RECORD OF DECISION
PAPELERA PUERTIRRIQUEÑA, INC., SUPERFUND SITE
UTUADO, PUERTO RICO

United States Environmental Protection Agency
Region 2
New York, New York
September 2017

473346

DECLARATION STATEMENT
RECORD OF DECISION

SITE NAME AND LOCATION

Papalera Puertirriquena, Inc., Superfund Site
Utuado, Puerto Rico

EPA Superfund Site Identification Number PRD090290685

STATEMENT OF BASIS AND PURPOSE

This Record of Decision (ROD) documents the U.S. Environmental Protection Agency's (EPA's) selection of a remedy to remediate contaminated soil, groundwater, and surface water associated with the Papalera Puertirriquena, Inc., (Papalera) Superfund Site located in Utuada, Puerto Rico (the Site), which was chosen in accordance with the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended, 42 U.S.C. §§ 9601-9675, and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 CFR Part 300. This decision document explains the factual and legal basis for selecting the remedy. The Administrative Record Index (see Appendix II) identifies the items that comprise the Administrative Record upon which the selected remedy is based.

The Puerto Rico Environmental Quality Board (PREQB) was consulted on the proposed remedy in accordance with CERCLA Section 121(f), 42 U.S.C § 9621(f), and concurs with the selected remedy (see Appendix IX).

ASSESSMENT OF THE SITE

Actual or threatened releases of hazardous substances from the Site, if not addressed by implementing the response action selected in this ROD, may present an imminent and substantial endangerment to public health, welfare, or the environment.

DESCRIPTION OF THE SELECTED REMEDY

The selected remedy described in this document addresses the entire Site and is the first and only planned remedial phase or operable unit for the Site. The selected remedy addresses contaminated soil, groundwater, and surface water. The major components of the remedy selected for the Site, which is Alternative 2, include the following:

- Installation of a Soil Vapor Extraction (SVE) system to address contamination in the soils above the water table;

- Installation of an Air Sparging (AS) system to address groundwater contamination;
- Operation and maintenance of the combined SVE/AS systems;
- Long-term monitoring of the groundwater, surface water, and the potential for vapor migration to indoor air until the remediation goals are met; and
- Institutional Controls to restrict use of the groundwater until remediation goals are met.

During remedial design, pilot testing will be required for the SVE and AS systems to determine the flow rates, pressure, and radius of influence of each SVE and air sparge location and, consequently, the number of SVE and sparge points needed. Pilot testing will also evaluate treatment of the collected vapors. It is conservatively assumed the SVE and AS systems would be operated for approximately 10 years. Hydraulic conductivity data collected during the remedial design will provide a better estimate of the necessary operation duration.

The estimated present-worth cost of the selected remedy is $2,633,000.

The environmental benefits of the selected remedy may be enhanced by consideration, during remedial design or implementation, of technologies and practices that are sustainable in accordance with EPA Region 2's Clean and Green Energy Policy.

DECLARATION OF STATUTORY DETERMINATIONS

The selected remedy meets the requirements for remedial actions set forth in CERCLA Section 121, 42 U.S.C. § 9621, because it: 1) is protective of human health and the environment; 2) meets a level or standard of control of the hazardous substances, pollutants, and contaminants that at least attains the legally applicable or relevant and appropriate requirements under federal and state laws; 3) is cost-effective; and 4) utilizes permanent solutions and alternative treatments (or resource recovery) technologies to the maximum extent practicable.

Once implemented, this remedy will result in no hazardous substances, pollutants, or contaminants remaining at the Site above levels that would necessitate limiting use or restricting exposure, but because the remedy will take more than five years to attain the remediation goals, EPA will conduct a review within five years of the construction of the systems at the Site to ensure that the remedy is, or will be, protective of human health and the environment.

ROD DATA CERTIFICATION CHECKLIST

The ROD contains the remedy selection information noted below. More details may be found in the attached Decision Summary and the Administrative Record file for this remedy.

- Chemicals of concern and their respective concentrations may be found in the "Results of Remedial Investigation" section.

- Current and reasonably anticipated future land use assumptions and current and potential future beneficial uses of groundwater are discussed in the "Current and Potential Future Site and Resource Uses" section.

- Baseline risks represented by the chemicals of concern may be found in the "Summary of Site Risks" section.

- Cleanup levels established for chemicals of concern and the basis for these levels may be found in the "Remedial Action Objectives" section.

- A discussion of principal threat waste may be found in the "Principal Threat Waste" section.

- Estimated capital, annual operation and maintenance, and total present-worth costs are discussed in the "Description of Remedial Alternatives" section.

- Key factors used in selecting the remedy (i.e., how the selected remedy provides the best balance of tradeoffs with respect to the balancing and modifying criteria, highlighting criteria key to the decision) may be found in the "Selected Remedy" and "Statutory Determinations" sections.

AUTHORIZING SIGNATURE

A. Carpenter

Angela Carpenter, Acting Director
Emergency & Remedial Response Division

9-29-17

Date

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 2

Decision Summary

RECORD OF DECISION
PAPELERA PUERTIRRIQUEÑA INC. SUPERFUND SITE
UTUADO, PUERTO RICO

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SITE NAME, LOCATION, AND DESCRIPTION

The Papelera Puertorriqueña Inc. (PPI) site (the Site) is an active manufacturing facility (hereinafter the Facility) located in the downtown area of the municipality of Utuado on Route 111, approximately 40 feet northeast of the river known as the Río Viví (see Appendix VII, Figure 1). The surrounding area includes commercial businesses, public schools, and residences, including a Puerto Rico Telephone company warehouse to the east and the Judith A. Rivas School to the west. The Facility consists of five concrete buildings on a 1.6-acre plot. The main structure was originally built in the 1970s; four additional structures were subsequently added to form the current E-shaped building. The main structure is divided into areas for manufacturing processes, storage, and offices. The Site can be accessed via two gates on the northeastern side of the property, an area which is covered in concrete. A small vegetated corridor, approximately 1,300 square feet in size, is located adjacent to the southeastern wing of the Facility. A second vegetated area is located between the Facility's southwestern wing and the Río Viví. There is no fence separating this vegetated area and the Río Viví (see Appendix VII, Figure 2)[1].

SITE HISTORY AND ENFORCEMENT ACTIVITIES

PPI has manufactured paper bags, cardboard boxes, and plastic bags at its Facility for approximately 46 years. Other paper-based products, such as greeting cards and gift wrapping paper, were also stored and distributed from the Facility. Currently, the Facility only manufactures paper bags.

The Puerto Rico Environmental Quality Board (PREQB) has been inspecting the Facility since March 1984, when PPI accidentally discharged liquids containing residues and inks into the Río Viví. During subsequent inspections between 1993 and 2003, PREQB observed drums containing hazardous substances (such as ammonia, butanol, ethyl acetate, sodium cyanide, sulfuric acid, tetrachloroethene (PCE), and trichloroethene (TCE)) stored without secondary containment, holes in the floor, and a sink in the development room draining into a hole in the floor. According to PREQB and PPI employees, hazardous substances were often discharged through these holes. Several visual inspections by PREQB indicated that PPI discharged unknown liquids into the Río Viví.
Various investigations were conducted by PREQB in response to complaints, emergency calls, and Site assessment activities from 1998 to 2006. Sampling conducted on Site included surface water, surface soil, septic tank soil, septic tank sludge, soil, sediment, and wastewater. Multiple hazardous substances were found in various media including PCE, TCE, benzene, copper, lead, mercury, zinc, and chromium.

Throughout PPI's operations at the Site, the Facility has been cited for several violations by the PREQB Land Pollution Control Area, Hazardous Waste Division.

HIGHLIGHTS OF COMMUNITY PARTICIPATION

On July 13, 2017, EPA released a Proposed Plan that recommended a plan for the clean-up of the

[1] An assessment of the Site on September 29, 2017 indicated that there were no physical changes to the Site resulting from Hurricanes Irma and Maria that would lead EPA to change the Selected Remedy.

Site and solicited public comment. The administrative record for that Proposed Plan was made available to the public at the information repositories maintained at the following locations: EPA's Docket Room in New York, New York; Utuado City Hall Mayor's Office #27 Antonio R. Barceló St. Utuado; PREQB Superfund File Room in San Juan, Puerto Rico; and EPA's Caribbean Environmental Protection Division Office in Guaynabo, Puerto Rico. A copy of the Administrative Record Index for the remedy is provided as Appendix II of this Record of Decision (ROD).

A notice of the availability of the Proposed Plan and supporting documentation was published in the Primera Hora newspaper on July 13, 2017 (Appendix III) and Éxitos 1530 Radio Station for three days. In order to facilitate communication with the community, a Spanish Fact Sheet was prepared and distributed throughout the community (Appendix IV). A public comment period opened on July 13, 2017, and a request for an extension to the original 30-day public comment period was received on July 20, 2017. A public notice providing the revised comment period dates was published in the Primera Hora on August 7, 2017. With this extension request, the public comment period ran from July 13 to September 12, 2017. A public meeting was held on July 20, 2017 at the Municipal Legislature Conference Room #18 Betances, St., Utuado. The purpose of the public meeting was to present the Proposed Plan to the community and to provide an opportunity for the public to ask questions and provide comments on the proposed remedial alternatives and EPA's preferred alternative.

Representatives from EPA and EQB attended the July 20, 2017 public meeting, answered questions, and received comments about the remedial investigation activities conducted at the Site and the proposed remedial alternatives for the Site. Comments were submitted during the public meeting. Appendix V of this ROD contains the official transcript of the public meeting. In addition, EPA's response to comments received during the public comment period is included in the Responsiveness Summary (Appendix VI).

SCOPE AND ROLE OF RESPONSE ACTION

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP), at 40 CFR Section 300.5, defines an operable unit as a discrete action that comprises an incremental step toward comprehensively addressing site problems. A discrete portion of a remedial response eliminates or mitigates a release, threat of a release, or pathway of exposure. The cleanup of a site can be divided into a number of operable units, depending on the complexity of the problems associated with the site.

This response action applies a comprehensive approach to all identified Site problems; therefore, only one operable unit is required to remediate the Site. EPA is addressing groundwater, soil, surface water, sediment, porewater, soil vapor, and indoor air contamination at the Site. These media pose an unacceptable current or future risk to human health or the environment. The primary objectives of the action selected in this ROD are to remediate the groundwater and soil contamination associated which can serve as a sources of the volatile organic compound (VOC) groundwater plume at the Site, and to minimize the migration of these contaminants.

SUMMARY OF SITE CHARACTERISTICS

Topography and Drainage

The Site is located in the Río Viví floodplain. The property slopes moderately down to the river, which is approximately 8 to 10 feet below the southwest edge of the building. Within the Utuado municipality, the river drops from an elevation of approximately 500 feet in the Site vicinity to approximately 410 feet to the west at the confluence with Rio Grande de Arecibo, a distance of approximately 0.9 mile. The river valley is flanked to the north and south by uplands; the hills on both sides of the valley rise to approximately 1,200 feet above mean sea level (amsl) within 0.5 miles from the Site. Two unnamed tributaries are close to the Site, one located 140 feet upstream and the other located 600 feet downstream. Both tributaries flow southwest towards the Río Viví.

Ecological Characteristics

Land use around the Site is primarily residential and commercial. Vegetation is restricted to a narrow strip along the southeastern side of the property and the southwestern portion of the property along the riverbank. The riparian banks behind the Site property contain a relatively open canopy vegetative community. The Site and the Río Viví along the Site boundary have limited vegetation and limited habitat for ecological receptors. Small fish and other wildlife were observed in the Río Viví along the Site boundary. In addition, both the U.S. Fish and Wildlife Service and Puerto Rico Department of Natural and Environmental Resources reported that no federally listed or Puerto Rico-listed or proposed threatened or endangered species are known to occur at the Site.

Geology

The soil in the Site vicinity generally consists of medium to dense, fine sandy silt near the surface, becoming richer in silty clay with some remnant rock structure close to the transition to the saprolite. The material is primarily sand with small proportions of gravel, silt, and clay. The thickness varies from 0 feet where the saprolite is exposed at the surface on the slope, to 12 feet on the alluvial terrace adjacent to the river. The river sediment and soil adjacent to the river is relatively thin because of the erosional nature of the river.

Saprolite, or highly weathered bedrock, is observed below the soil. The shallow saprolite zone is composed of weathered granodiorite. Remnant fractured bedrock structure is estimated to be present as a result of the presence of fractures in the parent bedrock, a high degree of weathering, and the presence of dry and saturated zones. This material is weathered rock and angular rock fragments (sand to gravel in size) in a fine silty sand matrix. Grain size was evaluated for one saprolite sample; sand was dominant, but the saprolite contains more clay and less gravel than the overlying soil. Based on the deep wells drilled to the top of bedrock (refusal), the thickness of the saprolite varies from 53 feet at MW-03D, adjacent to the Rio Viví, to 76.5 feet at MW-08R, the highest point at the Site. The average thickness is 66 feet.

The saprolite is underlain by the fractured granodiorite of the Utuado Pluton. The remedial investigation (RI) did not penetrate this unit.

Hydrogeology

The groundwater bearing units in the vicinity of the Site are the shallow, unconfined alluvial aquifer within the floodplain at the southwestern boundary of the Site and the underlying saprolite, which extends under the entire Site. Saprolite is the primary water bearing unit, but there are indications that its hydrogeologic properties vary with depth. The saprolite unit is highly weathered at the surface, becoming more fine-grained and less weathered with depth, which explains why dry zones are encountered in the saprolite during deeper monitoring well drilling. While continuous cores were not collected through the entire thickness of the saprolite, these characteristics are consistent with the Type Section of Volcanic Bedrock Weathering Profile for Puerto Rico. It is currently unknown if the plutonic bedrock acts as an aquifer, but it is expected that groundwater would flow through fractures occurring in the bedrock. Depth to water ranges from river level at the Río Viví (449.3 feet amsl) to 34.3 feet below ground surface (bgs) at the top of the slope of the Site at MW-08R (459.5 feet amsl).

The groundwater flow direction follows the topography from the highlands that border the river valley toward the Río Viví and flows in a similar direction to that of the regional bedrock joints. As it approaches the river, groundwater flow turns slightly to the west because it is influenced by the flow of the river. Groundwater flow in the deep saprolite could not be determined because of the alignment of the deep wells, but is expected to be toward the river also. The increase in the groundwater table elevation with distance from the river and the orientation of the groundwater contours as they approach the stream suggest that the river is most likely gaining, meaning groundwater discharges to the river. However, wells could not be drilled on the southwest side of the river because of physical Site limitations. Because of the similar topography and the location of the river at the base of the valley, it is likely that the groundwater gradient across the river is also toward the river and discharging to it.

EPA Remedial Investigation

The goal of the RI was to identify the nature and extent of contamination in Site media by collecting and analyzing samples and then comparing analytical results to federal, Commonwealth, and Site-specific screening criteria. Potential source areas were identified, and the physical characteristics of the Site area were defined based on data obtained during the RI. Data from field investigations helped define the nature and extent of contamination in groundwater, soil, surface water, sediment, porewater, soil vapor, and indoor air. The nature and extent of contamination in Site media was used along with Site-specific geology and hydrogeology to develop the conceptual Site model. These activities met the scope of the RI objectives.

Environmental media investigated during the RI included soil, groundwater, surface water, sediment, porewater, and soil gas. From March 2015 to December 2015, the following RI field activities were completed:

- Groundwater - Groundwater screening, well drilling and installation in the saprolite, piezometer installation, groundwater sampling, and synoptic water level measurements
- Soil – Boring installation, subsurface soil sampling, and drainage feature surface soil sampling
- Surface Water - Surface water, sediment, and porewater sampling
- Vapor – Subslab and indoor air sampling and ambient air sampling
- Surveys – Structural evaluation, topographic, ecological, and cultural resource surveys
- Conceptual Site Model

A Conceptual Site Model (CSM) was developed for the Site to provide an understanding of the hydrogeologic framework for the Site, interactions between the various media (soil, sediments, porewater, surface water, and groundwater), and the relative location of the contaminant source. The CSM integrates the different types of information and data collected during the RI, including geology, hydrogeology, background, setting, and analytical data, showing the distribution and migration pathways of contamination at the Site. The CSM is illustrated in Figure 3 of Appendix VII.

Physical Setting with Respect to Contaminant Migration

Most of the Site is underlain by unsaturated sandy silt near the surface, transitioning to silty clay with some remnant rock structure close to the transition to the underlying saprolite. Sieve analysis found that sand makes up approximately 69 to 77 percent of the matrix. The saprolite is exposed at the surface of the slope, but the overlying soil increases to 12 feet thick along the alluvial terrace adjacent to the river. The soil becomes thinner downslope toward the Río Viví, where it has been eroded.

Under the vadose zone is the water-bearing saprolite (weathered granodiorite); the majority of the groundwater contamination is in the shallow zone. Some intervals of the saprolite were observed to be dry, indicating that groundwater primarily flows through preferential flowpaths. The groundwater generally flows downslope from the Facility to the Río Viví, with a slight turn to the west (downriver) because it is influenced by the flow of the river. Measurements in paired shallow and deep saprolite monitoring wells indicate an upward gradient. The head measurements and the presence of PCE in porewater and surface water samples indicate the Río Viví is a gaining stream and Site groundwater discharges to the river.

Soil Sampling Results

Soil sample results indicate that PCE contamination in soil is confined to two areas in the southwestern portion of the Site, at drainage feature #2 and the former development room, suggesting that disposal likely occurred in these areas. PCE-contaminated soil in these areas appears to be localized, as evidenced by much lower levels in adjacent borings. In drainage feature #2 (SB-09), PCE was detected from 2-4 feet bgs at 2,100 micrograms per kilogram (μg/kg); however, PCE levels in samples above and below this interval were below the screening criterion. This suggests that elevated PCE levels are either highly localized, or that contaminant migration follows a non-linear path. PCE levels near the former development room south of drainage feature #2 suggest potential residual contamination. Elevated PCE in SB-01 (590 μg/kg)

and SB-02 (380 µg/kg), located at the southeastern and southwestern walls of the former development room (respectively), provide additional evidence of PCE disposal. The majority of PCE contamination occurs in the top four feet in this area; concentrations from 4-8 feet bgs generally decrease with depth. Slight detections of TCE and *cis*-1,2-dichloroethene, a breakdown product of TCE, in the two areas were also observed.

Metals concentrations were mostly below or only slightly above screening criteria, background levels, or naturally occurring levels. The highest levels of copper are mainly concentrated in the former discharge area, around drainage feature #4, and downgradient of drainage features #1 and #2. Elevated concentrations of lead were detected mainly on the Puerto Rico Telephone property and along the southeastern wall of the former development room on the PPI property.

Groundwater Sampling Results

PCE results in groundwater screening and monitoring wells suggest two major areas of contamination: drainage feature #2 in the southern portion of the Site (GW-02, MW-02S, and MW-02D), and the former development room at the southern corner of the Site (GW-01, GW-6-B, MW-03S, and MW-03D). PCE was found in groundwater at screening location GW-05-B in the known discharge area between the two major areas of contamination. Contamination in this portion of the Site is localized, as evidenced by surrounding wells with little or no contamination. PCE exceedances in GW-02 (2,100 and 330 µg/L), near drainage feature #2, indicate that contamination in this area has migrated downgradient toward the Rio Viví. Detections of PCE below the screening criterion in MW-02S/D suggest the plume is mainly contained in the upper portion of the saprolite (10 to 16 feet bgs) and moves laterally rather than vertically in the saprolite. This lateral migration reflects the upward movement of the contaminant plume as it discharges into the Río Viví. In the former development room area, GW-01, showed the highest PCE concentration (11,000 µg/L) in the shallow saprolite (8.5 - 12 feet bgs). PCE contamination appears to decrease dramatically in the deeper saprolite because an upward gradient reflects discharge into the Río Viví.

Copper, lead, and mercury levels in monitoring well sample results were below screening criteria, indicating that groundwater has not been impacted by Site-related metals.

Porewater, Surface Water, and Sediment Sampling Results

PCE is present in the porewater and surface water of the Río Viví as a consequence of discharge of PCE contaminated groundwater to the river from the shallow saprolite zone. The highest detected concentration of PCE at PZ-02 (130 µg/L) was located downgradient of the former development room. Levels of PCE generally dropped significantly in further downstream locations. PCE only exceeded its screening criterion in surface water in sample RV-SW-03 (13 µg/L). This sample was collected downstream of PZ-02. PCE was not detected in any sediment samples.

Results confirm that PCE contamination is migrating into the Río Viví particularly in the area downgradient of the former development room. However, lack of PCE detections in sediment

indicate PCE moves quickly as it discharges into the porewater and surface water, and it is not adsorbed to the sediment.

Copper and lead were detected below screening criteria in all porewater and surface water samples but were detected above screening criteria in sediment samples. Mercury was below the screening criterion in sediment but exceeded screening criteria in porewater and surface water. However, the concentrations of copper, lead, and mercury were consistent with upgradient and naturally occurring levels, indicating they likely represent naturally occurring concentrations.

Copper, lead, and mercury exceeded screening criteria in the catch basin sample collected from drainage feature #3 (CB-SW-06). However, lack of such high concentrations in the soil and groundwater in the vicinity suggests that contamination has remained within the drainage feature and has not migrated or impacted groundwater.

Indoor Air and Sub-slab Vapor Sampling Results

The highest levels of PCE in sub-slab and indoor air (AI-03/SS-03) were below and in the former development room, corresponding with the location of the highest PCE levels in soil and groundwater. The sub-slab sample exceeded PCE criterion, but the indoor air sample did not. These results confirm that PCE vapors are present in the vadose zone below the former development room, but they have not migrated into the building at a significant level.

Vapor intrusion evaluations were also performed at the neighboring properties, the Judith A. Rivas School, and the Puerto Rico Telephone property because of their proximity to the Site. The results did not indicate a need to pursue further investigations at these properties for indoor air.

Expected Fate and Transport of Site Contaminants

PCE contaminant mass is present in soil and groundwater at discharge locations, which are located both outside the footprint of the building and in the crawl-space area under the development room. Contamination protected from rainwater infiltration by the Site building is unlikely to leach into groundwater. Vadose zone contamination with infiltrating rainwater is likely to result in transfer of mass from the vadose zone to the underlying groundwater. Residual mass in the unsaturated zones is subject to volatilization and is likely the source of PCE detections in sub-slab and indoor-air vapor samples.

Groundwater contamination (up to 11,000 μg/L) was detected underneath the contaminated vadose zone. The highly heterogeneous saprolite structure and the complex groundwater flowpaths suggest the possibility that significant contaminant mass may still be present in the portions of the saprolite that are not in contact with faster groundwater flow. This mass would likely persist for a lengthy period under current Site conditions because biodegradation is negligible at the Site. Groundwater contamination is primarily in the upper saprolite zone, and the observed upward gradient in paired wells and the presence of PCE in porewater and surface water indicate that the plume discharges to the river. Therefore, significant migration of contamination deeper into the saprolite aquifer is unlikely.

Cultural Resources

In December 2015, a Stage 1A level Cultural Resources Survey was completed by RGA, Inc. The Stage 1A survey included comprehensive documentary research and a Site visit designed to identify known or potential historical, architectural, and/or archeological resources within the Area of Potential Effects (APE), an 8.4-acre area within the municipality of Utuado. The Stage 1A cultural resources survey was conducted in compliance with Section 106 of the National Historic Preservation (Federal Register (FR) Vol. 48, No. 190), 36 CFR Part 800: Protection of Historic Properties, and the Council for Protection of Land Based Archeological Resource's "Reglamento Para Investigaciones de Recursos Arqueológicos Terrestres" (1992). The work was performed under the direction of a registered professional archeologist.

RGA, Inc. completed a Stage IA cultural resources survey within the APE for the Site. The primary goal of the Stage IA cultural resources survey was to assess the archaeological sensitivity of the APE. The 8.4-acre APE possesses low sensitivity for archaeological resources. No previously recorded archaeological Sites are documented within the APE that exhibits significant disturbance in the form of commercial and residential urban development. The river banks within the APE are poorly drained and possess low sensitivity. Erosion and scouring from recent flood events on the river banks rendered the survival of intact archaeological resources in the APE unlikely. The APE is situated far from any historic roads or structures, indicating a low sensitivity for historic period archaeological resources. The Site reconnaissance yielded no evidence of rock outcrops that may contain petroglyphs and no evidence of possible prehistoric or historic features. No further archaeological survey is recommended because of the low likelihood of the survival of intact archaeological resources within the APE.

Summary of Remedial Investigation

EPA prepared an RI Report to document the nature and extent of the contamination at the Site. EPA also issued a Baseline Human Health Risk Assessment (HHRA) Report to document the current and future effects of Site contaminants on human health and the environment associated with the contamination that was previously detected at the Site. EPA also conducted a Screening-level Ecological Risk Assessment (SLERA) to evaluate any potential for ecological risks from the presence of Site contaminants in surface water and sediment. A detailed description of the results of the HHRA and SLERA for this Site is provided in the Summary of Risk Section of this ROD.

Two sources of PCE contamination were identified: (1) the former development room located in the southern corner of the PPI building and (2) the area around drainage feature #2 located in the southwestern portion of the Site. However, these contamination sources appear to be localized as evidenced by lower PCE concentrations in adjacent borings (SB-03 and SB-10 near SB-09; SB-8 and SB-12 near SB-01 and SB-02, see Appendix VII, Figure 4). The highest PCE detection in groundwater was 11,000J µg/L at GW-01 from 8.5 – 12.5 feet bgs, downgradient of the former development room where elevated soil concentrations were previously identified (see Appendix

VII, Figure 5).

Detections of copper, lead, and mercury above screening criteria suggest that wastes containing these metals were disposed along the southeastern property border between the PPI building and Puerto Rico Telephone and/or within the septic tank on the Puerto Rico Telephone property. All three metals were also detected in soil just downgradient of the former development room. Copper was also found around drainage features #4 and #5 in the southeastern portion of the Site. Mercury detections in drainage features and the former development room indicate disposal practices included mercury in waste. Semi-volatile organic compound contamination (butylbenzylphthalate and dibenzo-(a,h)-anthracene) was also detected in Site soils but were mainly limited to the northeast corner of the PPI property within the upper terrace.

CURRENT AND POTENTIAL FUTURE LAND AND RESOURCE USES

The primary land use in the vicinity of the Site is rural with some residential, commercial, and light industrial development. The Site contains an active manufacturing facility, a storage area, and offices, including a Head Start day care facility on the second floor. The Site is currently connected to the Utuado Urbano public water supply system operated by Puerto Rico Aqueduct Sewer Authority (PRASA). In addition, the Río Víví, which is adjacent to the Site, may be used for recreational activities. It is expected that future use will be similar to the current use. The HHRA evaluated potential risks to populations associated with both current and potential future land uses.

SUMMARY OF SITE RISKS

As part of the RI/FS, EPA conducted a baseline risk assessment to estimate the current and future effects of contaminants on human health and the environment. A baseline risk assessment is an analysis of the potential adverse human health and ecological effects of releases of hazardous substances from a site under current and future land uses in the absence of any actions or controls to mitigate such releases. The baseline risk assessment includes a HHRA and a SLERA. It provides the basis for taking action and identifies the contaminants and exposure pathways that need to be addressed by the remedial action. The remedial alternative that was proposed for the Site addresses contamination at the Site. The risks and hazards for the Site were presented in the baseline risk assessment and will be summarized in this section.

Baseline Human Health Risk Assessment

A four-step process is utilized for assessing Site-related human health risks for a reasonable maximum exposure scenario:

- Hazard Identification - uses the analytical data collected to identify the contaminants of potential concern at the site for each medium, with consideration of a number of factors explained below;
- Exposure Assessment - estimates the magnitude of actual and/or potential human exposures, the frequency and duration of these exposures, and the pathways (e.g., ingesting contaminated well-water) by which humans are potentially exposed;

- Toxicity Assessment - determines the types of adverse health effects associated with chemical exposures, and the relationship between magnitude of exposure (dose) and severity of adverse effects (response); and
- Risk Characterization - summarizes and combines outputs of the exposure and toxicity assessments to provide a quantitative assessment of site-related risks. The risk characterization also identifies contamination with concentrations that exceed acceptable levels, defined by the NCP as an excess lifetime cancer risk that is greater than the range of $1 \times 10^{-6} - 1 \times 10^{-4}$, an excess of lifetime cancer risk greater than 1×10^{-6} (*i.e.*, point of departure) combined with Site-specific circumstances, or a Hazard Index greater than 1; contaminants at these concentrations are considered chemicals of concern (COCs) and are typically those that will require remediation at the Site. Also included in this section is a discussion of the uncertainties associated with these risks.

Hazard Identification

In this step, the chemicals of potential concern (COPCs) in each medium were identified based on such factors as toxicity, frequency of occurrence, fate and transport of the contaminants in the environment, concentrations, mobility, persistence, and bioaccumulation. The risk assessment focused on surface soil, subsurface soil, surface water, sediment, groundwater, and soil gas contaminants related to the Site that may pose significant risk to human health. Analytical information that was collected to determine the nature and extent of contamination revealed the presence of Site-related VOCs in groundwater at concentrations of potential concern.

A comprehensive list of all COPCs that were investigated can be found in the baseline HHRA, entitled "Final Human Health Risk Assessment – Papelera Puertorriqueña, Inc. Superfund Site" - July 2016. This document is available in the administrative record file. The contaminated media, concentrations detected, and concentrations utilized to estimate potential risks and hazards for the COCs at the Site are presented in Table 1 (all tables can be found in Appendix VIII). Groundwater was the media that contained COCs.

Exposure Assessment

Consistent with Superfund policy and guidance, the HHRA is a baseline human health risk assessment and therefore assumes a state where no remediation or institutional controls are taken to mitigate or remove hazardous substance releases. With this assumption, cancer risks and noncancer hazard indices were calculated based on an estimate of the reasonable maximum exposure (RME) expected to occur under current and future conditions at the Site. The RME is defined as the highest exposure that is reasonably expected to occur at a Site. For those contaminants for which the risk or hazard exceeded the acceptable levels, the central tendency estimate (CTE), or the average exposure, was also evaluated.

As noted previously, the primary land use in the vicinity of the Site is rural with some residential, commercial, and light industrial development. The Site contains an active manufacturing facility, a storage area, and offices, including a Head Start day care facility. The Site is currently connected to the Utuado Urbano public water supply system operated by Puerto Rico Aqueduct Sewer Authority (PRASA). In addition, the Río Víví, which is adjacent to the

Site, may be used for recreational activities. It is expected that future use will be similar to the current use. The HHRA evaluated potential risks to populations associated with both current and potential future land uses.

Exposure point concentrations (EPCs) for the COPCs are used in the exposure assessment calculations to estimate potential chemical intake. The EPC is the lower of the upper confidence limit (UCL) on the mean or the maximum detected concentration.

Exposure pathways were identified for each potentially exposed population and each potential exposure scenario for exposure to surface soil, subsurface soil, surface water, sediment, groundwater, and soil gas. Exposure pathways assessed in the HHRA are presented in Table 2 and included current exposure to adult workers, Head Start staff, Head Start students and recreators, and future exposure to residents (adults and children), adult construction workers and recreators through a combination of incidental ingestion, dermal contact, and inhalation from contaminated media on the Site. In addition, per EPA guidance, a future user of groundwater was evaluated. Typically, exposures are evaluated using a statistical estimate of the exposure point concentration, which is usually an upper-bound estimate of the average concentration for each contaminant, but in some cases may be the maximum detected concentration. A summary of the exposure point concentrations for the COCs in groundwater can be found in Table 1, while a comprehensive list of the exposure point concentrations for all COPCs can be found in the HHRA.

Toxicity Assessment

Under current EPA guidelines, the likelihood of carcinogenic risks and noncancer hazards as a result of exposure to Site chemicals are considered separately. Consistent with current EPA policy, it was assumed that the toxic effects of the Site-related chemicals would be additive. Thus, cancer and noncancer risks associated with exposures to individual COPCs were summed to indicate the potential risks and hazards associated with mixtures of potential carcinogens and noncarcinogens, respectively.

Toxicity data for the HHRA were provided by the Integrated Risk Information System (IRIS) database, the Provisional Peer Reviewed Toxicity Database, or another source that is identified as an appropriate reference for toxicity values consistent with EPA's directive on toxicity values. This information for the COCs is presented in Table 3 (noncancer toxicity data summary) and Table 4 (cancer toxicity data summary). Additional toxicity information for all COPCs is presented in the HHRA.

Risk Characterization

Noncarcinogenic risks were assessed using a hazard index (HI) approach, based on a comparison of expected contaminant intakes and benchmark comparison levels of intake (reference doses, reference concentrations). Reference doses (RfDs) and reference concentrations (RfCs) are estimates of daily exposure levels for humans (including sensitive individuals) which are thought to be safe over a lifetime of exposure. The estimated intake of chemicals identified in environmental media (*e.g.*, the amount of a chemical ingested from contaminated drinking water)

is compared to the RfD or the RfC to derive the hazard quotient (HQ) for the contaminant in the particular medium. The HI is obtained by adding the hazard quotients for all compounds within a particular medium that impacts a particular receptor population.

The HQ for oral and dermal exposures is calculated as below. The HQ for inhalation exposures is calculated using a similar model that incorporates the RfC, rather than the RfD.

HQ = Intake/RfD

Where: HQ = hazard quotient
Intake = estimated intake for a chemical (mg/kg-day)
RfD = reference dose (mg/kg-day)

The intake and the RfD will represent the same exposure period (i.e., chronic, subchronic, or acute).

As previously stated, the HI is calculated by summing the HQs for all chemicals for likely exposure scenarios for a specific population. An HI greater than 1.0 indicates that the potential exists for noncarcinogenic health effects to occur as a result of site-related exposures, with the potential for health effects increasing as the HI increases. When the HI calculated for all chemicals for a specific population exceeds 1, separate HI values are then calculated for those chemicals which are known to act on the same target organ. These discrete HI values are then compared to the acceptable limit of 1 to evaluate the potential for noncancer health effects on a specific target organ. The HI provides a useful reference point for gauging the potential significance of multiple contaminant exposures within a single medium or across media.

The HI for noncancer effects at this Site is elevated for exposure to groundwater because of the concentrations of PCE for the future residents (Table 5). PCE was also identified as a COC because of elevated soil gas concentrations under the building.

For carcinogens, risks are generally expressed as the incremental probability of an individual developing cancer over a lifetime as a result of exposure to a carcinogen, using the cancer slope factor (SF) for oral and dermal exposures and the inhalation unit risk (IUR) for inhalation exposures. Excess lifetime cancer risk for oral and dermal exposures is calculated from the following equation, while the equation for inhalation exposures uses the IUR, rather than the SF:

Risk = LADD x SF

Where: Risk = a unitless probability (1×10^{-6}) of an individual developing cancer
LADD = lifetime average daily dose averaged over 70 years (mg/kg-day)
SF = cancer slope factor, expressed as [1/(mg/kg-day)]

These risks are probabilities that are usually expressed in scientific notation (such as 1×10^{-4}). An excess lifetime cancer risk of 1×10^{-4} indicates that one additional incidence of cancer may occur in a population of 10,000 people who are exposed under the conditions identified in the assessment. Again, as stated in the National Contingency Plan, the point of departure is 10-6 and

the acceptable risk range for Site-related exposure is 10^{-6} to 10^{-4}.

As shown in Table 6, total carcinogenic risks greater than 1×10^{-4} were identified for the future resident exposed to groundwater at the Site. PCE was the primary driver of elevated risk and was also identified as a COC as a consequence of elevated soil gas concentrations under the building.

Uncertainties

The procedures and inputs used to assess risks in this evaluation, as in all such assessments, are subject to a wide variety of uncertainties. In general, the main sources of uncertainty include:

- environmental data
- environmental parameter assumptions
- toxicity data
- risk characterization

Two of the primary sources of uncertainty identified in the HHRA were associated with exposure parameters and toxicological data. Uncertainty in exposure parameters was related to many of the parameters being associated with default values because Site-specific values were not available. This would provide a conservative estimate of potential risk and hazards.

Another important source of uncertainty was toxicological data. The toxicity factors used in the quantitative evaluation of potential risks and hazards were primarily selected from IRIS. For many chemicals, there is a lack of appropriate information on effects in humans (*i.e.*, epidemiologic studies). Therefore, animal studies are generally used to develop toxicity values in human health risk assessments, which may under- or over-estimate potential risks and hazards.

More specific information concerning uncertainty in the health risks is presented in the HHRA.

<u>Ecological Risk Assessment</u>

A SLERA (screening-level ecological risk assessment) was conducted to evaluate the potential for ecological risks from the presence of contaminants in surface soil. The SLERA focused on evaluating the potential for impacts to sensitive ecological receptors from Site-related constituents of concern through exposure to surface soil at the Site, and surface water, porewater, and sediment from the Rio Viví. Surface soil, surface water, porewater, and sediment concentrations were compared to ecological screening values as an indicator of the potential for adverse effects to ecological receptors. A complete summary of all exposure scenarios can be found in the SLERA.

Based on the results of the SLERA, there is not a potential for adverse effects to ecological receptors (invertebrates, reptiles, amphibians, birds, and mammals) from exposure to contaminated surface soil, sediment, or surface water. The screening criteria for all chemicals in these media were below the acceptable hazard quotient of 1 or would not result in long-term population impacts.

There was a completed exposure pathway (groundwater discharge to the Rio Viví) with exposure to a Site-related contaminant (PCE) to aquatic receptors identified. The risk associated with the exposure to contaminated groundwater that discharges to the river (HQ 1.2) is marginally above the EPA acceptable hazard quotient of 1 using the maximum detected value, and the hazard index would be less than 1 if a more realistic average porewater concentration were used. The identification of a completed exposure pathway and a potential ecological risk in a SLERA typically leads to the performance of a more in-depth Baseline Ecological Risk Assessment (BERA); however, because the SLERA's conservative assumptions led to only a marginally exceeded HQ, and because the remedy selected for the Site is expected to address the migration of PCE into the Rio Viví that would protect the ecological receptors from actual or threatened releases of hazardous substances, a BERA was not performed.

Risk Characterization Conclusion

In summary, PCE in groundwater associated with the Site was found to result in unacceptable risks or hazards for human health, and groundwater discharge to the Rio Viví could impact ecological receptors. The results of the HHRA indicate that the contaminated groundwater presents an unacceptable risk to human health at the Site. The estimated cancer risks for future residential groundwater users was 3×10^{-4}, which exceeds EPA's target risk range. Additionally, estimated non-cancer HI for future residential groundwater usage was 60, which exceeds the EPA's target threshold of 1.

The SLERA indicated that the there was a completed exposure pathway (groundwater discharge to the Rio Viví) with exposure to a Site-related contaminant (PCE) to aquatic receptors identified.

Basis for Taking Action

Based on the results of the RI/FS and the risk assessment, EPA has determined that a response action is necessary and that the response action selected in this ROD is necessary to be protective of the public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment.

REMEDIAL ACTION OBJECTIVES

Remedial action objectives (RAOs) are specific goals to protect human health and the environment. These objectives are based on available information and standards, such as applicable or relevant and appropriate requirements (ARARs), to-be-considered (TBC) guidance, and Site-specific, risk-based levels established using the risk assessments described above.

RAOs have been developed to focus on reducing the impact of PCE on groundwater quality and protection of human health from exposure to soil vapor. Furthermore, while PCE in soils does not pose an unacceptable human health or ecological risk directly, the levels detected in soil appear to act as a continuing source of contamination to the groundwater that will persist if not addressed by this action.

RAOs for soil:

- Prevent/minimize contaminated soil from serving as a source of groundwater contamination and surface water contamination (via surface runoff) exceeding remediation goals (discussed below)
- Prevent/minimize contaminated soil from serving as source of sub-slab vapor contamination.

RAOs for groundwater (and porewater):

- Prevent/minimize contaminated groundwater above remediation goals from serving as a source of river water contamination (Río Viví).
- Prevent human exposure to contaminant concentrations in groundwater above remediation goals.
- Restore the groundwater to drinking water quality.

RAO for surface water:

- Reduce PCE concentrations to levels below remediation goals by remediating contaminated soil and groundwater, thereby allowing surface water to recover.

Remediation Goals

Soil

There are no promulgated federal or Commonwealth chemical-specific ARARs for soil. To meet the RAOs for protection of groundwater, Site-specific impact-to-groundwater soil cleanup levels were developed. To meet the RAOs for protection of indoor air, impact-to-indoor air levels were developed based on a Site-specific attenuation factor calculated using the maximum indoor air concentration observed and its associated subslab vapor concentration. The Site-specific impact-to-groundwater soil cleanup criterion (30 µg/kg) was selected as the remediation goal for PCE over the impact to indoor air cleanup criteria (76 µg/kg) as a more conservative value.

Groundwater

Groundwater at the Site is classified as suitable for drinking water use. In order to accommodate any future use of Site groundwater as a source of potable water supply without a treatment system, federal drinking water standards have been identified as ARARs; therefore, the maximum contaminant level of 5 µg/L for PCE in groundwater is the remediation goal.

Surface Water

The Puerto Rico Water Quality Standards for Class SD surface waters (intended for use as a raw source of public water supply) will be used to monitor surface water quality over time at the Site.

Vapor Intrusion

The relevant sub-slab contaminant screening criteria and indoor air concentration(s) requiring mitigation were based on EPA Vapor Intrusion Screening Levels (VISLs) guidance. While not a remediation goal per se, the screening criteria for vapor intrusion will be used to monitor indoor air quality over time at the Site.

DESCRIPTION OF THE ALTERNATIVES

Section 121(b)(1) of CERCLA, 42 U.S.C. § 9621(b)(1), mandates that remedial actions must be protective of human health and the environment, be cost-effective, and utilize permanent solutions and alternative treatment technologies and resource recovery alternatives to the maximum extent practicable. Section 121(b)(1) also establishes a preference for remedial actions that employ, as a principal element, treatment to permanently and significantly reduce the volume, toxicity, or mobility of the hazardous substances, pollutants, and contaminants at a Site. Section 121(d) of CERCLA, 42 U.S.C. § 9621(d), further specifies that a remedial action must attain a level or standard of control of the hazardous substances, pollutants, and contaminants that at least attains ARARs under federal and state laws, unless a waiver can be justified pursuant to Section 121(d)(4) of CERCLA, 42 U.S.C. § 9621(d)(4).

Detailed descriptions of the remedial alternatives presented in this ROD are described in EPA's Feasibility Study (FS) Report, dated September 15, 2016.

The timeframes presented below for each alternative reflect only the time required to construct or implement the remedy and do not include the time required to design the remedy, negotiate the performance of the remedy with any potentially responsible parties, or procure contracts for design and construction.

The cost estimates, which are based on available information, are order-of-magnitude engineering cost estimates that are expected to be within +50 to -30 percent of the actual cost of the project.

Remedial alternatives were assembled by combining the retained remedial technologies and process options for the contaminated media and were evaluated in detail in the FS. The remedial alternatives are summarized below.

Common Elements

Several common elements are included as part of each active remedial alternative. Excluding five-year site reviews, which are statutorily required and thus are not part of any remedy, the common elements listed below do not apply to the No Action alternative (Alternative 1). The common elements for Alternatives 2 and 3 are as follows:

Pre-Design Investigation (PDI): The nature and extent of soil contamination in the vadose zone and groundwater contamination in the shallow saprolite underneath the PPI building would be fully delineated in a PDI. It is assumed that three new monitoring well pairs (total of six wells) would be installed in the saprolite during the PDI to define the extent of contamination. Design parameters also would be obtained during the PDI. However, because the costs of the PDI are incurred during the remedial design phase, the costs for the PDI, as with all remedial design costs, are not included as part of the estimate for the cost of the remedial alternatives;

Institutional Controls: Institutional controls, which include a well drilling restriction, would be used to restrict the use of the Site groundwater for potable use until performance standards are achieved;

Long-term Monitoring: A long-term monitoring program for the Site groundwater plume, surface water, and vapor would be instituted. The monitoring program should continue until concentrations have achieved remediation goals;

Five-Year Site Reviews: Per CERCLA, alternatives resulting in contaminants remaining above levels that, if attained, would otherwise allow for unrestricted use and unlimited exposure require that the Site be reviewed at least once every 5 years. If justified by the review, additional remedial actions may be implemented to remove, treat, or contain the contamination. The Site review would include evaluation of data collected from the long-term monitoring, a Site-wide visual inspection, and a report prepared by EPA;

Site Restoration: After the completion of all remedial actions, the soil vapor extraction wells, any other remedial wells, and soil vapor monitoring points would be properly abandoned. All the equipment and materials would be removed or demobilized. The Site would be restored to pre-remedial action conditions as much as possible, involving actions such as repairing the building slab and pavements and reseeding undeveloped areas disturbed by the remedy, and

EPA Region 2 Clean and Green Policy: The environmental benefits of the preferred remedy may be enhanced by giving consideration, during the design, to technologies and practices that are sustainable in accordance with EPA Region 2's Clean and Green Energy Policy. This will include consideration of green remediation technologies and practices.

Remedial Action Alternatives

Alternative 1: No Action

Capital Cost:	$0
O&M Costs:	$0
Present-Worth Cost:	$0
Construction Time:	Not Applicable

The NCP requires that a "No Action" alternative be developed and considered as a baseline for comparing other remedial alternatives. Under this alternative, there would be no remedial action conducted at the Site. This alternative does not include any monitoring or institutional controls. As mentioned above, because this alternative would result in contaminants remaining at the Site that are above levels that would otherwise allow for unrestricted use and unlimited exposure, CERCLA requires that if hazardous substances, pollutants, or contaminants remain on the Site post-remedy at levels above that which otherwise require no restrictions, the Site must be reviewed at least once every five years. If justified by the review, additional response actions may be implemented.

Alternative 2: Soil Vapor Extraction/Air Sparging (SVE/AS); Long-Term Monitoring; Institutional Controls

Capital Cost:	$1,703,000
Present Worth of O&M and Monitoring Costs:	$ 930,000
Present-Worth Cost:	$ 2,633,000
Construction Time:	7 months

In addition to the common elements (PDI, institutional controls, five-year Site reviews, and Site restoration) as described above, Alternative 2 consists of the following major activities:

- SVE system installation, operation, and maintenance
- AS pilot study
- Remedial design
- AS system installation, operation, and maintenance
- Performance evaluation

To address contaminants above the water table, vertical soil vapor extraction wells would be installed in the vadose zone to target the entire vadose zone contamination without extracting groundwater into the SVE wells. For cost-estimating purposes, it is assumed that 12 SVE wells would be installed as shown in Appendix VII, Figure 6. Piping for transferring the extracted soil vapor to the aboveground treatment system would be routed underground, along the wall, or overhead to minimize impact to routine building operations. Horizontal SVE pipes installed on the surface soils underneath the building would be considered during the PDI as a way to reduce the number of vertical SVE wells required for treatment.

The aboveground treatment system would be installed in a pre-fabricated unit brought into the PPI building on Site to treat the extracted soil vapor prior to discharge to the atmosphere. This system likely would consist of compressors, piping, an air-water separator, as necessary, and vapor phase activated carbon. Vapor discharged would meet Puerto Rico air discharge permit equivalency requirements.

For cost-estimating purposes, it is assumed the SVE system would be operated continuously for the first 2 years and intermittently for the following 8 years. The air flow rate (vacuum) and concentrations of contaminant, oxygen, and carbon dioxide in the extracted vapor would be monitored regularly. Additional sampling and analysis also would be conducted in order to meet the air emission permit equivalency requirements.

Under this alternative, AS wells would be installed to remove contamination from the saturated saprolite. The AS process would strip PCE from the groundwater. Volatilized PCE would then migrate into the vadose zone and be collected into the SVE system, which would be operated in conjunction with the AS. Vapor monitoring points would be installed in the vicinity of the sparge

zone to ensure the PPI building and nearby buildings are not affected by vapor intrusion from the AS process. The precise locations of the AS and SVE points would be confirmed during the remedial design. For cost estimating purposes, it is assumed the SVE and AS systems would be operated for approximately 10 years.

A pilot test would be required for SVE and AS to determine the flow rates, pressure, and radius of influence of each SVE and AS system location and, consequently, the number of SVE and AS points needed. The pilot test would also evaluate treatment of the collected vapors.

Data obtained during the RI, PDI, and pilot study would be used to develop the detailed approach for Site remediation during the design. All aspects necessary for implementing the remedial action would be considered, including, but not limited to, detailed layout of the treatment strategy and system, construction sequence, regulatory requirements, and cost estimates. For cost estimating purposes, it was conservatively assumed that vertical sparge points would have a 10-foot radius of influence and the horizontal sparge well would have a 13-degree angle of distribution. The density and layout of the sparge locations would be confirmed after the PDI.

For cost estimating purposes, it is assumed that both vertical and horizontal air sparge wells would be installed as presented in Appendix VII, Figures 7 and 8. Collected vapors would be added into the SVE treatment system. Air sparging would be operated in pulse mode, i.e., air sparging would be turned on and off at set durations.

Performance monitoring is critical to ensure that the SVE and AS systems are removing contaminants from the soils and groundwater plume and preventing the contamination from moving downgradient. The effectiveness of SVE in the vadose zone soil will be evaluated by collecting soil samples. The effectiveness of AS in the groundwater would be confirmed with groundwater monitoring.

Alternative 3: Soil Vapor Extraction and *In-Situ* Treatment; Long-Term Monitoring; Institutional Controls

Capital Cost:	$2,222,000
Present Worth of O&M and Monitoring Costs:	$ 799,000
Present-Worth Cost:	$ 3,021,000
Construction Time:	10 months

In addition to the common elements (PDI, institutional controls, five-year Site reviews, and Site restoration) as described above, Alternative 3 consists of the following major activities:

- SVE system installation, operation, and maintenance (similar to Alternative 2)
- *In-situ* treatment method treatability studies and pilot study
- Remedial design
- *In-situ* treatment application
- Performance evaluation

Under Alternative 3, the groundwater plume contaminated with PCE concentrations above the remediation goals in the saprolite would be remediated using *in situ* treatment. For cost-estimating purposes, *in-situ* enhanced anaerobic bioremediation (EAB) is selected as the representative *in situ* treatment process option. An electron donor would be injected using a direct push technology rig into boreholes from a depth of 10 to 30 feet bgs. For cost estimating purposes, it was assumed that the injection points would have a radius of influence of 9 feet, and a second round of injections would be conducted 3 years after the first round. Based on results of the pilot study, SVE and *in-situ* treatment would either be sequenced or designed to function in a coordinated fashion.

A laboratory treatability study would be conducted to identify the most effective amendment type and strength to be injected. A pilot test would be required to determine the *in-situ* treatment rates, pressure, and radius of influence of each injection location, and, consequently, the number of injection points needed. The pilot test would also evaluate the *in situ* effectiveness of the chosen amendment as well as identify design parameters that would inhibit the possibility of solubilized metals or deoxygenated groundwater migrating into the Río Viví.

In addition to the pilot testing required for *in-situ* treatment, other PDI, remedial design, and remedial performance monitoring are similar to Alternative 2.

COMPARATIVE ANALYSIS OF ALTERNATIVES

In selecting a remedy for a site, EPA considers the factors set forth in Section 121 of CERCLA, 42 U.S.C. § 9621, and conducts a detailed analysis of the viable remedial alternatives in accordance with the NCP, 40 C.F.R Section 300.430(e)(9), EPA's *Guidance for Conducting Remedial Investigations and Feasibility Studies*, OSWER Directive 9355.3-01, and EPA's *A Guide to Preparing Superfund Proposed Plans, Records of Decision, and Other Remedy Selection Decision Documents*, OSWER 9200.1-23.P. The detailed analysis consists of an assessment of the individual alternatives set forth in the FS against each of the nine evaluation criteria set forth at Section 300.430(e)(9)(iii) of the NCP, and a comparative analysis focusing upon the relative performance of each alternative against those criteria.

A comparative analysis of these alternatives, based upon the nine evaluation criteria noted below, follows.

Threshold Criteria *- The first two remedy selection criteria are known as "threshold criteria" because they are the minimum requirements that each response measure must meet in order to be eligible for selection as a remedy.*

Overall Protection of Human Health and the Environment

"Overall Protection of Human Health and the Environment" determines whether an alternative eliminates, reduces, or controls threats to public health and the environment through institutional controls, engineering controls, or treatment.

PCE is currently present above remediation goals or screening criteria in soil, vapor, groundwater, and surface water, and it poses a risk to future residential users of groundwater. The No Action alternative would not be protective of human health and the environment because to take no action would mean that nothing will be taken to remediate or monitor contamination and risk. Alternatives 2 and 3 would be protective of human health and the environment since they involve active treatment of the contamination in soil and groundwater until the RAOs and remediation goals are met. Institutional controls would be implemented to restrict future residential use of groundwater at the Site until remediation goals are met.

Compliance with ARARs, to be Considered (TBCs), and other Guidance

Section 121(d) of CERCLA, 42 U.S.C. § 9621(d), and Section 300.430(f)(1)(ii)(B) of the NCP, 40 C.F.R. § 300.430(f)(1)(ii)(B), require that remedial actions at CERCLA sites at least attain legally applicable or relevant and appropriate federal and state requirements, standards, criteria, and limitations, collectively referred to as "ARARs," unless such ARARs are waived under Section 121(d)(4) of CERCLA. "Compliance with ARARs" addresses whether a remedy will meet all ARARs or whether there is a basis for invoking a waiver.

As groundwater is a potential source of drinking water, federal MCLs are chemical-specific ARARs. Alternative 1 would not take any measures to evaluate future compliance with ARARs. It is anticipated that Alternatives 2 and 3 will reach compliance with chemical-specific ARARs through active treatment. A list of chemical-specific, location-specific, and action-specific ARARs can be found in Tables 7, 8 and 9, respectively, in Appendix VIII of this ROD.

Primary Balancing Criteria *- The next five remedy selection criteria, 3 through 7, are known as "primary balancing criteria." These five criteria are factors with which tradeoffs between response measures are assessed so that the best option will be chosen, given site-specific data and conditions.*

Long-Term Effectiveness and Permanence

"Long-term Effectiveness and Permanence" considers the ability of an alternative to maintain protection of human health and the environment over time.

Alternative 1 does not provide long-term effectiveness or permanence as no active remedial measure is proposed. Alternatives 2 and 3 would permanently and irreversibly reduce groundwater and soil PCE concentrations through active treatment and, consequently, reduce vapor and surface water contamination because soil and groundwater are the sources of contamination in these media. Residual risk would be within EPA's acceptable risk range for Alternatives 2 and 3. It is anticipated that Alternatives 2 and 3 will provide long-term effectiveness and permanence.

Reduction in Toxicity, Mobility, or Volume Through Treatment

"Reduction in Toxicity, Mobility, or Volume of Contaminants through Treatment" evaluates an alternative's use of treatment to reduce the harmful effects of principal contaminants, their ability to move in the environment, and the amount of contamination present.

The No Action alternative would not monitor and evaluate the reduction of contaminant toxicity, mobility, or volume through natural processes because no remedial action would be conducted. Alternatives 2 and 3 would reduce toxicity and volume through treatment in soil, groundwater, and soil vapor and is intended to achieve the remedial goals. Mobility of contamination in the vapor phase would be reduced with the SVE system.

Short-Term Effectiveness

"Short-term Effectiveness" considers the length of time needed to implement an alternative and the risks the alternative poses to workers, residents, and the environment during implementation.

Alternative 1 would not have short-term impacts because no action would be implemented. There would be some minor short-term impacts to the local community and workers with Alternatives 2 and 3 because of the active remedial actions undertaken and associated construction and operation. Alternative 2 would require a larger footprint and longer operations and maintenance (O&M) than Alternative 3 because it would combine air sparge with the SVE system. Alternative 3 may cause short-term impacts to the Río Viví if solubilized metals (primarily iron, manganese, and arsenic) and deoxygenated groundwater enter the river via groundwater discharge. A pilot test would be needed to determine the potential of these impacts to occur and the effectiveness of any mitigation measures (*e.g.*, impacts may be short-lived because the amendment and soluble metals may degrade and disperse quickly in the upon reaching surface water and reduced iron and manganese would precipitate in the aerobic conditions of the river).

