Attachment 1: P66 response to NJDEP comments on NJPDES Permit No. NJ0001511

Phillips 66
Bayway Refinery
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February 19, 2020

NJPDES Permit NJ0001511
Program Interest ID #46318
Inspection Report & NOV Response

New Jersey Department of Environmental Protection
Central Bureau of Water Compliance and Enforcement
Mail Code 44-03/PO Box 420
401 East State Street
Trenton, NJ 08625-0420
Attn: Andrew Coleman

Dear Mr. Coleman:

On January 8, 2020, we received your Compliance Evaluation Inspection report (CEI Report) dated January 3, 2020 for NJPDES Permit No. NJ0001511, Program Interest ID # 46318. Attached to the CEI Report was an associated Notice of Violation (NOV), EA ID# PEA190001-46318, signed December 26, 2019. In your email dated January 9, 2020 to George Bakun, Phillips 66, you approved a revised response due date for both the CEI Report and NOV to February 24, 2020. Together, the CEI Report and NOV list three deficiencies, two recommendations, and two corrective actions. This letter and its attachment contain responses to the CEI Report and NOV deficiencies, recommendations, and corrective actions, including remedial measures with implementation timing where appropriate. Please contact George Bakun at george.bakun@p66.com or (908) 523-5896 if you have any questions regarding the responses.

Certification:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for purposely, knowingly, recklessly, or negligently submitting false information.

Hope Gray

Hope Gray
Bayway Refinery HSE Manager

c: Murray Lantner
USEPA Region 2
Water Compliance Branch
290 Broadway, 20th Floor
New York, NY 10007

Bayway Refinery Response to
January 3, 2020 Compliance Evaluation Inspection (CEI)
Report & December 26, 2019 Notice of Violation (NOV)
NJPDES Surface Water Discharge Permit NJ0001511: Program Interest ID #46318

January 3, 2020 CEI Report Deficiency Nos. 1-3

Deficiency # 1: (repeated herein for reference)

Improper operation of the Polypropylene ("PE") Pellet Separator causing an unpermitted discharge of PE to the Morses Creek on June 20. The separator treats water used to wash the interior of rail cars previously filled with PE pellets and fluff. Wash water enters one end of a large rectangular separator which traps floating pellets and allows water to discharge through an underflow partition at the other end. During the June 20 inspection, P66 had installed several aerators in the chamber to stir up the water, reportedly to move the pellets to a designated area for removal. However, the mixing motion of the aerators churned the PE pellets into the water column, negating the role of the chambers final partition to capture the floating pellets. A circular screen designed to fit over the chamber outfall was hanging from a railing in the immediate vicinity and not in use. A steady flow laden with pellets was observed discharging from the chamber. See the attached photos. Video was also collected.

The Department first became aware of these pellets at a location in the Morses Creek near your DSN 005 outfall. A vactor truck was actively removing a large accumulation of floating pellets that had collected in a series of booms. This writer had no data to suggest what percentage of pellets were collected by these booms.

P66 reportedly removed the aerators from this treatment chamber soon after the June 20 inspection.

During the inspection on October 29, the separator appeared to be functioning. However, evidence of white PE fluff was noted along the walls of the final chamber. In addition, no final screen was in place to capture pellets that might escape.

PE pellets (though much fewer than June 20) were still noted at the same boomed collection area near DSN 005 in the Morses Creek during the October 29 inspection. See the attached photo.

Part IV.G.5.a of your Permit allows for the discharge from your Polypropylene Plant Pellet Separator because it is "clean in nature". The June 20 discharge of pellets from your improperly operated separator was far from "clean in nature", and a violation of your Permit. See the attached NOV.

P66 is hereby REQUIRED to create an O&M Manual for the proper operation and maintenance of this system and provide a copy to this writer within 30 days of receipt of this report. The O&M Manual shall specifically describe how this treatment system removes the PE pellets and fluff from the discharge. This writer is not convinced that the fluff material has the same buoyancy characteristics as the pellets. Furthermore, the Department strongly recommends that P66 add final treatment barriers, such as dual screens, to trap any pellets that might escape. The observations in the Morses Creek on October 29 show pellets are still escaping.

Finally, the Department recommends that a licensed N operator be assigned to oversee the operation of this treatment system. With your response to this inspection report, please provide this writer with the name of that responsible operator.

When your NJPDES Permit is renewed, this Bureau will suggest that this outfall from your PE plant receive a point source DSN designation with monitoring requirements. To avoid this designation and ultimately comply with this deficiency, this Bureau recommends that P66 consider re-routing the discharge to your process sewer.

Response to Deficiency # 1:

This response is organized as follows:

- Description of the facility
- NOV response
- Deficiency response

The required O&M Manual is attached as Attachment A, the draft Polypropylene Resin Separator Operations and Maintenance (O&M) Manual and incorporates applicable portions of the following responses to the deficiency and NOV as well.

Facility Description:

The Polypropylene Separator is used to separate and recover plastic residual or resin from several sources within the Polypropylene Plant, described further in Attachment A.

The separator discharge flows into a sewer that discharges into the upstream end of the Railroad Avenue Ditch, which carries commingled cooling water, stormwater and other permitted water streams for about one-half mile before discharging into Morses Creek. Railroad Avenue Ditch contains at least four containment booms with skimming locations, supplemented by more booms and floating absorbents as needed to control floating material, which includes sheen, oil, scum, foam, debris, plastic residuals or resin, and other floatables that can wash into the sewers. Three of the containment booms are located upstream of discharge monitoring point DSN 005A which is located underneath the NJ Turnpike overpass. Between DSN 005A and Morses Creek is the fourth boom and a low level overflow dam within Railroad Avenue Ditch. The overflow dam maintains the upstream water level within Railroad Avenue Ditch to increase the boom effectiveness for containing floating materials, including resin. The designed containment facilities within Railroad Avenue Ditch provide effective BMP redundancy for floating material containment and recovery, including resin and plastic residuals.

