Documentation of Environmental Indicator Determination

RCRA Corrective Action
Environmental Indicator (EI) RCRIS Code (CA725)
Current Human Exposures Under Control

Facility Name: BASF/American Cyanamid Agricultural PR
Facility Address: P.R. State Road #2, Km. 47.3, Manatí, Puerto Rico
Facility EPA ID#: PRD091065102

Definition of Environmental Indicators (for the RCRA Corrective Action)

Environmental Indicators (EIs) are measures being used by the Resource Conservation and Recovery Act (RCRA) Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved) to track changes in the quality of the environment. The two EIs 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 objectives of the RCRA Corrective Action program, the EIs 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 is for reasonably expected human exposures under current land- and groundwater-use conditions ONLY, and does 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 determination status codes should remain in the Resource Conservation and Recovery Information System (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 Information

BASF Agricultural Products (BASF) de PR facility in located in north central Puerto Rico at State Road No. 2 Km. 47.3 in the Municipality of Manatí (refer to *Attachment 1*). BASF manufacturing operations in Manati have been dedicated to the formulation of liquid herbicides since February 2009. As the facility is currently operating, access to its premises is controlled by security at all times. Manufacturing operations at the Site occupy approximately 21.41 acres of a total of 27.37 acres of land owned by the company. (Ref. 9)

BASF acquired the Manati Site in July 1, 2000 from the American Home Products Corporation (AHPC). AHPC had purchased the facility from Cyanamid Agricultural de PR, Inc. (Cyanamid or CAPRI) in November 24, 1994. (Ref. 9)

The Cyanamid Manati operation was engaged in the manufacturing of veterinary products and chemical intermediates for herbicide formulations since early 1976[1]. (Ref. 1) At the time, the Cyanamid manufacturing facilities occupied approximately 12 acres of land within the Manatí East Industrial Park (refer to *Attachment 1*). The land uses in the area surrounding the facility included: residential to the north and west (and some commercial); undeveloped land to the south, including a large sinkhole located adjacent to the facility; industrial to the east with the Davis & Geck[2] (D&G) manufacturing facility as fence-line neighbor. (Ref. 2)

The nearest major surface water body is the Rio Grande de Manati, located approximately 1.25 miles southwest. A sinkhole located on an adjacent 7.2 acre plot of land lies approximately 300 feet southwest of the facility (refer to *Attachment 1*). No groundwater wells are located on the facility premises; however, the facility's process (and fire) water is provided by two groundwater extraction wells located at the adjoining D&G facility. Potable water for the facility is provided by the Puerto Rico Aqueduct and Sewer Authority (PRASA). The facility is located over a sensitive karst aquifer, comprised of the Aguada and Aymamón limestone formations, which is an important water source for PRASA, industries and agricultural users in the region. This aquifer system is closely related to the nearby Tortugero Lagoon; its normal groundwater flow direction is north-north east toward the lagoon. The facility is located outside the 100-year flood zone. (Ref. 1)

Storm water from the facility is collected by storm sewers for discharge into a natural sinkhole that lies southwest of the facility; the sinkhole is permitted as a Class VI injection well to receive storm water runoff from the facility under permit UIC 870036 issued by the Puerto Rico Environmental Quality Board (PREQB). The facility monitors storm water quality parameters quarterly as per the discharge permit. A large kerosene spill occurred in November 17, 1997 at the D&G plant impacted the sinkhole through the facility's stormwater collection system. D&G notified and addressed the spill, undertook a cleanup effort and submitted a written notification on the spill remediation efforts to EPA in January 15, 1998. (Ref. 2)

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[1] Cyanamid Agricultural, a subsidiary of the American Cyanamid Company, started manufacturing operations at this site in March 3, 1976; veterinary products were manufactured at the Manatí plant until 1993. Cyanamid was purchased by AHPC in November 24, 1994.

[2] The former Davis & Geck facility was acquired by Doctors Hospital in November 13, 2003.

Regulatory Information

The former Cyanamid facility filed a Part A Permit application in November 19, 1980. It operated as a permitted hazardous waste Treatment, Storage and Disposal (TSD) facility from late 1980 until late 1983, when the facility requested to withdraw the Part A application and terminate interim status. During such period, the facility operated a liquid hazardous waste incinerator[3] unit (down-fired thermal model LV-10) until September 30, 1982, when the incinerator was taken out of service. In December 15, 1983, PREQB approved the declassification of the facility from TSD to generator. In April 30, 1984, EPA issued the facility a notification of interim status termination effective in May 30, 1984. (Ref. 1, 9)

A RCRA Facility Assessment (RFA) was conducted at this facility by the PREQB in late 1990 and a full report was issued in December 1990. Two visual site inspections (VSI) were conducted by PREQB staff as part of the 1990 RFA (October 1 and November 9, 1990). The main hazardous wastes streams identified as generated by the Cyanamid manufacturing operations at the site were as follows: (Ref. 1)

- Filter cakes impregnated with toluene (D001, F005)
- Filter bags
- Solvent mixture and residues from chemical testing (F003, F005, D001)
- Still bottoms of toluene recovery (F005)
- Spent toluene (F005, D001)
- Waste oil.

PREQB identified eleven (11) Solid Waste Management Units (SWMUs) and four (4) Areas of Concern (AOCs) during the 1990 RFA (refer to *Attachment 2*), as follows: (Ref. 1)

- SWMU #1 – Old Hazardous Waste Container Storage Area
- SWMU #2 – New Hazardous Waste Container Storage Area
- SWMU #3 – Incinerator
- SWMU #4 – Underground Storage Tank
- SWMU #5 – Aboveground Storage Tank
- SWMU #6 – Solvent Recovery Area
- SWMU #7 – Cargo Tank
- SWMU #8 – Process Drain Tank
- SWMU #9 – Satellite Area I

[3] The hazardous waste incinerator commenced operation around August 27, 1976; the unit was used for burning still bottoms from the recovery of toluene.

- SWMU #10 – Satellite Area II
- SWMU #11 – Waste Oil Storage Area
- AOC #1 – Raw Material Storage Area I
- AOC #2 – Raw Material Storage Area II
- AOC #3 – Raw Material Storage Area III
- AOC #4 – Loading/Unloading Area.

The 1990 RFA recommended no further action for all SWMUs and AOCs except for the Solvent Recovery Area (SWMU #6), where further sampling was recommended due to observation of dark stains on the distillation tank's surface and on the trench surface. (Ref. 1, 5) According to the RFA Report, the tars from the toluene distillation process (F005, D001) were the most likely source of such releases to the soil in the Solvent Recovery Area. (Ref. 1)

In April 29, 2009, EPA notified in writing to BASF Cyanamid Agricultural Products that the Manatí site was subject to RCRA Corrective Action requirements, including submission of a RCRA Facility Investigation (RFI) to fully characterize releases of hazardous waste at SWMU #6 (Solvent Recovery Area) based on the December 1990 RCRA Facility Assessment (RFA) Report's findings and recommendations. (Ref. 5)

In letter dated May 20, 2009, BASF replied to EPA's April 29, 2009 notification of the RFI Work Plan requirement by submitting a copy of an Environmental Site Assessment[4] (ESA) Report prepared by Malcolm Pirnie for the facility in March 2, 2000. (Ref. 6) This ESA was commissioned by American Home Products Corporation (AHPC) upon acquiring the Cyanamid facility in November 24, 1994 to assess the environmental conditions of the site and its compliance status regarding environmental regulations. At the time, such report was considered an internal due diligence assessment and was not submitted to EPA[5] or PREQB for review. (Ref. 2)

As part of the ESA effort, soil sampling was conducted to further assess the potential environmental issues identified at the Solvent Recovery Area (SWMU #6), the former Drum Storage Area, and the Tank Farm (refer to *Attachment 3*). The ESA also included sampling of the sediments at the nearby sinkhole as well as groundwater sampling from both D&G's process water production wells. Therefore, the ESA did address the recommendations made by the December 1990 RFA Report to further sample the soil in the Solvent Recovery Area. (Ref. 2)

[4] A Phase 2 due diligence assessment.

[5] As the 2000 ESA was conducted as an internal due diligence environmental assessment (i.e., in support of the innocent landowner defense under CERCLA), the assessment's work plan was not reviewed nor approved by EPA under the RCRA Corrective Action scheme. However, the ESA was conducted in accordance with the Phase 2 due diligence requirements and followed the recommendations of the New Jersey Technical Regulations remediation guidance of 2000 regarding target analytes in environmental samples for remediation projects.