Both Alternative 2 and Alternative 3 would require that equipment be brought indoors to install the SVE system and, for Alternative 3, to inject amendment through the building floor into contamination present under the building; this would require coring multiple holes in the floor, which may weaken the floor structure. Alternative 3 likely would require a shorter timeframe because the injected amendment could enter low-permeability zones (by diffusion, and also during the injection if shear-thinning fluids are used) and attack contamination that may be hidden from the sparge bubbles that would be used in Alternative 2, so the injected amendment would be more effective in treating the more permeable zones. For both alternatives, a pilot study would be needed to evaluate amendment distribution during *in situ* treatment injections or the zone of influence of air sparge points; timeframes could be lengthened if the heterogeneous geology impedes the ability to distribute air bubbles or amendment into contaminated zones (especially low-permeability zones). Additionally, for *in-situ* treatment, timeframes could become extended if the rate of contaminant destruction is modulated by dissolution rates of any residual dense non-aqueous phase liquid (DNAPL)[2].

[2] DNAPLs were not detected during the RI; however, PCE is often found as a DNAPL at sites with releases like this, and its presence even in small areas can complicate remedy implementation.

Implementability

"Implementability" addresses the technical and administrative feasibility of a remedy from design through construction and operation. Factors such as availability of services and materials, administrative feasibility, and coordination with other governmental entities are also considered.

All the alternatives are implementable. Alternative 1 would be easiest to implement, both technically and administratively, as there are no activities to implement. Alternatives 2 and 3 are implementable, although each presents some challenges.

Both Alternatives 2 and 3 are implementable but would require careful design as a result of space limitations and the potential for flooding from the adjacent river. It may also be difficult to distribute air bubbles or amendment to all the contaminated zones of the Site because of heterogeneous geology, especially the presence of any low permeability contaminated zones. Alternative 3 may be more difficult to implement then Alternative 2 as a consequence of three challenges: (1) it is unknown if the building floor structure can support the coring of multiple holes through the floor, (2) it is unknown if equipment that can be operated indoors is also capable of reaching the full depth of the contaminated zone, and (3) there is the potential for discharge into the river of soluble reduced metals and deoxygenated groundwater formed during anaerobic bioremediation.

Cost

"Cost" includes estimated capital and annual operation and maintenance costs, as well as present worth cost. Present worth cost is the total cost of an alternative over time in terms of today's dollar value. Cost estimates are expected to be accurate within a range of +50 to -30 percent. This is a standard assumption in accordance with EPA guidance.

The estimated capital costs, operation and maintenance (O&M) costs, and present worth costs for the alternatives are discussed in detail in EPA's FS Report. The cost estimates are based on the best available information. Alternative 1 has no cost because no activities are proposed. The present worth cost, using a discount rate of 7 percent, for Alternatives 2 and 3, are as follows:

Alternative	Estimated Capital Costs	Present Worth of O&M and Monitoring costs	Total Present Worth
1	$0	$0	$0
2	$1,703,000	$930,000	$2,633,000
3	$2,222,000	$799,000	$3,021,000

Modifying Criteria *- The final two remedy selection criteria, 8 and 9, are called "modifying criteria" because new information or comments from the state or the community on the Proposed Plan may modify the preferred response measure or cause another response measure to be considered.*

State/Support Agency Acceptance

"State/Support Agency Acceptance" considers whether the State and/or Support Agency agrees with the EPA's analyses and recommendations.

PREQB concurs with the selected remedy.

Community Acceptance

"Community Acceptance" considers whether the local community agrees with the EPA's analyses and preferred alternative. Comments received on the Proposed Plan are an important indicator of community acceptance.

EPA solicited input from the community on the remedial alternatives proposed for the Site. The preferred alternative was presented to the community in the Proposed Plan. A public comment period opened on July 13, 2017, and a request for an extension to the original 30-day public comment period was received on July 20, 2017. A public notice providing the revised comment period dates was published in the Primera Hora on August 7, 2017. With this extension request the public comment period ran from July 13 to September 12, 2017. In addition, a public meeting was held on July 20, 2017. During the comment period, one comment letter was received. A copy of the comment letter is provided in Appendix VI. A summary of significant comments contained in the letter and the comments received at the public meeting on July 20, 2017, as well as EPA's responses to those comments, are provided in the Responsiveness Summary (Appendix VI).

PRINCIPAL THREAT WASTES

The NCP establishes an expectation that EPA will use treatment to address the principal threats posed by a site wherever practicable (40 C.F.R. § 300.430(a)(1)(iii)(A)). The "principal threat" concept is applied to the characterization of "source materials" at a Superfund site. A source material is material that includes or contains hazardous substances, pollutants, or contaminants that act as a reservoir for the migration of contamination to groundwater, surface water, or air, or act as a source for direct exposure. Principal threat wastes are those source materials considered to be highly toxic or highly mobile that generally cannot be contained in a reliable manner or would present a significant risk to human health or the environment should exposure occur. The decision to treat these wastes is made on a site-specific basis through detailed analysis of alternatives, using the remedy selection criteria described above. The manner in which principal threat wastes are addressed provides a basis for making a statutory finding as to whether the remedy must employ treatment as a principal element.

Contaminated soil was detected at the Site along with elevated soil vapor concentrations, indicating that source material containing volatile, mobile contaminants is present in the vadose zone. While DNAPL was not directly observed at the Site, areas of elevated groundwater concentrations near the expected points of discharge were observed, and subsurface transport of contamination downgradient of these points has occurred. These observations indicate that principal threat waste in the form of mobile source materials (i.e., contaminated vadose zone soil and highly contaminated groundwater) are likely to be present at the Site. Both Alternatives 2 and 3 use active remediation to permanently treat principal threat waste.

SELECTED REMEDY

Description of the Selected Remedy

EPA's selected remedy is Alternative 2, Soil Vapor Extraction/Air Sparging (SVE/AS); Long-Term Monitoring; Institutional Controls. The AS process involves the injection of air into the contaminated aquifer. Injected air strips organic contaminants and helps to flush the contaminants into the unsaturated zone. An AS system, properly installed and operated, is generally most effective for removal of volatile, relatively insoluble organics from a highly permeable, relatively uniform sandy aquifer. If the mass of VOCs is great enough, SVE is frequently implemented in conjunction with AS to remove the vapor-phase contamination from the vadose zone by vacuum extraction and, if required, vapor treatment. The estimated present-worth cost of the preferred alternative is $2,633,000.

The major components of the remedy selected for the Site include the following:

- Installation of an SVE system to address contamination in the soils above the water table;
- Installation of an AS system to address groundwater contamination;
- Operation and maintenance of the combined SVE/AS systems;
- Long-term monitoring of the groundwater, surface water, and the potential for vapor migration to indoor air until the remediation goals are met; and
- Institutional controls to restrict use of the groundwater until remediation goals are met.

During remedial design, pilot testing will be required for SVE and AS to determine the flow rates, pressure, and radius of influence of each SVE and air sparge location and, consequently, the number of SVE and sparge points needed. Pilot testing will also evaluate treatment of the collected vapors. It is conservatively assumed the SVE/AS system will be operated for approximately 10 years. Hydraulic conductivity data collected during the remedial design will provide a better estimate of operation time.

The effectiveness of SVE in the vadose zone soil will be evaluated by collecting soil samples. The effectiveness of AS in the groundwater would be confirmed with groundwater monitoring.

In an effort to potentially enhance the environmental benefits of the selected remedies, consideration will be given, during the design, to technologies and practices that are sustainable, in accordance with EPA Region 2's Clean and Green Energy Policy.[3] This will include consideration of green remediation technologies and practices.

Rationale for the Selected Remedy

Based upon the requirements of CERCLA, the results of the RI, the detailed analysis of the alternatives, and public comments, EPA has determined that Alternative 2, Soil Vapor Extraction/Air Sparging; Long-Term Monitoring; Institutional Controls best satisfies the requirements of Section 121 of CERCLA, 42 U.S.C. § 9621, and provides the best balance of tradeoffs among the remedial alternatives with respect to the nine evaluation criteria, as set forth in Section 300.430(e)(9) of the NCP.

The selected remedy provides the best balance of trade-offs based on the information available to EPA at this time. EPA and EQB expect the preferred alternative to satisfy the following statutory requirements of Section 121(b) of CERCLA: (1) be protective of human health and the environment; (2) comply with ARARs; (3) be cost effective; (4) utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable; and (5) satisfy the preference for treatment as a principal element.

Alternative 1 (No Action) was not selected because it is not protective of human health and the environment. While Alternative 2 (SVE/AS) and Alternative 3 (SVE and In-Situ Treatment) are both proven technologies to actively remediate VOC-contaminated groundwater and saturated soils, Site-specific considerations and impediments make Alternative 3 less suitable for addressing Site soil and groundwater RAOs. Under Alternative 3, to reach contamination under the building, injection of amendment would need to be carried out using direct push technology and injection equipment inside the building. It is unknown if the building floor can support the coring of many holes through the floor for the injections. Short-term impacts may occur to the Río Viví if solubilized reduced metals or deoxygenated groundwater created under anaerobic conditions by *in situ* treatment migrate into the river. Alternative 2, the selected remedy, would have minimal short-term impacts as a result of the system installation. The air sparge points would be installed using drilling methods directly in the target remediation zone or, if horizontal drilling methods are used, from neighboring parcels. The SVE wells would be installed at the ground surface directly in the target remediation zone. Alternative 2 can be implemented with fewer challenges than Alternative 3, and at lower cost.

Estimated Selected Remedy Costs

The estimated capital, O&M, and present worth costs of the selected remedy are discussed in detail in EPA's September 2016 FS Report. The cost estimates, which are based on available information, are order-of-magnitude engineering cost estimates that are expected to be within +50 to -30 percent of what the actual cost of the project will be. Changes to the cost estimate can occur as a result of new information and data collected during the design of the remedy.

[3] See https://www.epa.gov/greenercleanups/epa-region-2-clean-and-green-policy

A cost estimate summary for the selected remedy is presented in Table 10 in Appendix VIII. The estimated capital, annual O&M, and total present-worth costs are presented below:

Capital Cost:	$1,703,000
Present-worth of O&M and Monitoring Costs:	$ 930,000
Present-Worth Cost:	$ 2,633,000

Expected Outcomes of the Selected Remedy

The selected remedy actively addresses the contamination identified in the soils and groundwater at the Site. Remediation of the sources of groundwater contamination at the Site will address principal threat waste material that acts as a reservoir for continued contamination of the groundwater. The selected remedy will restore the aquifer in the Site area. The results of the risk assessment indicate excess cancer risk and non-cancer health hazards associated with future human ingestion of ground water above acceptable levels under baseline conditions. The response action selected in this ROD will eliminate risks associated with this pathway. Achieving the cleanup levels will restore the aquifer to its beneficial use. The active treatment of soil and groundwater would reduce or eliminate concentrations in surface water because groundwater discharge is the source of surface water contamination. Risks from the residual contamination would be within EPA's acceptable risk range.

STATUTORY DETERMINATIONS

Section 121(b)(1) of CERCLA mandates that a remedial action must be protective to human health and the environment, cost-effective, and utilize permanent solutions and alternative treatment technologies to the maximum extent practicable. Section 121(b)(1) also establishes a preference for remedial actions which employ treatment to permanently and significantly reduce the volume, toxicity, or mobility of the hazardous substances, pollutants, or contaminants at the Site. 121(d) further specifies that a remedial action must attain a degree of cleanup that satisfies ARARs under federal and state laws, unless a waiver can be justified pursuant to 121(d)(4). For the reasons discussed below, EPA has determined that the selected remedy meets the requirements of Section 121 of CERCLA.

Overall Protection of Human Health and the Environment

This alternative would provide protection of human health and the environment. SVE/AS would remove the contaminants from soil and groundwater permanently and, consequently, would reduce or eliminate contamination in soil gas and surface water. The remaining low contaminant concentrations after the completion of the active treatment are expected to be reduced through natural processes such as dilution, dispersion, and volatilization. During remediation, exposure to groundwater would be prevented through institutional controls. This alternative would meet the RAOs for soil, groundwater, and surface water. Institutional controls would eliminate the exposure pathway for contaminated groundwater to local receptors before the RAOs and the remedial goals are achieved.

There is no direct contact risk to human health under current conditions. SVE/AS would permanently remove contamination by stripping contaminants from groundwater and soil although effectiveness may be limited in spots if the heterogeneous geology of the saprolite inhibits the movement of air bubbles through contaminated zones. The extracted soil gas, which includes PCE, would be treated to remove contamination prior to its release to the atmosphere. PCE adsorbed to the vapor phase carbon would be treated (i.e., destroyed) during the vapor phase carbon regeneration process. This alternative would achieve groundwater remedial goals and the soil remedial goals derived from chemical-specific ARARs for protection of groundwater and to address the potential for vapor intrusion into occupied buildings.

PCE would be permanently removed from Site media. The treatment process is not reversible. Institutional controls will prevent exposure to contaminated groundwater above remediation goals during remedy implementation. The long-term monitoring program and five-year review would assess the contamination conditions and determine the operational timeframe of the remedy.

Compliance with ARARs

The selected remedy will comply with chemical-specific ARARs for groundwater. Remedial goals were derived from chemical-specific ARARs for protection of groundwater and to address the potential for vapor intrusion into occupied buildings. This alternative would be designed and implemented in compliance with location- and action-specific ARARs identified in Tables 7, 8, and 9.

Cost Effectiveness

A cost-effective remedy is one whose costs are proportional to its overall effectiveness (40 C.F.R. § 300.430(f)(1)(ii)(D)). Overall effectiveness is based on the evaluations of long-term effectiveness and permanence, reduction in toxicity, mobility, and volume through treatment, and short-term effectiveness.

Each of the alternatives underwent a detailed cost analysis. In that analysis, capital and annual O&M costs were estimated and used to develop present-worth costs. In the present-worth cost analysis, annual O&M costs were calculated for the estimated life of each alternative. The total estimated present worth cost for implementing the selected remedy is $2,633,000.

Based on the comparison of overall effectiveness to cost, the selected remedy meets the statutory requirement that Superfund remedies be cost effective (40 C.F.R. § 300.430(f)(1)(ii)(D)) in that it represents reasonable value for the money to be spent. Overall effectiveness was evaluated by assessing three of the five balancing criteria in combination (long-term effectiveness and permanence; reduction in toxicity, mobility, and volume through treatment; and short-term effectiveness). Overall effectiveness was then compared to costs to determine cost-effectiveness. The overall effectiveness of the selected remedy has been determined to be proportional to the costs, and the selected remedy therefore represents reasonable value for the money to be spent.

Utilization of Permanent Solutions and Alternative Treatment (or Resource Recovery) Technologies to Maximum Extent Practicable

The selected remedy complies with the statutory mandate to utilize permanent solutions, alternative treatment technologies, and resource recovery alternatives to the maximum extent practicable. Of those alternatives that are protective of human health and the environment and comply with ARARs (or provide a basis for invoking an ARAR waiver), EPA has determined that the selected remedy provides the best balance of tradeoffs among the alternatives with respect to the balancing criteria set forth in Section 300.430(f)(1)(i)(B) of the NCP, because they each represent the maximum extent to which permanent solutions and treatment technologies can be utilized in a practicable manner at this Site. The selected remedy satisfies the criteria for long-term effectiveness and permanence by permanently reducing the mass of contaminants in the soil and groundwater at the Site, thereby reducing the toxicity, mobility, and volume of contamination.

The selected remedy is implementable because it employs standard technologies that are readily available.

Preference for Treatment as a Principal Element

Through the use of air sparge and soil vapor extraction technologies, the selected remedy satisfies the statutory preference for remedies that employ treatment as a principal element. The volume and toxicity of contaminated groundwater and soil would be reduced by the stripping of contamination. The mobility of soil vapor would be controlled by the vacuum applied to the treatment area through the SVE well system, which would prevent vapor migration.

Five-Year Review Requirements

Because this remedy will not result in hazardous substances, pollutants, or contaminants remaining at the Site above levels that allow for unlimited use and unrestricted exposure, but it will take more than five years to attain the remediation goals, EPA will conduct a review within five years of construction completion for the Site to ensure that the remedy is, or will be, protective of human health and the environment.

Short-Term Effectiveness

This alternative would have minimal short-term impacts because of the nature of the system installation and O&M of the SVE and AS systems, including regular change outs of filter media. The air sparge points would be installed using drilling methods directly in the target remediation zone or, if horizontal drilling methods are used, from neighboring parcels. The SVE wells would be installed at the ground surface directly in the target remediation zone. Engineering controls would be established to minimize the impact while the use of personal protective equipment by workers would minimize exposure.

Implementability

Challenges to technical feasibility include flooding risk, difficulties associated with drilling in weathered rock geology, and space limitations in sealing the SVE wells underneath the PPI building. Flooding risks would be addressed by halting operation during floods, which may increase time to reach remediation goals. If subsurface sparge points or SVE wells meet refusal during installation (as occurred infrequently during the RI), the points would be moved and re-drilled until no refusal was met. If a horizontal well is installed, a drill rig specially equipped to drill through rock formations could be required. Issues with sealing SVE wells to prevent short-circuiting under the building would be addressed through bentonite or concrete injections or plastic coverings over the exposed soil underneath the building.

Services and materials would be readily available. Specialized equipment would be shipped from the U.S. mainland for additional costs. Challenges to administrative feasibility include requiring access to the adjacent school and the Puerto Rico Telephone property for drilling the horizontal well.

DOCUMENTATION OF SIGNIFICANT CHANGES

The Proposed Plan for the Site was released for public comment on July 13, 2017, and the public comment period ran from that date through September 12, 2017. The Proposed Plan identified the selected remedy as the Preferred Alternative for the Site.

All written and verbal comments submitted during the public comment period were reviewed by EPA. Upon review of these comments, EPA has determined that no significant changes to the remedy, as it was originally identified in the Proposed Plan, are necessary.

APPENDIX I

PAPELERA PUERTIRRIQUEÑA INC. SUPERFUND SITE
PROPOSED PLAN

Papelera Puertorriqueña Inc. Superfund Site

Utuado, Puerto Rico
July 13, 2017
EPA Region 2

EPA ANNOUNCES PROPOSED CLEANUP PLAN

This Proposed Plan describes the remedial alternatives developed for the Papelera Puertorriqueña Inc. Superfund Site (Site), located in Utuado, Puerto Rico, and identifies the preferred remedy for the Site with the rationale for this preference. This document was developed by the U.S. Environmental Protection Agency (EPA), the lead agency for Site activities, in consultation with the Puerto Rico Environmental Quality Board (PREQB), the support agency. EPA is issuing this Proposed Plan as part of its public participation responsibilities under Section 117(a) of the Comprehensive Environmental Response, Compensation, and Liability Act, 42 U.S.C. § 9617(a) (CERCLA, commonly known as Superfund) and Sections 300.430(f) and 300.435(c) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP).

EPA added the Site to the National Priorities List (NPL) on September 23, 2009. The Site was used to manufacture paper bags, cardboard boxes, and plastic bags for approximately 46 years. Evidence of past discharges at this Site has demonstrated contamination of the groundwater, surface water, porewater, and soil by tetrachloroethene (PCE). Two sources of PCE contamination were identified in two different areas of the Site (a former development room and a drainage feature). The nature and extent of contamination at the Site is described in the Remedial Investigation (RI) Report, dated June 29, 2017. The remedial alternatives summarized in this plan are described in EPA's Feasibility Study (FS) Report, dated June 29, 2017. In order to satisfy federal regulations pertaining to selecting a

MARK YOUR CALENDAR

PUBLIC MEETING
July 20, 2017 - 5:00 pm to 7:00 pm
Municipal Legislature Conference Room
Calle Betances #18
Utuado, Puerto Rico 00641

PUBLIC COMMENT PERIOD
July 13, 2017 to August 12, 2017

PUBLIC REPOSITORIES
The Administrative Record file, which contains copies of the Proposed Plan and supporting documentation, is available at the following locations:

Utuado City Hall
Mayor's Office
Calle Antonio R. Barceló #27
Utuado, Puerto Rico 00641
Tel. (787) 894-3505
Hours: **Monday – Friday 8:00 am to 4:30 pm**

U.S. Environmental Protection Agency
City View Plaza II- Suite 7000
#48 PR-165 Km. 1.2
Guaynabo, Puerto Rico 00968-8069
Tel. (787) 977-5865
Hours: **Monday – Friday 9:00 am to 5:00 pm**
(By appointment)

Puerto Rico Environmental Quality Board
Emergency Response and Superfund Program
Edificio de Agencias Ambientales Cruz A. Matos
Urbanización San José Industrial Park
1375 Avenida Ponce de León
San Juan, PR 00926-2604
Tel. (787) 767-8181 ext. 3207
Hours: **Monday – Friday 9:00 am to 3:00 pm**
(By appointment)

U.S. EPA Records Center, Region 2
290 Broadway, 18th Floor
New York, New York 10007-1866
Tel. (212) 637-4308
Hours: **Monday to Friday – 9:00 am to 5:00 pm**
Or visit the website: www.epa.gov/superfund/papelera

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remedy under CERCLA, this information has been included in the Administrative Record file of this action, as well as other documents. EPA encourages the public to review these documents to gain a more comprehensive understanding of the Site and the Superfund activities that have been conducted.

The purpose of this Proposed Plan is to inform the public of EPA's preferred alternative and to solicit public comments pertaining to all of the remedial alternatives evaluated, including the preferred alternative. The preferred alternative includes the following: Soil Vapor Extraction (SVE) and Air Sparging (AS).

Changes to the preferred alternative, or a change from the preferred alternative to another remedial alternative described in this Proposed Plan, may be made if public comments or additional data indicate that such a change will result in a more appropriate remedial action. The final decision regarding the selected remedy will be made after EPA has taken into consideration all public comments. For this reason, EPA is soliciting public comments on all of the alternatives considered in the Proposed Plan because EPA may select a remedy other than the preferred alternative.

COMMUNITY ROLE IN SELECTION PROCESS

EPA relies on public input to ensure that the concerns of the community are considered in selecting an effective remedy for each Superfund site. To this end, this Proposed Plan has been made available to the public for a 30-day public comment period which begins with the issuance of this Proposed Plan and concludes on August 12, 2017.

EPA is providing information regarding the investigation and cleanup of the Site to the citizens through a public meeting and the public repositories. The public repositories contain the Site's administrative record file. EPA encourages the general public, particularly the Utuado community, to visit the public repositories to gain a more comprehensive understanding of the Superfund activities that have been conducted at the Site and the rationale used to select the preferred remedy.

EPA will hold a public meeting during the comment period to provide information regarding the environmental investigations conducted at the Site, the alternatives considered, and the preferred remedy. In addition, the community will have an opportunity to ask questions about the process and to provide comments on the proposed remedy. All comments received during the 30-day public comment period will be documented in the Responsiveness Summary Section of a Record of Decision (ROD) for the Site. A ROD is a document that formalizes the selection of the remedy for a Superfund site.

All written comments on this Proposed Plan should be addressed to:

Luis E. Santos
Remedial Project Manager
U.S. Environmental Protection Agency
City View Plaza II - Suite 7000
48 RD, 165 Km. 1.2
Guaynabo, Puerto Rico 00968-8069
Telephone: (787) 977-5869
E-mail: santos.luis@epa.gov

SCOPE AND ROLE OF ACTION

EPA is addressing the Site comprehensively. The contamination associated with this Site has been defined in sufficient detail to complete the required RI/FS and Baseline Risk Assessment reports.

SITE BACKGROUND

Site Description and History

The Site is an active manufacturing facility located in the downtown area of the municipality of Utuado and is approximately 40 feet northeast of the Río Viví. The facility consists of five concrete buildings on a 1.6-acre lot. The main structure is divided into areas for manufacturing processes, storage, and offices. The surrounding area includes

commercial businesses, public schools, and residences (Figure 1).

For 46 years, the facility manufactured paper bags, cardboard boxes, and plastic bags. Currently, the facility only manufactures paper bags. Historical manufacturing processes involved water-based and oil-based inks, high-density polyethylene pellets (resin pellets), ethyl acetate, and isopropanol. PCE, butanol, and various developer and fixer solutions were used to prepare flexography plates used in printing manufactured bag labels. The developer and fixer solutions contained ammonium, quinone, chloride, carbonate, sulfur, and formaldehyde-based compounds. Inks historically contained alcohol and methyl-based compounds, along with PCE and xylene.

In previous investigations conducted at the Site by the PREQB in 1998, 2000, 2001, and 2006, PCE was detected in water samples in the Río Viví and in surface and subsurface soil samples. Other hazardous substances historically detected at the Site include benzene, toluene, trichloroethene (TCE), ethylbenzene, 1,2-dichloroethane and various metals.

The facility has been inspected periodically by PREQB since March 1984, when the facility accidentally discharged liquids containing residues and inks into the Río Viví. During the inspections conducted between 1993 and 2003, PREQB observed the following:

- Several drums containing hazardous substances (such as ammonia, butanol, ethyl acetate, sodium cyanide, sulfuric acid, PCE, and TCE) stored without secondary containment;
- Several holes in the floor; and
- a sink located in a manufacturing area (development room) draining into a hole in the floor.

According to PREQB and facility employees, hazardous substances were often discharged through the holes in the floor. In addition, PREQB observed the facility discharging unknown liquids into the Río Viví.

Between 1998 and 2006, PREQB conducted several investigations in response to complaints, emergency calls, and also conducted site assessment activities. Surface water, surface soil, septic tank soil, septic tank sludge, soil, sediment, and wastewater samples were collected during these investigations. Multiple hazardous compounds were found, including PCE, TCE, benzene, chromium, and copper.

Geology and Hydrogeology

The Site is situated within the Río Viví floodplain, bounded to the north and south by highlands of predominantly granodiorite rocks known as the Utuado Pluton.

The soils underlying the Site are alluvial deposits in the Río Viví river valley and are made up of fine sandy silt near the surface, composed of more silty-rich clay with depth and an increased density of weathered rock as the soil transitions to saprolite, a weathered bedrock layer. The saprolite is a heterogenous unit as the density of weathered bedrock increases with depth. Underlying the saprolite is the Utuado Pluton which is predominantly composed of fractured granodiorite but also includes quartz diorite, quartz monzonite, diorite, and gabbro. RI investigations did not reach the bedrock since the vertical depth of contamination was defined above this unit.

Groundwater flow direction follows the topography from the highlands that border the river valley and discharges to the Río Viví.

While the primary water bearing unit underlying the Site occurs in the saprolite, groundwater is also present in the shallow alluvial soils. Since the saprolite is a variable geologic unit in terms of the degree of weathered rock, the hydrogeologic properties also vary with depth. It is expected that groundwater flows in water bearing fractures of the Utuado Pluton, but cannot be verified since the bedrock was not assessed in this investigation.

Depth to water ranges from river level at the Río Viví (449.3 feet above mean sea level [amsl]) to 34.3 feet below ground surface (bgs) at the top of the slope of the Site (459.5 feet amsl).

Population and Land Use

According to the 2010 census, the municipality of Utuado is comprised of 114.73 square miles with a population of 33,149. Land use around the Site is primarily residential and commercial.

Ecology

Vegetation is restricted to a narrow strip along the southeastern side of the Site and the southwestern portion of the Site, along the riverbank. The riparian banks behind the Site property contains a relatively open canopy vegetative community. The Site, and the Río Viví along the boundaries, have limited vegetation and limited habitat for ecological receptors. Small fish and other wildlife were observed in the Río Viví along the Site boundary. In addition, both the U.S. Fish and Wildlife Service and the Puerto Rico Department of Natural and Environmental Resources reported that no federally listed or Puerto Rico listed or proposed threatened or endangered species are known to occur at the Site.

NATURE AND EXTENT OF CONTAMINATION

The nature and extent of contamination in Site media (groundwater, surface water, porewater, and soil) was assessed during the RI by collecting and analyzing samples, and then comparing analytical results to federal, Commonwealth, and Site-specific screening criteria. Four chemicals were identified as Site-related contaminants (SRCs): PCE, copper, lead, and mercury. PCE is the primary SRC. Secondary SRCs were also identified, these are copper, lead, and mercury and were consistent with background levels. Secondary SRCs are discussed but are not the focus of the RI evaluation.

The RI soil sampling results indicate that PCE contamination in soil is confined to two areas in the southwestern portion of the Site, at drainage feature #2 and a former development room, suggesting that disposal likely occurred in these areas (Figure 2). PCE contaminated soil in these areas appears to be localized, as evidenced by much lower levels in adjacent borings. The highest level of PCE (2,100 micrograms per kilogram [µg/kg]) was detected from 2 to 4 feet bgs in drainage feature #2. However, PCE levels in samples above and below this interval were below the screening criterion, suggesting that this elevated PCE level is either highly localized, or that contaminant migration follows a non-linear path. PCE levels in soils near the former development room south of the drainage feature #2 suggest potential residual contamination. Two elevated PCE concentrations (590 µg/kg at 0 to 2 feet bgs and 380 µg/kg at 2 to 4 feet bgs), located at the southeastern and southwestern walls of the former development room, respectively, provides additional evidence of PCE disposal. Three metals (copper, lead, and mercury) were detected in a former discharge area, around drainage feature #4, downgradient of drainage features #1 and #2, and near the former development room, at concentrations below or only slightly above screening criteria, background levels, or naturally-occurring levels.

The RI groundwater sampling indicated the presence of PCE concentrations at groundwater screening location, GW-02, (2,100 micrograms per liter (µg/L) at 6 to 11 feet bgs and 330 µg/L at 12 to 16 feet bgs), near drainage feature #2, indicating that contamination in this area has migrated downgradient toward the Río Viví (Figure 3). Detections of PCE below the screening criterion in another groundwater monitoring location, MW-02S/D, suggest the contaminant plume is mainly contained in the upper portion of the saprolite (10 to 16 feet bgs) and moves laterally rather than deeper in the saprolite. This lateral migration reflects the upward movement of the contaminant plume as it discharges into the Río Viví. In the former development room area, a groundwater screening location, GW-01, showed the highest PCE concentration (11,000J µg/L) in the shallow saprolite (8.5 to 12 feet bgs). PCE contamination appears to decrease dramatically in the deeper saprolite since an upward gradient reflects discharge into the Río Viví. Concentrations of three metals (copper, lead, and mercury) in monitoring well samples were present below screening criteria, indicating that

groundwater has not been impacted by Site-related metals.

The PCE results from Río Viví porewater sampling suggest discharge from groundwater to porewater in the riverbed is occurring near the southern corner of the Site (PZ-02) (Figure 4).

The highest PCE in surface water (13 µg/L) was just downstream of PZ-02. These results indicate that the PCE groundwater plume discharges into the Río Viví, especially near the former development room in the southern corner of the Site. PCE was not detected in any river sediment samples, indicating that PCE discharged into the Río Viví moves quickly and is not adsorbed to the Río Viví sediment. Three metals (copper, lead, and mercury) were detected in porewater, surface water, and sediment at concentrations below screening criteria, or comparable to upgradient levels.

The potential for vapors to enter the building from a process called vapor intrusion was also evaluated. The highest levels of PCE in sub-slab (beneath the building floor) and indoor air samples (SS-03/AI-03) were in the former development room, similar to soil and groundwater results (Figure 5). The sub-slab sample (670,000 micrograms per cubic meter (µg/m^3)) exceeded the PCE criterion, but the indoor air sample (23 µg/m^3) did not. Results indicate that PCE is present in the vadose zone below the former development room but has not migrated into the building at a significant level.

The main areas where secondary SRC contamination was identified include the drainage features and the former development room. Secondary SRC contamination appears to be restricted to soil and has not migrated to groundwater or the Río Viví (surface water, porewater, and sediment). Metal concentrations detected in soil above the RI screening criteria were consistent with background levels and are not major contributors of risks to human health or ecological receptors.

Conceptual Site Model

PCE was likely discharged to the ground through holes in the floor of the development room and through drainage features. PCE contamination is present in soil and groundwater at discharge locations, which are located both outside and inside the footprint of the building and in the crawl-space area under the development room (Figure 6). Residual contamination, protected from rainwater infiltration by the Site building, is unlikely to leach into groundwater. Outside the building footprint, rainwater infiltrating through contamination in the vadose zone is likely to result in the transfer of contaminant mass from the vadose zone to the underlying groundwater. Residual contaminant mass in the unsaturated zones is subject to volatilization and is likely the source of PCE detections in sub-slab and indoor-air vapor samples.

Groundwater contamination (up to 11,000 µg/L) was detected underneath the contaminated vadose zone. The highly heterogeneous saprolite structure and the complex groundwater flowpaths suggest the possibility that significant contaminant mass may still be present in pore space not connected to zones with mobile, faster flowing groundwater. This mass would be expected to persist for a lengthy time period under current Site conditions because RI data indicate that biodegradation is negligible at the Site and residual Dense Non-Aqueous Phase Liquid (DNAPL) may be present.

Groundwater contamination is primarily in the upper saprolite zone, and the observed upward gradient in paired wells and the presence of PCE in porewater and surface water indicate that the plume discharges to the Rio Viví. Therefore, significant migration of contamination deeper into the saprolite aquifer is unlikely.

Principal Threat Waste

The principal threat waste concept is applied to the characterization of source materials at a Superfund site. A detailed explanation of principle threat wastes can be found in the box below, entitled "What is a Principle Threat?"

WHAT IS A "PRINCIPAL THREAT"?

The NCP establishes an expectation that EPA will use treatment to address the principal threats posed by a site wherever practicable (NCP Section 300.430(a) (1) (iii) (A)). The "principal threat" concept is applied to the characterization of "source materials" at a Superfund site. A source material is material that includes or contains hazardous substances, pollutants or contaminants that act as a reservoir for migration of contamination to ground water, surface water or air, or acts as a source for direct exposure. Contaminated ground water generally is not considered to be a source material; however, Non-Aqueous Phase Liquids (NAPLs) in ground water may be viewed as source material. Principal threat wastes are those source materials considered to be highly toxic or highly mobile that generally cannot be reliably contained, or would present a significant risk to human health or the environment should exposure occur. The decision to treat these wastes is made on a site-specific basis through a detailed analysis of the alternatives using the nine remedy selection criteria. This analysis provides a basis for

Contaminated soil was detected at the site along with elevated soil vapor concentrations, indicating that source material containing volatile, mobile contaminants is present in the vadose zone. While DNAPL was not directly observed at the site, areas of elevated groundwater concentrations near the expected points of discharge were observed, and subsurface transport of contamination downgradient of these points has occurred. These observations indicate that principal threat waste in the form of mobile source materials (i.e., contaminated vadose zone soil and highly contaminated groundwater) are likely to be present at the site.

SUMMARY OF SITE RISKS

The purpose of the risk assessment is to identify potential cancer risks and noncancer health hazards at the Site, assuming that no further remedial action is taken. A baseline human health risk assessment was performed to evaluate current and future cancer risks and noncancer health hazards based on the results of the RI.

A screening-level ecological risk assessment (SLERA) was also conducted to assess the risk posed to ecological receptors due to Site-related contamination.

Human Health Risk Assessment

As part of the RI/FS, a baseline human health risk assessment (HHRA) was conducted to estimate the risks and hazards associated with the current and future effects of contaminants on human health and the environment. A baseline HHRA is an analysis of the potential adverse human health effects caused by hazardous-substance exposure in the absence of any actions to control or mitigate these under current and future land uses.

A four-step HHRA process was used for assessing Site-related cancer risks and noncancer health hazards. The four-step process is comprised of: Hazard Identification (HI) of Chemicals of Potential Concern (COPCs), Exposure Assessment, Toxicity Assessment, and Risk Characterization (see box entitled "What is Risk and How is it Calculated?").

The baseline HHRA began with selecting COPCs in the various media (i.e., surface soil, surface water, sediment and groundwater, including vapor intrusion) that could potentially cause adverse health effects in exposed populations. The current and future land use scenarios for the Site included the following exposure pathways and populations:

- Worker: current and future ingestion, dermal contact and inhalation of surface soil and indoor air.
- Recreational User: adolescent current and future ingestion and dermal contact with surface soil and surface water and sediment from the Rio Viví.
- Day Care Staff: current and future inhalation of indoor air from vapor intrusion.
- Day Care Student: current and future inhalation of indoor air from vapor intrusion.

- Residents (adult/child): future ingestion, dermal contact and inhalation of vapors from residential use of untreated groundwater.
- Construction Worker: future ingestion, dermal contact and inhalation of surface and subsurface soil.

In this assessment, exposure point concentrations were estimated using either the maximum detected concentration of a contaminant or the 95% upper-confidence limit of the average concentration. Chronic daily intakes were calculated based on the reasonable maximum exposure (RME), which is the highest exposure reasonably anticipated to occur at the site. The RME is intended to estimate a conservative exposure scenario that is still within the range of possible exposures. Central tendency exposure (CTE) assumptions, which represent typical average exposures, were also developed. A complete summary of all exposure scenarios used for the Site can be found in the baseline HHRA report.

Surface and Subsurface Soil

Risks and hazards were evaluated for the potential current and future exposure to surface and subsurface soil. The populations of interest included workers, residential adults and children, and construction workers. The cancer risks were below or within the EPA acceptable ranges for all receptors. The non-cancer hazards were equal or below the EPA acceptable value of 1 for all receptors. Therefore, there were no COCs identified for the surface or subsurface soil (Table 1).

Additionally, lead in surface and subsurface soil was evaluated by comparing the maximum lead concentration detected to screening criteria for residential (400 mg/kg) and industrial exposure (800 mg/kg). The highest concentration of lead that was detected in surface or subsurface soil was 115 mg/kg, which is below the screening criteria., therefore lead is not a COC for the site as all detected lead concentrations were below the EPA Regional Screening Level for residential soil.

Table 1. Summary of hazards and risks associated with surface and subsurface soil at Papelera Puertorriqueña Site.

Receptor	Hazard Index	Cancer Risk
Surface Soil		
Worker - adult (current)	0.1	$5x10^{-6}$
Worker - adult (future)	0.09	$4x10^{-6}$
Residential - adult/child (future)	1	$2x10^{-5}$
Surface/Subsurface Soil		
Construction Worker – adult (future)	0.1	$2x10^{-7}$
There were no COCs identified in surface or subsurface soil.		

Surface Water and Sediment

Risks and hazards were evaluated for the potential current and future exposure to surface water and sediment from the Rio Viví. The populations of interest included adolescent recreational users. The cancer risk was below the EPA acceptable range and the non-cancer hazard was below the EPA acceptable value of a hazard index (HI) of 1. Therefore, there were no COCs identified in the surface water or sediment of the Rio Viví (Table 2).

Table 2. Summary of hazards and risks associated with surface water and sediment from the Rio Viví at Papelera Puertorriqueña Site.

Receptor	Hazard Index	Cancer Risk
Recreational User – adolescent (current/future)	0.05	$3x10^{-7}$
There were no COCs identified in the surface water or sediment from the Rio Viví.		

Additionally, lead in surface water (maximum value of 0.061 ug/l) and sediment (maximum value

WHAT IS RISK AND HOW IS IT CALCULATED?

Human Health Risk Assessment:
A Superfund baseline human health risk assessment is an analysis of the potential adverse health effects caused by hazardous substance releases from a site in the absence of any actions to control or mitigate these under current- and future-land uses. A four-step process is utilized for assessing site-related human health risks for reasonable maximum exposure scenarios.

Hazard Identification: In this step, the COPCs at the site in various media (*i.e.*, soil, groundwater, surface water, and air) are identified based on such factors as toxicity, frequency of occurrence, and fate and transport of the contaminants in the environment, concentrations of the contaminants in specific media, mobility, persistence, and bioaccumulation.

Exposure Assessment: In this step, the different exposure pathways through which people might be exposed to the contaminants in air, water, soil, etc. identified in the previous step are evaluated. Examples of exposure pathways include incidental ingestion of and dermal contact with contaminated soil and ingestion of and dermal contact with contaminated groundwater. Factors relating to the exposure assessment include, but are not limited to, the concentrations in specific media that people might be exposed to and the frequency and duration of that exposure. Using these factors, a "reasonable maximum exposure" scenario, which portrays the highest level of human exposure that could reasonably be expected to occur, is calculated.

Toxicity Assessment: In this step, the types of adverse health effects associated with chemical exposures, and the relationship between magnitude of exposure and severity of adverse effects are determined. Potential health effects are chemical-specific and may include the risk of developing cancer over a lifetime or other non-cancer health hazards, such as changes in the normal functions of organs within the body (*e.g.*, changes in the effectiveness of the immune system). Some chemicals are capable of causing both cancer and non-cancer health hazards.

Risk Characterization: This step summarizes and combines outputs of the exposure and toxicity assessments to provide a quantitative assessment of site risks for all COPCs. Exposures are evaluated based on the potential risk of developing cancer and the potential for non-cancer health hazards. The likelihood of an individual developing cancer is expressed as a probability. For example, a 10^{-4} cancer risk means a "one-in-ten-thousand excess cancer risk;" or one additional cancer may be seen in a population of 10,000 people as a result of exposure to site contaminants under the conditions identified in the Exposure Assessment. Current Superfund regulations for exposures identify the range for determining whether remedial action is necessary as an individual excess lifetime cancer risk of 10^{-4} to 10^{-6}, corresponding to a one-in-ten-thousand to a one-in-a-million excess cancer risk. For non-cancer health effects, a HI is calculated. The key concept for a non-cancer HI is that a threshold (measured as an HI of less than or equal to 1) exists below which non-cancer health hazards are not expected to occur. The goal of protection is 10^{-6} for cancer risk and an HI of 1 for a non-cancer health hazard. Chemicals that exceed a 10^{-4} cancer risk or an HI of 1 are typically those that will require remedial action at the site and are referred to as Chemicals of Concern or COCs in the final remedial decision or ROD.

of 21.3 mg/kg) was evaluated and all detected lead concentrations were below the Puerto Rico Water Quality Standard for Class SD surface water of 0.97 ug/l and the EPA Regional Screening Level for residential soil of 400 mg/kg, which was used as a screening value for sediment.

Groundwater and Vapor Intrusion

Risks and hazards were evaluated for the potential future exposure to groundwater. The population of interest included residential adults and children. The cancer risk was above the EPA acceptable range and the non-cancer hazard was above the EPA acceptable value of 1, primarily due to PCE. Therefore, PCE was identified as a COC in the groundwater (Table 3).

Additionally, lead in groundwater was evaluated and all detected lead concentrations (maximum value of 0.81 ug/l) were below the Puerto Rico Water Quality Standard for Class SG groundwater (15 ug/l).

The potential for vapors to enter the building from a process called vapor intrusion was also qualitatively evaluated for the building occupants (i.e., Head Start staff, students and office workers in the building) by screening soil gas concentrations taken below the building and indoor air concentrations collected from inside the building to compare against screening values. The sub-slab concentrations that were measured showed elevated concentrations of PCE. Indoor air concentrations that were measured indicated that PCE was not at elevated concentrations, therefore reducing concentrations of PCE in the sub-slab will ensure that the indoor air concentrations remain below screening criteria.

Table 3. Summary of hazards and risks associated with groundwater at Papelera Puertorriqueña Site

Receptor	Hazard Index	Cancer Risk
Residential - adult/child (future)	66	$3x10^{-4}$

Receptor	Hazard Index	Cancer Risk
The COC identified in the groundwater for the PPI site was tetrachloroethylene (PCE).		

Based on the results of the HHRA, a remedial action is necessary to protect public health, welfare, and the environment from actual or threatened releases of hazardous substances into the groundwater, which may also impact vapors migrating into the building.

Ecological Risk Assessment

A SLERA was conducted to evaluate the potential for ecological risks from the presence of SRCs. The SLERA focused on evaluating the potential for impacts to sensitive ecological receptors to SRCs of concern through exposure to surface soil, sediment, surface water and porewater. Concentrations in the media listed above were compared to ecological screening values as an indicator of the potential for adverse effects to ecological receptors. A complete summary of all exposure scenarios can be found in the SLERA report.

Based on the results of the SLERA, there is not a potential for adverse effects to ecological receptors (invertebrates, reptiles, amphibians, birds, and mammals) from exposure to contaminated surface soil, sediment, or surface water. The screening criteria for all chemicals in these media were below the acceptable hazard index of 1 or would not result in long-term population impacts.

There was a complete exposure pathway (groundwater discharge to the Río Viví) with exposure to the Site-related contaminant (PCE) to aquatic receptors identified. The risk associated with the exposure to contaminated groundwater that discharges to the river (HI = 1.2) is marginally above the EPA acceptable hazard index of 1 using the maximum detected value and would be less than 1 if a more realistic average value were used. Given that PCE discharges to the Río Viví, the remedial alternatives should address the groundwater discharge in order to protect the ecological receptors from actual or threatened releases of hazardous substances.

It is EPA's current judgment that the Preferred Alternative identified in this Proposed Plan, or one of the other active measures considered in the Proposed Plan, is necessary to protect public health or welfare or the environment from actual or threatened releases of pollutants or contaminants from this Site which may present an imminent and substantial endangerment to public health or welfare.

REMEDIAL ACTION OBJECTIVES

Remedial Action Objectives (RAOs) are specific goals to protect human health and the environment. These objectives are based on available information and standards, such as Applicable or Relevant and Appropriate Requirements (ARARs), To-Be-Considered guidance, and Site-specific risk-based levels.

The RI performed at the Site indicated PCE contamination in two major areas: the former development room in the south corner of the Site and drainage feature #2 (Figure 3) in the southwest portion of the Site building. Soil and groundwater in the upper reaches of the saprolite were found to be contaminated with PCE in these areas. PCE was also detected above its screening criterion in sub-slab soil vapor and sediment porewater and surface water in the Río Viví. The HHRA indicates that the direct contact risks from exposure to SRCs are within EPA's acceptable risk range. High concentrations of PCE detected in site soil samples indicate contaminated soil could serve as a continuing source for PCE contamination in groundwater and impact human health and the environment such as the Río Viví. Additionally, although vapor intrusion of PCE into site structures has not exceeded risk-based criteria, PCE vapor accumulation beneath the former development room has exceeded the PCE screening criterion. Soil vapor will be addressed as part of the soil remediation.

PCE was also detected above its RI screening criterion in multiple groundwater samples during the remedial investigation. Due to high PCE concentrations in groundwater and the human health risk posed by the contamination, RAOs were developed for this medium.

Surface water is hydraulically linked to groundwater and is also affected by soil via surficial runoff and soil erosion. When groundwater and soil are treated to RAOs, it is expected that surface water contamination will be mitigated as well.

RAOs have been developed to focus on reducing the impact to groundwater quality and protection of human health from exposure to soil vapor.

The RAOs for soil are:

- Prevent/minimize contaminated soil from serving as a source of groundwater contamination and surface water contamination (via surface water runoff) exceeding Preliminary Remediation Goals (PRGs).
- Prevent/minimize contaminated soil from serving as a source of sub-slab vapor contamination.

The RAOs for groundwater (and porewater) are:

- Prevent/minimize contaminated groundwater above PRGs from serving as a source of river water contamination (Río Viví).
- Prevent human exposure to contaminant concentrations in groundwater above PRGs.
- Restore the groundwater to drinking water quality.

The RAO for surface water is:

- Reduce PCE concentrations to levels below PRGs by remediating contaminated soil and groundwater exceeding the PRGs.

Preliminary Remediation Goals

To meet the RAOs, PRGs are developed to aid in defining the extent of contamination requiring remedial action. PRGs are chemical-specific remediation goals for each media and/or exposure route that are expected to be protective of human health and the environment. They are derived based on comparison to ARARs, risk-based levels, and background concentrations, with consideration also given to other requirements such as analytical detection limits, guidance values, and other pertinent information.

PRGs for Soil

There are no promulgated federal or commonwealth chemical-specific ARARs for soil. To meet the RAOs for protection of groundwater, Site-specific impact to groundwater soil cleanup levels were developed. To meet the RAOs for protection of indoor air, impact to indoor air levels were developed based on a Site-specific attenuation factor calculated using the maximum indoor air concentration observed and its associated sub-slab vapor concentration. The site-specific impact to groundwater soil cleanup criterion (30 µg/kg) was selected as the PRG for PCE over the impact to indoor air cleanup criteria (76 µg/kg) as a more conservative value.

PRGs for Groundwater

Groundwater at the Site is classified as suitable for drinking water use. In order to accommodate any future use of Site groundwater as a source of potable water supply without the treatment system, federal drinking water standards are relevant and appropriate requirements. The PRG for PCE in groundwater is the federal maximum contaminant level of 5 µg/L.

Screening Criteria for Surface Water

The Puerto Rico Water Quality Standards for Class SD surface waters (intended for use as a raw source of public water supply) will be used to monitor surface water quality over time at the Site.

Screening Criteria for Vapor Intrusion

The suitable sub-slab contaminant screening criteria and indoor air concentration requiring mitigation were based on EPA Vapor Intrusion Screening Levels guidance. The screening criteria for vapor intrusion will be used to monitor indoor air quality over time at the Site.

SUMMARY OF REMEDIAL ALTERNATIVES

CERCLA § 121(b)(1), 42 U.S.C. § 9621(b)(1), mandates that remedial actions must be protective of human health and the environment, be cost-effective, and utilize permanent solutions and alternative treatment technologies and resource recovery alternatives to the maximum extent practicable. Section 121(b)(1) also establishes a preference for remedial actions which employ, as a principal element, treatment to permanently and significantly reduce the volume, toxicity, or mobility of the hazardous substances, pollutants, and contaminants at a site. CERCLA § 121(d), 42 U.S.C. § 9621(d), further specifies that a remedial action must attain a level or standard of control of the hazardous substances, pollutants, and contaminants, which at least attains ARARs under federal and state laws, unless a waiver can be justified pursuant to CERCLA § 121(d)(4), 42 U.S.C. § 9621(d)(4).

The timeframes presented below for each alternative reflect only the time required to construct or implement the remedy, and do not include the time required to design the remedy, negotiate the performance of the remedy with any potentially responsible parties, or procure contracts for design and construction.

The cost estimates, which are based on available information, are order-of-magnitude engineering cost estimates that are expected to be within +50 to -30 percent of the actual cost of the project.

Common Elements

Several common elements are assumed to be included as part of each remedial alternative. The common elements listed below do not apply to the No Action alternative (discussed below). The common elements include the items below.

Pre-Design Investigation (PDI)

The nature and extent of soil contamination in the vadose zone and groundwater contamination in the shallow saprolite underneath the Site building would be fully delineated in a PDI. It is assumed that three new monitoring well pairs (a total of six wells) would be installed in the saprolite during the PDI to define the extent of contamination. Design parameters also would be obtained during the PDI.

Institutional Controls

Institutional controls (deed restriction and well drilling restriction) should restrict the use of the Site to non-residential use only and restrict usage of future groundwater extraction wells until cleanup is complete.

Soil Vapor Extraction (SVE)

Vertical SVE wells would be installed in the vadose zone to target the entire vadose zone contamination without extracting groundwater into the SVE wells. For cost-estimating purposes, it is assumed 12 SVE wells would be installed. Piping for transferring the extracted soil vapor to the aboveground treatment system would be routed underground, along the wall, or overhead to minimize impact to routine building operations. Horizontal SVE pipes installed on the surface soils underneath the building would be considered during the PDI as a way to reduce the number of vertical SVE wells required for treatment.

The aboveground treatment system would be installed in a pre-fabricated unit brought into the building on-Site to treat the extracted soil vapor prior to discharge to the atmosphere. This system

likely would consist of compressors, piping, an air-water separator, as necessary, and vapor phase activated carbon. Vapor discharged would meet Puerto Rico discharge requirements.

For cost-estimating purposes, it is assumed the SVE system would be operated continuously for the first 2 years and intermittently for the following 8 years. The air flow rate (vacuum) and concentrations of contaminant, oxygen, and carbon dioxide in the extracted vapor would be monitored regularly. Additional sampling and analysis also would be conducted in order to evaluate air emissions. An evaluation, discussed below, would be conducted prior to shutdown of the system.

Pilot Study

Site-specific inputs for the design of the active remediation technology would be determined during a pilot study. The radius of influence of injection (bioremediation amendments or air) and extraction (SVE) would be determined using temporary, pilot-scale equipment. Any potential secondary impacts from the remediation (such as geochemistry changes) would be evaluated as well.

Long-term Monitoring

A long-term monitoring program for the Site groundwater plume, surface water, and vapor would be instituted. The monitoring program should continue until contaminant concentrations in all media have achieved PRGs. For cost-estimating purposes, it is assumed that the long-term monitoring program would include annual monitoring for 20 years for 16 monitoring wells, seven (7) surface water locations, and seven (7) vapor locations. The monitoring data collected would be evaluated and used to assess the migration and attenuation of the groundwater contamination, effectiveness of the remedial action, and progress toward meeting PRGs.

Five-Year Site Reviews

Pursuant to CERCLA, alternatives resulting in contaminants remaining above levels that allow for unrestricted use and unlimited exposure require that the Site be reviewed at least once every 5 years. If justified by the review, additional remedial actions may be implemented to remove, treat, or contain the contamination. The Site review would include evaluation of data collected from the long-term monitoring, a Site-wide visual inspection, and a report prepared by EPA.

Site Restoration

After the completion of all remedial actions, the SVE wells, any other remedial wells, and soil vapor monitoring points would be properly abandoned. All equipment and materials would be removed or demobilized. The Site would be restored to pre-remedial action conditions, such as repairing the building slab and pavements, as much as possible.

EPA Region 2 Clean and Green Policy

The environmental benefits of the preferred remedy may be enhanced by giving consideration, during the design, to technologies and practices that are sustainable in accordance with EPA Region 2's Clean and Green Energy Policy[1]. This will include consideration of green remediation technologies and practices. Some examples of practices that could be applicable are those that reduce emissions of air pollutants, minimize fresh water consumption, incorporate native vegetation into revegetation plans, and consider beneficial reuse and/or recycling of materials, among others.

Remedial Action Alternatives

The remedial alternatives to address groundwater contamination at the Site are summarized below. With the exception of the No Action alternative, several common elements, as discussed above, are assumed to be part of each remedial alternative. See Figure 7.

[1] http://epa.gov/region2/superfund/green_remediation

The following alternatives are considered in this Proposed Plan:

- **Alternative 1: No Action**

Capital Cost	$ 0
Present Worth O&M Cost	$ 0
Total Present Worth Cost	$ 0
Construction Time Frame	N/A
Timeframe to meet RAOs	N/A

The NCP requires that a "No Action" alternative be developed as a baseline for comparison with the other site remedial alternatives. Under this alternative, EPA would take no action to prevent exposure to the soil contamination and the contaminated soil would be left in place. Contaminated groundwater would not be addressed.

Because this alternative would result in contaminants remaining above levels that allow for unrestricted use and unlimited exposure, CERCLA requires that the Site be reviewed at least every five years. If justified by the review, additional response actions may be implemented.

- **Alternative 2: SVE and AS**

Capital Cost	$ 1.7 million
Present Worth O&M Cost	$ 0.5 million
Total Present Worth Cost	$ 2.6 million
Construction Time Frame	7 months
Timeframe to meet RAOs	10 years

Alternative 2 would use a combination of technologies, including soil vapor extraction (SVE), and AS to extract and remove contaminant vapors from below ground for treatment above ground. SVE extracts vapors from the soil *above* the water table by applying a vacuum to pull the vapors out. AS, on the other hand, pumps air underground to help extract vapors from groundwater and wet soil found *beneath* the water table. The addition of air makes the chemicals evaporate faster, which makes them easier to extract with another technology, such as SVE.

AS wells would be installed to remove contamination from the saturated saprolite. The AS process would strip PCE from the groundwater. Volatilized PCE would then migrate into the vadose zone and be collected into the SVE system, which would be operated in conjunction with the AS. Vapor monitoring points would be installed in the vicinity of the sparge zone to ensure the Site building and nearby buildings are not affected by vapor intrusion from the AS process. The precise locations of the AS and SVE points would be confirmed during the remedial design. If present, principal threat waste will be addressed through treatment by this alternative. For cost estimating purposes, it is assumed the AS and SVE system would be operated for approximately ten (10) years.