The DSN 005A discharge monitoring point is located within Railroad Avenue Ditch upstream of additional floating material containment facilities. It was selected for monitoring for several reasons, including safety (existing hand rails, no need to walk on stone or sample from sloped banks along the ditch), easy access to sample the center of the ditch flow, and upstream of rain downspouts that discharge NJ Turnpike runoff into Railroad Avenue Ditch. It's selection for monitoring fully recognized that there were additional downstream containment facilities in Railroad Avenue Ditch, but NJDEP preferred to stay upstream of the NJ Turnpike downspouts; this became irrelevant during the permitting process when NJDEP decided that DSN 005A should only be sampled during dry weather. The Polypropylene Separator cannot discharge directly into Morses Creek and its discharge must first flow through the Railroad Avenue Ditch and DSN 005A. Figure 1 shows the resin separator, Railroad Avenue Ditch, the observed containment boom within Railroad Avenue Ditch underneath the NJ Turnpike, the DSN 005A

monitoring point, the Railroad Avenue Ditch dam, and the Railroad Avenue discharge point into Morses Creek, as described above.

NOV Response:

NJDEP's NOV specifically cites N.J.A.C. 7:14A-6.2(a)1, which states that a permittee must comply with the permit, with (a)2 then stating that a permittee can not discharge pollutants that are not authorized by the permit. However, discharge of pollutants is defined at N.J.A.C. 7:14A-1.2 as a release of a pollutant into the waters of the State. The definition goes on to further specifically state that a leak into a secondary containment system which does not involve a release into the waters or lands of the State is not a "discharge" for NJPDES purposes.

Considering the above and for the following reasons, Bayway does not believe that the cited observations constitute a violation of the permit:

- Neither the Polypropylene Separator nor the Railroad Avenue Ditch are waters of the State. As such, BMPs have been in use and continue to be implemented to capture floating material in Railroad Avenue Ditch upstream of its discharge into Morses Creek.
- Railroad Avenue Ditch continues for over thousand feet after the containment boom where the plastic residual and scum was photographed within the containment boom under the NJ Turnpike overpass by NJDEP on June 20 for recovery by vacuum trucks, which were actively skimming the contained floating material at the time. This boom is not located within a receiving waterbody. DSN 005A sampling point is located downstream of the cited collection point, as are additional containment facilities.
- Bayway underlined four statements in NJDEP's deficiency repeated above that incorrectly state that the observed locations were in Morses Creek. All four of those locations were within Railroad Avenue Ditch upstream of Morses Creek and none were representative of the discharge into Morses Creek from Railroad Avenue Ditch because the observed floating material was contained and being recovered, not discharged.
- Both NJDEP and USEPA representatives observed that there was no plastic residual in the Railroad Avenue Ditch past the photographed containment boom located underneath the NJ Turnpike, and at other locations downstream of that containment boom, including DSN 005A (which is still within Railroad Avenue Ditch upstream of the discharge into Morses Creek) and DSN 001 (Dam 1 overflow) on Morses Creek.
- Material suspended or floating in a water column is monitored as Total Suspended Solids (TSS, defined within N.J.A.C. 7:14A as total filterable residue), which includes plastic residual. NJPDES NJ0001511 permits the separator discharge into Railroad Avenue Ditch where the commingled flow includes TSS monitoring at DSN 005A. TSS is then further monitored downstream at DSN 001A, where the TSS permit limit has never been exceeded since the Polypropylene Plant started operations in 2002.
- Since NJPDES NJ0001511 started requiring monthly TSS monitoring at DSN 005A in October 2013, 77 grab samples have been collected averaging 11 mg/l TSS. Over that same time span, 338 composite samples have been collected of the Arthur Kill intake water and the DSN 001A discharge, with the intake TSS averaging 12 mg/l and the DSN 001A TSS averaging 11 mg/l. Since DSN 005A is required to be sampled only during dry weather by NJ0001511, almost all of the water originates from the Arthur Kill. This data indicates no measurable TSS increase into or out of Morses Creek relative to the intake water.
- The last underlined statement in NJDEP's deficiency repeated above and the associated October 29, 2019 photograph both incorrectly state that the containment boom within Railroad Avenue Ditch contained pellets. As discussed on October 29 at the location with NJDEP, the observed material was not comprised of pellets. Despite being similarly

white in color, it was clear that the materials at the photographed location (as is visible in the photographs) were not the same on June 20 and October 29. While at the containment boom location underneath the NJ Turnpike overpass, the material on October 29 was examined, discussed and determined to be remnants of absorbents used in Railroad Avenue Ditch for containment and oil recovery. Pellets are small and uniform as seen in the June 20 photograph. The October 29 material was large and varied in size and shape.

- Despite the observations at the pellet separator and within the Railroad Avenue Ditch containment boom on June 20, Bayway reminds the NJDEP that neither the NJDEP nor the USEPA observed any resin within Morses Creek (e.g., at Dam 1), at the DSN 005A monitoring point just downstream of the observed containment boom, or on the downstream side of the observed containment boom on June 20. In other words, the containment boom was working effectively at capturing the resin for recovery by vacuum truck upstream of the DSN 005A monitoring point and the Railroad Avenue Ditch discharge into Morses Creek.

Deficiency Response:

Although P66 does not agree that the observation of plastic residual in the Polypropylene Separator discharge or within Railroad Avenue Ditch constitutes a violation of the permit, we intend to implement actions to further reduce the potential release of plastic residuals into Railroad Avenue Ditch. As such, we have implemented the attached draft O&M Manual and the following actions in response to the inspection report deficiencies and NOV.

- As NJDEP is aware, the air injection system was promptly removed and will not be resurrected. Regarding the air system that was in trial use at the separator, although we agree that it was poorly designed, installed and used, we clarify that it was not installed to "stir up the water" and be an "aerator". The intended purpose of the system was to improve skimming by pushing floating material to the vacuum skimmer.
- Bayway designed and fabricated a trial cover for the separator outlet that will act as a second underflow baffle on the clean side of the separator baffle. Cover performance will be monitored, and modifications made if considered necessary
- Once the cover effectiveness is determined to be acceptable, Bayway will remove plastic infused buildup observed on the clean side of the separator baffle and outlet walls.
- Periodic inspections and oversight by an N licensed operator to ensure effective separator operation will begin March 2020. Bayway's N licensed operators will conduct the inspections. N operators currently planned to oversee the separator operation include George Bakun (N4 license #14833) and Anthony Leake (N4 license #672289) but can change with time.

