226-8444.

Sincerely,
Jones Environmental, Inc.

Roger Bright
Environmental Scientist

cc: File

ANALYSIS OF BROWNFIELDS CLEANUP ALTERNATIVES (ABCA)

**FORMER S&P PROPERTY/BELL STREET
SECTION 2, TOWNSHIP 17 NORTH, RANGE 14 WEST
LATITUDE 32°29'5.09" NORTH and LONGITUDE 93°46'5.84" WEST
SHREVEPORT, CADDO PARISH, LOUISIANA 71103**

**PREPARED FOR:
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OCTOBER 19, 2022

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1.0 Site and Contamination

1.1 Site Location

The subject property is located in Section 2, Township 17 North, Range 14 West with an approximate center of Latitude 32°29'5.09" North and Longitude as 93°46'5.84" West in Shreveport, Caddo Parish, Louisiana 71103. A Boundary Survey completed at the location indicates that the property is approximately 7 acres in size; please refer to **Appendix A – Figure 1, Boundary Survey**. The property was last occupied in the 1970's as a remote storage area for oilfield drilling and production equipment and appurtenances. No above surface structures or buildings are present at the location; please refer to **Appendix A - Figure 2, Site Map**.

Properties within the immediate vicinity of the facility consist of undeveloped property and commercial properties. A dirt road is present for property access. Bell Street terminates at the northern entrance of the property.

1.2 Previous Site Uses

The following list contains properties identified by city directories located at the vicinity of the subject property from 1935-2019:

Certified Sanborn® Fire Insurance Maps for the subject property and surrounding properties located in Section 2, Township 17 North, Range 14 West, Shreveport, LA 71103, were examined to determine past use of the subject property and surroundings. Sanborn® Fire Insurance Maps were available through the ERIS database.

1935 – This map depicts the subject property as developed with a residential dwelling, a small ancillary structure, and an automobile garage in the central portion of the property. The adjoining property to the north is depicted as a railroad followed by a mixture of commercial and residential development. The adjoining property to the east is depicted as Bell Street followed by a railroad spur and Swift & Co. (fertilizer manufacturer). An AST containing liquor is depicted near the eastern property boundary. The adjoining property to the south is depicted as undeveloped continuously to Kings Highway. The adjoining property to the west is depicted as undeveloped, followed by a creek and mixed development along Mansfield Road.

1961-1964 - These maps depict the subject property as undeveloped and cleared. The adjoining property to the south along Kings Highway is depicted as developed with Shreveport Regional Laboratory being the closest commercial facility.

Aerial Photographs reviewed for the property indicate the following:

1939 – This aerial photograph is of poor quality and limited use. The subject property contains no identifiable structures. Bell Street is depicted to the north and east of the subject property. Development is visible to the north along Texas Avenue. The modern day Distribution International (wholesale company) is depicted to the east. Adjoining property to the north, west and south is a mixture of undeveloped and partially developed property with no identifiable structures. There were no apparent *recognized environmental conditions* noted in these aerial photographs.

1959 – This aerial photograph depicts the subject property as partially cleared with no identifiable structures. Commercial development is depicted along the major streets to the north, west and south. Much of the adjoining property remains undeveloped. There were no apparent *recognized environmental conditions* noted in this aerial photograph.

1969 – This aerial photograph depicts the subject property as cleared with no identifiable structures and a dirt road running through the central portion of the subject property. Unidentifiable material is depicted on the southwestern portion of the subject property. There were no apparent *recognized environmental conditions* noted in this aerial photograph.

1976 – This aerial photograph depicts the subject property as cleared with no identifiable structures. There were no apparent *recognized environmental conditions* noted in this aerial photograph.

1983-1998 – These aerial photographs depict the subject property as cleared with no identifiable features. There were no apparent *recognized environmental conditions* noted in this aerial photograph.

2004-2010 – These aerial photographs depict the subject property as cleared. Unidentifiable material is depicted along the northeastern property boundary. A dirt road is depicted on the northeastern property boundary. There were no apparent *recognized environmental conditions* noted in these aerial photographs.

2015-2019 – These aerial photographs depict the current undeveloped condition of the subject property with an AST visible on the north end of the subject property. There is a dirt road depicted running from the north entrance of the subject property to the south and back to the northern entrance. There were no apparent *recognized environmental conditions* noted in this aerial photograph.