- **Alternative 3: SVE and *In-Situ* Treatment**

Capital Cost	$2.2 million
Present Worth O&M Cost	$ 0.4 million
Total Present Worth Cost	$3 million
Construction Time Frame	10 months
Timeframe to meet RAOs	10 years

The groundwater plume contaminated with PCE concentrations above the PRGs in the saprolite would be remediated using in situ treatment. For cost-estimating purposes, *in-situ* enhanced anaerobic bioremediation is selected as the representative *in-situ* treatment process option.

NINE EVALUATION CRITERIA FOR SUPERFUND REMEDIAL ALTERNATIVES
Overall protection of human health and the environment determines whether an alternative eliminates, reduces, or controls threats to public health and the environment through institutional controls, engineering controls, or treatment.
Compliance with ARARs evaluates whether the alternative would meet all of the applicable or relevant and appropriate requirements of federal and state environmental statutes and other requirements that pertain to the site, or provide grounds for invoking a waiver.
Long-term effectiveness and permanence considers the ability of an alternative to maintain protection of human health and the environment over time.
Reduction of toxicity, mobility, or volume through treatment is the anticipated performance of the treatment technologies an alternative may employ.
Short-term effectiveness considers the period of time needed to implement an alternative and the risks the alternative may pose to workers, residents, and the environment during implementation.
Implementability is the technical and administrative feasibility of implementing the alternative, including the availability of materials and services.
Cost includes estimated capital and annual operation and maintenance costs, as well as present-worth costs. Present worth cost is the total cost of an alternative over time in terms of today's dollar value. Cost estimates are expected to be accurate within a range of +50 to -30 percent.
Commonwealth acceptance considers whether the Commonwealth (the support agency) concurs with, opposes, or has no comments on the preferred remedy.
Community acceptance will be assessed in the ROD and refers to the public's general response to the alternatives described in the Proposed Plan and the RI/FS reports. Comments received on the Proposed Plan are an important indicator of community acceptance.

Nutrients will be injected in the soil to promote the growth of natural bacteria which will degrade existing contamination for cost estimating purposes, it was assumed that the injection points would have a radius of influence of nine (9) feet, and a second round of injections would be conducted three (3) years after the first round. Based on results of the pilot study discussed above, SVE and *in-situ* treatment would either be sequenced or designed to function in a coordinated fashion. If present, principal threat waste will be addressed through treatment by this alternative.

EVALUATION OF REMEDIAL ALTERNATIVES

Nine criteria are used to evaluate the different remediation alternatives individually and against each other in order to select a remedy. This section of the Proposed Plan profiles the relative performance of each alternative against the nine criteria, noting how it compares to the other options under consideration. The nine (9) evaluation criteria are discussed below. A detailed analysis of alternatives can be found in the FS report.

A comparative analysis of these alternatives based upon the evaluation criteria noted above is presented below.

Overall protection of human health and the environment

A threshold requirement of CERCLA is that the selected remedial action be protective of human health and the environment. An alternative is protective if it reduces current and potential risk associated with each exposure pathway at a site to acceptable levels.

PCE is currently present above PRGs or screening criteria in soil, vapor, groundwater, and surface water and poses a risk to future residential users of groundwater. The No Action alternative, Alternative 1, would not be protective of human

health and the environment as no action would be taken to remediate or monitor contamination and risk. Alternatives 2 and 3 would be protective of human health and the environment since they involve active treatment of the contamination in soil and groundwater until the RAOs and PRGs are met. Institutional controls would be implemented to restrict future residential use of groundwater at the site until PRGs are met.

Compliance with Applicable or Relevant and Appropriate Requirements

Compliance with ARARs is the other threshold requirement for remedy selection under CERCLA regulations.

PCE is present in groundwater and soils at concentrations exceeding PRGs, and thus are not currently in compliance with chemical-specific ARARs. Alternative 1 would not take any active measures to evaluate future compliance with ARARs. Alternatives 2 and 3 would reach compliance with chemical-specific ARARs through active treatment.

Long-Term Effectiveness and Permanence

Alternative 1 would not be considered a permanent remedy since no action would be implemented to reduce the level of contamination to below PRGs or verify any naturally occurring reduction. Alternatives 2 and 3 would permanently and irreversibly reduce groundwater and soil PCE concentrations through active treatment and, consequently, reduce vapor and surface water contamination as soil and groundwater are the sources of contamination in these media. Residual risk would be within EPA's acceptable risk range for Alternatives 2 and 3.

Reduction of Toxicity, Mobility, or Volume through Treatment

The No Action alternative would not monitor and evaluate the reduction of contaminant toxicity/mobility/volume (T/M/V) through natural processes because no remedial action would be conducted. Alternatives 2 and 3 would reduce T/M/V through treatment in soil, groundwater, and soil vapor and would achieve the PRGs.

Short-Term Effectiveness

With respect to the No Action alternative, there would be no short-term impact to the community and environment as no remedial action would occur. There would be some minor short-term impacts to the local community and workers for Alternatives 2 and 3 because of the active remedial actions undertaken and associated construction and operation.

Alternative 2 would require a larger footprint and longer operations) than Alternative 3 since it would combine air sparge with the SVE system. Alternative 3 may cause short-term impacts to the Río Viví if solubilized metals (chiefly iron, manganese, and arsenic) and deoxygenated groundwater enter the river via groundwater discharge.

Both Alternative 2 and Alternative 3 would require that equipment be brought indoors to install the SVE and, for Alternative 3, to inject amendment through the building floor into contamination present under the building; this would require coring multiple holes in the floor, which may weaken the floor structure. Alternative 3 likely would require a shorter timeframe since the injected amendment with additive could enter low-permeability zones and address contamination that may be hidden from the sparge bubbles that would be used in Alternative 2, which would preferentially treat the more permeable zones.

For both alternatives, a pilot study would be needed to evaluate amendment distribution during in situ treatment injections or the zone of influence

of air sparge points; timeframes could be lengthened if subsurface conditions impedes the ability to distribute air bubbles or amendment into contaminated zones (especially low-permeability zones). Additionally, for *in-situ* treatment, timeframes could become extended if the rate of contaminant destruction is modulated by dissolution rates of any residual DNAPL.

Implementability

The No Action alternative is implementable. Both Alternatives 2 and 3 are implementable but would require careful design due to space limitations and the potential for flooding from the Río Viví. It may also be difficult to distribute air bubbles or amendment to all the contaminated zones of the Site due to heterogeneous geology, especially the presence of any low-permeability contaminated zones. Alternative 3 may be more difficult to implement then Alternative 2 because of three challenges: (1) it is unknown if the Site building floor structure can support the coring of multiple holes through the floor, (2) it is unknown if equipment that can be operated indoors is also capable of reaching the full depth of the contaminated zone, and (3) there is the potential for discharge into the Río Viví of soluble reduced metals and deoxygenated groundwater formed during anaerobic bioremediation.

Cost

Alternative	Estimated Capital Cost	Present Worth of O&M and Monitoring costs	Total Present Worth
1	0	0	0
2	$1,703,000	$930,000	$2,633,000
3	$2,222,000	$799,000	$3,021,000

Community Acceptance

Community acceptance of the preferred remedy will be evaluated after the public comment period ends and will be described in the Responsiveness Summary section of the ROD for this Site.

PREFERRED REMEDY

EPA is proposing Alternative 2 (SVE and AS) as the preferred alternative for the Site because this alternative would effectively achieve the remedial action objectives. The combination of SVE and AS, and institutional controls ensures protectiveness.

Under Alternative 2, SVE and AS wells would be installed to remove contamination from the saturated saprolite. The AS process would strip PCE from the groundwater. Volatilized PCE would then migrate into the vadose zone and be collected into the SVE system, which would be operated in conjunction with the AS. Vapor monitoring points would be installed in the vicinity of the sparge zone to ensure the Site building and nearby buildings are not affected by vapor intrusion from the AS process. For cost estimating purposes, it is assumed the AS and SVE system would be operated for approximately ten (10) years. The estimated present-worth cost of the preferred alternative is $2,633,000.

Basis For Remedy Preference

The environmental benefits of the preferred remedy may be enhanced by consideration, during the design, of technologies and practices that are sustainable in accordance with EPA Region 2's Clean and Green Energy Policy. This would include consideration of green remediation technologies and practices.

Based upon the information currently available, EPA believes the preferred alternative meets the threshold criteria and provides the best balance of tradeoffs among the other alternatives with respect to the balancing criteria. The EPA and PREQB expect the preferred alternative to satisfy the following statutory requirements of CERCLA Section 121(b): 1) be protective of human health and the environment; 2) comply with ARARs; 3) be cost effective; 4) utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable; and 5) satisfy the preference for treatment as a principal element. The preferred alternative # 2, would satisfy the preference for

treatment as a principal element since SVE/AS would provide treatment of contaminated soil, principal threat waste, if present, and groundwater to achieve the PRGs. Long-term monitoring and five-year reviews would be performed to assure the protectiveness of the remedy. EPA will assess the modifying criteria of community acceptance in the ROD following the close of the public comment period.

Commonwealth/Support Agency Acceptance

The PREQB concurs with EPA's preferred alternative in this Proposed Plan.

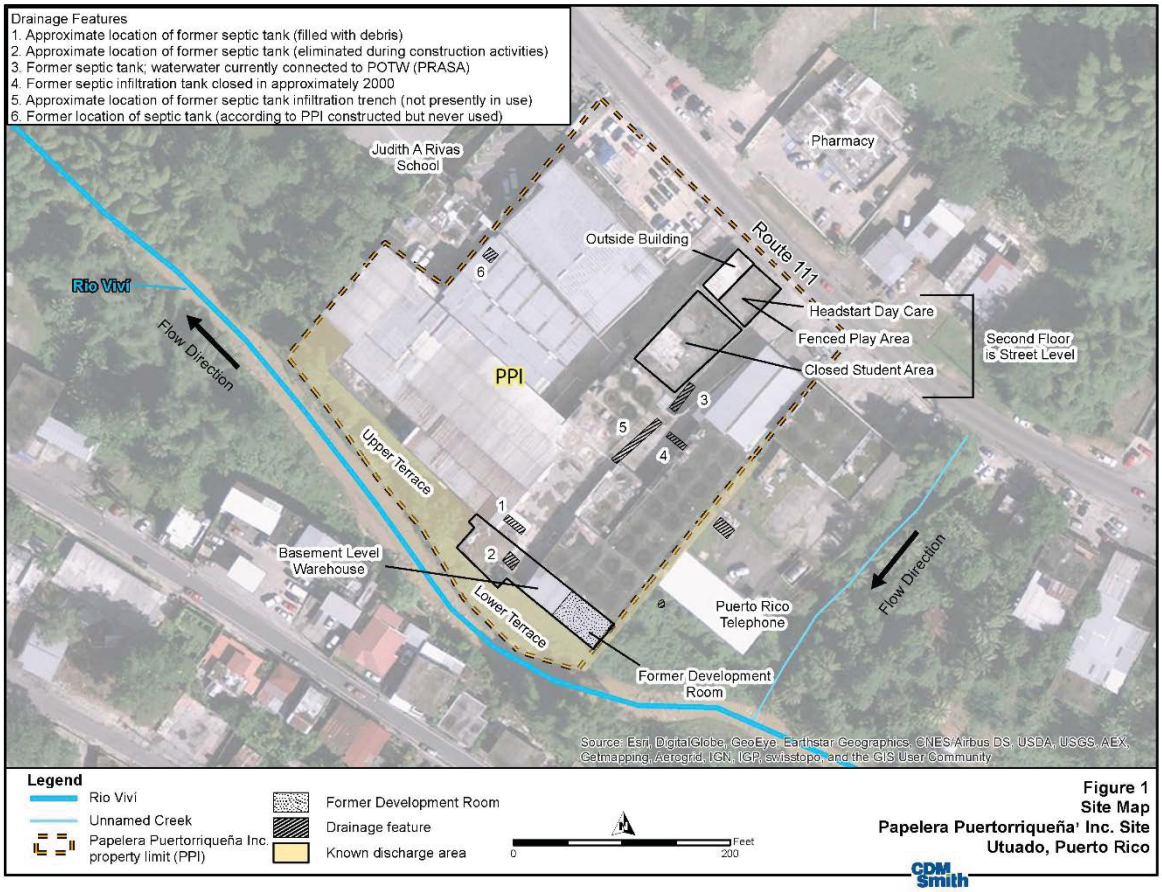


Figure 1
Site Map
Papelera Puertorriqueña' Inc. Site
Utuado, Puerto Rico

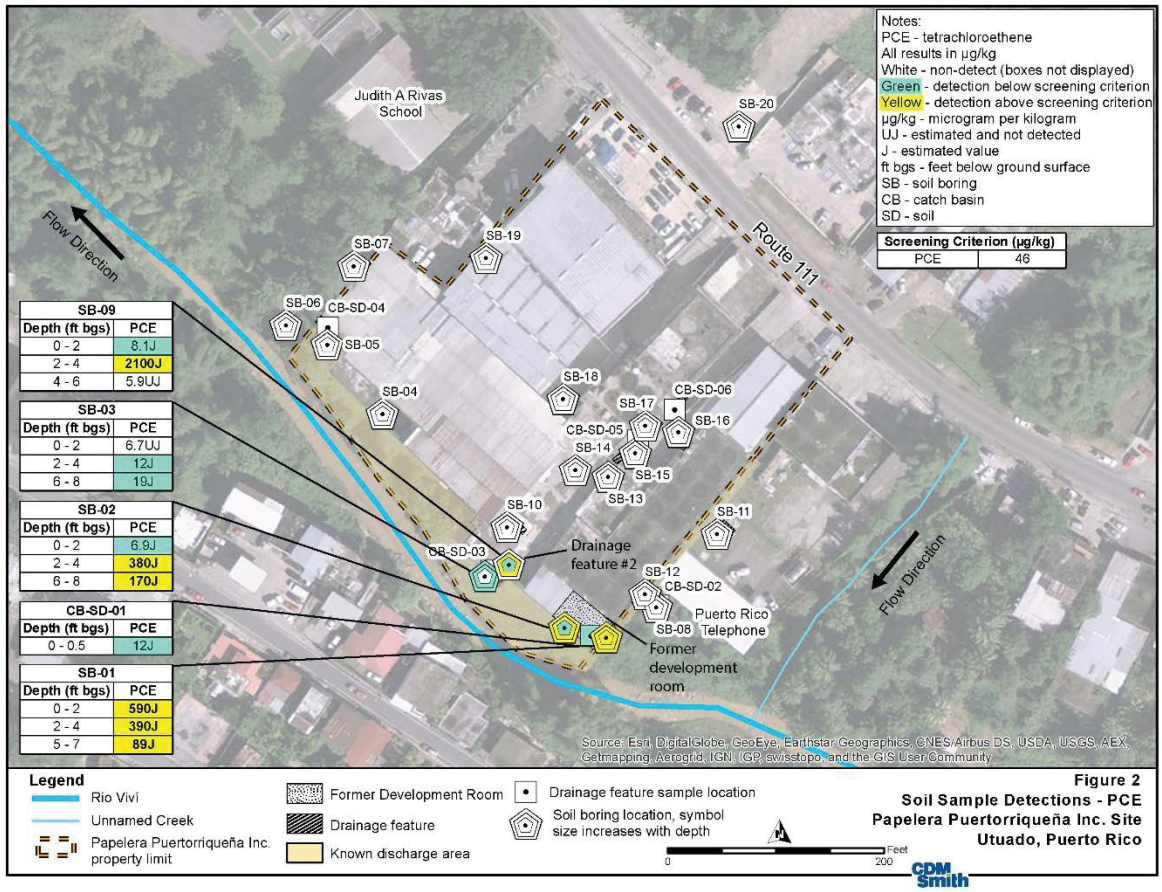


Figure 2
Soil Sample Detections - PCE
Papelera Puertorriqueña Inc. Site
Utuado, Puerto Rico

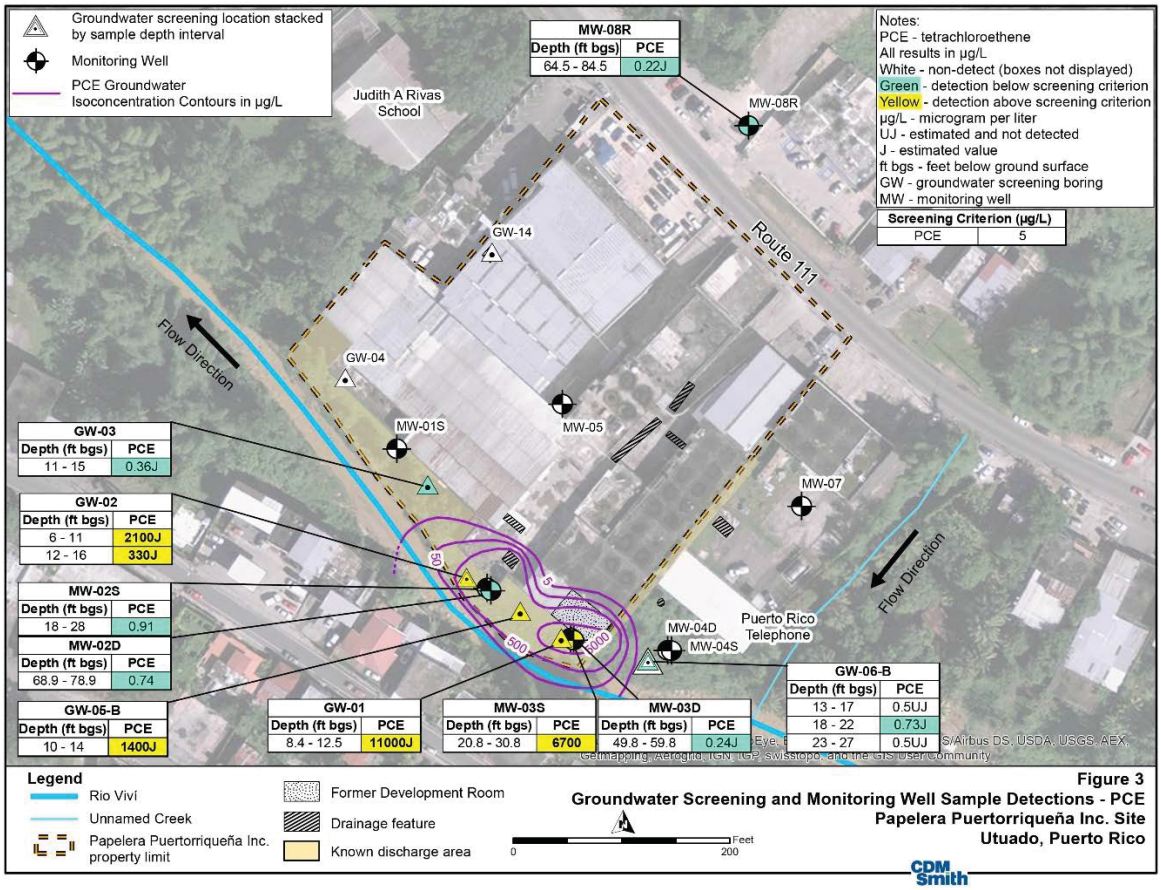


Figure 3
Groundwater Screening and Monitoring Well Sample Detections - PCE
Papelera Puertorriqueña Inc. Site
Utuado, Puerto Rico

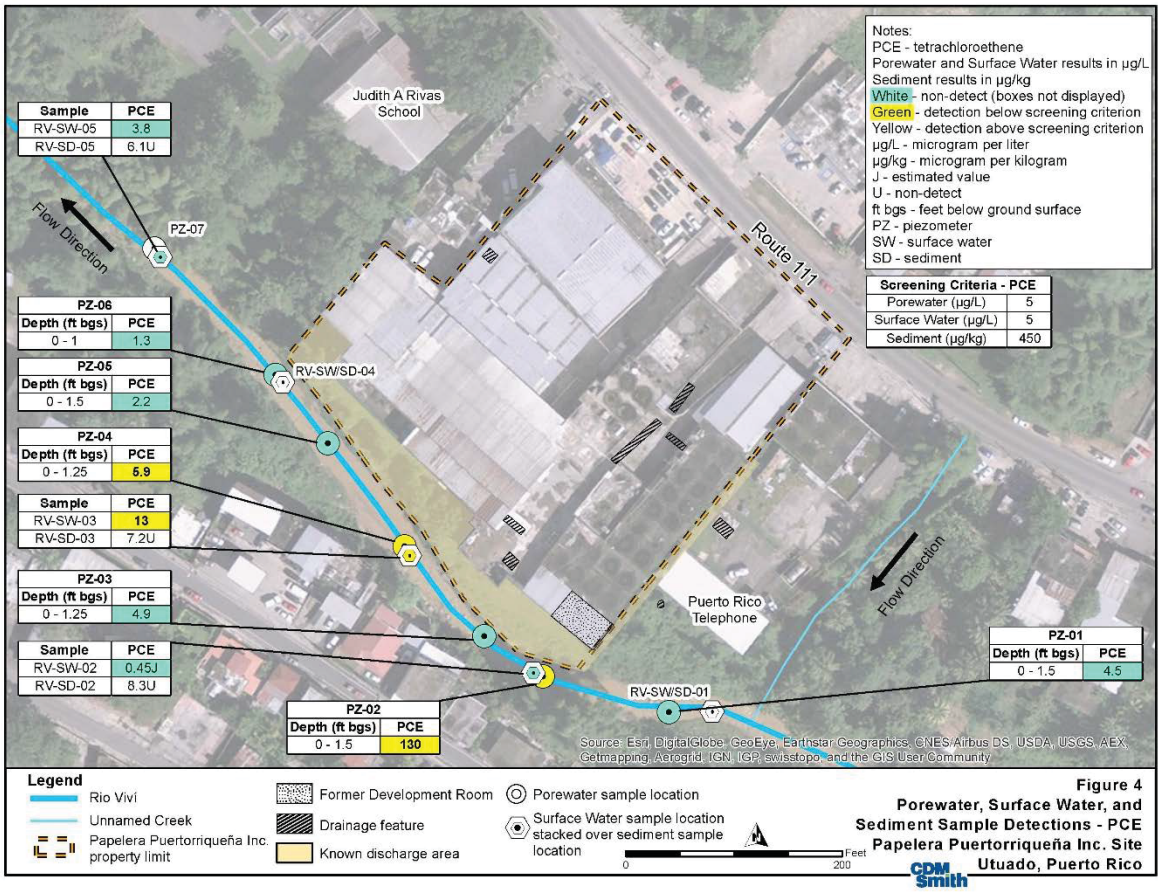


Figure 4
Porewater, Surface Water, and Sediment Sample Detections - PCE
Papelera Puertorriqueña Inc. Site
Utuado, Puerto Rico

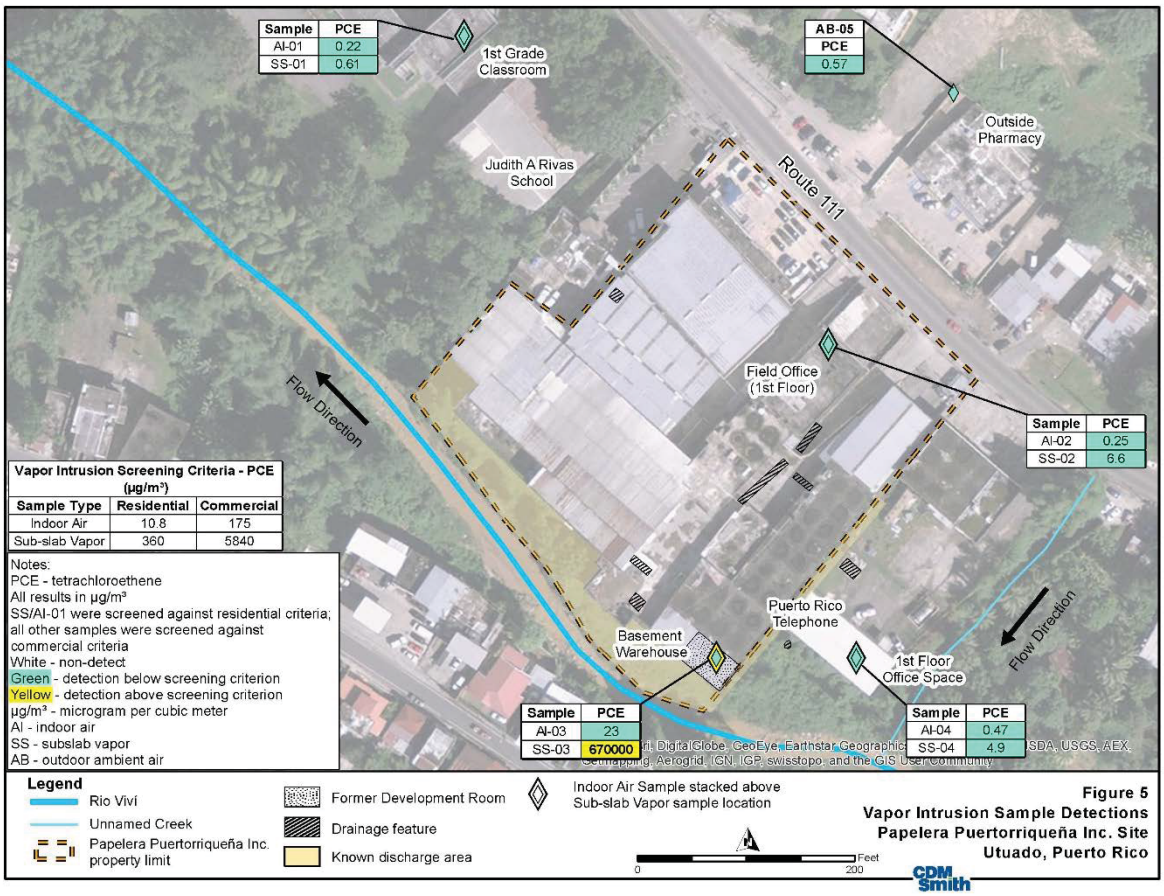


Figure 5
Vapor Intrusion Sample Detections
Papelera Puertorriqueña Inc. Site
Utuado, Puerto Rico

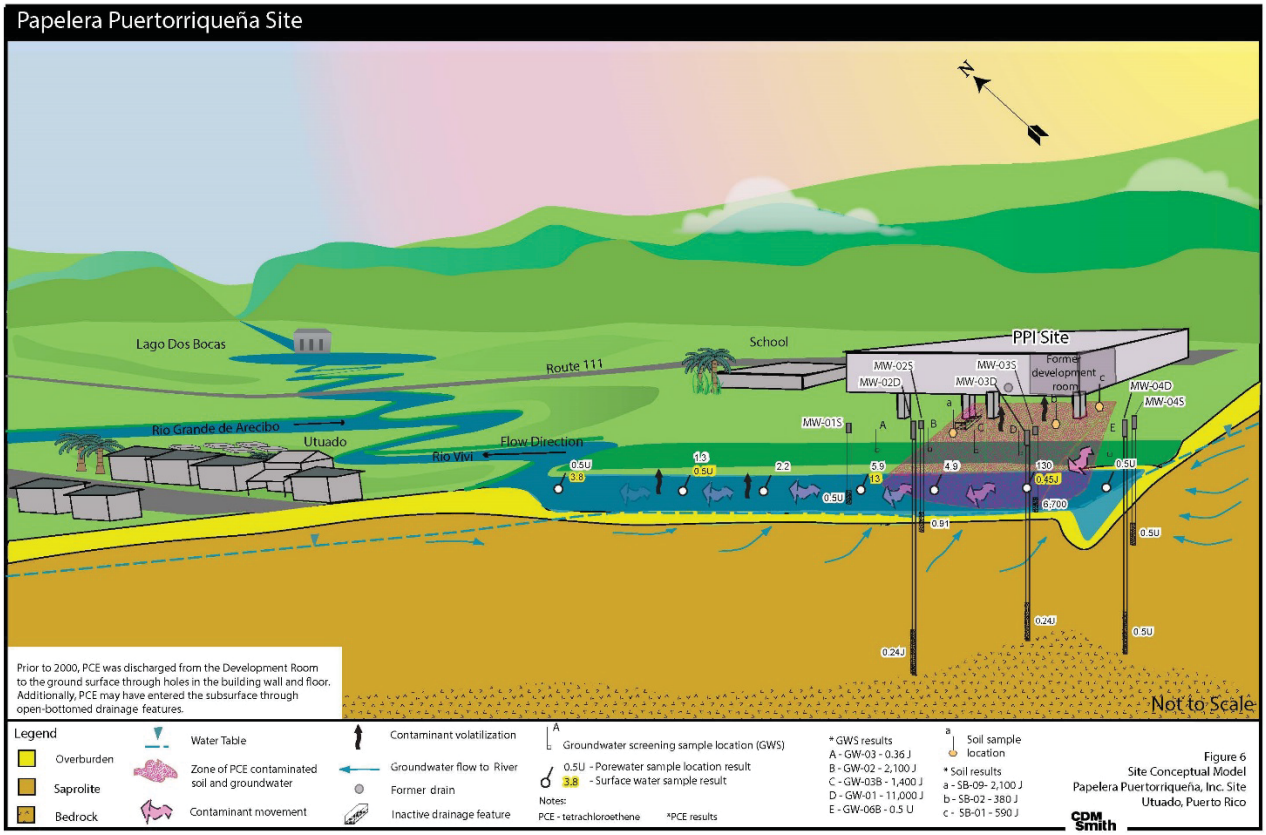
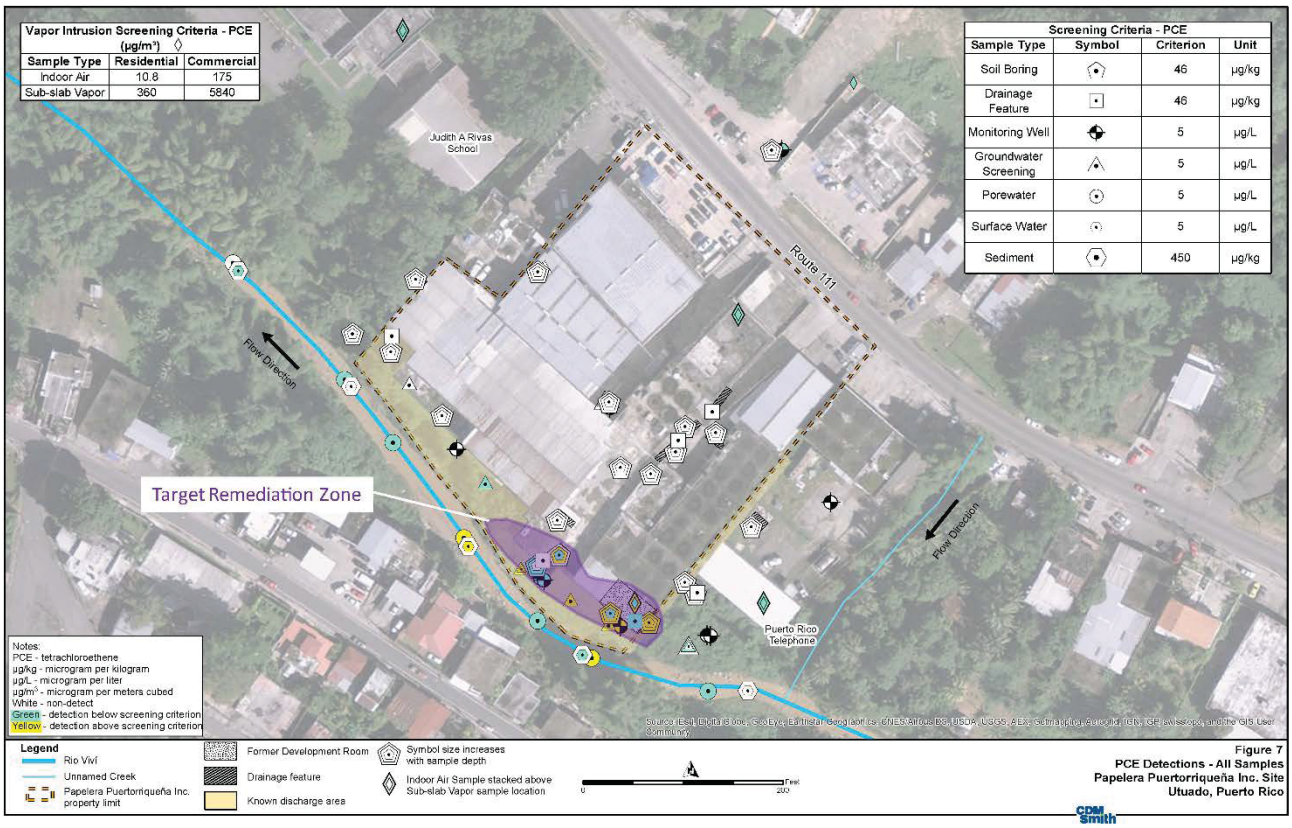


Figure 6
Site Conceptual Model
Papelera Puertorriqueña, Inc. Site
Utuado, Puerto Rico


Vapor Intrusion Screening Criteria - PCE (µg/m³)
Sample Type | Residential | Commercial
Indoor Air | 10.8 | 175
Sub-slab Vapor | 360 | 5840
Screening Criteria - PCE
Sample Type | Symbol | Criterion | Unit
Soil Boring | 46 | µg/kg
Drainage Feature | 46 | µg/kg
Monitoring Well | 5 | µg/L
Groundwater Screening | 5 | µg/L
Porewater | 5 | µg/L
Surface Water | 5 | µg/L
Sediment | 450 | µg/kg
Judith A Rivas School
Route 111
Flow Direction
Target Remediation Zone
Flow Direction
Puerto Rico Telephone
Notes:
PCE - tetrachloroethene
µg/kg - microgram per kilogram
µg/L - microgram per liter
µg/m³ - microgram per meters cubed
White - non-detect
Green - detection below screening criterion
Yellow - detection above screening criterion
Legend
Rio Vivi
Unnamed Creek
Papelera Puertorriqueña Inc. property limit
Former Development Room
Drainage feature
Known discharge area
Symbol size increases with sample depth
Indoor Air Sample stacked above Sub-slab Vapor sample location
0
200
Feet
Figure 7
PCE Detections - All Samples
Papelera Puertorriqueña Inc. Site
Utuado, Puerto Rico
CDM Smith

APPENDIX II
PAPELERA PUERTIRRIQUEÑA INC. SUPERFUND SITE
Administrative Record Index

ADMINISTRATIVE RECORD INDEX OF DOCUMENTS

FINAL

07/13/2017

REGION ID: 02

Site Name: PAPELERA PUERTORRIQUENA, INC.
CERCLIS ID: PRD090290685
OUID: 01
SSID: A202
Action:

DocID:	Doc Date:	Title:	Image Count:	Doc Type:	Addressee Name/Organization:	Author Name/Organization:
472361	7/13/2017	ADMINISTRATIVE RECORD INDEX FOR THE PAPELERA PUERTORRIQUENA INCORPORATED SITE	1	Administrative Record Index		R02: (US ENVIRONMENTAL PROTECTION AGENCY)
472357	5/10/2010	FINAL WORK PLAN VOLUME I FOR THE PAPELERA PUERTORRIQUENA, INCORPORATED SITE	130	Report	R02: (US ENVIRONMENTAL PROTECTION AGENCY)	R02: (CDM SMITH)
472355	5/27/2015	FINAL QUALITY ASSURANCE PROJECT PLAN FOR THE PAPELERA PUERTORRIQUENA, INCORPORATED SITE	495	Report	R02: (US ENVIRONMENTAL PROTECTION AGENCY)	R02: (CDM SMITH)
472353	8/30/2016	THE COMMUNITY ENGAGEMENT PLAN FOR THE PAPELERA PUERTORRIQUENA, INCORPORATED SITE	48	Report	R02: (US ENVIRONMENTAL PROTECTION AGENCY)	R02: (CDM SMITH)
436357	6/29/2017	REVISED FINAL HUMAN HEALTH RISK ASSESSMENT FOR THE PAPELERA PUERTORRIQUENA INCORPORATION SITE	263	Report		R02: (CDM SMITH)
436361	6/29/2017	REVISED FINAL SCREENING LEVEL ECOLOGICAL ASSESSMENT FOR THE PAPELERA PUERTORRIQUENA INCORPORATION SITE	69	Report		R02: (CDM SMITH)
436355	6/29/2017	REVISED FINAL FEASIBILITY STUDY REPORT FOR THE PAPELERA PUERTORRIQUENA INCORPORATION SITE	159	Report		R02: (CDM SMITH)
436359	6/29/2017	REVISED FINAL REMEDIAL INVESTIGATION REPORT FOR THE PAPELERA PUERTORRIQUENA INCORPORATION SITE	994	Report		R02: (CDM SMITH)
458471	4/11/2017	PUERTO RICO ENVIRONMENTAL QUALITY BOARD CONCURRENCE ON THE PROPOSED PLAN FOR THE PAPELERA PUERTORRIQUENA INCORPORATED SITE	1	Letter	R02: Santos, Luis (US ENVIRONMENTAL PROTECTION AGENCY)	R02: Nazario Borges, Julie, M (GOVERNMENT OF PUERTO RICO)
458472	7/10/2017	PROPOSED PLAN FOR THE PAPELERA PUERTORRIQUENA INCORPORATED SITE	21	Publication		R02: (US ENVIRONMENTAL PROTECTION AGENCY)

APPENDIX III
PAPELERA PUERTIRRIQUEÑA INC. SUPERFUND SITE
PUBLIC NOTICE

La Agencia Federal de Protección Ambiental
Anuncia el Plan Propuesto y Periodo de Comentarios
Para el Lugar de Superfondo Papelera Puertorriqueña Inc.
Utuado, Puerto Rico

Aviso Público

La Agencia Federal de Protección Ambiental (EPA por sus siglas en inglés) en colaboración con la Junta de Calidad Ambiental, anuncia el comienzo de un período de treinta (30) días de comentario público sobre el Plan Propuesto para la remediación del lugar conocido como Papelera Puertorriqueña Inc. en el municipio de Utuado, Puerto Rico. El Plan Propuesto describe las alternativas recomendadas y las razones para estas recomendaciones. Antes de seleccionar un remedio final, la EPA va a considerar los comentarios escritos y verbales recibidos durante este período de comentario público. Todos los comentarios (verbales y/o escritos) deberán ser recibidos en o antes del 12 de agosto de 2017. La EPA proveerá un resumen de todos los comentarios y sus respuestas en el Récord de Decisión para este lugar.

La EPA llevará a cabo una reunión pública el jueves 20 de julio del 2017, de 5:00 pm a 7:00 pm en el salón de conferencias Dr. Antonio Capella en la Legislatura Municipal anexo a la alcaldía de Utuado, Puerto Rico. El propósito de esta reunión es informarle a la comunidad sobre los hallazgos, conclusiones y recomendaciones de la investigación remedial realizada en el lugar. Además, se discutirá la alternativa de remediación recomendada. Durante esta reunión pública, la EPA contestará preguntas o comentarios que los participantes tengan con relación a la investigación realizada y sobre la alternativa de limpieza recomendada.

Copias del Plan Propuesto y otros documentos relacionados al lugar están disponibles en los siguientes repositorios de información:

Alcaldía Municipal
Oficina del Alcalde
Calle Antonio R. Barceló #27
Utuado, Puerto Rico 00641
(787) 894-3505
Horario: Lunes – Viernes 8:00am a 4:30 pm

Junta de Calidad Ambiental de Puerto Rico
Programa de Respuestas de Emergencias y Superfondo
Edificio de Agencias Ambientales Cruz A. Matos
Urbanización San José Industrial Park
1375 Avenida Ponce de León
San Juan, PR 00926-2604
(787)767-8181 ext 3207
Horario: Lunes – Viernes 9:00am a 3:00 pm
Por cita

Agencia Federal de Protección Ambiental, Región 2
División de Protección Ambiental del Caribe
City View Plaza II- Suite 7000
48 RD, 165 Km. 1.2
Guaynabo, PR 00968-8069
Fax: (787) 289-7104 (787) 977-5869
Horario: Lunes - Viernes 9:00 a.m. a 4:30 p.m.
Por cita

U.S. Environmental Protection Agency, Region 2
290 Broadway, 18th floor
New York, New York 10007-1866
(212) 637-4308
Horario: Lunes - Viernes 9:00 a.m. a 3:30 p.m.
Por cita

Para más información, favor llamar al señor Luis E. Santos al (787) 977-5865. Los comentarios escritos al Plan Propuesto deben ser enviados a:

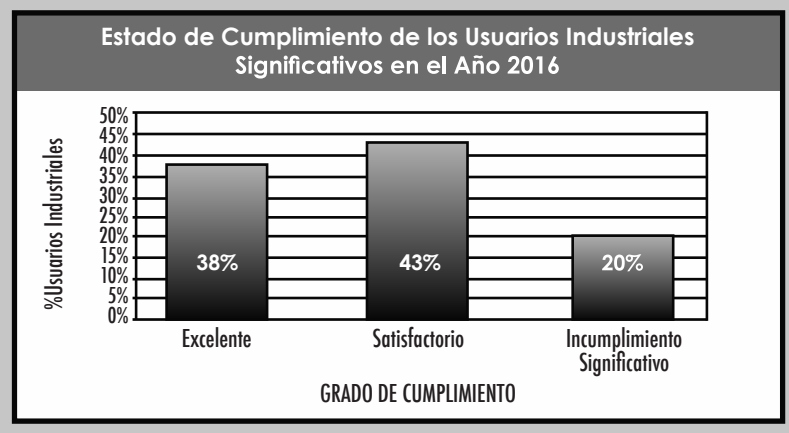
Luis E. Santos
Gerente de Proyectos
Agencia Federal de Protección Ambiental, Región 2
División de Protección Ambiental del Caribe
City View Plaza II- Suite 7000
48 RD, 165 Km. 1.2
Guaynabo, PR 00968-8069
Fax: (787) 289-7104
Email: santos.luis@epa.gov

NOTIFICACIÓN PÚBLICA

Autoridad de Acueductos y Alcantarillados
GOBIERNO DE PUERTO RICO

PUBLICACIÓN DEL ESTADO DE CUMPLIMIENTO DE USUARIOS INDUSTRIALES SIGNIFICATIVOS QUE DESCARGARON A LAS PLANTAS DE TRATAMIENTO DE AGUAS RESIDUALES DE LA AUTORIDAD DE ACUEDUCTOS Y ALCANTARILLADOS DURANTE EL AÑO 2016

Esta publicación se hace en cumplimiento con el Capítulo II, Articulo 2.09 del Reglamento sobre los Servicios de Agua y Alcantarillado de la Autoridad de Acueductos y Alcantarillados y con el Reglamento Federal de Pretratamiento, 40 CFR 403.8(f)(2)(vii).
El Programa de Pretratamiento de la Autoridad de Acueductos y Alcantarillados (la Autoridad), es un programa ambiental aprobado por la Agencia Federal de Protección Ambiental (EPA, por sus siglas en inglés) desde el 26 de octubre de 1985, para reglamentar las descargas industriales que reciben nuestras plantas de tratamiento de aguas residuales. La Autoridad supervisa las descargas industriales para proteger la operación e infraestructura y los cuerpos de agua en los que descargan nuestras plantas luego de completar sus procesos de depuración.
La siguiente gráfica describe el estado de cumplimiento de los usuarios industriales significativos durante el año 2016.



La Autoridad felicita a los siguientes usuarios industriales que demostraron un cumplimiento excelente con todos los requisitos establecidos en sus permisos de descarga durante el año 2016.

USUARIOS RECONOCIDOS POR EL CUMPLIMIENTO EXCELENTE CON LOS REQUISITOS DEL PROGRAMA DE PRETRATAMIENTO DE LA AUTORIDAD DURANTE EL 2016

USUARIO	PUEBLO
AIAC INTERNATIONAL PHARMA, LLC	ARECIBO
AIR MASTER AWNING, INC.	BARCELONETA
AMGEN MANUFACTURING LIMITED	JUNCOS
AMO PR MANUFACTURING, INC.	AÑASCO
BASF AGRICULTURAL PRODUCTS DE PR	MANATI
BAXTER HEALTHCARE OF PR	GUAYAMA
BORINQUEN CONTAINER, INC.	HATILLO
BRISTOL MYERS SQUIBB MFG. CO.	HUMACAO
CARIBBEAN ELECTROPLATING INC.	CATAÑO
CARIBBEAN REFRESCOS INC.	CIDRA
CENTRAL GENERATRIZ CAMBALACHE	ARECIBO
CLOROX MANUFACTURING CO. OF PR INC.	CAGUAS
COMBE PRODUCTS INC.	NAGUABO
COMPAÑÍA CERVECERA DE PUERTO RICO INC.	MAYAGÜEZ
COOPERVISION CARIBBEAN CORP.	JUANA DIAZ
DUPONT AGRICULTURAL CARIBE INDUSTRIES LTD	MANATI
G.E. INDUSTRIAL OF PR LLC (ARECIBO OPERATIONS)	ARECIBO
IPR PHARMACEUTICALS PUERTO RICO, INC.	CANOVANAS

USUARIO	PUEBLO
JANSSEN ORTHO, LLC. (MANATÍ OPERATIONS)	MANATI
JANSSEN ORTHO, LLC. (GURABO OPERATIONS)	GURABO
(GURABO OPERATIONS)	GURABO
LANFILL TECHNOLOGIES CORP. - OPERACIONES SAN JUAN	SAN JUAN
LILLY DEL CARIBE, INC. (CAROLINA SITE)	CAROLINA
MC NEIL HEALTHCARE, LLC	LAS PIEDRAS
MERIAL BARCELONETA, LLC	BARCELONETA
MICROSOFT OPERATIONS PR, LLC	HUMACAO
MSD INTERNATIONAL GMBH (PUERTO RICO BRANCH) LLC LAS PIEDRAS SITE	LAS PIEDRAS
NEOLPHARMA, INC.	CAGUAS
PEPSICO CARIBBEAN, INC. (FRITO LAY)	BARCELONETA
PFIZER PHARMACEITUCALS LLC (WYETH)	GUAYAMA
PFIZER PHARMACEUTICALS, INC. (VEGA BAJA SITE)	VEGA BAJA
PFIZER PHARMACEUTICALS, LLC (BARCELONETA SITE)	BARCELONETA
ST. JUDE MEDICAL PR, LLC	ARECIBO
THERMO KING PUERTO RICO MANUFACTURA, INC., ET AL	ARECIBO
TRADEWIND FOODS INC. (GOYA DE PUERTO RICO INC.)	BAYAMÓN
WARNER CHILCOTT CO. LLC (MANATÍ OPERATIONS)	MANATI
WARNER CHILCOTT CO. LLC (FAJARDO OPERATIONS)	FAJARDO

La siguiente lista describe a los usuarios industriales que en alguna instancia durante el año 2016 estuvieron en incumplimiento significativo con los requisitos del Programa de Pretratamiento de la Autoridad.

LISTA DE USUARIOS QUE INCURRIERON EN INCUMPLIMIENTO SIGNIFICATIVO CON LOS REQUISITOS DEL PROGRAMA DE PRETRATAMIENTO DURANTE EL AÑO 2016

INDUSTRIA	PUEBLO	SITUACIÓN DE CUMPLIMIENTO AL PRESENTE
MUNICIPIO DE AÑASCO (VERTEDERO MUNICIPAL)	AÑASCO	EN CUMPLIMIENTO
MYLAN, LLC	CAGUAS	EN CUMPLIMIENTO
QUALITY ELECTROPLATING CORP.	CAGUAS	INCUMPLIMIENTO
LANDFILL TECHNOLOGIES OF FAJARDO, CORP.	FAJARDO	INCUMPLIMIENTO
PALL LIFE SCIENCES PUERTO RICO, LLC	FAJARDO	EN CUMPLIMIENTO
ALLIED WASTE OF PONCE, INC	PONCE	EN CUMPLIMIENTO
ARAMARK CLEANROOM SERVICES (PR), INC.	BAYAMÓN	INCUMPLIMIENTO
WATER TREATMENT SPECIALIST, INC.	CATAÑO	EN CUMPLIMIENTO
ALLIED WASTE DE PUERTO RICO, INC.	CATAÑO	EN CUMPLIMIENTO
LANDFILL TECHNOLOGIES OF GUAYNABO, CORP.	GUAYNABO	INCUMPLIMIENTO
LANDFILL GAS TECHNOLOGIES CORP. OPERACIONES CAROLINA	CAROLINA	CUMPLIMIENTO
LANDFILL TECHNOLOGIES CORP. OPERACIONES TOA BAJA	TOA BAJA	EN INCUMPLIMIENTO
NORTHWESTERN SELECTA / NU MEAT PACKING, INC.	SAN JUAN	EN INCUMPLIMIENTO
LA VEGA LANDFILL & RESOURCES, INC.	VEGA BAJA	EN CUMPLIMIENTO
BLUE CARIBE (PURACAP)	DORADO	EN CUMPLIMIENTO
MUNICIPIO DE SANJUAN (IMPRENTA)	SAN JUAN	CIERRE DE OPERACIONES
MUNICIPIO DE TOA ALTA (VERTEDERO MUNICIPAL)	TOA ALTA	INCUMPLIMIENTO
EL COQUI LANDFILL CO. INC.	HUMACAO	INCUMPLIMIENTO
CENTURY PACKING CORP.	LAS PIEDRAS	INCUMPLIMIENTO

Para mayor información relacionada a esta publicación, puede comunicarse al Directorado Auxiliar de Asuntos Regulatorios al (787) 620-2277, extensiones 2489, 2455, 2381.

ANUNCIO DE EXTENSION DE PERIODO DE COMENTARIO PUBLICO PARA LUGAR DE SUPERFONDO DE PAPELERA PUERTORRIQUEÑA INC.

La Agencia Federal de Protección Ambiental (EPA, por sus siglas en inglés) ha extendido el periodo de comentario público para el Plan Propuesto del Lugar de Superfondo de Papelera Puertorriqueña Inc. ubicado en Utuado, Puerto Rico. La Agencia ha extendido el periodo de comentario que terminaba el 12 de agosto del 2017. El nuevo periodo de comentario comenzará el domingo 13 de agosto de 2017 y terminará el martes 12 de septiembre de 2017.

La EPA llevó a cabo una reunión con la comunidad el 20 de julio de 2017 para explicar a la comunidad el Plan Propuesto. La EPA está proponiendo un sistema de aireación y extracción de vapor de suelo (alternativa #2) como la alternativa preferida para el lugar por ser la que lograría efectivamente los objetivos de la acción correctiva. Puede ver el Plan Propuesto en la dirección electrónica **http://www.epa.gov/region02/superfund/npl/papelera**. También los documentos relacionados a la investigación del lugar pueden ser encontrados en la oficina del alcalde en la Alcaldía de Utuado.

Los comentarios sobre este Plan Propuesto deben ser enviados a:

Luis E. Santos
Gerente de Proyecto
#48 Carr 165
City View Plaza II
Suite 7000
Guaynabo, PR 00968
(787) 977-5869
santos.luis@epa.gov

Somos un Hit en Tu Radio….

Radio – Copy

La Agencia Federal de Protección Ambiental (EPA por sus siglas en inglés) llevará a cabo una reunión pública el jueves 20 de julio de 2017, de 5:00 pm a 7:00 pm en el salón de la Legislatura Municipal del Municipio de Utuado.

El propósito de esta reunión es informarle a la comunidad sobre los resultados de la investigación ambiental en el Lugar de Superfondo conocido como Papelera Puertorriqueña, Inc. y presentar el Plan Propuesto donde se detalla el remedio seleccionado.

Recuerde, importante reunión de la Agencia Federal de Protección Ambiental -EPA, este jueves 20 de julio a las 5:00 de la tarde en el salón de la Legislatura Municipal de Utuado.

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APPENDIX IV
PAPELERA PUERTIRRIQUEÑA INC. SUPERFUND SITE
Spanish Fact Sheet

Lugar de Superfondo de Papelera Puertorriqueña Inc.

Utuado, Puerto Rico
Julio 2017
EPA Región 2

PARA OBTENER MÁS INFORMACIÓN

Participación de la Comunidad
Participación del público es esencial para el éxito del Programa de Superfondo de la EPA. Si usted tiene alguna pregunta acerca de las actividades en el Lugar de Superfondo de Papelera Puertorriqueña Inc. de Utuado, póngase en contacto con:

Luis E. Santos, EPA Gerente de Proyectos, (787) 977-5869, santos.luis@epa.gov , o con Brenda Reyes, Coordinadora de Participación con la Comunidad de la EPA al (787) 977-5869, reyes.brenda@epa.gov .

Superfondo
Para obtener información sobre el proceso de Superfondo, visite el sitio web de la EPA en www.epa.gov/superfund.

Depósitos de información
El depósito de información contiene documentos relacionados con el Lugar, disponibles para la revisión del público en las siguientes ubicaciones:

Alcaldía Municipal
Oficina del Alcalde
Calle Antonio R. Barceló #27
Utuado, Puerto Rico
(787) 894-3505
Horario: lunes – viernes 8:00am a 4:30 pm

USEPA Región II
Centro de Expedientes del Superfondo
290 Broadway, piso 18
Nueva York, NY 10007-1866
(212) 637-4308
Horario: lunes a viernes de 9:00 AM a 5:00 PM

Agencia Federal de Protección Ambiental
División de Protección Ambiental del Caribe
City View Plaza II, Suite 7000
#48 PR-165 km 1.2
Guaynabo, Puerto Rico 00968-8069
Brenda Reyes, (787) 977-5869
Horario: lunes a viernes de 9:00 AM a 4:30 PM

Reunión Pública
Legislatura Municipal
Calle Betances #18
Utuado, Puerto Rico 00641
Fecha: 20 de julio de 2017
Hora: 5:00 PM

Hoja Informativa
PROGRAMA DE SUPERFONDO

Lugar de Superfondo de Papelera Puertorriqueña Inc.
Utuado, Puerto Rico
Julio 2017

Esta hoja informativa explica la acción preferida para el Lugar de Superfondo de Papelera Puertorriqueña Inc. (el Lugar) en Utuado, Puerto Rico. Este documento fue desarrollado por la Agencia de Protección Ambiental (EPA, por sus siglas en inglés), el organismo coordinador de las actividades del Lugar, en consulta con la Junta de Calidad Ambiental de Puerto Rico (JCA), la agencia de apoyo. La EPA publica este Plan Propuesto como parte de sus responsabilidades de participación pública bajo la Sección 117 (a) de Respuesta Ambiental Comprensiva, Ley de Compensación y Responsabilidad, 42 USC § 9617 (a) (CERCLA, comúnmente conocido como el programa de Superfondo) y las Secciones 300.430 (f) y 300.435 (c) del Plan de Contingencia Nacional por la Contaminación de Petróleo y las Sustancias Peligrosas (National Contingency Plan, NCP, por sus siglas en inglés).

La EPA añadió el Lugar a la Lista de Prioridades Nacionales (NPL, por sus siglas en inglés) el 23 de septiembre del 2009. El Lugar se ha utilizado para fabricar bolsas de papel, cajas de cartón y bolsas de plástico durante aproximadamente 46 años.

Se evidenció que en el pasado descargas provenientes del Lugar causaron contaminación con tetracloroeteno (PCE) del agua subterránea, agua superficial, agua de poro y en el suelo. Se identificaron dos fuentes de contaminación de PCE en dos áreas diferentes en el Lugar (un antiguo cuarto de revelado y un drenaje). La naturaleza y extensión de la contaminación en el Lugar será resumida en este documento y se describen en detalle en el informe de Investigación Remedial (RI) con fecha del 29 de junio del 2017. Las alternativas de remediación resumidas en este plan están descritas en el Estudio de Viabilidad (FS, por sus siglas en inglés) con fecha del 29 de junio del 2017. Con el fin de satisfacer las regulaciones federales bajo CERCLA, esta información se ha incluido en el expediente administrativo de esta acción, así como

otros documentos. La EPA anima al público a revisar estos documentos para obtener un entendimiento más amplio del Lugar y las actividades del Superfondo que se han llevado a cabo.

El propósito de este Plan Propuesto es informar al público de la acción preferida de la EPA y solicitar comentarios públicos relativos a todas las alternativas evaluadas, incluyendo la preferida. La alternativa preferida incluye Extracción de Vapor de Suelo (SVE) y Extrusión por Aeración (AS).