Since April 29, 2009, EPA and BASF had exchanged correspondence regarding the applicability of RCRA Corrective Action requirements to the Manatí Site, specifically the need for the Facility to submit an RFI Work Plan to address findings and recommendations of the December 1990 RCRA Facility Assessment (RFA) Report. In addition to such correspondence, EPA has had direct communication with BASF representatives, both via phone and face-to-face meetings, in an effort to obtain additional information and/or clarify existing information on the status of the Facility regarding its corrective action obligations. (Ref. 3-9)

References

1. RCRA Facility Assessment Report, Cyanamid Agricultural of PR, Inc., Barceloneta[6], Puerto Rico, PRD-091065102, prepared by Harold Carrasquillo Alberty, PREQB Land Pollution Control Area (LPCA), Hazardous Waste Division, December 1990. This RFA report was forwarded to Michael Poetzsch of EPA Region 2/HWFB/CFS through a letter from Flor del Valle, Director of PREQB's LPCA, dated 31 Dic. 1990.
2. Environmental Site Assessment (ESA) Report, American Cyanamid Company, Manatí, Puerto Rico Facility, prepared by Malcolm Pirnie, March 2, 2000. This ESA Report was submitted to Jean Robert Jean of EPA Region 2 in May 20, 2009 in response to EPA's April 29, 2009 notification to the facility of the requirement to file a RCRA Facility Investigation (RFI) under the RCRA Corrective Action requirements.
3. EPA letter addressed to BASF Cyanamid Agricultural Products from Jean Robert Jean of Region 2/RCRA Programs Branch, dated April 29, 2009, on the subject of RCRA Facility Investigation (RFI) for BASF Cyanamid Agricultural Products of Puerto Rico. The letter notified BASF that it is subject to RCRA Corrective Action requirements, including submission of an RFI Work Plan to fully characterize releases of hazardous waste at SWMU #6 (Solvent Recovery Area) based on the December 1990 RCRA Facility Assessment (RFA) Report's findings and recommendations.
4. BASF Corporation letter addressed to Jean Robert Jean of EPA Region 2/RPB from Joseph McKeon, dated May 20, 2009, in response to EPA's April 29, 2009 notification of requirement to submit an RFI Work Plan to characterize releases of hazardous waste from SWMU #6 as recommended in the December 1990 RFA Report. A copy of the March 2000 ESA Report was included as attachment to this letter (See Ref. 2).
5. BASF Corporation letter addressed to Ariel Iglesias of EPA Region 2/CEPD/RRB from Joseph McKeon dated, June 3, 2009, in response to EPA's April 29, 2009 notification of requirement to submit an RFI Work Plan to characterize releases of hazardous waste from SWMU #6 as identified in the December 1990 RFA Report.
6. EPA e-mail message addressed to Doris García of BASF Corporation from Angel Salgado of EPA Region 2/CEPD/RRB, dated June 11, 2013, on the subject of the RFI Work Plan filing status and March 2000 ESA Report data gaps. The message follows up on phone conversations between EPA and BASF occurred in July 17, 2012, May 29, 2013, and June 6, 2013, regarding EPA's information request on the RFI Work Plan and the March 2000 ESA Report data gaps.
7. BASF Corporation letter addressed to Angel Salgado of EPA Region 2/CEPD/RRB from Vernon C. Burrows, dated June 21, 2013, in response to EPA's e-mail dated June 11, 2013 regarding the RFI Work Plan filing status and March 2000 ESA Report data gaps.

[6] The original document erroneously indicated Barceloneta although the facility is actually located in Manatí.

8. EPA e-mail message addressed to Joseph McKeon of BASF Corporation from Angel Salgado of EPA Region 2/CEPD/RRB, dated July 2, 2013, on the subject of BASF Agricultural Chemicals Site Manatí PR. EPA's message confirmed receipt of three attachments forwarded by BASF, specifically, copies of (1) May 20, 2009 response to EPA's April 29, 2009 letter; (2) Tank Farm Removal Closure Samples and Disposal documentation ; and (3) June 21, 2013 response to EPA's June 11, 2013 e-mail request of information.
9. E-mail correspondence addressed to Angel Salgado of EPA Region 2/CEPD/RRB from Doris Garcia of BASF Agricultural Chemicals, dated July 7, July 21, and July 23, 2014, on the subject of BASF Manatí CA-725 Environmental Indicators determination status. BASF's correspondence provided responses to EPA's June 25, July 7, and July 22, 2014 information requests aimed at clarifying some remaining data gaps regarding the Manati Site's operational history.
10. Memorandum to the File from Angel Salgado of EPA, dated July 22, 2014, on the subject of EPA's review of corrective action documents related to the BASF Agricultural Products de PR facility in Manati as part of a CA-725 EIs determination.

AVAILABLE, RELEVANT AND SIGNIFICANT INFORMATION

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 (SWMUs), regulated units (RUs), and areas of concern (AOCs)), 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

Rationale

Summary of Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs):

A RCRA Facility Assessment (RFA) was conducted at this facility by the PREQB in late 1990 and a full report was issued in December 1990. Two visual site inspections (VSI) were conducted by PREQB staff as part of the 1990 RFA (October 1 and November 9, 1990). The RFA identified eleven (11) Solid Waste Management Units (SWMUs) and four (4) Areas of Concern (AOCs), as listed in the Regulatory Information section above. (Ref. 1)

SWMU #1 – Old Hazardous Waste Container Storage Area

This SWMU consisted of an open, unroofed 60 x 40 feet rectangular concrete pad for drum storage located southwest of the production (chemical) building. The concrete pad was sloped to direct any spills or rain water into a drain. An underground pipe connected the drain to a sump pit. The area could store up to an estimated 450 55-gallon drums. This area entered operation in 1976 and was active until April 1990, when a new container storage area was constructed (see SWMU #2 below). Inspections by PREQB showed RCRA deficiencies in this area and the facility was forced to build a new RCRA-compliant storage area. However, since the unit's secondary containment system was deemed adequate and showed no signs of releases, the RFA concluded that releases of hazardous waste to the environment from this area were unlikely. No further action was recommended for this SWMU. (Ref. 1)

SWMU #2 – New Hazardous Waste Container Storage Area

This SWMU consisted of a fenced 40 x 30 feet shed with a concrete floor and a sheet metal roof located west of the production building. The concrete floor was epoxy-coated and the drums were seen raised from the floor placed over wood pallets. The area could store up to an estimated 450 55-gallon drums and was used as a 90-day storage area for 55-gallon drums. This area entered operation in 1990 as it replaced the old drums storage area (see SWMU #1 above). The unit was surrounded by a 3 feet tall wall on three sides and was trenched for secondary containment. The trench drained into a sump pit. Since the unit's secondary containment system was deemed adequate and showed no evidence of releases, the RFA concluded that releases of hazardous waste to the environment from this area were unlikely. No further action was recommended for this SWMU. (Refs. 1)

SWMU #3 – Incinerator

Around August 27, 1976, the facility started operating a liquid hazardous waste incinerator unit (down-fired thermal model LV-10) for burning still bottoms from the recovery of toluene (F005). The unit operated continuously until September 30, 1982, when it was taken out of service. (Ref. 1) The incinerator's operation was permitted by the PREQB's Air Quality Program under permit number PFE-777-0500-I-II-III-(O). (Ref. 6)

The facility filed a Part B permit application for the incinerator and the container (drum) storage pad in October 5, 1982. A closure plan for the incinerator and the container storage pad was submitted to EPA/PREQB in June 30, 1983. A closure certification for the incinerator and drum storage pad was submitted to EPA in March 14, 1984, and was received by EPA in April 2, 1984. The incinerator was dismantled/decommissioned in or around August 1984. (Ref. 1, 6) Per EPA's RCRA records, closure verification-clean closure acceptance (CL380CA entry) for the incinerator was entered in 5/1/1985.

Since the unit's secondary containment system was deemed adequate and showed no evidence of releases, and no releases of hazardous waste had been reported from the unit, the 1990 RFA recommended no further action for this SWMU. (Ref. 1)

SWMU #4 – Underground Storage Tank

This SWMU consisted of a 6,000 gallon tank that served as the feed tank for the incinerator (see SWMU #3 above) since 1976, which was located underground adjacent to the incinerator. This horizontal cylindrical tank, made of 5/16 inch thick carbon steel, was enclosed below and on all sides by a one foot thick reinforced concrete. The dike was covered by steel plates at ground level. During the incinerator's active life, the tank stored liquid still bottoms from toluene recovery (F005). Once the incinerator was closed in late 1982, the tank was used for 90-day storage of liquid still bottoms for off-site solvent (toluene) recovery. (Ref. 1)

As per closure certification dated December 7, 1987, the tank was closed and decontaminated following RCRA requirements. Since the unit's secondary containment system was deemed adequate and showed no evidence of releases, and no releases of hazardous waste had been reported from the unit, the 1990 RFA recommended no further action for this SWMU. (Ref. 1)

SWMU #5 – Aboveground Storage Tank

This SWMU consisted of a funnel shaped stainless steel vertical tank (6' top diameter x 16') with a 2,300 gallon holding capacity that was located at the Solvent Recovery Area. The unit served as temporary holding tank for toluene recovery still bottoms (F005) generated during the toluene distillation process. From this tank, the still bottoms were discharged into a cargo tank located directly below. The tank had a concrete dike for secondary containment. It entered operation in 1984 and was still in use at the time of the 1990 RFA. (Ref. 1)

