



APPLICATION FOR A COASTAL ZONE ACT PERMIT

Amended March 2005

State of Delaware
Department of Natural Resources & Environmental Control
Office of the Secretary

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Permit Application Instructions

1. Complete all parts of the application. For sections which are not applicable to your project, do not leave blank; present a statement to that effect and clearly state why the section is not applicable to your project.
2. Where sufficient space is not provided on the application form for requested information, attach extra pages referencing each answer by the appropriate part and question number.
3. Submit three complete copies of the permit application to:

Department of Natural Resources & Environmental Control
89 Kings Highway
Dover, DE 19901
4. Comply if required, or as requested by the DNREC Secretary, with 7 Delaware Code, Chapter 79, Section 7902. If requested, but not made part of your application it will not be considered administratively complete until this form is reviewed.
5. Be sure to include your permit application fee of \$3,000; otherwise the application will not be considered administratively complete. Make checks payable to "State of Delaware."
6. This application for a Coastal Zone Act Permit is a public document. Do not include information that you do not wish the public to review. If this application requires you to place confidential information or data in the application to make it administratively complete, note the Delaware Freedom of Information Act, Section 5 (Requests for Confidentiality), for the proper procedure in requesting confidentiality.
7. On the last page of text in this application, the applicant shall clearly print their name.

PART 1

APPLICANT AND SITE IDENTIFICATION

1.1 Identification of the permit applicant:

Name: **Tapeta™ Footings, Inc.**
Address: **102 Piney Creek Lane**
North East, MD 21901

Telephone No: **410-287-8091**
Fax No: **410-287-8410**

1.2 Authorized agent (if any):

Name: **Compliance Plus Services, Inc.**
Address: **336 South Warminster Road**
Hatboro PA 19040

Telephone No: **215-734-1414**
Fax No: **215-734-1424**

Include written authorization from client for being authorized agent for this application.

See Attachment A

1.3 Project property location (street address):

341 Pigeon Point Road
New Castle, DE 19720

1.4 Provide a general map of appropriate scale to clearly show project site:

See Attachment B

PART 2
EVIDENCE OF LOCAL ZONING AND PLANNING APPROVAL

See Attachment C

I, _____, for **New Castle County**
(Name of County, City of Town)

do hereby affirm that the project proposed by **Tapeta™ Footings, Inc.**
(Name of Applicant)

located at **341 Pigeon Point Road, New Castle, DE 19720**, in
(Address)

the **HI – Heavy Industrial zoning district is in**
full compliance with the zoning code as it applies to this project.

The above named applicant's project is in compliance with the adopted comprehensive development plan for the geographic area within which the project will be located.

(Signature)

(Title)

(Date)

This part is essential for a complete Permit Application. No application will be considered administratively complete without it. While the applicant is strongly advised to use this form, the local zoning jurisdiction may utilize another form or document than this one to demonstrate "evidence of local zoning approval," but such documents must be signed and dated by the proper official.

PART 3

PROJECT PROPERTY RECORD

- 3.1 Name and address of project premises owner(s) of record:
**Port Contractors, Inc.
529 Terminal Avenue
New Castle, DE 19720**
- 3.2 Name and address of project premises equitable owner(s):
Same as above.
- 3.3 Name and address of lessee(s):
**Tapeta™ Footings, Inc.
102 Piney Creek Lane
North East, MD 21901**
- 3.4 Is the project premises under option by permit applicant?
No.
- 3.5 What is the present zoning of the land for this entire project site?
**According to the property records available on the New Castle
County Delaware Website (<http://wwwnccde.org/parcelview/>)
the subject property is zoned as HI – UDC - Heavy Industrial**

PART 4

PROJECT OPERATIONS

- 4.1 Describe the characteristics of the manufactured product and all the process and/or assembly operations utilized by the proposed project. Include in the description (Use attachments if necessary):
- a. the raw materials, intermediate products, by-products and final products and characteristics of each. Review any materials' risk of carcinogenicity, toxicity, mutagenicity and/or the potential to contribute to the formation of smog. Provide material safety data sheets (MSDS) if available;

Tapeta™ product is composed of the following ingredients:

- Sand (Silica)
- Wax
- Polymeric fibers
- Synthetic rubber
- Washed polyethylene and/or crosslink pvc

See Attachment D

- b. the step-by-step procedures or processes for manufacturing and/or assembling the product(s). Provide a flow diagram to illustrate procedures;

See Attachment E

Raw materials that comprise the final Tapeta™ product consist of sand, wax, polymeric fibers, synthetic rubber, washed polyethylene and/or crosslink pvc.

The manufacturing process begins by placing the individual ingredients (raw materials) at the proper proportions into a pre-mix pile on the warehouse floor. The pre-mix pile is then loaded into a Keenan mixer (5-ton capacity) which blends the material for a pre-set time. After this initial blending the wax ingredient is injected into the mixture and blended by the mixer to obtain the desired consistency. All of this occurs inside the warehouse.

Note: The wax will initially be heated to 230°F in the storage tank. Once the wax is injected into the sand/ rubber/fiber mixture (via stationary downward aimed spray bar) it continues to blend until cooling to a temperature below 100°F. This ensures that the wax has solidified and coated all particles.

After the wax ingredient is injected and blended in the mixture, the finished product is transported to the outside stockpile area where it will be stored for future shipment.

- c. the nature of the materials mentioned above in 4.1 (a) as to whether or not the materials require special means of storage or handling;

All raw materials will be trucked or railed to the site and will be placed and maintained inside the warehouse. On occasion the synthetic rubber, washed polyethylene, and crosslink pvc may be stored outdoors in storage bins (jersey barriers) due to space limitations in the warehouse. If any of the raw materials are stored outside they will be tarped at the end of each production day.

The Tapeta™ material (finished product) does not require any special means of storage or handling.

- d. list the machinery (new and/or existing) to be utilized by this project;

**42 gallon wax reservoir with dual element filter
Hot wax distribution spray bar
40 gallon fuel tank
Loader
Forklift
Tractor(s)
Keenan mixer(s)**

- e. list any new buildings or other facilities;

This project will not require any new buildings or facilities.

- f. if this project represents a totally new facility at a new or existing facility, what will be the new rate of maximum production, and;

The proposed operation may generate a maximum production of finished product of 150,000 tons/year.

- g. if this project represents a totally new facility at a new or existing facility, what will be the maximum production rate?

The proposed operation may generate a maximum production rate of 75 tons/hour.

- 4.2 Describe daily hours of plant operations and the number of operating shifts.

Normal hours of operation will be 8:00am to 4:00pm Monday through Friday with an hour on each end of the day for start-up and shutdown of the operation. The facility may, from time to time, extend its hours based on operational and customer needs.

- 4.3 Provide a site plan of this project with:
- a. a north arrow;
 - b. a scale of not less than one inch to 200 feet;
 - c. identity of the person responsible for the plan, including any licenses and their numbers;
 - d. the acreage of the applicant's entire property and acreage of the proposed project;
 - e. property lines of entire property;
 - f. lines designating the proposed project area for which application is being made clearly distinguished from present facilities and operating areas (if any);
 - g. existing and proposed roads, railroads, parking and loading areas, piers, wharfs, and other transportation facilities;
 - h. existing water bodies and wetlands and proposed dredge and fill areas, and;
 - i. existing and proposed drainage ways, gas, electric, sewer, water, roads, and other rights-of-way.

See Attachment E.

- 4.4 How many acres of land in total are required for this proposed project, both existing, utilized, developed land (if any), and new land?

This project will require inside warehouse space of approximately 41,250sf and outside storage space of 1 to 2 acres.

PART 5A

ENVIRONMENTAL IMPACTS

Air Quality

5.1 Describe project emissions (new and/or increased over current) by type and amount under maximum operating conditions:

Emissions can be expected from the following sources:

- A 29 Hp boiler fired on diesel fuel
- Tractors which move the Keenan mixers during the processing of the materials into the final product

The methodology used to estimate emissions is detailed on spreadsheets attached to this application. Generally, however, the following assumptions were used:

- Eight (8) hours per day of operation, five (5) days per week, 50 weeks per year (2,000 hours per year)
- Production rate of 75 tons per hour (assumes two (2) mixers).

(Please note that mobile equipment (i.e. loaders, forklifts, etc.) will be utilized at the site for material movement and loading/unloading operations. These mobile units are typically in use at numerous existing operations within the coastal zone and are not included in this analysis as unique to the manufacturing process.)

Combustion emissions can be summarized as follows:

Pollutant	Summary for 150,000 TPY Production			
	Mix Tractor Emissions	Boiler	Total Emissions	
			Lbs/Yr	Tns/Yr
NO _x	4,791	492	5,283	2.64
CO	3,165	137	3,302	1.65
SO ₂	16	20	35	0.02
PM	257	55	311	0.16
VOCs	N/A	19	19	0.01
Total:	8,229	722	8,951	4.48
	Offsets Required @ 130%:		11,636	5.82

- 5.2 Describe how the above emissions change in the event of a mechanical malfunction or human error.

Any malfunction of the mixing equipment will generally result in a shutdown of the process. Therefore, it is anticipated that there will be no excess emissions in the event of a malfunction.

- 5.3 Describe any pollution control measures to be utilized to control emissions to the levels cited above in 5.1.

Not applicable.

- 5.4 Show evidence that applicant has, or will have, the ability to maintain and utilize this equipment listed in 5.3 in a consistently proper and efficient manner. (For example, provide college transcripts and/or records of training courses and summary of experience with this pollution control equipment of person(s) responsible for pollution control equipment, and/or provide copies of contracts with pollution control firms to be responsible for maintaining and utilizing this equipment.)

The Tapeta™ mixing operation is primarily performed by employees operating front-end loaders and tractors which power the Keenan mixers. New loader operators or tractor operators will undergo training and supervised operation until such time as proficiency in operation and maintenance in Tapeta™ production is obtained.

Water Quality

- 5.5 Describe any new wastewater discharge or increase over current discharge levels due to this proposed project:

There will be no process wastewater generated from this facility.

<u>Pollutant</u>	<u>Amount (ppm)</u>
a.	
b.	
c.	
d.	
e.	

- 5.6 Describe the current method of employee sanitary wastewater disposal and any proposed changes to that system due to this proposed project.

There are employee sanitary facilities located in the warehouse; these facilities are connected to the public sanitary sewer system located on Pigeon Point Road.

