DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

Interim Final 2/5/99

RCRA Corrective Action
Environmental Indicator (EI) RCRIS code (CA725)

Current Human Exposures Under Control

Facility Name: **BORICUA WOOD PROCESSING**
Facility Address: Km. 5.5, State Road 865, Toa Baja, PR
Facility EPA ID #: **PRD090564477**

1. Has **all** available relevant/significant information on known and reasonably suspected releases to soil, groundwater, surface water/sediments, and air, subject to RCRA Corrective Action (e.g., from Solid Waste Management Units (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been **considered** in this EI determination?

_X_ If yes - check here and continue with #2 below.

____ If no - re-evaluate existing data, or

____ if data are not available skip to #6 and enter"IN" (more information needed) status code.

BACKGROUND

Definition of Environmental Indicators (for the RCRA Corrective Action)

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EI developed to-date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future.

Definition of "Current Human Exposures Under Control" EI

A positive "Current Human Exposures Under Control" EI determination ("YE" status code) indicates that there are no "unacceptable" human exposures to "contamination" (i.e., contaminants in concentrations in excess of appropriate risk-based levels) that can be reasonably expected under current land- and groundwater-use conditions (for all "contamination" subject to RCRA corrective action at or from the identified facility (i.e., site-wide)).

Relationship of EI to Final Remedies

While Final remedies remain the long-term objective of the RCRA Corrective Action program the EI are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993, GPRA). The "Current Human Exposures Under Control" EI are for reasonably expected human exposures under current land- and groundwater-use conditions ONLY, and do not consider potential future land- or groundwater-use conditions or ecological receptors. The RCRA Corrective Action program's overall mission to protect human health and the environment requires that Final remedies address these issues (i.e., potential future human exposure scenarios, future land and groundwater uses, and ecological receptors).

Duration / Applicability of EI Determinations

EI Determinations status codes should remain in RCRIS national database ONLY as long as they remain true (i.e., RCRIS status codes must be changed when the regulatory authorities become aware of contrary information).

Facility Description:

The Boricua Woods facility is located in a mixed usage area (industrial, commercial, and residential), in the western suburbs of the San Juan metropolitan area. The nearest residential areas are located across the street from the facility, along Calle Algarrobo and Calle Almendro.

The facility covers 3.8 acres, and is fully enclosed by a secure fence. It is a wood treatment facility, where a preservative formulation is applied to untreated wood, in pressure treatment cylinders. Operations commenced at the facility in 1957, and the facility has always utilized an inorganic "CCA" preservative solution, with the active ingredients being Chromic Acid (Chromium Trioxide), Cupric Oxide, and Arsenic Pentoxide. The specific formulation Boricua Wood utilizes is classified as "CCA - Type C", and known commercially as Wolmanac Concentrate. As of 1992, the last year for which EPA has information, the facility utilized approximately 130,000 pounds of Wolmanac Concentrate per year. The facility briefly utilized an organic chlorphenolic based preservative "for a short period prior to 1970" for "immersion wood treatment" in an in-ground steel tank, rather under pressure in treatment cylinders. [Ref. 1]

The closest off-site potable groundwater well is reported to be located approximately 200 feet southeast of the facility at the Ponche Distillery; however, based on expected regional groundwater flow to the north, the "Description of Current Conditions Report" indicates that the Ponche well is hydraulically upgradient (i.e., south) of Boricua Wood. The "Description of Current Conditions Report" also indicates that groundwater in the area has been reportedly impacted by perchloroethylene ("perc"/PCE) releases; however, the Boricua Wood facility never used that compound. [Ref 1]

The hazardous waste generated by the facility is the waste F035, which consists of wastewaters, process residuals, preservative drippage, and spent formulations generated at plants that use inorganic preservatives containing arsenic or chromium. [Ref. 1 and 40 CFR § 261.31]

The facility is a hazardous waste generator, that does not require a RCRA permit. The facility operated as a RCRA hazardous waste storage facility (container storage) until 1988, when it "converted" to a "less than 90 day storage facility" by completing RCRA "closure" for its

container storage unit. Corrective Action is being addressed under a RCRA 3008(h) Corrective Order issued in 1992 (Ref 2).

Ref 1. "Description of Current Conditions Report" prepared by Anderson-Mulholland & Associates, January 1993.

Ref 2. RCRA Section 3008(h) Administrative Order on Consent, September 1992.