As no releases of hazardous waste had been reported from this unit to the environment, and no signs of releases were observed during the VSIs performed by PREQB in late 1990 as part of the RFA, no further action was recommended for this SWMU. (Ref. 1)

SWMU #6 – Solvent Recovery Area

This SWMU consisted of five aboveground steel tanks for the recovery/recycling of spent toluene from the site's manufacturing process. Spent toluene generated during manufacturing operations was collected and stored in two carbon steel, 2,000 gallon solvent recovery tanks (Tanks #040 and #045). From these tanks the spent toluene was transferred to one stainless steel, 2,000 gallon tank (Tank #130-030), where distillation of the spent solvent occurred. Once distilled, the regenerated toluene was discharged into two carbon steel, 2,000 gallon tanks (Tanks #130-035A and #130-035B). From these tanks, the distilled toluene was either returned to the manufacturing process for reuse or transferred to four toluene storage tanks located at the tank farm area (in the southeast corner of the Site). (Ref. 1)

The Solvent Recovery Area had been in operation since 1976 and was still in use at the time of the 1990 RFA. A 30' L x 10" W x 4" H trench provided secondary containment for the unit; the trench drained into a 40' L x 15' W process drain tank dike (see SWMU #8 below). (Ref. 1)

A potential for releases of hazardous waste to soil/groundwater from this unit was determined to exist during the VSIs performed by PREQB as part of the 1990 RFA as dark stains were observed on the surface of the distillation tank and on the trench. The stains appeared to originate from toluene distillation tars. Soil sampling of this area was recommended in the RFA report to further assess if hazardous waste releases had indeed occurred. (Ref. 1)

SWMU #7 – Cargo Tank

This SWMU consisted of a mobile, 6,000 gallon capacity, stainless steel horizontal cylindrical tank (tank truck) located under the funnel shaped vertical tank (SWMU # 5). This mobile tank received the toluene still bottoms (F005) from the funnel tank and was used as a 90-day storage unit for toluene still bottoms. Once filled, the tank truck was transported to a treatment /disposal facility for off-site disposal of the still bottoms. (Ref. 1)

The cargo tank had been in operation since 1982 and was still in use at the time of the 1990 RFA. It was located in a 13' W x 50' L area surrounded by a 3' H dike with a 2' x 2' x 2' sump that drained into the process drain tank. (Ref. 1)

As no releases of hazardous waste had been reported from this unit to the environment, and no signs of releases were observed during the VSIs performed by PREQB as part of the 1990 RFA, no further action was recommended for this SWMU. (Ref. 1)

SWMU #8 – Process Drain Tank (Wastewater Treatment Unit)

This SWMU consisted of a 20,000 gallon capacity, steel horizontal, cylindrical underground tank used for performing pH adjustment (elemental neutralization) of wastewaters generated during the site's operations (i.e., process wastewaters, and wastewaters from tank cleanup, decanting activities, and SWMU drainage). The 11' W (diameter) x 28' L tank was enclosed within a reinforced concrete basin, and the area above the tank was provided with a metal grid. Once the wastewater in the tank was neutralized, it was transferred to other wastewater treatment units for further treatment. The tank had been in operation since 1976 and was still in use at the time of the 1990 RFA. (Ref. 1)

As no releases of hazardous waste had been reported from this unit to the environment, and no signs of releases were observed during the VSIs performed by PREQB as part of the 1990 RFA, no further action was recommended for this SWMU. (Ref. 1)

SWMU #9 – Satellite Area I

This satellite area consisted of a 5' x 5' area located inside the chemical plant used for accumulating and storing filter cakes and filter bags contaminated with toluene. The area had a concrete floor and accommodated up to two containers: 55-gallon metal drums (containing filter cakes) and/or 30-gallon poly drums (containing filter bags). Upon filling, the drums were transferred to the new hazardous waste storage area (see SWMU #2 above) for further storage. This satellite area was provided with a trench that drained into the Process Drain Tank (see SWMU #8 above). It had been in operation since 1985 and was still in use at the time of the 1990 RFA. (Ref. 1)

As no releases of hazardous waste had been reported from this unit to the environment, and no signs of releases were observed during the VSIs performed by PREQB as part of the 1990 RFA, no further action was recommended for this SWMU. (Ref. 1)

SWMU #10 – Satellite Area II

This satellite area consisted of a 5' x 5' area located outside the chemical plant (on the north end of the plant) used for accumulating and storing lab wastes. The area had a concrete floor, was roofed (sheet metal) and had a cyclone fence gate. The area accommodated only one container: a 55-gallon poly drum. Upon filling, the drum was transferred to the new hazardous waste storage area (see SWMU #2 above) for further storage. The 4" D concrete pad of this satellite area drained into the Process Drain Tank (see SWMU #8 above). It had been in operation since 1989 and was still in use at the time of the 1990 RFA. (Ref. 1)

As no releases of hazardous waste had been reported from this unit to the environment, and no signs of releases were observed during the VSIs performed by PREQB as part of the 1990 RFA, no further action was recommended for this SWMU. (Ref. 1)

SWMU #11 – Waste Oil Storage Area

This storage area consisted of a 13' W x 38' L concrete pad located outside the chemical plant (on the west end of the plant) used for storing waste oils (non-hazardous waste) generated by the site's operations for off-site disposal. The concrete pad had an aluminum roof and back wall. The area was surrounded by an 8' H concrete curb and had a 38' L trench on its back. Waste oil was stored on 55-gallon steel drums. The unit had been in operation since 1984 and was still in use at the time of the 1990 RFA. (Ref. 1)

As no releases of hazardous waste had been reported from this unit to the environment, and no signs of releases were observed during the VSIs performed by PREQB as part of the 1990 RFA, no further action was recommended for this SWMU. (Ref. 1)

AOC #1 – Raw Material Storage Area I

This storage area consisted of a 20' x 42' shed located on the west side of the Facility used for storing raw materials such as phosphoric acid and HCL. The shed had a concrete floor and a sheet metal roof, and was completely surrounded by a 9' H concrete dike. The area had been in operation since 1976 and was still in use at the time of the 1990 RFA. (Ref. 1)

As no releases of hazardous waste had been reported from this unit to the environment, and no signs of releases were observed during the VSIs performed by PREQB as part of the 1990 RFA, no further action was recommended for this SWMU. (Ref. 1)

AOC #2 – Raw Material Storage Area II

This storage area consisted of a 42' x 52' shed located on the west side of the Facility used for storing raw materials such as phosphorus oxychloride. The shed had a concrete floor and a sheet metal roof, and had a concrete dike. The area had been in operation since 1976 and was still in use at the time of the 1990 RFA. (Ref. 1)

As no releases of hazardous waste had been reported from this unit to the environment, and no signs of releases were observed during the VSIs performed by PREQB as part of the 1990 RFA, no further action was recommended for this SWMU. (Ref. 1)

AOC #3 – Raw Material Storage Area III

This storage area consisted of a 40' L x 30' W shed located on the west side of the Facility used for storing raw materials such as Pursuit Technical, acetic acid, ammonium hydroxide. The shed had a concrete floor (epoxy coated), a sheet metal roof, and was fenced on all sides. The area's concrete pad had a 30' L x 1' W trench and with a sump. It had been in operation since 1989 and was still in use at the time of the 1990 RFA. (Ref. 1)

As no releases of hazardous waste had been reported from this unit to the environment, and no signs of releases were observed during the VSIs performed by PREQB as part of the 1990 RFA, no further action was recommended for this SWMU. (Ref. 1)

AOC #4 – Loading/Unloading Area

This area consisted of a 86' x 17' concrete pad located on the east side of the Facility used for unloading raw materials from tank trucks for transfer to the materials storage tanks at the Tank Farm. The area was surrounded by trenches that drained into a concrete pit. Only raw materials were managed in this area such as sulfuric acid, sodium hydroxide, toluene and aniline. This area had been in operation since 1976 and was still in use at the time of the 1990 RFA. (Ref. 1)

As no releases of hazardous waste had been reported from this unit to the environment, and no signs of releases were observed during the VSIs performed by PREQB as part of the 1990 RFA, no further action was recommended for this SWMU. (Ref. 1)

Refer to *Attachment 4* for a Summary Table of Media Impacts.