Cambios a la alternativa preferida o un cambio de alternativa preferida a otra alternativa correctiva descrita en este Plan Propuesto es posible si los comentarios públicos o datos adicionales indican que tal cambio resultará en una acción correctiva más apropiada. La decisión final sobre el recurso seleccionado se hará después de que la EPA haya tomado en consideración todos los comentarios del público. Por esta razón, la EPA está solicitando comentarios públicos sobre todas las alternativas consideradas en el Plan Propuesto porque la EPA puede seleccionar un remedio distinto de la alternativa preferida.

ROL DE LA COMUNIDAD EN EL PROCESO DE SELECCIÓN

La EPA solicita el insumo del público para asegurar que las preocupaciones de la comunidad sean consideradas en la selección de un remedio efectivo para cada Lugar de Superfondo. Para ello, el Plan Propuesto ha sido puesto a la disposición del público por un período de comentarios de 30 días que comienza con la emisión del Plan Propuesto y concluye el 12 de agosto del 2017.

La EPA estará proporcionando información sobre la investigación y limpieza del Lugar al público a través de una reunión pública y estableciendo depósitos de información, que contienen el expediente administrativo. La EPA exhorta al público en general, especialmente al de Utuado, a obtener información sobre el Lugar, las actividades de Superfondo que se han realizado en el mismo y la explicación sobre la selección de la alternativa preferida.

La reunión pública a celebrarse durante el periodo de comentarios proporcionará información sobre las investigaciones completadas en el Lugar, las alternativas evaluadas, explicación de la alternativa preferida, así como para recibir comentarios del público. Todos los comentarios recibidos durante el período de comentarios públicos de 30 días se documentarán en la sección “Resumen de Respuestas” del Registro de Decisión (ROD, por sus siglas en inglés), el documento que formaliza la selección del remedio para el Lugar.

Los comentarios escritos sobre este Plan Propuesto deberán dirigirse a:

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ALCANCE Y ROL DE LA ACCIÓN A TOMAR

La EPA evalúa el Lugar de manera integral. La contaminación asociada con este Lugar ha sido definida con suficiente detalle para completar los informes requeridos; el RI, el FS y la evaluación de riesgo.

ANTECEDENTES DEL LUGAR

Descripción Del Lugar e Historial

El Lugar es una planta de manufactura activa ubicada en el centro de la ciudad del municipio de Utuado y está aproximadamente a 40 pies al noreste del Río Viví. La facilidad consta de cinco edificios de hormigón en un lote de 1.6 acres. La estructura principal se divide en áreas de fabricación, almacenamiento y oficinas. La zona circundante incluye negocios comerciales, escuelas públicas y residencias (Figura 1).

Durante 46 años, la instalación fabricó bolsas de papel, cajas de cartón y bolsas de plástico. Actualmente, la planta sólo fabrica bolsas de papel. El proceso de fabricación en el pasado involucraba tintas a base de agua y aceite, pastillas de polietileno de alta densidad (pastillas de resina), acetato de etilo e isopropanol. Se usó PCE, butanol y diversas soluciones de revelador y fijador para preparar placas de flexografía aplicadas cuando se usaban en la impresión de etiquetas de bolsas fabricadas. Las soluciones desarrolladoras y fijadoras contenían compuestos basados en amonio, quinona, cloruro, carbonato, azufre y formaldehído. Las tintas históricamente contenían alcohol y compuestos basados en metilo, junto con PCE y xileno.

En investigaciones previas llevadas a cabo en el Lugar por la JCA en 1998, 2000, 2001 y 2006, el PCE se detectó históricamente en muestras de agua en el Río Viví y en muestras de suelos superficiales y subsuelo. Otras sustancias peligrosas históricamente detectadas en el Lugar incluyen benceno, tolueno, tricloroeteno (TCE), etilbenceno, 1,2-dicloroetano y diversos metales.

La facilidad ha sido inspeccionada periódicamente por la JCA desde marzo del 1984, cuando la facilidad descargó accidentalmente líquidos que contenían residuos y tintas en el Río Viví. Durante las inspecciones realizadas entre 1993 y 2003, la JCA observó lo siguiente:

• Varios drones almacenados sin contención secundaria que poseían sustancias peligrosas (como amoníaco, butanol, acetato de etilo, cianuro de sodio, ácido sulfúrico, PCE y TCE);
• varios agujeros en el piso; y
• un fregadero en un área de fabricación (cuarto de revelado) que drenaba por un agujero en el piso.

Según la JCA y los empleados de la instalación, las sustancias peligrosas se descargaban a menudo a través de los orificios del piso. Además, la JCA observó la instalación descargando líquidos desconocidos al Río Viví.

Entre 1998 y 2006, la JCA llevó a cabo varias investigaciones en respuesta a las denuncias, llamadas de emergencia, y las actividades de evaluación de la Evaluación del Sistema de Información Preventiva Global de Respuesta Ambiental, Compensación y Responsabilidad. Durante estas investigaciones se tomaron muestras de aguas superficiales, suelo superficial, suelo y lodo de fosa sépticas, suelo, sedimentos y aguas residuales. Se encontraron compuestos peligrosos múltiples, incluyendo PCE, TCE, benceno, cromo y cobre.

Geología e Hidrogeología

El Lugar está situado en el llano de inundación del Río Viví, delimitado al norte y al sur por pendientes rocosas predominantemente compuestas por granodioritas del Plutón Utuado.

Los suelos subyacentes en el Lugar son depósitos aluviales del valle del río Viví y están formados por limo arenoso fino cerca de la superficie, de arcilla más rica en sedimentos más profundos y a medida que el suelo pasa a saprolita el material es de mayor densidad, roca erosionada. La saprolita es una unidad heterogénea de roca madre erosionada que con profundidad aumenta su densidad. Subyacente a la saprolita se encuentra el Plutón de Utuado, que está compuesto principalmente de granodiorita fracturada, pero también incluye diorita de cuarzo, monzonita de cuarzo, diorita y gabro. Las investigaciones del RI no alcanzaron el lecho rocoso ya que la profundidad vertical de contaminación se definió por encima de esta unidad.

La dirección del flujo de agua subterránea sigue la topografía de las pendientes circundantes inclinadas hacia el valle que bordea el Río. El agua subterránea fluye y descarga al Río Viví.

Mientras que la fuente primaria de soporte de agua subyacente al Lugar se produce en la saprolita, el agua subterránea también está presente en los suelos aluviales poco profundos. Dado que la saprolita es una unidad geológica variable en términos del grado de meteorización en la roca, las propiedades hidrogeológicas también varían con la profundidad. Se espera que el agua subterránea circule en las fracturas del Plutón de Utuado, pero no puede ser verificado, ya que no se evaluó la roca base en esta investigación.

La profundidad del agua varía desde el nivel del río en el Río Viví (449.3 pies sobre el nivel promedio del mar) a 34.3 pies debajo de la superficie del terreno (bgs, por sus siglas en inglés) y en la parte más alta del Lugar a 459.5 pies el nivel promedio del mar.

Población y Uso

De acuerdo con el censo del 2010, el municipio de Utuado se compone de 114.73 millas cuadradas con una población de 33,149. El uso primario del suelo en las proximidades del Lugar es principalmente residencial y comercial.

Ecología

La vegetación se limita a una estrecha franja a lo largo del lado sureste del Lugar y a la parte suroeste del Lugar a lo largo de la orilla del río. Los bancos ribereños detrás de la propiedad del Lugar contienen una comunidad vegetativa de dosel relativamente abierta. El Lugar y el Río Viví a lo largo de los límites, tienen vegetación limitada y hábitat limitado para receptores ecológicos. Se observaron peces pequeños y otros animales silvestres en el Río Viví a lo largo del límite del Lugar. Además, el Servicio de Pesca y Vida Silvestre de los Estados Unidos y el Departamento de Recursos Naturales y Ambientales de Puerto Rico comunicaron que no hay información sobre la existencia de ninguna de las especies amenazadas o en peligro listadas en la lista o en Puerto Rico enumeradas o propuestas en Puerto Rico en el Lugar.

NATURALEZA Y ALCANCE DE LA CONTAMINACIÓN

La naturaleza y el alcance de la contaminación en el Lugar se evaluó en los distintos medios (agua subterránea, agua superficial, agua de poro y suelos) durante el RI mediante la toma y análisis de las

muestras y luego comparando los resultados a las leyes federales, estatales y criterios de detección específicos del Lugar. Se identificaron cuatro sustancias químicas como contaminantes relacionados con el Lugar (SRC, por sus siglas en inglés): PCE, cobre, plomo y mercurio. PCE es el principal SRC. Se identificaron también los SRC secundarios; cobre, plomo y mercurio que eran consistentes con los antecedentes. Se discuten los SRC secundarios, pero no son el foco de la evaluación del RI.

Los resultados del muestreo de suelo del RI indican que la contaminación por PCE en el suelo se limita a dos áreas en la parte suroeste del Lugar, cerca del drenaje # 2 y un antiguo cuarto de revelado, lo que sugiere que la descarga probablemente ocurrió en estas áreas (Figura 2). Suelo contaminado con PCE en estas áreas parece estar localizado, como lo demuestran los niveles mucho más bajos en los barrenos adyacentes. El nivel más alto de PCE se detectó (2,100 microgramos por kilogramo [µg/kg]) de 2 a 4 pies bgs en el drenaje # 2. Sin embargo, los niveles de PCE en las muestras por encima y por debajo de este intervalo estaban por debajo del criterio de detección, lo que sugiere que este nivel elevado de PCE es altamente localizado, o que la migración de contaminantes sigue una trayectoria no lineal. Los niveles de PCE cerca del antiguo cuarto de revelado al sur del drenaje # 2 sugieren potencial contaminación residual. Dos concentraciones elevadas de PCE (590 µg/kg de 0 a 2 pies bgs y 380 µg/kg de 2 a 4 pies bgs), localizadas en las paredes surorientales y suroccidentales del antiguo cuarto de revelado, respectivamente, proporcionan evidencia adicional de descargas de PCE. Se detectaron tres metales (cobre, plomo y mercurio) en un área anteriormente utilizada para descargas, alrededor del drenaje # 4, aguas debajo de los drenajes # 1 y # 2 y cerca del cuarto de revelado, a concentraciones por debajo o sólo ligeramente por encima de los criterios de detección, niveles de trasfondo o niveles naturales.

El muestreo de agua subterránea para el RI reveló la presencia de concentraciones de PCE en la muestra preliminar de agua subterránea, GW-02, (2,100 microgramos por litro (µg/L) de 6 a 11 pies bgs y 330 µg/L de 12 a 16 pies bgs), cerca del drenaje # 2, indicando que la contaminación en esta área ha migrado hacia abajo y hacia el Río Viví (Figura 3). Las detecciones de PCE por debajo del criterio de detección en otro pozo monitoreo (MW-02S / D) sugieren que el penacho está principalmente contenido en la parte superior de la saprolita (10 a 16 pies bgs) y que se mueve lateralmente más que vertical en la saprolita. Esta migración lateral refleja el movimiento hacia arriba del penacho a medida que desemboca al Río Viví. En el área utilizada previamente como cuarto de revelado, una muestra preliminar de agua subterránea (GW-01) mostró la concentración más alta de PCE (11.000 J µg/L) en la saprolita cercana a la superficie (8.5 a 12 pies bgs). La contaminación por PCE parece disminuir drásticamente en la saprolita más profunda, ya que existe un gradiente ascendente que simula la descarga hacia el Río Viví. Tres niveles de metales (cobre, plomo y mercurio) en las muestras de pozos de monitoreo estaban presentes por debajo de los criterios de detección, lo que indica que el agua subterránea no ha sido afectada por los metales relacionados con el Lugar.

Los resultados de PCE en el muestreo de agua de poro en el Río Viví sugieren que el agua subterránea descarga a el agua de poro en el cauce del río cerca de la esquina sur del Lugar (PZ-02) (Figura 4).

La detección de PCE más alta en el agua superficial (13 µg/L) estaba justo aguas abajo de PZ-02. Estos resultados indican que el penacho de PCE en el agua subterránea descarga en el Río Viví, especialmente cerca del antiguo cuarto de revelado en la esquina sur del Lugar. No se detectó PCE en muestras de sedimentos tomadas en el rio, lo que indica que el PCE manando en el Río Viví se mueve rápidamente y no se adsorbe al sedimento. Se detectaron tres metales (cobre, plomo y mercurio) en muestras de agua de poro, agua superficial y sedimentos en concentraciones por debajo de los criterios de detección o comparables a niveles detectados aguas arriba.

También se evaluó el potencial de entrada de vapores al edificio por un proceso denominado intrusión de vapor. Los niveles más altos de PCE en sub-losa (debajo del piso del edificio) y muestras de aire interior (SS-03 / AI-03) se encontraron en el antiguo cuarto de revelado, similar a los resultados de suelo y agua subterránea (Figura 5). La muestra de sub-losa (670.000 microgramos por metro cúbico (µg / m3)) superó el criterio de detección para PCE, pero la muestra de aire interior (23 µg / m3) no. Los resultados indican que PCE está presente en la zona vadosa debajo del antiguo cuarto de revelado, pero no ha emigrado en el edificio a un nivel significativo.

Las principales áreas impactadas por los SRCs secundarios incluyen los drenajes y el antiguo cuarto de revelado. La contaminación parece estar restringida al suelo y no ha migrado al agua subterránea ni al Río Viví (agua superficial, agua de poro y sedimentos). Las concentraciones de metales detectadas en el suelo por encima de los criterios de detección del RI fueron consistentes con los detectados en las muestras de trasfondo y no son los principales contribuyentes de los riesgos para la salud humana o receptores ecológicos.

Modelo Conceptual del Lugar

El PCE fue probablemente descargado al suelo a través de agujeros en el piso del cuarto de revelado y a través de drenajes. La contaminación de PCE está presente en el suelo y en el agua subterránea en los lugares de descarga, los cuales están ubicados tanto en el exterior como en el interior de la huella del edificio y en el área debajo del cuarto de revelado (Figura 6). La contaminación residual protegida de la infiltración del agua de lluvia por el edificio del Lugar es poco probable que penetre en el agua subterránea. Fuera de la huella del edificio, el agua de lluvia que se infiltra a través de la contaminación en la zona vadosa es probable que resulte en la transferencia de masa de la zona vadosa al agua subterránea. La masa residual en las zonas no saturadas está sujeta a volatilización y es probablemente es la fuente de detecciones de PCE en las muestras de sub-losa y de aire en el interior.

Se detectó contaminación en el agua subterránea (hasta 11,000 µg/L) debajo de la zona vadosa contaminada. La estructura en la altamente heterogénea saprolita y la complejidad en el sistema de flujo del agua subterránea sugieren la posibilidad de que una masa significativa de contaminantes pueda estar presente en el espacio de poros desconectado a zonas con agua subterránea móvil y de flujo más rápido. Se espera que esta masa persista durante un periodo de tiempo prolongado en las condiciones actuales del Lugar porque los datos del RI indican que la biodegradación es insignificante en el Lugar y puede estar presente en su fase densa liquida no acuosa (DNAPL, por sus siglas en inglés) residual.

La contaminación del agua subterránea se encuentra principalmente en la zona superior de la saprolita, y el gradiente ascendente observado en los pozos de monitoreo pares con la presencia de PCE en el agua de poro y superficial indican que el penacho descarga al Río Viví. Por lo tanto, potencial migración de la contaminación a zonas más profundas en el acuífero de la saprolita es poco probable.

Residuos de Amenaza Principal

El concepto de residuos de la amenaza principal se aplica a la caracterización de materiales de origen en un lugar de Superfondo. Una explicación detallada de los residuos de la amenaza principal se puede encontrar en el recuadro a continuación, titulado "¿Qué son los residuos de amenaza principal?"

Se detectó suelo contaminado en el Lugar además de concentraciones elevadas de vapor de suelo, lo que indica que la fuente, el material que contiene contaminantes móviles volátiles está presente en la zona vadosa. Aunque no se observó DNAPL directamente en el Lugar, se observaron áreas de concentraciones elevadas en el agua subterránea en áreas esperadas a ser impactadas por descargas, y ha migrado verticalmente en estos lugares. Estas observaciones indican que es probable que los residuos de la amenaza principal en forma de materiales de origen móviles (es decir, el suelo de la zona vadosa contaminada y el agua subterránea altamente contaminada) estén presentes en el Lugar.

¿Qué son los residuos de amenaza principal?

El NCP establece una expectativa de que la EPA usará tratamiento donde sea posible para atender residuos de una amenaza principal originada en un Lugar (Sección 300.430 (a) (1) (iii) (A) del NCP). El concepto de "amenaza principal" se aplica a la caracterización de "materiales de origen" en un lugar de Superfondo. Un material de origen es un material que incluye o contiene sustancias peligrosas, contaminantes que actúan como una reserva para la migración de contaminación al agua subterránea, superficial o de aire, o actúa como fuente de exposición directa. El agua subterránea contaminada generalmente no se considera un material de origen; sin embargo, los líquidos de fase no acuosa (NAPLs, por sus siglas en inglés) en agua subterránea pueden ser considerados como material de origen. Desechos de la amenaza principal son aquellos materiales en la fuente considerados altamente tóxicos o altamente móviles que, en general, no pueden ser confinados de manera confiable o que representan un riesgo significativo para la salud humana o el medio ambiente en caso de exposición. La decisión de tratar estos desechos se hace sobre una base específica del Lugar a través de un análisis detallado de las alternativas utilizando los nueve criterios de selección de remedio. Este análisis proporciona una base para hacer una determinación legal de que el recurso emplea el tratamiento como un elemento principal.

Resumen de Riesgos

El propósito de la evaluación del riesgo es determinar los posibles riesgos de cáncer y riesgos para la salud no cancerígenos del Lugar suponiendo que no se tomen medidas de remediación. Una evaluación inicial de riesgo para la salud humana se realizó para evaluar los riesgos de cáncer actuales y futuros y los riesgos para la salud no cancerígenos en base a los resultados de la investigación de remediación.

Una Evaluación de Riesgo Ecológico a nivel de detección (SLERA, por sus siglas en inglés) también se llevó a cabo para evaluar el riesgo que supone para los receptores ecológicos como resultado de la contaminación relacionada al Lugar.

Evaluación de Riesgos a la Salud Humana

Como parte del RI y el estudio de viabilidad (RI/FS, por sus siglas en inglés), se llevó a cabo una evaluación inicial de riesgos a la salud humana (HHRA, por sus siglas en inglés) para estimar los riesgos y peligros asociados con los efectos actuales y futuros de los contaminantes sobre la salud humana y el medio ambiente. La evaluación inicial HHRA es un análisis de los posibles efectos adversos para la salud causados por la exposición de sustancias peligrosas en ausencia de cualquier acción para controlar o mitigar estas exposiciones en virtud de los usos actuales y futuros del terreno.

Una evaluación de cuatro pasos de riesgos a la salud humana fue usada para evaluar los riesgos de cáncer y peligros a la salud no cancerígenos. El proceso de cuatro pasos está compuesto por: Identificación de Peligro de los Químicos de Potencial Preocupación (COPCs, por sus siglas en inglés), Evaluación de Exposición, Evaluación de Toxicidad y Caracterización de Riesgo.

La evaluación de referencia de los riesgos a la salud humana comenzó seleccionando los COPCs en los medios (por ejemplo, suelos de superficie, agua de superficie, sedimento y agua subterránea, incluyendo vapor de suelo) que pudieran causar efectos adversos a la salud en poblaciones expuestas. Los escenarios actuales y futuros de uso de terreno en el Lugar incluyeron los siguientes medios de exposición y poblaciones:

- Trabajadores: ingestión actual y futura, contacto dérmico e inhalación de los vapores producidos por exposición a la superficie y aire interior.
- Los usuarios recreativos (adolescentes): ingestión actual y futura, y contacto dérmico por exposición recreativa a suelo superficial e ingestión e inhalación del agua de superficie y sedimento del Rio Viví.
- Personal de Guardería (Cuido): inhalación actual y futura de aire interior por intrusión de vapor.
- Estudiante de Guardería (Cuido): inhalación actual y futura de aire interior por intrusión de vapor.
- Residentes (niño/adulto): ingestión futura, contacto dermal e inhalación de vapores por uso residencial de agua sin tratar.
- Trabajadores de la Construcción (adultos): ingestión futura, contacto dérmico e inhalación de los vapores producidos por exposición a la superficie y al subsuelo durante las actividades de construcción.

En esta evaluación de riesgo a la salud humana, las concentraciones de los puntos de exposición fueron estimadas usando ya sea el máximo de concentración detectado de un contaminante o el 95% de límite de seguridad de la concentración promedio. Las ingestas diarias crónicas se calcularon basadas en la exposición máxima razonable (RME, por sus siglas en inglés), la cual es la mayor exposición razonablemente anticipada que se espera que ocurra en el Lugar. El RME está diseñado para estimar un escenario conservador de exposición que esté aun en el rango de posibles exposiciones. Se desarrollaron además suposiciones de exposición de tendencia central. Un resumen completo de todos los escenarios de exposición puede ser encontrado en el reporte de la evaluación de riesgos de salud del Lugar.

Suelo de Superficie y Subsuelo

El riesgo y los peligros fueron evaluados para la exposición actual y futura a suelo superficial. Las poblaciones de interés incluyeron adultos y niños residentes actuales y futuros, y futuros trabajadores de la construcción. Los riesgos de cáncer estuvieron por debajo del rango aceptable de la EPA para todas las poblaciones. Los riesgos no cancerígenos eran iguales o estaban por debajo del valor aceptable de 1 establecido por la EPA. Por lo tanto, no hubo compuestos identificados como sustancias químicas de preocupación (COCs, por sus siglas en inglés) en la superficie del suelo o del subsuelo (Tabla 1).

En adición, se evaluó la presencia de plomo en suelo superficial y subsuelo comparando la concentración máxima de plomo detectada con los criterios de detección para uso residencial (400 mg/kg) y exposición industrial (800 mg/kg). La concentración más alta de plomo que se detectó en el suelo superficial o subsuelo fue de 115 mg/kg, lo que está por debajo de los criterios de selección. Por lo tanto, el plomo no es un COC para el Lugar ya que todas las concentraciones de plomo detectadas estaban por debajo del nivel regional de detección de suelo.

Tabla 1. Resumen de riesgos asociados al suelo de superficie y subsuelo en el Lugar de Papelera Puertorriqueña.

Receptor	Indice de Riesgo	Riesgo de Cancer
Suelo de Superficie		
Trabajador - adulto (actual)	0.1	$5x10^{-6}$
Trabajador - adulto (futuro)	0.09	$4x10^{-6}$
Residente - adulto/niño (futuro)	1	$2x10^{-5}$
Suelo de Superficie y Subsuelo		
Trabajador de Construcción – adulto (futuro)	0.1	$2x10^{-7}$
No se identificaron COCs en los suelos de superficie o subsuelo.		

Agua de Superficie y Sedimento

Los riesgos y peligros fueron evaluados para determinar el potencial de una futura exposición al agua de superficie y sedimento del Rio Viví. Las poblaciones de interés incluyeron a los adolescentes usuarios recreacionales. Los riesgos de cáncer estuvieron por debajo del rango aceptable de la EPA y los no cancerígenos estaban por debajo del valor aceptable de la EPA del índice de riesgo (HI) de 1. Por lo tanto, no hubo COCs identificados en las aguas superficiales o sedimentos del Río Viví. (Tabla 2).

Tabla 2. Resumen de riesgos asociados al agua de superficie y sedimento en el Rio Vivi en el Lugar de Papelera Puertorriqueña.

Receptor	Indice de Riesgo	Riesgo de Cancer
Usuario recreacional – adolescente (actual/futuro)	0.05	$3x10^{-7}$
No se identificaron COCs en el agua superficial o sedimento en el Rio Viví.		

Además, las concentraciones de plomo encontradas en el agua de superficie (con un valor máximo de 0.061 ug/l) y sedimento (con un valor máximo 21.3 mg/kg) evaluadas resultaron estar por debajo de los niveles para Calidad de Agua de Puerto Rico para la clase SD para agua de superficie y los niveles regionales de detección de la EPA para suelos residenciales (400 mg/kg), el cual fue utilizado como criterio de detección para sedimiento.

Agua Subterránea e Intrusión de Vapores

Los riesgos y peligros fueron evaluados para determinar el potencial de una futura exposición al agua subterránea. La población de interés incluía adultos y niños residentes. El riesgo de cáncer estaba por encima del rango aceptable de la EPA y el riesgo no canceroso estaba por encima del valor aceptable de EPA de 1, principalmente debido a la presencia de PCE. Por lo tanto, PCE fue identificado como un COC en el agua subterránea (Tabla 3).

Además, se evaluó el plomo en el agua subterránea y todas las concentraciones de plomo detectadas (valor máximo de 0.81 ug/L) estuvieron por debajo de niveles para Calidad de Agua de Puerto Rico para la clase SG para agua subterránea (15 µg/L).

El potencial de los vapores para entrar al edificio a partir de un proceso llamado intrusión de vapor también se evaluó cualitativamente para los ocupantes del edificio (es decir, personal de Head Start, estudiantes y trabajadores de oficina en el edificio) comparando las concentraciones detectadas debajo y dentro del edificio a los criterios de detección. Las concentraciones de sub-losa que se midieron mostraron concentraciones elevadas de PCE. Las concentraciones en el aire interior que se midieron indicaron que el PCE no estaba en concentraciones elevadas, por lo tanto la reducción de las concentraciones de PCE en la sub-losa garantizará que las concentraciones en el aire interior permanezcan por debajo de los criterios de detección.

Tabla 3. Resumen de riesgos asociados al agua subterránea en el Lugar de Papelera Puertorriqueña.

Receptor	Indice de Riesgo	Riesgo de Cancer
Residente – adulto/niño (actual/futuro)	66	$3x10^{-7}$
El COCs identificado en el agua subterránea en el Lugar es el tetracloroetileno (PCE).		

A base a los resultados de la HHRA, es necesaria una acción correctiva para proteger la salud pública, el bienestar y el medio ambiente de las emisiones reales o amenazadas de sustancias peligrosas en el agua subterránea, que también pueden afectar los vapores que emigran al edificio.

Evaluación de Riesgo Ecológico

Un SLERA se llevó a cabo para evaluar el potencial de riesgos ecológicos por la presencia de contaminantes en el Lugar. El enfoque del SLERA fue evaluar el potencial de impactos a receptores ecológicos sensibles de constituyentes de riesgo relacionados al lugar por medio de la exposición al suelo, sedimento, agua de superficie y de poro en el Lugar. Las concentraciones fueron comparadas a los valores de revisión como un indicador del potencial a efectos adversos a receptores ecológicos. Un resumen completo de todos los escenarios de exposición puede encontrarse en el SLERA.

En base a los resultados de la SLERA, no existe la posibilidad de efectos adversos a los receptores ecológicos (invertebrados, reptiles, anfibios, aves y mamíferos) de la exposición a suelos superficiales contaminados, sedimentos o aguas superficiales. Los criterios de detección para todos los productos químicos en estos medios estaban por debajo del índice de riesgo aceptable de 1 o no darían como resultado impactos a largo plazo en la población.

Había una completa vía de exposición (descarga de agua subterránea al Río Viví) del contaminante relacionado con el Lugar (PCE) a receptores acuáticos identificados. El riesgo asociado con la exposición al agua subterránea contaminada que desemboca en el río (HI = 1.2) es marginalmente superior al índice de riesgo aceptable de la EPA de 1 utilizando el valor máximo detectado y sería inferior a 1 si se utilizara un valor medio más realista. Dado que las descargas de PCE al Río Viví, las alternativas de remediación deben abordar la descarga de aguas subterráneas con el fin de proteger los receptores ecológicos de las emisiones reales o potencialmente amenzantes de sustancias peligrosas.

Es la opinión actual de la EPA que la Alternativa Preferida identificada en este Plan Propuesto o una de las otras medidas activas consideradas en el Plan Propuesto es necesaria para proteger la salud pública o el medio ambiente de las emisiones reales o amenazadas de contaminantes o contaminantes de este Lugar que pueda presentar un peligro inminente y sustancial para la salud pública.

OBJETIVOS DE ACCIÓN REMEDIAL

Los Objetivos de Acción Remedial (RAOs, por sus siglas en inglés) son metas específicas para proteger la salud humana y el ambiente. Estos objetivos están basados en información disponible y estándares, tales como requisitos aplicables o relevante y apropiados (ARARs, por sus siglas en inglés), guías a ser consideradas y niveles basados en el lugar específico.

El RI realizado en el Sitio indicó contaminación por PCE en dos áreas principales: el antiguo cuarto de desarrollo en la esquina sur del Lugar y el drenaje # 2 (Figura 3) en la porción suroeste del edificio. Se encontró que el suelo y el agua subterránea en la parte superior de la saprolita estaban contaminados con PCE en estas áreas. PCE también se detectó por encima de su criterio de detección en el vapor de suelo de sub-losa , agua de poro, sedimentos y aguas superficiales en el Río Viví. El HHRA indica que los riesgos de contacto directo a la exposición de los SRCs están dentro del rango de riesgo aceptable de la EPA. Las altas concentraciones de PCE detectadas en muestras de suelo en el Lugar indican que el suelo contaminado podría servir como una fuente continua de contaminación de PCE al agua subterránea e impactar la salud humana y el medio ambiente como el Río Viví. Además, aunque la intrusión de vapor de PCE en las estructuras del Lugar no ha superado los criterios basados en el riesgo, la acumulación de vapor de PCE debajo del cuarto de desarrollo anterior si ha superado el criterio de detección para PCE. El vapor del suelo se tratará como parte de la remediación del suelo.

PCE también se detectó por encima de su criterio de detección en el RI en múltiples muestras de agua subterránea durante la investigación de remediación. Debido a concentraciones elevadas de PCE en el agua subterránea y al riesgo para la salud humana que plantea la contaminación, se elaboraron RAOs para este medio.

El agua superficial está ligada hidráulicamente al agua subterránea y también es afectada por el suelo a través de la escorrentía superficial y la erosión del suelo. Cuando el agua subterránea y el suelo son tratados con RAOs, se espera que la contaminación del agua superficial también se mitigue.

Los RAOs para Suelo son:

• Prevenir/minimizar el suelo contaminado como fuente de contaminación al agua subterránea y contaminación del agua superficial (por escorrentía superficial) que exceda los Objetivos de Remediación Preliminares (PRGs, por sus siglas en inglés).
• Prevenir/minimizar el suelo contaminado como fuente de contaminación de vapores de sub-losa.

Los RAOs para Agua Subterránea (Agua de Poro) son:

• Prevenir/minimizar el agua subterránea contaminada por encima de los PRGs que sirva como fuente de contaminación al rio (Río Viví).
• Prevenir exposición humana el contaminante en concentraciones por encima de los PRGs.
• Restablecer el agua subterránea a los estándares de agua potable.

Los RAOs para el Agua de Superficie son:

• Reducir las concentraciones de PCE a niveles por debajo de los PRGs mediante la remediación de suelo y agua subterránea por encima de los PRGs.

METAS PRELIMINARES DE REMEDIACIÓN

Para satisfacer los RAO, se desarrollaron los PRGs para ayudar a definir la extensión de la contaminación que requiere medidas correctivas. Los

PRGs son medidas químico- específicas para cada uno de los medios y / o vía de exposición que se espera que sean de protección a la salud humana y al medio ambiente. Se derivan basado en la comparación con los ARARs, niveles basados en el riesgo, y las concentraciones de trasfondo, teniendo en cuenta también dado a otros requisitos como límites analíticos de detección, los valores de orientación, y otra información pertinente.

PRGs para Suelo

No se han promulgado ARARs quimico-especificos para suelos ya sean federales o del Estado Libre Asociado de Puerto Rico. Para satisfacer los RAO para la protección del agua subterránea y atender los impactos Lugar-específicos se desarrollaron niveles para la remediación del suelo. Para satisfacer los RAO para la protección del aire interior, el impacto a los niveles del aire interior se desarrolló en base a un factor de atenuación El criterio de limpieza Lugar-específico para el suelo (30 µg / kg) fue seleccionado como PRG para PCE sobre el criterio de limpieza para aire interior (76 µg / kg) como un valor más conservador.

PRGs para Agua Subterránea

El agua subterránea del Lugar se clasifica como apta para el uso de agua potable. Con el fin de asegurar cualquier uso futuro del agua subterránea del Lugar como una fuente de suministro de agua potable sin el sistema de tratamiento, las normas federales de agua potable son requisitos relevantes y apropiados. El PRG para el agua subterránea es de 5 µg/L.

Criterios de Detección para Agua de Superficie

El Estándar de Calidad del Agua para Puerto Rico para el agua de superficie Clase SD (destinado a ser utilizado como fuente cruda de suministro de agua potable) será utilizado para monitorear a largo plazo la calidad del agua de superficie en el Lugar.

Criterios de Detección para Vapor de Suelo

Los criterios de detección adecuados para los contaminantes de sub-losa y las concentraciones de requiriendo mitigación se basaron en la guía de Niveles de Detección de Intrusión de Vapor de la EPA. Los criterios de detección para intrusión de vapor se utilizarán para monitorear a largo plazo la calidad del aire interior en el Lugar.

RESUMEN DE LAS ALTERNATIVAS REMEDIALES

La ley de CERCLA § 121 (b) (1), 42 U.S.C. § 9621 (b) (1), exige que las medidas correctivas sean de protección a la salud humana y el medio ambiente, sean costo efectivas, y utilicen soluciones permanentes y tecnologías alternativas de tratamiento y alternativas de recuperación de recursos en la mayor medida posible. La Sección 121 (b) (1) también establece una preferencia por las medidas remediales que emplean, como elemento principal, el tratamiento para reducir de forma permanente y significativamente el volumen, toxicidad, o la movilidad de las sustancias peligrosas, y contaminantes en un Lugar. CERCLA § 121 (d), 42 USC § 9621 (d), especifica además que una acción remedial debe alcanzar un nivel o un estándar de control en las sustancias peligrosas y contaminantes, que al menos alcance los ARARs bajo las leyes federales y estatales, a menos que una dimisión puede justificarse en virtud de CERCLA § 121 (d) (4), 42 USC § 9621 (d) (4).

Los plazos que se presentan a continuación para cada alternativa sólo reflejan el tiempo necesario para construir o implementar el remedio y no incluyen el tiempo requerido para diseñar el remedio, negociar de haber partes potencialmente responsables, o procurar contratos para el diseño y construcción.

Los estimados de gastos, que se basan en la información disponible, son estimaciones de orden de magnitud de costos de ingeniería que se espera que estén dentro de +50 a -30 por ciento del costo real del proyecto.

Elementos comunes

Se supone que varios elementos comunes se incluyen como parte de cada alternativa de remediación. Los elementos comunes enumerados a continuación no aplican a la alternativa de No Acción. Los elementos comunes incluyen los siguientes elementos.

Investigación de Pre-Diseño (PDI, por sus siglas en inglés)

La naturaleza y extensión de la contaminación del suelo en la zona vadosa y la contaminación del agual subterránea en la saprolita poco profunda debajo del edificio en el Lugar estarían completamente delineadas en un PDI. Se supone que en la saprolita se instalarán tres nuevos pozos pares de monitoreo (en total seis pozos) durante el PDI para definir la extensión de la contaminación. Los parámetros de diseño también se obtendrían durante el PDI.

Controles institucionales

Los controles institucionales (restricción en la escritura y restricción de perforación de pozos) deben restringir el uso del Lugar únicamente a uso no

residencial y restringir el uso de futuros pozos de extracción de agua subterránea hasta que finalice la limpieza.

Extracción del Vapor del Suelo (SVE)

Los pozos verticales SVE serían instalados en la zona vadosa para atender la contaminación de toda la zona vadosa sin extraer agua subterránea por los pozos SVE. Para fines de estimación de costos, se supone que se instalarán 12 pozos SVE. Las tuberías para transferir el vapor del suelo extraído al sistema de tratamiento se instalarán por encima del suelo debajo del edificio, a lo largo de la pared o en la parte superior para minimizar el impacto en las operaciones de construcción rutinarias. Las tuberías SVE horizontales instaladas en el suelo debajo del edificio serán consideradas durante el PDI como una forma de reducir el número de pozos verticales SVE requeridos para el tratamiento.

El sistema de tratamiento en la superficie será instalado a una unidad prefabricada dentro del edificio para tratar el vapor del suelo extraído antes de su descarga a la atmósfera. Este sistema probablemente consistiría en compresores, tuberías, un separador aire-agua, según sea necesario, y el carbón activado en fase de vapor. El vapor para descargas cumpliría con los requisitos de descarga de Puerto Rico.

Para fines de estimación de costos, se supone que el sistema SVE se operará continuamente durante los primeros 2 años y de forma intermitente durante los siguientes 8 años. El caudal de aire (vacío) y las concentraciones de contaminante, oxígeno y dióxido de carbono en el vapor extraído serían monitoreados regularmente. También se realizarían muestreos y análisis adicionales para evaluar las emisiones al aire. A continuación, se discutirá la evaluación que se llevará a cabo antes del cierre del sistema.

Estudio piloto

Los detalles específicos del Lugar para el diseño de la tecnología de remediación activa se determinarían durante un estudio piloto. El radio de influencia de la inyección (enmiendas de biorremediación o aire) y extracción (SVE) se determinaría utilizando equipo temporal a la escala de un estudio piloto. Cualquier posible impacto secundario de la remediación (como los cambios geoquímicos) también serán evaluados.

Monitoreo a Largo Plazo

Se instituiría un programa de monitoreo a largo plazo del penacho de agua subterránea del Lugar, agua de superficie y vapor. El programa de monitoreo debe continuar hasta que las concentraciones de contaminantes en todos los medios hayan logrado los PRGs. Para fines de estimación de costos, se supone que el programa de monitoreo a largo plazo incluiría monitoreo anual durante 20 años para 16 pozos de monitoreo, siete (7) localizaciones de agua de superficie y siete (7) localizaciones de vapor. Los datos de monitoreo tomados serían evaluados y utilizados para evaluar la migración y atenuación de la contaminación en el agua subterránea, la efectividad de la acción correctiva y el progreso hacia el cumplimiento de los PRGs.

Evaluación de cada Cinco Años

A base de lo establecido por CERCLA, las alternativas que resultan de contaminantes por encima de los niveles que permiten el uso ilimitado y la exposición ilimitada requieren que el Lugar sea evaluado al menos una vez cada cinco años. Si lo justifica la revisión, medidas correctivas adicionales pueden ser consideradas para eliminar, tratar o contener la contaminación. La revisión del Lugar incluiría la evaluación de los datos tomados del monitoreo a largo plazo, una inspección visual de todo el Lugar y un informe preparado por la EPA.

Restauración del Lugar

Después de la culminación de todas las acciones correctivas, los pozos SVE, cualquier otro pozo de recuperación y los puntos de monitoreo del vapor del suelo serían abandonados apropiadamente. Todo el equipo y materiales serían removidos o desmovilizados. El Lugar sería restaurado a condiciones de acción pre-remedial tanto como sea posible, como la reparación de la losa del edificio y el pavimento.

EPA Región 2 - Política de Eficiencia Energética (Clean and Green Policy)

Los beneficios ambientales del remedio preferido pueden mejorarse tomando en consideración, durante el diseño, las tecnologías y prácticas que sean sostenibles, de acuerdo con la Política Energética de la EPA en la Región 2. Esto incluirá la consideración de tecnologías y prácticas de remediación verdes. Algunos ejemplos de prácticas que serían aplicables son las que reducen las emisiones de contaminantes al aire, minimizar el consumo de agua potable, incorporar vegetación nativa en los planes de revegetación, y considerar la reutilización y / o reciclaje de materiales beneficiosos, entre otros.

Alternativas de Remediación

Las alternativas de remediación que atenderán la contaminación del agua subterránea están

resumidas a continuación. Con la excepción de la opción de No Acción, varios elementos comunes, tal discutidos arriba, son parte de cada alternativa de remediación, ver Figura 7.

Las siguientes alternativas han sido consideradas en este Plan Propuesto:

Alternativa 1: No Acción

Costo Capital Total	$ 0
Costo de Operación y Mantenimiento	$ 0
Total del Valor Neto Presente	$ 0
Tiempo Estimado de Construcción	0 meses
Tiempo Estimado para lograr RAOs	0 años

El NPC exige que se evalue una alternativa de "No acción" como base para comparar con las otras alternativas de remediación. Bajo esta alternativa, la EPA no tomaría ninguna acción para prevenir la exposición a la contaminación del suelo y el suelo contaminado se dejaría en su lugar. No se atenderá el agua subterránea contaminada.

Debido a que esta alternativa daría lugar a que los contaminantes permanezcan por encima de los niveles que permiten un uso irrestricto y una exposición ilimitada, CERCLA requiere que el Lugar sea reevaluado al menos cada cinco años. Si la revisión lo justifica, pueden aplicarse medidas de remediación adicionales.

Alternativa 2: SVE y AS

Costo Capital Total	$ 1.7 millones
Costo de Operación y Mantenimiento	$ 0.5 millones
Total del Valor Neto Presente	$ 2.6 millones
Tiempo Estimado de Construcción	7 meses
Tiempo Estimado para lograr RAOs	10 años

La Alternativa 2 usaría una combinación de tecnologías, incluyendo la extracción de vapor del suelo (SVE), y AS para extraer y eliminar los vapores contaminantes del suelo para el tratamiento en la superficie. SVE extrae los vapores del suelo de la zona vadosa aplicando un vacío para sacar los vapores. AS, por otro lado, bombea aire al subsuelo para ayudar a extraer vapores del agua subterránea y del suelo saturado encontrado debajo del nivel freático. La adición de aire hace que los productos químicos se evaporen más rápidamente, lo que los hace más fáciles de extraer con otra tecnología, como SVE. Los pozos AS se instalarán para eliminar la contaminación de la saprolita saturada. El proceso AS quitaría PCE del agua subterránea. El PCE volatilizado migraría entonces a la zona vadosa y se recogería con el sistema SVE, que sería operado conjuntamente con el AS. Se instalarán puntos de monitoreo de vapor en las inmediaciones de la zona de aspersión para asegurar que el edificio del Lugar y los edificios cercanos no se vean afectados por la intrusión de vapor del proceso de AS. Las localizaciones precisas de los puntos AS y SVE se confirmarían durante la fase de diseño. Si está presente, los residuos de amenaza principal serán tratados mediante el tratamiento de esta alternativa. Para fines de estimación de costos, se supone que el sistema AS y SVE sería operado por aproximadamente diez (10) años.

Alternativa 3: SVE y tratamiento *In-Situ*

Costo Capital Total	$ 2.2 millones
Costo de Operación y Mantenimiento	$ 0.4 millones
Total del Valor Neto Presente	$ 3 millones
Tiempo Estimado de Construcción	10 meses
Tiempo Estimado para lograr RAOs	10 años

El penacho de agua subterránea contaminado con concentraciones de PCE por encima de los PRG en la saprolita se remediaría utilizando el tratamiento in situ. Para propósitos de estimación de costos, se selecciona la biorremediación anaeróbica in situ como la opción representativa del proceso de tratamiento in situ.

Los nutrientes se inyectarán en el suelo para promover el crecimiento de bacterias naturales que degradarán la contaminación existente, con fines de estimación de costos se asumió que los puntos de inyección tendrían un radio de influencia de nueve (9) pies y se necesitaría una segunda ronda de inyecciones a tres (3) años después de la primera ronda. En base de los

resultados del estudio piloto discutido anteriormente, el SVE y el tratamiento in situ estarían secuenciados o diseñados para funcionar de manera coordinada. De estar presente, los residuos de principal amenaza serán tratados mediante el tratamiento de esta alternativa.

EVALUACIÓN DE ALTERNATIVAS DE REMEDIACIÓN

Se utilizan nueve criterios para evaluar las diferentes alternativas de remediación individualmente y uno contra el otro a fin de seleccionar un remedio. Esta sección del Plan Propuesto perfila el rendimiento relativo de cada alternativa contra los nueve criterios, teniendo en cuenta cómo se compara con las otras opciones consideradas. A continuación, se analizan los nueve criterios de evaluación. Un análisis detallado de las alternativas se puede encontrar en el FS.

Un análisis comparativo de estas alternativas basadas en los criterios de evaluación mencionados anteriormente se presenta a continuación.

Protección General de Salud Humana y el Medio Ambiente

Un requisito mínimo de CERCLA es que la acción de remediación seleccionada proteja la salud humana y el medio ambiente. Una alternativa es protectora si reduce a niveles aceptables el riesgo actual y potencial asociado con cada vía de exposición en un lugar.

Las detecciones de PCE están actualmente por encima de PRGs o criterios de detección en el suelo, vapor, aguas subterráneas y aguas superficiales, y representa un riesgo para futuros residentes, usuarios del agua subterránea. La alternativa de No Acción, Alternativa 1, no protegería a la salud humana y al medio ambiente ya que no se tomarían medidas para remediar o monitorear la contaminación y el riesgo. Las alternativas 2 y 3 protegerían la salud humana y el medio ambiente, ya que proveen tratamiento activo para la contaminación en el suelo y las aguas subterráneas hasta que se alcancen las RAO y los PRG. Se implementarán controles institucionales para restringir el uso futuro residencial del agua subterránea en el Lugar hasta que se cumplan los PRG.

El cumplimiento de los requisitos aplicables o relevantes y apropiados (ARARs)

El cumplimiento de ARARs es el otro requisito de umbral para la selección de remedio bajo las regulaciones de CERCLA.

PCE está presente en el agua subterránea y en el suelo en concentraciones que exceden PRGs, y por lo tanto no están actualmente en conformidad con ARARs químico-específicos. La Alternativa 1 no tomaría medidas activas para evaluar el cumplimiento futuro de los ARARs. Las alternativas 2 y 3 alcanzarían el cumplimiento de ARARs químicos-específicos mediante el tratamiento activo.

Efectividad y Permanencia a Largo Plazo

La alternativa 1 no se consideraría un recurso permanente, ya que no se aplicaría ninguna medida para reducir el nivel de contaminación por debajo de los PRG ni para verificar reducción natural que pudiera estar ocurriendo. Las alternativas 2 y 3 reducirían de forma permanente e irreversible las concentraciones de PCE en el agua subterránea y el suelo mediante el tratamiento activo y, en consecuencia, reducirían la contaminación del vapor y del agua superficial, ya que el suelo y el agua subterránea son las fuentes de contaminación en estos medios. El riesgo residual estaría dentro del rango de riesgo aceptable de la EPA para las Alternativas 2 y 3.

Reducción de la Toxicidad, Movilidad o Volumen por Medio de Tratamiento

La alternativa de No Acción no monitorearía ni evaluaría la reducción de la toxicidad/movilidad /volumen de contaminantes (T/M/V) a través de procesos naturales, porque no se llevaría a cabo ninguna acción de remediación. Las alternativas 2 y 3 reducirían el T/M/V mediante el tratamiento en el suelo, el agua subterránea y el vapor del suelo, y lograrían los PRG.

Efectividad a Corto Plazo

Con respecto a la alternativa de No Acción, no habrá ningún impacto a corto plazo para la comunidad y el medio ambiente ya que no ocurriría ninguna acción correctiva. Habría algunos impactos menores a corto plazo para la comunidad local y los trabajadores con las Alternativas 2 y 3 debido a las acciones de remediación activas y construcción y operación del sistema.

La Alternativa 2 requeriría una mayor huella y su operación sería más larga) que la Alternativa 3, ya que combinaría la aireación con el sistema de SVE. La Alternativa 3 puede causar impactos a corto plazo en el Río Viví si los metales solubilizados (principalmente hierro, manganeso y arsénico) y el agua subterránea desoxigenadas entran al río a través de la descarga del agua subterránea.

Tanto la Alternativa 2 como la Alternativa 3 requerirían que el equipo de SVE se instale en el interior y, para la Alternativa 3, para inyectar enmiendas a través del piso del edificio a la contaminación existente debajo del edificio; esto requeriría perforar múltiples orificios en el piso, lo que podría debilitar la estructura del piso. La Alternativa 3 requeriría un plazo menor ya que la enmienda modificada con aditivo podría entrar en zonas de baja permeabilidad y tratar la contaminación que podría estar oculta de las burbujas que se produzcan en la Alternativa 2, que preferentemente trataría las zonas más permeables.

Para ambas alternativas, se necesitaría un estudio piloto para evaluar la distribución de enmiendas durante las inyecciones de tratamiento in situ o la zona de influencia de los puntos de aspersión de aire; los plazos se podrían alargar si las condiciones del subsuelo impiden la capacidad de distribuir burbujas de aire o de modificar las zonas contaminadas (especialmente zonas de baja permeabilidad). Adicionalmente, para el tratamiento in situ, los plazos podrían extenderse si la tasa de destrucción de contaminantes es modulada por las velocidades de disolución de cualquier DNAPL residual.

Implementación

La alternativa de No Acción es implementable. Ambas alternativas 2 y 3 son implementables, pero requerirían un diseño cuidadoso debido a las limitaciones de espacio y al potencial de inundación del Río Viví. También puede ser difícil distribuir burbujas de aire o enmendar a todas las zonas contaminadas del Lugar debido a que la geología es heterogénea, especialmente la presencia de cualquier zona contaminada de baja permeabilidad. La Alternativa 3 puede ser más difícil de implementar que la Alternativa 2 debido a tres desafíos: (1) se desconoce si la estructura del piso del edificio del Lugar puede soportar que se hagan múltiples orificios a través del piso, (2) se desconoce si el equipo que puede ser operado en interiores también es capaz de alcanzar toda la profundidad de la zona contaminada, y (3) existe el potencial de descarga en el Río Viví de metales reducidos solubles y aguas subterráneas desoxigenadas formadas durante la biorremediación anaeróbica.

Costo

Alternativa para Suelo	Costo Capital	Costo Presente O&M	Total del Valor Neto Presente
1	0	0	0
2	$1,703,000	$930,000	$2,633,000
3	$2,222,000	$799,000	$3,021,000

Aceptación de la Comunidad

La aceptación de la comunidad del remedio preferido será evaluada después de que termine el periodo público de comentarios y se describa en la sección Resumen de Respuesta del ROD para este Lugar. El ROD es el documento que formaliza la selección de un remedio para un Lugar.

Remedio Preferido

La EPA está proponiendo la Alternativa 2 (SVE y AS) como la alternativa preferida para el Lugar porque esta alternativa lograría efectivamente los objetivos de la acción correctiva. La

combinación de SVE y AS, y los controles institucionales garantizan la protección.

Bajo la Alternativa 2, se instalarán pozos SVE y AS para eliminar la contaminación en la saprolita saturada. El proceso AS quitaría PCE del agua subterránea. El PCE volatilizado migraría entonces a la zona vadosa y se recogería en el sistema SVE, que sería operado conjuntamente con el AS. Se instalarán puntos de monitoreo de vapor en las inmediaciones de la zona de aspersión para asegurar que el edificio del Lugar y los edificios cercanos no se vean afectados por la intrusión de vapor durante el proceso de AS. Para fines de estimación de costos, se supone que el sistema AS y SVE sería operado por aproximadamente diez (10) años. El costo actual estimado de la alternativa preferida es de $2,633,000.

Bases Para Preferencia del Remedio

Los beneficios ambientales del remedio preferido pueden ser mejorados al considerar, durante el diseño, tecnologías y prácticas que sean sostenibles de acuerdo con la Política de Energía Limpia y Verde de la Región 2 de la EPA. Esto incluiría la consideración de tecnologías y prácticas de remediación ecológica.

Basándose en la información actualmente disponible, la EPA cree que la alternativa preferida cumple los criterios de umbral y proporciona el mejor balance de compensaciones entre las otras alternativas con respecto a los criterios de equilibrio. La EPA y la PREQB esperan que la alternativa preferida pueda satisfacer los siguientes requisitos estatutarios de la Sección 121 (b) de CERCLA: 1) proteja la salud humana y el medio ambiente; 2) cumpla con los ARARs; 3) sea rentable; 4) utilice soluciones permanentes y tecnologías alternativas de tratamiento o tecnologías de recuperación de recursos en la medida posible; y 5) satisfaga la preferencia por el tratamiento como elemento principal. La alternativa preferida # 2, satisfaría la preferencia por el tratamiento como un elemento principal, ya que SVE / AS proporcionaría tratamiento de suelos contaminados, residuos de amenaza principal, si estaba presente, y agua subterránea para lograr los PRGs. Se llevará a cabo un monitoreo a largo plazo y revisiones cada 5 años para asegurar la protección del remedio. La EPA evaluará los criterios de modificación de la aceptación de la comunidad en el ROD después del cierre del período de comentarios públicos.

Estado Libre Asociado de Puerto Rico / Agencia de Apoyo

La JCA está de acuerdo con la acción preferida incluida en el Plan Propuesto.