- 5.7 Identify the number, location, and name of receiving water outfall(s) of any and all process wastewater discharge (new or current) affected by this proposed project.

Not applicable. No process waste water will be generated by this project.

- 5.8 If any effluent is discharged into a public sewer system, is there any pretreatment program? If so, describe the program.

Not applicable. This project does not generate process wastewater and no wastewater other than sanitary wastewater will be discharged into a public sewer system.

- 5.9 Identify the number, location, and name of receiving waters of stormwater discharges:

All storm water discharges will be directed to the Christina River.

- a. describe the source of stormwater run-off (roofs, storage piles, parking lots, etc.;

The majority of the project site is asphalt paved and the warehouse's roof drains empty onto the paved surface. The site has been developed so that stormwater sheetflows across the site into the bio-filtration swales located along the northeast and northwest parcel boundaries. The stormwater exits the site and follows drainage swales along the adjacent railroad tracks and eventually enters into the Lobdell Canal and Christina River.

- b. describe the pollutants likely to be in the storm water;

The pollutants most likely to be in the storm water run-off would be from fugitive particulates and normal truck traffic associated with the delivery of raw materials and the load out of the finished product.

- c. describe any pollution control device(s) or management technique(s) to be used to reduce the amount of stormwater generated and devices to improve the quality of the stormwater run-off prior to discharge;

This facility already has a General NPDES stormwater permit for industrial operations and associated site-specific stormwater pollution prevention (SWPP) plan. This plan will be modified to include the proposed operation and will implement appropriate best management practices.

BMP's for Stockpiled Materials

- **Stockpile incoming raw materials inside the warehouse; tarp those raw materials that are occasionally stored outside.**
- **Divert storm water around outside storage areas;**
- **Pile the raw materials stored outside to minimize surface area exposed to precipitation and re-tarp these piles at the end of each day;**
- **Practice good housekeeping measures such as frequent removal of debris;**
- **Store waste materials (packaging) in covered dumpsters;**
- **Control fugitive particulates on the outdoor portions of the site by using a street sweeper as necessary;**
- **Have a spill control kit on site to handle any accidental spills from trucks loading/unloading materials at the site.**

- d. what amount of stormwater run-off increase over current levels will result from this proposed project;

There will be no additional stormwater run-off over current levels at this site.

- e. describe any new or improved stormwater drainage system required to safely carry off stormwater without flooding project site or neighboring areas down gradient.

No new stormwater drainage systems are required for this project.

- 5.10 Will this project use a new water intake device, or increase the use (flow) from an existing intake device? If, yes, please state: **No. This project will not use a new water intake device.**

- a. the volume of water to withdrawn, and;

Not applicable. See 5.10 above.

- b. describe what will be done to prevent entrainment and/or entrapment of aquatic life by the intake device.

Not applicable. See 5.10 above.

- 5.11 Will this proposed project result in a thermal discharge of water, or an increase in the flow or temperature of a current thermal discharge? If yes, state: **No. There will be no water discharge from this project hence no thermal discharge of water.**

- a. the volume of the new flow or increase from the existing thermal discharge both in flow and amount of heat;

Not applicable. See 5.11 above.

- b. after all cooling water mechanisms have been applied to the hot water, how warm will the water be when it is discharged into a receiving waterway, discharge canal, or ditch and what will be the difference in discharge temperature and ambient temperature (delta T) at various seasons of the year?

Not applicable. See 5.11 above.

- c. what equipment and/or management techniques will be used to reduce the thermal load of the discharge water?

Not applicable. See 5.11 above.

- 5.12 Will any proposed (new) discharge or change in existing discharge cause, or have potential to cause, or contribute to the exceedence of applicable criteria appearing in the State of Delaware Surface Water Quality Standards?

No. This facility operates under a General NPDES stormwater discharge permit for industrial activity and will abide by the terms and conditions of the permit.

- 5.13 Describe any oils discharged to surface waters due to this proposed project.

This process will not generate any oils; therefore, no oils will be discharged to surface waters. (Note: the wax has an oil content but when hardened there is no discharge of oil.)

Vehicles loading and unloading materials to the site may have an opportunity to contribute small amounts of motor oil to stormwater runoff. Our BMP for this site includes a Spill Prevention and Control Program and spill control kit.

- 5.14 Describe any settleable or floating solid wastes discharged to surface waters due to this project.

None. See 5.9(c) above detailing BMP's that will be in place.

- 5.15 Show evidence that the applicant has, or will have, the ability to maintain and utilize any water pollution control equipment listed in questions 5.5 through 5.14 in a consistently proper and efficient manner. (For example, provide college transcripts and/or training courses and summary of prior experience with this pollution control equipment of person(s) responsible

for pollution control equipment, and/or provide copies of contracts with pollution control firms.)

BMP's will be utilized to control water quality. These controls do not require advanced education for operation and maintenance. However, in accordance with our NPDES permit we provide annual training for all employees that work in areas where industrial materials are used or stored, addressing topics such as spill response, good housekeeping practices, material management practices, etc.

Water Quantity

- 5.16 Identify the source of water needed for the proposed project, including potable water supplies.

United Water Delaware provides water service to the project site, including potable water.

- 5.17 If wells are to be used, identify the aquifer to be pumped and the depth, size and pumping capacity of the wells and state whether or not a permit has been applied for.

Not applicable. No wells are installed at this facility.

- 5.18 Estimate the amount of water to be used for every purpose, including cooling water. State daily and maximum water use in the unit of gallons per day. State if water use will vary with the seasons, time of day or other factors.

The projected use of water is based on supply only to the sanitary facilities on site and approximately 2.5 gallons per day of water added to the boiler.

- 5.19 How close is the proposed well(s) to any well on adjacent lands?

Not applicable. There are no wells on this site.

Solid Waste

- 5.20 Describe each type and volume of any solid waste (inc. biowastes) generated by this project and the means used to transport, store, and dispose of the waste(s).

Solid waste may be generated occasionally from shipping material scraps. The polymeric fibers are shipped in bales, and the washed polyethylene and/or crosslink pvc is shipped in supersacks. These materials will be placed in covered dumpsters and will be transported off site by a waste disposal company for proper disposal at an appropriately permitted facility.

- 5.21 Will there be any on-site recycling, re-use, or reclamation of solid wastes generated by this project?

Wooden pallets will be reused for shipment of the finished product when possible. Unusable wooden pallets will be transported to a recycling facility or will be taken to a permitted disposal facility. There will be no on-site recycling, re-use or reclamation of any other solid wastes at this facility.

- 5.22 Will any waste material generated by this project be destroyed on-site? If so, how would that be done?

No waste material generated by this project will be destroyed on-site.

Hazardous Waste

- 5.23 Will this proposed project result in the generation of any hazardous waste as defined by the "Delaware Regulations Governing Hazardous Waste?"

No. The project will not result in the generation of hazardous waste as defined by "Delaware Regulations Governing Hazardous Waste".

- 5.24 If so, identify which hazardous waste, the amount of each, and how it is generated.

Not applicable. See 5.23 above.

- 5.25 Describe the transport of any hazardous waste and list the permitted hazardous waste haulers to be utilized.

Not applicable. See 5.23 above.

- 5.26 Will the proposed project cause the applicant to store, treat, and/or dispose of hazardous waste?

No.

- 5.27 Does the applicant currently generate any hazardous waste at this site?

No.

Habitat Protection

- 5.28 What is the current use of the land that is to be used for the proposed project?

Currently this warehouse is being used for storage of dry bulk materials. The neighboring land uses are also zoned HI-Heavy Industrial and consist of bulk materials storage, public scale and

industrial warehousing. The proposed operation would be compatible with its neighboring land uses.

- 5.29** Will the proposed project result in the loss of any wetland habitat? If so, answer the following:

No loss of wetland habitat will result from the proposed project.

- a. will any wastewater and/or stormwater be discharged into a wetland, and;

Not applicable. See 5.29 above.

- b. if so, will the discharge water be of the same salinity as the receiving wetlands?

Not applicable. See 5.29 above.

- 5.30** Will the proposed project result in the loss of any undisturbed natural habitat or public use of tidal waters? If so, how many acres?

No. There will be no loss of any undisturbed natural habitat or public use of tidal waters.

- 5.31** Do threatened or endangered species (as defined by the DNREC and/or the Federal Endangered Species Act) exist at the site of the proposed project, or immediately adjacent to it? If so, list them.

See Attachment G

Edna Stetzar, Biologist/Environmental Review Coordinator for the DNREC Natural Heritage Program, completed a threatened and endangered species literature review for this area. The results of the review revealed no threatened or endangered species exist at this site. A copy of the review letter prepared by Edna Stetzar is provided in Attachment G.

- 5.32** Will this proposed project have any effect on these threatened or endangered species (as defined by the DNREC and/or the Federal Endangered Species Act).

Not applicable

- 5.33** What assurances can be made that no threatened or endangered species exist on the site of the proposed project site?

Not applicable;

- 5.34** Describe any filling, dredging, or draining that may affect nearby wetlands or waterways.

There will be no filling, dredging or draining on the proposed site.

- 5.35 If dredging is proposed, how much will occur and where will the dredged materials go for disposal?

Not applicable. See 5.34 above.

Other Environmental Effects

- 5.36 Describe any effects noticeable of the proposed project site including: heat, glare, noise, vibration, radiation, electromagnetic interference, and odors.

The facility will not produce any heat, glare, vibration, radiation, electromagnetic interference or odors.

The process equipment and the site operations in general will comply with the Delaware Regulations governing the control of noise. Noise generated by the heavy equipment and truck traffic at the proposed site will be less than or equivalent to the current level generated by similar equipment currently operating in this heavy industrial area near the Port of Wilmington. High truck traffic volumes and noise generating facilities dominate the immediate area so noise from this operation will not degrade the surrounding environment.

- 5.37 Describe what will be done to minimize and monitor such effects.

Operations will be performed inside the warehouse.

- 5.38 Describe any effect this proposed project will have on public access to tidal waters.

This project will have no effect on public access to tidal waters on any of the proposed sites.

- 5.39 Provide a thorough scenario of the proposed project's potential to pollute should a major equipment malfunction or human error occur, including a description of backup controls and safety provisions planned for this project to minimize any accidents.

Not applicable. See 5.2 above.

- 5.40 Describe how the air, water, solid and hazardous waste streams, emissions, or discharge change in the event of a major mechanical malfunction or human error.

Not applicable. See 5.2 above.