Current Status of SWMUs and AOCs

The 1990 RFA recommended no further action for all SWMUs and AOCs except for the Solvent Recovery Area (SWMU #6), where further sampling was recommended due to observation of dark stains on the distillation tank's surface and on the trench surface. (Ref. 1, 5)

An internal Environmental Site Assessment (ESA) was conducted at this Site in 2000 to assess the environmental conditions of the Facility and its compliance status regarding environmental regulations. As part of such due diligence assessment, soil sampling was conducted to further assess the potential environmental issues identified by the ESA at several operational areas in the Facility, including the Solvent Recovery Area (SWMU #6), the former Drum Storage Area[7], and the Tank Farm[8]. The ESA also included sampling of sediments at the nearby sinkhole as well as sampling of groundwater from both D&G's process water production wells and distribution system. (Ref. 2)

To specifically address the recommendations made by the December 1990 RFA Report to further sample the soil in the Solvent Recovery Area (SWMU #6), the ESA collected four soil samples around the Solvent Recovery Area and two additional soil samples around the Chemical Building (in the vicinity of the Solvent Recovery Area). All soil samples collected as part of the ESA were analyzed for priority pollutants plus 40[9]. (Ref. 2, 6)

The ESA conclusions regarding the potential environmental issues identified at the former Cyanamid facility in Manatí are summarized below:

- Analytical results for four soil samples collected in the general vicinity of the former Solvent Recovery Area (SWMU #6) revealed no detections above applicable guidance levels. These four samples were identified in the ESA as samples B-8, B-9, B-12, and B-18. The soil samples for the Chemical Building, identified in the ESA as samples B-6 and B-7, showed no detections above applicable guidance levels, either.
- Analytical results for one soil sample collected in the vicinity of the former Drum Storage Area revealed no concentrations of chemical constituents above applicable guidance values.
- Analytical results for five surface soil samples collected under the Tank Farm showed detections for toluene that exceeded EPA's migration to groundwater Soil Screening Level (SSL) in some of the initial samples. These five initial samples were obtained from four 5 feet deep excavations made under the Tank Farm and were identified in the ESA as samples B-1, B-2, B-3, East and West. Subsequent sampling was performed from these excavations for VOCs analysis; toluene was detected in one soil sample at 278 mg/kg. Further excavation was undertaken under the Tank Farm where toluene levels were found high. Post-excavation soil samples were collected and analyzed for VOCs; analytical results for these samples were not included in the ESA Report and

[7] The Drum Storage Area was identified as SWMU #2 in the 1990 RFA Report.

[8] The Tank Farm was not identified as a SWMU or AOC in the 1990 RFA Report.

[9] The Priority Pollutant List plus 40 (PP + 40) refers to the analysis of a sample for Priority Pollutant List compounds and up to 20 non-targeted volatile organic compounds and up to 20 non-targeted semi-volatile organic compounds using the GC/MS analytical method. The use of PP + 40 was based on the recommendations of the New Jersey Technical Regulations remediation guidance of 2000, which specified the target analytes in environmental samples for remediation projects.

were recently submitted to EPA by BASF. The post-report results for the post-excavation soil samples showed toluene levels under applicable guidance values.
- Analytical results for a sample of sediment collected from the sinkhole adjacent to the facility revealed no volatile organic chemical constituents above applicable guidance values.
- Analytical results for the groundwater samples collected from both Davis & Geck's process water production wells revealed low concentrations of chlorinated VOCs detected below EPA's Maximum Contaminant Levels (MCLs) for drinking water. (Ref. 2)

Analytical results obtained for soil samples as part of the ESA were compared with Soil Screening Levels (SSLs). These SSLs are risk-based concentrations developed by EPA in the *May 1996 Soil Screening Guidance: Technical Background Document*. Based on the results of the ESA, neither the soils around the Solvent Recovery Area, the adjacent Chemical Building, or the former Drum Storage Areas, nor the sediment collected from the sinkhole adjacent to the facility, had concentrations of priority pollutant constituents above the SSLs. On the analytical results for the Tank Farm, however, one sample (collected from the northeast excavation) did exceed EPA's migration to groundwater SSL for toluene. Upon further excavation of the toluene impacted soil under the Tank Farm, additional post-excavation sampling was conducted. Results for the post-excavation soil samples analyzed for VOC indicated that toluene levels were under the SSL. (Ref. 2).

In May 29, 2009, PREQB conducted a reconnaissance of the BASF Manatí Site. In a report letter dated June 1, 2009 to EPA on this site visit, PREQB indicated that it assessed the old chemistry plant, which at the time, was being used for liquid herbicide formulation[10]. The former Solvent Recovery Unit (SWMU #6) was also assessed. In its report, PREQB indicated that no groundwater monitoring wells were installed at the facility. The report included copies of photos taken by PREQB of the assessed areas. (Ref. 3)

More recently, in November 20, 2013, EPA performed a RCRA site visit at BASF to assess the current conditions of the facility's former SWMUs (as identified in the December 1990 RFA), and to visually inspect the areas where soil/groundwater sampling was performed as part of the ESA activities. In its report of the visit, EPA indicated that the former SWMUs don't exist anymore, and for the most part, the only physical features remaining of them were their former concrete slabs. (Ref. 4)

Based on the information currently available to EPA for the BASF Manatí Site, including the 2000 ESA Report submitted by BASF and its analytical data for soil sampling, EPA has determined that the Site has met its corrective action obligations under RCRA by addressing the recommendations of the 1990 RFA.

References:

1. RCRA Facility Assessment Report, Cyanamid Agricultural of PR, Inc., Barceloneta, Puerto Rico, PRD-091065102, prepared by Harold Carrasquillo Alberty, PREQB Land Pollution Control Area (LPCA), Hazardous Waste Division, December 1990.

[10] The old Cyanamid chemistry plant was closed in November 3, 2004; since February 2009, BASF has used the former chemical plant facility for the formulation of liquid herbicides. The first batch of liquid herbicide was manufactured in February 9, 2009.

2. Environmental Site Assessment (ESA) Report, American Cyanamid Company, Manatí, Puerto Rico Facility, prepared by Malcolm Pirnie, March 2, 2000.

3. PREQB letter addressed to Angel Salgado of EPA Region 2/CEPD/RRB dated June 1, 2009 on the subject of a Site Reconnaissance performed by PREQB Inspector Diana Cruzado in May 29, 2009 at BASF Cyanamid Agricultural in Manatí.

4. EPA RCRA Site Visit Report prepared by Angel Salgado, EPA's Region 2 RCRA Corrective Action Project Manager, upon assessing the facility in November 20, 2013.

5. EPA letter addressed to BASF Cyanamid Agricultural Products from Jean Robert Jean of Region 2/RCRA Programs Branch, dated April 29, 2009, on the subject of RCRA Facility Investigation (RFI) for BASF Cyanamid Agricultural Products of Puerto Rico.

6. E-mail correspondence addressed to Angel Salgado of EPA Region 2/CEPD/RRB from Doris Garcia of BASF Agricultural Chemicals, dated July 7, July 21, and July 23, 2014, on the subject of BASF Manatí CA-725 Environmental Indicators determination status. BASF's correspondence provided responses to EPA's June 25, July 7, and July 22, 2014 information requests aimed at clarifying some remaining data gaps regarding the Manati Site's operational history.

GROUND WATER KNOWN OR REASONABLY SUSPECTED TO BE CONTAMINATED

2. Are groundwater, soil, surface water, sediments, or air media known or reasonably suspected to be "contaminated"[11] 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)?

Media	Yes	No	?	Rationale/Key Contaminants
Groundwater		X		
Air (indoors)[12]		X		
Surface Soil (e.g., <2 ft)		X		
Surface Water		X		

11 "Contamination" and "contaminated" describe 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).

12 Recent evidence (from the Colorado Department of Public Health and Environment, and others) suggests 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.

Sediment		X		
Subsurface Soil (e.g., >2 ft)		X		
Air (Outdoor)		X		

X 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.

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.

Rationale:

Surface/Subsurface Soil, Surface Soil/Sediment, and Indoor/Outdoor Air

BASF Agricultural Products (BASF) de PR facility, formerly owned and operated by the American Cyanamid Company, was engaged in the manufacturing of veterinary products and chemical intermediates for herbicide formulations since 1976. (Ref. 2) A RCRA Facility Assessment (RFA) conducted at this facility by the PREQB in late 1990 identified eleven (11) SWMUs and four (4) AOCs. The 1990 RFA recommended no further action for all SWMUs and AOCs except for the Solvent Recovery Area (SWMU #6), where further sampling was recommended due to observation of dark stains on the distillation tank's surface and on the trench surface. (Ref. 1) An Environmental Site Assessment (ESA) was conducted in 2000 by the new facility owner, AHPC, to assess the environmental conditions of the site and its compliance status regarding environmental regulations. The ESA included soil sampling to further assess the potential environmental issues identified at the Solvent Recovery Area (SWMU #6), as recommended by the 1990 RFA Report; but it also sampled soil at the former Drum Storage Area and the Tank Farm, as well as sediments at the nearby sinkhole and groundwater (see groundwater data discussion below) from both Davis & Geck's process water production wells. (Ref. 2)

The analytical results of soil/sediment samples showed no concentrations of priority pollutant constituents[13] above applicable guidance values for any of the areas assessed. All analytical results obtained for soil samples/sediment as part of the ESA were further compared with EPA's Soil Screening Levels[14] (SSLs). Neither the soils around the Solvent Recovery Area, the adjacent Chemical Building, or the former Drum Storage Areas, nor the sediment collected from the sinkhole adjacent to the facility, exceeded the migration to groundwater SSLs. On the analytical results for the Tank Farm, however, one sample (collected from the northeast excavation) did exceed EPA's migration to groundwater SSL for

[13] Further discussion on the priority pollutants plus 40 constituents analyzed in the soil samples collected as part of the ESA is provided under footnote #9 above.