Deficiency # 2: (repeated herein for reference)

During the inspection on June 20, an oily floating substance was trapped behind the boom at your DSN 004 outfall. See the attached photo. Reportedly, a vactor truck was dispatched to skim this material. On the date of the inspection, P66 was adding a pesticide called Clam-Trol (allowed by its Permit) to its salt water intake to kill Mollusca, Barnacles, Hydrozoa, Bryozoa, and Bacterial, Fungal and Algal Slime in its cooling water system. According to representatives of P66, Clam-Trol material is added annually. However, P66 is hereby REQUIRED to create BMPs for the collection and removal of this material at DSN 004 during times (and immediately afterwards if necessary) when this chemical is added.

On the October 29 inspection, a light sheen was noted behind the boom at the DSN 004 outfall.

Response to Deficiency # 2:

DSN 004A is known onsite as Poly Ditch. Similar to Tremley Ditch and Railroad Avenue Ditch, Poly Ditch is a manmade ditch constructed to convey refinery discharges to Morses Creek. Poly Ditch is not a receiving waterbody. Poly Ditch starts at the outlet of a culvert which discharges commingled stormwater and cooling water into Poly Ditch. Similar to Tremley Ditch and Railroad Avenue Ditch, the Poly Ditch has a low level overflow dam over one thousand feet upstream of its discharge into Morses Creek. The dam maintains a constant water level in the upstream portion of the ditch allowing two containment booms to capture sheen and other floating material that enters the Poly Ditch (e.g. from equipment leaks or road run-off draining into the Poly Ditch). The dam and spill booms together are a significant BMP that supplements other BMPs. The dam and booms were specifically installed to reduce the chance of oil and other floating material from spills, leaks and stormwater runoff from entering Morses Creek. Similar to Tremley Ditch and Railroad Avenue Ditch, Poly Ditch is not a receiving waterbody, it is a conveyance. Figure 2 shows Poly Ditch, the dam and spill booms within Poly Ditch, and the Poly Ditch discharge point into Morses Creek, as described above.

The DSN 004A discharge monitoring point is located at the sewer outlet into Poly Ditch upstream of the two containment booms and associated overflow dam. It was selected for monitoring for several reasons, including safety (existing hand rails, no need to walk on stone or sample from sloped banks), easy access to sample the center of the ditch flow, and being located outside of the butane and propane storage area that Poly Ditch runs through, which requires gas testing by a process operator before entry to ensure safe conditions. Selection of this point for monitoring fully recognized the downstream containment facilities in Poly Ditch.

Poly Ditch continues for over one thousand feet after the first containment boom where the floating material was observed contained on June 20. The floating material was predominantly biological scum being released in response to the ongoing molluscicide treatment. Note that biological scum can have a dull sheen that is similar in appearance to dull sheen from oil, depending on the oil source and quantity. Regarding the light sheen observed on October 29, we again note that the sheen was contained within the first containment boom within Poly Ditch. We also note that the amount of material collected at the containment boom on both days was very small relative to the over 10 million gallons of day of continuous flow into Poly Ditch, that there was no ongoing observable sheen discharging from the upstream sewer into Poly Ditch on either day, no sheen was observed past the first boom, and that Bayway verified that there were no equipment oil leaks into Poly Ditch on either day. The Poly Ditch receives runoff from an area that includes paved surfaces, streets and parking areas. With some rain preceding both inspection days, the most likely source of the nominal amount of sheen observed would have been road runoff and/or biological scum resulting from biocide treatment, which is generally conducted daily using bleach (bleach treatment is separate from the molluscicide treatment). Regardless of the source of the floating material, the containment boom was functioning as designed, allowing subsequent recovery by vacuum truck. The need for vacuum trucks is determined through normal operator rounds, which include checking the spill booms in Poly Ditch at least once per shift. This floating material containment system is one of several BMPs already in place and proven to be effective as observed by NJDEP and USEPA.

Regardless of the floating material being contained, in response to NJDEP's inspection report for NJPDES NJ0026671, Bayway added BMPs pertaining to the containment and recovery of floating material to its SPP Plan. Those BMPs are not repeated in this response for brevity but they still apply. Specific to the molluscicide application, please note that the application process

takes the better part of a day and is conducted by a water treatment contractor. During the molluscicide treatment, the Bayway SPP Plan BMPs are supplemented by the contractor services, which include the requirement for the contractor to conduct periodic checks after chemical treatment starts of the injection facilities and the cooling water discharge points, which include Poly Ditch.

Deficiency # 3: (repeated herein for reference)

To the knowledge of this writer, the following process sewer overflows have occurred since the previous inspections were conducted in June and November 2017:

a. During the June 13 inspection, an overflow was observed in the containment area between tanks 132 & 133. An oily sheen was observed on the surface, and the surrounding crushed stone was contaminated. See the attached photos. According to representatives of P66, a non-functioning valve caused this overflow. During the inspections conducted in October, this valve was still not fixed, however the area was remediated and replaced with clean stone. To the knowledge of the Department, the water/oil contained in this area did not flow to Morses Creek.

b. Heavy rains occurred between June 22 and 23, 2019, totaling nearly 4 inches in 24 hours. During that event, the process sewer on Refinery Ave overflowed from several manholes sending a sheen to DSN 004 via the poly ditch. Some sheen escaped the Dam 1 to the Arthur Kill. P66 estimates that 5 gallons of oil overflowed, with 1 gallon passing Dam 1. P66 properly notified the NJDEP Hotline and submitted a 5-day letter.

c. During a heavy rain event on July 31, a sheen was noted past DSN 001. P66 representatives traced the sheen to a broken process sewer manhole that overflowed to the Railroad Avenue Ditch. P66 estimates that 5 gallons of oil overflowed, with 1 gallon passing Dam 1. P66 properly notified the NJDEP Hotline and submitted a 5-day letter. The broken process manhole was repaired. Thus no response to this deficiency is required.

d. Though it has not occurred since the previous 2017 inspections to the knowledge of this writer, P66 has a history of overflows from a manhole in the Greater Elizabeth Culvert during periods of heavy rain.

With your response to this inspection report, please indicate those steps that P66 has (or will) initiate to prevent a re-occurrence of overflows from locations in a. b. d. and other locations on the property. As noted in a. and b., these overflows can result in the release of petroleum to the surface waters of the State.