PART 5B

ENVIRONMENTAL OFFSET PROPOSAL REDUCTION CLAIM

Is applicant claiming the right to have a reduced offset proposal due to past voluntary improvements as defined in the Regulations Governing Delaware's Coastal Zone?

Circle one below

YES

NO

If yes, provide an attachment to the application presenting sufficient tangible documentation to support your claim.

PART 5C

ENVIRONMENTAL OFFSET PROPOSAL

If the applicant or the Department finds that an Environmental Offset Proposal is required, the proposed offset project shall include all the information needed to clearly establish:

- A. A qualitative and quantitative description of how the offset project will more than offset the negative impacts from the proposed project.
- B. How the offset project will be carried out and in what period of time.
- C. What the environmental benefits will be and when they will be achieved.
- D. What scientific evidence there is concerning the efficacy of the offset project in producing its intended results.
- E. How the success or failure of the offset project will be measured in the short and long term.
- F. What, if any, negative impacts are associated with the offset project.
- G. How the offset will impact the attainment of the Department's environmental goals for the Coastal Zone and the environmental indicators used to assess long-term environmental quality within the Coastal Zone.

The offset proposals must clearly and demonstrably* more than offset any new pollution from the applicant's proposed project. The applicant can claim (with documentation) evidence of past voluntary environmental investments (as defined in the Regulations) implemented prior to the time of application. Where the Department concurs with the applicant that such has occurred, the positive environmental improvement of the offset proposal against the new negative impact can be somewhat reduced.

The applicant must complete the Coastal Zone Environmental Impact Offset Matrix. This matrix can be found on the same web site as this application. The matrix is found at 'CZA Matrix' just below this site. On page one, the applicant must list all environmental impacts in the column labeled "Describe Environmental Impacts". In the column to the immediate right, the applicant should reference the page number of the application or attachment which documents each impact listed. In the "Describe Environmental Offset Proposal" column, applicant must state what action is offsetting the impact. The offset

action shall be referenced by page number in the column to the right to show how the offset will work. The applicant shall not utilize the far right column.

In the above, the entire offset proposal, including the matrix, shall be available to the public, as well as the evidence of past voluntary environmental enhancements.

* For purposes of this requirement, the DNREC will interpret the phrase “clearly and demonstrably” to mean an offset proposal that is obviously so beneficial without detailed technical argument or debate. The positive environmental benefits must be obviously more beneficial to the environment than the new pollution that minimal technical review is required by the Department and the public to confirm such. The total project must have a positive environmental impact. The burden of proof is on the applicant.

5C.1 – General

As discussed in previous sections of this application, Tapeta™ will be using the Pigeon Point Road facility as a “base of operations”. To that end, Tapeta™ intends to manufacture the race track surface material for export through the Port of Wilmington. In many instances, surface material to be installed domestically will be manufactured at the site of the actual track(s). Therefore, even though this application has been structured so as to accommodate approximately 250 days per year of operation, it is more likely that the equipment will be routinely absent from the site. Accordingly, environmental emissions to the Coastal Zone will be substantially less than as if the equipment was on site 100 percent of the time.

The Tapeta™ equipment uses a small oil fired boiler and mobile tractor(s) that move/mix the materials in the Keenan trailers. Estimated emissions using a combination of certified manufacturer’s data and US Environmental Protection Agency (EPA) AP-42 emission factors are presented as Attachment H to this application. Emissions have been estimated as if the equipment will be permanently on-site even though, as discussed above, this will likely not be the case.

Informal policy is to “offset” emissions by 130 percent of estimated actual. However, it is likely that the actual offset attained will be substantially greater. Tapeta™, therefore, believes that the actual qualitative benefit will be much greater than 130 percent based on:

- It is probable that the equipment will not be on site from time to time for what could be substantial periods. Thus the amount of new emissions would be less than quantified below.
- The acquisition of emission credits through the Delaware Economic Development Office (DEDO) will be sufficient to more than offset the combustion emissions from the actual Tapeta™ processing equipment.

The qualitative and quantitative implications of this request are discussed in greater detail below.

5C.2 – Offsetting Approach

The Tapeta™ boiler and mix tractors will produce relatively small amounts of: NO_x, CO, SO₂, PM<_{2.5}, and VOCs. These estimated quantities are present in tabular form, below.

Pollutant	Summary for 150,000 TPY Production			
	Mix Tractor Emissions	Boiler	Total Emissions	
			Lbs/Yr	Tns/Yr
NO _x	4,791	492	5,283	2.64
CO	3,165	137	3,302	1.65
SO ₂	16	20	35	0.02
PM	257	55	311	0.16
VOCs	N/A	19	19	0.01
Total:	8,229	722	8,951	4.48
	Offsets Required @ 130%:		11,636	5.82

The actual site of operations or the process of producing the racetrack surface material does not lend itself to changes which produce appropriate offsets to balance the increased air emissions. Tapeta™ is proposing to acquire emissions credits through the Delaware Economic Development Office (DEDO). An acquisition of three (3) NO_x emissions credits and three (3) SO₂ emissions credits will be completed concurrent with the issuance of the Coastal Zone permit.

In addition, in its commitment to the continued enhancement of Delaware's Coastal Zone and the surrounding community, Tapeta™ proposes to make financial contributions to assist two local environmental enhancement projects.

The location of the proposed facility on Pigeon Point Road is close to the South Wilmington area of the City of Wilmington, DE. The revitalization of South Wilmington is being addressed by the development of a Special Area Management Plan (SAMP). A comprehensive action plan is being developed by a Core Management Team which oversees the efforts of several workgroups working on various SAMP components. A major recommendation of the South Wilmington SAMP Neighborhood Plan and SAMP Drainage Study is the restoration of the South Wilmington wetland.

See Attachment J

In October 2007, a Wetland & Hydrologic Assessment Summary Report was issued. The South Wilmington area contains a 27 acre wetland area located between Walnut Street, A Street, S. Buttonwood Street and Garasches Lane. The report provides recommendations on wetland restoration efforts. A list

of future needs includes steps required to determine the best way to increase water connectivity between the wetlands and the Christina River.

The applicant is proposing a one time financial contribution of \$2,500.00 to assist in the implementation of the recommendations of the Wetland & Hydrologic Assessment Summary Report. This contribution will be made within 60 days of receipt by Tapeta™ of the final, approved Coastal Zone Permit.

The second environmental enhancement project involves one time financial contribution of \$2,500.00 to assist in the establishment or continuance of a trust fund to assist the South Wilmington SAMP with street tree maintenance. This trust fund would provide funding to local residents or community organization(s) to insure that street trees planted in the effort to assist in the revitalization of the neighborhoods are properly maintained and nurtured throughout their life expectancy.

No negative impacts are anticipated in association with these one-time donations.

5C.2 – Quantitative and Qualitative Offsetting Considerations

The following table presents a summary of estimated emissions from Tapeta™'s proposed operation. These emissions are based on 4,000 hours per year of operation (i.e. – two tractors at 250 days per year each; average of eight (8) hours per day of operation). The estimate uses a combination of manufacturer engine emission data and US Environmental Protection Agency (EPA) AP-42 emission factors. Details of the actual calculations are presented in spreadsheet form as Attachment H.

Pollutant	Summary for 150,000 TPY Production			
	Mix Tractor Emissions	Boiler	Total Emissions	
			Lbs/Yr	Tns/Yr
NO _x	4,791	492	5,283	2.64
CO	3,165	137	3,302	1.65
SO ₂	16	20	35	0.02
PM	257	55	311	0.16
VOCs	N/A	19	19	0.01
Total:	8,229	722	8,951	4.48
	Offsets Required @ 130%:		11,636	5.82

The necessary offsets will be obtained through the acquisition of emission credits from the Delaware Economic Development Office (DEDO). Tapeta™ will acquire three tons of NO_x emission credits and three tons of SO₂ emissions credits. The total of six tons of emissions credits is significantly greater than the required offsets.

5C.2a - Qualitative Considerations

The proposed offsetting measure of purchasing emissions credits will result in reductions to air emissions from the Coastal Zone due to a permanent reduction in operations which result in air emissions. The reduction will be realized even if Tapeta™ is not operating the mixing operation at the site.

In addition to improving air quality, the offset proposal (involving contributions to assist with wetlands restoration and street tree maintenance within the South Wilmington area) will also enhance the environment contributing to the Coastal Zone.

5C.3 - Offset Project Implementation

The acquisition of the Emissions Credits and the financial contributions to assist in the wetland restoration and tree maintenance trust fund projects will be completed concurrent with or within 60 days of the receipt of the Coastal Zone permit, as appropriate.

5C.4 - Expected Environmental Benefits

As discussed above, a net air quality improvement is expected from the proposed offsetting project. In addition, the financial contributions to assist in the implementation of the recommendations to restore the quality of a local wetland and in establishment of trust fund for street tree maintenance in the South Wilmington area will enhance the efforts to revitalize that economically depressed area.

5C.5 - Technical Basis for Proposed Project

The US EPA performed extensive field evaluation to develop the methodologies contained in AP-42, Sections 13.2.1 and 13.2.2. In fact, EPA has updated and refined the data and methods in Sections 13.2.1 and 13.2.2 as recently as March, 2007 and November, 2006 respectively. These methods have been historically and continue to be established, accepted approaches to modeling these types of emissions.

5C.6 - Potential Negative Impacts of Proposed Project

The proposed project will result in a very slight increase in the amount of solid waste generated at the site. However, all solid wastes will be collected, stored in covered dumpsters as appropriate and transported off site for either recycling or proper disposal in a permitted facility.

5C.7 - Attainment of Coastal Zone Environmental Goals

The proposed offsetting measure (acquisition of emissions credits) is permanent and can be expected to furnish benefits to air quality for the long term.

The wetlands restoration effort associated with the South Wilmington wetlands will benefit the Coastal Zone since the wetlands are near the Christina and Delaware Rivers, both which impact the Coastal Zone. The City of Wilmington is concerned that haphazard development will result in increased non-point source pollution, loss of wetlands, degradation of riparian vegetation and a lost opportunity to create community open space. Assisting with the restoration of wetlands through the financial contribution will play a critical role in insuring the recommendations of the SAMP Master Plan are implemented.

Similarly, the financial contribution towards the trust fund established to provide/assist in street tree maintenance will enhance both the environment and the local community. Local residents, wary of planting trees due to future maintenance obligations, will be able to proceed without overriding concerns about future costs.

