United States Environmental Protection Agency Region 4
Enforcement and Compliance Assurance Division
Water Enforcement Branch
61 Forsyth Street, SW Atlanta, Georgia 30303

New-Indy Catawba, LLC
Industrial Wastewater Treatment System
5300 Cureton Ferry Road
Catawba, South Carolina
NPDES Permit Number: SC0001015
Compliance Evaluation Inspection: April 26 – 27, 2021
Reconnaissance Inspection with Sampling Diagnostic: May 25 – 26, 2021

Compliance Evaluation Inspection
Project No. CV-SC0001015-042621

Reconnaissance Inspection
Project No. CV-SC0001015-052621

Table of Contents

I. INTRODUCTION

Representatives of the United States Environmental Protection Agency (EPA) and the South Carolina Department of Health and Environmental Control (SCDHEC) conducted a Compliance Evaluation Inspection (CEI) on April 26 and 27, 2021, on the New-Indy Catawba, LLC (New-Indy) facility's Industrial Wastewater Treatment System (IWTS). A follow-up Reconnaissance Inspection (RI) with Sampling Diagnostics was conducted by the EPA on May 25 and 26, 2021. New-Indy operates and maintains the associated IWTS. New-Indy Containerboard is New-Indy's corporate owner, and their office is located at 3500 Porsche Way, Suite 150, Ontario, California. Both inspections were conducted under the authority of Section 308 of the Clean Water Act (CWA), as amended. This report provides a summary of the inspections.

EPA and SCDHEC inspectors met with New-Indy representatives at the facility located at 5300 Cureton Ferry Road in Catawba, South Carolina and conducted an opening conference on April 26, 2021, followed by a walk-through of the IWTS. EPA inspectors and sampling team also met with New-Indy's Environmental Manager on May 25, 2021 to collect samples and conduct a RI to record any changes in operations or conditions of the IWTS since the CEI. SCDHEC inspectors were not on-site for the RI/sampling. A summary of findings is detailed below.

II. PARTICIPANTS

Key personnel participating in the CWA inspection include:

Name	Position	Phone Number
Dennis Sayre	EPA Inspector	404-562-9756
Brad Ammons	EPA Inspector	404-562-9769
Matt Miller	SCDHEC Inspector	803-896-0620
Sonya Johnson	SCDHEC Inspector	803-896-0620
Bryon Amikc	SCDHEC Permit Writer	803-898-4236
Pete Cleveland	New-Indy Technical Manager	803-981-8206
Daniel Mallett	New-Indy Environmental Manager	803-981-8010
Steve Weber	New-Indy Legal Council	704-372-9000
Mita Ghosh	EPA Legal Counsel (Water)	404-562-9568
Mary Rose	EPA Legal Counsel (Air)	404-562-9023

Legal counsel for New-Indy and EPA only participated in the opening and closing conference for the CEI. Other participants attending the CEI opening and closing conferences that did not participate in the CEI or RI included Katherine Haile (EPA Region 5 - Air and Radiation Division (ARD)), Scott Hamilton (EPA Region 5 - ARD), and Andrew Mills (EPA Region 4 – Enforcement and Compliance Assurance Division, Air Enforcement Branch).

III. FACILITY DESCRIPTION

The New-Indy IWTS is an aerated lagoon system used to treat industrial wastewater produced in wood pulping and paper production, (Figure 1). The IWTS has a flow capacity of greater than 75 million gallons per day (MGD) according to the latest National Pollutant Discharge Elimination System (NPDES) permit application, dated September 27, 2019. However, the IWTS's average flow since full operational start-up in February 2021 has been approximately 25 MGD. There are

four influent flow paths to the IWTS and three permitted outfalls. Permitted outfalls include Outfall 001, 01A and 01B. Outfall 001 is located at the Post-aeration Basin (Figure 2) on the banks of the Catawba River. Outfall 001 transmits all treated wastewater to the Catawba River from the #1 Holding Pond through a diffuser pipe in the Catawba River. Outfall 01A is located next to the Primary Clarifier and discharges approximately 0.06 MGD of domestic wastewater that comingles with the Primary Clarifier effluent. Outfall 01B discharges into Sludge Pond #2. Influent flow paths to the IWTS includes flow from the headworks to the Primary Clarifier, flow from the former bleaching process to Sludge Pond #2 through Outfall 01B, domestic waste through Outfall 01A, and foul condensate that is piped directly to the Aeration Stabilization Basin (ASB). Outfall 01B is no longer in use.

Approximately 20 to 26 MGD of process wastewater enters the Primary Clarifier through a bar screen at the Headworks, along with stormwater runoff during rain events. Primary Clarifier effluent is currently being routed directly to the ASB through the EQ Basin Bypass Pipe and the open channel Inlet Ditch. The Primary Clarifier has a 4.7 million gallon capacity and is used to settle influent solids prior to aeration in the ASB. Sludge removed from the bottom of the Primary Clarifier is discharged into the Equalization (EQ) Basin for settling and initial dewatering.

The ASB is a 64-acre aerated lagoon consisting of 52 aerators. Effluent from the ASB flows to the #1 Holding Pond by gravity then to the Post-aeration Basin for final aeration and discharge into the Catawba River through Outfall 001 using a submerged diffuser pipe, (Figure 2).

Sludge removed from the EQ Basin and ASB is either hauled or piped directly to Sludge Pond #4 for dewatering and permanent storage.

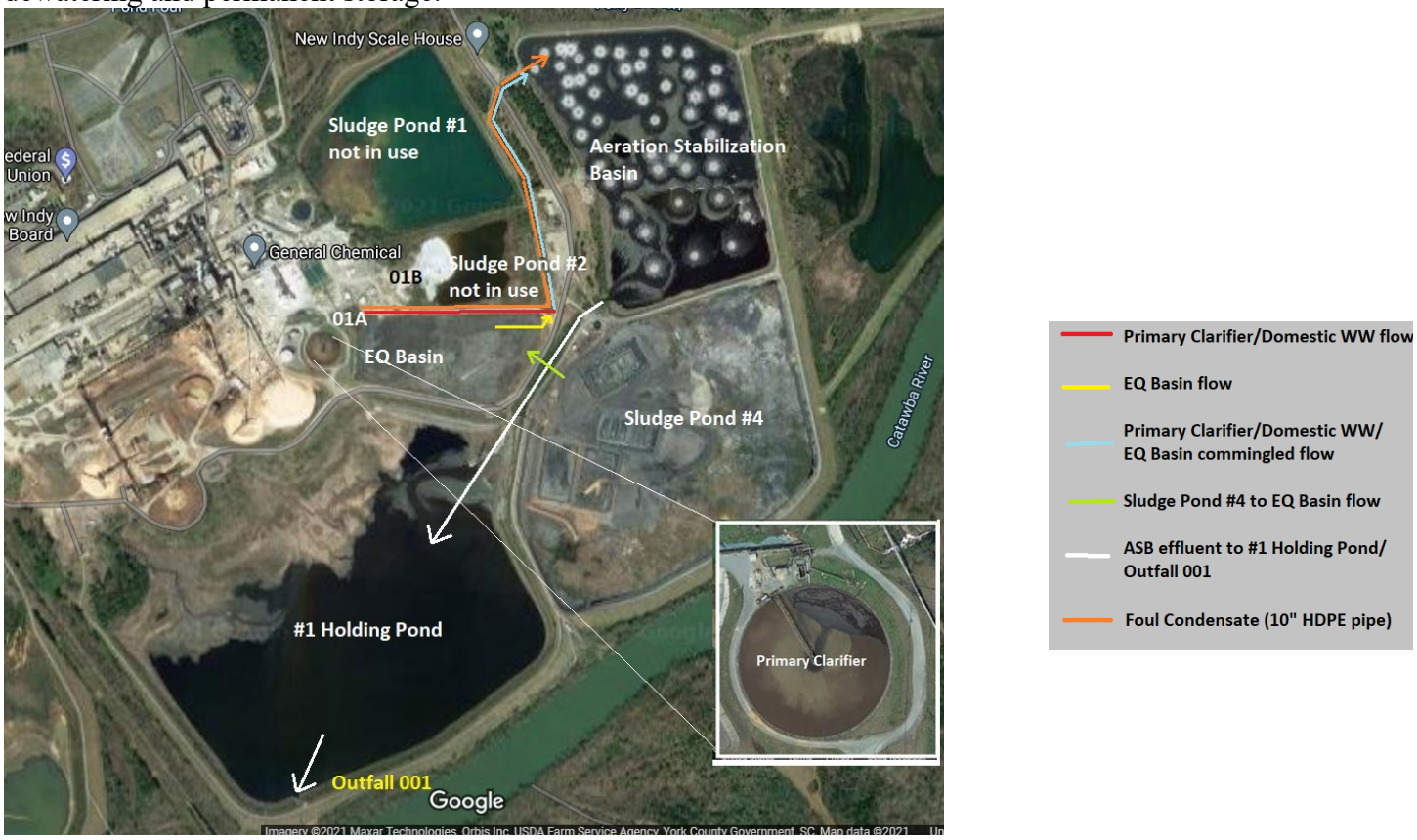

Figure 1. Aerial display of the IWTS.