Response to Deficiency # 3:

a. Regarding the Tank 132 and 133 containment area: The Tank 132 and 133 containment area drains to the refinery process sewer. The containment valve was removed for repair. As a result, during rain, runoff from the Tank 132 and 133 containment area immediately starts to enter and fill the process sewer. During heavy rain, the process sewer can become full and temporarily pond the containment area. Because the process sewer that the containment area flows into can contain oil, oil can float up a full process sewer against the runoff flowing down the process sewer (i.e., similar to how a corrugated plate oil-water separator functions). Floating oil that comes out of the process sewer can then spread across the ponded water and leave staining behind as the

ponded water recedes. The Tank 132 and 133 containment area can only discharge to the process sewer and can not discharge to Morses Creek; there are no other outlets from this containment area. As stated by NJDEP, the containment area was cleaned. A new Tank 132 and 133 containment area valve is not yet installed but is in the work planning process for installation during the second quarter of 2020, conditions permitting. The work requires additional excavation and sewer isolation and thus must be planned around weather and other refinery activities.

b. Regarding the July 22 process sewer overflow: As stated in a November 18, 2019 email to NJDEP, a process sewer manhole cover with built-in openings was identified as the source of the process sewer overflow into Refinery Avenue. The manhole cover was replaced with a solid manhole cover to prevent a recurrence. We reiterate that although oil was released to Morses Creek with some sheen passing over Dam 1, all oil was still contained within Bayway Refinery property and recovered with no identifiable environmental impact due to Bayway's rapid spill response.

c. Regarding the July 31 process sewer overflow: The process sewer manhole that was damaged extended above grade, exposing it to potential impacts by vehicles. NJDEP was advised in a November 21, 2019 email that the damaged process sewer manhole was repaired on August 6, 2019 and protected from potential future impacts with barricades. Similar to the July 22 incident, all oil was contained within Bayway Refinery property and recovered with no identifiable environmental impact due to Bayway's rapid spill response.

d. Regarding the Greater Elizabeth Culvert: The Greater Elizabeth Culvert is a railroad underpass between the process side of the refinery and the refinery's Greater Elizabeth Tankfield. It is only used by refinery personnel to access the Greater Elizabeth Tankfield. Being an underpass, the culvert is a low point within the area that receives runoff and cannot drain without being pumped. Currently, a portable pump is in use to drain this area. Refinery personnel control the pump and can access the Greater Elizabeth Tankfield by an alternate route if needed while the culvert is pumped. Bayway is planning to install a permanent pump in an existing sump after repairing the sump so as to pump out runoff that flows into the culvert. The work is planned for the second quarter 2020, conditions permitting. Similar to the response to "a." above, there is no outlet from this area other than the process sewer, so there is no potential for an offsite release to a regulated waterbody due to ponding or a related overflow into the culvert.

As the NJDEP knows, Bayway Refinery has documented emergency response procedures to prepare for events such as very heavy rain and hurricanes. In response to the July 22 and 31 incidents, Bayway also initiated a routine visual inspection of areas where process sewer overflows have occurred in the past to ensure that prior conditions that led to the overflows do not recur.

January 3, 2020 CEI Report Recommendations I and II

Recommendation I: (repeated herein for reference)

The Department is aware of many procedures implemented by P66 following hurricane Sandy. These include closing the doors and entrances to the salt water pump station and deploying barriers around the P66 and Infineum API Separators. However, the Department is not aware of P66 conducting recent drills to deploy these measures. The Department recommends that such drills be performed periodically and reviewed for their effectiveness.

Response to Recommendation I:

Bayway maintains a variety of emergency response teams, including firefighting, rescue, spill response and general emergency response teams. Emergency response includes hurricane preparation. Annual training is part of the team responsibilities and can include classroom training, simulated drill response, equipment maintenance, equipment deployment and drill/training participation with outside organizations and agencies. Drills can range from process operator response to simulated localized emergencies (e.g., isolating equipment) to full spill response team involvement with agency participation. Equipment deployment can include spill booms, firefighting equipment and other equipment depending on the drill. Hurricane preparation is conducted annually at the start of the season, and more frequently during actual preparation based on forecasts that activate the Bayway hurricane response procedures. Annual hurricane response preparation includes checking equipment inventory, equipment deployment locations, and emergency generators. Hurricane preparation also periodically includes response equipment deployment.

Recommendation II: (repeated herein for reference)

Numerous trip hazards were noted at the DSN 001 Dam. Such hazards could compound during night visits by your operators in poor weather conditions.

Response to Recommendation II:

Bayway strives to ensure safe operating conditions and appreciates NJDEP's input. In response, a supervisor responsible for the area was advised, inspected the area, and took appropriate response to ensure safe access where needed in the area of Dam 1.

Compliance Evaluation Summary and Checklist dated 12/26/2019

The following addresses an additional item listed as noncompliance in the inspection report checklist that was not specifically included in the CEI report letter or addressed elsewhere in this response letter.

Page 6 of 11, Bottom Box: (repeated herein for reference)

On Page 6 of 10 of NJDEP's Compliance Evaluation Summary and Checklist dated 12/26/2019, NJDEP cites N.J.A.C. 7:14A-12.8(c) for noncompliance for visible sheen "behind spill boom in front of DSN 004 outfall on June 20.

Response:

Further to the response to Deficiency #2, we add that N.J.A.C. 7:14A-12.8(c) is from the section of the rules establishing requirements to be considered for inclusion in a permit. N.J.A.C. 7:14A-12.1 specifically says that subchapter 12 specifies "effluent standards which may be incorporated into a permit" (underlining added for emphasis). As NJDEP knows, NJPDES NJ0001511 was issued final specifically with no visible sheen and no petroleum hydrocarbon numerical limit at DSN 004A. As such, Bayway can not be in violation of a requirement that was not included in the permit. Even so, we note that despite 76 monthly samples collected since monitoring began at DSN 004A in October 2013, there have been no Total Petroleum Hydrocarbon results reported above the detection limit of < 2 mg/l at the DSN 004A.

December 26, 2019 NOV Corrective Action Nos. 1 and 2

Corrective Action # 1: (repeated herein for reference)

P66 shall immediately operate the Polypropylene Plant's treatment separator as designed. Within 30 days of receipt of this NOV, P66 shall create an O&M Manual for the proper operation of this separator. A copy of the O&M Manual shall be sent to this writer for review and comment.