[14] Risk-based concentrations developed by EPA in the *May 1996 Soil Screening Guidance: Technical Background Document*.

toluene. Upon further excavation (removal) of the toluene-impacted soil under the Tank Farm, additional post-excavation sampling was conducted. Results for the post-excavation soil samples analyzed for VOC indicated that toluene levels were under the SSL. (Ref. 2)

In face of the absence of surface/subsurface soil and sediments contamination at the Site as per the 2000 ESA sampling results, contamination of indoor or outdoor air at this Site is considered unlikely.

Groundwater

The facility is located within the Northern Coast Limestone Belt of Puerto Rico, overlying a sensitive aquifer system comprised of the Aguada and Aymamón limestone formations. This aquifer system represents an important water source for the Puerto Rico Aqueduct and Sewer Authority (PRASA), industries and agricultural users in the region. The aquifer is closely related to the nearby Tortugero Lagoon and normal groundwater flow is north-north east in the direction of the lagoon. A large, natural sinkhole lies approximately 300 feet southwest of the facility. The sinkhole is permitted as an injection well to receive storm water runoff from the facility. The nearest major surface water body is the Rio Grande de Manati, located approximately 1.25 miles southwest of the facility. (Ref. 1)

No groundwater wells are located within the actual facility. All process (and fire) water for the facility is provided by two groundwater extraction wells located at the adjoining D&G facility. These extraction wells, labeled North (#104114) and South (#104115), are operated by D&G and maintained by BASF. (Ref. 3) The North well is 286 feet deep and screened at 230 below land surface (bls) while the South well is 285 feet deep and is screened at 219 feet bls. (Ref. 2) Refer to *Attachment 5* for a diagram showing the location of the D&G groundwater extraction wells.

As indicated above, the 2000 ESA included sampling of the groundwater from both D&G's process water extraction wells. Analytical results for the process groundwater samples collected from both D&G's wells revealed low concentrations of chlorinated volatile organic chemicals (VOCs) below EPA's Maximum Contaminant Levels (MCLs) for drinking water. (Ref. 2)

References:

1. RCRA Facility Assessment Report, Cyanamid Agricultural of PR, Inc., Barceloneta, Puerto Rico, PRD-091065102, prepared by Harold Carrasquillo Alberty, PREQB Land Pollution Control Area (LPCA), Hazardous Waste Division, December 1990.

2. Environmental Site Assessment (ESA) Report, American Cyanamid Company, Manatí, Puerto Rico Facility, prepared by Malcolm Pirnie, March 2, 2000.

3. E-mail correspondence addressed to Angel Salgado of EPA Region 2/CEPD/RRB from Doris Garcia of BASF Agricultural Chemicals, dated July 7, July 21, and July 23, 2014, on the subject of BASF Manatí CA-725 Environmental Indicators determination status. BASF's correspondence provided responses to EPA's June 25, July 7, and July 22, 2014 information requests aimed at clarifying some remaining data gaps regarding the Manati Site's operational history.

EXPOSURE PATHWAYS DETERMINATION

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?

Table 1 - Summary Exposure Pathway Evaluation Table
Potential Human Receptors (Under Current Conditions)

"Contaminated" Media	Residents	Workers	Day-Care	Construction	Trespasser	Recreation	Food[15]
Groundwater					–	–	
Air (indoor)				–	–	–	–
Surface Soil (e.g. < 2 ft)							
Surface Water			–	–			
Sediment			–	–			
Subsurface Soil (e.g., > 2 ft)	–	–	–		–	–	
Air (outdoors)						–	–

Instruction 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. These spaces instead have dashes ("--"). While these combinations may not be probable in most situations they may be possible in some settings and should be added as necessary.

__ 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.

15 Indirect Pathway/Receptor (e.g., vegetables, fruits, crops, meat and dairy products, fish, shellfish)

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

Rationale:

This question is not applicable. See the response to Question 2.

EXPOSURE PATHWAYS SIGNIFICANCE

4. Can the exposures from any of the complete pathways identified in #3 be reasonably expected to be significant[16] (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 cannot 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:

This question is not applicable. See the response to Question 2.

SIGNIFICANT EXPOSURE PATHWAYS ASSESSMENT

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).

16 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.

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:

This question is not applicable. See the response to Question 2.

DETERMINATION

6. Check the appropriate RCRIS 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 BASF Agricultural Products de PR - Manatí Site, EPA ID# PRD091065102, located at State Road No. 2 Km. 47.3 in the Municipality of Manatí, Puerto Rico, 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.

(Based on the information and analytical data evaluated for the BASF Manatí Site, EPA has determined that under current conditions, human exposures are under control at the Site).

Completed by: _____ Date: 7-30-14

Angel Salgado, Environmental Scientist
Response & Remediation Branch
Caribbean Environmental Protection Division
EPA Region 2

Reviewed by: _____ Date: 2014-07-30

Jesse Aviles, Environmental Scientist
Response & Remediation Branch
Caribbean Environmental Protection Division
EPA Region 2

Approved by: _____ Date: 8-04-14

for Ramon Torres, Branch Chief
Response & Remediation Branch
Caribbean Environmental Protection Division
EPA Region 2

Locations where references may be found:

References reviewed to prepare this EI determination are identified after each response. Reference materials are available at U.S. EPA, Region 2.

Contact telephone and e-mail numbers: Angel Salgado
(787) 977-5854
salgado.angel@epa.gov

Final Note: The Human Exposures EI is a Qualitative Screening indicator of exposures and the determinations within the scope of this document should not be used as the sole basis of an exposure assessment process; this determination in no way should restrict the scope of more detailed (e.g., site-specific) assessments of exposure risks.

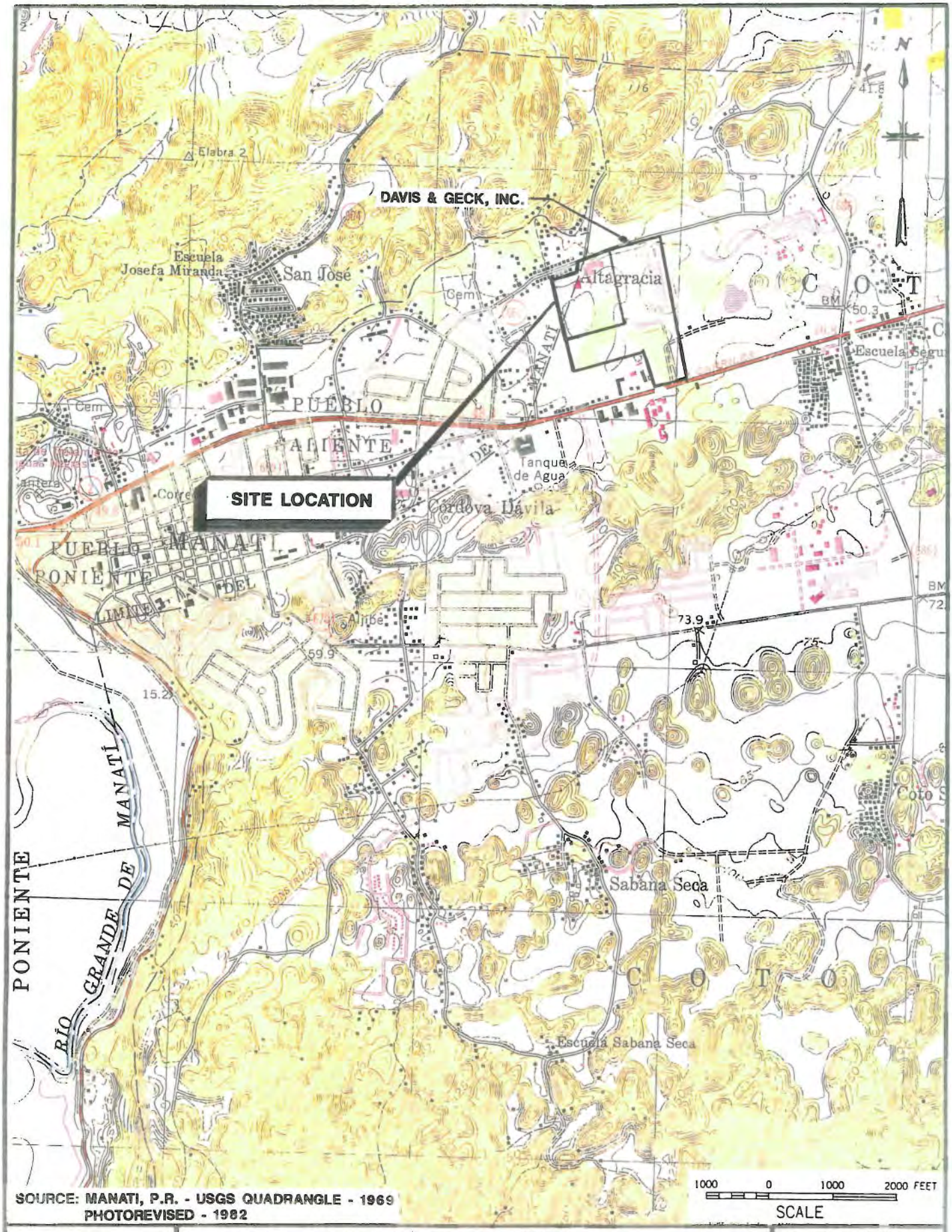
Attachments

The following attachments have been included in support to this EI determination.