5C.8 – Affirmation of Negative Impacts

The following is to affirm that Tapeta™ expects no “offsetting” will be necessary to the following media.

5.C.8a – Water Quality

5.C.8.a.1 – Surface water

Tapeta™ expects no adverse impacts to proximate surface waters.

5.C.8.a.2 – Ground Water

Tapeta™ expects no adverse impacts to proximate ground water.

5.C.8b – Water Use

5.C.8.b.1 – Process water

Tapeta™ will require no process water. No offsetting necessary.

5.C.8.b.2 – Cooling Water

Tapeta™ will require no cooling water. No offsetting necessary.

5.C.8.b.3 – Effluent Water

Tapeta™ will discharge no effluent water. No offsetting necessary.

5.C.8.d – Hazardous Waste

Tapeta™’s operation will produce no hazardous waste. No offsetting necessary.

5.C.8.e – Habitat

5.C.8.e.1 – Wetlands

The implementation of Tapeta™'s project will impact no wetlands proximate to the site. No offsetting necessary.

The applicant is proposing a one time financial contribution of \$2,500.00 to assist in the implementation of the recommendations of the South Wilmington SAMP Wetland & Hydrologic Assessment Summary Report.

5.C.8.e.2 – Flora and Fauna

The implementation of Tapeta™'s project will impact no flora and fauna proximate to the site. No offsetting necessary.

5.C.8.f – Drainage/Flood Control

The implementation of Tapeta™'s project will not impact drainage or flood control at the site. No offsetting required.

5.C.8.g – Erosion

The implementation of Tapeta™'s project will not increase erosion at the site. No offsetting required.

5.C.8.h – Land Use Effects

5.C.8.h.1 – Glare

The implementation of Tapeta™'s project will produce no glare impacts. No offsetting necessary.

5.C.8.h.2 – Heat

The implementation of Tapeta™'s project will produce no heat impacts. No offsetting necessary.

5.C.8.h.3 – Noise

The implementation of Tapeta™'s project will produce no noise impacts. No offsetting necessary.

5.C.8.h.4 – Odors

The implementation of Tapeta™'s project will produce no odor impacts. No offsetting necessary.

5.C.8.h.5 – Vibration

The implementation of Tapeta™'s project will produce no vibration impacts. No offsetting necessary.

5.C.8.h.6 – Radiation

The implementation of Tapeta™'s project will produce no radiation impacts. No offsetting necessary.

5.C.8.h.7 – Electro-magnetic Interference

The implementation of Tapeta™'s project will produce no electro-magnetic interference impacts. No offsetting necessary.

5.C.8.h.8 – Other Effects

It is not expected that Tapeta™'s project will produce any additional impacts other than those specifically stated in this application.

5.C.8.i – Threatened and Endangered Species

It is not expected that Tapeta™'s project will impact any threatened or endangered species. No offsetting required.

5.C.8.j – Impacts from Process Materials

It is not expected that Tapeta™'s project will utilize any raw materials or produce any intermediate or finished materials that will cause any adverse impacts. Therefore, no offsetting is required.

PART 6
ECONOMIC EFFECTS

Construction

- 6.1 Estimate the total number of workers for project construction and the number to be hired in Delaware.
- No construction is required for this project; operations will take place inside an existing warehouse.**
- 6.2 Estimate the weekly construction payroll.
- Not applicable.**
- 6.3 Estimate the value of construction supplies and services to be purchased in Delaware.
- Not applicable.**
- 6.4 State the expected dates of construction initiation and completion.
- Not applicable.**
- 6.5 Estimate the economic impact from loss of natural habitat or any adverse economic effects degraded water or air quality will have on individuals indirectly or directly dependent on that habitat or air or water quality (e.g. commercial fishermen, waterfowl guides, trappers, fishing guides, and charter or head boat operators and bait and tackle dealers).
- Not applicable.**

Operations

- 6.6 State the number of new employees to be hired as a direct result of this proposed project and how many of them will be existing Delaware residents and how many will be transferred in from other states.
- Seven (7) full-time employees will be required to support the proposed manufacturing project. These employees will likely be from the surrounding area.**
- 6.7 If employment attributable to the proposed project will vary on a seasonal or periodic basis, explain the variation and estimate the number of employees involved.
- Manufacturing for the proposed project will not be seasonal. However, a significant portion of the material manufactured will be exported through the Port of Wilmington and will require additional**

labor. Approximately 18 to 22 equipment operators and/or truck drivers will be hired during ship loading activities.

- 6.8 Estimate the percent distribution of annual wages and salaries (based on regular working hours) for employees attributable to this project:

<u>Wage/salary</u>	<u>Percent of employees</u>
\$12,001-20,000	
\$20,001-29,000	
\$29,001 -39,000	
\$39,001 and over	100%

- 6.9 Estimate the annual taxes to be paid in Delaware attributable to this proposed project:

State personal income taxes: approximately \$26,000/year

State corporate income taxes: approximately \$225,000/year

County and School District taxes: No new taxes

Municipal taxes:

It is estimated that approximately \$112,500/yr in Gross Receipts Taxes will be paid to Delaware.

PART 7

SUPPORTING FACILITIES REQUIREMENTS

Describe the number and type of new supporting facilities and services that will be required as a result of the proposed project including, but not limited to:

Roads **None**

Bridges **None**

Piers and/or docks **None**

Railroads **None**

Microwave towers **None**

Special fire protection services not now available **None**

Traffic signals **None**

Sewer expansion **None**

Energy related facilities expansion **None**

Pipelines **None**

PART 8

AESTHETIC EFFECTS

- 8.1 Describe whether the proposed project will be located on a site readily visible from a public road, residential area, public park, or other public meeting place (such as schools or cultural centers).

This property is readily visible from Pigeon Point Road. It is a triangle shaped property adjoined by railroad lines to the northwest and the northeast. The southern boundary adjoins property owned by the City of Wilmington, and Pigeon Point Road abuts the southwestern corner of the property. There are no public parks, schools or other public meeting places within this area. The nearest year-round residence to the site is approximately 0.25 miles.

- 8.2 Is the project site location within half a mile of a place of historic or scenic value?

This site is not within half a mile of any historic or scenic areas.

- 8.3 Describe any planned attempt to make the proposed facility aesthetically compatible with its neighboring land uses. Include schematic plans and/or drawings of the proposed project after it is complete, including any landscaping and screening.

The proposed operation will be located adjacent to the Port of Wilmington and its' industrial neighbors. The neighboring land uses for this site are also zoned HI-Heavy Industrial. The proposed facility would be compatible with its neighboring land uses.

PART 9

EFFECTS ON NEIGHBORING LAND USES

- 9.1 How close is the nearest year-round residence to the site of this proposed project?

0.25 miles

- 9.2 Will this proposed project interfere with the public's use of existing public or private recreational facilities or resources?

No. There are no public or private recreational facilities in this area.

- 9.3 Will the proposed project utilize or interfere with agricultural areas?

No. There are no agricultural areas near this site.

- 9.4 Is there any possibility that the proposed project could interfere with a nearby existing business, commercial or manufacturing use?

No.

If applicable, the applicant needs to comply with 7 Del. Code, Chapter 79, as part of this application.

See Attachment K

CERTIFICATION BY APPLICANT

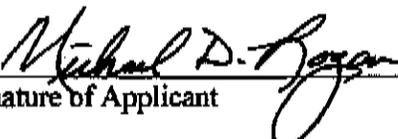
I hereby certify that all the information contained in this Permit Application and in any attachments is true and complete to the best of my belief.

I hereby acknowledge that any falsification or withholding of information will be grounds for denial of a Coastal Zone Permit.

I also hereby acknowledge that all information in this application will be public information subject to the Delaware Freedom of Information Act except for clearly identified proprietary information agreed to by the Secretary of the Department of Natural Resources & Environmental Control.

Michael D. Logan

Print Name of Applicant



Signature of Applicant

Vice President, Compliance Plus Services, Inc.

Title

11/19/2007

Date

ATTACHMENT A

AUTHORIZING AGENT



Tapeta™ Footings, Inc.

102 Piney Creek Lane

North East, Maryland 21901

E-mail: footings@tapeta.com

Tel. 410.287.8091

Fax: 410.287.8410

May 22, 2007

Department of Natural Resources & Environmental Control
98 Kings Highway
Dover, DE 19901

Re: Authorized Agent

Please be advised that with regard to Tapeta™ Footings, Inc.'s Application for a Coastal Zone Act Permit, our authorized agent will be:

Compliance Plus Services
336 South Warminster Road
Hatboro, PA 19040

Sincerely,

Andra Caraballo
General Manager

ATTACHMENT B

GENERAL MAP



ATTACHMENT C

EVIDENCE OF LOCAL ZONING

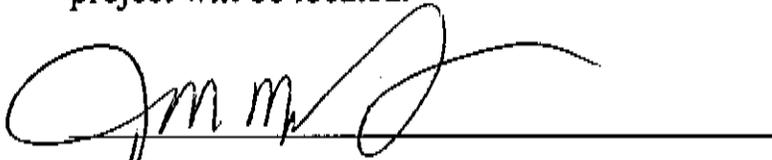
NEW CASTLE COUNTY

PART 2

EVIDENCE OF LOCAL ZONING AND PLANNING APPROVAL

I, **Joseph M. Abele, Jr.**, hereby affirm that the project proposed by **Tapeta Footings, Inc.**, located at **341 Pigeon Point Road, New Castle, Delaware, 19720**, in the **HI – Heavy Industrial** zoning district is in full compliance with the zoning code as it applies to this project.

The above-named applicant's project is in compliance with the adopted comprehensive development plan for the geographic area within which the project will be located.

A handwritten signature in black ink, appearing to read 'J M Abele Jr', is written over a solid horizontal line.

Planner III

October 1, 2007

This part is essential for a complete Permit Application. No application will be considered administratively complete without it. While the applicant is strongly advised to use this form, the local zoning jurisdiction may utilize another form or document than this one to demonstrate "evidence of local zoning approval," but such documents must be signed and dated by the proper official.