Figure 2. Post-aeration Basin, Outfall 001 and discharge diffuser pipe location.

IV. BACKGROUND

New-Indy took possession of the kraft pulp and paper manufacturing mill through a purchase agreement with Resolute Forest Products US, Inc- Catawba (Resolute), on or about December 31, 2018. Resolute operated the mill as a Bleached Papergrade Kraft mill for "white paper" production. New-Indy continued to operate the mill from January 1, 2019 as a white paper production mill, to September 2, 2020, at which time the mill was shut down for redesign as an Unbleached Kraft paper mill to manufacture cardboard, also referred to as "brown paper." In November 2020, New-Indy began mill start-up with intermittent operations. Full brown paper production operations began on February 1, 2021.

The facility's wastewater is regulated under the CWA, 40 CFR Part 430, (Pulp, Paper, and Paperboard Point Source Category), Subpart C (Unbleached Kraft Subcategory). The white paper manufacturing process was regulated under 40 CFR Part 430, Subpart B (Bleached Papergrade Kraft and Soda Subcategory).

V. INSPECTION PROCEDURES

The overall objective of this CEI was to evaluate the conditions and operational performance of the IWTS and New-Indy's self-monitoring program and offer compliance assistance as needed. The objective of the RI was to discuss any operational or maintenance changes made since the April 27th CEI. Specific tasks included conducting interviews with New-Indy staff, reviewing Discharge Monitoring Reports (DMRs) and other records and conducting a site visit throughout the IWTS.

VI. FINDINGS AND CONCLUSIONS

Site Visit Findings:
(refer to Attachment 1 for all "Photo" references)

1. The Headworks showed signs of excessive surface corrosion, but otherwise appeared to be operating as designed, (Photo 1).
2. The Primary Clarifier weirs appeared to be level and discharging uniformly; however, the V-notches in the continuous V-notch weir were not visible due to an excessive build-up of process fibers clogging the weir (Photo 2). The Primary Clarifier effluent is discharged into the EQ Basin Bypass Pipe to the Inlet Ditch then to the ASB. Settled sludge from the Primary Clarifier is discharged into the EQ Basin.
3. Flow is measured from the domestic wastewater discharge at Outfall 01A using an ultrasonic flow measuring device and a Palmer-Bowlus flume, (Photo 3). The effluent was clear and flow was estimated to be approximately 25 to 50 gallons per minute. Flow from Outfall 01A is mixed with the Primary Clarifier effluent. Outfall 01A flow measurements were not verified due to the de minimus impact on the total wastewater flow entering the ASB.
4. The Primary Clarifier effluent and Outfall 01A is channeled through an open ditch to the EQ Basin Bypass Pipe located along the side of the EQ Basin. A gate valve is used to divert flow to the EQ Basin or to the EQ Basin Bypass Pipe inlet, (Photo 4). All flow from the open channel ditch was being diverted to the EQ Basin Bypass Pipe at the time of inspection.
5. The EQ Basin was approximately 75 percent full of sludge deposits. New-Indy was in the process of excavating the sludge using a long-arm excavator, (Photos 5 and 6). Dredged material is hauled to Sludge Pond #4 for dewatering and permanent storage. Flow from the EQ Basin is discharged into the Inlet Ditch. EQ Basin flow and EQ Basin Bypass Pipe flow merges at the beginning of the Inlet Ditch which flows to the ASB, (Photo 7 and 8).
6. Sludge removal operations were in progress at the inlet side of the ASB, (Photo 9). Sludge excavated from the ASB is hauled to Sludge Pond #4.
7. Foul condensate[1] enters into the ASB through a 10" HDPE pipe, (Photo 10). The foul condensate discharge pipe was originally an 8" HDPE pipe. New-Indy replaced the pipe with a 10" HDPE pipe to accommodate increased flow. Increased flow of foul condensate to the ASB was the result of an internal mill configuration change. The mill's previous pollution control configuration used a steam stripper to partially remove sulfonated compounds from the foul condensate prior to discharging to the IWTS. New-Indy's Bureau of Air Quality Construction Permit (Permit number 2440-0005-DF, 5/13/2020), allows New-Indy to decommission the steam stripper and to hard pipe 100 percent of the foul condensate directly to the IWTS.
8. The ASB was approximately 80 to 90 percent covered with a sludge blanket that is believed to be 3 to 4 feet in depth, (Photos 9, 10, and 11). The ASB is approximately 20 feet in depth. There is a total of 52 aerators located throughout the ASB, 33 were operational on April 26th and 38 were operational on May 26th. New-Indy plans to repair the remaining aerators when sludge removal operations clear the sludge away from the inoperable aerators.
9. A dredging barge located at the northeast end of the ASB pumps sludge to Sludge Pond #4 through a pipe laid along the bank of the ASB, (Photo 11). The barge was not operating during the inspection. Sludge piped to Sludge Pond #4 is discharged into geotextile sludge dewatering bags.

[1] Foul condensate is wastewater collected from the mill wood chip digesters and evaporators. Foul condensate contains reduced sulfur compounds, concentrated Biochemical Oxygen Demand and Volatile Organic Compounds. (EPA/310-R-02-002, Profile of Pulp and Paper Industry, 2nd edition, 2002)

10. Observations on May 26th shows that New-Indy has removed approximately 70 to 80 percent of the total floating sludge from the ASB, (Photo 12). Sludge removal operations were ongoing.
11. The ASB was initially designed with floating baffles to increase retention time in the lagoon. According to the Environmental Manager, prior to New-Indy ownership, the baffles were overcome by the weight of sludge deposits in the ASB and are submerged.
12. The Post-aeration Basin receives flow from Holding Pond #1. A thick layer of foam believed to be from high concentrations of lignin and tannin, was observed in the Post-aeration Basin aeration tank, (Photo 13). Observations on May 26th shows very little foaming in the Post-aeration Basin, (Photo 14),
13. Dissolved Oxygen (DO) and pH are measured continuously in the equipment room at the Post-aeration Basin, (Photo 15). The DO and pH probes are located in a sampling box outside of the Post-aeration Basin equipment room. Significant foaming was observed at the sampling box on April 26th, (Photo 16). No foam build-up was observed at the sampling box on May 26th, (Photo 17).
14. New-Indy uses "PI ProcessBook" automated monitoring software for real-time monitoring of pH, DO and other processes and instruments used throughout the mill.
15. A fatty acid solution[2] is used as a defoaming agent that is injected into the Post-aeration Basin at the aeration tank and at the Post-aeration Basin discharge pipe (Outfall 001), (Photos 18).
16. A submerged diffuser pipe disburses effluent from the Post-aeration Basin into the Catawba River. Brown flumes were noted in the river at the diffuser pipe, (Photo 19). Brown flumes were also noted on May 26th, (Photo 20). One location on the diffuser pipe appeared to discharge much larger volumes than other locations downstream in the pipe indicating that there may be clogging or corrosion at the diffuser outlets.

Site Inspection Conclusions:

The Environmental Manager explained that the ASB filled rapidly with fibrous sludge due to difficulties during plant start-up. The redesigned pulp drier and paper machine experienced start-up issues causing excess fibrous solids in the effluent which rapidly filled the ASB between January and March 2021. Concerns about compromising the integrity of the ASB berms from the weight of heavy dump trucks and excavators, as well as restricted access to Sludge Pond #4 due to the excessively wet conditions prevented New-Indy from initiating solids removal from the ASB until mid-April 2021.