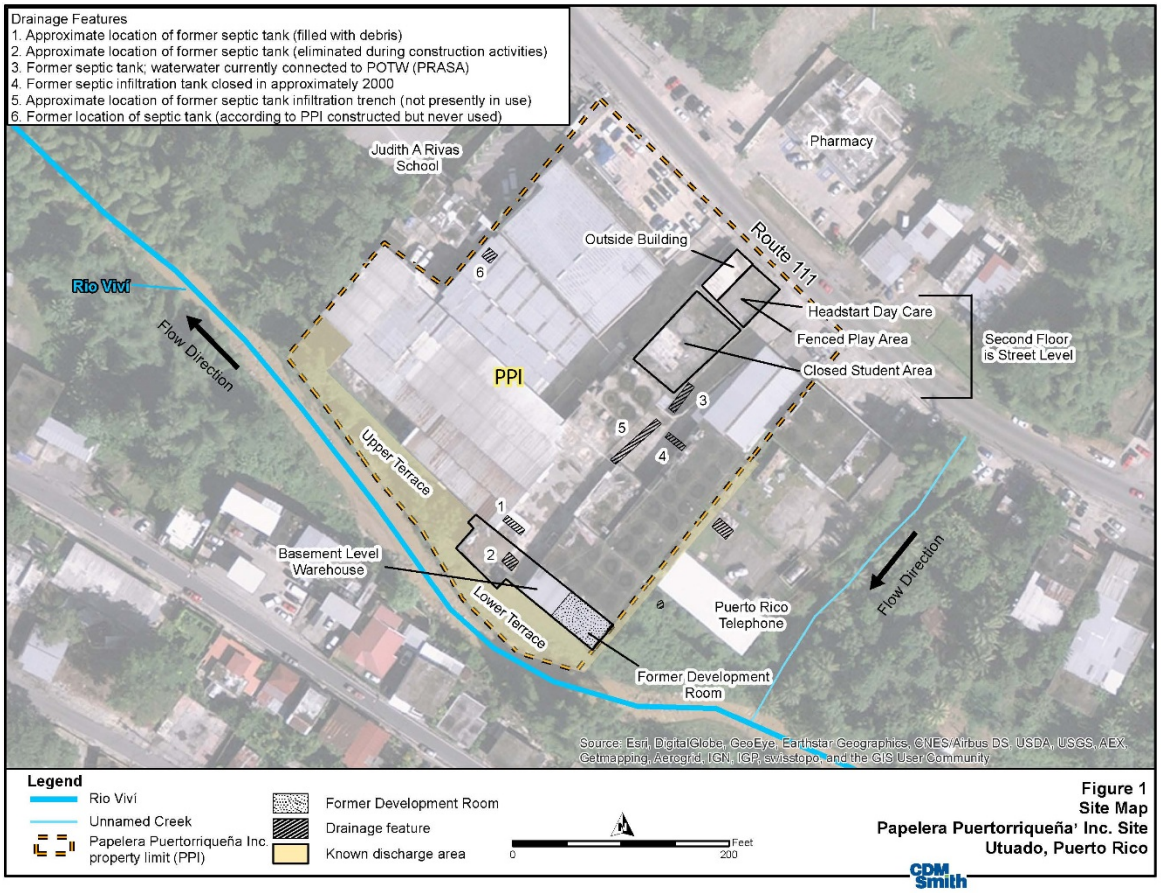


Figure 1
Site Map
Papelera Puertorriqueña, Inc. Site
Utuado, Puerto Rico

CDM Smith

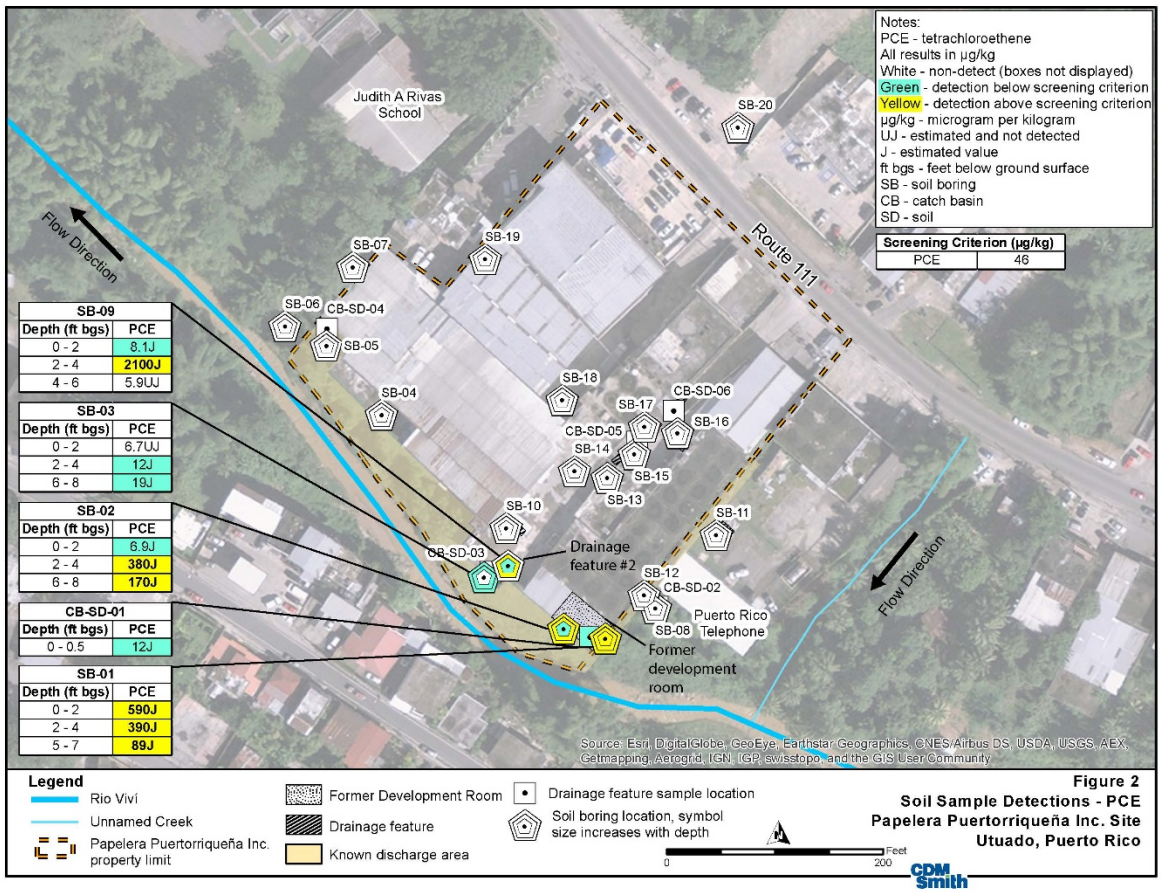


Figure 2
Soil Sample Detections - PCE
Papelera Puertorriqueña Inc. Site
Utuado, Puerto Rico

CDM Smith

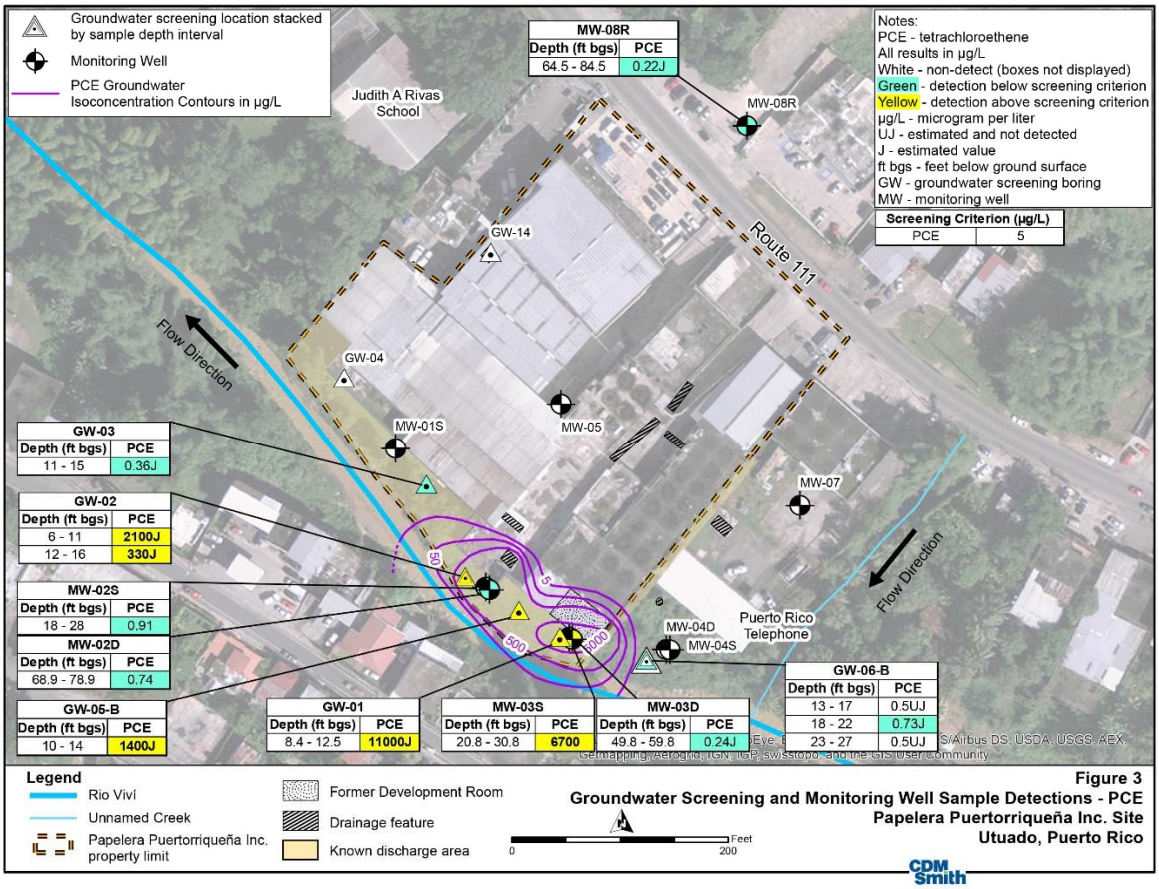


Figure 3
Groundwater Screening and Monitoring Well Sample Detections - PCE
Papelera Puertorriqueña Inc. Site
Utuado, Puerto Rico

CDM Smith

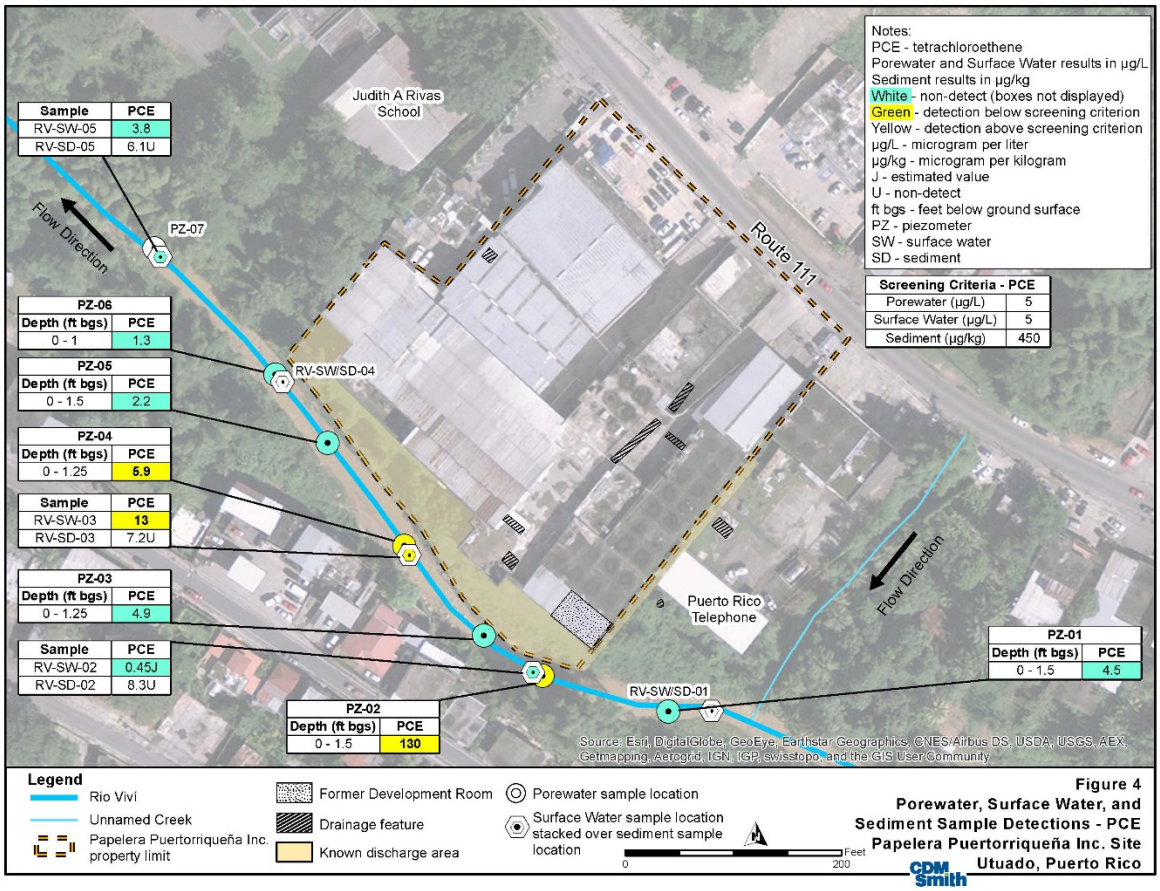


Figure 4
Porewater, Surface Water, and Sediment Sample Detections - PCE
Papelera Puertorriqueña Inc. Site
Utuado, Puerto Rico

CDM Smith

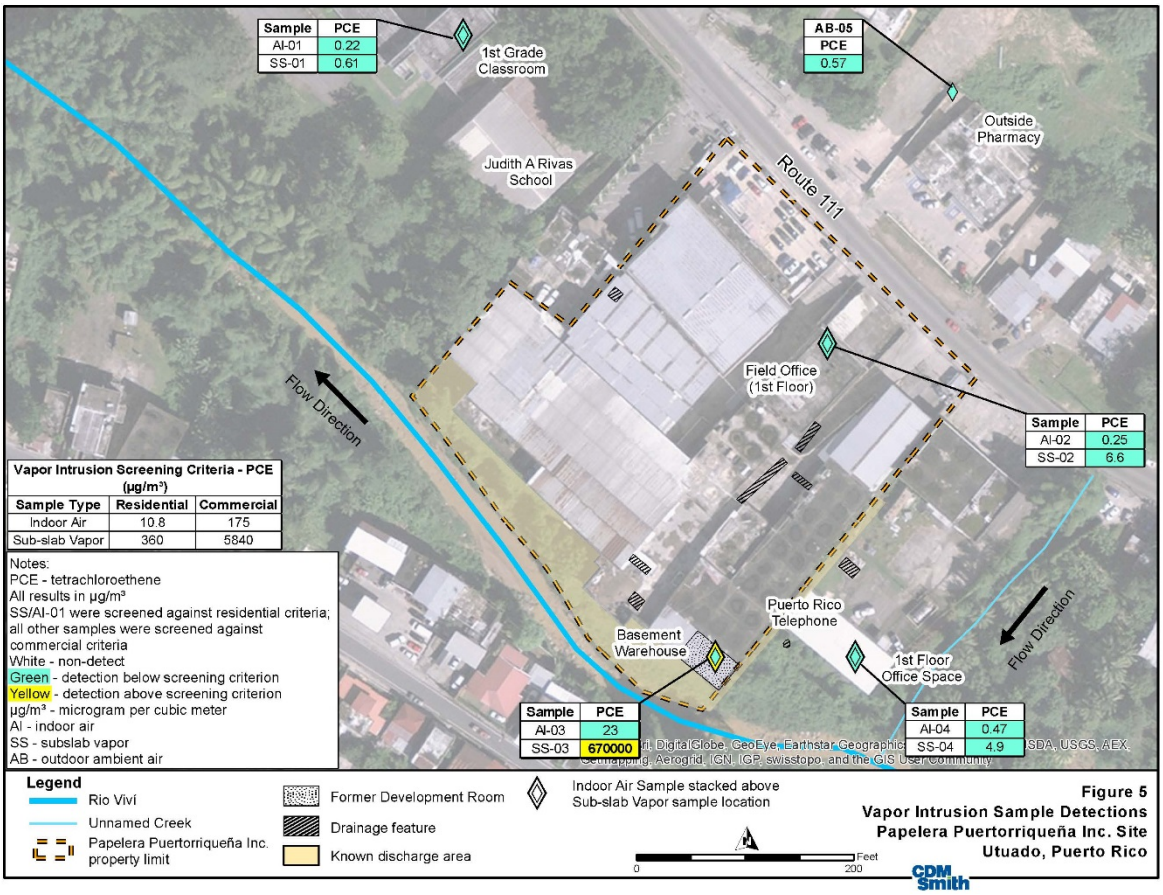


Figure 5
Vapor Intrusion Sample Detections
Papelera Puertorriqueña Inc. Site
Utuado, Puerto Rico

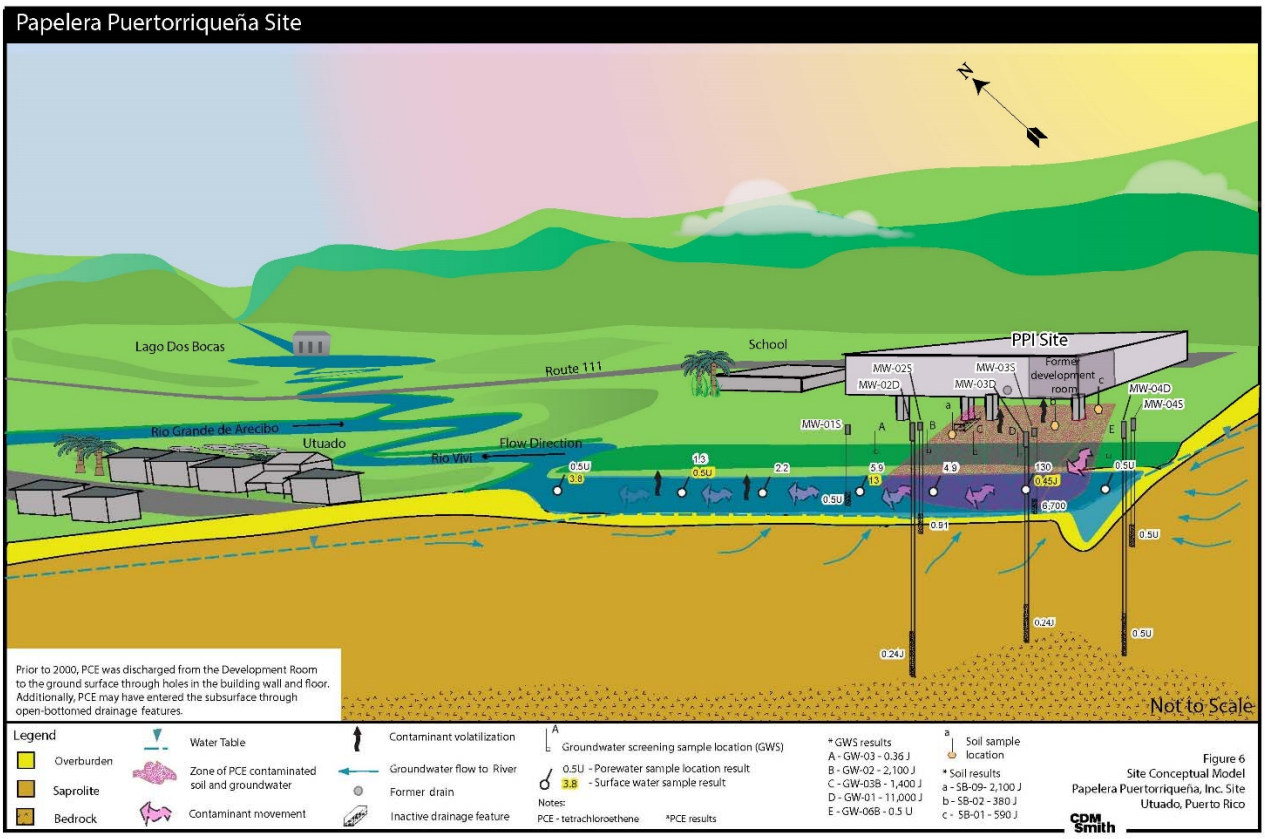
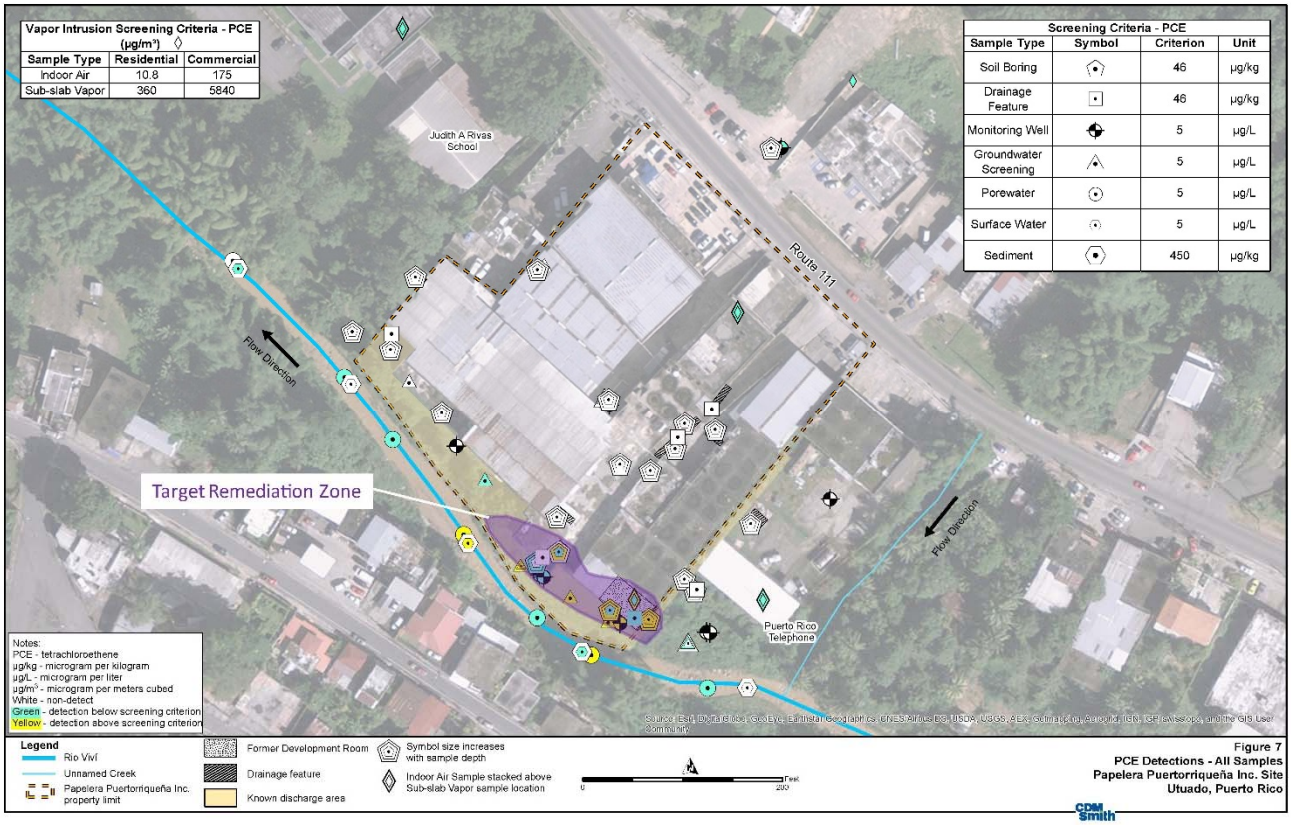


Figure 6
Site Conceptual Model
Papelera Puertorriqueña, Inc. Site
Utuado, Puerto Rico


Vapor Intrusion Screening Criteria - PCE (µg/m³)
Sample Type | Residential | Commercial
Indoor Air | 10.8 | 175
Sub-slab Vapor | 360 | 5840
Screening Criteria - PCE
Sample Type | Symbol | Criterion | Unit
Soil Boring | 46 | µg/kg
Drainage Feature | 46 | µg/kg
Monitoring Well | 5 | µg/L
Groundwater Screening | 5 | µg/L
Porewater | 5 | µg/L
Surface Water | 5 | µg/L
Sediment | 450 | µg/kg
Judith A Rivas School
Route 111
Flow Direction
Target Remediation Zone
Puerto Rico Telephone
Notes:
PCE - tetrachloroethene
µg/kg - microgram per kilogram
µg/L - microgram per liter
µg/m³ - microgram per meters cubed
White - non-detect
Green - detection below screening criterion
Yellow - detection above screening criterion
Legend
Rio Vivi
Unnamed Creek
Papelera Puertorriqueña Inc. property limit
Former Development Room
Drainage feature
Known discharge area
Symbol size increases with sample depth
Indoor Air Sample stacked above Sub-slab Vapor sample location
Feet
0
200
Figure 7
PCE Detections - All Samples
Papelera Puertorriqueña Inc. Site
Utuado, Puerto Rico
CDM Smith

APPENDIX V
PAPELERA PUERTIRRIQUEÑA INC. SUPERFUND SITE
Transcript of the public meeting and written comments

PUBLIC MEETING
PAPELERA PUERTORRIQUEÑA, INC., SUPERFUND SITE
UTUADO, PUERTO RICO
JULY 20, 2017
UTUADO, PUERTO RICO

Reporter's Notes:
Meeting Scheduled for: 5:00pm
Place: Utuado Municipal Legislature

Meeting opens at 5:00pm

Brenda Reyes: Good afternoon, my name is Brenda Reyes, I am a Public Affairs Officer for the U.S. Environmental Protection Agency, EPA Caribbean Office, Region 2. This is an informative meeting, or public information session, regarding the Papelera Puertorriqueña Superfund site, located in Utuado, Puerto Rico. The meeting is now open. We will wait a little while to allow more people to arrive, because people continue to arrive. The meeting will be recorded, comments are recorded as required by law; we will then provide responses, a summary of responses to the comments. This afternoon I have with me my colleague, Luis Santos, he is the Papelera Project Manager, we also have with us CDM representatives Mike Valentino and Frances Delano —CDM is the U.S. Environmental Protection Agency contractor that will be working at the site. So please give us a little time for other persons to arrive and then we can begin the meeting at 5:30.

Luis Santos: It is important to note that... It is important to let you know that... —My name is Luis Santos, I am a project manager. I work for the Environmental Protection Agency. It is important to note that regardless, the purpose of today's meeting is to inform you, in general terms, about the process we have followed, what agency it is, what the agency does, how the

site came to the agency's attention, what we have done, and what projects we have to remedy the situation we found. Basically, there is a 30-day comments period, which began on July 13. Right now, well, any member of the community that is not here today is not left out, because the documents are in the repository located here, at the City Hall, you may find and see them there, and we have until August 12 to receive comments. All comments will be considered and answered.

Carmen M. Ayala Cuervos: Is there an address to send comments?

Luis Santos: Yes, yes. In the document... There are two documents as you come in, the document in English is the Agency's official document. The document in Spanish is, basically, the translation, but it has not been translated by a translator, I cannot say it is an official document, because I would have to pay a translator to [ensure] it is true and exact[and] therefore contains all the information, and is true to the English version.

Carmen M. Ayala Cuervos: And does it provide the address that can be used?

Luis Santos: Exactly, it may be used as reference, it contains the necessary basic information, and based on it any person may go on to make any comment he/she may be unable to make today, he/she could make it at that time.

Carmen M. Ayala Cuervos: August...?

Luis Santos: The comments period began on July 13.

Carmen M. Ayala Cuervos: It continues until when?

Luis Santos: Until August 12, 30 days.

Carmen M. Ayala Cuervos: August 12.

Luis Santos: We are providing a little time. If you have any doubts or questions we may... The presentation is simple, we will proceed slowly so we can see it in detail. But it is a question of... Let us wait until the half hour.

The record is closed to allow the people who continue to arrive to settle in.

5:30pm
The meeting is opened again to officially being the presentation

Brenda Reyes: Ok, now we will officially begin. Please note that the meeting is being recorded. Whenever you wish to ask a question or make a comment, use this microphone *(Reporter's note: refers to a microphone located in the area reserved for the public).* Please use this microphone, always identify yourself with your first and last name, because these comments will become part of what is known as the Response to Comments, the Responsiveness Summary. I now identify myself again, my name is Brenda Reyes, Public Affairs Officer for the U.S. Environmental Protection Agency, Caribbean Office. I am accompanied today by my colleague, the project manager Luis Santos. Representing CDM we have José Reyes, Mike Valentino, and Frances Delano. Our colleagues from the Puerto Rico Environmental Quality Board arrived a few minutes ago, they are also present, they are here to answer any questions. I remind you that the purpose of the meeting is to present the proposed plan for the Papelera Puertorriqueña Superfund site located in Utuado. We inform the public about the preferred alternative and request comments from the public. These are part of the requirements

established by law. We have certain public participation mechanisms, we try to make them very inclusive. These meetings are held... a public meeting is held. We have announced this public meeting in several ways. Regulations require that we publish the notice in the newspaper with highest circulation in the country. However, we always distribute flyers in the communities we visit, it is an additional step, it promotes person to person communication, and we provide information and answer questions prior to the meeting. In addition, we placed radio spots in the Éxitos 1530 radio station for three days, and sent a press release which was published by some media such as: Noticel, the La Perla del Sur newspaper, some online media in the web. So we have complied with these communication requirements. In addition, as indicated, my colleague Santos will be making a presentation today. For those of you who do not have it, we have an fact sheet about the Papelera Superfund site, it is at the front. If you want to take an additional fact sheet you may do so, it is in English and in Spanish. If you want to speak with Mr. Santos after the meeting, and after the questions, because you do not feel comfortable asking questions in public, we will be pleased to stay behind for a little while, it will be recorded, but we would appreciate it if you came here for it to be recorded. *(Reporter's note: points to the area where the recording and transcript of the meeting is taking place).* It is important to include all comments in the Responsiveness Summary. So without further ado, Luis.

Frances Delano: Questions will be heard at the end.

Brenda Reyes: Of course. Luis will make the presentation and then we proceed with the questions. A small detail, I forgot to thank the Municipality of Utuado and the Municipal

Legislature, who very kindly loaned us this room to hold the public meeting –it is comfortable and centrally located. So our thanks to the Municipality of Utuado.

Luis Santos: Good afternoon, my name is Luis Santos, I work for the U.S. Environmental Protection Agency, EPA, for the Superfund program. Superfund is a "nickname", because the real name of the program under which this investigation falls is CERCLA, that is the Comprehensive Environmental Response, Compensation and Liability Act. That is CERCLA. It is also known as the Superfund and it became effective in 1980. Its aim is to clean up everything [related to] the practices in use prior to the eighties, the sixties, or earlier that are currently causing public health and environmental problems.

(Reporter's note: Shows slide 2: Focus of the Investigation).

The focus of the investigation... again, is Papelera Puertorriqueña, Inc.
The objectives will be to: Define the nature, extent, and sources of contamination in the groundwater, surface water and soil. Assess the risk to human health and the environment.

(Reporter's note: Shows slide 3: Superfund Process).

This shows the Superfund process, and the arrows tell us that the site is identified; next, a preliminary study is performed; it is listed, and a site inspection is performed from this listing, the site is inspected, and at that time samples are collected. Then a mathematical model is prepared which results in a percentage score; any site with a score higher than twenty-eight point five percent is eligible to be added to EPA's National Priorities List. Once listed, in our case it was added on September twenty-three 2009, because of its score, it was added to the

National Priorities List, and once it was added to the National Priorities List an initial investigation, a remedial investigation/feasibility study is required. This is what I will be presenting this afternoon.

(Reporter's note: Shows to slide 4: Location Map)

Here we see the location map of the... this is Hwy. 111 and this is the Río Viví. To give you the location of where we will... the site.

(Reporter's note: Shows slide 5: Soil and Sediment Samples)

Ok. As I explained before, soil samples were collected throughout the facility. The area circled in red is where [contamination] levels exceeding the criteria were found, where contamination was found.

(Reporter's note: Shows slide 6: Groundwater Samples)

Let us proceed with the groundwater investigation: Monitoring wells were drilled and samples were collected. These samples included the complete contaminant list, to detect which contaminant should concern us most, and whether there was any contaminant that should concern us. Again it showed that the impacted area is the same.

(Reporter's note: Shows slide 7: Río Viví Samples)

Let us proceed to the Río Viví which is one of the boundaries, neighboring the facility, and samples were collected along the river, before the facility, at the facility and after the facility. Again, contaminants were detected in the same areas.

(Reporter's note: Shows slide 8: Soil Vapor Samples)

Surface soil samples were collected, soil vapor samples were collected in the facility, because we have a Head Start there, and that concerns us, we wanted to make sure they were not impacted. Soil vapor samples were collected, vapor from the contamination, to see if any of them were migrating and could escape. The results were that in the area identified before... it continues to reproduce, we continue to have readings. That is to say, that the whole area coincides, in all the sampled areas contamination was detected in the same place.

(Reporter's note: Shows slide 9: Conceptual Site Model)

This is a pie cut view, a lateral cut, it shows the facility and the area where it would flow. It is a conceptual model.

(Reporter's note: Shows slide 10: Remediation Target Zone)

All this leads us to conclude that the area shaded in violet is the area for which a decision must be made, because it is the contaminated area, the same area that is repeatedly shown to be contaminated in all the media sampled.

(Reporter's note: Shows slide 11: Contaminant)

The contaminant that concerns us in this case is tetrachloroethylene, or PCE. This is found in the groundwater, the soil, surface water and in porewater.

(Reporter's note: Shows slide 12: Human Health Risks)

Once we have the results, of what we call the study or remedial investigation, which provided the data I just presented, then we proceed with the risk assessment evaluation. At this point we are designing the risk assessment. This includes the workers, Head Start employees, and Río Viví users in areas adjacent to the study area. Present and Future. The future includes: residents and construction workers who could be working with remediation or in remedial activities. The human risks would be: carcinogenic, non-carcinogenic—future residents— and potential exposure of workers and future residents to subsoil and groundwater in the basement of the building. The principal contaminant that concerns us, we repeat, in terms of human health is PCE.

(Reporter's note: Shows slide 13: Remediation Objectives)

Soil remediation objectives would be:

- Prevent/minimize contaminated soil from being a source of groundwater contamination and surface water contamination (via surface water runoff) exceeding the criteria for the detected contaminants.
- Prevent/minimize contaminated soil from serving as a source of vapor contamination inside the building.

Groundwater remediation objectives would be:

- Prevent/minimize contaminated groundwater above PRGs from serving as a source of Río Viví contamination.
- Prevent human exposure to contaminant concentrations in groundwater above PRGs.
- Restore the groundwater to drinking water quality.

(Reporter's note: Shows slide 14: Remediation Objectives)

Soil vapor intrusion objectives would be:

- Mitigate the public health impacts of soil vapor intrusion into the building.

(Reporter's note: Shows slide 15: Remediation Alternatives)

We have considered 3 alternatives to attain the aforementioned objectives. Alternative number one, which must always be considered, is the No Action alternative. The No Action alternative means no action would be taken. Alternative number two would be subsoil aeration. This aeration would promote the volatilization of subsoil vapors, accelerating degradation and lowering the levels to acceptable values. Alternative number three would be *In-Situ* treatment using bioremediation to achieve the same objective, that is to mitigate and/or reduce detected contamination levels to reasonable levels that fall within federal and state quality standards.

(Reporter's note: Shows slide 16: Proposed Plan)

The alternative being considered and which we are presenting in the documents provided for your consideration during the next 30 days, that is from July 13 to August 12, would be alternative number two, which would consist of groundwater aeration in the plume area together with soil vapor extraction wells and the installation of air injection wells to remove and volatilize contaminants to achieve the principal objective to reduce contamination levels so that they meet federal and state contamination standards.

(Reporter's note: Shows slide 17: Work Team)

For the duration of the project the U.S. Environmental Protection Agency has worked, in my case, in coordination with the Puerto Rico Environmental Quality Board; whose project manager in this case is Pascual Velázquez, who is with us here.

(Reporter's note: Shows slide 18: Questions)

I don't expect to clarify or enter into technical details here, because the technical details are included in the documents provided for your consideration, and which have been made available to you. We hope you have the opportunity to evaluate and examine them and submit your comments. All comments will be considered and answered. If the comment required an amendment to the proposed plan, it would be done, if necessary. At this time I open the meeting for questions and discussion. If anyone has a question please go to the microphone and identify yourself so we can begin the dialogue.

Wilson Viruet Ríos: Good afternoon, my name is Wilson Viruet, PIP (Puerto Rican Independence Party) municipal legislator here in Utuado. The first thing I must say is that I'm sorry that many of the residents and the community of Utuado have not come. I will be honest with you which is what I feel as a resident of Utuado, and because I am concerned about the town of Utuado. Not just the town of Utuado, I worry about my beloved country, Puerto Rico, given the situations we are experiencing here in Utuado and in other towns. I believe that many residents of Utuado did not come –like the young woman who sent me this "thing "in the newspaper, in the radio– very few residents of Utuado have come, very few people from the community close to Papelera. One of the concerns, and I don't mean to be disrespectful, is that the people no longer believe in you. I say this clearly, the people of Puerto Rico do not believe

in EPA, because of what is happening in the town of Peñuelas. Here I've made a proposal regarding the herbicides that are being spread throughout Puerto Rico. What worse contaminant is there? antennas everywhere, they speak of cancer, and all that... Environmental pollution, and many things that are happening in Puerto Rico. And I want... I find it regrettable, that there are very few residents of Utuado here, right now, here, from the community, in this meeting. I have been honest, I say what I feel. Right now we have a situation in the town of Peñuelas with the landfills. The Puerto Rico Police is being used to hold demonstrators back, and the people are going in, ruining the environment, contaminating the water. I believe that... I don't know if I am drifting from the subject, the problem with the manufacturer here, but there are many things going on and it must be stopped, and EPA must be aware, must be conscious of this, because I believe, that either someone higher up is holding you back or you are not doing your job, don't want to do your job. It is regrettably what I must say here. Thank you.

Luis Santos: Thank you for your words. EPA has many programs. The specific program I am representing here at this time is the Superfund program, which has done an excellent job, with results that surpass the quality standards, both in the laboratory and in the investigation. These are studies and results that can be reproduced because they were studied and designed carefully. We are not rushing this. We are not seeking a result... for the work performed to validate a specific result. We have nothing in mind. We simply have certain guidelines. These guidelines were followed to the letter, by the federal agency, by its contractors, and jointly with the state agency *(Reporter's note: refers to the Puerto Rico Environmental Quality Board).* I am

proud of the work we did, at least insofar as the investigation carried out in the Papelera Puertorriqueña Superfund site.

Brenda Reyes: Well, we invited all the municipal legislators. Flyers were left. Is there any other municipal legislator here?

Reporter's note: A lady from the public raises her hand and says yes.

Brenda Reyes: Ok. perfect. We did our job by inviting the municipal legislators. In my work experience, I have been with EPA for 15 years. I have worked 15 for years, almost, with Superfund cases, because I began with the Vega Baja case. I must say that municipal legislators are among the most active people in this type of meeting. I am sorry there are only two municipal legislators here, because you are the ones expected to look after the interests of the people of your town. Regarding pesticides, I don't know if you have read that they are considering eliminating, or if there is a bill to eliminate glyphosates. Apart from that, regarding the Peñuelas ashes case, the leading role is held by the Puerto Rico Environmental Quality Board. I would invite you to send me an electronic mail with all your concerns, and I will forward it to them, or I can give you the email of our director, Mrs. Carmen Guerrero. Carmen was the Director of the Department of Natural Resources two years ago. Mrs. Guerrero is very open, very approachable, she loves to receive the communities, and I will very gladly inform her of your concerns. As I have said you may email her, she will read the email, you may send me a copy of the email, the email is very simple, guerrero.carmen@epa.gov, reyes.brenda@epa.gov, and these concerns could be addressed in a conversation. The purpose of today's forum is to answer questions about the Papelera Puertorriqueña case. If you want another meeting as

municipal legislators, a separate meeting, if you want my colleague to make a presentation to the Municipal Legislature, please let us know. It must be during business hours, of course, but we will gladly come if you invite us.

Luis Santos: Let us continue with the comments period.

Carmen Santiago: Good afternoon, my name is Carmen Santiago, and I am a resident of the community. I have spoken with you before and I am concerned that the community is not present here. I don't know why, perhaps a reason much like mine, that I had not heard about the meeting. Ok, often it is due to lack of interest, "that has nothing to do with me" or many other things... human beings have many excuses. My question is, something that concerned me, you said that this began 8 years ago?

Luis Santos: Well no. We said that the Papelera Puertorriqueña has been operating...

Carmen Santiago: Yes, I know...

Luis Santos: ... for more years. It was added to the National Priorities List eight years ago...

Carmen Santiago: Ok.

Luis Santos: And since then, it has an important role for the federal agency, to investigate it and inform you as to the degree and magnitude of the contamination, to find a remedy and come and present it to you.

Carmen Santiago: What concerns me is... that is, it took nine years for this to come to our attention. And so I ask myself, what happened during those 9 years?

Luis Santos: Well, when it is added to the National Priorities List it is also listed. When we started the investigation we also held a meeting with the community to inform them about the studies we would be carrying out. These processes generally take time, because we expect that the work done is of high quality. A design must be prepared, a work plan. This work plan must be validated for it to meet the expected objectives. Then we begin... Monitoring wells are not installed from one day to the next. The sampling process as such, the monitoring well installation and sampling may take 2 years.

Carmen Santiago: Do you know why I am concerned? because in nine years, according to your presentation, there are carcinogens there, there was contamination, people were affected.

Luis Santos: Well there are...

Carmen Santiago: ...the waters as such were affected, if the waters were affected they are not potable... all these things, can you imagine how many persons have suffered the effects of this contamination? After nine years... look once you are buried... once my mother is buried she does not need... I know the ones that remain behind need it, but this is a concern. See? Those other studies, that is, all that sampling performed during the eight years, will I find that in the documents?

Luis Santos: Yes in the documents.

Carmen Santiago: You say they are in the documents.

Luis Santos: That is correct.

Carmen Santiago: Because this is what is concerning, that is to say, nine years!

Luis Santos: At this time I can say...

Carmen Santiago: Forgive me... and the area, where you said you focused... there is a Head Start there...

Luis Santos: Because the Head Start...

Carmen Santiago: Is in the area, in the focus area, right?

Luis Santos: No, no. The Head Start is... this building is very...

Carmen Santiago: Yes, I know.

Luis Santos: ... it is... it has several floors... Basically, the contamination is found at soil level, at the subterranean level, and does not even reach the employees, the vapors that may escape from there. That is one of the possible contaminants, or possible contamination, to humans. In terms of the drinking water, there is no potable water well there, water is not being extracted there. And in terms of the river, the river flows by quickly, although it continues to release little by little.

Carmen Santiago: so that...

Luis Santos: So that big impact, as you have mentioned, has not been that dramatic. Yes, some action must be taken.

Carmen Santiago: because there has been an impact...

Luis Santos: ...because the levels found require that some action be taken.

Carmen Santiago: Ok. and what levels are needed to state that the contamination is minimal?

Luis Santos: To lower...

Carmen Santiago: to what?

Frances Delano: The limits are different because the media are different...

Luis Santos: There we would have to... Identify yourself (*he tells Frances)*

Frances Delano: Frances Delano. The media are different as are the PRGs.

Carmen Santiago: If I go to the document, will I find the answer to all my questions?

Luis Santos: You will find four documents. The first document consists of the studies, and there you will find all the samplings performed and the results.

Carmen Santiago: And what was the reason for this study? Why was it performed, there must have been some community complaints...

Luis Santos: Yes, you will find it there.

Carmen Santiago: Ok.

Luis Santos: Once we have the results, you will find another document which is what we call the human...

Brenda Reyes: The human risk assessment.

Luis Santos: ...the human risk assessment. There you will find all the possible alternatives that were evaluated and it will state if there was, if there was not, how there was, and what the human risk is, and you will find an ecological one. Based on these two documents, and the risk, is that you will find the study of alternatives to remediate the site, the specific situation.

Carmen Santiago: What comes next?

Luis Santos: What comes next?

Carmen Santiago: I am asking because I work at the school that is next to the building, I worked there at the university, which is in the same building. That is why I want to know...

Luis Santos: Well there you will find...

Carmen Santiago: ...if there was any...

Luis Santos: ...well the study...

Carmen Santiago: ...what was the magnitude...

Luis Santos: You will find these questions, these concerns you have in the human risk assessment; you will also find them in the ecological risk assessment.

Carmen Santiago: Thank you, good afternoon.

Luis Santos: They are summarized in the document, both in English and in Spanish, but the specific details are to be found in the document.

Olgaly Ramos Rodríguez: Yes, good afternoon, my name is Olgaly Ramos, I am also a resident of Utuado. I have a couple of questions. One to follow-up on what the colleague mentioned regarding the school. Have you perhaps considered giving a conference focused on the parents and relatives of the people in the area, so they may know they have access to these documents and that they can learn what was detected and what was not detected? Because I noticed that although [the contamination level] is below the screening detection level, right? because it is colored green, you did detect something in the vapor, so I don't know, I as a mother would like to know, if I were in that school.

Luis Santos: The vapor detected remains at the facility and does not escape. That is, the contamination is limited to the facility and has not impacted the school to which you have made reference. It has not impacted the Head Start either...

Olgaly Ramos Rodríguez: At the Head Start, yes I think that too...

Luis Santos: ...the Head Start is on the third floor, it has not been impacted either.

Olgaly Ramos Rodríguez: So you took samples inside the school? Inside the Head Start, for example? Was that done?

Frances Delano: Yes, and samples were also taken in the school.

Olgaly Ramos Rodríguez: Yes, for that reason, because since it shows that they were detected, but at low levels, but then it was not nothing, which is how one would like to see it.

Brenda Reyes: Some seven years ago, I came along with the Agency for Toxic Substances and Disease Registry, more or less seven years ago —seven or eight years— I came along with the Agency for Toxic Substances and Disease Registry and we held a meeting at the school. We identified the concerns of the school personnel at that time. At that time the person who met with us was a librarian. We always try to interview a social worker or a nurse, who are the persons that can provide us information about school population, etc., etc.

Olgaly Ramos Rodríguez: Yes.

Brenda Reyes: But we did visit the school and samples were taken in the Head Start and in the school.

Olgaly Ramos Rodríguez: Yes, right, to increase the amount of information...

Carmen Santiago: *(Reporter's note: speaks outside the microphone)* At that time it was a high school, at present it is a Pre-kinder, Special Education elementary school up to the fifth grade.

Luis Santos: But based on the studies...

Carmen Santiago: I am the librarian that is why I am asking.

Luis Santos: Based on the investigations performed, that were performed, and the documents that support them, which are to be found at the City Hall, you will find that the school has not been impacted, there is no risk in the school. Basically the risk and contamination is to be found in the facility, the corner of the facility where the circles were drawn.

Carmen Santiago: *(Reporter's note: speaks outside the microphone)* That is, forgive me, but that was then, this sampling...

Aledawi Figueroa (reporter): Forgive me, I need for you to speak into the microphone, because otherwise I cannot record and write what you are saying.

Olgaly Ramos Rodríguez: Do you want me to repeat it? No, yes, that's right, thinking about that, that there is more, what you were saying, that access to information, that more people may have it. As to the documents here, are they also in Spanish for those who do not understand English?

Luis Santos: No we have them in English only.

Olgaly Ramos Rodríguez: Ok, that may be...

Luis Santos: Yes.

Olgaly Ramos Rodríguez: It may be complicated. And then, my other question was if you could talk a little more about the description of the wells, that alternative you have, because since that is not my area, I cannot even visualize it. If you could —I know it is a lot of information— but at least in terms of the size, the equipment used, a little more information about the alternative selected, if you could tell us a little about that.

Frances Delano: There is no design until the pilot study is done.

Olgaly Ramos Rodríguez: I see, but for example, the well, this, when you speak of extraction wells, what do you mean? That is what I am asking.

Luis Santos: Well, the wells... There will be injection wells...

Olgaly Ramos Rodríguez: Ok. This is what I want, to understand it, just to know what you are talking about.

Luis Santos: The mechanism we visualize is that we have a volatile contamination source...

Olgaly Ramos Rodríguez: Ok.

Luis Santos: ...air is injected, and this air activates and volatilizes this contaminant, and this contaminant is recovered seeking...

Olgaly Ramos Rodríguez: You use machinery to recover...?

Luis Santos: ...to extract it... you have injection wells and extraction wells...

Olgaly Ramos Rodríguez: Ok. extraction wells.

Luis Santos: and the idea is for the level of the contaminant there to be lowered...

Olgaly Ramos Rodríguez: Yes, exactly.

Luis Santos: ...reduce them, until they are eliminated, if this were the case.

Olgaly Ramos Rodríguez: And the last thing I wanted to ask you is if you will be sharing... did you ask for our email in order to share the presentation, so that we may have access to it also?

Luis Santos: Well the presentation...

Olgaly Ramos Rodríguez: Since it has some additional information, perhaps, than what there is here...

Luis Santos: We could... well...

Olgaly Ramos Rodríguez: Or more summarized, let us say...

Luis Santos: Well... in EPA's website, that appears in the English document, if you click on it, you could even find the documents we have here and you would not have to...

Olgaly Ramos Rodríguez: Ok, we would not need to come...

Luis Santos: No, you don't even have to come here.

Olgaly Ramos Rodríguez: Ok, perfect, very well, thank you.

Luis Santos: You will find the document you have in your hands and the other documents.

Olgaly Ramos Rodríguez: perfect, Ok, thank you very much.

Andrea Camacho: I want to know why only... Oh, my name is Andrea Camacho, I am an environmental engineer, I work for Nollum Environmental Engineers. I have a question. I consider that there are less invasive methodologies that may be tried to remove these contaminants. They have not been used here, but perhaps, the situation here would be an ideal case to see if this works. Basically, it is done with microorganisms. Basically, we are working with the biostimulation of a strain of microorganisms. From what you have said, I understand, more or less, that these PCE concentrations are not that high. We are talking of hydrocarbons,

chlorinated, volatile organic compounds. These microorganisms are capable of metabolizing them and possibly reducing them significantly, perhaps below... If it were possible, perhaps to include another pilot, and put them to work, I could provide the bacteria. These bacteria have not been genetically manipulated, they are found in nature. Right now I don't have the equipment and all that is needed to set up a microbiology lab, and probably perform a study of native bacteria to be found on site and biostimulate them. Because you would need an amount, well, depending on the concentrations found, to be able to... Let us consider composting, who here has done composting at some time? Yes, you dig, right? and what do you do? Well in this case you have to remove oxygen from the bio compost, and it is the bacteria and the worms that do the work. Well, it would be something similar to that. Obviously, a little more technical. I believe it would also be somewhat more cost-effective. In addition, it would not only treat the soil, the groundwater, but it could also create an ecological channel using eco-technology, and place aquatic biomass through the plants; and whatever is being introduced into the river, even if falls in and is diluted, and the concentration is reduced, in order to prevent risks, or to see it better, well, to try to eliminate it and instead of just one process, maybe it could consist of three processes, that are a bit less expensive, to divide it. These studies are being done and PCE removal effectiveness is eighty to eighty-nine percent.

Luis Santos: Well the idea you have presented is excellent. This is the perfect time for you to make a written presentation and for it to be evaluated before a decision is made. EPA has not yet made its decision and this alternative you are proposing could be ideal if we could have it as soon as possible so that we could evaluate it, and during this process determine if it is more convenient.

Andrea Camacho: Of course. I also wanted to include something else. In the times we are living, sustainability is a must. Sustainability requires community participation, and this would be a project that could include not only the participation of specialists, but also that of the community, such as the school. Some laboratory exercises could be prepared for people who are not knowledgeable, for example, vapor extraction is difficult to visualize, but is not really that complicated, it is just a little more technical, and a little more expensive. But I also believe that this type of things are not negative for Puerto Rico, but are rather learning moments and opportunities to see how science, government and the community can work as a team.

Luis Santos: As far as I am concerned the position you suggest is excellent. I urge you to present it to us during this period, so that we have it, and can consider it during this process. We have not yet made a final decision. We are presenting what we have found, the risks and the alternatives. You propose an alternative that may be effective, we need you to submit it in writing.

Andrea Camacho: Yes, that is not a problem. One other question. I have tried to find information about the characterization, basically of the concentrations present in the soil and water. Where can I find them? How do I find them? I could not find them. I searched EPA's website and EPA did not... we tried to find them and have been unable to find the information. Because according this we... for example I am proposing this, but I don't know if it is feasible, because I don't have the information.

Luis Santos: I urge you to look at the document here and those in the CD disk and in hard copy tomorrow.

Andrea Camacho: Thank you very much.

Luis Santos: Because it is there.

Andrea Camacho: Thank you.

Luis Santos: Right.

Carlos W. López Freytes: First, good afternoon to all those present. Help me a little here, I haven't used a microphone for some time. For the record, my name is Carlos López Freytes. I am the environmental attorney for Papelera Puertorriqueña, which has been involved with this issue from the very moment it arose. And before I, basically, quickly read our written presentation, because this is also a public comments process, for all of you to present your position, it is also important for the company to express its opinion regarding what EPA is proposing. Because, once EPA proposes a remedial action, Papelera will be subject, as the responsible party, right? when the time comes, for addressing the consequences of EPA's decisions. That is why, we too have a duty in legal terms and in terms of social responsibility, to respond to and clear up any points we feel are not correct. But to try to clear up certain doubts that were brought up a moment ago. The discussion dealt with what was —and I like to explain it in very simple terms, because I love that— when discussing soil vapor extraction, to make it easy, think of it as a vacuum cleaner that suctions the air, removes the volatile gases and cleans them. It's that simple. Nothing more complicated than that. Obviously, technicians make it more difficult, because it is more difficult. But in order to understand it, think of it as a vacuum cleaner, suctioning the air. I inject air and suction the volatile [compounds] and clean. That is all

it is. So I hope this will help clear up this matter somewhat. The benefit is that I am an engineer in addition to being an attorney, so I understand a little of the technical dynamics. Well, I want to begin, and also to explain. The concern about the school and the Head Start was brought up. The truth is, based on the explanation... and Luis, I don't know if you can show the slide you presented of the Papelera facility. It has been possible to identify, based on the results presented by EPA today, that concentrations above the regulatory levels have been detected in a specific place, to the south-east of the facility. But it is inside the facility. Nothing has been detected outside the facility. I want that to be clear. Therefore, what is the risk for the community outside the facility? None. I know that, clearly, well, sometimes it is more difficult to explain, but I can be a little more categorical.

Luis Santos: Let me know... *(Reporter's note: Luis is looking for the slide Atty. López requested)*

Carlos W. López Freytes: You can leave it there. Any of them, as long as you can see the facility. Ok. As you see the spot marked in red there, that is where it is located, next to the property, that is where the [contaminant] concentration is found. The contamination does not reach the place where the school, the Head Start, and even Papelera employees are located, and Papelera has always been very responsible towards its employees. Therefore, there is no risk, and these are the findings of EPA's investigations, that there is no risk, for the employees, for the Head Start and for the school. So, I wanted that to be very clear so that you are not confused. Now then, having explained that issue, I will go on to quickly read my presentation.

Good afternoon, I have already introduced myself, my name is Carlos W. López Freytes, and I have been the attorney for Papelera for the duration of the Superfund Act EPA process. Today

we have come to participate in this Administrative Record public comments process, which consists of the presentation made by Mr. Luis Santos to us all, and specifically, to make our recommendations regarding the Work Plan and the proposal that EPA has developed and proposes for site remediation. The first thing I must state is that the notification of remediation reports and alternatives was made over the web page —for those who wish to examine them, as I did, I obtained them through EPA's website. I must admit that EPA is more advanced about these processes, and they publish them via the Internet. And whoever wants to, can access those documents without having to make copies elsewhere. Some documents have been posted since June 29, others were published on July 10. EPA decided to begin this administrative record publishing process, and the corresponding public meeting, within the 30 days comments period, as required by CERCLA, which is the Law Luis mentioned, Section 117(a). As part of these requirements, said section also required that a Public Notice be published in a general circulation newspaper. Specifically, EPA in its publication "A Guide to Preparing Superfund Proposed Plans, Records of Decisions, and other Remedy Selection Decision Documents" of July 1999, has established the public policy regarding public notices that must be issued. Specifically, this rule establishes that the procedure requires that the notice must be published two weeks prior to the start of the public process. I have the duty to state that unfortunately this was not done for this process, and obviously, EPA guidelines to begin the public process were not followed. Nevertheless, we have done our job by coming here, and presenting our comments, even though the process was not followed. After verifying with EPA, the public notice was issued, right, on July 13, 2017, and clearly did not met the two-week advance public comments publishing term required by the guidelines, to have it available

for public comments. In addition, said public notice has not met EPA rules, since, specifically, it did not include one of the requirements and the alternatives discussed, as required by regulations, and the guide itself. And, obviously, well, I must also point that out, given the lack of that document, and that description, which, although it has been discussed in detail today, was not included in the public notice as required by the guide. For all of the above reasons, we believe that EPA published a public notice and began a process that did not comply with the rules and this must be stated for the record. It is also important to note that said guide states that if any person were to request 30 additional days to the originally stipulated term for public comments, which as has been stated expires on August 12, 2017, EPA may grant such extension, as long as the request is made in time. Given this, and not only for your benefit, but also for the benefit of the company, we are requesting 30 additional days, as allowed by the regulations, and as established by EPA rules, for EPA to determine whether it will grant such 30 additional days, established by regulations and as stated in the NCP §300.430(f)(3)(i). However, and in spite of this, we believe it is necessary to make a preliminary presentation of our comments so that EPA can begin to consider them at this time, while we formally present our final comments, since we will be presenting our written comments be it on August 12, or within the 30 additional days requested. First, we would like to clearly establish that Papelera Puertorriqueña is a local small business located in Utuado, and therefore Puerto Rican. It is not, and we are not speaking here of a multimillionaire multinational corporation with all the resources in the world. And it is important to understand this, because all processes, including processes under the Superfund Act, have rules that apply to small businesses, in terms of the applicability of the different rules, including the remediation and the investigation performed.