2. Are groundwater, soil, surface water, sediments, or air **media** known or reasonably suspected to be **"contaminated"**[1] above appropriately protective risk-based "levels" (applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action (from SWMUs, RUs or AOCs)?

	Yes	No	?	Rationale / Key Contaminants
Groundwater		X		See below and CA 750 Evaluation dated Sept. 1999
Air (indoors)[2]		X		No volatile constituent contamination at the facility
Surface Soil (e.g., <2 ft)	X			
Surface Water	X			Arsenic and Chromium in waters in stormwater catch basins and drains
Sediment	X			Arsenic and Chromium contaminated sediments in stormwater sewers and open drainage ditches leading from the wood treatment area.
Subsurf. Soil (e.g., >2 ft)	X			
Air (outdoors)		X		No volatile constituent contamination at the facility

____ If no (for all media) - skip to #6, and enter "YE," status code after providing or citing appropriate "levels," and referencing sufficient supporting documentation demonstrating that these "levels" are not exceeded.

_X_ If yes (for any media) - continue after identifying key contaminants in each "contaminated" medium, citing appropriate "levels" (or provide an explanation for the determination that the medium could pose an unacceptable risk), and referencing supporting documentation.

—— If unknown (for any media) - skip to #6 and enter "IN" status code.

Footnotes:

[1] "Contamination" and "contaminated" describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriately protective risk-based "levels" (for the media, that identify risks within the acceptable risk range).

[2] Recent evidence (from the Colorado Dept. of Public Health and Environment, and others) suggest that unacceptable indoor air concentrations are more common in structures above groundwater with volatile contaminants than previously believed. This is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration necessary to be reasonably certain that indoor air (in structures located above (and adjacent to) groundwater with volatile contaminants) does not present unacceptable risks.

Rationale and Reference(s):

1) The Contaminants of Concern have been determined to be arsenic and chromium, based on:

a) the facility's representation that it has only used the CCA inorganic preservative solution [Ref 9], and

b) Analysis for a broad list of other inorganic and organic constituents during Screening investigations conducted as part of the initial RFI for the wood treatment area soils (where the facility's two pressure treatment cylinders are located). Those screenings determined that no other inorganic or organic constituents appeared to be present at the facility at concentrations warranting further investigation. This included lead (which is constituent of the waste F035), and organic constituents such as pentachlorophenol and the base-neutral acid (BNA) extractable organic compounds [also referred to as poly-aromatic hydrocarbons (PAHs)] that are associated with organic wood preservative formulations, as well as dioxins and furans. During this initial screening, lead was detected in the soils at a maximum concentration of 47 mg/kg, which is well below the EPA recommended ("Integrated Exposure-Uptake Biokinetic Model [IEUBK])residential clean-up level of 400 mg/kg. The BNA organics and pentachlorophenol were all non-detect. Dioxins and furans were also screened for at the wood treatment area and detected at maximum concentrations of 4.30 ug/kg and 1.90 ug/kg respectively; however, these were indicated to be within expected anthropogenic background levels and not expected to be associated with Boricua Wood's preservative formulations. [Ref 4, 5, and 9]

Besides the initial screening discussed above, further sampling of soils at the former pentachlorophenol (PCP) treatment tank area, which was utilized for a limited period prior to

1970, for organic constituents (PCP and BNA/PAHs) was also implemented. PCP was detected at a maximum concentration of 440 - 770 ug/kg, which is significantly below its Region 3 Risk-based Concentration value of 48,000 ug/kg for industrial soils and 5,300 ug/kg for residential soils. 2,3,4,6-tetrachlorophenol was detected at a concentration of 40 ug/kg Region 3 Risk-based Concentration is 61,000,000 ug/kg for industrial soils and 2, 300,000 ug/kg for residential soils). Several PAHs were detected at maximum estimated ("J" validated) concentrations ranging from 73 ug/kg for fluoranthene (Region 3 Risk-based Concentration is 82,000,000 ug/kg for industrial soils and 3, 100,000 ug/kg for residential soils) to 330 ug/kg for dibenzo(a,h)anthracene (Region 3 Risk-based Concentrations between 780 ug/kg for industrial soils and 87 ug/kg for residential soils). Because the detected concentrations were far below applicable risk-based standards [except for dibenzo(a,h)anthracene, which was below the industrial standard, but not the residential], no further action was required for the PCP and PAH containing soils, as long as Boricua Wood remains an industrial site with access controls. [Ref 10]

2) Initial investigations were focused: a) on soils at the wood treatment area, where the facility's two pressure treatment cylinders are located, and b) stormwater catch basins and sewers underlying the wood treatment/pressure cylinder, area as well as the associated off-site stormwater drains immediately downgradient from the wood treatment area. Besides being the most likely contaminated area, the open stormwater catch basins underlying the area represented a direct pathway for off-site releases.