Aggressive sludge removal operations have facilitated repair of five aerators between April 26th and May 26th. On April 26th, inspectors noted that 19 of 52 aerators were inoperable in the ASB, and on May 26th, 14 aerators were inoperable. Most of the remaining nonoperational aerators are located on the east side of the ASB where sludge was being removed.

Complaints of Hydrogen Sulfide (H_sS) odors have been persistent off-site from February 1, 2020, up to the time of the CEI. On May 26th, inspectors noted that New-Indy began injecting Calcium Ammonium Nitrate (CAN) in the Inlet Ditch, just before entering the ASB. CAN injection began approximately four weeks prior to the RI conducted on May 26 and 27, 2021. The Environmental Manager stated that complaints have significantly decreased since the introduction of CAN into the treatment process. Hydrogen Peroxide (H_2O_2) injection, in conjunction with CAN injection, was scheduled to begin on May 28th. The introduction of CAN and H_2O_2 provides oxidization to the ASB influent which aids

[2] Safety Data Sheet description: Hydrotreated Heavy Paraffinic Distillate, Octadecanoic acid, reaction products with triethylenetetramine, CAS No. 64742-54-7

conversion of sulfides to sulfates. Sulfates are less likely to produce H_sS. Repairing the remaining nonoperational aerators should also aid in reducing H_sS emissions.

VI. PERMIT REVIEW

NPDES permit number SC0001015 was issued to Resolute Forest Products, Inc. on July 27, 2009, with an effective on October 1, 2009. The permit expired on September 30, 2014. New-Indy is currently operating under an administratively continued NPDES permit. The permit was modified, effective on January 1, 2019, to reflect the change in ownership. The administratively continued permit was issued to reflect CWA requirements for pulp and paper mills using the Bleached Papergrade Kraft process and is not reflective of the Unbleached Kraft process. New-Indy submitted a permit application to SCDHEC on, or about September 27, 2019, which included the new Unbleached Kraft process.

VII. RECORDS AND REPORTS

EPA's Compliance History Online[1](ECHO), located at www.echo.epa.gov, is a public website repository for data and displays compliance history of facilities, including reported DMR data, inspections, enforcement activity, and other relevant information. The EPA reviewed New-Indy's DMR data from January 1, 2018 to March 31, 2021. Records indicate that New-Indy, and Resolute prior to the transfer of ownership, has been in compliance with NPDES permit effluent limits for the period reviewed with exception of a fecal coliform violation at Outfall 01A for the month of November 2020.

Inspectors reviewed laboratory reports, chain-of-custody (COC) sheets used for on-site lab testing of biochemical oxygen demand (BOD_5), and total suspended solids (TSS), for samples analyzed at the New-Indy laboratory, as well as COC sheets for ammonia samples collected by Shealy Environmental Services, Inc. Testing methods were in accordance with 40 CFR Part 136. Inspectors also verified calculations used to calculate Ultimate Oxygen Demand. No discrepancies were noted, with exception of the January 2020 COC which did not annotate the location being sampled.

New-Indy uses NCASI[3] Technical Bulletin (TB) 803 (May 2000), Method 71.01 to measure effluent color. The NPDES permit prescribes NCASI TB 253. TB 803 is an update of procedures outlined in TB 253 for the measurement of color in pulp mill wastewaters.

VIII. FLOW MEASUREMENT

Flow discharged from Outfall 001 is measured using a Fischer-Porter magnetic flowmeter. Calibration is performed annually.

IX. SAMPLING REVIEW

Sample results from samples collected during the RI will be sent in a separate report from the EPA Region 4 Laboratory Services and Applied Science Division.

The EPA inspectors observed an individual volume sample collected from the composite sampler located at Outfall 001. The composite sampler pulled 118ml of effluent, well over the 100ml minimum recommended.

[3] NCASI – National Council for Air and Stream Improvement

New-Indy laboratory analyzes samples for color, BOD_5 and TSS. DO and pH are monitored continuously, as described above. Shealy Environmental Services collects samples and analyzes effluent for all other NPDES permit required parameters.

New-Indy no longer collects samples for constituents listed under Outfall 01B in the NPDES permit. Outfall 01B is no longer in use.

X. DISCUSSION

IWTS Configuration:

The current IWTS is not operating in a configuration approved by SCDHEC in the most current NPDES permit or through any NPDES permit modification. However, prior to New-Indy ownership, Resolute obtained a Wastewater Construction Permit, enclosed as Attachment 2 (Wastewater Construction Permit No. 20098-IW and *Wastewater Construction Application Package*), that allowed Resolute to modify the existing EQ Basin and sludge dewatering system and to conduct a pilot study aimed at increasing the efficiency of sludge management. The current operating configuration conforms to the Wastewater Construction Permit, issued on April 25, 2017 and is shown in Figure 2 of Attachment 2. The permit application applicable to the current NPDES permit show that the Primary Clarifier sludge underflow was pumped directly to Sludge Pond #4 for dewatering and decant from Sludge Basin #4 flowed by gravity to the EQ Basin. Section 2.2 of Attachment 2, which is the configuration currently in use, shows that the underflow from the Primary Clarifier is diverted to the EQ Basin for sludge dewatering, and Primary Clarifier overflow is diverted around the EQ Basin to the ASB Inlet Ditch through the EQ Basin Bypass Pipe.

The Wastewater Construction Permit stipulates that the permittee is to obtain "Approval to Place in Operation" the configuration proposed in Attachment 2 no later than April 25, 2020. No such approval has been made by SCDHEC thus far; however, New-Indy submitted a NPDES permit modification package to SCDHEC, dated September 27, 2019, that reflects the use of the configuration and Unbleached Kraft process currently in use.

Dioxin contamination:

The white paper manufacturing process created deposits of dioxin in the wastewater sludge. Dioxin is a toxic byproduct of the chorine-bleaching process. Sludge removed from the treatment basins are stored in Sludge Pond #4 for permanent disposal, in accordance with the NPDES permit. New-Indy is currently in discussions with SCDHEC regarding dioxin contaminates in the sludge. Dioxin contamination and permanent sludge storage is beyond the scope of this report; however, the outcome of the discussions will likely affect the future configuration of the IWTS.

XI. ATTACHMENTS

1. Inspection Photographs
2. Construction Permit No. 20098-IW and Wastewater Construction Application Package

END OF REPORT

Attachment 1, Photographs
New-Indy Catawba, LLC

Photo 1. Headworks/Bar Screen


Photo 2. Primary Clarifier


Photo 3. Outfall 01A, domestic wastewater outfall.


Photo 4. Open channel ditch directing flow from the Primary Clarifier to the EQ Basin and EQ Basin Bypass Pipe inlet.


Photo 5. EQ Basin, west/influent side.

Photo 6. EQ Basin, influent side, west to east.

Photo 7. EQ Basin and EQ Basin Bypass Pipe outlets to the Inlet Ditch.

Photo 8. Inlet Ditch from EQ Basin outlet.

Photo 9. ASB northwest end new the Inlet Ditch. Excavator dredging operations in progress.

Photo 10. ASB northwest end looking south-southeast. The HDPE pipe is a 10" inlet pipe used to discharge foul condensate directly into the ASB from the process area.

Photo 11. Dredging barge located on the northeast side of the ASB.

Photo 12. ASB observations on May 26th shows positive effects of aggressive sludge removal.

Photo 13. Post-aeration Basin interior holding tank.

Photo 14. Post-aeration Basin interior, May 26th.

Photo 15. Dissolved Oxygen and pH meter display. Post-aeration Basin equipment room.

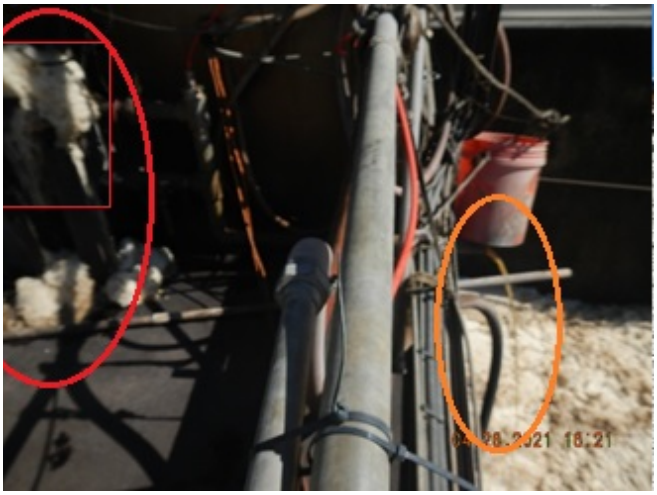

Photo 16. Post-aeration Basin. Sampling box indicated by the red boxed outline. Orange outline shows defoaming agent inflow. Significant foaming observed at the sampling box, indicated by red oval outline.