Attachment 1 – Figure 1: Location Map (1982), BASF Agricultural Products de PR, Manatí (formerly Cyanamid Company), taken from the Environmental Site Assessment (ESA) Report, American Cyanamid Company, Manatí, Puerto Rico Facility, prepared by Malcolm Pirnie, dated March 2, 2000 (Ref. 2)
Attachment 2 – Figure 3: Plant Layout (1994), BASF Agricultural Products de PR, Manatí (formerly Cyanamid Company), taken from the Environmental Site Assessment (ESA) Report, American Cyanamid Company, Manatí, Puerto Rico Facility, prepared by Malcolm Pirnie, dated March 2, 2000 (Ref. 2)
Attachment 3 – Figure 6-1: Soil Sampling Locations (2000), taken from the Environmental Site Assessment (ESA) Report, American Cyanamid Company, Manatí, Puerto Rico Facility, prepared by Malcolm Pirnie, dated March 2, 2000 (Ref. 2)
Attachment 4 – Summary of Media Impacts Table.
Attachment 5 – Site Plan-Northeast: BASF Process Water Extraction Wells Location Diagram[17], prepared by BASF Engineering Department, dated July 2014.

[17] Both groundwater wells are physically located in the adjoining D&G facility; D&G operates the wells while BASF provides maintenance.

Attachment 1



SOURCE: MANATI, P.R. - USGS QUADRANGLE - 1969
PHOTOREVISED - 1982

MALCOLM PIRNIE	CYANAMID AGRICULTURAL De PUERTO RICO, INC. LOCATION MAP	MALCOLM PIRNIE, INC. 2654-036 FIGURE 1

SOURCE CAPRI PLANT INFORMATION, 1994

1 — ADMINISTRATION
2 — LABORATORY
3 — SOLID FORMULATION
4 — LIQUID FORMULATION
5 — CHEMICAL BLDG.
6 — UTILITIES
7 — MAINTENANCE SHOP
8 — TANK FARM
9 — SERVICE BUILDING
10 — WAREHOUSE
11 — DQ FACILITY
12 — DRUM STORAGE AREA
13 — STORAGE SHED
14 — STORAGE SHED
15 — STORAGE AREA
16 — EMERGENCY VEHICLES GARAGE

17 - Solvent Recovery
18 - Bone Yard

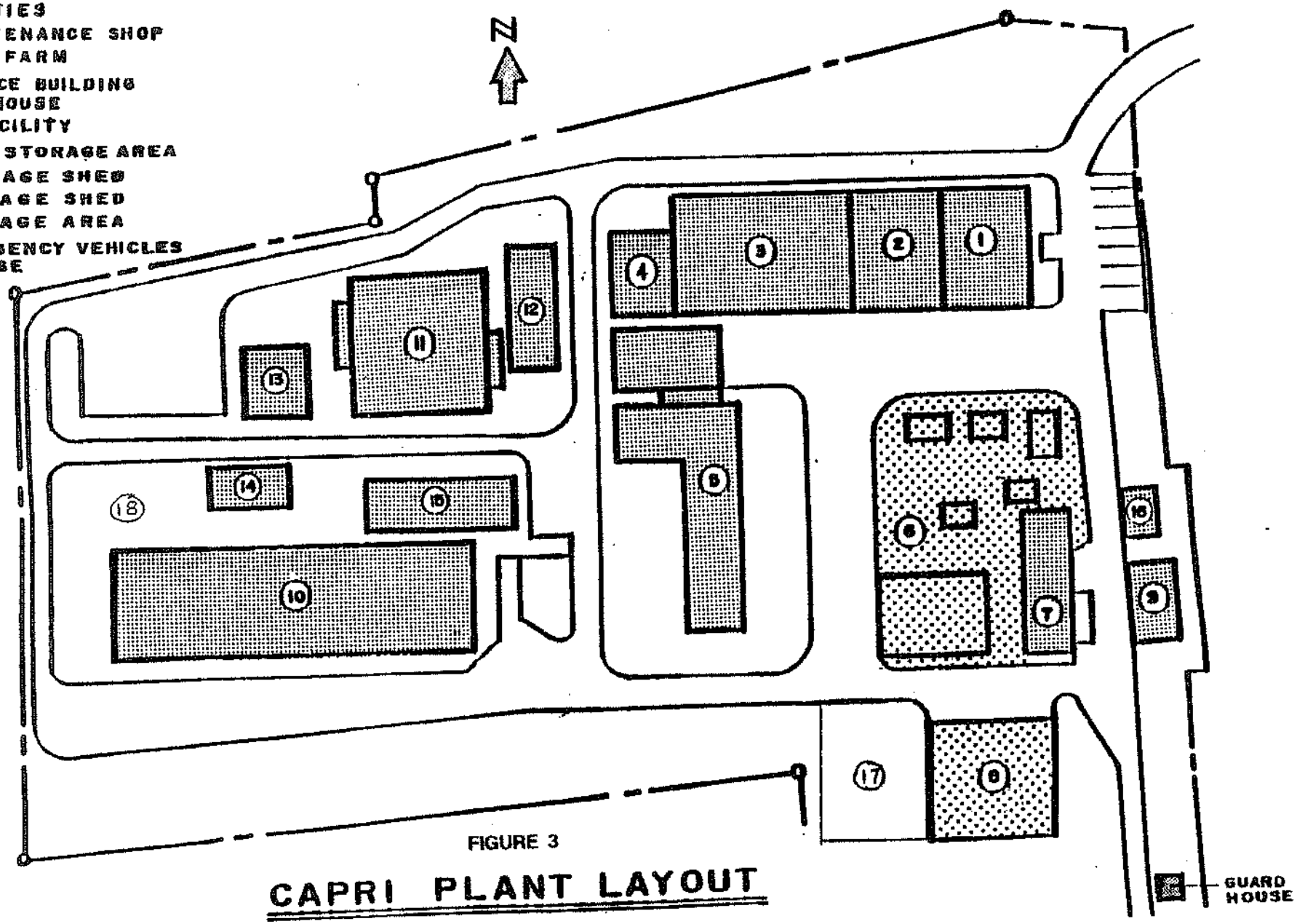
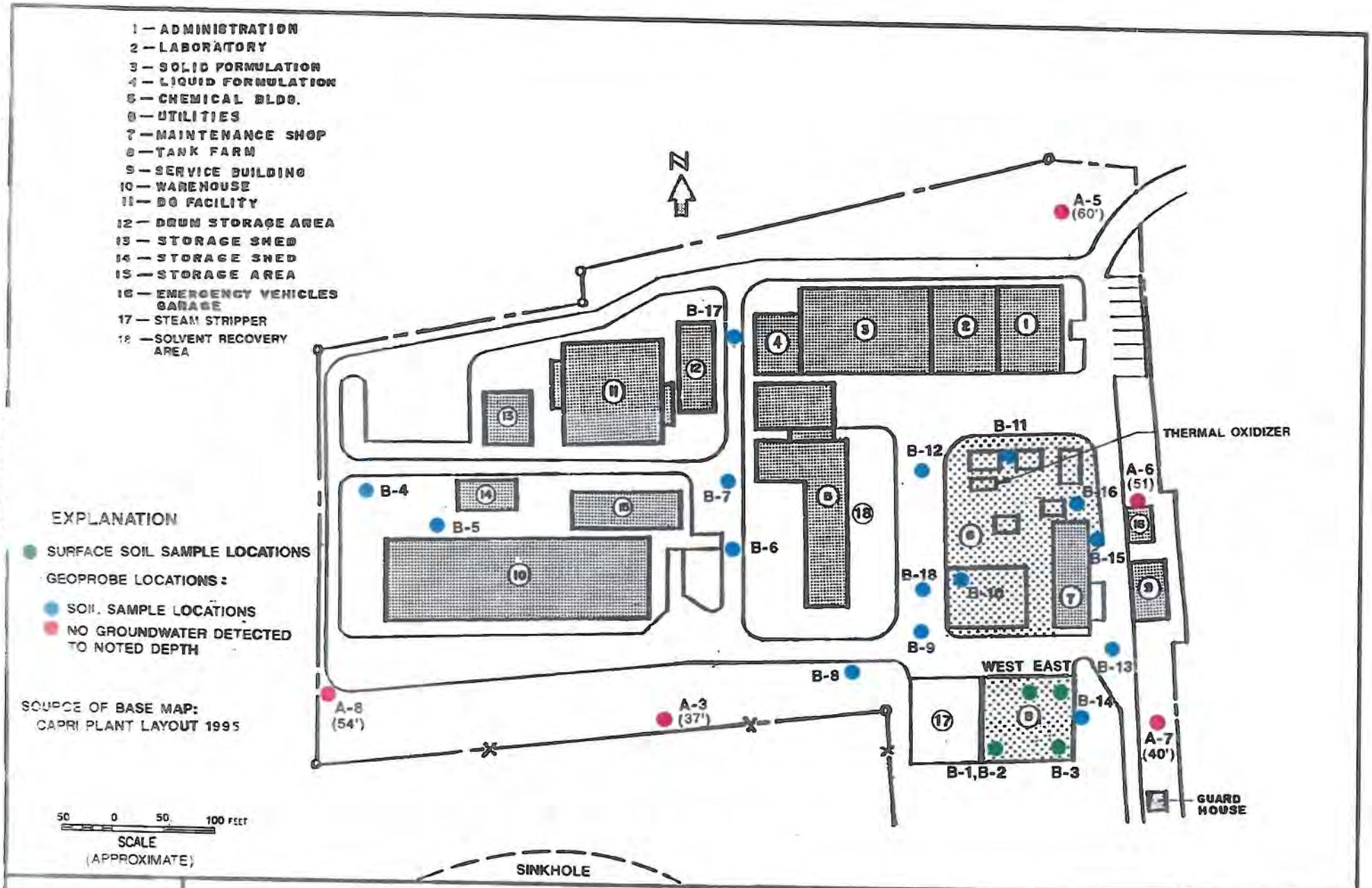