ATTACHMENT D

MSDS

MATERIAL SAFETY DATA SHEET

Product Name: TAPETA™
Manufacturer: Tapeta™ Footings, Inc.
102 Piney Creek Lane
North East, MD 21901
(410) 287-8091–Voice (410) 287-8410 – Fax

Prepared By: H.P. Shotwell, Ph.D., CIH
Revised: May 10, 2006
August 18, 2006

<u>Ingredients</u>	<u>Formula</u>	<u>% By Weight</u>	<u>CAS #</u>
Sand (Silica)	SiO ₂	40-86	14808-60-7
Wax	N/A	5-20	N/A
Polymeric fibers		5-50	N/A
Synthetic Rubber	(C ₅ H ₈) _n	2-12	9003-31-0

Crystalline Silica – Inhaling particles of crystalline silica in the respirable range of particle sizes may lead to lung scarring. Some agencies have classified respirable crystalline silica as a human carcinogen. Some studies seem to show an association between exposure to respirable crystalline silica and chronic kidney diseases, connective tissue and rheumatoid disorders. Crystalline silica may cause corneal abrasion. No adverse effects from skin contact or ingestion are known.

Crystalline silica may cause corneal abrasion. No adverse effects from skin contact or ingestion are known.

Signs & Symptoms of Exposure: Generally, there are no immediate signs or symptoms of exposure to crystalline silica.

Medical Conditions Aggravated By Exposure: Pre-existing lung conditions such as bronchitis and emphysema may be aggravated.

NOTE: Respirable crystalline silica is formed by the high energy impact of silica crystals against a hard surface, such as in sand blasting. Production of respirable silica under the intended conditions of use is extremely unlikely. Small amounts of silica contained in Tapeta™ will be coated with wax and rendered non-respirable.

No immediate responses from inhalation, ingestion or skin contact with Tapeta™ are known. Consequently, the need for first aid procedures is not anticipated following these routes of exposure.

Eye Contact: DO NOT RUB EYES. Flush eyes with clean tempered water for 15 minutes. Seek appropriate medical treatment if discomfort persists for more than a few minutes following first aid.

This product is not flammable, combustible, unstable or explosive. It will not polymerize or react chemically.

DECOMPOSITION PRODUCTS:

If subjected to extreme heat, the decomposition products may include irritating smoke, carbon dioxide and carbon monoxide.

In case of spills, shovel and/or sweep up, and place material in closeable containers for re-use or disposal.

This material is stable and will not degrade over a wide range of environmental conditions. It is not affected by extremes of environmental temperature or humidity.

Under normal-use conditions, breathing zone concentrations of crystalline silica are not expected to reach detectable levels. If, in the course of handling this product, significant dusting occurs or is likely to occur, the use of appropriate respiratory protection is recommended.

Appearance: Sandy, greenish-gray solids with flecks of black and colored material.

<u>Odor:</u>	None	<u>Solubility in Water:</u>	Insoluble
<u>Evaporation Rate:</u>	N/A	<u>Melting/Boiling Points:</u>	N/A
<u>Vapor Pressure:</u>	N/A	<u>Vapor Density:</u>	N/A

Stability: This product and all of its components are stable.

Incompatibilities: Contact with powerful oxidizing agents such as, but not limited to, fluoride, chlorine trifluoride and oxygen difluoride should be avoided.

Hazardous Polymerization: Will not occur.

Toxicological Data: No data is available for this product under normal routes of exposure.

<u>Carcinogenicity:</u> (Silica)	<u>NIOSH</u> Yes	<u>NTP</u> Yes	<u>IARC</u> Category 1	<u>OSHA</u> No
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[REDACTED]

No data for the environmental hazards or fate of Tapeta™ were found.

[REDACTED]

It is not anticipated that this product will be disposed of as waste. However, the product may be landfilled. Check local ordinances before disposal.

[REDACTED]

This product is not regulated by the USDOT.

[REDACTED]

This product is NOT REGULATED by the following agencies: RCRA (40 CFR 261 et seq), CERCLA (40 CFR 302), SARA Title III (EPCRA), Clean Air Act.

Crystalline silica, as a component of the product, is regulated under OSHA. The 8-hour, Time-Weighted Average OSHA Permissible Exposure Limit for respirable crystalline silica is: $PEL (mg/M^3) = \frac{10 mg/M^3}{(\% SiO_2 + 2)}$

(See 29 CFR 1910.1000, Table Z-3).

Airborne, respirable particles of crystalline silica, are known to the State of California to cause cancer.

[REDACTED]

Tapeta™ consists of chemically inert materials and sand, which contains crystalline silica. Under normal conditions of use, the generation of free crystalline silica in dust sufficient to exceed current exposure limits is highly unlikely.

New Page 1

REW TECHNOLOGIES, INC.

MATERIAL SAFETY DATA SHEET

TEXT VERSION

File: MSDS_10000.txt

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1. Product Identification

Product Name:.....Polyethylene (PE) Powder, Pellets, or
Granules (Regrind)

Other Industry Names:..Various Trade Names

CAS Number:.....9002-88-4

Chemical Family:.....Polyolefin

2. Physical Data

Boiling Point:.....Not Applicable

Vapor Pressure:.....Not Applicable

Appearance and Odor:..Pellets, powder, or granules, little or no odor

Melting Point:.....212-257°F (100-125°C)

Solubility in Water:..Insoluble

Specific Gravity:.....0.90 - 0.965

Stability:.....Stable

3. Fire & Explosion Hazard Data

Flash Point:..... >800°F (450°C)

Flammable Limits in Air:..Not Applicable

Autoignition Temp:.....No data available

NFPA Rating: Health (1) Fire (1) Reactivity (0)

(Applies only to exposure during a fire)

FIRE AND EXPLOSION HAZARDS: Heat from fire may melt and decompose polymer, generating flammable vapors. Fire fighters should wear self-contained breathing apparatus in the positive pressure mode when there is a possibility of exposure to smoke, fumes, or hazardous decomposition products. Water, if applied in a high-pressure stream, will spread the burning surface layer. Clear all other personnel from the area. Walking surface contact may present a slipping/falling hazard. Polyethylene dust particles in the atmosphere are combustible and may be explosive.

EXTINGUISHING MEDIA: CO2, Dry Chemical, Foam, or Water.

FIREFIGHTING PROCEDURES: Water should be applied as a spray from a fogging nozzle, since polyethylene is a surface burning material. Keep above burning material. Notify authorities if liquid enters sewer/public waters.

4. Human Health Data

INHALATION: Nuisance dust from this product may cause respiratory irritation following an excessive inhalation exposure. Follow exposure limits given below. Fumes may be generated in operations

using heated polyethylene.

INGESTION: Rats fed acute oral doses of 7.95 g/kg showed no evidence of adverse effects. Dietary levels of 1.25, 2.5, or 5% polyethylene for 90 days produced no evidence of adverse effects in rats.

EYE CONTACT: Powder or dust may cause eye irritation.

SKIN CONTACT: Product can be abrasive and cause irritation. Molten or heated material can cause serious burns to unprotected skin.

OCCUPATIONAL EXPOSURE LIMITS: PEL/TWA: No OSHA PEL for this product. For nuisance dust: 15 mg/m3 for total dust and 5 mg/m3 for respirable dust. TLV/TWA: No ACGIH TLV for this product. For nuisance particulates: 10 mg/m3 for total dust.

5. Preventative Measures

ENGINEERING CONTROLS: Local exhaust and/or enclosures should be used to whenever feasible to maintain concentrations below acceptable limits.

RESPIRATORY: If engineering controls are not sufficient or feasible to maintain concentrations below exposure limits, use NIOSH/MSHA approved respiratory protection.

EYE: Dust service goggles should be worn to prevent mechanical injury or other irritation to eyes due to airborne particles which may result from handling this product.

SKIN: When use can result in skin contact, wear gloves and other protective clothing as required to prevent mechanical irritation or burns. Practice good personal hygiene. Wash hands and other exposed areas with mild soap and water before eating, drinking, smoking, and when leaving work.

OTHER HYGIENIC PRACTICES: Use good personal hygiene practices. Wash hands before eating, drinking, smoking, or using toilet. Promptly remove soiled clothing and wash thoroughly before reuse. Shower after work using plenty of soap and water.

OTHER WORK PRACTICES: Material spilled on hard surface can be a serious slipping/falling hazard. Use care in walking on spilled material. Clean areas where spills occur as soon as practical.

6. Emergency and First Aid Procedures

INHALATION: If overcome by exposure, remove victim to fresh air immediately. Give oxygen or artificial respiration as needed. Obtain emergency medical attention. Prompt action is essential.

EYE CONTACT: In case of eye contact with solid material, immediately rinse with clean water for 20-30 minutes. Retract eyelids often. Obtain emergency medical attention if pain, blinking, tears, or redness persist.

SKIN CONTACT OR INGESTION: Skin contact or ingestion are not expected to present a significant hazard under anticipated conditions of normal use.

 7. Additional Precautions in Handling, Storage, and Use

Transfer from storage with a minimum of dusting. Ground all transfer, blending, mixing, and dust collection equipment to prevent static sparks. Remove all ignition sources from the material handling, transfer, and processing areas where dust may be present.

 8. Environmental and Regulatory Data

PRECAUTIONS IF MATERIAL IS SPILLED OR RELEASED: Creates slipping hazard on any hard surface. Potential dust explosion hazard from airborne release. Evacuate or limit access. Equip responders with proper protection (see Section 5, Preventative Measures). Extinguish all ignition sources. Stop release. Notify fire and/or environmental authorities. On land, sweep/shovel into suitable disposal containers. On water, material floats and is insoluble. Contain and collect as for any solid. Report per regulatory requirements.

WASTE DISPOSAL METHODS: Comply with federal, state, and local regulations for solid waste disposal. Contaminated product, soil, or water should not be designated a RCRA hazardous waste unless contaminated with other materials.

TOXIC SUBSTANCES CONTROL ACT: This product is listed in the TSCA Inventory of Chemical Substances.

SARA HAZARD CATEGORIES: Immediate/Acute Health Hazard, Fire Hazard

 9. Preparation Information

Prepared By: RBW Technologies, Inc.
 433 Hartmann Rd Evans City, PA 16033
 Ph 724-452-8440 Fax 724-452-0810
 www.rbw.com email: H&S@rbw.com
 Prepared: 3/19/96 Updated: 1/2/01

[Back](#) [Home](#)

WINMIN CORPORATION
 18 Elm Street
 Canaan, CT 06840

Emergency Telephone Number
 (203) 966-8880

Telephone Number for Information
 (203) 966-8880

Date Prepared: June 2000

SECTION 1: IDENTIFICATION

PRODUCT NAME: Crystalline Silica in the form of Quartz - various grades

SYNONYMS: Quartz, Crystalline Silica, Silicon Dioxide

SECTION 2: COMPONENTS

CAS#	Component	Percentage	Exposure Limits
14808-60-7	Crystalline Silica in the form of Quartz	87 - 99.9%	PEL - See Below TLV- 0.05 mg/m ³ TWA (respirable fraction) MSHA - See Below

OSHA PEL and MSHA Exposure Limit for Crystalline Silica, Quartz:
 (Respirable) $\frac{10 \text{ mg/m}^3}{\% \text{ Silica} + 2}$

National Institute for Occupational Safety and Health (NIOSH) has recommended that the permissible exposure limit be changed to 50 micrograms respirable free silica per cubic meter of air (0.05 mg/m³) as determined by a full shift sample up to 10 hour working day, 40 hours per week. The 1974 NIOSH Criteria for a recommended Standard for Occupational Exposure to Crystalline Silica should be consulted for more detailed information.