Photo 17. Post-aeration Basin. Sampling box observed on May 26th.

Photo 18. Defoaming agent discharge pipe, discharging into the Post-aeration Basin outlet to Outfall 001.

Photo 19. Outfall 001 diffuser pipe location on the Catawba River. Brown flumes noted at the river surface.

Photo 20: Outfall 001 diffuser pipe, May 26th. Brown flumes noted at the river surface.

Healthy People. Healthy Communities.

April 25, 2017

Wayne Griffin
RESOLUTE FP US INC
5300 CURETON FERRY RD
CATAWBA, SC 29704

Re: Construction Permit No. 20098-IW
RESOLUTE FP US INC
CATAWBA OPERATIONS
EQ BASIN & SLUDGE DEWATERING IMPROVEMENTS
York County

Dear Mr. Griffin:

Enclosed is a SC Wastewater Construction Permit for the above referenced project. Construction is to be performed in accordance with this permit and supporting engineering report, plans, and specifications approved by this Office.

This system cannot be placed into operation until final approval is granted by the appropriate Bureau of Environmental Health Services (BEHS) Regional Office. Your Regional contact is Kristen L Jones, in the MIDLANDS REGION BEHS LANCASTER. This regional office should be notified when construction begins at the following address and phone number: 2475 DHEC RD, LANCASTER SC 29720, 803-285-7461.

Upon completion of any construction, a letter must be submitted to the BEHS Regional Office from the registered engineer certifying that the construction has been completed in accordance with the approved plans and specifications. An inspection may then be scheduled. The BEHS Regional Office will approve the system for operation upon successful completion of this project.

Sincerely,

Byron M Amick
Industrial Wastewater Permitting Section
Water Facilities Permitting Division

cc via email: Kristen L Jones, MIDLANDS REGION BEHS LANCASTER
James M Kirlin, TRC Environmental Corporation

Wastewater Construction Permit
Bureau of Water

PROJECT NAME: RESOLUTE FP US INC - CATAWBA OPERATIONS EQ BASIN & SLUDGE DEWATERING IMPROVEMENTS	COUNTY: YORK

PERMISSION IS HEREBY GRANTED TO: **RESOLUTE FP US INC**
Catawba Operations
5300 Cureton Ferry Rd
Catawba SC 29704

for the construction of an upgrade to an existing wastewater treatment plant in accordance with the construction plans, specifications, engineering report and the Construction Permit Application signed by James M Kirlin, Registered Professional Engineer, S.C. Registration Number: 19829.

PROJECT DESCRIPTION: Modification of the existing Equalization (EQ) Basin and Sludge Dewatering system. See Page 2.

The effluent will be discharged to the Catawba River at a daily average rate of 25,000,000 *(no new flow)* gallons per day.

The effluent concentrations of those constituents the wastewater treatment system is designed to remove or reduce are contained in NPDES Permit #SC0001015.

CONDITIONS: See page 3.

In accepting this permit, the owner agrees to the admission of properly authorized persons at all reasonable hours for the purpose of sampling and inspection. This is a permit for construction only and does not constitute DHEC approval, temporary or otherwise, to place the system in operation. An Approval to Place in Operation is required and can be obtained following the completion of construction by contacting the LANCASTER EQC OFFICE at 803-285-7461. Additional permits may be required prior to construction (e.g., Stormwater).

PERMIT NUMBER:	**20098-IW**
ISSUANCE DATE:	**April 25, 2017**
EXPIRATION DATES:	**April 25, 2019** (to begin construction) **April 25, 2020** (to obtain Approval to Place in Operation)

Jeffrey P. deBessonet, P.E., Director
Water Facilities Permitting Division

BMA

PROJECT DESCRIPTION

The modifications, will consist of the following:

- installation of approximately 500 LF of 12-inch HDPE gravity piping, to divert primary sludge to a new pipe discharge outlet on the EQ Basin
- sludge dredging equipment dredged material conveyance piping will be provided by a third-party contractor
- installation of Geotextile Tubes for sludge watering, while maintaining the option to use third-party mobile sludge dewatering units
- installation of a polymer feed system, with an 8,000-gallon holding/mix tank for the 1% polymer solution and a chemical feed pump capable of pumping up to 200 gpm
- installation of three finger dikes in the EQ Basin, to enable shore-based mechanical excavation
- replacement of two (2) existing aspirating aerators with a 75-HP and a 84-HP aspirator aerators.
- all associated piping and appurtenances

The existing process wastewater treatment system which consists of:

- Bar Screens
- a 275-foot diameter Primary Clarifier
- a 31 acre, 840 acre-foot (approx. 275 million gallons) Sludge Basin (No. 1 Sludge Basin)
- a 16.3 acre, 495 acre-foot (approx. 162 million gallons) Sludge Basin (No. 2 Sludge Basin)
- a 16.2 acre, 55 million gallon Equalization (EQ) Basin (aka No. 3 Sludge Basin)
- a 64 acre, 375 million gallon Aerated Stabilization Basin (ASB)
- a 132 acre, 1675 million gallon effluent Holding Basin (No. 1 Holding Basin)
- a 160 acre, 1400 million gallon effluent Holding Basin (No. 2 Holding Basin)
- a 80 foot long by 40 foot wide by 35 foot deep concrete Post Aeration Basin with three (3) aerators (75-HP surface aerator, **75-HP aspirator aerator** and **84-HP aspirator aerator**) and a chemical defoaming feed system
- a 0.5 million gallon Sludge Storage Tank
- **sludge removal and dewatering system**
- a 89 acre, 3280 acre-feet Sludge Basin (No. 4 Sludge Basin)
- a Color Removal System, which consists of four (4) 3,000 gallon Alum/Cationic Polymer storage tanks, one 8,000 gallon Acid storage tank, one 3,000 gallon Polymer mix tank, one 3,000 gallon Polymer Day tank, one 20,000 gallon coagulant mix tank, one 20,000 gallon Flocculent mix tank, one circular (70 ft. Dia.) Dissolved air flotation clarifier, and one 12,000 gallon sludge tank
- a lined 84 acre 2-Cell Temporary Wastewater Storage Basin (No. 5 Sludge Basin; aka Dove Pond)
- an effluent diffuser system (which consists of three (3) 100 foot sections of HDPE piping with each sections diameters being 48 inches, 36 inches, and 30 inches, fifty-one (51) 8-inch diffuser check valves as nozzles spaced equally along the diffuser)
- all associated piping and appurtenances

* Items in bold are new to the overall system

PROJECT DESCRIPTION

The treated sanitary wastewater enters the process wastewater system at the primary clarifier overflow structure. The existing sanitary wastewater treatment system which consists of:

- two (2) in-ground in-series digester/settling tanks
- a chlorine contact chamber located at the end of the second tank of the series
- mechanical agitator
- a 1150-gallon hypochlorite solution storage poly-tank with secondary containment
- a metering chemical feed pumps
- an 8-inch Palmer-Bowlus Flume flow measuring device
- all associated pumps, piping and appurtenances

CONDITIONS

1. This Permit supersedes the following Permits to Construct: 136 issued March 6, 1957, 287 issued June 20, 1960, 1138 issued November 8, 1967, 1660 issued August 21, 1970, 4519 issued March 29, 1977, 4672 issued June 14, 1977, 5864 issued December 1, 1978, 12670 issued October 20, 1986, 15045 issued March 8, 1989, 16745 issued October 24, 1990, 17706-IW issued July 18, 1994, 18010-IW issued July 5, 1996, 18209-IW issued October 22, 1997, 18220-IW issued December 8, 1997, 18395-IW issued June 1, 1999, 18449-IW issued November 8, 1999, 18535-IW issued August 21, 2000, 19109-IW issued April 5, 2007, 19148-IW issued September 19, 2007 and 19349-IW issued January 29, 2010.

2. All waste oil and solid and hazardous waste shall be properly disposed of in accordance with the rules and regulations of the Bureau of Land and Waste Management of SCDHEC.