When investigations commenced, recently enacted regulations (40 CFR Part 264 Subpart W) and the 1992 Consent Order, required that the facility construct a drip-pad meeting the requirements of 40 CFR Part 264 Subpart W, to fully cover the soils underlying the wood treatment/pressure cylinder area. Those initial investigations found that an area of approximately 970 square yards underlying where the new drip-pad (required by the Order) was to be installed, contained surface and subsurface soils contaminated with arsenic and chromium at maximum concentrations of 1,510 mg/kg and 1,720 mg/kg respectively.

In addition, the sediments and waters in the stormwater catch basins underlying the area where the new drip-pad was to be installed, as well as the sewers leading from those catch basins to an off-site open drainage ditch were found to be contaminated with arsenic and chromium. The sediments contained arsenic and chromium at maximum concentrations of 7,210 mg/kg and 4,660 mg/kg respectively, in on-site catch basins. Lead was measured in the sediments at a maximum concentration of 15 mg/kg. Standing water in the open drainage ditch immediately down-gradient of the facility contained arsenic at a maximum concentration of 2,460 ug/L and chromium a concentration of 486 ug/L, which is well above both respective MCLs of 10 ug/L for arsenic and 100 ug/L for chromium. (Ref 4, 5, and 6).

See further discussion of surface and subsurface soil contamination at other areas of the site and off-site areas, as well as contaminated sediments in off-site stormwater sewers and open drainage ditches, and the clean-up of the site and off-site impacted areas, under Question 3 below.

3. Groundwater at the facility and in off-site areas has not been impacted by releases from Boricua Wood. The basis for this conclusion is given in the September CA 750 Evaluation (Contaminated Groundwater Under Control), previously completed for this facility in 1999, and discussed below:

A. Three deep soil borings (to depths of 16.5 - 20 feet) were installed either directly within the area subsequently covered by the Subpart W drip pad, or immediately adjacent to it. A series of soil samples were obtained in each of the three borings and analyzed for arsenic and chromium. The results showed that (Reference #4, #5, #6, & #7):

1) arsenic and chromium concentrations exceeding the approved on-site clean-up criteria of 80 mg/kg arsenic, and 400 mg/kg chromium, were only present in soils above 4 feet below ground surface (or shallower);

2) arsenic and chromium concentrations in the three deep borings attenuated rapidly with depth below 4 feet below ground surface. Initially only two deep borings were installed and sampled. The concentration of arsenic and chromium in the bottom most samples from those two borings ranged from 51 mg/kg arsenic and 213 mg/kg chromium (at 16 - 16.5 feet below surface) in boring DP-20, to 8.8 mg/kg arsenic and 92 mg/kg chromium (at 19.5 - 20.0 feet below surface) in boring DP-37 (both located inside the boundaries of where the drip-pad would be installed). (Reference #6) Because of the relatively elevated arsenic and chromium concentration (51 mg/kg arsenic and 213 mg/kg chromium) measured in the 16 - 16.5 foot sample in boring DP-20 (which Boricua indicated "may have been cross-contaminated from surface soils..."), EPA, in 1998, requested that a third deep soil boring be installed. Since the drip pad had already been constructed, that third deep soil boring (NW-17) was located approximately twenty feet west of the drip pad. The concentrations of arsenic and chromium in the bottom most sample (19.5 - 20.0 feet below surface) from the 1998 deep boring (NW-17) were relatively low (3.7 mg/kg arsenic and 131 mg/kg chromium), consistent with the evidence from the two previous deep borings that arsenic and chromium concentrations attenuated rapidly with depth. (Reference #7)

3) In all three borings the groundwater aquifer was not encountered at the total depth of 20 feet below ground surface.