PEL means OSHA Permissible Exposure Limit.

TLV means American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Value.

MSHA means Mine Safety and Health Administration Exposure Limit.

TWA means 8 hour time weighted average.

Note: The Permissible Exposure Limits (PEL) reported above are the pre-1989 limits that were reinstated by OSHA June 30, 1993 following a decision by the 11th Circuit Court of Appeals. These PELs are now being enforced by Federal OSHA. Be aware that more restrictive exposure limits may be enforced by some states, agencies or other authorities.

SECTION 3: HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

This product is a chemically inert, non-combustible mineral. A single exposure will not result in serious adverse effects. Excessive inhalation of dust may cause lung disease, silicosis, with symptoms of shortness of breath and reduced pulmonary function. See "Cancer Status" in this Section 3.

HEALTH HAZARDS:

Inhalation: Breathing silica dust may not cause noticeable injury or illness even though permanent lung damage may be occurring. Inhalation of dust may have the following serious chronic health effects:

Silicosis: Excessive inhalation of respirable crystalline silica dust may cause a progressive, disabling and sometimes fatal lung disease called silicosis. Symptoms include cough, shortness of breath, wheezing, non-specific chest illness and reduced pulmonary function. This disease is exacerbated by smoking. Individuals with silicosis are predisposed to develop tuberculosis. Inhalation of air with a very high concentration of respirable silica dust can cause the most serious forms of silicosis in a matter of months or a few years.

Cancer Status: The International Agency for Research on Cancer has determined that crystalline silica inhaled in the form of quartz or cristobalite from occupational sources is carcinogenic to humans (Group 1 - carcinogenic to humans). Refer to IARC Monograph 68, Silica, Some Silicates and Organic Fibres (published in June 1997) in conjunction with the use of these materials. The National Toxicology Program classifies respirable crystalline silica as "known to be a human carcinogen". Refer to the 9th Report on Carcinogens (2000). The American Conference of Governmental Industrial Hygienists (ACGIH) classifies crystalline silica, quartz, as a suspected human carcinogen (A2).

Other Data with Possible Relevance to Human Health:

There is some evidence that breathing respirable crystalline silica or the disease silicosis is associated with an increased incidence of significant disease endpoints such as scleroderma (an immune system disorder manifested by fibrosis of the lungs, skin and other internal organs) and kidney disease.

For further information consult "Adverse Effects of Crystalline Silica Exposure" published by the American Thoracic Society Medical Section of the American Lung Association, American Journal of Respiratory and Critical Care Medicine, Volume 155, pages 761-768, 1997.

Inhalation of dust may cause irritation of the nose, throat and respiratory passages.

Skin Contact: No adverse effects expected.

Eye Contact: Contact may cause mechanical irritation and possible injury.

Ingestion: No adverse effects expected for normal, incidental ingestion.

Chronic Health Effects: See "Inhalation" subsection above with respect to silicosis, cancer status and other data with possible relevance to human health.

Medical Conditions Aggravated by Exposure: Individuals with respiratory disease, including but not limited to, asthma and bronchitis, or subject to eye irritation should not be exposed to respirable quartz dust.

Signs and Symptoms of Exposure: There are generally no signs or symptoms of exposure to crystalline silica (quartz). See "Inhalation" subsection above for symptoms of silicosis.

SECTION 4: FIRST AID

Gross Inhalation: Remove victim to fresh air. If breathing has stopped, perform artificial respiration. If breathing is difficult have qualified personnel administer oxygen. Get prompt medical attention.

Skin Contact: No first aid should be needed since this product does not affect the skin. Wash exposed skin with soap and water before breaks and at the end of the shift.

Eye Contact: Flush the eyes immediately with large amounts of running water, lifting the upper and lower lids occasionally. If irritation persists or for imbedded foreign body, get immediate medical attention.

Ingestion: If large amounts are swallowed, get immediate medical attention.

SECTION 5: FIRE AND EXPLOSION DATA

Flash Point (Method Used): Fully oxidized, will not burn.

Autoignition Temp: Will not burn.

Flammable Limits: LEL: Not applicable UEL: Not applicable

Extinguishing Media: This product will not burn but is compatible with all extinguishing media. Use any media that is appropriate for the surrounding fire.

Special Fire Fighting Procedures: None required with respect to this product. Firefighters should always wear self-contained breathing apparatus for fires indoors or in confined areas.

Unusual Fire and Explosion Hazards: None.

Hazardous Combustion Products: None.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Wear appropriate protective equipment. If uncontaminated, collect using dustless method (HEPA vacuum or wet method) and place in appropriate container for use. If contaminated: a) use appropriate method for the nature of contamination, b) consider possible toxic or fire hazards associated with the contaminating substances. Collect for disposal.

SECTION 7: HANDLING AND STORAGE

Do not breathe dust. Do not rely on your sight to determine if dust is in the air. Silica may be in the air without a visible dust cloud. Use normal precautions against bag breakage or spills of bulk material. Avoid creation of respirable dust. Do not use as a dry abrasive blasting agent. ANSI/AIHA Z9.4:1997 recommends that silica sand be prohibited as an abrasive blasting agent for use in fixed location abrasive-blast enclosures. Use good housekeeping in storage and use areas to prevent accumulation of dust in work area.

Use adequate ventilation and dust collection. Maintain and use proper, clean respiratory equipment (See Section 8). Launder clothing that has become dusty. Empty containers (bags, bulk containers, storage tanks, etc.) retain silica residue and must be handled in accordance with the provisions of this Material Safety Data Sheet. WARN and TRAIN employees in accordance with state and federal regulations.

WARN YOUR EMPLOYEES (AND YOUR CUSTOMERS - USERS IN CASE OF RESALE) BY POSTING AND OTHER MEANS OF THE HAZARDS AND OSHA PRECAUTIONS TO BE USED. PROVIDE TRAINING FOR YOUR EMPLOYEES ABOUT OSHA PRECAUTIONS.

Additional information on silica hazards and precautionary measures can be found at the following websites:
 NIOSH Joint Campaign on Silicosis Prevention <http://www.cdc.gov/niosh/sicampn.html>
 OSHA Crystalline Silica Website <http://www.osha-slc.gov/SLTC/silicacrystalline/index.html>
 MSHA Silicosis Prevention Website <http://www.msha.gov/S&HINFO/SILICO/SILICO.HTM>

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Ventilation: Use local exhaust as required to maintain exposures below applicable occupational exposure limits (See Section 9. See also ACGIH "Industrial Ventilation - A Manual for Recommended Practice", (current edition).

Respiratory Protection: Use appropriate respiratory protection for respirable particulates based on consideration of airborne workplace concentrations and duration of exposure arising from intended end use. Refer to the most recent standards of ANSI (Z88.2), OSHA (29 CFR 1910.134), MSHA (30 CFR Parts 56 and 57) and NIOSH Respirator Decision Logic.

Gloves: Protective gloves recommended.

Eye Protection: Safety glasses or goggles recommended.

Other Protective Equipment/Clothing: As appropriate for the work environment. Dusty clothing should be laundered before reuse.

9: PHYSICAL AND CHEMICAL PROPERTIES

Appearance and Odor: White powder, odorless.

pH: Not applicable

Boiling Point: 4046°F / 2230°C

Melting Point: 2930°F / 1610°C

Solubility in Water: Negligible

Percent Volatile: 0%

Specific Gravity (water=1): 2.65

Vapor Pressure: Not applicable

Vapor Density: Not applicable

Evaporation Rate: Not applicable

SECTION 10: STABILITY AND REACTIVITY

Stability: Stable

Conditions to Avoid: None

Incompatibility: Powerful oxidizing agents such as fluorine, chlorine trifluoride, manganese trioxide, etc.

Hazardous Decomposition Products: Silica will dissolve in hydrofluoric acid producing a corrosive gas, silicon tetrafluoride.

Hazardous Polymerization: Will not occur.

Conditions to Avoid: None

SECTION 11: TOXICOLOGICAL INFORMATION

No acute toxicity data is available for product or components. Refer to Section 3 for health hazard information.

SECTION 12: ECOLOGICAL INFORMATION

No ecotoxicity data is available. This product is not expected to present an environmental hazard.

SECTION 13: DISPOSAL

Waste Disposal Method: If uncontaminated, dispose as an inert, non-metallic mineral. If contaminated, dispose in accordance with all applicable local, state/provincial and federal regulations.

SECTION 14: TRANSPORTATION DATA

U.S. DOT HAZARD CLASSIFICATION

Proper Shipping Name: Not Regulated
Technical Name: N/A
UN Number: N/A
Hazard Class/Packing Group: N/A
Labels Required: None
DOT Packaging Requirements: N/A
Exceptions: N/A

SECTION 15: OTHER REGULATORY INFORMATION

SARA 311/312: Hazard Categories for SARA Section 311/312 Reporting: Chronic Health

SARA 313: This Product Contains the Following Chemicals Subject to Annual Release Reporting Requirements Under the SARA Section 313 (40 CFR 372): None

CERCLA Section 103 Reportable Quantity: None

California Proposition 65: This product contains crystalline silica (respirable) which is known to the State of California to cause cancer.

Toxic Substances Control Act: All of the components of this product are listed on the EPA TSCA Inventory or exempt from notification requirements.

European Inventory of Commercial Chemical Substances: All of the components of this product are listed on the EINECS Inventory or exempt from notification requirements. (The EINECS number for Quartz: 231-545-4)

Canadian Environmental Protection Act: All the components of this product are listed on the Canadian Domestic Substances list or exempt from notification requirements.

Japan MHL: All of the components of this product are existing chemical substances as defined in the Chemical Substance Control Law.