3. Resolute has used mobile sludge dewatering systems provided by a third-party contractor in the past and may continue to use third-party owned dewatering equipment. The owner of the mobile dewatering equipment must have a DHEC issued Wastewater Construction Permit for the mobile equipment, and must receive a written approval from the Bureau of Water to use the equipment at the site.

4. In accordance with Regulation 61-67, Standards for Wastewater Facility Construction, all wastewater treatment facilities shall be closed out within one hundred eighty (180) days when the facility is closed or the effluent disposal permit is inactivated, terminated or revoked, unless otherwise determined by the Department. Closure of wastewater treatment facilities necessitates the submittal of a closure plan and approval of the plan by the Department in accordance with R.61-82 prior to closure of any wastewater treatment unit(s).

Equalization Basin and Sludge Dewatering Improvements

Wastewater Construction Permit Application Package

Resolute FP US Inc. – Catawba Operations

March 2017

S. C. DEPT. OF HEALTH & ENVIRONMENTAL CONTROL
BUREAU OF WATER
WASTEW[illegible] FACILITIES
APPROVED [illegible] RUCTION
(SUBJECT T[illegible] NH[illegible]
AP[illegible] PMIT)
AL WRITTE[illegible] VAL FC [illegible] ON MU
BE[illegible] BTA[illegible] EI [illegible] OFFIC[illegible] ATER CO
PL[illegible] ON OF CONS[illegible] UCTION
PE[illegible] IT NO. 20098-IW DATE 4-25-17

RECEIVED
MAR 14 2017
WATER FACILITIES
PERMITTING DIVISION

SOUTH CAROLINA REGISTERED PROFESSIONAL ENGINEER
JAMES M. KIRLIN
3/13/17

James M. Kirlin, PE
Project Manager/Senior Engineer

SOUTH CAROLINA
TRC ENGINEERS, INC.
No. 3330
CERTIFICATE OF AUTHORIZATION

30 Patewood Drive, Suite 300, Greenville, SC 29615, • 864.281.0030 Phone • 864.281.0288 Fax • www.TRCsolutions.com

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Section 1
Introduction

1.1 Background

Resolute FP Us Inc. (Resolute) operates a pulp and paper manufacturing facility in Catawba, York County, South Carolina (see Figure 1). Wastewater generated from the facility is treated in an onsite wastewater treatment system and discharged to the Catawba River in accordance with the National Pollutant Discharge Elimination System (NPDES) Permit Number SC0001015. The treatment systems consists of a primary clarifier, an Equalization Basin (EQ Basin), an Aerated Stabilization Basin (ASB), two treated effluent holding ponds, a Post-Aeration Basin (PAB), an effluent diffuser, sludge dewatering operations, and sludge disposal basins. The flow rate of wastewater generated at the mill averages 25 to 30 million gallons per day (MGD).

The mill has experienced operating challenges with the primary sludge dewatering operations performed since the early 2000s. These challenges have resulted in reduced sludge dewatering efficiencies, which have contributed to high solids remaining in the sludge press filtrate streams, high dewatering aid chemistry costs, and reduced sludge throughput.

In an effort to improve sludge dewatering operations, Resolute initiated a pilot study in April 2016 to evaluate sending clarifier underflow sludge to the EQ Basin. The goal of the study was to evaluate the impact on sludge dewatering from using the EQ Basin to thicken and equalize primary sludge. The pilot study also evaluated utilizing a hydraulic dredge to convey the thickened sludge to four mobile belt filter presses. The dredge and belt presses were owned and operated by Bio-Nomic Services, Inc. for Resolute. This pilot study was approved by the South Carolina Department of Health and Environmental Control (SC DHEC) in a Letter of Approval dated February 12, 2016. SC DHEC extended the approval for the pilot study until March 31, 2017 requiring Resolute to obtain a construction permit if Resolute intended to implement the operations on a permanent basis.

The pilot study was successful in demonstrating the viability of utilizing the EQ Basin to equalize and thicken the clarifier underflow stream improving the efficiency, cost effectiveness, and safety of the sludge dewatering operations. Therefore, Resolute intends to implement specific aspects of the pilot study full time at the mill as a series of improvements to the site wastewater treatment system.

1.2 Construction Permit Application Purpose

This construction permit application submittal has been prepared to notify SC DHEC of the following improvement/modification projects listed below and described in detail in this engineering report.

- Implement improvements related to the EQ Basin pilot study approved by SC DHEC on February 12, 2016, specifically;
  - Piping to convey clarifier underflow sludge to the EQ Basin on a permanent basis to thicken and equalize sludge quality, but retain the ability to convey clarifier underflow sludge directly to sludge dewatering equipment at the No. 4 Sludge Basin, as necessary
  - Use of a hydraulic dredge to remove settled solids from the clarifier
  - Use of mobile presses to dewater routine dredged material from the EQ Basin
- Use of geotextile tubes to dewater routinely dredged material from the EQ Basin and primary sludge pumped directly from the clarifier as an alternative to using belt presses to allow the mill flexibility in managing this material,
- Installation of a series of finger dikes in the EQ Basin to allow access for land-based equipment to perform maintenance dredging of existing bark and heavier solids, and
- Replacement of submerged, supplemental aerators in the Post-Aerator Basin that have become inoperable.

1.3 Construction Permit Application Contents

This construction application package contains the following components,

1. Engineering Report prepared in accordance with S.C. Regulation 61-67.200,
2. Wastewater System Construction Application (Appendix A),
3. Site Location Map (Figure 1),
4. Wastewater System Improvements Process Flow Diagram (Figure 2),
5. Project Site Layout Map (Figure 3),
6. EQ Basin Finger Dike Sketch (Figure 4)
7. Equipment Information and Specifications (Appendix B),
8. Engineering Calculations (Appendix C), and
9. Check for $550 for the construction application fee for a modification (no expansion) to a wastewater treatment system for facilities that discharge greater than 1 MGD (attached).

Section 2
Project Description

2.1 Existing Treatment and Primary Solids Management

Resolute generates 25 to 30 MGD of wastewater as part of mill operations. The majority of the heavier solids in the wastewater are removed in the clarifier as underflow. These solids include including grit, lime, fiber, wood ash, and bark. Historically, the clarifier underflow was pumped to the No. 4 Sludge Basin directly for settling. Decant from the No. 4 Sludge Basin flowed by gravity to the ASB inlet ditch. Overflow from the clarifier has historically flowed by gravity to the EQ Basin for equalization and mixing with process streams that are not treated in the clarifier, *e.g.*, the bleach plant effluent and treated sanitary wastewater.

In the early 2000s, the mill began pumping the clarifier underflow to onsite sludge dewatering operations managed by outside contractors. The contract dewatering operations generated a sludge cake that was then placed in the No. 4 Sludge Pond for disposal. Filtrate from the dewatering operations flowed by gravity to the ASB inlet ditch.

2.2 EQ Basin Pilot Study Conclusions

Resolute initiated a SC DHEC-approved pilot study in April 2016 to evaluate the use of the EQ Basin to equalize and thicken primary sludge. The study involved pumping the clarifier underflow to the EQ Basin and diverting clarifier overflow wastewater around the EQ Basin. This allowed the EQ Basin to serve to equalize the sludge stream that at times could be variable in consistency and constituents. The additional settling time provided by the EQ Basin allowed the settled sludge to thicken to improve the ability of the filter presses to dewater the sludge. A hydraulic dredge was used to remove the settled solids from the EQ Basin and pump the sludge to mobile filter presses located adjacent to the location of the former permanent sludge dewatering operation at the No. 4 Sludge Basin. The dewatered sludge cake was placed in the sludge basin.

Conveying clarifier underflow sludge to the EQ basin has proven to be a useful method for thickening and equalizing the sludge prior to dewatering. Attenuating sludge inconsistencies has resulted in a more homogenized sludge quality, reduced the need for dewatering aid chemicals, and provided the means to potentially hold sludge allowing dewatering operations to only be performed during daylight hours which improves worker safety.

The use of a dredge to remove the settled solids from the EQ Basin and convey them to the mobile belt filter presses has also proved successful. Based on the success of the pilot study,

Resolute intends to implement the ability to convey clarifier underflow to the EQ Basin and dredging the settled material to mobile filter presses or geotextile tubes on a permanent basis. With either system, dewatered sludge will be placed in the No. 4 Sludge Basin.