1.3 Site Assessment Findings

The Biomedical Research Foundation (BRF) contracted Jones Environmental, Inc. (JEI) to prepare a Phase I Environmental Site Assessment (ESA) in June 2020. This assessment did identify one (1) *recognized environmental condition (REC)* in connection with the property. During the site reconnaissance visit, various types of oilfield drilling and production equipment, and appurtenances in poor condition (stock tanks, vessels, separators, tubulars, wellheads, valves, drums, etc.), were observed on the subject property.

According to Mr. Brad Schmidt, S&P Company historically utilized the subject property as a remote storage area for excess oilfield drilling and production equipment. According to Mr. Schmidt, S&P Company ceased utilizing the property for this purpose in the 1970's when United Parcel Service (UPS) purchased the rest of the tract to the west. The disposition of oilfield production equipment that has been in contact with oil and gas production fluids requires the completion of a Naturally Occurring Radioactive

Material (NORM) survey. The level of radiation detected determines if the material can be recycled as scrap metal or must be disposed of as a waste. Also, a large majority of the containers were observed to be in poor condition and the amount of vegetation on site made it difficult to determine if there were releases from the equipment. The possibility of NORM contamination, the poor condition of the containers as observed and the inability to determine if there has been a release from any of the equipment meet the definition of a *REC* representing a material threat of impact to the environment as defined in the ASTM Phase I ESA protocol.

Based on the findings presented in the Phase I ESA, Colton Environmental Management, Inc. (Colton) was contracted by BRF to conduct a confirmatory NORM survey of the property in September 2020. The survey was conducted on all equipment located at the facility. Additionally, soil surveying was completed throughout the property as part of the assessment. The survey was conducted using a Ludlum Model 3 instrument with a Ludlum Model 44-2 detector. The soil survey was completed in a grid-pattern throughout the facility. Ninety-four (94) locations were surveyed across the 7-acre facility during the soil survey.

Results from the survey activities conducted indicated the following:

Background		10 microroentgens/hour (uR/hr)
Equipment	1-Vertical 4' x 20' Heater Treater	100 uR/hr
	1-Horizontal 24" x 12' Separator	40 uR/hr
	1-10' piece of 2" Tubing	130 uR/hr
	1-23' piece of 2" Tubing	150 uR/hr
	1-23' piece of 2 ½" Tubing	110 uR/hr

Based on the equipment confirmatory survey and NORM equipment as defined in the Louisiana Department of Environmental Quality (LDEQ) Environmental Regulatory Code (ERC) Title 33, Part XV, Chapter 14, Section 1408, the contaminated equipment includes 3 pieces of tubing and 1 vertical heater treater since a maximum radiation exposure rate of greater than 50 uR/hr was recorded. Additionally, the horizontal separator is considered NORM equipment since scrap facilities are unlikely to accept any equipment with exposure rates greater than background.

The confirmatory soil survey at the site indicated an area along the eastern side of the property with ten (10) readings of two or more times above the background exposure rate. This area is rectangular in shape and was estimated to be approximately 245 feet in length and approximately 50 feet in width. Readings from the area ranged between 20 uR/hr to 50 uR/hr; please refer to **Appendix A – Figure 3** for the survey locations and readings.

Soil sampling for laboratory analysis was not completed during the soil survey at the location. Based on the findings from the survey, JEI submitted a work plan to the LDEQ for the collection of soil samples to determine if soil remediation via excavation and disposal are necessary on December 8, 2021. The work plan for the completion of the soil sampling was approved in LDEQ correspondence dated December 22, 2021. All soil sampling was conducted in accordance with LAC 33 §1407, the LDEQ approved work plan, and the EPA approved project QAPP.

Soil sampling was conducted in a grid that contains the entire area of interest. Soil samples were collected in 15 cm depth intervals of soil throughout the grid (0-15 cm and 15-30 cm). Individual grids did not exceed 100 square meters. A reference grid was established at the site using survey equipment,

survey tape, wooded stakes, flagging, and pin flags. Due to the width of the area of interest identified during the initial site survey, a western and eastern column were established. The western column of the grid was established on 10 X 10 meter intervals. This resulted in a column of sampling grids approximately 80 meters in length by 10 meters in width. Each grid was assigned numerical values running north to south along the column (Grids 1-8).

The eastern column of the area grid was established on 7.5 X 13.4 meter intervals due to the survey results, resulting in a 100 square meter grid. This resulted in a column of sampling grids approximately 80.5 meters in length by 7.5 meters in width. Each grid was assigned numerical values running north to south along the column and sequentially continuing from the western column (Grids 9-14). Please refer to **Appendix A – Figure 4**.

After establishing the sampling grid across the area of interest, soil samples were collected by the project Radiation Safety Officer (RSO) on January 12, and January 13, 2022. The soil samples were submitted to ARS Aleut Analytical, LLC in Port Allen, Louisiana for analysis of natural NORM parameters in accordance with EPA Method 901.1m.