Australian Inventory of Chemical Substances: All of the components of this product are listed on the AICS inventory or exempt from notification requirements.

Canadian WHMIS Classification: Class D, Division 2, Subdivision A (Very Toxic Material causing other Toxic Effects)

16: OTHER INFORMATION

European Community Labeling Classification: Harmful (Xn)

European Community Risk and Safety Phrases: R40, R48, S22

NFPA Hazard Rating: Health: 1 Fire: 0 Reactivity: 0

HMIS Hazard Rating: Health: * Fire: 0 Reactivity: 0

* Warning - Chronic health effect possible - inhalation of silica dust may cause lung injury/disease (silicosis). Take appropriate measures to avoid breathing dust. See Section 3.

References:

- Registry for Toxic Effects of Chemical Substances (RTECS), 1998
- Patty's Industrial Hygiene and Toxicology
- NTP Ninth Report on Carcinogens, 2000
- IARC Monograph Volume 68, Silica, Some Silicates and Organic Fibres, 1997

Revision Summary: Revised TLV (Section 2) and Revised NTP and ACGIH Carcinogen Classification (Section 3).

The data in this Material Safety Data Sheet relates only to the specific material designated herein and does not relate to use in combination with any other material or in any process. The information set forth herein is based on technical data the Unimin Corporation believes reliable. It is intended for use by persons having technical skill and at their own discretion and risk. Since conditions of use are outside the control of Unimin Corporation, no warranties, expressed or implied, are made and no liability is assumed in connection with any use of this information. Any use of these data and information must be determined by the user to be in accordance with federal, state and local laws and regulations.

PRODUCT RTI GROUND RUBBER

APRIL 2002

MATERIAL SAFETY DATA SHEET
RECYCLING TECHNOLOGIES INT'L, LLC
60 FILBERT ST.
HANOVER, PA 17331

INFORMATION (717) 633-9008 EMERGENCY (717) 633-9008 FAX (717) 633-9505

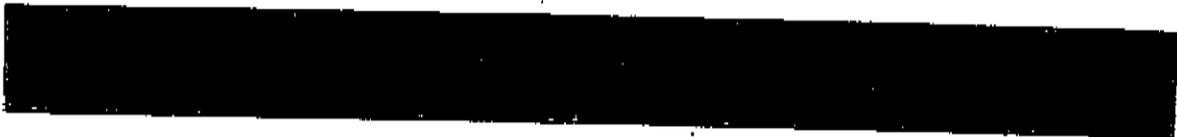


PRODUCT NAME Ground Rubber
APPEARANCE Black granular powder
SPECIFIC GRAVITY 1.13 to 1.27
VAPOR PRESSURE N/A
EVAPORATION RATE N/A

SOLUBILITY IN WATER Insoluble
ODOR Trace smell of vulcanized rubber
MELTING POINT N/A
VAPOR DENSITY N/A
BOILING POINT N/A



<u>MATERIAL (CAS)</u>	<u>% WL</u>	<u>ACGIH/TLV</u>	<u>OSHA/PEL</u>
NAPHTHENIC/AROMATIC OIL(64742-01-4)	LESS THAN 25%	3 mg/M3	6 mg/M3
CARBON BLACK (1333-86-4)	LESS THAN 35%	3.5 mg/M3	3.5 mg/M3
TALC, RESPIRABLE DUST(14807-96-6)	LESS THAN 5%	2.0 mg/M3	2.0 mg/M3
ZINC COMPOUNDS(1314-13-2)	LESS THAN 3%	10 mg/M3	10 mg/M3



FLASH POINT Ignition temperature of dust cloud
FLAMMABLE LIMITS N/A 608° F. approximately**

EXTINGUISHING MEDIA Water, foam, dry powder, water fog (**DO NOT USE HIGH PRESSURE WATER**)

FIRE FIGHTING PROCEDURES Heavy smoke and noxious gases may be formed under fire conditions, wear NIOSH approved breathing equipment.

UNUSUAL FIRE/EXPLOSION HAZARDS *Dust may be explosive if mixed with air in critical proportions in the presence of an ignition source

**Estimates based on data for 200 mesh synthetic & crude hard rubber dust; information contained in the NFPA Fire Protection Handbook.

PRODUCT RTI GROUND RUBBER



STABLE Yes

CONDITIONS TO AVOID Storage near fire or flame. Storage of hot material in hoppers due to potential spontaneous combustion.

HAZARDOUS DECOMPOSITION OR BY BY-PRODUCTS Thermal decomposition may produce carbon monoxide, carbon dioxide, zinc fume, sulfur dioxide, liquid and gaseous hydrocarbons.



ROUTE OF ENTRY Inhalation

CARCINOGENICITY Rubber is not listed as a carcinogen

SIGNS AND SYMPTOMS OF EXPOSURE Skin itching, irritation of mucous membranes, eye irritation

MEDICAL CONDITIONS CAUSED BY EXPOSURE Could potentially aggravate allergies, due to dust exposure and/or inhalation

EMERGENCY PROCEDURES Wash with soap and water. Ordinary methods of personal hygiene are appropriate



IF SPILLED Sweep or vacuum into disposal containers

WASTE DISPOSAL METHOD Product is not defined as hazardous waste. Follow Federal, State, and/or Local regulations

HANDLING AND STORING Do not store near open flame or ignition source

OTHER PRECAUTIONS If material burns, oils will be released. These must be disposed of by following Federal, State or Local regulations.

PRODUCT RTI GROUND RUBBER



RESPIRATORY PROTECTION Use any dust and mist respirator for up to 10 mg/M3

VENTILATION Yes

PROTECTIVE GLOVES Recommended

EYE PROTECTION Use safety goggles to prevent dust entry

WORK/HYGIENIC PRACTICES Good personal hygiene, frequent washing with soap and water of exposed areas, remove and clean contaminated clothing



MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY INFORMATION

Product Name: Iims 912969, 912972, 912965

Manufacturer Information:

Sunoco, Inc. (R&M)
Ten Penn Center
1801 Market Street
Philadelphia, Pennsylvania, 19103-1699

Product Use:

Wax

Emergency Phone Numbers:

Chemtrec (800) 424-9300
Sunoco Inc. (800) 984-8861

Information:

Product Safety Information (610) 859-1120

2. COMPOSITION/INFORMATION ON INGREDIENTS

Component	CAS No.	Amount (Vol%)
PROPRIETARY		100 - 100

EXPOSURE GUIDELINES (SEE SECTION 15 FOR ADDITIONAL EXPOSURE LIMITS)

CAS No.	Governing Body	Exposure Limits
---------	----------------	-----------------

3. HAZARDS IDENTIFICATION

• **EMERGENCY OVERVIEW**

Poses little or no immediate hazard.

Hazards Ratings:

Key: 0 = least, 1 = slight, 2 = moderate, 3 = high, 4 = extreme

	Health	Fire	Reactivity	PPH
NFPA	0	1	0	
HMIS	0	1	0	X

• **POTENTIAL HEALTH EFFECTS**

• **PRE-EXISTING MEDICAL CONDITIONS**

The following diseases or disorders may be aggravated by exposure to this product: Available data does not identify any conditions.

▪ **INHALATION**

Wax fume generated in molten state may cause discomfort and nausea.

LC50 (mg/l): no data

LC50 (mg/m3): no data

LC50 (ppm): no data

▪ **SKIN**

Non-irritating to the skin. Contact with heated product may cause thermal burns.

Draize Skin Score: no data Out of 8.0

LD50 (mg/kg): no data

▪ **EYES**

Non-irritating to the eyes. Contact with product at elevated temperatures can result in thermal burns.

▪ **INGESTION**

Practically non-toxic if ingested.

LD50 (g/kg): no data

4. FIRST AID MEASURES

• **INHALATION**

Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen and continue to monitor. Get medical attention.

• **SKIN**

Remove contaminated clothing. Wash skin with soap and water. Get medical attention. For hot product, immediately immerse in or flush the affected area with large amounts of cold water to dissipate heat. Cover with clean cotton sheeting or gauze and get prompt medical attention. No attempt should be made to remove material from skin or to remove contaminated clothing as the damaged flesh can be easily torn.

• **EYES**

Flush eye with water for 15 minutes. Get medical attention.

• **INGESTION**

Material is practically non-toxic. Induction of vomiting is not required. Get medical attention immediately.

5. FIRE FIGHTING MEASURES

• **EXTINGUISHING MEDIA**

Water spray; Regular foam; Dry chemical; Carbon dioxide;

• **FIRE FIGHTING INSTRUCTIONS**

Wear structural fire fighting gear. As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

FLAMMABLE PROPERTIES

	Typical	Minimum	Maximum	Text Result	Units	Method
Flash Point				GREATER THAN 350	F	N/A
Autoignition Temperature				no data	F	N/A
Lower Explosion Limit				no data	%	N/A
Upper Explosion Limit				no data	%	N/A

6. ACCIDENTAL RELEASE MEASURES

Contain spilled liquid with sand or earth. DO NOT use combustible materials such as sawdust. Use appropriate personal protective equipment as stated in Section 8 of this MSDS. Advise the Environmental Protection Agency

(EPA) and appropriate state agencies, if required. Allow material to solidify, and scrape up. Vacuum or sweep up material and place in a disposal container.