B. The shallow groundwater aquifer is believed to be relatively deep, at approximately 93 feet below ground surface [not 8 feet as indicated in the 1990 RCRA Facility Assessment (RFA) (Reference #1) prepared by the Puerto Rico Environmental Quality Board (EQB) for EPA and the 1985 Superfund Scoring Report, prepared by NUS Corporation for EPA (Ref #2). See Note following C below.] This is based on:

a) in the facility's on-site process water production well the water table is at 93 feet (Ref 9);

b) a groundwater aquifer was not encountered in a total of 7 deep soil borings installed by Boricua Wood, in conjunction with work required under the 1992 Order. In addition to the 3 deep soil borings continuously sampled for arsenic and chromium (as discussed above), 4 "geo-technical" borings were drilled to 25 feet below ground surface in June 1993, as part of the drip-pad installation project [Ref #4, Appendix B]. Of the 7 borings (3 sampled plus 4 "geo-technical"), 5 encountered no water to their total depth. In 2 of the geo-technical borings (DP-19 and DP-24), thin zones of water were encountered between 20 - 25 feet below surface. However, the water bearing zones observed in both those borings (DP-19 and -24) are described as "tight water bearing clays". Also, in neither of those borings was the encountered water pumped or bailed, so as to measure groundwater recharge, etc. Boricua Wood has interpreted that those shallow water zones in borings DP-19 and DP-24 were perched water zones, rather than a true aquifer, since these shallow zones were not encountered in the 5 other deep borings drilled at the site. (Reference #4 and #7)

C. The 1985 Superfund Scoring work (Reference #2) included sampling of the facility's on-site process water well (apparently from a surface tap, not by bailer, or their own pump). Arsenic was non-detect, and chromium was detected at 12 ug/liter, which is below its maximum contaminant level (MCL) of 50 ug/liter. [It is unclear where the water sampled in 1985 came from, i.e., 8 ft below ground, or, as seems more likely based on the below Note, from below 93 ft.] Also as part of its 1985 work, Superfund sampled 3 public water supply [i.e., PRASA] wells approximately 2-3 Km north and northwest (down-gradient) of the Boricua facility. No hazardous constituents were detected in those public water supply wells. (Reference #2).

NOTE: The 1990 RCRA Facility Assessment (RFA) (Reference #1) prepared by the Puerto Rico Environmental Quality Board (EQB) for EPA and the 1985 Superfund Scoring Report, prepared by NUS Corporation for EPA (Ref #2) had indicated that groundwater was eight feet below ground surface. Both appear to be incorrect (the RFA depth was derived from the 1985 Superfund Scoring report). Boricua Wood, in the "Description of Current Conditions" Report(Reference #9) and September 1993 RFI report (Reference #4), refutes the 8 foot figure, and states that the water table is at 93 feet below surface [i.e. + 25 feet above mean sea-level] in their on- site production well. The RFA's 8 foot groundwater depth is apparently based on the 1985 Superfund report, which seems to be in error, as to both the on-site well's total depth, which is 160 ft according to Boricua Wood (Ref 9), not 60 ft as stated in the Superfund report, and the depth of its water table.

References:

1. "RCRA Facility Assessment (RFA), prepared by the Puerto Rico Environmental Quality Board, May 30, 1990.

2. "Superfund Hazardous Ranking Report, prepared by NUS Corporation (for EPA), November 1985.

3. "RFI Work Plan Proposed Drip Pad Area", prepared by Anderson-Mulholland & Associates, December 1992.

4."Draft RFI Report Proposed Drip Pad Area" prepared by Anderson-Mulholland & Associates, September 1993.

5. "Draft Phase 1A RFI Report" (3 volumes), prepared by Anderson-Mulholland & Associates, June 1994.

6. "Phase 1A RFI Report (revised), prepared by Anderson-Mulholland & Associates, February 1995.

7. "Phase 2C RFI Report", prepared by Anderson-Mulholland & Associates, December 1998.

8. "Soil Screening Guidance: Technical Background Document" (EPA/540/R-95/128), May 1996.

9. January 1993 "Description of Current Conditions Report" prepared by Anderson-Mulholland & Associates.

10. "Phase 2B RFI Report" (includes sampling of former pentachlorophenol treatment tank area), prepared by Anderson-Mulholland & Associates, August 1998.

3. Are there **complete pathways** between "contamination" and human receptors such that exposures can be reasonably expected under the current (land- and groundwater-use) conditions?

Summary Exposure Pathway Evaluation Table

Potential **Human Receptors** (Under Current Conditions)

"Contaminated" Media	Residents	Workers	Day-Care	Construction	Trespassers	Recreation	Food[3]
~~Groundwater~~	___	___	___	___	___	___	___
~~Air (indoors)~~	___	___	___	___	___	___	___
Soil (surface, e.g., <2	no	no*	no	no*	no*	no	no
Surface Water	no	no	no	no	no	no	no
Sediment	no	no	no	no	no	no	no
Soil (subsurface e.g.,	no	no*	no	no*	no*	no	no
~~Air (outdoors)~~	----	-----	----	-----	----	----	----

[3] Indirect Pathway/Receptor (e.g., vegetables, fruits, crops, meat and dairy products, fish, shellfish, etc.)