While the pilot study was successful at demonstrating improved primary solids dewatering, there were two concerns encountered during the course of the project. Very old, thick bark solids were discovered in the western end of the EQ Basin that appeared to have been present in the basin prior to the study. As an option to enable access to remove these solids through mechanical excavation techniques, Resolute is considering installing finger dikes in the EQ Basin to allow access for shore-based excavators to remove the aged, bark-containing sludge for placement in the No. 4 Sludge Pond.

2.3 Clarifier Underflow Sludge Conveyance Piping

Resolute utilized 12-inch High Density Polyethylene (HDPE) piping to tie into existing sludge conveyance piping during the pilot study to divert primary sludge to the EQ Basin (see Figure 3). Resolute intends to use this piping on a permanent basis, but move the pipe discharge outlet to the location shown on Figure 3. The flowrate of clarifier underflow is approximately 3 MGD. At this flowrate pipe flow velocity is 5.9 feet per second (fps), which meets the minimum recommended velocity of 2 fps to minimize solids settling in piping. Supporting engineering calculations are provided in Appendix C. The path to the EQ Basin (~ 500 ft) is much shorter than the path to the former sludge dewatering operations (~ 2,800 ft); therefore, upgrades to the existing clarifier sludge pumps will not be necessary.

Resolute intends to retain the existing piping and capability of conveying clarifier underflow sludge directly from the existing underflow pumps to the sludge dewatering operations at No. 4 Sludge Basin.

2.4 EQ Basin Dredge Operations

Resolute's contractor utilized a hydraulic dredge with a horizontal cutter/suction head in the EQ Basin during the pilot study. The dredged used a variable speed pump that had the capacity to convey dredged material up to 2,000 gallons per minute (gpm) to the mobile presses, though the flowrate utilized during the study was much less. Resolute intends to continue contract dredging in the EQ basin to remove settled material as needed. The type and size of dredge may change as conditions, the dewatering method, and the selected contractor's equipment warrant. While the dredge itself may not need to be permitted; the information on the dredge is being provided as supporting information for the overall project.

The piping for the dredged material conveyance will continue to be portable 8 and 12-inch HDPE pipe provided by the dredging contractor.

2.5 Sludge Dewatering Modifications

As described above, since the early 2000's, Resolute has utilized contracted filter press systems to dewater primary solids that were pumped directly from the clarifier. Prior to the pilot study the sludge dewatering operations involved a permanently mounted dewatering system. Mobile presses were utilized during the pilot study, and the permanent presses were removed from the site by the outgoing contractor. Resolute intends to continue utilizing mobile belt presses as needed and understands that contractor/owners of mobile presses would need SC DHEC approval specific to each mobilization.

While retaining the option to utilize mobile presses, Resolute also intends to implement the use of geotextile tubes for sludge dewatering. Geotextile tubes are large, disposable "socks" made of synthetic filter fabric. Sludge material dredged from the EQ Basin, or directly from existing clarifier underflow pumps, will be pumped into these geotextile tubes. The filter fabric media will retain solids within the tube and allow water filtrate to permeate out of the tube. The tubes would be placed on graded pads in the No. 4 Sludge Basin on top of existing dewatering sludge (see Figure 3) utilizing a liner material to contain filtrate from the tubes.

The tubes themselves are fabricated by a geotextile fabric manufactured and shipped to the site as needed in rolls. An example manufacturer's information sheet is provided in Appendix B. Typically the tubes are provided in circumferences of 30 to 100 feet with lengths up to 300 feet, but can be fabricated to custom dimensions to suit project needs.

Portable HDPE dredge piping will be used to convey sludge from the EQ basin dredge or the clarifier underflow pumps to the geotextile tubes. Dewatering aid polymer chemical will be injected into the HDPE conveyance line from a chemical make-down unit. The polymer chemical metering pump is capable of pumping up to 200 gallons per minute of the 1 percent polymer solution. The flow rate will depend on dredging rate and solids consistency in the dredged material. Polymer will be delivered to the site by tanker trucks and mixed to 1 percent in an 8,000-gallon poly tank. The polymer feed pump will pull from this tank.

Information on the chemical make-down unit and a Safety Data Sheet for the polymer is provided in Appendix B. The anticipated flowrate of dredged material pumped to the geotextile tubes will be 1,500 to 3,500 gpm depending on the dredge used and the size and quantity of geotextile tubes used.

Once filled with dewatered sludge, the geotextile tubes will remain in the No. 4 Sludge Basin.

Filtrate (also referred to as "weep water") from the tubes will be collected in perimeter ditches around the tube pads and routed by gravity through portable HDPE pipe to the basin perimeter ditches that drain to the inlet ditch to the ASB.

Resolute is currently utilizing geotextile tubes as part of a maintenance dredging project from the ASB (see Figure 3) that is separate from the EQ basin project. The tubes utilized for this project are staged within the No. 4 Sludge Basin. The proposed primary sludge dredging and dewatering project would be operated very similar to the ASB maintenance dredging project.

2.6 EQ Basin Finger Dikes

The pilot study involved pumping clarifier underflow sludge to the EQ Basin. At the same time clarifier overflow was also continuing to flow by gravity into the basin until the bypass line for the clarifier overflow around the EQ Basin could be re-established. Resolute discovered during the pilot study that the existing bypass line was damaged by collapses in the line and could not be reused. A mobile pumping system was brought in to aid in the bypassing until a new gravity line could be installed.

During the pilot study Resolute's dredging contractor encountered bark material in the EQ Basin that had settled out from wastewater operations over time. This material, which was determined to be present in the basin prior to the pilot study, was encountered in the western end of the EQ basin near the wastewater inlet location. The pilot study belt filter presses had difficulty processing the sludge with bark in it so dredging this specific area in the basin was abandoned in favor of areas in the center and in the eastern end of the basin.

To enable shore-based mechanical excavation equipment to remove the bark solids, Resolute is considering installing a series of finger dikes into the basin as shown on Figure 3.

If installed, the fingers dikes will be installed across the basin (see Figures 3 and 4). The finger dikes would be constructed by bridging the sludge with a synthetic biaxial geogrid as a base, then placing wood chips on top the geogrid, and then wood ash as the top of the dike. A sketch showing a dike section is provided on Figure 4.

The material excavated from the EQ Basin by excavator will be placed in the No. 4 Sludge Basin.

2.7 Post-Aeration Submerged Aerator Replacement

As part of the current wastewater treatment system, Resolute operates a PAB to meet the NPDES permit minimum dissolved oxygen limit of 1 milligram per liter. The PAB was originally permitted in the late 1990's. The construction permit package for the PAB included two surface floating aerators; however, it is believed that during testing during startup of the PAB that one of the aerators was replaced with two aspirating aerators due to foaming concerns. Both of the aspirating aerators have become inoperable. Resolute recently replaced those aerators with aerators of similar design, one with a 75-HP motor and one with an 84-HP motor. The

manufacturer's equipment sheets are provided in Appendix B and calculations supporting the aerator selection is provided in Appendix C.

2.8 Impact of Proposed Modifications on Treatment Performance

Pumping the settled sludge stream from the clarifier to the EQ Basin during the pilot study has not impacted the facility's compliance with the site's NPDES permit. The use of the EQ Basin to equalize and thicken the sludge has improved sludge dewatering operations, and Resolute intends to make this a permanent improvement.

Resolute is currently replacing the existing EQ Basin bypass line that had become inoperable and is considering installing finger dikes in the EQ Basin to allow land-based excavators to reach the older bark solids in the western end of the basin.