Analytical results obtained from the soil sampling were compared using LDEQ NORM protocols. This includes limits of 5 picocuries per gram (pCi/g) or less of Ra-226 or Ra-228 above background within the first 15 centimeters of soil depth and 15 pCi/g or less for every subsequent interval. The limits established for this project were determined to be 7.174 pCi/g for Ra-226 and 5.459 pCi/g for Ra-228 in the 0-15 cm soils and 16.596 pCi/g for Ra-226 and 16.046 pCi/g for Ra-228 in the 15-30 cm soils. Please refer to **Appendix B – Soil Sampling Results**.

The laboratory results obtained from the soil sampling activities indicate that all of the composite soil samples from each grid within the 0-15 cm interval exceed the limit for Ra-226. Additionally, the concentrations of Ra-226 detected in grids 3 and 11 at depths of 15-30 cm exceed the limits established for the location. Based on the results of the soil sampling activities, JEI recommended the excavation and disposal of impacted soil as the most appropriate alternative for site remediation.

Between May 31 and June 3, 2022, soil excavation was completed to a depth of 15 cm across the area of concern. The area was determined to be approximately 245 feet by 50 feet. Two of the grids, Grid 3 and Grid 11, were excavated to depths of approximately 30 cm based on the analytical results. Impacted soils were loaded onto 18-yard dump trucks and transported to R360 in Elm Grove, Louisiana for disposal. This resulted in approximately 2,236 barrels of impacted soil removed and disposed. Each load was accompanied by a UIC-28 waste manifest. An additional 172 barrels of soil was removed from the area on June 8, 2022 and transported for disposal to R360. The soil was generated as part of post excavation grade work.

Following the excavation activities at the location, the area of excavation was re-surveyed and results were compared to the previously established background level of 10 uR/hr. The post excavation survey indicated that survey readings were two times or more above the background throughout the area. Efforts were made utilizing survey equipment and a trackhoe to define the areas two times or more background both horizontally and vertically within the area of concern. Results of the survey indicated that the impact appears to extend beyond both the horizontal and vertical limits of the original area of concern. Activities

were ceased until further evaluations and discussions could be completed to determine the next appropriate course of action.

Following initial discussions with LDEQ, survey readings of greater than 20uR/hr were utilized to determine the area of impacted soil requiring remediation. This resulted in an area of approximately 2,800 square meters (30,139 square feet) at depths ranging from 2 feet bgs to 10 feet bgs identified as requiring remediation. For NORM disposal purposes, this value was converted to approximately 19,500 barrels of impacted soil. Please refer to **Appendix A – Figure 9**.

1.4 Project Goal

The intended project goal is the completion of NORM waste disposal, confirmation soil sampling, and site restoration to achieve receipt of a Release for Unrestricted Use from the LDEQ. The remediation of the site will be conducted in accordance with LDEQ requirements, through the United States Environmental Protection Agency (USEPA) Brownfields Cleanup Grant Program.

2.0 Applicable Regulations and Cleanup Objectives

2.1 Cleanup Oversight Responsibility

The cleanup of the property will be overseen by the LDEQ Emergency & Radiological Service Division-Radiation Section. All documents prepared for this site are submitted to the LDEQ under an assigned site-specific Agency Interest Number. These documents can be viewed under the LDEQ Electronic Data Management System website, <https://edms.deq.louisiana.gov>.

2.2 Cleanup Standards for Contaminated Materials

As identified during the confirmation NORM survey, NORM waste appears to include soil located along the eastern boundary of the property. The site has been registered with the LDEQ using Form RPD-36.

The cleanup standards for the site are intended for the issuance of an unrestricted land designation from the LDEQ.

Registered sites where soil contamination has been identified must meet the following criteria prior to consideration of unrestricted land use:

- Records must document that areas of contamination were remediated to below 5 picocuries per gram or less of Ra-226 or Ra-228 above background within the first 15 centimeters of soil depth as determined by a radiological laboratory.
- A post survey of the land documenting the remediation of soils must be completed.
- Documentation of the transfer of contaminated soil from the location to an authorized and/or licensed facility for treatment, storage, and/or disposal.

2.3 Laws and Regulations Applicable to the Cleanup

Laws and regulations that are applicable to the cleanup include the Brownfields Revitalization Act, the Federal Davis-Bacon Act, LDEQ regulations (LAC 33:XV, Chapter 14), DOT, U.S. Nuclear Regulatory Commission, and other state and local by-laws. Federal, state, and local laws regarding the procurement of any subcontractors used as part of the cleanup will be followed.