* Based on the May 2003 Phase 2D Corrective Measures Work Plan currently being implemented is fully completed and, with regard to trespassers, that the area being addressed under that Phase 2D work plan remains fully enclosed by secure fencing until completion of the corrective measures required under that work plan. [Ref 15] .

Instructions for Summary Exposure Pathway Evaluation Table:

1. Strike-out specific Media including Human Receptors' spaces for Media which are not "contaminated" as identified in #2 above.

2. enter "yes" or "no" for potential "completeness" under each "Contaminated" Media -- Human Receptor combination (Pathway).

Note: In order to focus the evaluation to the most probable combinations some potential "Contaminated" Media - Human Receptor combinations (Pathways) do not have check spaces ("___"). While these combinations may not be probable in most situations they may be possible in some settings and should be added as necessary.

_X_ If no (pathways are not complete for any contaminated media-receptor combination) - skip to #6, and enter "YE" status code, after explaining and/or referencing condition(s) in-place, whether natural or man-made, preventing a complete exposure pathway from each contaminated medium (e.g., use optional Pathway Evaluation Work Sheet to analyze major

pathways).

____ If yes (pathways are complete for any "Contaminated" Media - Human Receptor combination) - continue after providing supporting explanation.

____ If unknown (for any "Contaminated" Media - Human Receptor combination) - skip to #6 and enter "IN" status code.

Rationale and Reference(s):

All contaminated media (surface and subsurface soils, and sediments and water in stormwater catch basins/sewers/ and open drainage ditch), at the facility, as well as at off-site areas impacted by releases from the facility, have been, or are currently being, remediated (i.e., cleaned-up and/or addressed through other measures) to prevent unacceptable human exposures.

Investigations conducted at the facility indicate that groundwater has not been impacted. The remediation activities implemented at the facility since 1992 under the RCRA 3008(h) Consent Order between EPA and Boricua Wood, are as follows:

Phase I Remediation Activities: Drip-Pad Area and associated Stormwater Catch Basins and Sewers

Delineation of the arsenic and chromium contaminated surface and subsurface soils at the wood treatment area, where the facility's two pressure treatment cylinders are located, and contaminated sediments in stormwater sewers and catch basins underlying that area was completed between 1993 and 1995 (Ref 3, 4, 5, & 6).

Corrective measures were then implemented so that: 1) sourcing of on-going, direct releases of arsenic and chromium from the wood treatment operations via the storm sewers and catch basins underlying the actual treatment area has been stopped by first removing the contaminated sediments and water, and then sealing all catch basins and stormwater sewers in the wood treatment area; 2) the most elevated areas of soil contamination from past releases (i.e., hot spots within the area where the drip pad has been installed) have been excavated and disposed of in a hazardous waste landfill; 3) any further migration of contaminants from the residual soil contamination left in place in the area underlying the drip-pad has largely been eliminated by preventing future storm water infiltration through installation of the drip pad and associated run-on/run-off controls (including roofing covering the entire drip pad); and 4) direct human exposure to the contaminated soils left in place under the new drip pad is prevented. The corrective measures included (Reference #1 and #2):

a) excavation of approximately 145 cubic yards of the most highly contaminated arsenic and chromium containing soils underlying the area where a drip pad

meeting all requirements of 40 CFR § 264 Subpart W requirements was installed (Fig 3 and 4). The drip-pad itself prevents human exposure to the remaining contaminated soils left in place beneath it.

b) removal of approximately 2.25 tons (550 gallons) of contaminated storm sewer and catch basin sediments (with some water) from the area where the Subpart W drip pad was to be installed, as well as those leading from the wood treatment area (Fig 5).

c) sealing with cement of all catch basins and sewers (which formerly, by design received process drippage and spillage) inside the area where the Subpart W drip pad was to be installed, as well as those leading from the wood treatment area (Fig 5)

d) installation of a drip pad and associated run-on/run-off controls (including roofing covering the entire drip pad) meeting all requirements of 40 CFR § 264 Subpart W requirements (Fig 4).

e) installation of an asphalt cap over areas of arsenic and chromium contaminated soils adjacent to the drip-pad, but that were not covered by the drip-pad structure (Fig. 4).