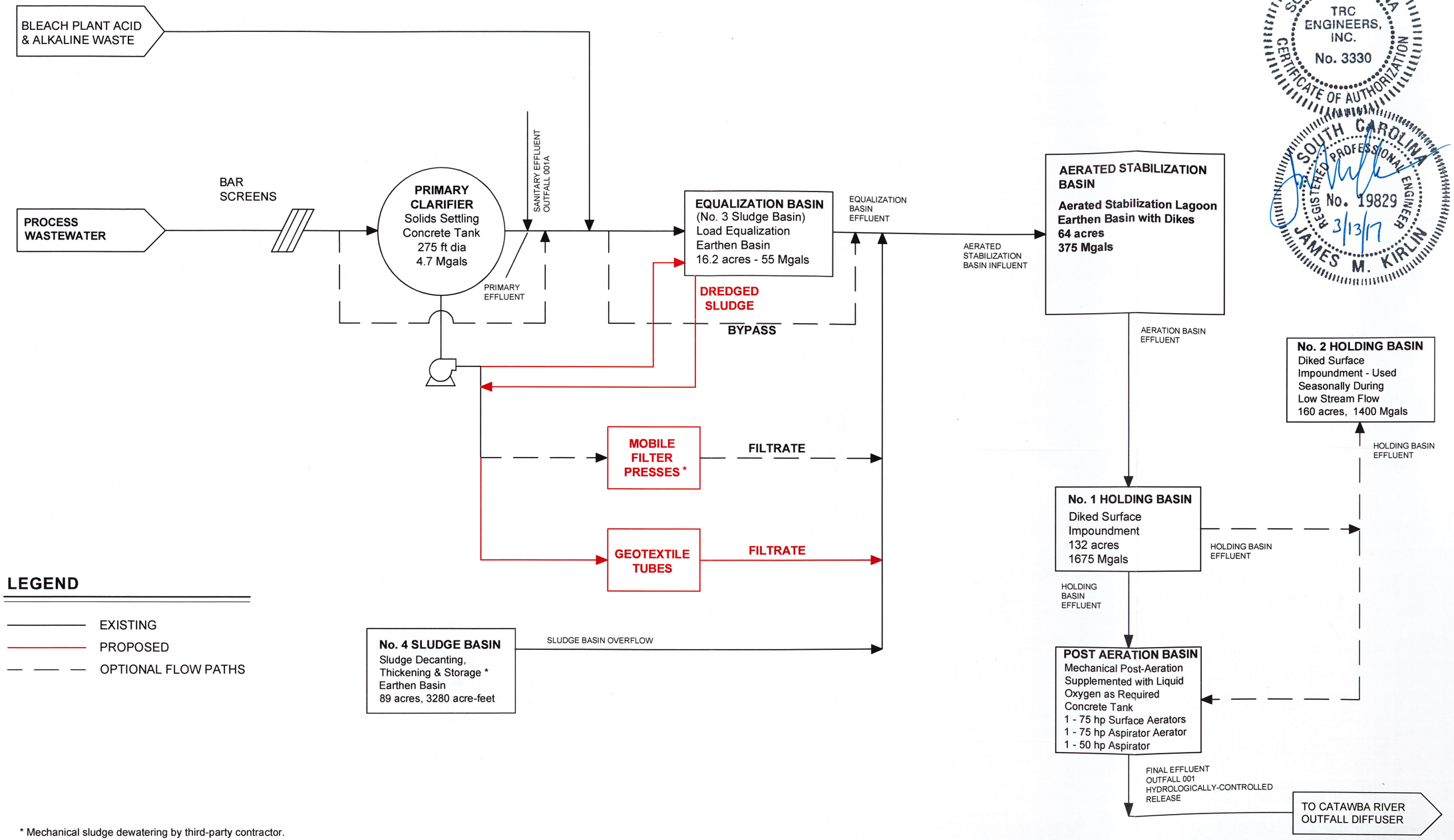
The flexibility to dewater sludge through mobile presses and geotextile tubes likewise will not impact wastewater treatment operations and compliance with the mill's NPDES permit. Filtrate from the dewatering operations, whether from filter presses or geotextile tubes will still drain to the ASB inlet ditch as has been the practice historically at the mill. The improvements in primary sludge management and dewatering is intended to reduce the concentration of TSS in the ASB influent stream.

The replacement of the two aspirating aerators with aerators of similar design will support the dissolved oxygen addition role of the PAB. The existing, floating aerator in the PAB is sufficient for normal flow rates, and the two aspirating aerators enables Resolute to meet effluent minimum dissolved oxygen requirements at higher discharge flow rates.

Section 3
Project Summary

Resolute performed a pilot study testing the effectiveness of utilizing the EQ Basin to thick and homogenize sludge from the primary clarifier on improving sludge dewatering operations. The study was successful in demonstrating that equalizing and thickening the sludge improved the efficiency of sludge dewatering and reduced dewatering aid chemical usage. As a result of that study, and along with other modifications, Resolute requests approval to implement the following improvements at the facility:

1. Leave the HDPE primary sludge conveyance piping from the primary clarifier pumps to the EQ Basin in place permanently,
2. Use the EQ Basin to thicken and equalize primary clarifier sludge,
3. Use a portable dredge as needed to remove solids from the EQ Basin
4. Use mobile filter presses as needed to dewatering sludge from the EQ Basin or directly from the primary clarifier sludge pumps (with the understanding that a letter of approval from SC DHEC will be needed for each mobile filter press mobilization),
5. Use geotextile tubes placed in No. 4 Sludge Basin to dewatering sludge from the EQ Basin, or direct from the primary clarifier sludge pumps with a chemical dewatering aid make-down and injection system,
6. Install finger dikes in the EQ basin as needed to remove aged, bark solids, and
7. Replace two inoperable aspirating aerators in the PAB with two similar aspirating aerators.



LEGEND

- EXISTING
- PROPOSED
- OPTIONAL FLOW PATHS

* Mechanical sludge dewatering by third-party contractor.

SOURCE:

1. DRAWING REVISED FROM DRAWING BY ARCADIS GERAGHTY & MILLER (3/21/00) AND EARTH TECH (10/06).

SOUTH CAROLINA
TRC ENGINEERS, INC.
No. 3330
CERTIFICATE OF AUTHORIZATION

SOUTH CAROLINA
REGISTERED PROFESSIONAL ENGINEER
No. 19829
3/13/17
JAMES M. KIRLIN

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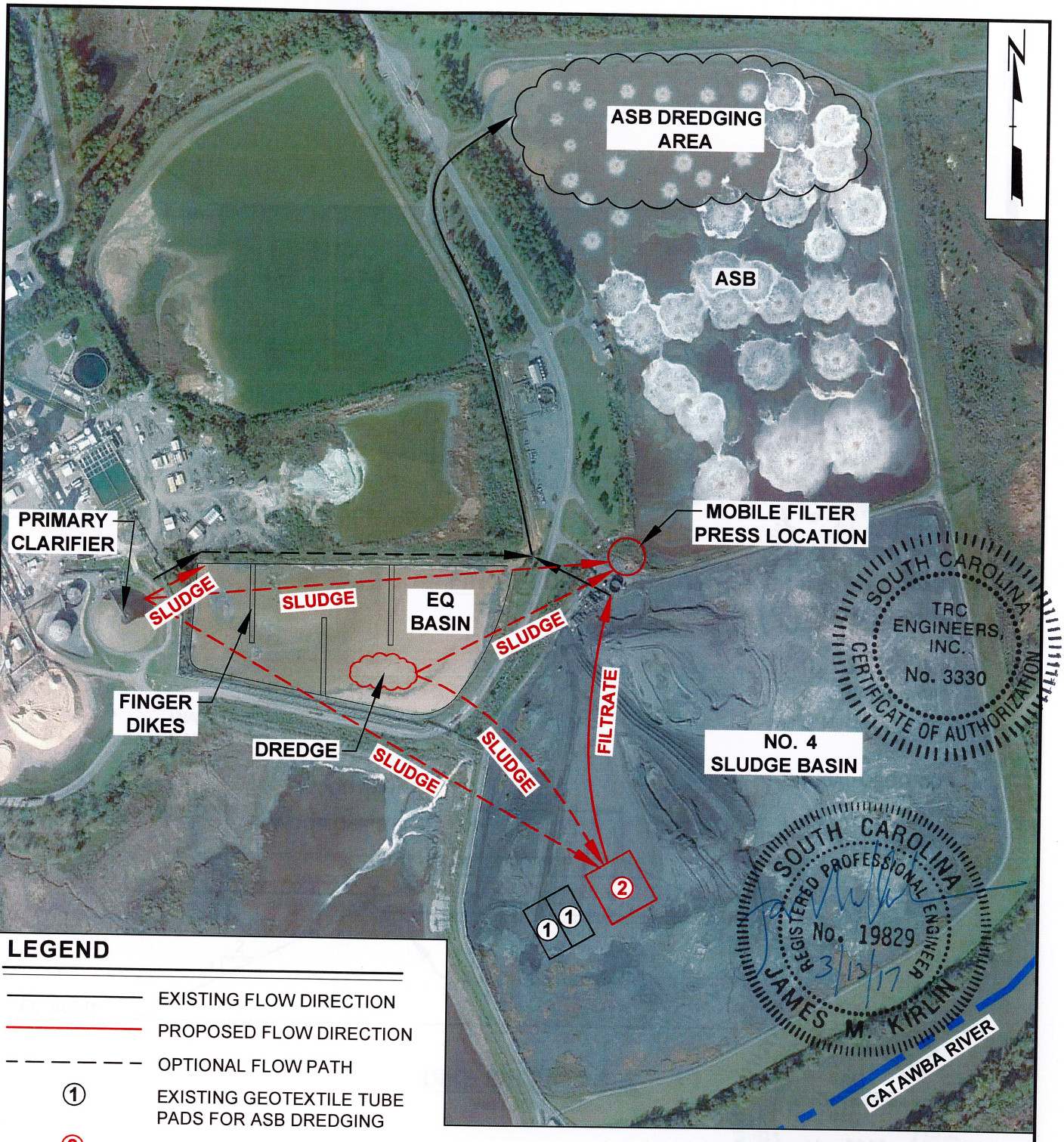
PROJECT:
RESOLUTE FP US INC.
CATAWBA, SOUTH CAROLINA