Response to Corrective Action # 1:

A draft Polypropylene Resin Separator O&M Manual is included as Attachment A for NJDEP's review and comment. The manual documents operations and maintenance practices and procedures in use at the Polypropylene Separator. Since NJDEP requires review and comment, the manual will be finalized for inclusion with other Standard Operating Procedures for the Polypropylene Plant after NJDEP provides comments or confirms that there are no comments. Please note that whereas the separator is being operated as designed, Bayway maintains the right to modify the design, operating and maintenance procedures when required as conditions change and/or improvements are identified. For example, the trial outlet pipe cover that has been designed and constructed was not part of the original design, but it is expected to improve containment and capture of plastic residuals within the separator.

Corrective Action # 2: (repeated herein for reference)

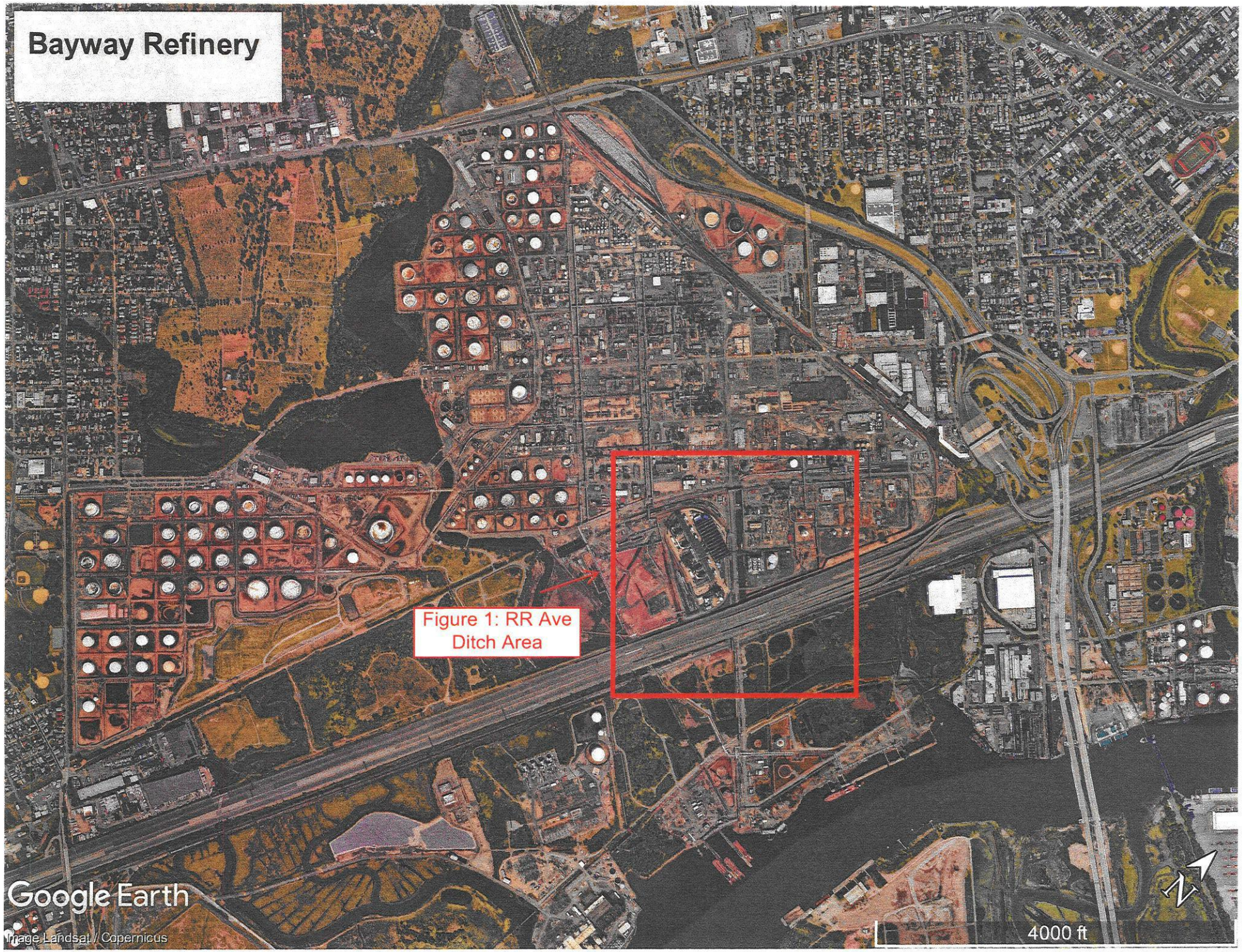
P66 shall employ additional measures to ensure that PE pellets and fluff are not discharged from the separator to the Morses Creek and the surface waters of the State. This might include secondary screens and/or other provisions. As an overall solution, the Department strongly recommends that P66 consider re-routing this discharge to its process sewer. See the attached inspection report cover letter. [N.J.A.C. 7:14A-6.2(a)1]