Phase II Remediation Activities

A. Clean-up of arsenic and chromium contaminated soils in 7 residential lots located across the street from the facility (along Calle Algarrobo and Calle Almendro), and contaminated sediments in the open drainage ditch traversing those lots [Ref. 7]included the following (see Figures 6 through 11):

a) RFI completed September 1996 [Ref 7 & 8]

b) CMS completed September 1996

c) Corrective Measures Work Plan completed June 1997. [Ref. 9]

d) Corrective Measures Implemented June-October 1997, and included [see Ref 10]:

* excavation of arsenic and chromium contaminated soils in the 7 residential lots to maximum depth of 4.5 feet, and also, excavation of contaminated sediments in an open drainage ditch traversing the 7 lots. The clean-up standards required to be achieved were:

surface to 2 feet below surface = arsenic 20 parts per million (ppm) and/or

chromium 300 ppm;

2 feet to 4.5 feet = arsenic 80 ppm, chromium 400 ppm;

* total 567 cubic yards of soil and contaminated sediments were excavated;

* collection of 37 samples following excavation to confirm clean-up;

* construction of an enclosed storm water drain [in place of the former open drainage ditch] following clean-up of the contaminated soils/sediments in the open drain that previously traversed the residential lots; and

* backfilling with clean fill, and site restoration. [Ref 10]

B. Phase 2A, B, & C [Phase II A, B, & C] investigations and clean-ups at on-site, non-drip pad areas of the facility.

1) Phase 2 A & B RFI: investigation and where necessary excavation (and disposal) of any soils approved on-site clean-up standard of 80 mg/kg arsenic and 400 mg/kg chromium of an on-site soil pile, and soils adjoining process fluid storage tanks, an old wood drying areas, and a short lived, pentachlorophenol solution treatment area (see Fig 25). Completed August 1998 [Ref 11].

Interim Measure: Excavation and disposal of soils from an on-site soil pile, and soils adjoining process fluid storage tanks. Completed August 1998 [Ref 11].

2) Phase 2C RFI: consisted of a program of three deep (20 feet) soil borings to determine if groundwater may have been impacted. Results were negative based on attenuation of soil concentrations of arsenic and chromium with depth. See more detailed discussion under Question 2. Completed December 1998. [Ref 12]

C. Phase 2D [II-D]: Investigation and clean-up of an off-site vacant property [non-residential] immediately adjacent to the eastern boundary of Boricua Wood (see Figures 12 through 24).

1) Surface and subsurface soils in this lot contaminated with arsenic and chromium at maximum concentrations of 2,580 mg/kg and 1,930 mg/kg, respectively. The areas containing the maximum concentrations are in surface soils along the Boricua Wood fence, directly adjacent to preservative solution holding tanks and a mixing tank (which adjoin the wood treatment area) on the Boricua Wood property. (Ref 14)

2) The off-site lot is currently vacant, and owned by Masaco Realty of Puerto Rico (Ref

14). It is bordered by a food processing facility (Empresas La Famosa) on its south, local roads (Routes 865 and 866) on its north and east, and Boricua Wood's wood treatment area and preservative tanks on its west.

3) The off-site lot is currently fenced, preventing trespasser from entering the site. (Ref 15).

4) Corrective Measures are currently being implemented under the May 2003, EPA approved, CMI work plan (Ref 14), and include :

a) Removal (excavate), to a maximum depth of 15 feet below surface, of all soils containing arsenic exceeding 20 mg/kg and/or chromium exceeding 100 mg/kg. Estimated volume of surface and subsurface soils to be excavated is total of 2300 cubic yards of arsenic and chromium contaminated soils.

b) All excavated soils must be screened for TCLP for arsenic or chromium, and soils failing TCLP (estimated 60 cubic yards) must be disposed of as a characteristic hazardous waste in a permitted hazardous waste landfill. Soils passing TCLP may be disposed of as a non-hazardous waste in a permitted solid waste landfill (approximately 2240 cubic yards). However, those non-hazardous soils (based on TCLP results) must also be screened with the synthetic precipitate leaching procedure (SPLP), and those soils whose SPLP results exceed 200 ug/L arsenic and/or 2000 ug/L chromium, must undergo an approved stabilization and solidification prior to disposal in a solid waste landfill (Ref 14).

REFERENCES

1. "Drip Pad Soil Excavation and Removal Interim Measures Report"prepared by Anderson-Mulholland & Associates, May 1996.

2. "Drip Pad Assessment Report and Certification", prepared by McPherson & Associates, P.C., October 30, 1996.