Again, this is why we must state this. We must also establish, and make clear, that Papelera Puertorriqueña, from the very moment it became aware of this process, has fully collaborated with all EPA efforts, and we propose to continue to participate in this process, because Papelera Puertorriqueña has a clear and reasonable awareness, not only towards its employees and the work they do, but towards its surroundings. However, and for this very reason, we are here, and wish to personally explain the different circumstances, and Papelera's perspective. The comments I will present during these proceedings are not meant —and I want this to be clear— are not meant to be understood as running counter to the recommendations, the alternatives, or the actions proposed by EPA. But we do want to state that there are other alternatives that may be more effective and feasible, both financially and operationally, and that is our role here today. This is why Papelera Puertorriqueña submitted several comments to EPA on September 8, 2016, which are attached to today's presentation, to ensure they are documented and included in the official record, since we need and ask that they be considered part of the record and the assessment EPA will carry out with all the public comments presented today. Obviously, and unfortunately, and without knowing the reasons why, EPA thus far has not considered these comments, which we presented approximately 1 year ago, for which reason we find it necessary to restate them. We wish to reiterate that subsequently we will be submitting, obviously, all our technical comments which will validate what I will explain now, and which appeared in that letter of September 8, 2016. Some of the most important comments, which we highlight in this communication are the following. The data in the Revised Final Remediation Investigation Report (RI) clearly shows that the contamination found in the site is very limited —as I have stated, it is limited to the area in red, it is limited specifically to that area— it is

limited in horizontal and vertical extent, both in soil and groundwater, since they are localized in the specific area where an alleged release of tetrachloroethylene (PCE)occurred. Therefore, the impact area is very restricted and limited, and does not extend beyond the property. Therefore, the risk is well controlled, because it is a very specific area with no external risk. The Papelera Puertorriqueña property is an industrial property that will continue to be used for such purposes, for which reason the Revised Final Human Health Risk Assessment concludes that given the industrial use, there are no unacceptable risks to human health and the environment. It concludes that the only time when a risk to human health and the environment could arise would be if the site were to be used for residential purposes. And, if you recall, in his presentation, Mr. Luis Santos explained that if it were to be used for residential purposes in the future, then yes, there would be some risks, but the truth is that the Papelera facility will never be used as a residential area. Therefore, that estimated future risk does not exist. Both suppositions... I'm sorry... The only time it is deemed that a human health or environmental risk could arise would be if the site were to be used as residential area and the groundwater were used as a potable source of water. As our colleague stated, the area will not be used for residential purposes, as I explained. And there are no groundwater extraction sources, therefore, there is no risk for the community or for anyone considering extracting water from that site. Why is this so? Because if anyone were to consider drilling a groundwater well at the site it would have to request permission from the Department of Natural Resources, which must first determine if PRASA water is available —the same water you receive in your homes— and if there is PRASA water, Natural Resources cannot approve a groundwater well under its regulations. Therefore, since the area is served by PRASA there is no risk of anyone coming

along to extract groundwater for drinking water purposes. Thus, the truth is that the risks being predicted for the alternative EPA is identifying are unreal. And such an investment, and preparing such a costly analysis, in circumstances that are not real, knowing we are a small company, is an unfair decision. And this is why we must state this today.

For this reason, we have proposed that the first alternative which Papelera would gladly carry out, and which is allowed under EPA regulations, is to establish what is known as Institutional Control. This is basically to establish a restrictive covenant. Papelera has no problem with restricting the property to industrial use for the rest of its life. This way, there would be no risk whatever for any resident who could in the future buy the Papelera facility, because whoever acquired it next would be purchasing an industrial facility, and never a residential area. Therefore, this risk that is leading EPA to make a recommendation, a more active alternative, is not in order. Among the alternatives proposed by EPA, many of the alternatives being considered are extremely invasive, particularly the last two alternatives mentioned. These alternatives are very expensive. To give you an idea, the cost of alternative number two has been estimated by EPA at approximately 2.6 million dollars. This is the cleanup estimate. I must be clear, that in my experience —my hair has turned grey because of this process, because I have dealt with this process before— the process rarely, the cost of a cleanup process rarely remains within estimate. And, clearly, we have a significant concern, that the real cost will be much greater, when the circumstances, as we have explained, are that there is no risk to human health, as EPA has established and the documents support. That is why we have identified another alternative, which is the Natural Attenuation alternative as a feasible alternative to consider. In our opinion, EPA has not adequately evaluated this alternative, when

it has the clear duty to do so. What I mean to say is that there is another alternative, the natural attenuation alternative that should be considered. What does this mean? As we have agreed, the system currently has located the contamination to one point. Since contamination is located at one point, when the contamination reaches the river, if it does so, it is not detected. What happens? Do you see the text that reads Impacted Area, or the boundaries of the property? When these areas are sampled, no trace of contamination is found. Therefore, if there is no risk of water contamination downstream; if there is no risk of contamination, if no contaminants were detected in the sediment, or in the river, but rather it is located in one point, why choose such an expensive alternative? The system... the fact is, scientifically speaking, that the system is managing the contaminants naturally, as it would in the case of an arable farm with cow excrement, right? where the cows walk by the river and defecate. When samples are taken in the river, perhaps the point at which cows walk by will have positive readings of fecal coliform, but downstream it will be clean, because the river managed the contamination. This is exactly what is happening here. Whether through dilution or volatilization, it evaporated prior to reaching downstream... the truth is that according to the analyses performed by EPA, there is no contamination downstream. Then, what is the risk? None. Clearly, the process for choosing such an invasive and aggressive alternative as soil vapor extraction requires that there be a risk to human health and the environment. And based on the description provided, this is not the case. Therefore, we believe that this is not the appropriate alternative, it is not supported by known science and does not comply with regulations. It must be noted that the hydrogeological data generated in the RI shows that Río Viví is a gaining stream that collects all the waters around it, including groundwater, for which

reason traces of contamination could not be found in the river sediment, but was found in the surface waters immediately beyond the site where PCE was handled. However, the analyses themselves showed that no PCE concentrations were to be found downstream and upon leaving the Papelera Puertorriqueña property. This means that given the specific characteristics of Río Viví, the PCE is volatilized and diluted by wholly natural means, eliminating any risk to human health and the environment in the waters [downstream] the company's property. Given the absence of contaminants downstream the property, it is easy to conclude that a natural attenuation process is working at present and has been doing so for the last nine years. Therefore, regarding your concern about the risk to the school located downstream, or in the Head Start, based on the situation found, the fact is there has been no risk, because the system has been managing it naturally by itself. Given the absence of contaminants downstream the property, it is easy to conclude that a natural attenuation process is in operation. It is important to note that the contaminant detected has not been used by Papelera Puertorriqueña for several decades, because this type of operation no longer exists, and technologies have improved, there are better ways to perform these functions. Wherefore, it may be scientifically concluded that the material detected in the soil is not a growing source, but rather something that is there at the site and the system is managing it adequately. To validate —and I am almost done— to validate the use of this alternative, together with the use restriction we have already established for the property, Papelera recommends a long-term monitoring plan. This plan would consist of sampling both the groundwater and surface water at different locations in and outside the property. This monitoring should be in effect until one of the following conditions is met: stability of the groundwater contamination area, or a change in the groundwater

contamination that creates a risk. What I mean is that since the monitoring has never showed a change in circumstances, then, the system is working. The second alternative is, if I were to detect a change, where monitoring identifies contamination downstream or elsewhere, then the alternative must be changed. Because monitoring must continue to take place, to ensure the health and safety of individuals and the environment. And finally, that if within a ten year period the monitoring shows there has been no change, and the system is under control, then allow the system to manage and clean itself naturally. The alternative we have proposed is reasonable, it addresses EPA concerns, complies with the regulations, and does not create risks to human health and the environment. Under this scenario, Papelera Puertorriqueña expects EPA to analyze this proposal scientifically and add it to the list of alternatives to be considered in its Proposed Plan, since it is a real and fair alternative that would allow Papelera Puertorriqueña, Inc., to collaborate more effectively with the proposed work. Subsequently, within the required term, we will submit the specific technical data which will support this proposal. Thank you very much and we are at your service should you have any questions.

Luis Santos: Thank you Carlos. We will consider it, as we will any other alternative or presentation submitted during these thirty days. That is what the thirty days are for to gather information such as that presented by him or any other person, whether or not they are here, after evaluating the reports we have left in the repository. We urge you to advise any person not here to visit the repository, analyze the documents as Mr. Carlos López Freytes did, and submit presentations, which will be considered, because that is what the law stipulates. The agency will provide a response to all the things stated and mentioned by Carlos, it will be done in writing, and it will be included in the final document.

Brenda Reyes: As Luis indicated, the comments of Atty. Carlos López Freytes will be answered in the "Responsiveness Summary" in the Comments Summary. But regarding the public comments period and the newspaper notice, the guidelines specify that the meeting must be announced approximately ten days prior to the scheduled date. EPA, I work twenty Superfund cases in Puerto Rico. EPA notices are generally issued within fourteen to twenty-one days. In this case, in particular, we did so seven days in advance. We used a general circulation newspaper in Puerto Rico, the Primera Hora newspaper, specific guidelines are followed that state the notice must be posted in a visible section. For example, it recommends the Entertainment and Sports sections. I publish my notices between the Entertainment and Sports sections, and I try to tell the newspaper: "look this is where I want you to place my notice." The size of the notice is visible, it follows the guidelines, it bears the agency's logo. I need you to understand that if an extension of the comments period is requested, such extension is considered. He can request it, as he has done, and anyone else can do so. But the agency complied with the specific requirements and the guidelines given to those of us who work in the public affairs and community relations area. And, forgive me, we made radio announcements, which was not required. The radio announcements were a bonus, we send press releases, which we did, and in addition to that we distributed flyers. And it is jolly fun to distribute flyers under the sun, but it is a standard practice, and my colleague and I have worked many cases, for many years. EPA did not follow this practice when I arrived in 2002. So we distribute flyers, we talk to people, we visit key individuals, in this case the Utuado Business Association, we spoke with them, we also visited the Municipal Legislature, and it also does not include visiting municipal legislators. But experience has shown us that these are the best

people to convey the information to their communities. So, having said that, it will also be answered in writing.

Carlos W. López Freytes: No problem, I was referring to Section 2.6.1, it is there, and I reaffirm, what I said.

Luis Santos: Right.

Carmen Santiago: I would like to ask something. Because doubts are starting to emerge and like the Puerto Rican country folk, I am cunning... My name is Carmen Santiago. The young lady here spoke of a pilot plan *(Reporter's note: Points to Frances Delano, referring to a previous comment).* If a decision has not been made, what is the pilot plan? What are we talking about?

Luis Santos: Ok. she is saying that there are stages in the Superfund process, from the time the site is identified until it is complemented and the work is completed, and the site is remedied. We are at the Remedial Investigation/Feasibility Study stage, on our way to a Record of Decision. The pilot program to which... the pilot study to which she made reference is used or incorporated after the Remedial Design, the decision, and the action are taken. That is, it is done during the design, but we are getting ahead of ourselves, she got ahead of the process, and at this time we are not contemplating it, because we have not yet reached the decision which is called the Record of Decision. We are on our way to the Record of Decision. It is not until a decision is made that a design is prepared, and what the lady said comes to bear during this design process. The question you had.

Carmen Santiago: My question arises because the gentleman here made a presentation, and explained that this contamination is located inside a structure, that it has not moved. Then if it has not moved, why should I worry that there may be contamination outside that place?

Luis Santos: Well, the levels...

Carmen Santiago: Well I must have found something to be able to reach that conclusion. Or — and please forgive me, because I have to... I have to leave for church— ...or like some people I know said, there are other agendas. Forgive me, if that is the case, God forbid. An agency... a corporation in our town. If something is wrong then it must be corrected, but if there is nothing wrong...

Luis Santos: What is...

Carmen Santiago: ...we must prevent other agendas from interfering. Forgive me, good afternoon, I have to go pay my respects to the Almighty.

Luis Santos: Ok, good afternoon. Does anyone else want to comment?

Wilson Viruet: Good Afternoon, Wilson Viruet, PIP municipal legislator. As I told my colleague Carmen, who just left, she is a teacher, librarian. I too am a retired teacher. I know that that company, Papelera, they are persons... I know the persons that... a Papelera Puertorriqueña as we say here, and it is located here in Utuado. She brought up the concern of whether there is a hidden agenda, well I too was wondering this. A neighbor of mine, who works at the Papelera told me, "Wilson, there is conference, an EPA meeting at the Legislature" and I said, "No, I have already been informed." He said: "we are going to lose our jobs". I said: "Don't worry about this

it is a political issue." It may also be political, there are political agendas, as in everything. The situation concerns me, that my colleague left. The Monserrate Moreno School, has been closed some three or four years, and there is now another school managed by another group. My daughter studied at that school, the one that was transferred to the Judith Vivas school, close to Papelera. Some three or four years ago I was at the school when I received a call, "look, come pick-up your child, because they are sending them home because there is a gas inhalation problem." But Papelera is located down there, and the school was up there, further up. The gas inhalation problem continued for two days. It was kept under wraps, and they closed the school and moved the children to the Judith Vivas school. And other things had happened. The closing of schools in Lares this year was blamed on the septic tanks in the schools, that affected the Cuevas... the Cavernas de Camuy. Look at the excuse they used. The excuse... they closed five, six school in Lares to consolidate them. When I spoke with the principals and the teachers they said "no, it was because... they said the septic tanks, that there is a sewer that connects to the Cuevas de Camuy... and EPA and Environmental Quality: the school must be closed." and so they closed it this year. That was this year. This is how they closed the school, too. That is why I have my concerns, because sometimes there are hidden agendas. If there is something, then investigate it. But, I think the attorney spoke very well, and touched some points, and cleared up some issues, and you also should clear up points that are very important, and for the benefit of the town of Utuado, we welcome it all. Thank You.

Luis Santos: The comment is received.

Carlos W. López Freytes: Thank you Luis for allowing me to clear something up. In the first place, I have to clear up something. There is no hidden agenda here, I want this to be very clear. Papelera may have a different opinion as to the alternative being proposed by EPA, but this does not detract from the fact that EPA has done its job by performing the assessment and monitoring whether there is a contaminant. And I wish to make it clear, that I have never said there were no contaminants. What I said was that it was located in only one place, and that it does not represent a risk, but there are contaminants. I want this to be clear, because I don't want the record to reflect something that is not true. That is not our position, we are not trying to attack EPA. Our argument it that Papelera's position should be evaluated, because it is technically correct, and that is why we support it. But we also have the duty to make clear that contamination was detected in the place identified in red, and in the Río Viví, immediately at that red area. The issue is that no contaminants were detected outside that area. That is, there are contaminants. And I also don't want it to be said that my comment is that there is a hidden agenda and that EPA is not doing its job, and I was duty bound to clear this up for the record. Thank You.

Luis Santos: Thank you. The comment is received. Any other comment?

Pascual Velázquez: Yes, good evening to all, my name is Pascual Velázquez, I work for the Puerto Rico Environmental Quality Board. I will be very brief without entering into controversies. Since attorney López Freytes established for the record that —and EPA also, clearly— that there is contamination present. The contamination is the result of bad management in the facility in the past. There were some discharges made, the EQB performed

inspections and informed and notified Papelera, the owner at that time, that wastewater with process contaminants was being disposed of incorrectly. I will not go into the technical aspects, nor will I go into agenda controversies. Yes, the contamination is localized, but this is not the purpose of my comment. The purpose is, how did the contaminant get there? Because Papelera process wastewater was managed incorrectly, it was discharged into the soil, it reached the groundwater, the river, and that is when the problem started. What the magnitude is more or less, I will not go into that type of thing. But we must ask ourselves how the contaminant got there. It got there because company process wastewater was managed incorrectly. And that... EQB inspectors went there and notified it, and reported it in the reports prepared by the agency. I want this to be clear for the record, because I think this part was left out, that there is in fact a contaminant there. How did it get there? Because of mismanagement at a given time by the company.

Luis Santos: The comment is received. Thank you. We are coming to the end of the stipulated period. We are available to hear any further comments, and include them for the record, if there are no more comments it is time to end the activity. Thank you for participating. The process will continue, and we will remain here until seven, if you should want to make any comments. Thank You.

6:52pm the record is closed.

6:58 pm An additional question is heard individually

Carmen M. Ayala Cuervos: In the first place, good afternoon. I have only one question that concerns me very much. There are two. You spoke of contamination at the school and the Head Start. But what about the residences? My home is behind Papelera. I saw that all those things they added are there. I don't know if it was you, who did it to examine all that. My concern is... My question is, What measures do you have [in place] to prevent erosion, there in my area, and to prevent all that from toppling down, and that contamination to reach us faster? According to the map, I think it is at the very corner of my house. I don't know if this is true, but my house is behind, behind Papelera. Then this river is a beach approximately until it somewhere near the Hwy., and when the building was built the course of the river changed or was altered towards my house. It is clear that I am frightened, I feel the house is going to tumble down there. Like one... I don't know if you have seen a house in Jayuya that was lost. You haven't seen it? I was taken there expressly to see it. And I saw another one in Mayaguez that was also lost in a landslide.

Luis Santos: Mention your concerns, because if you do so we can answer your comment appropriately.

Carmen M. Ayala Cuervos: Could you visit me?

Luis Santos: We could visit you.

Carmen M. Ayala Cuervos: Could you visit me to see it for yourself?

Luis Santos: Yes I can.

Carmen M. Ayala Cuervos: Well then, I would be very grateful if you did. I am a widow. I am 87 years old. I would like to clear this up. See? Thank you. You are very kind.

Luis Santos: The comment is received. thank You.

The meeting comes to an end and the record is closed at 7:01 pm.

REPORTER'S CERTIFICATION

I, Aledawi Figueroa Martínez, a reporter for Smile Again Learning Center, Corp. hereby CERTIFY:

The above is a true and exact copy of the recording made during the meeting held in the place and on the date indicated in page one of this transcription.

I also certify that I have no interest in the results of this issue, and am not related in any degree of consanguinity to the parties thereto.

In Isabela, Puerto Rico, on July 28, 2016.

[Signed: Aledawi Figueroa Mtz]

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CERTIFICADO DE TRADUCCIÓN AL INGLÉS	**CERTIFICATE OF TRANSLATION INTO ENGLISH**
Yo, Mercedes Solís, traductora profesional y miembro de la *American Translators Association*, por la presente certifico que a mi mejor entender el documento anterior es una traducción fiel y exacta al inglés del texto en español, realizada a petición de la parte interesada.	I, Mercedes Solís, professional translator and member of the American Translators Association, hereby certify that, to the best of my knowledge and abilities, the foregoing is a faithful rendering into English of the Spanish text, made at the request of interested party.
En San Juan, Puerto, hoy 10 de agosto de 2017.	In San Juan, Puerto Rico, today, August 10, 2017.
Mercedes Solís	*Mercedes Solís*
ATABEX TRANSLATION SPECIALISTS P.O. Box 195044, San Juan, PR 00919-5044 21472	ATABEX TRANSLATION SPECIALISTS P.O. Box 195044, San Juan, PR 00919-5044 21472

REUNIÓN PÚBLICA
LUGAR DE SUPERFONDO DE PAPELERA PUERTORRIQUEÑA INC.
UTUADO, PUERTO RICO
20 DE JULIO DE 2017
UTUADO, PUERTO RICO

Notas de transcripción:
Hora pautada de reunión: 5:00pm
Lugar: Legislatura Municipal Utuado

Se abre record a las 5:00pm

Brenda Reyes: Buenas tardes, mi nombre es Brenda Reyes, oficial de Asuntos Públicos de la Región 2 de la Oficina del Caribe de la EPA, de la Agencia Federal de Protección Ambiental. Ésta es una reunión informativa, o una sesión de información al público, relacionada al lugar de Superfondo Papelera Puertorriqueña, que ubica en Utuado, Puerto Rico. Damos por abierta la reunión. Vamos a esperar un ratito a que lleguen más personas, ya que tenemos más personas llegando. La reunión va a ser grabada, los comentarios son grabados, es parte del requisito de ley, que estos comentarios sean grabados, y se provee luego unas respuestas, un resumen de respuestas a comentarios. Conmigo en la tarde de hoy se encuentra mi compañero Luis Santos, gerente de proyecto de Papelera, se encuentran representantes de la empresa CDM ─CDM es el contratista de la Agencia Federal de Protección Ambiental que va a estar trabajando en el lugar─ Mike Valentino, Frances Delano. Así que, les voy a pedir si podemos esperar un ratito para que lleguen más personas y poder entonces a las 5:30 dar comienzo a la reunión.

Luis Santos: Es importante dejar saber que….Es importante dejar saber que…─Mi nombre es Luis Santos, soy gerente de proyectos. Trabajo para la Agencia de Protección Ambiental ─. Es importante dejar saber que independientemente, la reunión de hoy es,

básicamente, para dejar saber, en general, el proceso que hemos seguido, quién es la agencia, a qué se dedica la agencia, por qué el lugar llega a la agencia, qué hicimos y los proyectos que tenemos para remediar aquello que encontramos. Básicamente, hay un periodo de comentarios de 30 días que comenzó el 13 de julio. Ahora mismo, pues, aquellas personas de la comunidad que no estén aquí presentes no se pierden, porque los documentos están en el depositorio que está aquí, en la casa alcaldía, allí pueden tenerlos, pueden verlos, y tenemos hasta agosto 12 para recibir los comentarios. Todo comentario se va a analizar y se va a contestar.

Carmen M. Ayala Cuervos: ¿Y hay dirección para enviar esos comentarios?

Luis Santos: Sí, sí. En el documento…Hay dos documentos en la entrada, el documento que está en inglés es el documento oficial de la agencia. El documento que está en español, básicamente, es la traducción, pero como no está traducido por un traductor, no puedo decir que es oficial, porque tendría que pagar un traductor para que sea fiel y exacta. Por lo tanto, contiene toda la información, y es fiel a lo que dice el de inglés.

Carmen M. Ayala Cuervos: ¿Y tiene esa dirección que se puede usar?

Luis Santos: Exactamente, se puede usar como referencia, tiene la información básica necesaria, y de allí pues la persona puede moverse a emitir el comentario que no pueda hacer hoy, lo podría hacer en aquel momento.

Carmen M. Ayala Cuervos: ¿Agosto…?

Luis Santos: El periodo de comentario empezó en julio 13.

Carmen M. Ayala Cuervos: ¿Hasta cuándo?

Luis Santos: Hasta agosto 12, 30 días.

Carmen M. Ayala Cuervos: agosto 12

Luis Santos: Estamos dando un tiempito. Cualquier duda o pregunta podemos…La presentación es sencilla y vamos a ir poco a poco, para que podamos ver en detalle. Pero es cuestión de… Vamos a esperar hasta las y media.

Se cierra record para darle oportunidad a que se acomoden las personas que siguen llegando.

5:30pm
Se abre record para comenzar oficialmente la presentación.

Brenda Reyes: Bien, ahora sí que arrancamos oficialmente. Le indico que la reunión está siendo grabada. En cualquier momento que ustedes vayan a hacer alguna pregunta o comentario, tenemos este micrófono *(Nota de transcriptora: Se refiere a un micrófono que se ha posicionado en el área del público).* Me gustaría que utilizaran este micrófono, siempre se identifican, con nombre y apellido, ya que estos comentarios pasan a ser parte de lo que se conoce como las respuestas a comentarios, el resumen de las respuestas a comentarios. Me identifico nuevamente, mi nombre es Brenda Reyes, Oficial de Asuntos Públicos de la Agencia Federal de Protección Ambiental, Oficina del Caribe. Me acompañan hoy mi compañero, gerente de proyecto, Luis Santos. De parte de CDM tenemos a José Reyes, Mike Valentino y Frances Delano. Los compañeros de la Junta de Calidad Ambiental llegaron hace unos minutos, también se encuentran presentes, ellos están aquí para contestar cualquier pregunta. Le comento que el propósito de la reunión es presentar el plan propuesto para el lugar de Superfondo,

Papelera Puertorriqueña, que ubica en Utuado. Nosotros informamos al público sobre la acción preferida y solicitamos los comentarios del público. Esto es parte de los requisitos de ley. Nosotros tenemos unos mecanismos de participación pública, tratamos de que sean muy inclusivas. Se llevan a cabo estas reuniones, se lleva a cabo una reunión pública. Nosotros estuvimos anunciando esta reunión pública de diferentes formas. El requisito reglamentario es anunciarla en un rotativo de mayor circulación en el país. No obstante, nosotros siempre repartimos hojas sueltas en las comunidades que vamos, es un paso más adelante, promueve la comunicación cara a cara, y notificar, y contestar preguntas previas a la reunión. Aparte de eso, en la estación Éxitos 1530, se pautaron cuñas por tres días, cuñas radiales, y se hizo un comunicado de prensa que algunos medios como: Noticel, el periódico La Perla del Sur, algunos medios online en las redes, lo publicaron. Así que nosotros cumplimos con estos requisitos de comunicación. A parte de eso, como bien les indicara, el compañero Santos va a estar hoy llevando a cabo una presentación. Tenemos esta hoja para quien no la tenga, es una hoja informativa, sobre el lugar de Superfondo, Papelera, se encuentra al frente. En el caso de que quieran llevar una adicional, está en inglés y en español, la pueden llevar. Si ustedes quisieran hablar con el compañero Santos, luego de la reunión, y luego de las preguntas, porque no se sienten cómodos haciendo la pregunta en el público, pues con mucho gusto, nos vamos a quedar por aquí un ratito, va a ser grabada, pero le agradecería que vengan por aquí para que se grabe *(Nota de transcriptora: señala al área donde se está grabando y transcribiendo la reunión)*. Es importante que todos los comentarios cuenten en el resumen de comentarios. Así que, sin más preámbulos, Luis.

Frances Delano: Las preguntas al final.

Brenda Reyes: Ah sí, claro. Luis hará la presentación y entonces, luego pasamos a las preguntas. Un pequeño detalle, se me olvidó agradecer al municipio de Utuado y a la Legislatura Municipal, que tan amablemente nos prestaron este salón para llevar a cabo la reunión pública ─cómodo, céntrico─. Así que muchas gracias al Municipio de Utuado.

Luis Santos: Buenas tardes, mi nombre es Luis Santos, trabajo para la Agencia Federal de Protección Ambiental que, por sus siglas en inglés es la EPA, para el programa de Superfondo. Superfondo es un "nickname", porque realmente el nombre del programa al que pertenece esta investigación se llama CERCLA, que por sus siglas en inglés es *Comprehensive Environmental Response, Compensation, and Liability Act*. Es CERCLA. También es conocida como Superfondo que entró en vigor en el 1980, y lo que pretende es recoger todo lo que, las prácticas que se hicieron antes de los ochentas, para los setentas, o antes, que en este momento están creando un problema de salud pública y del medio ambiente.

(Nota de la transcriptora - Se pasa a la laminilla 2: Enfoque de la Investigación)

El enfoque de la investigación…Volvemos a decir, Papelera Puertorriqueña Incorporado. Los objetivos serán: Definir la naturaleza, alcance y fuentes de la contaminación en el agua subterránea, superficial y suelo. Evaluar el riesgo a la salud humana y al medio ambiente.

(Nota de la transcriptora - Se pasa a la laminilla 3: Proceso Superfondo)

Éste es el proceso de Superfondo, y las flechitas nos van diciendo que se descubre el lugar, luego se hace un estudio preliminar, se lleva una lista, en esa lista se hace un "site inspection", se inspecciona el lugar y ahí en ese momento se toman muestras. De ahí

todo eso se monta en un módulo matemático, el cual da una puntuación en porciento, y todo lugar que pasa del veintiocho punto cinco por ciento es elegible para entrar en la lista nacional de prioridad. Una vez entra, en el caso de nosotros entró el veintitrés de septiembre de 2009, porque hizo la puntuación, entró a nuestra Lista Nacional de Prioridad, y una vez entró a la Lista Nacional de Prioridad es requisito hacer una investigación inicial, una investigación remedial y un estudio de viabilidad ─que en inglés le llamamos "remedial investigation/feasibility study"─. Eso es lo que yo voy a presentar en esta tarde.

(Nota de la transcriptora - Se pasa a la laminilla 4: Mapa de Localización)

Aquí tenemos el mapa de la localización del… ésta es la carretera 111 y éste es el Río Viví. Para localizarnos en dónde vamos a…el lugar estudiado.

(Nota de la transcriptora - Se pasa a la laminilla 5: Muestras de Suelo y Sedimento)

Ok. Como le dije anteriormente se hicieron muestras de suelo en toda la facilidad. El área en círculo rojo fue donde se encontraron los niveles que excedían los parámetros, que se detectó contaminación.

(Nota de la transcriptora - Se pasa a la laminilla 6: Muestras de agua subterránea)

Vamos al estudio de agua subterránea. Hincamos pozos, se hicieron los muestreos. Estos muestreos incluyeron toda la lista de contaminantes, para detectar cuál es el que más nos preocupa, y si hay alguno que nos preocupa. Incide de nuevo que donde encontramos el área impactada es en el mismo lugar.

(Nota de la transcriptora - Se pasa a la laminilla 7: Muestras en el Río Viví)

Vamos al Río Viví que es uno de los extremos, vecino de la misma facilidad, y se tomaron muestras a lo largo del río, antes de la facilidad, en la facilidad y luego de la facilidad. Vuelve a coincidir que en las áreas donde tenemos detección de contaminación es en el mismo lugar.

(Nota de la transcriptora - Se pasa a la laminilla 8: Muestras de Vapor de Suelo)

Se hizo muestreo de suelo superficial, muestras de vapor de suelo en el área de la facilidad, porque tenemos un Head Start que nos preocupa, y queremos asegurarnos de que ellos no estaban impactados, y se hicieron muestras de vapor, lo que llamamos "soil vapor", vapor de la contaminación para ver si alguno estaba emigrando y podía salir. Los resultados fueron que, en el área que antes se sigue reproduciendo, volvemos a tener lecturas. O sea, que toda el área coincide, en todas las áreas muestreadas coinciden la detección en el mismo lugar.

(Nota de la transcriptora - Se pasa a la laminilla 9: Modelo Conceptual del Lugar)

Esto es como si viéramos, lo cortáramos como si fuera en un bizcocho, un corte lateral y vemos la facilidad y vemos el área de cómo fluiría. Es un modelo conceptual.

(Nota de la transcriptora - Se pasa a la laminilla 10: Área Impactada para Remediación)

Todo nos lleva a concluir que el área que está sombreada en violeta es el área que tenemos que tomar una decisión de qué vamos a hacer, porque realmente es donde se presenta la contaminación, que es la misma que se vino repitiendo en todos los medios muestreados.

(Nota de la transcriptora - Se pasa a la laminilla 11: Contaminante)

El contaminante que nos preocupa en este caso es Tetracloroetileno, conocido por sus siglas como PCE. Este está en agua subterránea, en suelo, en agua superficial y en el agua que está en los poros debajo del terreno.

(Nota de la transcriptora - Se pasa a la laminilla 12: Riesgos a la Salud Humana)

Luego que tenemos los resultados, que llamamos el estudio que es el "remedial investigation", o el estudio remedial, que nos llevó a los datos que le acabo de presentar, pues entonces pasamos los datos por riesgo. Aquí estamos diseñando estudio de riesgo. Pues mira, a los trabajadores, a los empleados de Head Start y a usuarios del Río Viví de las colindancias del área estudiada. Presente y Futuro. Futuro vemos: residentes y trabajadores de la construcción que podamos estar trabajando en el remedio o en las actividades remediales. El riesgo humano, pues los riesgos humanos serían: cancerígenos, no cancerígenos -futuros residentes- y potencial exposición a subsuelo y agua subterránea en el sótano del edificio por trabajadores y futuros residentes. El contaminante principal de preocupación ─volvemos a repetirlo─ a la salud humana, es el PCE.

(Nota de la transcriptora - Se pasa a la laminilla 13: Objetivos de Remediación)

En suelo los objetivos de remediación serían:

- Prevenir y minimizar el suelo contaminado como fuente de contaminación del agua subterránea y contaminación de agua superficial (por escorrentía superficial) que exceda los parámetros de los contaminantes en cuestión.

- Prevenir y minimizar el suelo contaminado que sirva como fuente de contaminación de vapor dentro del edificio.

El objetivo en agua subterránea es:

- Prevenir y minimizar el agua subterránea contaminada por encima de los PRGs como fuente de contaminación del Río Viví.
- Prevenir la exposición humana a concentraciones de contaminantes en aguas subterráneas por encima de los PRGs.
- Restablecer el agua subterránea a la calidad de agua potable.

(Nota de la transcriptora - Se pasa a la laminilla 14: Objetivos de Remediación)

Objetivos en los vapores que puedan salir del suelo es:

- Mitigar los impactos a la salud pública como resultado de la intrusión de vapor del suelo al edificio.

(Nota de la transcriptora - Se pasa a la laminilla 15: Alternativas de Remediación)

Hemos considerado 3 alternativas para poder lograr los objetivos que antes mencioné. La alternativa número uno, que siempre hay que tomarla en consideración, es no hacer nada. No hacer nada es no hacer nada. La alternativa número dos sería aireación en el subsuelo. Esta aeración lo que promovería es la volatilización de estos vapores que están en los subsuelos, acelerando la degradación y llevando los niveles a unos valores

aceptables. La alternativa número tres sería tratamiento en situ, donde se utilizaría una biorremediación para fines de lograr lo mismo, que es mitigar, bajar los niveles de contaminación ya detectados, a unos niveles que sean razonables, y que estén dentro de los estándares de calidad, tanto federales como estatales.

(Nota de la transcriptora - Se pasa a la laminilla 16: Plan Propuesto)

La alternativa que estamos contemplando, y que estamos presentando en los documentos que están a consideración de ustedes por los próximos 30 días ─o sea, desde julio 13 a agosto 12─ pues sería la alternativa número dos, que sea la aireación del agua subterránea en el área del penacho en combinación con pozos de extracción de vapor de suelo, se inyecta y se extrae unos pozos de vapor moviendo, volatilizando los contaminantes a fin de lograr el objetivo principal de que los valores que vemos bajen y cumplan con los estándares, tanto federales como estatales, de contaminación.

(Nota de la transcriptora - Se pasa a la laminilla 17: Equipo de Trabajo)

En todo este proyecto hemos trabajado la Agencia Federal de Protección Ambiental, en el caso mío, en coordinación con la Junta de Calidad Ambiental, que en este caso el gerente de proyecto es Pascual Velázquez, caballero que se encuentra aquí con nosotros.

(Nota de la transcriptora - Se pasa a la laminilla 18: Preguntas)

Básicamente, no pretendo con esto aclarar, ni entrar en detalles técnicos, porque los detalles técnicos se encuentran en los documentos que van a estar a su consideración, y que están disponibles. Esperamos que tengan la oportunidad de evaluarlos, visitarlos y someter comentarios. Todo comentario va a ser analizado y contestado. Si el

comentario ameritara hacer alguna enmienda al plan propuesto, pues así se hará, de ser necesario. En este momento abro a preguntas y a un compartir. Agradezco que las preguntas que tengan vayan al micrófono, se identifiquen y podamos entrar en diálogo.

Wilson Viruet Ríos: Muy buenas tardes, mi nombre es Wilson Viruet, legislador municipal del PIP aquí en Utuado. Lo primero que le digo es que me da mucha pena que mucha gente de aquí de Utuado, y de la comunidad, no hayan venido. Le voy a decir la pura realidad, y es lo que yo siento como utuadeño que soy, y porque me preocupa el pueblo de Utuado. No tan solo el pueblo de Utuado, me preocupa mi querido país, Puerto Rico, por las situaciones que estamos pasando nosotros aquí en Utuado y en otros pueblos. Yo entiendo que mucha gente de aquí de Utuado no vinieron, ─como dijo la muchacha horita que se mandó un "deso" por periódico, por la radio─ vino muy poca gente de aquí de Utuado, muy poca gente de la misma comunidad cercana a la Papelera. Una de las preocupaciones, no es por faltarle el respeto a ustedes, es que ya el pueblo no cree en ustedes. Lo digo así bien claro, ya la gente de aquí de Puerto Rico no cree en la agencia de la EPA, por las situaciones que están pasando en el pueblo de Peñuelas. Aquí yo he hecho una propuesta, en cuestión a lo de los herbicidas, que están regando por todo Puerto Rico. ¿Qué peor contaminante que eso? antenas por todos lados, hablan de cáncer, y de todo eso… Contaminación en el ambiente, y muchas cosas que están pasando aquí en Puerto Rico. Y quiero que…veo que es lamentable, que aquí hay bien poquita gente de Utuado, ahora mismo aquí, de la comunidad, en esta charla. Le he sido sincero, lo que yo siento lo digo. Ahora mismo tenemos una situación en el pueblo de Peñuelas con los vertederos. Utilizan a la Policía de Puerto Rico para aguantar a los manifestantes, y esa gente entrando allí, dañando el ambiente, contaminación del

agua. Entiendo que…Yo no sé si me estoy saliendo del tema, aquí de lo de la fábrica, pero es muchas cosas que están pasando, y hay que hacer un alto, y que la EPA sea consciente, tenga una "conciensidad", porque yo creo que, o alguien de arriba lo está pisando a ustedes, y ustedes no están haciendo el trabajo, no quieren hacer el trabajo. Es lo que lamentablemente le digo aquí. Muchas gracias.

Luis Santos: Le doy las gracias por sus expresiones. La EPA se divide en muchos programas. El programa en particular al que yo estoy representando en este momento, es el programa de Superfondo, el cual hemos hecho un trabajo excelente y de calidad, unos resultados que pasan los estándares de calidad, tanto de laboratorio, como de estudios del área. Son estudios y resultados que pueden ser reproducidos porque fueron estudiados, fueron diseñados con calma. En esto no hemos estado corriendo. No estamos buscando un resultado para que la labor que se haga nos dé ese resultado. No llevábamos nada en mente. Simple y sencillamente tenemos unas guías. Esas guías se siguieron al pie de la letra, tanto por la Agencia Federal, sus contratistas y compartiendo rol con la agencia estatal *(Nota de transcriptora: se refiere a la Junta de Calidad Ambiental)*. Yo me siento orgulloso del trabajo que hicimos, por lo menos a lo que respecta el estudio que se hizo en Papelera Puertorriqueña Superfund Site.

Brenda Reyes: Bueno, nosotros invitamos a todos los legisladores municipales. Se le dejaron hojas sueltas. ¿Hay alguien más que sea legislador municipal aquí?

Nota de transcriptora: Señora en el público levanta su mano y dice que sí.

Brenda Reyes: Ok, perfecto. Nosotros hicimos el rol de invitar a los legisladores municipales. En mi experiencia de trabajo, yo llevo 15 años en la EPA. Llevo 15 años

trabajando, ya casi, los casos de Superfondo, porque yo empecé con el caso de Vega Baja. Yo le debo decir que las legisladoras y los legisladores municipales son probablemente las personas más activas en este tipo de reunión. Lamento que solamente haya dos legisladores municipales aquí, pues porque ustedes son los llamados a velar por los intereses de su pueblo. Con relación a los plaguicidas, no sé si ha leído que se está considerando eliminar, o hay un proyecto de ley, para eliminar el glifosato. A parte de eso, con relación al caso de las cenizas de Peñuelas, el rol primario lo tiene la Junta de Calidad Ambiental de Puerto Rico. Yo le invitaría a que todas estas preocupaciones, si usted me escribe un correo electrónico, yo se las hago llegar, o le doy el correo electrónico de nuestra directora, la señora Carmen Guerrero. Carmen fue la secretaria del Departamento de Recursos Naturales, hasta hace casi dos años atrás. La señora Guerrero es una persona muy abierta, muy comunicativa, le encanta recibir a las comunidades, y yo con muchísimo gusto le hago llegar esa preocupación. Como le digo, le puede escribir un email a ella, ella lo va a leer, me puede copiar en el email, el email es muy sencillo guerrero.carmen@epa.gov, reyes.brenda@epa.gov, y esas preocupaciones se pueden atender en un diálogo. El foro de hoy es para contestar preguntas sobre el caso de Papelera Puertorriqueña. Si ustedes quisieran alguna reunión como legisladores municipales, aparte, quisieran que el compañero viniera a presentar esto a la Legislatura Municipal, pues nos dejan saber. Tiene que ser dentro de horas laborables, eso sí, pero con muchísimo gusto, nosotros siempre venimos, nos invitan.

Luis Santos: Seguimos con el periodo de comentarios.

Carmen Santiago: Buenas tardes mi nombre es Carmen Santiago y yo soy residente en la comunidad. Ya yo hablé con anterioridad con ustedes y me preocupa que la comunidad no esté. Las razones no las sé, quizás la misma mía, que no me había enterado. Ok, y muchas veces pues por dejadez, "eso no tiene que ver conmigo" o hay muchas cosas…los seres humanos tenemos muchas excusas. Pregunto, algo que me preocupó, usted dijo que ¿esto comenzó hacen 8 años?

Luis Santos: Bueno no. Estamos hablando de que la Papelera Puertorriqueña lleva operando…

Carmen Santiago: Sí, yo sé.

Luis Santos: …por más tiempo. Ocho años es que se enlistó en la Lista Nacional de Prioridad…

Carmen Santiago: ok

Luis Santos: Y desde ese momento, tiene un rol importante para la Agencia Federal, para estudiarla y llevarle a saber a usted la intensidad y la magnitud de la contaminación, buscar un remedio y venir aquí a presentarlo.

Carmen Santiago: Lo que me preocupa es que…o sea tardó nueve años en que ésto llegue a conocimiento de nosotros. Entonces yo me pregunto ¿qué paso en esos 9 años?

Luis Santos: Bueno, cuando se enlista como parte de la "National Priority List" (la Lista Nacional de Prioridades) se publica también. Cuando empezamos los estudios tuvimos también una reunión con la comunidad y le presentamos los estudios que íbamos a realizar. Estos son procesos que suelen ser lentos porque la labor y el trabajo que se

espera es de calidad. Hay que hacer un diseño, hay que hacer un "work plan", un plan de trabajo. Ese plan de trabajo tiene que ser validado para que cumpla los objetivos que se esperan. Luego se empiezan…Hincar pozos no es de un día para otro. El proceso de muestreo como tal, hincada de pozos y muestreo le puede durar 2 años.

Carmen Santiago: ¿Sabe por qué me preocupa? Porque en nueve años, según lo que usted presenta ahí si hay cancerígenos, si hubo una serie de contaminación, si se afectaron personas.

Luis Santos: Bueno hay…

Carmen Santiago: …se afectó como tal las aguas, al afectarse las aguas, que no es potable…todas esas cosas, ¿se imagina cuánta gente habrá sufrido los efectos de esa contaminación? Luego de nueve años…mire después que está enterrado ya…después que mami está enterrada ya no necesita que… Yo sé que los que se quedan necesitan, pero eso preocupa. ¿Ve? Esos otros estudios, o sea, todo ese muestreo que se hizo en ocho años ¿yo lo voy a encontrar en los documentos?

Luis Santos: Sí, en los documentos.

Carmen Santiago: ¿En los documentos que usted me dice que están?

Luis Santos: Es correcto.

Carmen Santiago: Porque eso es lo preocupante, o sea, ¡nueve años!

Luis Santos: En este momento yo le puedo decir…

Carmen Santiago: Perdóneme… y el área, usted me dijo que se enfocaron hacia…allí hay un Head Start…

Luis Santos: Porque el Head Start

Carmen Santiago: …está en el área, en el foco, ¿no?

Luis Santos: No, no. El Head Start está…este edificio es bien…

Carmen Santiago: Sí yo sé.

Luis Santos: …es bien…tiene varios pisos…Básicamente donde se encuentra la contaminación es a nivel de terreno, a nivel subterráneo, y no llega acceso ni tan siquiera a los empleados, los vapores que puedan surgir de allí. Que ese es uno de los posibles contaminantes, o posible contaminación, a humanos. En términos de agua potable, ahí no hay ningún pozo de agua potable hincado, que ahí no se está tomando agua. Y en términos del río, el río tiene un caudal que desaparece rápido, aunque sigue saliendo poco a poco.

Carmen Santiago: o sea que…

Luis Santos: El impacto grande, como el que usted me menciona, no ha sido tan dramático. Sí, hay que tomar una acción.

Carmen Santiago: porque ha habido impacto…

Luis Santos: …porque los niveles encontrados requieren tomar una acción.

Carmen Santiago: ok. ¿Y qué niveles se requieren para poder decir que el nivel de contaminación es mínimo?

Luis Santos: Lograr bajar…

Carmen Santiago: ¿a cuánto?

Frances Delano: Los límites son diferentes porque son distintos medios…

Luis Santos: Ahí tendríamos que… identifícate *(le indica a Frances)*

Frances Delano: Frances Delano. Son distintos medios y son los PRGs.

Carmen Santiago: Voy al documento y voy a encontrar la contestación a todo lo que le estoy preguntando.

Luis Santos: Usted va a encontrar cuatro documentos. El primer documento es de estudios, y ahí va a encontrar todos los muestreos que se hicieron y los resultados.

Carmen Santiago: ¿y a qué responde ese estudio? ¿Por qué se hace? Tiene que haber unos señalamientos de la comunidad…

Luis Santos: Sí, ahí lo va a encontrar.

Carmen Santiago: ok.

Luis Santos: Una vez tenemos los resultados, va a encontrar otro documento que es lo que nosotros le llamamos el "human…

Brenda Reyes: La evaluación de riesgo humano.

Luis Santos: …la evaluación de riesgo humano. Ahí usted va a encontrar todas las posibles alternativas evaluadas y le va a decir si hubo, si no hubo, cómo hubo, y cuál es el riesgo humano, y va a encontrar uno ecológico. En base a esos dos documentos, y al riesgo, es que va a encontrar el estudio de alternativas para remediar el lugar, la situación en particular.

Carmen Santiago: ¿Qué es lo que procede ahora?

Luis Santos: ¿Qué es lo que procede ahora?

Carmen Santiago: Pregunto, porque yo trabajo en la escuela que está contigua al edificio, trabajé allí en la universidad, que está dentro del mismo edificio. Por eso es que quiero saber…

Luis Santos: Pues allí va a encontrar…

Carmen Santiago: …si lo hubo…

Luis Santos: …pues el estudio…

Carmen Santiago: …cuál fue la magnitud...

Luis Santos: En el estudio de riesgo humano va a encontrar esas dudas, esas inquietudes que usted tiene, y en el estudio de riesgo ecológico también las va a encontrar.

Carmen Santiago: Muchas gracias, buenas tardes.

Luis Santos: Están resumidas, en el documento tanto en inglés como en español, pero en sus detalles específicos los va a encontrar en el documento.

Olgaly Ramos Rodríguez: Si buenas tardes, mi nombre es Olgaly Ramos, también residente de aquí de Utuado. Tengo un par de preguntitas. Una dando seguimiento también a lo que la compañera mencionó con respecto a la escuela. ¿Han pensado, tal vez, llevar una charla como está más dirigida hacia los padres y los familiares, a la gente que está en esa área, para que sepan que tienen acceso a estos documentos y que pueden ver sobre lo que se detectó y sobre lo que no se detectó? Porque vi que, a pesar de que está bajo el criterio, ¿verdad?, porque está pintadito en verde, pero sí detectaron

algo en vapores, así que no sé, yo como mamá me gustaría saberlo, si estuviera en la escuela.

Luis Santos: Pues los vapores detectados se mantienen localizados en la facilidad y no sale. O sea, la contaminación se mantiene en la facilidad y no ha impactado a la escuela a la que usted hace referencia. Inclusive, no ha impactado al Head Start…

Olgaly Ramos Rodríguez: Al Head Start, sí eso pienso también…

Luis Santos: …al Head Start que está en el tercer piso, tampoco lo ha impactado.

Olgaly Ramos Rodríguez: ¿Y tomaron muestras dentro de la escuela? ¿Dentro del Head Start por ejemplo? ¿Eso se tomó también?

Frances Delano: Sí, y en la escuela también se tomaron muestras.

Olgaly Ramos Rodríguez: Sí, por eso, porque como sale que detectaron, pero bajo niveles, pero de todas formas no está en blanco, que es como uno quisiera verlo.

Brenda Reyes: Hace como siete años atrás, yo vine con la Agencia para el Registro de Sustancias Tóxicas, como siete años más o menos -siete u ocho años- yo vine con la Agencia de Registro de Sustancias Tóxicas, y nos reunimos en la escuela. Nosotros agarramos las preocupaciones que tenía el personal escolar en esos momentos. En esos momentos quien nos atendió fue una bibliotecaria. Siempre se busca entrevistar a un trabajador social o a una enfermera, que son las personas que nos pueden brindar información sobre la población escolar, etcétera, etcétera.

Olgaly Ramos Rodríguez: Sí

Brenda Reyes: Pero la escuela se visitó y se tomaron muestras en Head Start y en la escuela.

Olgaly Ramos Rodríguez: Sí exacto como para aumentar esa información…

Carmen Santiago: *(Nota de transcriptora*: *Habla fuera de micrófono)* En ese momento era una escuela superior, en este momento la escuela es una escuela elemental de Pre kinder, Educación Especial a 5to grado.

Luis Santos: Pero en base a los estudios…

Carmen Santiago: Yo soy la bibliotecaria por eso pregunto.

Luis Santos: En base a esos estudios que se han hecho, que se hicieron y a los documentos que los sostienen, que están en la alcaldía, va a encontrar que la escuela no ha sido impactada, y no hay riesgo en la escuela. Básicamente el riesgo y la contaminación se encuentra en la facilidad, en la esquina de la facilidad, donde estaban los círculos.

Carmen Santiago: *(Nota de transcriptora*: *Habla fuera de micrófono)* O sea, perdóneme, eso fue en ese momento, ese muestreo…

Aledawi Figueroa (transcriptora): Discúlpenme, necesito que sea en el micrófono porque si no, no puedo grabar y escribir lo que dicen.

Olgaly Ramos Rodríguez: ¿Quiere que yo repita? No, sí, eso mismo, es pensando en eso, en que haya más, lo que estaban hablando, ese acceso a la información, que más gente pueda tenerla. En cuanto a los documentos que están aquí, ¿también se encuentran en español para gente que no puede entenderlo en inglés?

Luis Santos: No, los tenemos en inglés nada más.

Olgaly Ramos Rodríguez: Ok, que eso puede ser…

Luis Santos: Sí.

Olgaly Ramos Rodríguez: Puede ser complicado. Y entonces, lo otro que le quería preguntar era si podía hablar un poquito más sobre la descripción de los pozos, esa alternativa que tienen, porque como yo no soy de esa área no lo puedo ni visualizar, a ver si podía ─sé que es mucha información─ pero por lo menos en cuanto al tamaño, el equipo que usan, un poquito más de información sobre esa alternativa que escogieron, si nos podría hablar un poco.

Frances Delano: No hay diseño hasta que no se haga el estudio piloto.

Olgaly Ramos Rodríguez: Aha, pero por ejemplo el pozo, esto, cuando me está diciendo pozos de extracción, ¿eso a qué se refiere? Eso es lo que yo estoy preguntando.

Luis Santos: Bueno, los pozos…Va a haber unos pozos de inyección…

Olgaly Ramos Rodríguez: ok, eso es lo que quería, como para entenderlo simplemente saber lo que están hablando.

Luis Santos: El mecanismo que estamos visualizando es, tenemos una fuente de contaminación que es volátil…

Olgaly Ramos Rodríguez: Aha

Luis Santos: …se le inyecta el aire, y ese aire activa para volatilizar ese contaminante y ese contaminante se recupera buscando que…

Olgaly Ramos Rodríguez: ¿Utilizan como una maquinaria para recuperar…?

Luis Santos: …para extraerlo…tiene pozos de inyección y pozos de extracción…

Olgaly Ramos Rodríguez: ok, de extracción

Luis Santos: y la idea es lograr que el contaminante que está allí baje los niveles…

Olgaly Ramos Rodríguez: sí, exacto

Luis Santos: …reducirlos, y hasta eliminarlos, si ese fuera el caso.

Olgaly Ramos Rodríguez: Y lo último que quería preguntar es si ustedes van a compartir… ¿el email lo tomaron para poder compartirnos la presentación, que tengamos acceso a ella también?

Luis Santos: Bueno la presentación …

Olgaly Ramos Rodríguez: Como tiene un poquito de información adicional, a lo mejor, de lo que hay aquí…

Luis Santos: Podríamos…bueno…

Olgaly Ramos Rodríguez: O más resumida, digamos…

Luis Santos: Bueno… en la página de la EPA, que aparece en el documento en inglés, si usted le da “click”, podría encontrar, inclusive, los documentos que están aquí y no tendría que…

Olgaly Ramos Rodríguez: ok, que no hay que venir…

Luis Santos: No, no hay ni que venir aquí

Olgaly Ramos Rodríguez: ok, perfecto, muy bien, pues gracias.

Luis Santos: Va a encontrar el documento que tiene en sus manos, "plus" los otros documentos.

Olgaly Ramos Rodríguez: perfecto, ok, muchas gracias.

Andrea Camacho: Yo quiero saber porque solamente…Ah, mi nombre es Andrea Camacho, soy ingeniera ambiental, pertenezco a la firma Nollum Environmental Engineers. Yo tengo una pregunta. Considero que hay unas metodologías para la remoción de esos contaminantes que son un poquito menos invasivas, que se podrían tratar. No se han tratado aquí, pero tal vez, este problema que está pasando aquí sería uno ideal para poder ver si esto funciona. Básicamente es con microorganismos. Básicamente nosotros estamos trabajando con una sepa de microorganismos para bioestimularlos. Por lo que usted dijo, tengo la idea, más o menos, de que esas concentraciones que ustedes tienen de PCE no son tan altas. Estamos hablando de hidrocarburos, clorados, son orgánicos volátiles. Pues estos microorganismos tienen la capacidad de metabolizarlos, y probablemente reducirlos bastante, tal vez por debajo. Si hubiera la posibilidad, de que, tal vez, incluyan otro piloto, y las ponen a trabajar, las bacterias yo las puedo proveer. Yo estoy trabajando con algunas bacterias que yo las quiero traer aquí, para ponerlas a trabajar. Son bacterias que no han sido manipuladas genéticamente, te las da la naturaleza propiamente. Debido a que yo no tengo, por ahora, el equipo, y todo, para montar un laboratorio de microbiología, y probablemente hacer un estudio de las bacterias autóctonas que tengan en el lugar y poder bioestimularlas. Porque se necesitaría una cantidad, bueno, dependiendo las concentraciones que hay para poder eh…Vamos a pensar en compostaje ¿quién ha

hecho compostaje alguna vez aquí? Sí, ¿tu cavas verdad? y ¿qué haces? Pues en este caso el biocompostaje, tienes que quitarle el oxígeno, y las que hacen el trabajo ahí son las bacterias y las lombrices. Pues esto sería algo parecido a eso. Obviamente, un poquito más técnico. Pienso que también sería un poquito más costo-efectivo. Además, que no solamente te trataría el suelo, el agua subterránea, sino también se puede crear un canal ecológico, a través de eco-tecnología, y situar una biomasa acuática, a través de plantas, y eso que esté cayendo al río, aunque caiga y sea diluido, y la concentración baje, por cuestiones de evitar riesgo, o lo quieran ver mejor, pues tratar de eliminarlo y en vez de hacer un solo proceso, tal vez se pueden hacer tres procesos, que sean un poco más económicos, se divida eso. Ya esos estudios se están haciendo y tienen una efectividad en los PCEs del ochenta al ochenta y nueve porciento de remoción.

Luis Santos: Pues es excelente la idea que usted ha traído. Estamos en un momento ideal para que usted nos haga la presentación por escrito, para ser evaluada antes de tomar la decisión. La EPA no ha tomado la decisión y esa alternativa que usted nos está compartiendo sería ideal poder tenerla lo más pronto posible, para nosotros poderla evaluar, y durante ese proceso poder ver si es la que nos conviene más.

Andrea Camacho: Claro. De todas maneras, quería incluir algo más en esto. Nosotros estamos viviendo en una época en que es necesario adherirnos a la sustentabilidad. Y la sustentabilidad necesita participación de la comunidad, y éste sería un proyecto que, no solamente sería participe gente especializada, si no también parte de la comunidad como la escuela, por ejemplo. Se pueden hacer unos ejercicios, como de laboratorio, para que la gente que no tiene conocimiento, como por ejemplo, la extracción de vapores, es difícil visualizarla, pero en realidad no es tan complicado, solamente que es un poco

más técnico, y es un poquito más costoso. Pero de esa manera también pienso que este tipo de cosas no son cosas negativas para la isla, sino son momentos de aprendizaje y de ver cómo la ciencia, con el gobierno, con la comunidad pueden trabajar en equipo.

Luis Santos: Para mí es excelente la postura que usted nos ha planteado. Le exhorto a que nos la presente en este periodo, cuestión de que nosotros la tengamos, y podamos tomarla en consideración durante este proceso. Aquí no se ha tomado ninguna decisión final. Estamos planteando lo que encontramos, los riesgos y las alternativas. Usted trae una que puede ser efectiva, necesitamos que nos la someta por escrito.