FIGURE 3

CAPRI PLANT LAYOUT

Attachment 2

Attachment 3



MALCOLM PIRNIE

MANATI, PUERTO RICO
CAPRI

GEOPROBE AND SOIL SAMPLE LOCATION MAP

JANUARY - FEBRUARY 2000

MALCOLM PIRNIE, INC.

FIGURE 6-1

Attachment 4 - Summary of Media Impacts

AOC or SWMU	GW	AIR (Indoors)	SURFACE SOIL	SURFACE WATER	SEDIMENT	SUB SURFACE SOIL	AIR (Outdoors)	CORRECTIVE ACTION MEASURE	KEY CONTAMINANTS
SWMU #1 – Old Hazardous Waste Container Storage Area	No	No	No	No	No	No	No	The unit was active until April 1990, when a new container storage area (SWMU #2) was constructed. As the unit's secondary containment system was adequate and showed no signs of releases, the 1990 RFA concluded that releases of hazardous waste were unlikely. No further action was recommended.	Toluene still bottoms, lab waste, Waste oil (D001, F005).
SWMU #2 – New Hazardous Waste Container Storage Area	No	No	No	No	No	No	No	The area entered operation in 1990 as it replaced the old drums storage	Toluene still bottoms, lab waste, solvent mixtures (D001, F005, F003).

AOC or SWMU	GW	AIR (Indoors)	SURFACE SOIL	SURFACE WATER	SEDIMENT	SUB SURFACE SOIL	AIR (Outdoors)	CORRECTIVE ACTION MEASURE	KEY CONTAMINANTS
								area (SWMU #1). The concrete pad was roofed and was trenched as secondary containment. As the unit's secondary containment system was adequate and showed no signs of releases, the 1990 RFA concluded that releases of hazardous waste were unlikely. No further action was recommended.	
SWMU #3 – Incinerator	No	No	No	No	No	No	No	The unit operated continuously until September 30, 1982, when it was taken out of service. Unit was dismantled/	Toluene still bottoms (F005).

AOC or SWMU	GW	AIR (Indoors)	SURFACE SOIL	SURFACE WATER	SEDIMENT	SUB SURFACE SOIL	AIR (Outdoors)	CORRECTIVE ACTION MEASURE	KEY CONTAMINANTS
								decommissioned in August 1984. As the secondary containment system was adequate and showed no signs of releases, the 1990 RFA concluded that releases of hazardous waste were unlikely. No further action was recommended.	
SWMU #4 – Underground Storage Tank	No	No	No	No	No	No	No	The tank served as feed tank to the incinerator (SWMU #3). It was enclosed under and on all sides by a 1 foot thick concrete dike. The tank was closed and decommissioned in 1987. As the unit's secondary	Toluene still bottoms (F005).

AOC or SWMU	GW	AIR (Indoors)	SURFACE SOIL	SURFACE WATER	SEDIMENT	SUB SURFACE SOIL	AIR (Outdoors)	CORRECTIVE ACTION MEASURE	KEY CONTAMINANTS
								containment system was adequate and showed no signs of releases, the 1990 RFA concluded that releases of hazardous waste were unlikely. No further action was recommended.	
SWMU #5 – Aboveground Storage Tank	No	No	No	No	No	No	No	The funnel shaped tank was located in the Solvent Recovery Area (SWMU #6) to collect still bottoms from distillation of toluene until discharge into the Cargo Tank. The tank was in use since 1984 and had a concrete dike. As the unit's	Toluene still bottoms (F005).

AOC or SWMU	GW	AIR (Indoors)	SURFACE SOIL	SURFACE WATER	SEDIMENT	SUB SURFACE SOIL	AIR (Outdoors)	CORRECTIVE ACTION MEASURE	KEY CONTAMINANTS
								secondary containment system was adequate and showed no signs of releases, the 1990 RFA concluded that releases of hazardous waste were unlikely. No further action was recommended.	
SWMU #6 – Solvent Recovery Area	No	No	No	No	No	No	No	The unit was comprised of five above-ground tanks involved in treating and processing spent toluene generated during manufacturing. The unit was in use since 1976 and was trenched. The observation of dark stains on	Spent and distilled toluene (F005, D001).

AOC or SWMU	GW	AIR (Indoors)	SURFACE SOIL	SURFACE WATER	SEDIMENT	SUB SURFACE SOIL	AIR (Outdoors)	CORRECTIVE ACTION MEASURE	KEY CONTAMINANTS
								the distillation tank surface and on the trench during the 1990 RFA lead to the conclusion that releases of hazardous waste from this unit were likely. The 1990 RFA recommended sampling of the area's soil to further assess the nature and extent of potential releases from this unit.	
SWMU #7 – Cargo Tank	No	No	No	No	No	No	No	The tank truck was used to collect toluene still bottoms from the funnel-shaped storage tank (SWMU #5) for off-site transportation and disposal.	Toluene still bottoms (F005).

AOC or SWMU	GW	AIR (Indoors)	SURFACE SOIL	SURFACE WATER	SEDIMENT	SUB SURFACE SOIL	AIR (Outdoors)	CORRECTIVE ACTION MEASURE	KEY CONTAMINANTS
								The unit was in use since 1982 and was diked. As the unit's secondary containment system was adequate and showed no signs of releases, the 1990 RFA concluded that releases of hazardous waste were unlikely. No further action was recommended.	
SWMU #8 – Process Drain Tank	No	No	No	No	No	No	No	The steel underground tank received wastewaters generated from manufacturing operations for pH adjustment (elemental neutralization). Has been in use since 1976 and	Process wastewater containing toluene, aniline, ethanol (F005).

AOC or SWMU	GW	AIR (Indoors)	SURFACE SOIL	SURFACE WATER	SEDIMENT	SUB SURFACE SOIL	AIR (Outdoors)	CORRECTIVE ACTION MEASURE	KEY CONTAMINANTS
								is enclosed within a reinforced concrete basin. As the unit's secondary containment system was adequate and showed no signs of releases, the 1990 RFA concluded that releases of hazardous waste were unlikely. No further action was recommended.	
SWMU #9 – Satellite Area I	No	No	No	No	No	No	No	The unit accumulated filter cakes/bags contaminated with toluene in up to two drums. Has been in use since 1985 and had a trench that drained to the Process Drain	Toluene from filter cakes/bags (F005).