TITLE:
PROPOSED WASTEWATER TREATMENT SYSTEM IMPROVEMENTS

DRAWN BY:	C. NEWELL
CHECKED BY:	J. KIRLIN
APPROVED BY:	J. KIRLIN
DATE:	FEBRUARY 2017
PROJ. NO.:	27139.0000.0000
FILE:	271390-PID-FIGURE_2.dwg

FIGURE 2



LEGEND

- EXISTING FLOW DIRECTION
- PROPOSED FLOW DIRECTION
- OPTIONAL FLOW PATH
- ① EXISTING GEOTEXTILE TUBE PADS FOR ASB DREDGING
- ② LOCATION FOR GEOTEXTILE PAD FOR EQ DREDGING

0 600 1200

SCALE IN FEET

SOURCE:
OCTOBER 2014 AERIAL OBTAINED FROM GOOGLE MAPS AT https://www.google.com/maps/.

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PROJECT:
RESOLUTE FP US INC.
CATAWBA, SOUTH CAROLINA

TITLE:
PROJECT SITE LAYOUT MAP

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CHECKED BY:	J. KIRLIN
APPROVED BY:	J. KIRLIN
DATE:	FEBRUARY 2017
PROJ. NO.:	271390.0000.0000
FILE:	271390-SITE.dwg

FIGURE 3

8.5x11 — ATTACHED XREFS: — ATTACHED IMAGES: 10-2016 GOOGLE AERIAL CATAWBA_QUAD VANWYCK_QUAD
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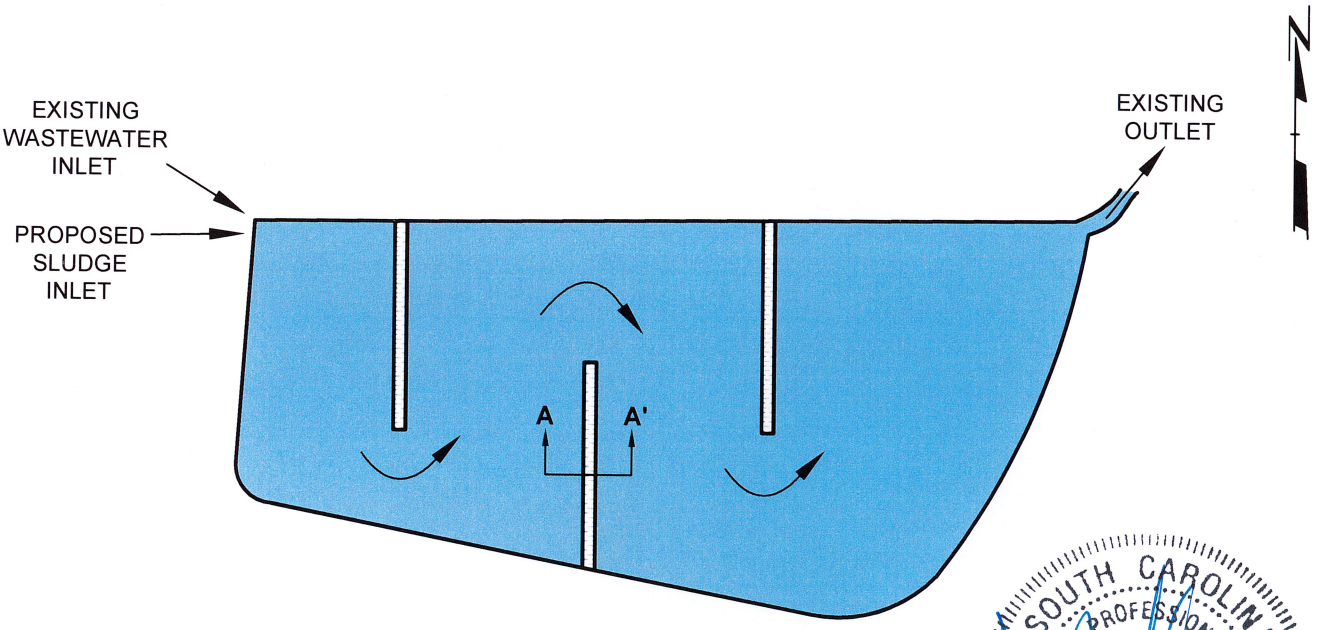
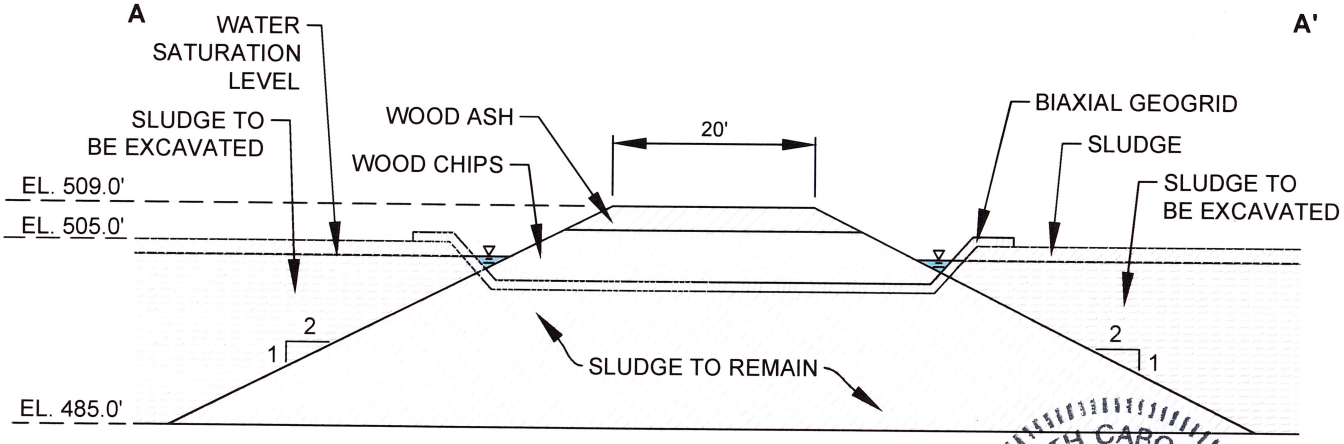


EQ BASIN PLAN VIEW
FINGER DIKES
NOT TO SCALE

SOUTH CAROLINA REGISTERED PROFESSIONAL ENGINEER No. 19829 3/13/17 JAMES M. KIRLIN



DIKE SECTION A-A'
NOT TO SCALE

SOUTH CAROLINA TRC ENGINEERS, INC. No. 3330 CERTIFICATE OF AUTHORIZATION

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PROJECT:
RESOLUTE FP US INC.
CATAWBA, SOUTH CAROLINA

TITLE:
EQ BASIN FINGER DIKE SKETCH

DRAWN BY:	C. NEWELL
CHECKED BY:	J. KIRLIN
APPROVED BY:	J. KIRLIN
DATE:	FEBRUARY 2017
PROJ. NO.:	271390.0000.0000
FILE:	271390-SITE.dwg

FIGURE 4

8.5x11 — ATTACHED XREFS: — ATTACHED IMAGES: 10-2016 GOOGLE AERIAL CATAWBA_QUAD, VAN-WYCK_QUAD
DRAWING NAME: J:\CAD\Resolute\271390_CATAWBA\0000\271390-SITE.dwg — PLOT DATE: March 09, 2017 - 11:35AM — LAYOUT: FIGURE 4

PERMIT APPLICATION