Andrea Camacho: Sí, no hay ningún problema. Otra pregunta que yo tengo. Yo he estado tratando de buscar la información de la caracterización, básicamente, de las concentraciones que están presentes en la tierra y el agua. ¿Dónde yo las consigo? ¿Cómo las consigo? No las pude encontrar. Entré a lo de la EPA y la EPA no me…tratamos de buscarlas y no hemos podido encontrar la información. Porque de acuerdo a eso es que…por ejemplo, yo estoy planteando esto, pero yo no sé si es viable, porque no tengo la información.

Luis Santos: Yo le exhorto a que mañana mismo venga a los documentos que están aquí, que están en disco y están en “hard copy” y los vea.

Andrea Camacho: Muchas gracias.

Luis Santos: Porque están.

Andrea Camacho: Gracias

Luis Santos: Bien

Carlos W. López Freytes: Primero que nada buenas tardes a todos. Ayúdame un poquito, hace tiempo que no uso un micrófono. Para efectos de record mi nombre es Carlos López Freytes. Yo soy el abogado ambiental de Papelera Puertorriqueña, que ha estado envuelto desde el primer día que surgió este asunto. Y antes de yo, básicamente leer rápidamente lo que es la ponencia que nosotros tenemos escrita, porque a la vez que este proceso es uno de comentarios públicos, para que todos ustedes puedan dar su posición, es importante también para la empresa expresar su posición sobre lo que la EPA está proponiendo. Porque a la vez, a la EPA proponer una medida de limpieza, Papelera va a estar sujeta, como ser la entidad responsable, ¿verdad? en su momento, pues tener que atender las consecuencias de las determinaciones de la EPA. Por eso, pues, nosotros tenemos un deber también legal, y de responsabilidad social, de responder y aclarar puntos que nosotros entendemos son incorrectos. Pero para aclarar varias dudas que se hablaron hace un momentito. Estaban hablando de lo que era ─y a mí me gusta explicarlo en arroz y habichuela, porque a mí me encanta eso─ cuando estaban hablando del "soil vapor extraction" para hacerlo fácil, piensen que es una maquinita, como un "vacum cleaner", que va succionando el aire, te saca los volátiles y los limpia. Así de sencillo. No es nada más complicado. Obviamente, los técnicos lo hacen más difícil, porque es más difícil. Pero para que lo entiendan piensen como un "vacum cleaner" chupando el aire. Le tiro el aire y chupo los volátiles y limpio. Eso es todo lo que es. Así que, espero que eso los ayude a aclarar un poquito el asunto. De beneficio yo soy ingeniero a la vez que abogado, así que por eso entiendo un poco la dinámica técnica. Pues quiero empezar, para efectos de también aclarar. Se estaba hablando sobre la preocupación de la escuela y el Head Start. La realidad, por la

explicación…y Luis, no sé si puedes poner la gráfica que tenías presentada sobre la facilidad de Papelera. Se ha podido identificar, por los resultados que ha presentado la EPA en el día de hoy, que la concentración donde se ha detectado por encima de los niveles reglamentarios es en un lugar específico y es al área sureste de la facilidad. Pero es dentro de la facilidad. Fuera de la facilidad, no se detecta nada. Quiero que quede claro. Por lo tanto ¿qué riesgo hay para la comunidad fuera de la facilidad? Ninguno. Yo sé que obviamente, pues, a veces es un poco más difícil explicarlo pero yo puedo ser un poco más categórico.

Luis Santos: Me vas diciendo…*(Nota de transcriptora: Luis está buscando la laminilla que el Licenciado López le solicitó.)*

Carlos W. López Freytes: Puedes dejarlo ahí. En cualquiera después que se vea la facilidad. Ok. Como ven donde está la marca roja, en esa marca es donde está localizado, pegado hacia la propiedad, ahí es donde está la concentración. Donde está la escuela, donde está el Head Start, inclusive, donde están los empleados de Papelera, que Papelera siempre ha sido responsable con sus empleados, no llega contaminación. Por lo tanto, no hay riesgo, y eso lo concluyen los propios estudios de la EPA, que no hay riesgo, ni para los empleados, ni para los del Head Start, ni para la escuela. Así que, yo quería dejar eso bien claro para ustedes para que tampoco se queden confundidos. Ahora pues entonces, ya aclarado ese asunto, paso a leer rápidamente mi ponencia.

Muy buenas tardes, pues ya me presenté, mi nombre es Carlos W. López Freytes, y he sido el abogado de Papelera, durante todo el proceso bajo la Ley del Superfondo que ha realizado la EPA. En el día de hoy nos presentamos para participar de este proceso de comentarios públicos sobre el Récord Administrativo, que es el que el señor Luis Santos

ha presentado para todos, y en particular, para emitir nuestras recomendaciones sobre el Plan de Trabajo, y la propuesta que ha trabajado y ha establecido la EPA para la remediación del lugar. Lo primero que tengo que notificar es que la notificación de los informes y alternativas de remediación fue realizada en la página de internet —que el que lo quiera revisar también, como yo lo hice, yo los obtuve a través de la página de internet de la EPA. Tengo que reconocer que la EPA es más avanzada en esos procesos y lo publican a través de la internet. Y el que lo quiera, puede lograr su acceso a través de esos documentos sin tener que sacar copias en otro lugar. Están publicados, unos documentos desde el 29 de junio, y otros se publicaron el 10 de julio. La EPA tomó la determinación de dar comienzo a este proceso de publicación del record administrativo, y la respectiva reunión pública, dentro del periodo de 30 días de comentarios, conforme lo requiere la ley CERCLA, que fue la que Luis habló, la Sección 117(a). Como parte de estos requisitos, dicha sección requería la publicación de un Aviso Público en un periódico de circulación general. En específico, la EPA a través de su "*A Guide to Preparing Superfund Proposed Plans, Records of Decision, and Other Remedy Selection Decision Documents*", de julio de 1999, ha establecido cuál es la política pública sobre los avisos públicos que deben de notificarse. Y específicamente esa normativa establece que el procedimiento requiere que se notifique dos semanas antes de que empiece el proceso público. Yo tengo, obviamente, el deber de señalar, que desgraciadamente eso no ocurrió en este proceso, y, obviamente, no se ha cumplido con la guía propia de la EPA, para, obviamente, comenzar el proceso público. No obstante, hemos hecho nuestro trabajo de poder venir aquí, a hacer nuestros comentarios, a pesar de que ese proceso no se llevó. Después de verificar con la EPA, la publicación del aviso público,

pues obviamente, el mismo se hizo el 13 de julio del 2017, y no cumplió, obviamente, con tener las dos semanas antes, como requiere sus propias guías, de tenerlo disponible para comentarios de todo el público. Adicionalmente, dicho aviso público, no ha cumplido con las normas de la EPA, al no tener específicamente incluido uno de los requisitos y las alternativas discutidas, como requiere la reglamentación, y lo requiere la misma guía. Y, obviamente, pues tengo el deber también de señalar eso, ante esa falta de no tener ese documento, y esa descripción, que, aunque sí la han discutido con detalle en el día de hoy, no está incluida en el aviso público como lo requiere la guía. Por todo lo anteriormente descrito, entendemos que la EPA, obviamente, realizó la publicación de un aviso público y se comenzó un proceso que no cumplió con normas, y es importante que lo señalemos para record. Además, es importante señalar que dicha guía reconoce que cualquier persona que solicite 30 días adicionales al tiempo originalmente establecido para comentarios públicos, los cuales ya se ha explicado vencen el 12 de agosto de 2017, podrán ser otorgados por la EPA, siempre y cuando se presenten a tiempo. Ante eso, no sólo para beneficio de ustedes, si no para beneficio de la empresa, para efectos de record, estamos solicitando 30 días adicionales, como la reglamentación lo permite, y como las propias normas de la EPA lo establecen, para que así la EPA pueda determinar si otorga esos 30 días adicionales, que por reglamento y como está citado en el NCP §300.430(f)(3)(i) se establece. Sin embargo, y a pesar de esto, entendemos necesario plantear preliminarmente nuestros comentarios para que la EPA pueda comenzar a considerarlos desde ahora, en lo que formalmente presentamos nuestros comentarios finales, dado que presentaremos nuestros comentarios escritos, ya sea el 12 de agosto, o en los treinta días adicionales que hemos solicitado. Primero

que nada, queremos dejar claramente establecido que Papelera Puertorriqueña es una empresa pequeña, es un “Small Business” local, de Utuado, y de aquí puertorriqueña. No es y no estamos hablando de una multinacional, multimillonaria, ni con todos los recursos del mundo. Y por eso es que es bien importante que se reconozca, dado que todos los procesos, inclusive bajo la ley de Superfondo, hay unas normas aplicables a los “Small Businesses” para efectos de la aplicación de las distintas normativas, incluyendo la remediación y la investigación que se realiza. Nuevamente, por eso tenemos el deber de identificarlo. También tenemos que establecer, y dejar claro, que Papelera Puertorriqueña, desde que se conoció de todo este proceso, siempre ha colaborado con todo el esfuerzo que la EPA ha desarrollado, y todavía pensamos en mantenernos en ese proceso porque Papelera Puertorriqueña tiene una conciencia clara y razonable, no solo con sus empleados, y con las tareas que realizan, si no con los alrededores. No obstante, por eso mismo es que estamos aquí, y queremos dar cara para efectos de explicar las distintas circunstancias y cómo son los puntos de vista de parte de Papelera. Los comentarios que ahora voy a estar presentando en este procedimiento no pretenden ─y quiero que quede claro ─ no pretendemos oponernos a las recomendaciones, o a las alternativas, y las acciones que la EPA quiere hacer. Pero sí queremos dar a conocer que existen otras alternativas que pueden ser aún más efectivas, y más viables, tanto económicamente como operacionalmente, y ese es el rol que tenemos aquí en el día de hoy. Es por ello que nosotros, Papelera Puertorriqueña, presentó unos comentarios a la EPA el 8 de septiembre de 2016, los cuales están anejados en la ponencia que incluimos el día de hoy, para que consten y formen parte del record oficial, dado que necesitamos, y solicitamos, que los mismos sean

considerados como parte del record y de la evaluación que la EPA va a proceder a hacer de todos los comentarios públicos en el día de hoy. Obviamente, desgraciadamente, y sin conocer obviamente las razones para ello, la EPA hasta el momento no ha considerado estos comentarios que presentamos aproximadamente hace 1 año, y ante ello nos vemos en la obligación de reafirmarnos en los mismos. Queremos reiterar que posteriormente estaremos sometiendo, obviamente, todos nuestros cometarios técnicos que validarán lo que voy a explicar ahora, y lo que consta en esa carta del 8 de septiembre de 2016. Algunos de los comentarios más importantes, que resaltamos en esa comunicación son los siguientes. Los datos que aparecen en el "*Revised Final Remediation Investigation Report*" (RI) claramente demuestran que la contaminación encontrada en el lugar, es bien limitada ─como yo les dije, es limitada al área roja, está específicamente mantenida en esa área─ está mantenida en su extensión horizontal y vertical, tanto en el suelo como en las aguas subterráneas, ya que se mantienen en el área específica donde hubo el supuesto escape de "Tetrachloroethylene" (PCE). Por tanto, el área de impacto es una bien restringida y limitada, y no se extiende fuera de la propiedad. Al haber eso, pues el riesgo está bien controlado porque es un área bien específica donde no hay riesgo hacia afuera. La propiedad de Papelera Puertorriqueña, es una propiedad industrial que se va a continuar utilizando de dicha manera, por tal razón, el "*Revised Final Human Health Risk Assessment*" concluye que ante dicho uso industrial, no hay riesgos inaceptables para la salud humana y el ambiente. En el único momento que se concluye que podría surgir un riesgo a la salud humana y al ambiente, es si el lugar fuera a ser utilizado como área residencial. Que, si se recuerdan en la presentación que trajo el compañero Luis Santos, explicó que, si el futuro uso fuera a ser

uno residencial, pues hubiera así algunos riesgos, pero la realidad es que la facilidad de Papelera nunca va a ser utilizada como facilidad residencial. Por lo tanto, ese riesgo estimado futuro, es inexistente. Ambas suposiciones obviamente… Perdón… En el único momento que se concluye que podría surgir un riesgo a la salud humana y al ambiente, es si el lugar fuera a ser utilizado como área residencial y a su vez se utilizara el agua subterránea como fuente de agua potable. Como bien dijo el compañero, el área no va a utilizarse como área residencial, como yo expliqué. Pero no existen fuentes de agua subterránea que se vayan a extraer, por lo tanto, no hay riesgo alguno, ni para la comunidad, ni para cualquiera que piense extraer agua de ese lugar. Y ¿por qué? Porque si alguien desea hacer un pozo de extracción de agua tiene que pedir autorización del Departamento de Recursos Naturales, y si va a pedir permisos del Departamento de Recursos Naturales, tiene que primero ver si existe disponibilidad de agua de Acueductos ─el agua que ustedes reciben en sus casas─ si hay agua de Acueductos, Recursos Naturales nunca puede aprobar, por reglamento, un pozo de extracción. Por lo tanto, al esa área estar servida por Acueductos, no hay riesgo alguno de que nadie venga a extraer agua subterránea para suplido de agua potable. Por lo tanto, la realidad es que los riesgos que se están estimando para concluir la alternativa que la EPA está identificando son irreales. Y llegar a hacer esa inversión, y hacer ese análisis tan costoso, por unas circunstancias que no son reales, sabiendo que somos una pequeña empresa, es un poco injusto en la toma de decisiones. Y por eso lo tenemos que decir en el día de hoy.

Por tal razón, nosotros hemos propuesto que la primera alternativa que Papelera está muy dispuesta a hacer, y que la reglamentación de la EPA lo permite, es establecer lo

que se conoce en inglés como un *Institutional Control.* Esto es básicamente establecer una restricción de uso. Papelera no tiene problema alguno que la propiedad se restrinja para uso industrial por el resto de la vida. De esa manera no va a haber riesgo alguno para ningún residente que en un futuro compre la facilidad de Papelera. Porque el próximo adquirente tendrá que comprar una facilidad industrial, no podrá comprar nunca un área residencial. Por lo tanto, ese riesgo que está llevando a la EPA a llevar a hacer una recomendación, una alternativa más activa, no cae. Dentro de las alternativas propuestas por la EPA, se consideran una serie de alternativas extremadamente invasivas, que es específicamente las últimas dos que se han especificado. Estas alternativas son extremadamente costosas. Para que tengan una idea, la alternativa número dos, la EPA ha estimado que el costo es aproximadamente 2.6 millones de dólares. Ese es el estimado de la limpieza. Debo ser claro, que, por mis experiencias, ─ yo llevo estas canas de este proceso, es porque ya yo he estado en estos procesos anteriormente ─ rara vez el proceso, el costo del proceso de una limpieza, se mantiene dentro de ese estimado. Y obviamente tenemos una preocupación significativa, de que realmente el costo real va a ser mucho mayor, cuando las circunstancias que hemos explicado es que no existe un riesgo para la salud humana, como ya la EPA ha establecido, y los documentos lo sustentan. Por eso hemos identificado que existe otra alternativa, que es la alternativa de "Natural Attenuation" como una alternativa viable a considerarse. En nuestra opinión, la EPA no ha evaluado adecuadamente esta alternativa, cuando realmente tiene el deber de hacerlo. Lo que quiero decir es que existe otra alternativa de "natural attenuation" que debe considerarse. ¿Qué es lo que significa? El sistema actualmente, como hemos identificado, está localizada la

contaminación en un punto. Al estar localizada en un punto, cuando llega la contaminación, si llega al río, no se detecta. ¿Qué pasa? Usted ve donde están las letras Área Impactada, o al borde de la propiedad. Cuando se muestrea en esas áreas no se detecta ningún rastro de contaminación. Por lo tanto, si no hay riesgo de contaminación al agua, aguas abajo, si no hay riesgo de contaminación, los sedimentos no tuvieron ningún contaminante detectado, en el río, sino que está localizada en un punto, ¿por qué llegar a esa consideración tan costosa? El sistema, la realidad es, y científicamente hablando, el sistema naturalmente está manejando los contaminantes, como lo haría cuando usted tiene una granja agrícola y tiene descargas de las vacas, ¿verdad?, y las vacas pasan por el río y hacen sus descargas. El río, cuando usted lo muestrea, el punto donde están las vacas pasando, a lo mejor, le va a dar positivo a que hay coliformes fecales, pero aguas abajo le da que está limpio. Porque el sistema manejó esa contaminación. Eso es exactamente lo que está pasando aquí. Ya sea por dilución o por vaporización, de que se evaporó antes de llegar aguas abajo…la realidad es que por los análisis que la EPA ha realizado, aguas abajo no existe contaminación. Por lo tanto ¿qué riesgo hay? Ninguno. El proceso, obviamente, para llegar a concluir una alternativa tan invasiva, y agresiva, como envuelve el “soil vapor extraction”, requiere el que haya un riesgo a la salud humana y al ambiente. Y por la descripción de lo que hemos visto, aquí no lo hay. Por lo tanto, entendemos que la alternativa no es la adecuada, no está sustentada en la ciencia que conocemos y no cumple tampoco con la reglamentación. Cabe señalar que los datos hidrogeológicos generados en el *RI* identifican que el Río Viví es un cuerpo de agua que recoge todas las aguas de su alrededor, incluyendo las aguas subterráneas, por lo que no se pudo encontrar rastros

de contaminación en los sedimentos del río, pero sí en el agua superficial inmediatamente después del lugar que manejó PCE. Sin embargo, los propios análisis claramente demostraron que aguas abajo, y al momento de salir de la propiedad de Papelera Puertorriqueña, no se encontraban concentraciones de PCE. Esta situación demuestra que por las características particulares del Río Viví, el PCE se volatiliza y diluye, lo cual es una causa totalmente natural, eliminando cualquier riesgo a la salud humana y al ambiente aguas debajo de la propiedad de la empresa. Ante esta ausencia de contaminante aguas abajo de la propiedad, es de fácil conclusión que un proceso de atenuación natural está hoy funcionando, y ha estado funcionando por los pasados nueve años. Por lo tanto, cuando usted estaba preocupada del riesgo que hubiera en la escuela aguas abajo, o en el Head Start, por la situación que hemos encontrado, es que no ha habido riesgo porque el sistema lo ha estado manejando naturalmente por sí solo. Ante esta ausencia de contaminante aguas abajo de la propiedad, es de fácil conclusión que un proceso de atenuación natural está operando. Es importante señalar, que el contaminante detectado, no está siendo utilizado por Papelera Puertorriqueña en varias décadas, porque ya ese tipo de operación no existe, y las tecnologías han ido mejorando, existen mejores maneras de hacer dichas funciones. Por lo que se puede científicamente concluir que el material detectado en el suelo no es una fuente que está creciendo, si no es algo que ya está ahí y que meramente pues está en el lugar y el sistema lo está manejando adecuadamente. Para validar ─ y ya voy terminando ─ Para validar el uso de esta alternativa, unida a la restricción de usos que ya hemos establecido en la propiedad, Papelera recomienda un plan de monitoreo a largo plazo. Este plan consistiría de la toma de muestras, tanto de agua subterránea y superficiales, en distintas

localizaciones dentro y fuera de la propiedad. Este monitoreo se propone que se mantenga en vigor hasta que ocurra una de las siguientes condiciones: la estabilidad del área de contaminación en agua subterránea, o que se altere la contaminación en aguas subterráneas creando entonces un riesgo. Lo que quiero decir es que por el monitoreo no se detectó nunca que hay cambio en las circunstancias, pues por lo tanto, el sistema está funcionando. La segunda alternativa es, si yo empiezo a detectar cambio, donde, por los monitoreos encuentro contaminación o aguas abajo, o en otro lugar, pues tenemos que cambiar la alternativa. Porque siempre hay que mantenerse monitoreando, para asegurar la salud y la seguridad de la gente, y del medio ambiente. Y por último que, si en diez años la monitoria demuestra que no ha habido cambio, y que el sistema se mantiene controlado, pues que ahí se mantenga el sistema de manera natural, manejándose y limpiándose. Esta alternativa propuesta es una razonable, que atiende las preocupaciones señaladas por la EPA, cumple con la reglamentación, y no crea riesgo alguno a la salud humana y al ambiente. Ante este escenario, Papelera Puertorriqueña, espera que la EPA, científicamente, analice esta propuesta y la añada al listado de alternativas a considerar en su Plan Propuesto, ya que es una alternativa real y justa, y que permitiría a Papelera Puertorriqueña, Inc. colaborar más directamente en los trabajos que se proponen. Posteriormente, dentro del término solicitado, presentaremos los datos técnicos específicos que todavía van a reafirmar esta propuesta. Muchas gracias y cualquier pregunta estamos a sus órdenes.

Luis Santos: Carlos gracias. Vamos a considerarla, como cualquier otra alternativa, o ponencia que surja durante estos treinta días. Para eso son estos treinta días. Para recoger información como la que él traiga, o que traiga cualquier otra persona, esté aquí

o no esté aquí, luego de haber evaluado los informes que hemos dejado en el depositorio. Exhortamos a que muevan a las personas que no están aquí, a que vayan al lugar, analicen los documentos y al igual que hizo nuestro compañero Carlos López Freytes, también hagan sus presentaciones, las cuales se van a tomar en consideración, porque eso la ley lo exige. Para todo lo que dijo, y mencionó Carlos, va a haber una respuesta de la agencia, y va a ser por escrito, y se va a incorporar en el documento final.

Brenda Reyes: Como indicó Luis, los comentarios que hizo el Licenciado Carlos López Freyte serán respondidos en el "Responsiveness Summary", en el Resumen de Comentarios. Pero sobre el periodo de comentarios públicos, y el anuncio en el periódico, la guía lo que especifica es que alrededor de diez días antes de la reunión, debe ser notificada. La EPA, yo trabajo veinte casos de Superfondo en Puerto Rico. La EPA generalmente en un periodo de catorce a veintiún días notifica. En este caso, específicamente, lo hicimos siete días antes. Utilizamos un periódico de circulación general de Puerto Rico, fue en el periódico Primera Hora, se siguen las guías específicas, que indican que se debe ubicar en una sección que sea visible. Por ejemplo, te recomienda Espectáculos, Deportes. Yo publico entre Espectáculos y Deportes, es donde yo trato de decirle al periódico: "mira, en esta ubicación es donde yo quiero mi anuncio". El tamaño del anuncio es visual, sigue las guías, lleva el logo de la agencia. Quiero que comprendan que, si se solicita un periodo de extensión al periodo de comentarios públicos, se toma en consideración la extensión. Lo puede solicitar él, como lo ha solicitado, o lo puede solicitar cualquier otra persona. Pero esta agencia cumplió con el requisito específico, y las guías que se nos dan a las personas que trabajamos en el área de asuntos públicos y relaciones con la comunidad. Y, perdón, hicimos anuncios

de radio, que no estaba incluido en el combo. Los anuncios de radio fueron bonificación adicional, se hace comunicado de prensa, que hicimos comunicado de prensa, y encima de eso repartimos hojas sueltas. Y está bien chévere, bajo el sol, venir a repartir hojas sueltas, pero es práctica estándar ya, y eso, mi compañero y yo llevamos trabajando en muchos casos, y muchos años ya. La EPA no tenía esa práctica, cuando yo llegué en el año 2002. Así que, repartimos hojas, hablamos con las personas, visitamos personas claves, en este caso se visitó a la Asociación de Comerciantes de Utuado, dialogamos con ellos, también visitamos a la Legislatura Municipal. Y, tampoco está incluido notificar a los legisladores municipales. Pero la práctica nos ha demostrado que éstas son las mejores personas que llevan la información a sus respectivas comunidades. Así que comentado, nota aparte, se responderá también por escrito.

Carlos W. López Freytes: No hay problema, yo me refiero a la sección 2.6.1, que ahí está, y me reafirmo en lo que dije.

Luis Santos: Bueno

Carmen Santiago: Voy a preguntar algo. Porque es que empiezan a surgir dudas, y como el jíbaro de Puerto Rico, quizás yo soy del jíbaro aguzao…Mi nombre es Carmen Santiago. La joven aquí habla de un plan piloto *(Nota de Transcriptora: Señala a Frances Delano, refiriéndose a comentario anterior)*. Si no hay una decisión tomada ¿cuál es ese plan piloto? ¿De qué estamos hablando?

Luis Santos: Ok. Lo que ella está hablando es que, el proceso de Superfondo, para llegar desde que se descubre el lugar, hasta que se complementa, y se completa la labor, y se remedia el lugar, pasa por etapas. Nosotros estamos en la etapa de “Remedial

Investigation/Feasibility Study", que en español es estudio de viabilidad y estudio de campo y llegar a un record de decisión. Ese programa piloto al cuál ella…ese estudio piloto al cual ella se refiere se utiliza, o se incorpora, luego de tomada la decisión como el "Remedial Design" como el diseño, y la acción. O sea, en el diseño es que se lleva eso, pero estamos muy adelantados, ella adelantó el proceso, y en este momento no estamos contemplándolo, porque todavía no hemos llegado a la toma de decisión que se le llama el record de decisión. Estamos camino al record de decisión. Una vez tomada la decisión pues entonces se hace el diseño, y en ese proceso de diseño es que entra lo que la compañera acaba de decir. Que usted tuvo duda.

Carmen Santiago: O sea, mi duda parte porque el caballero aquí nos hace una presentación, y nos dice que esa contaminación es dentro de una estructura, que eso no ha salido de ahí. Entonces si eso no ha salido de ahí, ¿cuál es la razón para yo ponerme a pensar que quizás hay una contaminación fuera del lugar?

Luis Santos: Bueno, los valores…

Carmen Santiago: Pues tengo que haber encontrado algo para poder llegar a esa conclusión. O ─usted me va a disculpar, porque yo tengo que…yo voy para la iglesia ─ …o como decía una gente que yo conozco, esto tiene otras agendas. Me disculpa, si es que lo hay, Dios quiera que no. Una agencia…una corporación de nuestro pueblo. Si hay algo que está mal que se corrija, pero si realmente no hay nada mal

Luis Santos: Lo que nos está…

Carmen Santiago: …hay que evitar el que entren otras agendas. Me disculpa, buenas tardes, porque yo tengo que ir a cumplir con Papa Dios.

Luis Santos: Ok, buenas tardes. ¿Alguien más?

Wilson Viruet: Buenas tardes, Wilson Viruet, legislador municipal del PIP. Según le dije a la compañera, Carmen, que salió ahora mismo, que es compañera maestra bibliotecaria. Yo soy maestro retirado también. Sé que esta compañía Papelera es una persona…las personas que yo conozco son personas que… una Papelera Puertorriqueña, como decimos acá, y aquí en el pueblo de Utuado. Ella tocó el tema horita de si hay agenda escondida, pues, eso yo también estaba pensado. De que un trabajador vecino mío, que trabaja en la Papelera, me dijo "Wilson, hay una conferencia, una reunión de la EPA en la Legislatura" y yo le dije "No, ya me habían avisado". Él me dijo: "Nos vamos a quedar sin trabajo". Yo le dije: "No te preocupes que esto es algo político". Puede ser político también, hay agendas políticas. Como todo. Me da "deso" la situación, que la compañera se fue. La Escuela Monserrate Moreno, hacen tres o cuatro años que esa escuela está ahora mismo cerrada, y hay una escuela que ahora trabaja otro grupo de programa que tienen ahora. Mi hija estudiaba en esa escuela, esa es la que se movió a la Judith Vivas, que es cerca de la Papelera. Hacen tres o cuatro años yo estaba en la escuela y me llaman "mira, ven y recoge a la nena, porque están enviando a los nenes, que hay una inhalación de gases". Pero la Papelera queda por acá abajo, y la escuela queda por allá arriba, más para arriba. Fueron dos días, inhalación de gases. Y eso se quedó callado, y cerraron la escuela, y movieron la escuela la Judith Vivas. Y habían pasado otras cosas. En Lares, el cierre de escuelas que hubo este año, se lo achacaron a que los pozos que estaban en las escuelas, que afectaban las Cuevas…las Cavernas de Camuy. Mira la excusa que usaron. La excusa…Cerraron cinco escuelas o seis, en Lares, para empatarlas unas con otras.

Cuando yo hablé con los directores, y los maestros, y me dicen “no, si fue que…dicen que, los pozos muros, que hay una alcantarilla que conecta allá a las Cuevas de Camuy. Y que la EPA y Calidad Ambiental… Hay que cerrar la escuela” y la cerraron este año. Eso fue este año. Ese es el tipo de modo que utilizaron para cerrar la escuela también. Por eso es que yo pongo mucho en duda, porque, a veces, hay agendas escondidas. Si hay algo que lo investiguen. Pero creo que el licenciado habló muy bien, y tocó unos temas, y nos aclaró unas cosas, y ustedes también nos deberían aclarar puntos que son bien importantes, y que si es para beneficio para el pueblo de Utuado, bienvenido sea a todo. Muchas gracias.

Luis Santos: Tomado el comentario.

Carlos W. López Freytes: Gracias Luis por permitirme aclarar algo. Primero que nada, yo tengo que aclarar. Aquí no hay agenda escondida, quiero que quede eso claro. Papelera podrá diferir en la alternativa que está proponiendo la EPA, pero eso en nada afecta que la EPA ha hecho su trabajo en hacer la evaluación, monitorear si hay algún contaminante. Y tengo que aclarar, yo nunca he dicho que no hubo contaminantes. Yo he dicho que está localizado en un solo lugar, y que no presenta riesgo, pero hay contaminantes. Quiero que quede eso claro, porque tampoco quiero que el record quede injusto. Nuestro planteamiento no es ese, no estamos para atacar a la EPA. Nuestra posición es que se evalúe lo que Papelera piensa, porque nuestra posición es técnicamente correcta, y por eso nos sustentamos en ella. Pero también tenemos el deber de aclarar que se detectó en el lugar donde está marcado de rojo, y en el agua del Río Vivi, inmediatamente donde está el área roja. Lo que pasa es que fuera de esa área no se detectó contaminante. O sea, que sí hay. Y por lo tanto, tampoco quiero que se

malinterprete de que mi comentario es que hay una agenda escondida y de que la EPA tampoco está haciendo su trabajo, y tenía el deber en record de dejarlo también claro. Gracias.

Luis Santos: Gracias. Tomado el comentario. ¿Alguno más? ¿Otro comentario?

Pascual Velázquez: Sí, buenas noches a todos, mi nombre es Pascual Velázquez, de la Junta de Calidad Ambiental. Bien breve y sin entrar en controversia. Ya que el licenciado López Freytes, para record, dejó establecido sí que ─ y la EPA también, obviamente ─ que hay contaminación. La contaminación se produce por un mal manejo, que hubo en la facilidad en años atrás. Hubo unas descargas, hubieron unas inspecciones de la Junta, donde se informó y se notificó a las personas de Papelera, al dueño, en aquel momento, de que se estaba disponiendo de manera inadecuada de unas aguas de uso que tenían el contaminante, que salían de su proceso. No voy a entrar en la parte técnica, tampoco voy a entrar en controversias de agendas. Sí está localizada la contaminación, pero eso no es mi propósito del comentario. El propósito es que ¿cómo llega el contaminante allí? Porque se manejó inadecuadamente los desperdicios que producían en su proceso Papelera, se descargaron al terreno, llegó al agua subterránea, llegó al río, y de ahí es que surge el problema. Si es de una magnitud más o menos, ese tipo de cosa, pues no voy a entrar en eso. Pero tenemos que preguntarnos cómo llegó ahí el contaminante. Llegó por un mal manejo de las aguas de proceso de la compañía. Y eso… Inspectores de la Junta fueron, y lo notificaron. Y así lo reportaron en informes que se produjeron en la agencia. Quiero dejarlo claro para record porque creo que se obvió esa partecita, de que sí hay un contaminante. ¿Cómo

llegó allí? Pues con un mal manejo que hubo en un momento dado, que se hizo en la compañía.

Luis Santos: Tomado el comentario, gracias. Estamos completando el tiempo establecido. Estamos disponibles si hubiese más comentarios para seguir oyendo, y llevarlos a record, de no haber más ninguno estamos llegando a la hora de concluir la actividad. Muchas gracias por la participación. El proceso va a seguir, y vamos a estar aquí hasta las siete, para cualquier comentario que quieran traernos. Gracias.

6:52pm se cierra record.

6:58pm Se atiende de manera individual una pregunta adicional.

Carmen M. Ayala Cuervos: Primero que todo buenas tardes. Solamente tengo una preguntita que me inquieta mucho. Son dos. Ustedes hablaron de la contaminación de la escuela y de Head Start. Pero ¿y las residencias? La mía está detrás de la Papelera. Yo vi que están allí, todas esas cosas que metieron. No sé si fueron ustedes, que metieron para examinar todo eso. El miedo mío es…La pregunta mía es ¿Qué medida tienen ustedes para evitar erosión, allí en lo mío y que siga derrumbándose todo eso, y que esa contaminación llegue más pronto? Según el mapa yo creo que está en la misma esquina de mi casa. No sé si es cierto. Pero mi casa está detrás, detrás de la Papelera. Entonces, ese río es una playa hasta por allá en la carretera, y cuando pusieron el edificio se desvió o desviaron, el río contra mi casa. De más está decirle que me la paso asustada, me parece que la casa se va a ir por ahí para abajo. Como una, yo no sé si ustedes han visto una casa en Jayuya, que se fue. ¿No la han visto? A mí me llevaron expresamente allí a verla. Y en Mayagüez vi otra que se fue también en un derrumbe.

Luis Santos: Mencione sus preocupaciones, porque a la medida que usted las mencione vamos a poder tomar el comentario y contestarlo apropiadamente.

Carmen M. Ayala Cuervos: ¿Pueden visitarme?

Luis Santos: Podríamos visitarla

Carmen M. Ayala Cuervos: ¿Pueden visitarme para que ustedes vean?

Luis Santos: Sí puedo

Carmen M. Ayala Cuervos: Pues yo se los voy a agradecer. Soy viuda. Tengo 87 años. Me gustaría aclarar esas cositas. ¿vez? Gracias a ustedes. Muy amables.

Luis Santos: Pues, tomado el comentario. Gracias

Se dan por terminadas las labores y se cierra record a las 7:01pm.

CERTIFICADO DE TRANSCRIPTORA

Yo, Aledawi Figueroa Martínez, transcriptora de Smile Again Learning Center, Corp. CERTIFICO:

Que la que antecede constituye la transcripción fiel y exacta de la grabación realizada durante la reunión celebrada en el sitio y la fecha que se indican en la página uno de esta transcripción.

Certifico además que no tengo interés en el resultado de este asunto y que no tengo parentesco en ningún grado de consanguinidad con las partes involucradas en él.

En Isabela, Puerto Rico, a 28 de julio de 2016.

Aledawi Figueroa Martínez
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APPENDIX VI
PAPELERA PUERTIRRIQUEÑA INC. SUPERFUND SITE
RESPONSIVENESS SUMMARY

PUBLIC COMMENTS PREPARED IN SUPPORT OF THE RESPONSIVENESS SUMMARY FOR THE RECORD OF DECISION PAPELERA PUERTORRIQUEÑA INC. SITE UTUADO, PUERTO RICO

On July 13, 2017, the U.S. Environmental Protection Agency (EPA) released for public comment the Proposed Plan for the Papelera Puertorriqueña Inc. (PPI) Superfund Site (Site). During the public comment period, EPA held a public meeting on July 20, 2017, to discuss and accept comments regarding the Proposed Plan. EPA received verbal comments at the public meeting as well as written comments during the public comment period, which lasted from July 13, 2017 through September 12, 2017. EPA's initial thirty-day comment period was extended for thirty additional days in response to a request for an extension. This document summarizes comments from the public at the public meeting on July 20, 2017, and those submitted via electronic mail (PPI's written comments dated September 8, 2016 and September 11, 2017). EPA's responses are provided following each comment.

The comments are grouped into the following categories:

- Community Participation
- Superfund Process
- Remedial Investigation
- Risk Assessments
- Feasibility Study
- Preferred Alternative - Alternative 2
- Miscellaneous

Community Participation

Comment 1: Several attendees noted poor community attendance at the public meeting.

Response 1: EPA released a public notice in Primera Hora, a general circulation newspaper, posted and distributed flyers throughout the municipality, and announced the public meeting on the local radio station. In addition, a press release was sent to online newspapers Noticel and La Perla del Sur. Extensive efforts were made to inform the community of the public meeting date and location. A total of twenty-six people attended the meeting.

Comment 2: A legal representative of PPI stated that EPA's release of the public notice was in violation of EPA's July 1999 guidance "A Guide to Preparing Superfund Proposed Plans, Records of Decisions, and other Remedy Selection Decision Documents", which establishes that the procedure requires the notice to be published two weeks prior to the start of the public comment period and availability of the Proposed Plan. Based on this requirement, an extension of 30 days to the comment period was requested by the PPI legal representative.

Response 2: EPA notes that the referenced document is guidance and provides guidelines for the preparation of certain decision documents. It does not establish requirements. Nonetheless,

pursuant to Section 300.430(f)(3) of the National Contingency Plan (NCP), which provides for an automatic extension of the public comment period upon timely request, EPA extended the comment period for an additional 30 days.

Comment 3: A community member asked where to send comments.

Response 3: EPA informed the meeting attendees that the address to send written comments was provided in the Proposed Plan. Versions in English and Spanish (as a fact sheet) were available at the meeting as well as at the information repository. EPA's press releases and public notices also informed the public where to send written comments.

Comment 4: A community member asked about the comment period start and end dates.

Response 4: EPA announced the comment period start and end dates with the release of two public notices; one included the comment period extension notification. In addition, the dates were provided in the Proposed Plan distributed at the public meeting, in public notices, and in EPA's press releases.

Comment 5: A community member asked for document availability and language.

Response 5: As stated in the public notices, Proposed Plan, and during the public meeting, the following reports are available for public review at the information repository in the Utuado City Hall: the Proposed Plan, the Remedial Investigation (RI) report, the Feasibility Study (FS) report, the Human Health Risk Assessment (HHRA) report, the Screening Level Ecological Risk Assessment (SLERA) report, the Community Engagement Plan (CEP), the Work Plan, and the Quality Assurance Project Plan (QAPP). Documents are also available at EPA offices in San Juan and New York, the Puerto Rico Environmental Quality Board (PREQB), and online at EPA's Superfund web page. All official documents are available in English.

Comment 6: Has EPA informed parents, students, and school personnel (Judith A. Rivas School and Head Start school) of the availability of documents at the information repository and given a presentation to discuss results?

Response 6: EPA representatives are available upon request to meet with interested parties. The July 13, 2017 public meeting was open to all members of the community including school personnel, students, and parents; representatives of both schools were present. The meeting was announced in the newspaper, local radio station, online newspapers, and flyers were posted and distributed throughout the town. In addition, a public availability session was held on June 11, 2015 at the Head Start school located in the PPI building to inform personnel, parents of participants, and the general public about the Site. A total of ten people attended the public availability session.

<u>Superfund Process</u>

Comment 7: Why did the Site get listed; were there community complaints?

Response 7: PREQB has been inspecting the Site since the early 1980s after various citizen complaints of colorful discharges to the Rio Viví. PREQB also performed various sampling events, visual inspections of the facility operations, and a Supplemental Site Investigation (SSI) under the

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). This information was used to evaluate the Site using the Hazard Ranking System (HRS). This is the principal mechanism that EPA uses to place uncontrolled waste sites on the National Priorities List (NPL). It is a numerically based screening system that uses information from initial, limited investigations to assess the relative potential of sites to pose a threat to human health or the environment. The Site's HRS score was 34.69, sites with HRS scores of 28.5 or greater are eligible for placement on the NPL.

EPA evaluated the various investigation results and proposed the Site for the National Priorities List (NPL) with the concurrence of the Commonwealth of Puerto Rico.

Remedial Investigation

Comment 8: A community member expressed concern regarding the time it took to present the results of the investigation from the listing of the Site and the potential risks of exposure to contaminated potable water during this time.

Response 8: When EPA included the Site on the NPL in September 2009, the Superfund process started, which includes various stages: administration, development of work plans, negotiation with the potentially responsible party, completion of field activities (installation of wells and sampling of potentially affected media), evaluation of results, evaluation of remedial alternatives, and report writing. The process from the Site listing on the NPL to the completion of the investigation and evaluation of remedial alternatives is formalized in the Superfund law.

The Site and nearby communities are connected to a public water system administered by the Puerto Rico Aqueduct and Sewer Authority (PRASA). The water source is an intake at Lago Caonillas located several miles east and upgradient of the Site. Contaminated groundwater from the Site is not a source of potable water. EPA is diligent in eliminating immediate threats to human health. No one is currently using the groundwater as a drinking water source and the goal in remediating the site is to restore the groundwater so that it could be used as a source of drinking water in the future and to eliminate impacts from the groundwater to the surface water body (Rio Vivi).

Comment 9: A school representative expressed concern regarding potential exposure to contaminants at the Head Start and nearby school. She noticed that the vapor intrusion sampling figure in the Proposed Plan showed that both schools had detections of tetrachloroethene (PCE).

Response 9: EPA's remedial investigation results at both the Head Start facility and the nearby school did not identify exposure to Site-related contamination. Indoor air results for both facilities exhibited trace levels of PCE. However, concentrations were well below the screening criteria established for vapor.

Sampling results indicate that while Site contamination was detected below the PPI building floor, it was not shown to have migrated into the building first floor at levels above the screening criteria. Concentrations in indoor air in the second floor of the PPI building, where the Head Start facility is located, are expected to be lower than those measured in first floor and, therefore, also below the applicable screening levels for indoor air.

Comment 10: A community member asked about the cleanup levels.

Response 10: The cleanup levels or remediation goals (RGs) for PCE for each medium are the following; 5 micrograms per liter (µg/L) for groundwater and surface water, and 30 micrograms per kilogram (µg/kg) for soil.

Comment 11: Has EPA sampled at the nearby school and Head Start?

Response 11: Yes, EPA collected one indoor air and sub-slab soil vapor sample at the Judith A. Rivas School and one indoor air and sub-slab soil vapor sample at a location on the first floor below the Head Start facility. PCE concentrations did not exceed its vapor screening criterion in any of the indoor samples. Please see response to Comment 9 for further details.

Comment 12: Is information available regarding Site media and contaminant concentrations in soil and water (groundwater, surface water, and pore water)?

Response 12: Details of Site media and results are presented in the RI report, which is available for review at the information repository.

Comment 13: RI report, page 1-3: the third paragraph discusses the reported emergency call in October and November 2001. The following sentence should be added at the end of the paragraph: "However, those air emissions were not associated with PPI operations."

Response 13: EPA notes the information provided in the comment. The final documents for the Site will not be modified, as the correction would not change the environmental findings documented in the RI Report.

Comment 14: RI report, page 1-3: the fifth paragraph that starts with "Two visual inspections…," the sixth line should clarify that the vegetated area which contained …"six corroded 55-gallons metal drums, stained blue and black soils and a partially buried septic tank…" is outside of the PPI property to the east and the area or the described features were not associated with PPI operations (see Appendix A of the RI report).

Response 14: EPA notes the information provided in the comment. See response #13.

Comment 15: The RI is based on an investigation data set that does not fully characterize the site hydrogeology (hydraulic conductivity and deep saprolite groundwater flow direction). The lack of data causes potentially significant issues with successful implementation of EPA's Preferred Alternative.

Response 15: EPA identified hydrogeological data gaps in the RI report in Section 7.5. The lack of additional hydrogeological data did not impact the development of remedial alternatives and the successful completion of the FS. The source of contamination and surrounding area is being targeted for active remediation as this is where the contaminant mass can be significantly reduced and logistically where treatment is feasible. EPA will collect additional hydrogeological data during the pre-design investigation (PDI). The preferred alternative performance will be evaluated and design parameters obtained during the remedial design pilot study.

Comment 16: The RI included a PCE isocontour map (Figure 4-5 - Groundwater Screening and Monitoring Well Detections - PCE) showing the results of groundwater screening and monitoring well samples collected from the various depths. EPA identified two major areas of groundwater

impacts: 1) drainage feature #2 and 2) the former development room, and suggested that groundwater impacts were limited to the upper portion of the saprolite. The RI also stated that the existence of dense non-aqueous phase liquid (DNAPL) could not be ruled out due to concentrations of PCE detected in certain locations (6,700 µg/L at MW-03S and 11,000 µg/L [estimated] at GW-01). DNAPL was not observed during the RI, and the following was noted; any DNAPL that may have existed would have likely diffused into unsaturated zone pore spaces or into the low permeability soils and the highly heterogeneous saprolite structure and the complex groundwater flowpaths suggest the possibility that significant contaminant mass may still be present in the portions of the saprolite that are not in contact with faster groundwater flow. However, the total estimated mass of PCE (1.2 kg) in groundwater using RI data is not significant.

Response 16: PPI estimated there is 1.2 kg of PCE in the groundwater. However, PPI may have significantly underestimated the mass of PCE in the aquifer for the following reasons: 1) the estimate did not take into consideration the PCE mass from the potential presence of DNAPL, which could represent the bulk of contaminant mass; 2) there is no basis for the average concentration (i.e., 500 µg/L) used for the calculation, considering 4 out of 5 locations within the plume area have contaminant concentrations an order of magnitude higher than the 500 µg/L used for the calculation (the arithmetic mean of the PCE concentration from the samples collected is approximately an order of magnitude higher); 3) as indicated in the RI and FS, the extent of contamination has not been fully delineated; thus, the contaminated area could be significantly larger. Overall, the contaminant mass could be orders of magnitude higher than calculated by PPI.

Risk Assessments

Comment 17: What are the risks and magnitude?

Response 17: Unacceptable risks to human health would be a concern if the Site is redeveloped for residential use and/or a water supply well is established on the property. The potential health hazards to individual organs/effects (i.e., nervous system, liver, and kidneys) are predominantly the result of exposure to PCE in groundwater. In addition, the results of the vapor intrusion evaluation revealed that elevated PCE concentrations in the vadose zone below the former development room may potentially expose workers and future residents to Site-related contaminants via inhalation of vapors emanating from soil and groundwater.

Comment 18: Under the future land use scenario, the HHRA assumes a theoretical situation where the Subject Property (Papelera Puertorriqueña Inc. facility) will be redeveloped for residential use and future residents will consume impacted groundwater at the Subject Property. The HHRA does not assess the likelihood of future residential development, as recommended in the National Contingency Plan (NCP). PPI's technical advisers concluded that redevelopment of the Site for residential use is highly unlikely for the following reasons:

- The Subject Property and surrounding areas obtain potable water from the PRASA and the Department of Natural and Environmental Resources (DNER) regulates and prohibits the installation of groundwater wells in areas served by PRASA. In addition, the data included by EPA in Sections 3.3.2 and 3.3.4 of the RI present clear indications of the limited groundwater resources at the PPI Site.

- The current owner does not intend on redeveloping the Subject Property. This Site is and has always been used for industrial purposes.
- Redevelopment would likely require significant costs for building decommissioning, and demolition and construction of new structures;
- Redevelopment of the Subject Property for residential use is not likely in the foreseeable future given current economic conditions in Puerto Rico;
- There are no known plans for the Municipality of Utuado to redevelop the Subject Property or surrounding areas into residential neighborhoods; and
- Based on United States census data, the population of Utuado is decreasing (33,149 people in 2010 and 29,56410 in 2016).

Therefore, the assumption of future residential land use in the HHRA is not appropriate for the Subject Property and only the industrial and commercial land scenario should have been used to develop Remedial Action Objectives (RAOs).

Response 18: The HHRA performed for the Site fully complies with EPA protocols and procedures for conducting risk assessments at Superfund sites. EPA guidance states that the residential land use scenario should be evaluated in the baseline HHRA whenever there are homes on or near the site (EPA 1991: OSWER Directive 9285.6-03). Homes are located approximately 70 feet from the Site.

While EPA's "Land Use in the CERCLA Remedy Selection Process" (EPA 1995: OSWER Directive 9355.7-04) outlines "a public process and sources of information which should be considered in developing reasonable assumptions regarding future land use," the guidance also states that it is most relevant to sites where surface soil is the primary exposure pathway. The guidance states that it does not address consideration of future groundwater use for CERCLA sites. Separate expectations are established for groundwater in the NCP, specifically: "EPA expects to return usable ground waters to their beneficial uses wherever practicable, within a timeframe that is reasonable given the particular circumstances of the site."

Feasibility Study

Comment 19: Describe the wells, the alternative, and the design.

Response 19: The selected alternative is a combination of Soil Vapor Extraction (SVE) and Air Sparging (AS). The system consists of wells that extract vapors from above the water table by applying a vacuum and wells that aerate groundwater and wet soil beneath the water table. The addition of air makes chemicals evaporate more easily and extraction with the SVE system becomes more efficient. The details of the location and quantity of wells will be confirmed during the remedial design after a pilot study.

Comment 20: EPA has not adequately evaluated Monitored Natural Attenuation (MNA) as an alternative in the FS.

Response 20: EPA evaluated MNA during the FS evaluation of technologies (see discussions under FS Sections 2.5.3 and 2.6.1.3) and it was eliminated from further consideration because there is insufficient evidence to demonstrate that MNA would effectively meet Remedial Action Objectives (RAOs) within a reasonable timeframe compared to that offered by other technologies (e.g., the active treatment technologies described in the FS alternatives). MNA refers to the remedial action that relies on naturally-occurring attenuation processes to achieve site-specific remediation goals within a reasonable timeframe. Natural attenuation processes that reduce contaminant concentrations in soil and groundwater include destructive (biodegradation and oxidation/reduction reactions with other subsurface constituents) and nondestructive mechanisms (precipitation, dissolution, adsorption, and desorption). Extensive modeling and monitoring are typically performed as part of an MNA response action to demonstrate that contaminants do not represent significant risk and that natural attenuation is occurring at a sufficient rate to meet the RAOs. As stated in the EPA 1999 OSWER Directive entitled, "Use of Monitored Natural Attenuation at Superfund, RCRA Corrective Action, and Underground Storage Tank Sites, "*[a]s with any other remedial alternative, MNA should be selected only where it meets all relevant remedy selection criteria, and where it will meet site remediation objectives within a timeframe that is reasonable compared to that offered by other methods*."

In response to this comment, EPA is providing an expanded evaluation within the context of the criteria used to evaluate alternatives in a feasibility study.

Overall Protection of Human Health and the Environment

The HHRA indicates potential future risks to residents if a water supply well is established at the site and water is used for residential purposes. Additionally, the HHRA concluded that workers and future residents may potentially be exposed to Site-related volatile chemicals of potential concern (COPCs) via inhalation of vapor emanating from soil and groundwater at the Site. The SLERA concluded that ecological threats at the Site are negligible. The objective for the Site remediation, as stated in NCP, is to return usable groundwaters to their beneficial uses wherever practicable, within a timeframe that is reasonable given the particular circumstances of the site, which is the case at PPI. MNA would not meet this NCP objective for the reasons discussed below.

Left to natural attenuation, contaminant concentrations in groundwater and potentially sub-slab vapor are expected to exceed PRGs for the foreseeable future for the following reasons:

- *Source material*: The highest PCE detection in groundwater was 11,000J µg/L at location GW-01 from 8.5 to 12.5 feet below ground surface (bgs), downgradient of the former development room. DNAPL was not observed during the RI, but the presence of PCE at greater than 1 percent of the solubility limit indicates that a limited volume of residual DNAPL may be present in the low-conductivity shallow saprolite. The presence of DNAPL could sustain elevated contaminant concentrations for a significant time period. To note, the discharge likely occurred in the 1980s or 1990s, and almost 20 years later, elevated concentrations of PCE are stilldetected in soil and groundwater.

- *No evidence of a destructive natural attenuation process:* As discussed in the RI Report, mole fractions of PCE breakdown products are very small compared to the parent compound (PCE), indicating limited degradation is occurring. Site geochemistry is not conducive to

microbial reductive dehalogenation of PCE because the aquifer is not in sufficiently reducing conditions and lacks sufficient organic carbon.

- *Hydrogeology not appropriate for rapid attenuation*: The highly heterogeneous saprolite structure and the complex groundwater flowpaths suggest the possibility that significant contaminant mass may still be present in pore spaces not connected to zones with mobile, faster flowing groundwater. Contaminant mass held within isolated pore spaces would be expected to persist for a lengthy time period under current Site conditions because RI data indicate that residual DNAPL may be present, and biodegradation is negligible at the Site.

MNA alone would not prevent contamination from continuing to serve as a source of river water contamination, or prevent/minimize contaminated soil from serving as a source of sub-slab vapor contamination (two Remedial Action Objectives for the Site). As a result, MNA would not be protective of human health and the environment.

Compliance with ARARs

PCE is present in groundwater and surface water at concentrations exceeding PRGs, which were derived from chemical-specific Applicable or Relevant and Appropriate Requirements (ARARs); thus, the Site is not currently in compliance with chemical-specific ARARs. Furthermore, surface water (Río Viví) is being degraded by an uncontrolled discharge from the Site, and is not in compliance with ARARs. Due to the minimal natural attenuation occurring at the Site, groundwater and surface water would not be expected to meet ARARs in the foreseeable future due to natural processes alone.

Long-Term Effectiveness and Permanence

Magnitude of Residual Risk **–** Due to the minimal natural attenuation at the Site as discussed above, residual risks similar to the current conditions are likely to be present for the foreseeable future. The discharge likely occurred in the 1980s or 1990s. Almost 20 years later, elevated concentrations of PCE up to 11,000 µg/L are till detected in groundwater. The presence of PCE at greater than 1 percent of the solubility limit indicates that a limited volume of residual DNAPL may be present in the low-conductivity shallow saprolite. The presence of DNAPL could sustain elevated contaminant concentrations for a significant time period.

Adequacy of Controls **-** Natural attenuation alone is not likely to be adequate to control discharges to surface water or potential vapor intrusion. MNA would not meet the objectives of preventing further migration of the plume, preventing exposure to the contaminated groundwater, and providing further risk reduction.

Reliability of Controls – Due to the minimal natural attenuation at the Site, MNA alone will not be reliable in reducing the contaminant concentrations within a reasonable timeframe.

Reduction of Toxicity, Mobility and Volume (T/M/V) through Treatment

As discussed in the FS, there is no evidence that MNA is occurring at this Site. T/M/V would not be reduced through treatment under MNA. Data collected during the RI do not indicate that natural processes will reduce T/M/V within the foreseeable future.

PPI also stated that Alternative 3 proposed the use of enhanced anaerobic biodegradation (EAB) to remediate groundwater, which could alter the groundwater biogeochemistry and potentially create favorable conditions for MNA. This statement is misguided.

Biodegradation is typically the most significant destructive attenuation mechanism. Chlorinated solvents, such as PCE, attenuate predominantly by reductive dechlorination under anaerobic conditions. The extent and rate of the reductive dechlorination process depends on many factors: 1) an adequate supply of electron donors; 2) the absence of competing electron acceptors, such as oxygen, nitrate/nitrite, ferric iron, or sulfate; 3) the number of chlorine atoms attached to the molecule; and 4) the subsurface microbial ecology.

EAB involves the injection of nutrient and, at times, specific bacteria to create highly reducing conditions (such as methanogenic conditions) to promote reductive dichlorination of PCE. The estimated cost for Alternative 3 using EAB is $3,021,000, greater than EPA's preferred alternative. Once the EAB remedy were completed, reductive dichlorination of PCE would not continue as the aquifer will revert back to the natural oxidizing conditions.

Short-Term Effectiveness

Only limited monitoring activities would be required for this alternative; thus, there would be limited short-term impacts to workers and the community from implementation of an MNA remedy.

Implementability

PPI stated that MNA is a potentially viable alternative remedy at PPI and recent EPA Records of Decision indicate that MNA is an acceptable remedy by demonstrating reduction in contaminant of concern (COC) concentrations through a multiple lines of evidence approach. PPI cited Maunabo Groundwater Contamination site and Corozal Well site as two examples of MNA being selected by EPA as a component of a remedy or as the sole remedy. EPA would like to point out that there are significant differences in site conditions between PPI and the two example sites. PPI acknowledged that EPA was able to demonstrate that MNA has been observed, through multiple lines of evidence, at these two sites. However, EPA was unable to find evidence of natural attenuation at the PPI Site as discussed in the RI and FS reports.