AOC or SWMU	GW	AIR (Indoors)	SURFACE SOIL	SURFACE WATER	SEDIMENT	SUB SURFACE SOIL	AIR (Outdoors)	CORRECTIVE ACTION MEASURE	KEY CONTAMINANTS
								Tank (SWMU #8) as secondary containment. As the unit's containment system was adequate and showed no signs of releases, the 1990 RFA concluded that releases of hazardous waste were unlikely. No further action was recommended.	
SWMU #10 – Satellite Area II	No	No	No	No	No	No	No	The unit accumulated laboratory waste in one 55-gallon drum. Has been in use since 1989 and had a trench that drained to the Process Drain Tank (SWMU #8) as secondary containment. As	Laboratory waste (F002, F003, F005).

AOC or SWMU	GW	AIR (Indoors)	SURFACE SOIL	SURFACE WATER	SEDIMENT	SUB SURFACE SOIL	AIR (Outdoors)	CORRECTIVE ACTION MEASURE	KEY CONTAMINANTS
								the unit's containment system was adequate and showed no signs of releases, the 1990 RFA concluded that releases of hazardous waste were unlikely. No further action was recommended.	
SWMU #11 – Waste Oil Storage Area	No	No	No	No	No	No	No	The unit stored waste oil in 55-gallon steel drums for off-site disposal. Has been in use since 1984 and is trenched. As the unit's secondary containment system was adequate and showed no signs of releases, the 1990 RFA	Waste oil.

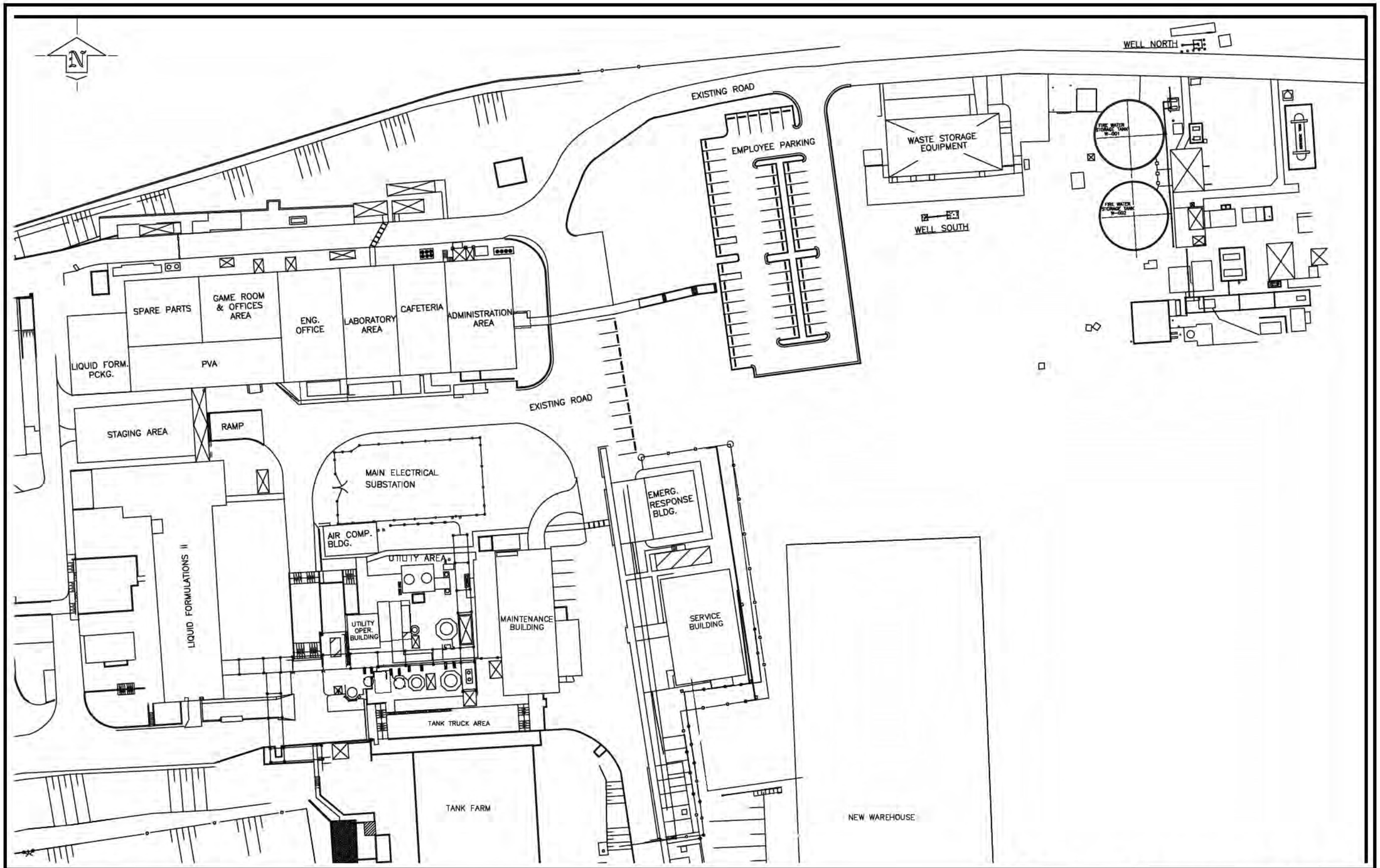
AOC or SWMU	GW	AIR (Indoors)	SURFACE SOIL	SURFACE WATER	SEDIMENT	SUB SURFACE SOIL	AIR (Outdoors)	CORRECTIVE ACTION MEASURE	KEY CONTAMINANTS
								concluded that releases of hazardous waste were unlikely. No further action was recommended.	
AOC #1 – Raw Material Storage Area I	No	No	No	No	No	No	No	The unit stored raw materials in drums. Has been in operation since 1976 and had a concrete dike for containment. As no hazardous waste were managed here and its containment system was adequate and showed no signs of releases, the 1990 RFA concluded that releases of hazardous waste were unlikely. No further	Phosphoric acid, HCL.

AOC or SWMU	GW	AIR (Indoors)	SURFACE SOIL	SURFACE WATER	SEDIMENT	SUB SURFACE SOIL	AIR (Outdoors)	CORRECTIVE ACTION MEASURE	KEY CONTAMINANTS
								action was recommended.	
AOC #2 – Raw Material Storage Area II	No	No	No	No	No	No	No	The unit stored raw materials in drums. Had been in operation since 1976 and had a concrete dike for containment. As no hazardous waste were managed here and its containment system was adequate and showed no signs of releases, the 1990 RFA concluded that releases of hazardous waste were unlikely. No further action was recommended.	Phosphorous oxychloride.
AOC #3 – Raw Material Storage Area III	No	No	No	No	No	No	No	The unit stored raw materials in drums. Had been	Pursuit technical, acetic acid, ammonium

AOC or SWMU	GW	AIR (Indoors)	SURFACE SOIL	SURFACE WATER	SEDIMENT	SUB SURFACE SOIL	AIR (Outdoors)	CORRECTIVE ACTION MEASURE	KEY CONTAMINANTS
								in operation since 1989 and had a concrete dike for containment. As no hazardous waste were managed here and its containment system was adequate and showed no signs of releases, the 1990 RFA concluded that releases of hazardous waste were unlikely. No further action was recommended.	hydroxide.
AOC #4 – Loading/Unloading Area	No	No	No	No	No	No	No	The area was used for unloading raw materials from tank trucks for transfer to the materials storage tanks at the	Sulfuric acid, sodium hydroxide, toluene, aniline.

AOC or SWMU	GW	AIR (Indoors)	SURFACE SOIL	SURFACE WATER	SEDIMENT	SUB SURFACE SOIL	AIR (Outdoors)	CORRECTIVE ACTION MEASURE	KEY CONTAMINANTS
								Tank Farm. Has been in operation since 1976 and is surrounded by trenches that drained into a concrete pit. As no hazardous waste were managed here and its containment system was adequate and showed no signs of releases, the 1990 RFA concluded that releases of hazardous waste were unlikely. No further action was recommended.	

Source: RCRA Facility Assessment Report, Cyanamid Agricultural of PR, Inc., Barceloneta, Puerto Rico, PRD-091065102, prepared by Harold Carrasquillo Alberty, PREQB Land Pollution Control Area (LPCA), Hazardous Waste Division, December 1990. This RFA report was forwarded to Michael Poetzsch of EPA Region 2/HWFB/CFS through a letter from Flor del Valle, Director of PREQB's LPCA, dated 31 Dic. 1990. (Ref. 1)



SCALE:	N.T.S.	PROJECT NO.:
DRAWN BY:	C.MELENDEZ	07/21/14
CHKD BY	C. DEL RIO	07/21/14
PRE ENG. APPROVAL		
APPROVAL		

BASF Agricultural Products de PR
State Road No.2, Km. 47.3
Manati, PR 00674

BASF

PROJECT NAME: SITE PLAN

DRAWING NAME: NORTHEAST SITE PLAN

AREA NO. | DRAWING NO. | REV. NO.

CAD FILE: SITE