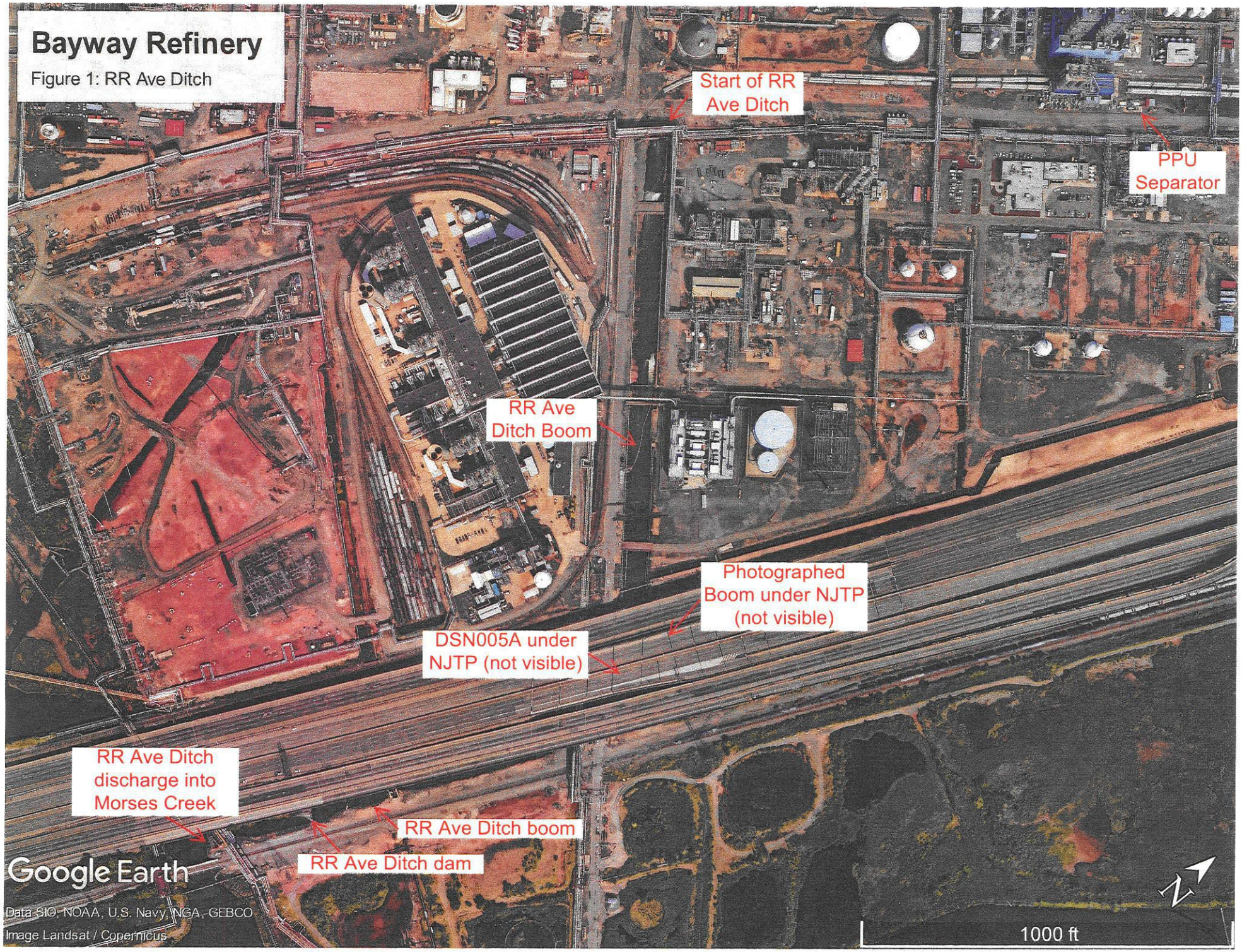
Response to Corrective Action # 2:

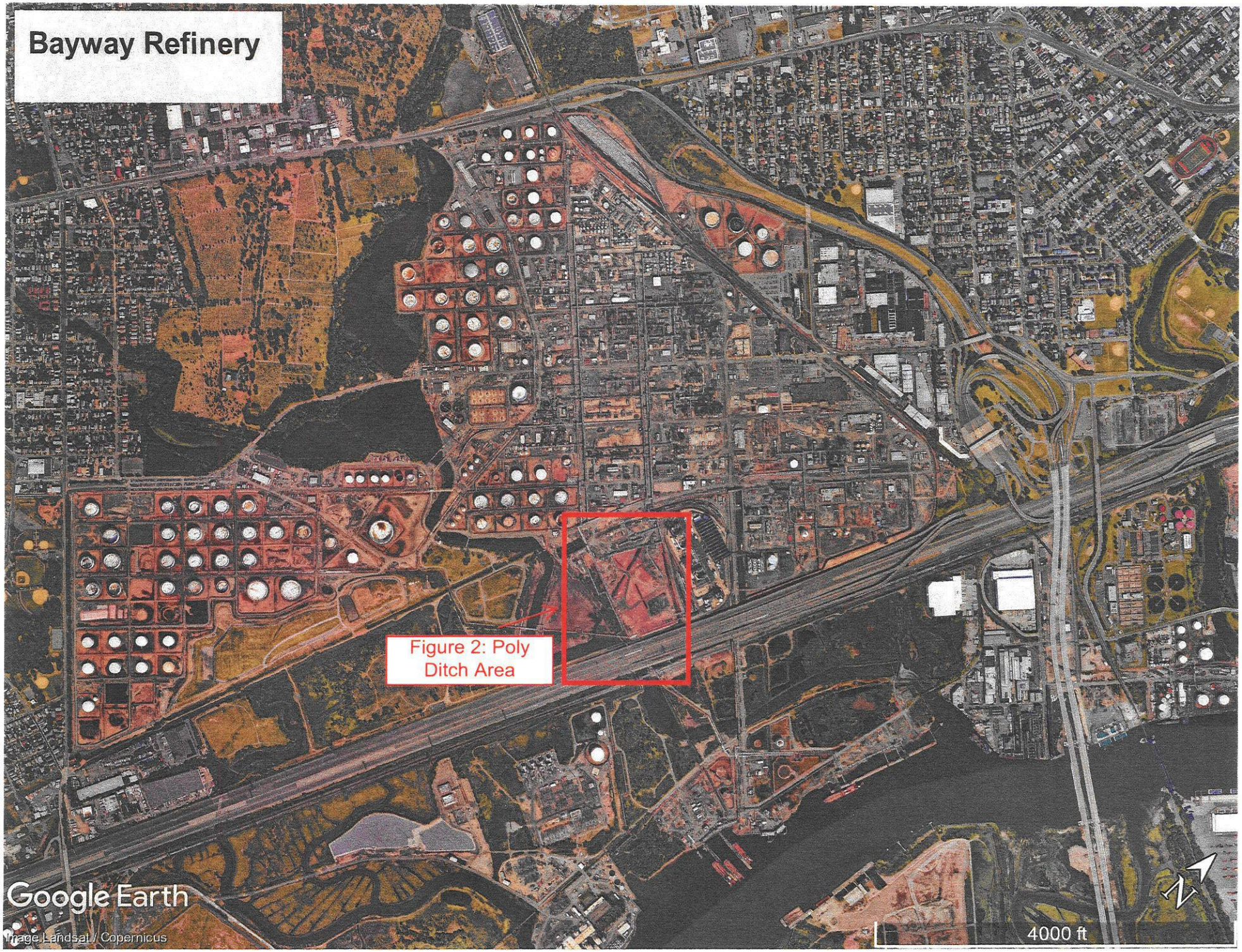
As described in response to Deficiency #1, P66 already employs "additional measures to ensure that PE pellets and fluff are not discharged from the separator to the Morses Creek and the surface waters of the State." These additional measures include the containment booms within Railroad Avenue Ditch upstream of DSN 005A that were photographed by NJDEP, as well as additional containment booms downstream of the DSN 005A monitoring point but still upstream of the DSN 005A discharge into Morses Creek. However, Bayway still intends to implement additional measures to reduce plastic residual from entering Railroad Avenue Ditch. Bayway has already committed to installing a cover over the separator outlet, improving waste management contractor performance, and implementing oversight of the pellet separator by N licensed operators as discussed in response to inspection report deficiencies. Bayway also intends to evaluate the potential use of screens, fences and/or curtains for the baghouse exhaust roll-off area in 2020 if current equipment trials with roll-off covers are not considered successful.