Cost

MNA would typically involve performing extensive modeling and monitoring as part of an MNA response action to demonstrate that contaminants do not represent significant risk and that natural attenuation is occurring at a sufficient rate to meet the RAOs. Monitoring would involve annual monitoring for 30 years. The total present value for an MNA remedy for the PPI Site has not been developed. However, the cost estimate for the MNA remedy at the Maunabo site, which PPI stated is similar to the PPI Site, is $2.5 million.

Comment 21: Due to the HHRA exposure assumptions, the FS alternatives are based on overly conservative assumptions, and as a result, none of the alternatives reflect a "reasonably anticipated future land use" as defined in the NCP. Under the "reasonably anticipated future land use" scenario

presented in the PPI Technical Memorandum, active soil and groundwater remediation is not required to protect public health or the environment.

Response 21: The baseline HHRA is a means for EPA to quantify the potential risks at the Site. The objective for the Site remediation, as stated in NCP, is to return usable groundwaters to their beneficial uses wherever practicable, within a timeframe that is reasonable given the particular circumstances of the site, which is the case at PPI. The alternative must be protective of human health and the environment and compliant with ARARs are the two threshold criteria.

Preferred Alternative – Alternative 2

Comment 22: Have less invasive technologies been considered as remedial alternatives, such as microorganisms?

Response 22: As part of the FS process, EPA screens multiple remedial technologies and process options to develop alternatives. From this initial evaluation, bioremediation (in situ treatment) was considered a viable technology and was further evaluated for the Site, but since alone it would not reach the remedial goals within a reasonable timeframe, it was combined with SVE and presented as Alternative 3 in the Proposed Plan.

Comment 23: The cost of EPA's preferred alternative is disproportionate to the environmental and human health benefits.

Response 23: Cost is only one of the nine evaluation criteria. EPA evaluated the alternatives with respect to all nine criteria and selected the remedy that provides the best balance among the nine criteria.

Comment 24: Recent EPA Records of Decision for Maunabo Groundwater Contamination Site and Corozal Well Site indicate that MNA is an acceptable remedy by demonstrating reductions in chemicals of concern (COC) concentrations through multiple lines of evidence.

Response 24: Please see response to Comment #20 under Feasibility Study.

Comment 25: Implementation of the EPA Preferred Alternative will have a significant impact on the economic stability of the PPI business, since as a Potential Responsible Party, it could jeopardize PPI's continuous operations and its respective contribution to the economy of the already depressed area of the Utuado Municipality.

Response 25: With respect to a responsible parties' financial ability to fund or implement a cleanup or to pay response costs, EPA does not intend to put responsible parties out of business and will look to its policy on ability to pay (ATP) determinations under certain circumstances. In appropriate cases, EPA may enter into ATP settlements with individuals and businesses for recovery of response costs and performance of cleanup work.

Miscellaneous

Comment 26: A representative of the municipal legislature expressed concern about EPA's lack of involvement in issues not related to the Site.

Response 26: EPA notes the information provided by the commenter and encourages concerned citizens to communicate directly to the community relations liaison Mrs. Brenda Reyes via electronic email (reyes.brenda@epa.gov) to better direct concerns.

APPENDIX VII
PAPELERA PUERTIRRIQUEÑA INC. SUPERFUND SITE
FIGURES

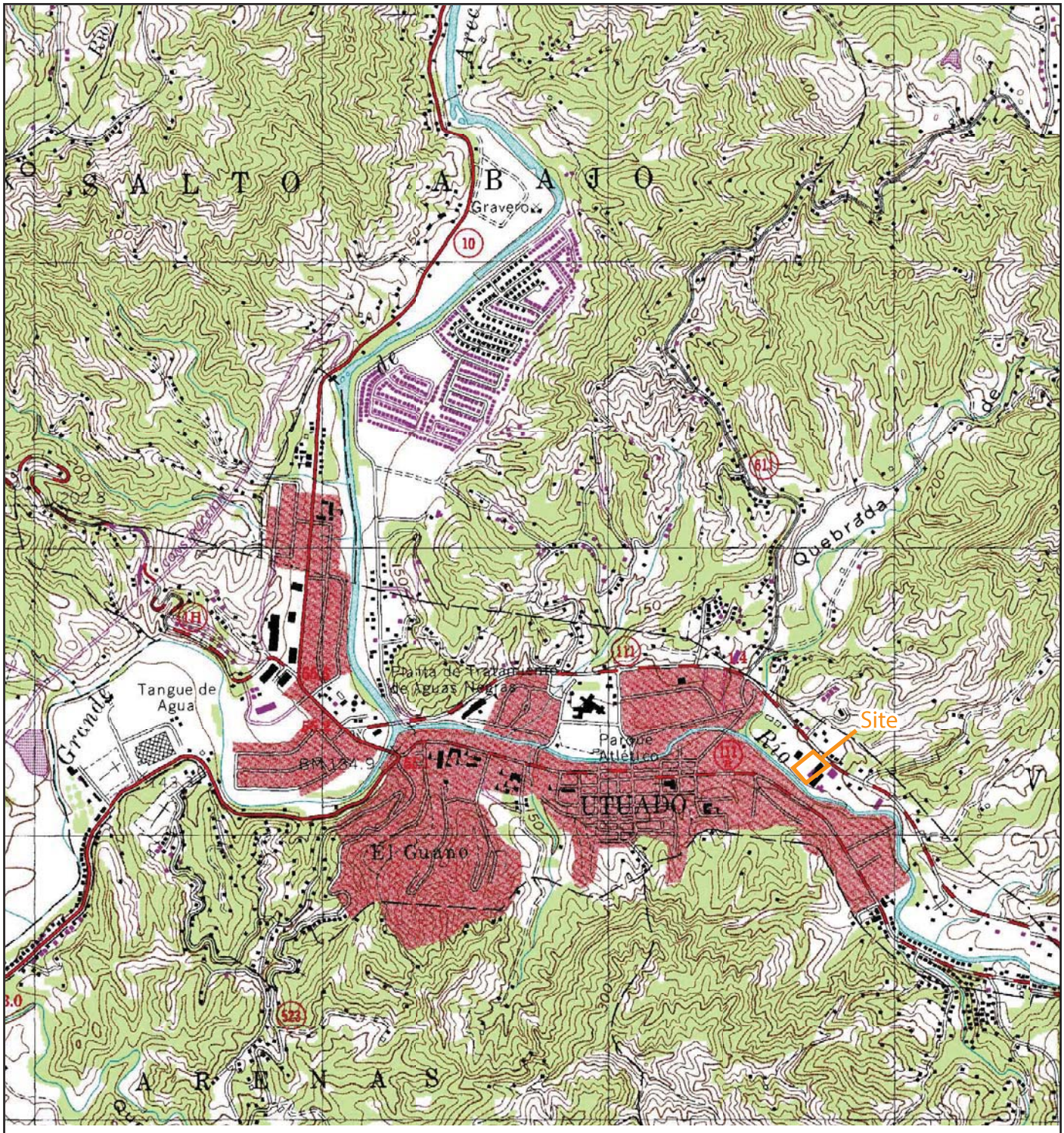
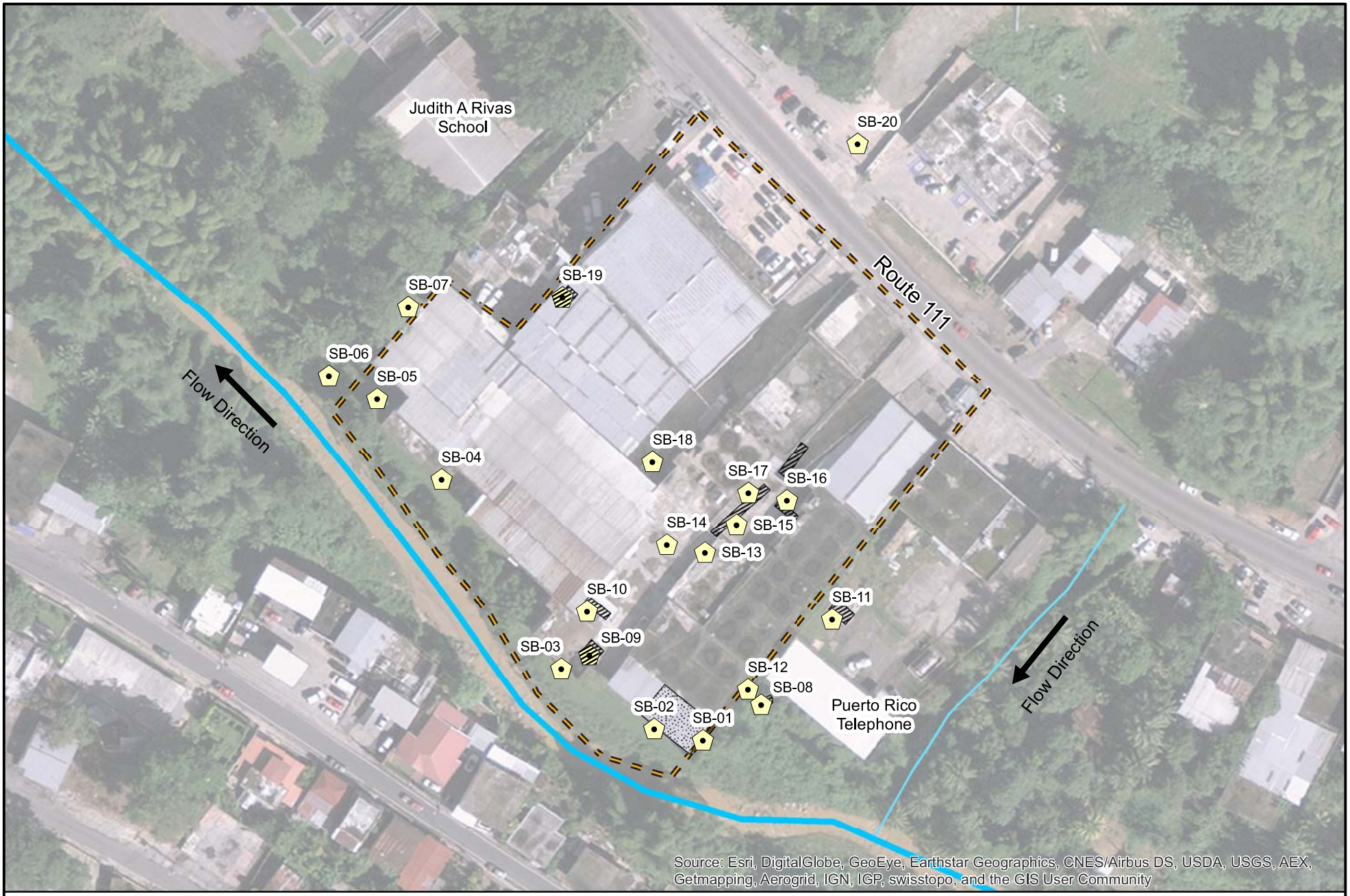


Figure 1
Site Location
Papelera Puertorriqueña, Inc. Site
Utuado, Puerto Rico

CDM Smith



Legend

- Rio Viví
- Unnamed Creek
- Papelera Puertorriqueña Inc. property limit
- Former Development Room
- Drainage feature
- Soil boring location
  hatch denotes sample collected within feature

N

0 200 Feet

Figure 2
Soil Boring Locations
Papelera Puertorriqueña Inc. Site
Utuado, Puerto Rico

CDM Smith

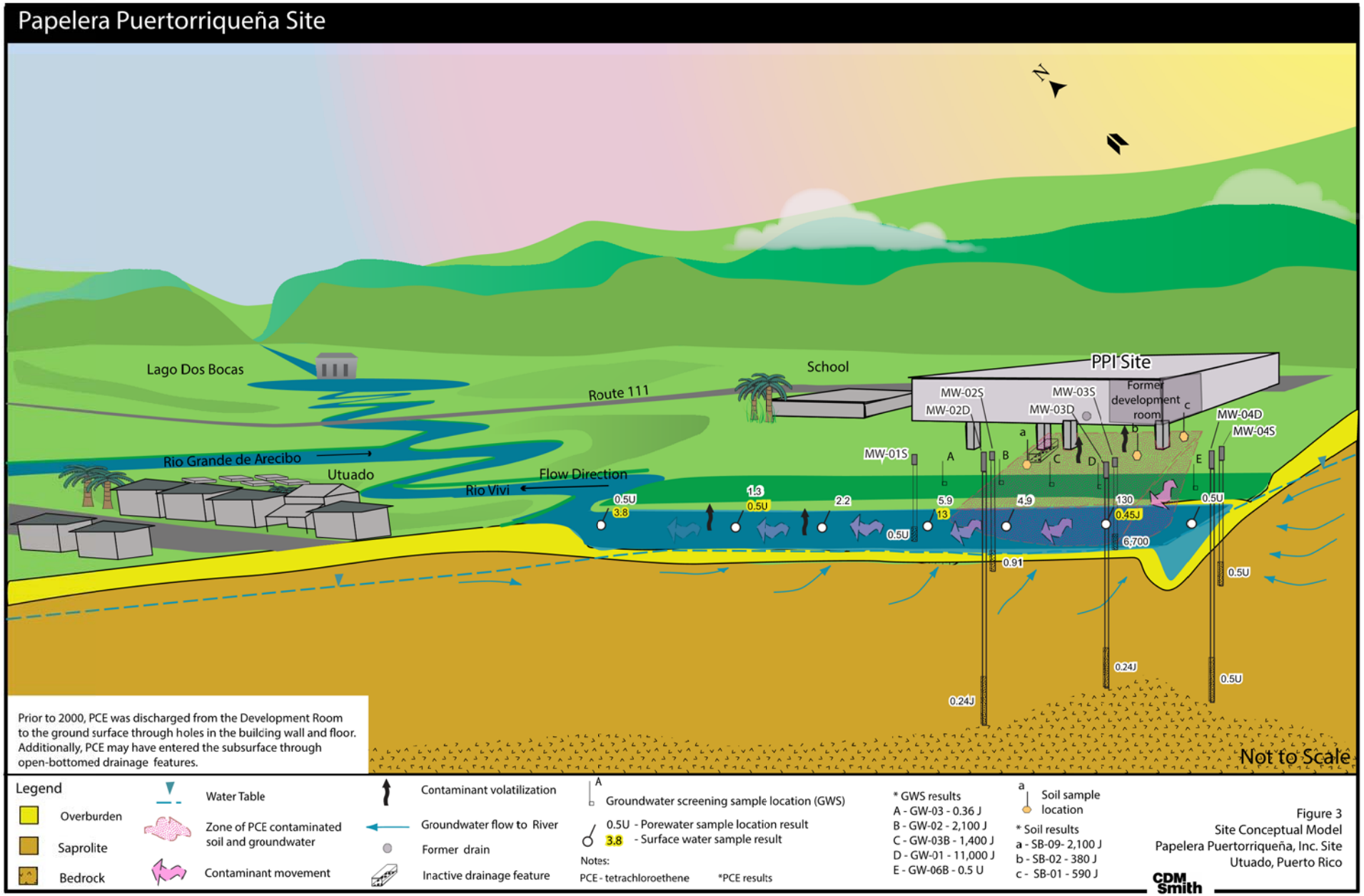


Figure 3
Site Conceptual Model
Papelera Puertorriqueña, Inc. Site
Utuado, Puerto Rico

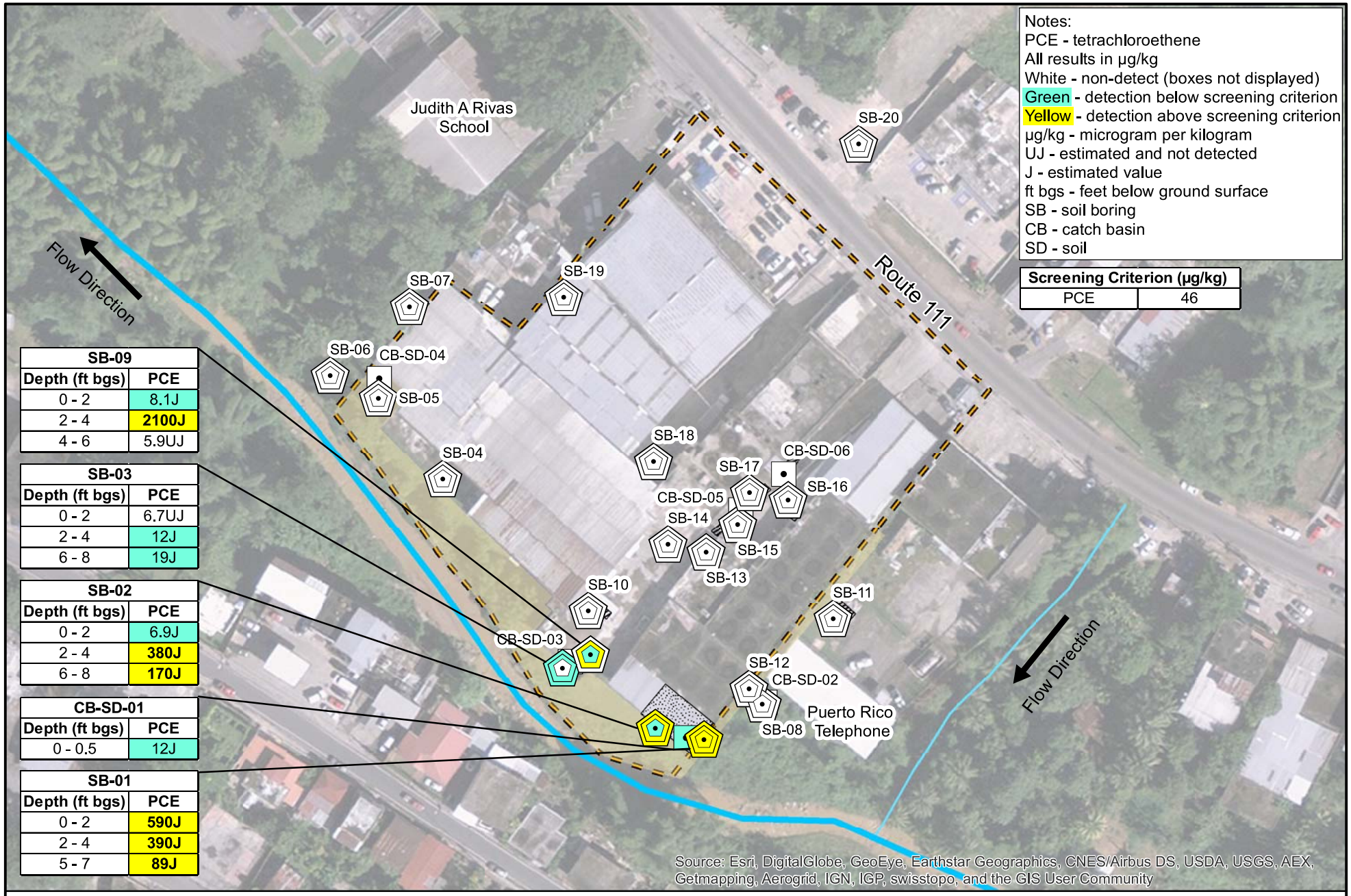


Figure 4
Soil Sample Detections - PCE
Papelera Puertorriqueña Inc. Site
Utuado, Puerto Rico

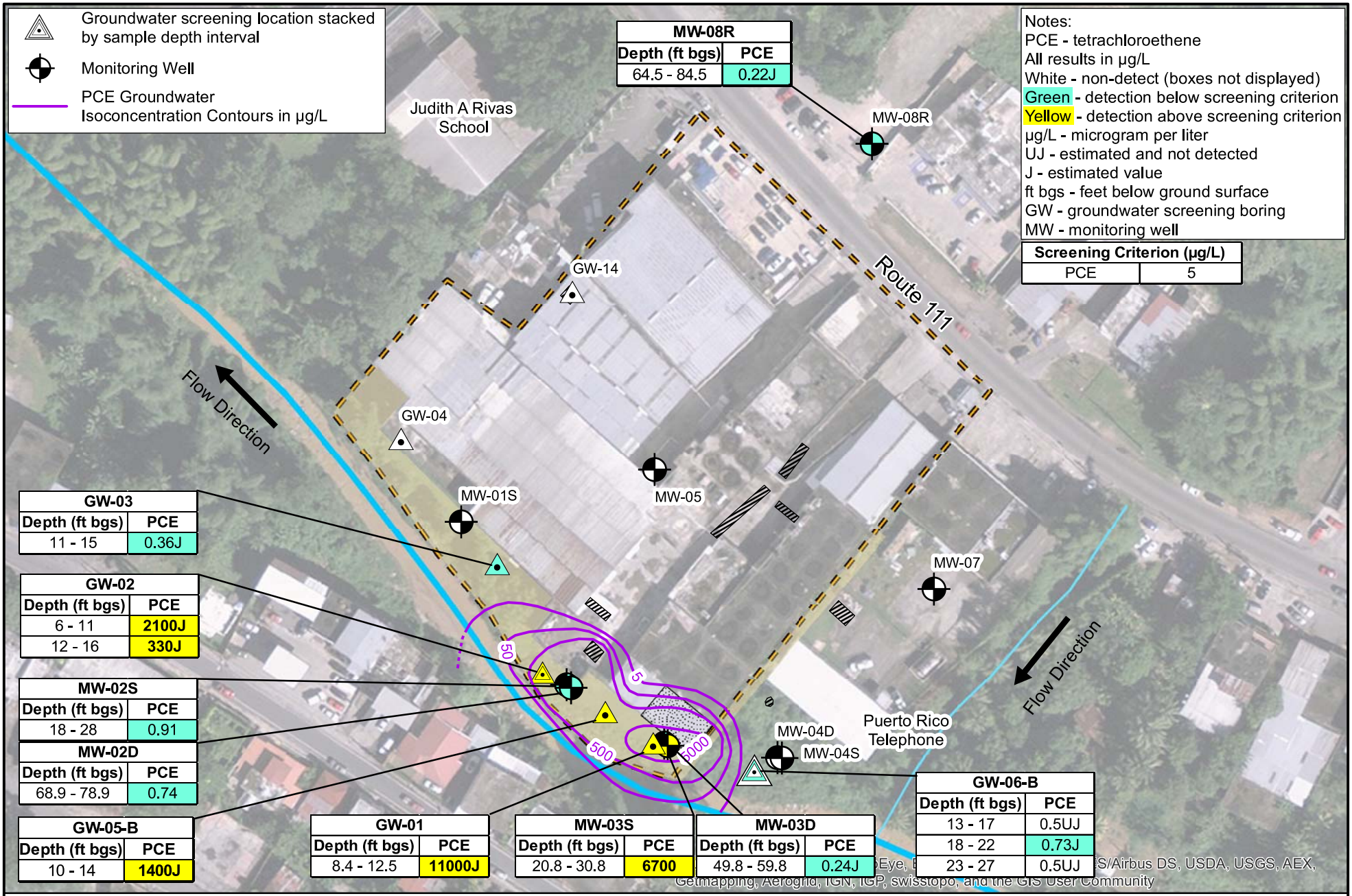


Figure 5
Groundwater Screening and Monitoring Well Sample Detections - PCE
Papelera Puertorriqueña Inc. Site
Utuado, Puerto Rico

CDM Smith

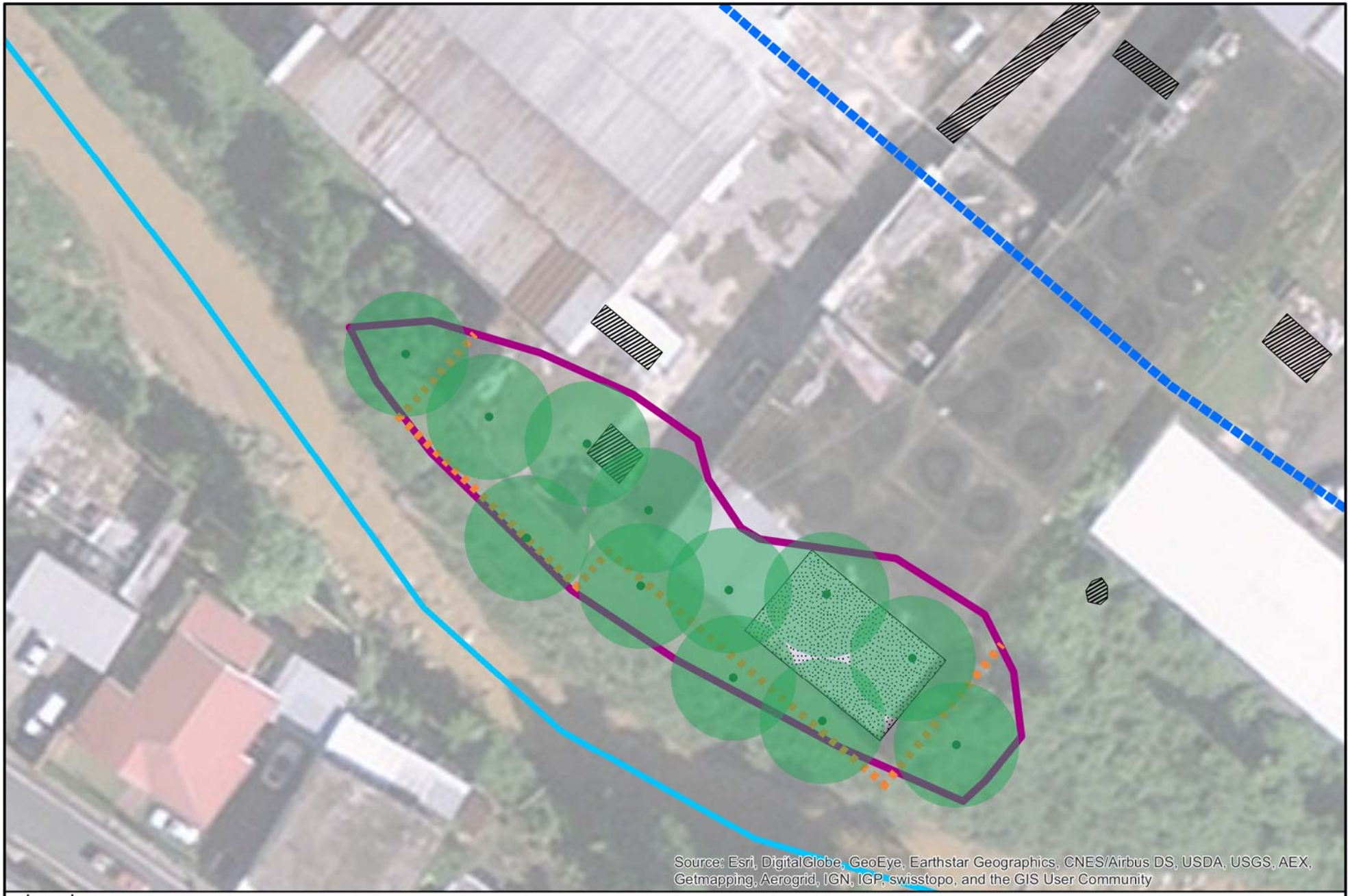


Figure 6
SVE Well Plan View
Papelera Puertorriqueña Inc. Site
Utuado, Puerto Rico

CDM Smith

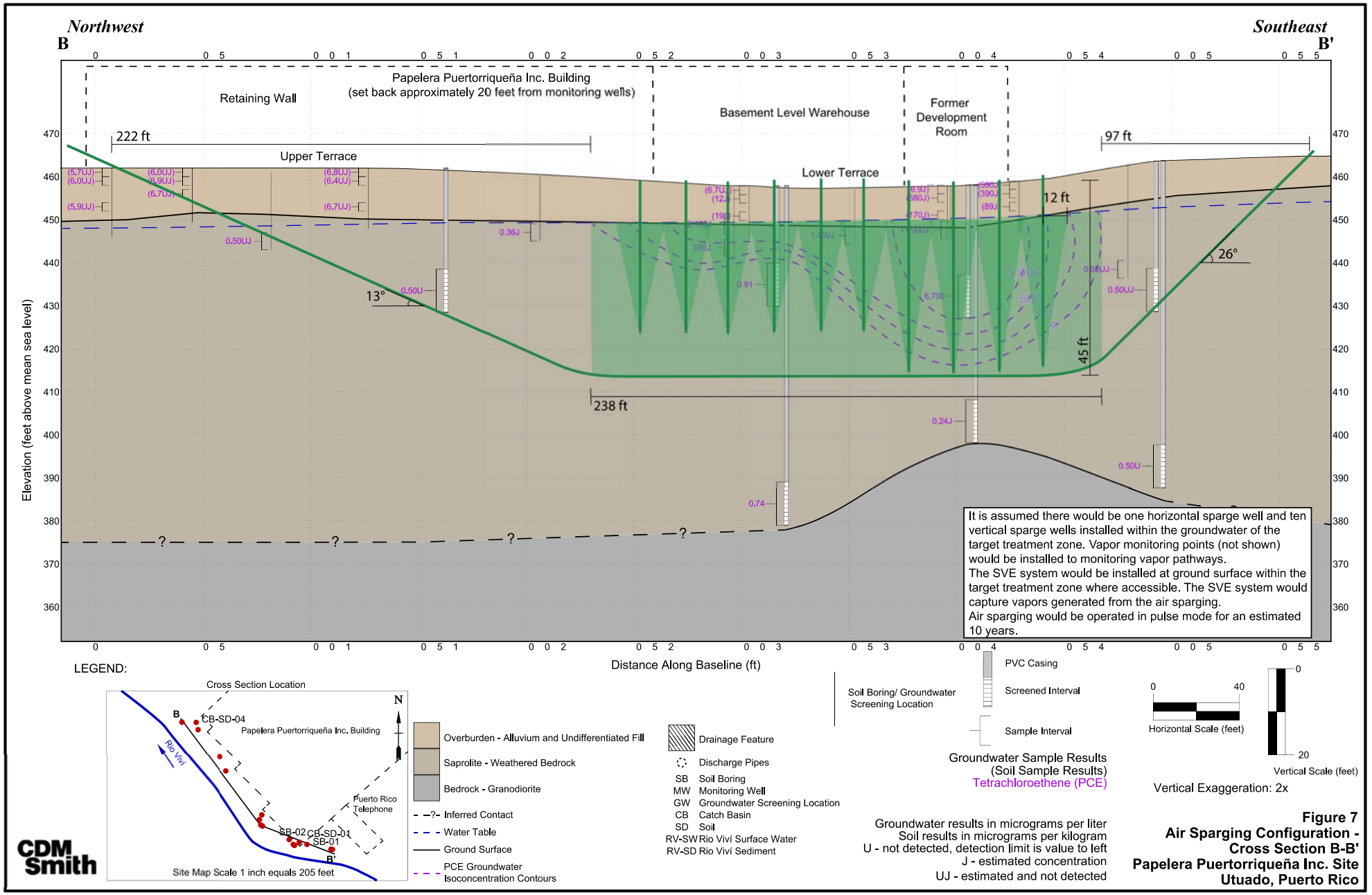


Figure 7
Air Sparging Configuration - Cross Section B-B'
Papelera Puertorriqueña Inc. Site
Utuado, Puerto Rico

CDM Smith

STANDARD CROSS SECTION PAPELERA PAPELERA.GPJ STANDARD_ENVIRONMENTAL_PROJECT.GDT 1/4/16 REV.

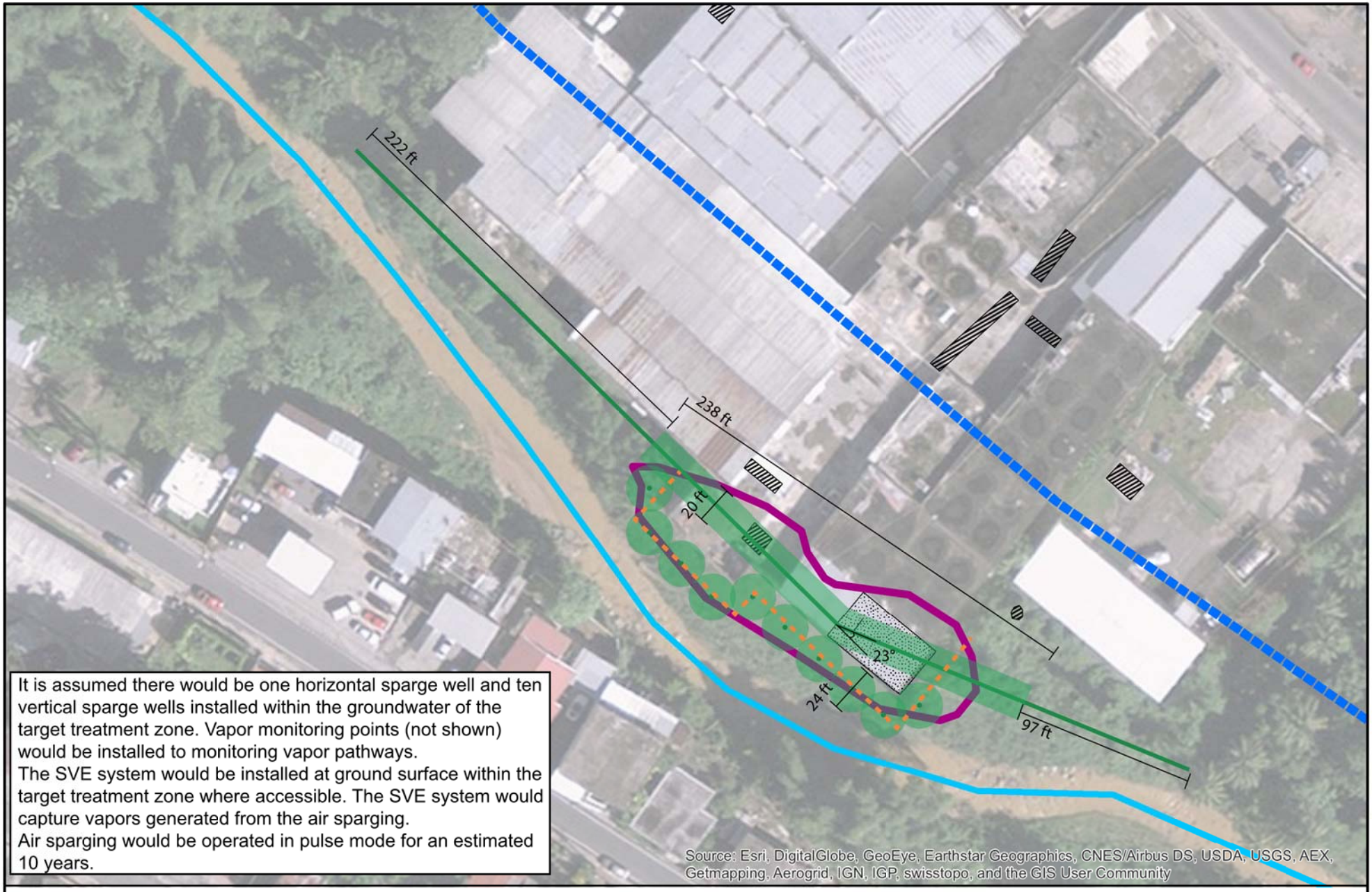


Figure 8
Air Sparging Configuration - Plan View
Papelera Puertorriqueña Inc. Site
Utuado, Puerto Rico

CDM Smith

APPENDIX VIII
PAPELERA PUERTIRRIQUEÑA INC. SUPERFUND SITE
TABLES

TABLE 1

Summary of Chemicals of Concern and Medium-Specific Exposure Point Concentrations

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Point	Chemical of Concern	Concentration Detected		Concentration Units	Frequency of Detection	Exposure Point Concentration (EPC)	EPC Units	Statistical Measure
		Min	Max					
Tap Water	Tetrachloroethene	0.24	6,700	ug/l	5/9	13	ug/l	Maximum

Summary of Chemicals of Concern and Medium-Specific Exposure Point Concentrations

This table presents the chemicals of concern (COCs) and exposure point concentrations (EPCs) for each of the COCs in groundwater. The table includes the range of concentrations detected for each COC, as well as the frequency of detection (i.e., the number of times the chemical was detected in the samples collected at the site), the EPC and how it was derived. A qualitative analysis also identified tetrachloroethene as a COC for the vapor intrusion pathway based on elevated soil gas concentrations beneath the building.

TABLE 2

Selection of Exposure Scenarios

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	Type of Analysis
Current/Future	Soil	Surface soil	PPI Site	Worker	Adult	Ing/Der/Inh	Quantitative
				Recreational User	Adolescent (12-18)	Ing/Der	Quantitative
	Indoor Air	Indoor air	Indoor air	Worker	Adult	Inh	Qualitative
				Day Care Staff	Adult	Inh	Qualitative
				Day Care Students	Child (0-3 yrs)	Inh	Qualitative
	Surface water	Surface water	Rio Viví	Recreational user	Adolescent (12-18)	Ing/Der	Quantitative
	Sediment	Sediment	Rio Viví	Recreational user	Adolescent (12-18)	Ing/Der	Quantitative
Future	Soil	Surface soil	PPI Site	Resident	Adult/Child	Ing/Der/Inh	Quantitative
		Surface and subsurface soil	PPI Site	Construction worker	Adult	Ing/Der/Inh	Quantitative
	Groundwater	Groundwater	Groundwater	Resident	Adult/Child	Ing/Der/Inh	Quantitative
		Indoor air	Indoor air	Resident	Adult/Child	Inh	Qualitative

Ing – Ingestion
Der – Dermal
Inh - Inhalation

Summary of Selection of Exposure Pathways

The table describes the exposure pathways that were evaluated for the risk assessment. Exposure media, exposure points, and characteristics of receptor populations are included.

TABLE 3

Non-Cancer Toxicity Data Summary

Pathway: Oral/Dermal

Chemical of Concern	Chronic/ Subchronic	Oral RfD Value	Oral RfD Units	Absorp. Efficiency (Dermal)	Adjusted RfD (Dermal)	Adj. Dermal RfD Units	Primary Target Organ	Combined Uncertainty /Modifying Factors	Sources of RfD: Target Organ	Dates of RfD:
Tetrachloroethene	Chronic	6E-03	mg/kg-day	1	6E-03	mg/kg-day	CNS	1000	IRIS	01/26/16

Pathway: Inhalation

Chemical of Concern	Chronic/ Subchronic	Inhalation RfC	Inhalation RfC Units	Inhalation RfD	Inhalation RfD Units	Primary Target Organ	Combined Uncertainty /Modifying Factors	Sources of RfD: Target Organ	Dates:
Tetrachloroethene	Chronic	4E-02	mg/m^3	-----	-----	CNS	1000	IRIS	01/26/16

Key

-----: No information available
CNS – Central Nervous System
IRIS: Integrated Risk Information System, U.S. EPA

Summary of Toxicity Assessment

This table provides non-carcinogenic risk information which is relevant to the contaminants of concern in groundwater and indoor air. When available, the chronic toxicity data have been used to develop oral reference doses (RfDs) and inhalation reference doses (RfDi).

TABLE 4

Cancer Toxicity Data Summary

Pathway: Oral/Dermal

Chemical of Concern	Oral Cancer Slope Factor	Units	Adjusted Cancer Slope Factor (for Dermal)	Slope Factor Units	Weight of Evidence/ Cancer Guideline Description	Source	Date
Tetrachloroethene	2.1E-03	$(mg/kg/day)^{-1}$	2.1E-03	$(mg/kg/day)^{-1}$	Likely to be carcinogenic to humans	IRIS	01/26/16

Pathway: Inhalation

Chemical of Concern	Unit Risk	Units	Inhalation Slope Factor	Slope Factor Units	Weight of Evidence/ Cancer Guideline Description	Source	Date
Tetrachloroethene	2.6E-07	$1(ug/m^3)$	-----	-----	Likely to be carcinogenic to humans	IRIS	01/22/16

Key:

EPA Weight of Evidence:

IRIS: Integrated Risk Information System. U.S. EPA
-----: No information available

Summary of Toxicity Assessment

This table provides carcinogenic risk information which is relevant to the contaminants of concern in groundwater and indoor air. Toxicity data are provided for both the oral and inhalation routes of exposure.

TABLE 5

Risk Characterization Summary - Noncarcinogens

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult/Child

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Non-Carcinogenic Risk			
					Ingestion	Dermal	Inhalation	Exposure Routes Total
Groundwater	Groundwater	Tap water	Tetrachloroethene	CNS	**20**	**10**	**30**	**60**
							Hazard Index Total=	**60**

CNS – central nervous system

Summary of Risk Characterization - Non-Carcinogens

The table presents hazard quotients (HQs) for each route of exposure and the hazard index (sum of hazard quotients) for exposure to groundwater. The Risk Assessment Guidance for Superfund states that, generally, a hazard index (HI) greater than 1 indicates the potential for adverse non-cancer effects. A qualitative analysis also identified tetrachloroethene as a COC for the vapor intrusion pathway based on elevated soil gas concentrations beneath the building.

TABLE 6

Risk Characterization Summary - Carcinogens

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult/Child

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogenic Risk			
				Ingestion	Dermal	Inhalation	Exposure Routes Total
Groundwater	Groundwater	Tap water	Tetrachloroethene	6E-05	4E-05	**2E-04**	**3E-04**
						Total Risk =	**3E-04**

Summary of Risk Characterization – Carcinogens

The table presents cancer risks for groundwater exposure. As stated in the National Contingency Plan, the point of departure is 10^{-6} and the acceptable risk range for site-related exposure is 10^{-6} to 10^{-4}. A qualitative analysis also identified tetrachloroethene as a COC for the vapor intrusion pathway based on elevated soil gas concentrations beneath the building.

TABLE 7

Chemical-specific ARARs, Criteria, and Guidance

Regulatory Level	ARAR	Status	Requirement Synopsis	Feasibility Study Consideration
Federal	EPA Regional Screening Level (RSL) (November 2015)	To Be Considered	Establishes risk-based screening levels for the protection of human health.	The RSL will be considered in the development of the PRGs if there are no applicable standards.
Federal	National Primary Drinking Water Standards (40 CFR 141) - MCLs	Relevant and Appropriate	Establishes health-based standards for public drinking water systems. Also establishes drinking water quality goals set at levels at which no adverse health effects are anticipated, with an adequate margin of safety. Groundwater at the site is currently not used as a source of drinking water.	The standards were used to develop the PRGs to accommodate any future use of site groundwater as a source of drinking water supply.
Federal	Clean Water Act, Ambient Water Quality Criteria (40 CFR 131)	To Be Considered	Sets criteria for water quality based on protection of human health and protection of aquatic life.	The standards will be used as guidelines to assess the effect of source removal on groundwater and surface water quality.
Federal	OSWER Vapor Intrusion Assessment: Vapor Intrusion Screening Level (VISL) Calculator Version 3.4, June 2015 RSLs	Relevant and Appropriate	Provides generally recommended screening level concentrations for groundwater, soil gas (exterior to buildings and sub-slab), and indoor air for default target risk levels and exposure scenarios.	The standards were used to develop screening criteria for vapor intrusion.
Commonwealth of Puerto Rico	Puerto Rico Water Quality Standards (PRWQS) Regulation, August 2014	Relevant and Appropriate	This regulation is to preserve, maintain and enhance the quality of the waters of Puerto Rico and regulate any discharge of any pollutant to the waters of Puerto Rico by establishing water quality standards. Water quality standards and use classifications are promulgated for the protection of the uses assigned to coastal, surface, estuarine, wetlands, and ground waters of Puerto Rico.	The PRWQS are applicable, relevant, and appropriate chemical-specific ARARs as site groundwater is known to discharge into Puerto Rico waters. These standards will be considered in the development of the PRGs and evaluated under action-specific ARARs if any remedial alternatives under consideration entail any addition discharges to waters of Puerto Rico.

Acronyms:
ARARs - Applicable or Relevant and Appropriate Requirements
CFR - Code of Federal Regulations
MCLs - Maximum Contaminant Levels
OSWER - Office of Solid Waste and Emergency Response
PRGs - Preliminary Remediation Goals

TABLE 8

Location-specific ARARs, Criteria, and Guidance

Regulatory Level	ARAR	Status	Requirement Synopsis	Feasibility Study Consideration
Federal	Statement on Procedures on Floodplain Management and Wetlands Protection (40 CFR 6 Appendix A)	To Be Considered	This Statement of Procedures sets forth Agency policy and guidance for carrying out the provisions of Executive Orders 11988 and 11990.	According to FEMA's flood hazard map for the area, the Site is within the 100 year flood boundary. According to the U.S. Fish and Wildlife Service National Wetland Inventory, the site is adjacent to a wetland classified as a riverine system (Río Viví). Alternatives will take into consideration floodplain management and wetland protection.
Federal	Policy on Floodplains and Wetland Assessments for CERCLA Actions (OSWER Directive 9280.0-12, 1985)	To Be Considered	Superfund actions must meet the substantive requirements of Executive Order 11988, Executive Order 11990, and 40 CFR part 6, Appendix A.	Alternatives will take into consideration floodplain management and wetland protection.
Federal (Non-Regulatory)	Wetlands Executive Order (EO 11990)	To Be Considered	Federal agencies are required to minimize the destruction, loss, or degradation of wetlands and to preserve and enhance natural and beneficial values of wetlands.	Remedial alternatives that involve construction must include all practicable means of minimizing harm to wetlands. Wetlands protection considerations must be incorporated into the planning and decision making of remedial alternatives.
Federal	National Environmental Policy Act (NEPA) (42 USC 4321; 40 CFR 1500 to 1508)	To Be Considered	This requirement sets forth EPA policy for carrying out the provisions of the Wetlands Executive Order (EO 11990) and Floodplain Executive Order (EO 11988).	The requirement will be considered during the development of alternatives.
Federal	Clean Water Act (CWA) Section 404 (40 CFR 404)	To Be Considered	Under this requirement, no activity that adversely affects a wetland is permitted if a practicable alternative that does not affect wetlands is available. If no other practicable alternative exists, impacts on wetlands must be mitigated.	The effects on wetlands will be evaluated during the identification, screening, and evaluation of alternatives. Permits may be required for some alternatives.
Federal	National Historic Preservation Act (40 CFR 6.301)	Applicable	This requirement establishes procedures to provide for preservation of historical and archeological data that might be destroyed through alteration of terrain as a result of a federal construction project or a federally licensed activity or program.	The effects on historical and archeological data will be evaluated during the identification, screening, and evaluation of alternatives.

Acronyms:
ARARs - Applicable or Relevant and Appropriate Requirements
CERCLA – Comprehensive Environmental Response, Compensation and Liability Act of 1980
CFR - Code of Federal Regulations
FEMA – Federal Emergency Management Agency
OSWER - Office of Solid Waste and Emergency Response

TABLE 9

Action-specific ARARs, Criteria, and Guidance

Regulatory Level	ARAR	Status	Requirement Synopsis	Feasibility Study Consideration
General - Site Remediation				
Federal	OSHA Recording and Reporting Occupational Injuries and Illnesses (29 CFR 1904)	Applicable	This regulation outlines the record keeping and reporting requirements for an employer under OSHA.	These regulations apply to the companies contracted to implement the remedy. All applicable requirements will be met.
Federal	OSHA Occupational Safety and Health Standards (29 CFR 1910)	Applicable	These regulations specify an 8-hour time-weighted average concentration for worker exposure to various organic compounds. Training requirements for workers at hazardous waste operations are specified in 29 CFR 1910.120.	Proper respiratory equipment will be worn if it is not possible to maintain the work atmosphere below the 8-hour time-weighted average at these specified concentrations.
Federal	OSHA Safety and Health Regulations for Construction (29 CFR 1926)	Applicable	This regulation specifies the type of safety equipment and procedures to be followed during site remediation.	All appropriate safety equipment will be on-site, and appropriate procedures will be followed during remediation activities.
Federal	RCRA Identification and Listing of Hazardous Wastes (40 CFR 261)	Applicable	This regulation describes methods for identifying hazardous wastes and lists known hazardous wastes.	This regulation is applicable to the identification of hazardous wastes that are generated, treated, stored, or disposed during remedial activities.
Federal	RCRA Standards Applicable to Generators of Hazardous Wastes (40 CFR 262)	Applicable	Describes standards applicable to generators of hazardous wastes.	Standards will be followed if any hazardous wastes are generated on-site.
Federal	RCRA Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities – General Facility Standards (40 CFR 264.10–264.19)	Relevant and Appropriate	This regulation lists general facility requirements including general waste analysis, security measures, inspections, and training requirements.	Facility will be designed, constructed, and operated in accordance with this requirement. All workers will be properly trained.

TABLE 9

Action-specific ARARs, Criteria, and Guidance (continued)

Regulatory Level	ARAR	Status	Requirement Synopsis	Feasibility Study Consideration
Commonwealth of Puerto Rico	Regulation of the Puerto Rico Environmental Quality Board (PREQB) for the Prevention and Control of Noise Pollution	Applicable	This standard provides the standards and requirements for noise control.	This standard will be applied to any remediation activities performed at the site.
Commonwealth of Puerto Rico	Puerto Rico's Anti-degradation Policy	Applicable	Conserve, maintain and protect the designated and existing uses of the waters of Puerto Rico. The water quality necessary to protect existing uses, including threatened and endangered species shall be maintained and protected.	The requirement will be considered during the development of alternatives. The potential effects of any action will be evaluated to ensure that any endangered or threatened species and their habitat will not be affected.
Waste Transportation				
Federal	Department of Transportation (DOT) Rules for Transportation of Hazardous Materials (49 CFR Parts 107, 171, 172, 177 to 179)	Applicable	This regulation outlines procedures for the packaging, labeling, manifesting, and transporting hazardous materials.	Any company contracted to transport hazardous material from the site will be required to comply with this regulation.
Federal	RCRA Standards Applicable to Transporters of Hazardous Waste (40 CFR 263)	Applicable	Establishes standards for hazardous waste transporters.	Any company contracted to transport hazardous material from the site will be required to comply with this regulation.
Waste Disposal				
Federal	RCRA Land Disposal Restrictions (40 CFR 268)	Applicable	This regulation identifies hazardous wastes restricted for land disposal and provides treatment standards for land disposal.	Hazardous wastes will be treated to meet disposal requirements.
Federal	RCRA Hazardous Waste Permit Program (40 CFR 270)	Applicable	This regulation establishes provisions covering basic EPA permitting requirements.	All permitting requirements of EPA must be complied with.

TABLE 9

Action-specific ARARs, Criteria, and Guidance (continued)

Regulatory Level	ARAR	Status	Requirement Synopsis	Feasibility Study Consideration
Commonwealth of Puerto Rico	PREQB Regulation for the Control of Non-Hazardous Solid Waste (November 1997)	Applicable	This regulation establishes standards for the generation, management, transportation, recovery, disposal and management of non-hazardous solid waste.	Control activities for the non-hazardous wastes must comply with the treatment and disposal standards.
Commonwealth of Puerto Rico	PREQB Regulation for the Control of Hazardous Solid Waste (September 1998)	Relevant and Appropriate	This regulation establishes standards for management and disposal of hazardous wastes.	All remedial activities must adhere to these regulations while handling hazardous waste during remedial operations.
Water Discharge or Subsurface Injection				
Federal	National Pollutant Discharge Elimination System (NPDES) (40 CFR 100 et seq.)	Applicable	NPDES permit requirements for point source discharges must be met, including the NPDES Best Management Practice (BMP) Program. These regulations include, but are not limited to, requirements for compliance with water quality standards, a discharge monitoring system, and records maintenance.	Project will meet NPDES permit requirements for point source discharges.
Federal	Safe Drinking Water Act – Underground Injection Control (UIC) Program (40 CFR 144, 146)	Relevant and Appropriate	Establish performance standards, well requirements, and permitting requirements for groundwater re-injection wells.	Project will evaluate the requirement for injection of reagent for in situ treatment.
Commonwealth of Puerto Rico	Puerto Rico Water Quality Standards (PRWQS) Regulation, August 2014	Applicable	This regulation is to preserve, maintain and enhance the quality of the waters of Puerto Rico and regulate any discharge of any pollutant to the waters of Puerto Rico by establishing water quality standards. Water quality standards and use classifications are promulgated for the protection of the uses assigned to coastal, surface, estuarine, wetlands, and ground waters of Puerto Rico.	Project will meet PRWQS requirements for point source discharges.

TABLE 9

Action-specific ARARs, Criteria, and Guidance (continued)

Regulatory Level	ARAR	Status	Requirement Synopsis	Feasibility Study Consideration
Off-Gas Management				
Federal	Clean Air Act (CAA)—National Ambient Air Quality Standards (NAAQs) (40 CFR 50)	Applicable	These provide air quality standards for particulate matter, lead, NO_2, SO_2, CO, and volatile organic matter.	During remediation and treatment, air emissions will be properly controlled and monitored to comply with these standards.
Federal	Standards of Performance for New Stationary Sources (40 CFR 60)	Relevant and Appropriate	Set the general requirements for air quality.	During remediation and treatment, air emissions will be properly controlled and monitored to comply with these standards.
Federal	National Emission Standards for Hazardous Air Pollutants (40 CFR 61)	Applicable	These provide air quality standards for hazardous air pollutants.	During remediation and treatment, air emissions will be properly controlled and monitored to comply with these standards.
Federal	Federal Directive - Control of Air Emissions from Superfund Air Strippers (OSWER Directive 9355.0-28)	Applicable	Provides guidance on control of air emissions from air strippers used at Superfund Sites for groundwater treatment.	During treatment, air emissions will be properly controlled and monitored to comply with these standards.
Commonwealth of Puerto Rico	PREQB Regulation for the Control of Atmospheric Pollution (2012)	Applicable	Describes requirements and procedures for obtaining air permits and certificates; rules that govern the emission of contaminants into the ambient atmosphere.	Need to meet requirements when discharging off-gas. Need to meet fugitive emissions requirements during remediation and treatment. Need to meet visible emissions requirements for motor vehicles.

Acronyms:
ARARs - Applicable or Relevant and Appropriate Requirements
CERCLA – Comprehensive Environmental Response, Compensation and Liability Act of 1980
CFR - Code of Federal Regulations
FEMA – Federal Emergency Management Agency
OSWER - Office of Solid Waste and Emergency Response

TABLE 10

Alternative 2
Air Sparging and Soil Vapor Extraction
Cost Estimate Summary

Item No.	Item Description	Extended Cost
CAPITAL COSTS		
1.	General Conditions	$355,000
2.	Air Sparge System	$636,000
3.	Soil Vapor Extraction System	$237,000
	Subtotal	**$1,228,000**
	Contingency (20%)	$245,600
	Subtotal	$1,473,600
	General Contractor Bond and Insurance (5%)	$73,680
	Subtotal	$1,547,280
	General Contractor Markup (profit - 10%)	$154,728
	TOTAL CAPITAL COSTS	**$1,703,000**
OPERATION, MAINTENANCE & MONITORING COSTS		
4a	Annual O&M for Air Sparge and SVE Systems -yr 1 and 2	$147,000
4b	Annual O&M for Air Sparge and SVE Systems -yr 3-10	$42,000
5.	Annual Monitoring Costs	$42,000
PRESENT WORTH (with discounting)		
	Total Capital Costs	$1,703,000
	Operations and Maintenance for Air Sparge and SVE systems (for 10 years)	$484,832
	Long-term Monitoring Cost (for 20 years)	$444,949
	TOTAL PRESENT WORTH	**$2,633,000**

Notes:

1. Present worth calculation assumes 7% discount rate after inflation is considered.
2. Additional details of this cost estimate can be found in the Final Feasibility Study Report, July 2016, Appendix C.

APPENDIX IX
PAPELERA PUERTIRRIQUEÑA INC. SUPERFUND SITE
Puerto Rico Environmental Quality Board Concurrence Letter

To: USEPA/R2

From: Augusto Márquez
PR Environmental Quality Board

Date: September 29, 2017

Re: Papelera Puertorriquena Superfund Site

EQB concurs with the selected remedy identified in EPA's Record of Decision for the Papelera Puertorriqueña Inc Superfund site which will address soil, surface water and groundwater contamination through the use of soil vapor extraction and air sparging.