All appropriate permits (i.e. Site registration (RPD-36), Louisiana One Call, waste characterization acceptance for disposal) will be obtained prior to the commencement of the work.

3.0 Evaluation of Cleanup Alternatives

3.1 Cleanup Alternative Considered

In order to address the contamination at the site, three different alternatives were considered. These included Alternative #1: No Action, Alternative #2: Access Control/Capping, and Alternative #3: Excavation/Removal with Offsite Disposal/Recycle.

3.2 Cost Estimate of Cleanup Alternatives

To satisfy EPA requirements, the effectiveness, implementation, and estimated cost of each cleanup alternative must be considered prior to the selection of a cleanup alternative.

Effectiveness

- Alternative #1: No Action. No Action is not considered an effective option in the controlling of preventing the direct exposure of potential receptors to the contamination present in the surface soils at the site.
- Alternative #2: Access Control/Capping. Creating a restricted area through the use of fencing and posting signage notifying personnel when they are entering a NORM contaminated area with capping is considered a semi-effective alternative for reducing potential receptors from direct contact with impacted soil, provided that the cap (concrete/clean soil) and fencing is maintained. This alternative is considered a much less effective method for protection from radiation exposure. The alternative would result in contaminated material left in place at the site. The use of a cap does not eliminate the potential for radiation exposure from adjoining areas. Additionally, access control capping would require radiation surveys to be conducted in perpetuity, deed restrictions, continual inspection/maintenance of the cap and access control, while limiting the potential property use for future development plans
- Alternative #3: Excavation/Removal with Offsite Disposal/Recycle is considered an effective way to eliminate the risk posed by contamination, since contaminants will be removed and potential exposure pathways will no longer exist.

Implementation

- Alternative #1: No Action. The implementation of this alternative is considered easy, since no actions would be required.
- Alternative #2: Access Control/Capping. This alternative is considered a relatively easy alternative to implement, although site preparation and site work would be necessary. Site preparation for the placement of a cap and fencing to include design, construction, and consideration of potential future property use would be needed for implementation. Worker protection considerations would be required to be in place for the restricted area. The preparation and implementation of a land use restriction would be required for the property. Additionally, NORM surveys, monitoring inspections and maintenance of the cap/fencing would require continual planning and reporting. Long term requirements and site maintenance with minimal reduction in potential harmful exposure to human health and the environment associated with this alternative make this the most difficult alternative to implement.
- Alternative #3: Excavation/Removal with Offsite Disposal/Recycle is considered fairly easy to implement. Coordination (i.e. safety barricades, monitoring, worker protection) and very short term disturbance to the community surrounding (i.e. noise from equipment and truck traffic) are expected. However, following the completion of the excavation, removal, and disposal of contaminated soil and equipment, no site monitoring, maintenance, or reporting will be required. This option would allow for an unrestricted land designation and would remove all potential risks associated with future harmful exposure to the environmental and personnel. On-site activities could be implemented and completed within days or weeks in comparison to decades of continual monitoring and maintenance of Alternative #2.

Cost

- There would be no cost under Alternative #1: No Action.
- It is estimated that the long term cost for implementation, construction, and monitoring/reports for Alternative #2: Access Control/Capping would be \$170,000-\$240,000.
- The estimated cost to complete Alternative #3: Excavation/Removal with Offsite Disposal/Recycle is estimated to be between \$900,000 and \$995,000 depending on volumes of contaminated soil and required disposal facility. Based on the soil sampling results completed at the location the alternative will require the excavation and disposal of approximately 19,500 barrels of NORM impacted soil, refer to **Appendix A – Figure 9** for proposed area of excavation.

3.3 Recommended Cleanup Alternative

The recommended cleanup alternative for this site in Alternative #3: Excavation/Removal with Offsite Disposal/Recycle. Alternative #1 is not recommended since it does not address potential site risks. Alternative #2 is estimated to cost approximately the same as Alternative #3. However, this alternative will require long term monitoring and maintenance/reporting to ensure the restricted area is adequately maintained. The use of this alternative will also leave contamination in place which increases the possibility of exposure and require property use restrictions to be implemented.

Due to the apparent limited area of impact and depths of impact requiring remediation, Alternative #3 is considered the most effective means of cleanup. The excavation will remove all potential risks from the site, have an unrestricted land use designation, and will require the shortest time to implement and complete of the alternatives considered for the location.

ATTACHMENT A

FIGURES

ATTACHMENT B
SOIL SAMPLING RESULTS