Although Bayway has the ability to reroute the separator discharge to its process sewer, this is not recommended. Floating material that enters the process sewer mixes with floating oil in the process sewer. Currently, all oil recovered from the process sewer is recovered for eventual feed back into the refinery with no resultant waste. Resin within the process sewer will mix with oil in the process sewer. Oil is skimmed for discharge back into the refinery slop oil system, from where oil is recycled back into the refinery feed. Pellets mixed in with the oil will impact

operations and refinery equipment and can reduce processing rates and increase environmental impacts. Adding resin to the process sewer could also create more hazardous waste and reduce the amount of oil recycled back to the process.


Bayway Refinery
Figure 1: RR Ave
Ditch Area
Google Earth
Image Landsat / Copernicus
4000 ft


Bayway Refinery
Figure 1: RR Ave Ditch
Start of RR Ave Ditch
PPU Separator
RR Ave Ditch Boom
Photographed Boom under NJTP (not visible)
DSN005A under NJTP (not visible)
RR Ave Ditch discharge into Morses Creek
RR Ave Ditch boom
RR Ave Ditch dam
Google Earth
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Image Landsat / Copernicus
1000 ft


Bayway Refinery
Figure 2: Poly Ditch Area
Google Earth
Image Landsat / Copernicus
4000 ft
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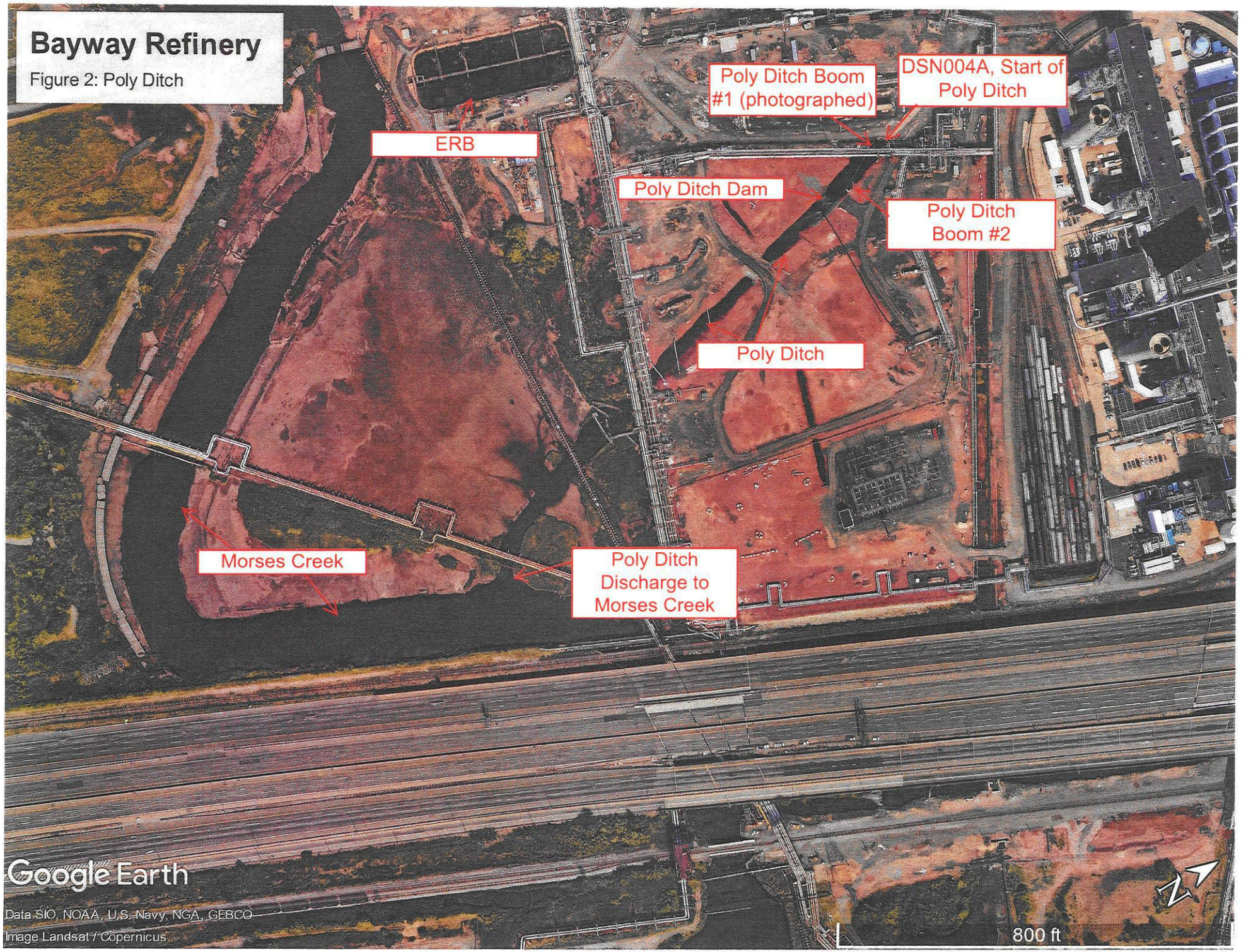
Bayway Refinery
Figure 2: Poly Ditch
ERB
Poly Ditch Boom #1 (photographed)
DSN004A, Start of Poly Ditch
Poly Ditch Dam
Poly Ditch Boom #2
Poly Ditch
Morses Creek
Poly Ditch Discharge to Morses Creek
Google Earth
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Image Landsat / Copernicus
800 ft

Attachment A:
Draft Polypropylene Resin Separator Operations and Maintenance (O&M) Manual

The following documents operations and maintenance practices and procedures currently in use at the Polypropylene Separator. Since NJDEP requires review and comment of this draft O&M Manual, these procedures will be added to existing documented Standard Operating Procedures for the Polypropylene Plant after NJDEP either provides comments or confirms that there are no comments.