3. "RFI Work Plan Proposed Drip Pad Area", prepared by Anderson-Mulholland & Associates, December 1992.

4. "Draft RFI Report", prepared by Anderson-Mulholland & Associates, September 1993.

5. "Draft Phase 1A RFI Report and Interim Measures Work Plan" (3 volumes) (supplemental in Drip Pad area), prepared by Anderson-Mulholland & Associates, June 1994.

6. "Phase 1A RFI Report (revised), prepared by Anderson-Mulholland & Associates,

February 1995.

7. "Draft Phase 1B RFI Report and Off-Site Interim Measures Work Plan" (3 volumes) [off-site lots along Calle Algarrobo and Calle Almendro), and contaminated sediments in the open drainage ditch traversing those lots], prepared by Anderson-Mulholland & Associates, September 1995.

8. "Draft Phase 1C RFI Report" [off-site lots along Calle Algarrobo and Calle Almendro), and contaminated sediments in the open drainage ditch traversing those lots], prepared by Anderson-Mulholland & Associates, September 1996.

9. Offsite Corrective Measures Work Plan - Revision 1, February 1997, as modified by the April 1997 Addendum 1, and also the June 1997 Addendum 2, all prepared by Anderson-Mulholland & Associates.

10. March 1998 Offsite Corrective Measures Final Report, prepared by Anderson-Mulholland & Associates, March 1998.

11. "Phase 2B RFI Report" (includes sampling of former pentachlorophenol treatment tank area), prepared by Anderson-Mulholland & Associates, August 1998.

12. "Phase 2C RFI Report", prepared by Anderson-Mulholland & Associates, December 1998.

13. "Soil Screening Guidance: Technical Background Document" (EPA/540/R-95/128), May 1996.

14. "Phase 2D Corrective Measures Implementation Work Plan" (Revision 3), prepared by Anderson-Mulholland & Associates, May 2003.

15. Letter to Adolph Everett of EPA from Luis J. Fernandez of Boricua Wood, September, 2003.

Figures

1. Drip-Pad Area, Extent of Arsenic Contaminated Surface Soils (prior to excavation and drip-pad installation)
2. Drip-Pad Area, Extent of Chromium Contaminated Surface Soils (prior to excavation and drip-pad installation)

3. Drip-Pad Area, proposed soil excavation areas

4. Drip-Pad Area, proposed primary soil excavation area and Proposed Area to be Covered with

Asphalt Cap.

5. Storm Sewer System in Drip Pad Area (showing sealed catch basins and sewers)

6. Lot 1-7 Area (along Calle Algarrobo and Calle Almendro) Regional setting with respect to the BWP (Boricua Wood Facility)

7. Detail of Lot 1-7 Area (along Calle Algarrobo and Calle Almendro)

8. Lot 1- 4 Area (along Calle Algarrobo and Calle Almendro) Soil Removal Map
9. Lots 5 - 6 Area (along Calle Algarrobo and Calle Almendro) Soil Removal Map

10. Lot 7 Area (along Calle Algarrobo and Calle Almendro) Soil Removal Map

11. Lot 5 - 7 Area (along Calle Algarrobo and Calle Almendro) New Enclosed Storm Water Collection System (following removal of contaminated soils/sediments in open drainage ditch)

12. Location of Phase 2D Investigation Area

13. Phase 2D Soil Extent of Arsenic Contamination (0 - 0.5 ft below ground surface [bgs])

14. Phase 2D Soil Extent of Arsenic Contamination (1 - 1.5 ft bgs)

15. Phase 2D Soil Extent of Arsenic Contamination (2 - 2.5 ft bgs)

16. Phase 2D Soil Extent of Arsenic Contamination (4 - 4.5 ft bgs)

17. Phase 2D Soil Extent of Arsenic Contamination (below 5 ft bgs)

18. Phase 2D Soil Extent of Chromium Contamination (0 -0.5 ft bgs)

19. Phase 2D Soil Extent of Chromium Contamination (1 - 1.5 ft bgs)

20. Phase 2D Soil Extent of Chromium Contamination (2 - 2.5 ft bgs)

21. Phase 2D Soil Extent of Chromium Contamination (4 - 4.5 ft bgs)

22. Phase 2D Class I Soil Excavation Area (soils with arsenic concentrations between 20 -100 mg/kg).

23. Phase 2D Class II Soil Excavation Area (soils with arsenic concentrations between 100 - 610 mg/kg and/or chromium concentrations between 100 - 400 mg/kg).