Polypropylene Plant Resin Separator Description

The Polypropylene Plant operates and maintains a resin separator that is used to recover plastic residuals for offsite recycling by others. For purposes of this manual, plastic residuals and resin are used interchangeably. The resin separator is ten feet wide by sixty feet long. Flow enters from the upstream or south end of the separator and flows northward to the discharge outlet at the north end. Because polypropylene is lighter than water, as the flow moves toward the discharge end, plastic residuals separate from the non-turbulent flow stream and float to the surface. An underflow baffle upstream of the outlet pipe traps the plastic residual in the separation basin for recovery while the water flows underneath the baffle to the discharge outlet. Regardless of the size and shape of the residual, it will separate and float in non-turbulent water, with the only difference being that smaller particles may take longer to separate from the water stream and float to the surface. Thus, the main factor affecting the effectiveness of the separator is the flow rate/turbulence.

Water entering the pellet separator includes the following sources:

- Wash water from reactor resin sampling pads, pelleting building cooling water pads and floor drains, and load out building railcars.
- Storm water runoff from the bag house exhaust and resin skimming containment areas.

The pellet separator discharge is currently permitted to discharge to Railroad Avenue Ditch, where the discharge commingles with other flows before discharging into Morses Creek. Currently there are no monitoring requirements or numeric permit limits on the separator discharge. Monitoring is conducted of the commingled flow in the Railroad Avenue Ditch at monitoring point DSN 005A in accordance with NJ0001511. NJDEP's permit basis included that the water discharged from the pellet separator was "clean", which was based on the following:

- Only city water is used to wash resin to the separator.
- Only rail cars dedicated to polypropylene service can be washed to the separator.
- No chemical addition or storage is allowed in any area that could drain or be washed to the separator.

Additional BMPs in use or under consideration to further ensure a clean water discharge into Morses Creek from Railroad Avenue Ditch include:

- Periodic sweeping in buildings.
- Trial use of covers over roll-offs receiving baghouse exhaust to minimize windblown residuals from the roll-offs.
- Trial use of a cover over the separator outlet pipe designed to act as a second underflow baffle. The trial will monitor cover effectiveness for possible improvements.

- Removal of plastic residual trapped between the separator baffle and outlet cover (frequency to be based on observations after the outlet cover is installed)

Separator Operation and Maintenance

Currently, separator skimming and residuals management are contracted services. Floating residuals were originally pumped from the separator to a contained roll-off dumpster which then decanted water back to the separator. The pumping operation has been replaced with a vacuum system that vacuums floating residuals up from a single point in the separator basin to a contained dumpster that still decants (less) water back to the separator. Residuals removed from the separator area, including those collected from the baghouse exhaust, are shipped offsite for recycling when containers are full.

Residuals that collect in the separator basin are currently skimmed three times per week, which has based on operating experience proven to be effective for controlling resin build-up within the separator basin. Contracted personnel push floating residuals manually with hand held rakes towards the vacuum point to speed recovery. A trial using air discharge pipes to help move floating material towards the vacuum point was unsuccessful due to the creation of turbulence that resuspended some floating residual. This system was removed and will not be used again. In the event that residual is observed to be passing under the baffle, additional skimming will be conducted to control the discharge and residual trapped in the area between the baffle and outlet cover will be arranged to be skimmed.

Management of residual containers, whether for offsite recycling or offsite disposal, is contracted. The Contractor is required to follow all terms and conditions of the contract as well as site specific waste management procedures, including those in the Bayway Refinery Stormwater Pollution Prevention Plan. These procedures include but are not limited to the following requirements:

- Contractor to walk the area around a container before and after loading or unloading the container.
- Contractor to contact Bayway personnel for cleanup response in the event that material spills from a container being loaded or unloaded from a truck.
- Roll-offs not actively in use must be covered with heavy duty tarps secured around the roll-off.
- Residuals are to remain within containment areas awaiting recovery or within covered containers while awaiting offsite shipment. Residuals are not to be placed on grade outside of controlled containment areas or containers.

For product quality control, only lined roll-offs provided by the recycler are used for resin to be recycled. Resin to be shipped offsite for disposal (e.g., due to other material mixed in with the resin) is managed similarly to other wastes.

Recovery of loose residual outside of containment areas will be conducted by Bayway or contracted personnel as needed based on visual observations by Bayway and contracted personnel. Recovery methods can include vacuuming, sweeping or washing to a controlled area (e.g., the separator basin). Vacuum equipment can include vacuum trucks and manually controlled equipment.

Because the discharge side of the resin separator baffle is generally clean, it is exposed to sun that can lead to growth on the baffle and walls that can become infused with plastic.

Periodically, these accumulations will be removed and skimmed, using the outlet pipe cover for containment.

Separator Operation Oversight

Although everyone onsite has an inherent responsibility to ensure safe and environmentally acceptable operations, primary responsibility for the resin separator and baghouse area operation belongs to a Polypropylene process operator, who is onsite continuously when the Polypropylene Plant is operating. As part of their responsibilities, the process operator will visually check the separator for residual accumulation at least once every 12-hour shift.

In accordance with a NJDEP recommendation, process operator visual inspections will be supplemented periodically by a licensed waste water treatment plant operator with an N (industrial) license. The N licensed operator will focus on the separator operation to ensure a clean water discharge in accordance with the NJPDES permit, generally on a weekly basis. Observations requiring follow-up will be communicated to the appropriate Bayway personnel and documented in a file to be maintained by the Bayway environmental staff.