24. Phase 2D Class III Soil Excavation Area (soils with arsenic concentrations greater than 610 mg/kg and/or chromium concentrations greater than 400 mg/kg)

25. Boricua Wood Facility Map, showing wood treatment (pressure cylinders) area, drip-pad area, and former pentachlorophenol (PCP) immersion tank.

Attachments truncated, see facility file.

4. Can the **exposures** from any of the complete pathways identified in #3 be reasonably expected to be **"significant"**[4] (i.e., potentially "unacceptable" because exposures can be reasonably expected to be: 1) greater in magnitude (intensity, frequency and/or duration) than assumed in the derivation of the acceptable "levels" (used to identify the "contamination"); or 2) the combination of exposure magnitude (perhaps even though low) and contaminant concentrations (which may be substantially above the acceptable "levels") could result in greater than acceptable risks)?

____ If no (exposures can not be reasonably expected to be significant (i.e., potentially "unacceptable") for any complete exposure pathway) - skip to #6 and enter "YE" status code after explaining and/or referencing documentation justifying why the exposures (from each of the complete pathways) to "contamination" (identified in #3) are not expected to be "significant."

____ If yes (exposures could be reasonably expected to be "significant" (i.e., potentially "unacceptable") for any complete exposure pathway) - continue after providing a description (of each potentially "unacceptable" exposure pathway) and explaining and/or referencing documentation justifying why the exposures (from each of the remaining complete pathways) to "contamination" (identified in #3) are not expected to be "significant."

____ If unknown (for any complete pathway) - skip to #6 and enter "IN" status code

Rationale and Reference(s): N/A

[4] If there is any question on whether the identified exposures are "significant" (i.e., potentially "unacceptable") consult a human health Risk Assessment specialist with appropriate education, training and experience.

5. Can the "significant" **exposures** (identified in #4) be shown to be within **acceptable** limits?

____ If yes (all "significant" exposures have been shown to be within acceptable limits) - continue and enter "YE" after summarizing and referencing documentation justifying why all "significant" exposures to "contamination" are within acceptable limits (e.g., a site-specific Human Health Risk Assessment).

____ If no (there are current exposures that can be reasonably expected to be "unacceptable")- continue and enter "NO" status code after providing a description of each potentially "unacceptable" exposure.

____ If unknown (for any potentially "unacceptable" exposure) - continue and enter "IN" status code

Rationale and Reference(s): N/A

6. Check the appropriate RCRAInfo status codes for the Current Human Exposures Under Control EI event code (CA725), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (and attach appropriate supporting documentation as well as a map of the facility):

_X_ YE - Yes, "Current Human Exposures Under Control" has been verified. Based on a review of the information contained in this EI Determination, "Current Human Exposures" are expected to be "Under Control" at the **BORICUA WOOD PROCESSING** facility, EPA ID # **PRD090564477** located at Km. 5.5, State Road 865, Toa Baja, PR under current and reasonably expected conditions. This determination will be re-evaluated when the Agency/State becomes aware of significant changes at the facility.

____ NO - "Current Human Exposures" are NOT "Under Control."

_____ IN - More information is needed to make a determination.

Completed by:	(signature)	Original signed by	Date	9/18/2003
	(print)	Timothy R. Gordon		
	(title)	Project Manager		
	(EPA Region or State)	EPA Region 2, RCRA Programs Branch		

Supervisor	(signature)	Original signed by	Date	9/24/2003
	(print)	Dale Carpenter		
	(title)	Chief, Caribbean Section, RCRA Programs Branch		
	(EPA Region)	Region 2		

Supervisor	(signature)	Original signed by	Date	9/29/2003
	(print)	Adolph Everett		
	(title)	Chief, RCRA Programs Branch		
	(EPA Region)	Region 2		

Locations where References may be found:

U.S. Environmental Protection Agency - Region 2
RCRA Records Center
290 Broadway - 15 th Floor, Room 1528
New York, NY 10007-1866

Contact telephone and e-mail numbers

Timothy R. Gordon, Project Manager
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FINAL NOTE: THE HUMAN EXPOSURES EI IS A QUALITATIVE SCREENING OF EXPOSURES AND THE DETERMINATIONS WITHIN THIS DOCUMENT SHOULD NOT BE USED AS THE SOLE BASIS FOR RESTRICTING THE SCOPE OF MORE DETAILED (E.G., SITE-SPECIFIC) ASSESSMENTS OF RISK.