7. HANDLING AND STORAGE

- **HANDLING**
Wash thoroughly after handling. Avoid contact with this material.
- **STORAGE**
NFPA class IIIB storage. Flash point is greater than 200 degrees F.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Consult With a Health and Safety Professional for Specific Selections

- **ENGINEERING CONTROLS**
No special ventilation requirements.
- **PERSONAL PROTECTION**
 - **EYE PROTECTION**
Full-face shield is recommended to protect against splash of hot product.
 - **GLOVES or HAND PROTECTION**
When a material is heated, wear gloves to protect against thermal burns. The glove(s) listed below may provide protection against permeation. Gloves of other chemically resistant materials may not provide adequate protection. Insulated polyvinyl chloride; Insulated nitrile;
 - **RESPIRATORY PROTECTION**
Concentration in air determines the level of respiratory protection needed. Use only NIOSH certified respiratory equipment. Respiratory protection is not usually needed unless product is heated or misted.. Half-mask air purifying respirator with dust / mist filters or HEPA filter cartridges is acceptable for exposures to ten (10) times the exposure limit. Full-face air purifying respirator with dust / mist filters or HEPA filter cartridges is acceptable for exposures to fifty (50) times the exposure limit.
 - **OTHER**
Wear insulated impervious protective gear to protect against the splash of hot product. Insulated polyvinyl chloride; Insulated nitrile; Remove contaminated clothing and wash before reuse. For non-fire emergencies, respiratory protection may be necessary and wear appropriate protective clothing to avoid contact with material.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical Property	Typical	Units	Text Result	Reference
Appearance		N/A	DARK SOFT SOLID.	
Boiling Point		F	no data	
Bulk Density		lb/gal	no data	
Melting Point		F	160 MIN.	
Molecular Weight		g/mole	no data	
Octanol/Water Coefficient		N/A	no data	
pH		N/A	no data	
Specific Gravity		N/A	no data	
Solubility in Water		wt %	NIL	
Odor		N/A	TYPICAL WAX ODOR.	
Odor Threshold		ppm	no data	
Vapor Pressure		mmHg	NIL	@ 20 C

Viscosity (F)	97.9	SUS		@ 210 F
Viscosity (C)		CsT	no data	
% Volatile		wt %	NIL	

10. STABILITY AND REACTIVITY

- **STABILITY**
Stable
- **CONDITIONS TO AVOID**
Wax will slowly oxidize and turn rancid if heated in open air for long periods of time
- **INCOMPATIBILITY**
Strong oxidizers
- **HAZARDOUS DECOMPOSITION PRODUCTS**
Combustion may produce carbon monoxide, carbon dioxide and other asphyxiants.
- **HAZARDOUS POLYMERIZATION**
Will not polymerize.

11. ECOLOGICAL INFORMATION

No data available

12. DISPOSAL CONSIDERATIONS

Follow federal, state and local regulations. This material is not a RCRA hazardous waste, if not contaminated. Do not flush material to drain or storm sewer. Contract to authorized disposal service.

13. TRANSPORT INFORMATION

<u>Governing Body</u>	<u>Mode</u>	<u>Proper Shipping Name</u>
DOT	Ground	Petroleum Wax NOIBN

<u>Governing Body</u>	<u>Mode</u>	<u>Hazard Class</u>	<u>UN/NA No.</u>	<u>Label</u>
DOT	Ground	N/A	N/A	Not Regulated

14. REGULATORY INFORMATION

<u>Regulatory List</u>	<u>Component</u>	<u>CAS No.</u>

Title III Classifications Sections 311,312:

- Acute: YES
- Chronic: NO
- Fire: NO
- Reactivity: NO
- Sudden Release of Pressure: NO

15. OTHER INFORMATION

Limits For the Product- 2mg/m3 Wax Fume (OSHA PEL/ACGIH TLV) WHMIS Classification: not controlled. Please refer to the material safety data sheet for complete information.



William Barnet & Son, LLC
P. O. Box 131 / 1300 Hayne Street
Arcadia, SC 29320 USA
Phone: 864-576-7154

MSDS/Polyester
Issue Date: 5/27/91
Reviewed : 1/01/07
Page 1 of 2

Material Safety Data Sheet

POLYESTER: Staple fiber, tow, filament yarn, threadwaste, polymer

1. PRODUCT IDENTIFICATION:

Polyester is a family of fiber products having similar hazard and physical property characteristics. These products are made from polyethylene terephthalate polymer and one or more surface finishes.

2. HEALTH HAZARD DATE:

Non toxic. This product is not listed by OSHA, NTP, or IARC as a carcinogen.

3. REACTIVITY DATE:

There are no known physical or health hazards associated with this product, as defined in the code of Federal Regulations, Title 29, and Part 1910, 1200. The polymer immobilizes the constituents of the polymer system (delusterants, catalyst residues, etc) which, therefore, presents no likelihood of exposure under normal conditions of processing and handling. However, exposure to chemical substances may occur as a result of processing these fibers. Processing may release and aerosolize the residual moisture and surface finishes. Heating the fibers may volatilize the finishes or produce a chemical change. William Barnet & Son recommends maintaining finish mist below the OSHA standard of 5 mg/m³.

4. PHYSICAL CHEMICAL DATA:

Polyethylene terephthalate is chemically stable and resistant to attack by oils, solvents, weak acids and weak alkalis.

5. FIRE AND EXPLOSION:

Polyester will burn if exposed to flame. Decomposition products generated from molten polymer may be subject to auto ignition. Combustion products will be comprised of carbon, hydrogen, and oxygen. The exact composition will depend on the conditions of combustion. Firefighters should protect themselves from decomposition and combustion products that may include carbon monoxide and other toxic gases.

6. CONTROL MEASURES:

Adequate ventilation is recommended to maintain finish mist levels below 5 mg/m³. Customary personal hygiene measures, such as washing hands after working with such fibers, are recommended. Use of safety glasses and gloves, and standing to one side when cutting bale wires is advised.

7. SPILL, LEAK, AND DISPOSAL:

These products are not classified as hazardous wastes under the Resource Conservation and Recovery Act and, unless prohibited by state or local regulation, can be disposed of in a municipal landfill or incinerated. These fibers are not classified by the Department of Transportation as a hazardous material.

8. INFORMATION CONTACT:

William Barnet & Son, LLC
P.O. Box 131
Arcadia, SC 29320

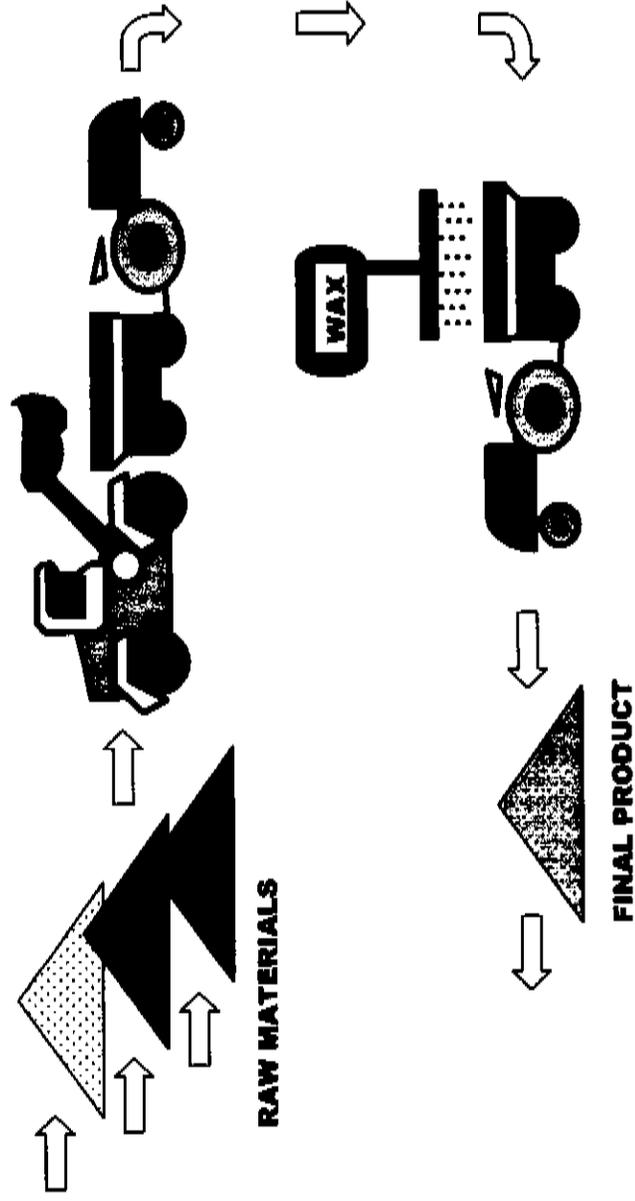
Telephone: (864)-576-7154
Technical Service Manager

To the best of our knowledge, the information contained herein is accurate. However, neither William Barnet & Son nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards which exist.

ATTACHMENT E

FLOW DIAGRAM

TAPETA™ MANUFACTURING PROCESS



ATTACHMENT G

ENDANGERED SPECIES



STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES & ENVIRONMENTAL CONTROL
DIVISION OF FISH & WILDLIFE
NATURAL HERITAGE & ENDANGERED SPECIES
4876 HAY POINT LANDING ROAD
SMYRNA, DELAWARE 19977

TELEPHONE: (302) 653-2880
FAX: (302) 653-3431

October 15, 2007
(Request received September 25, 2007)

Lynn Carre
Port Contractors, Inc.
529 Terminal Avenue
New Castle, DE 19720

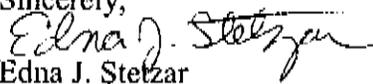
*RE: Racetrack Sand Operation
341 Pigeon Point Rd, Tax Parcel 10-0006.00-006, New Castle, DE
Applicant: Tapeta Footings, Inc.*

Dear Ms. Carre:

Thank you for contacting the Natural Heritage and Endangered Species program about information on rare, threatened and endangered species, unique natural communities, and other significant natural resources as they relate to the above referenced project.

A review of our database indicates that there are currently no records of state-rare or federally listed plants, animals or natural communities at or adjacent to this project site.

We are continually updating records on Delaware's rare, threatened and endangered species, unique natural communities and other significant natural resources. If the start of the project is delayed more than a year past the date of this letter, please contact us again for the latest information. If you have any questions, please contact me at (302) 653-2883 ext. 101.

Sincerely,

Edna J. Stetzar
Biologist/Environmental Review Coordinator

(Please see Invoice on next page)

ATTACHMENT H

DETAILED EMISSIONS CALCULATIONS

Tapeta Footings, Inc.
 New Castle, DE
 Summary of Estimated Operation Emissions

EMISSION SUMMARY WITH MIX TRACTOR USING MFG. DATA w/ Tier II Engines

Pollutant	Summary for 150,000 TPY Production			
	Mix Tractor Emissions	Boiler	Total Emissions	
			Lbs/Yr	Tns/Yr
NO _x	4,791	492	5,283	2.64
CO	3,165	137	3,302	1.65
SO ₂	16	20	35	0.02
PM	257	55	311	0.16
VOCs	N/A	19	19	0.01
Total:	8,229	722	8,951	4.48
	Offsets Required @ 130%:		11,636	5.82

Tapeta Footings, Inc.
 New Castle, DE

Emission Estimates From Wax Trailer Engine

Boiler Make: Byran CLM-120FDO
 Boiler Hp: 29
 Boiler Btu/hr: 969,963
 Fuel Consumption: 6.83 GPH

Fuel Oil Heat Content: 142,000 Btu/Gal

Annual Tonnage: 150,000
 Batches per Year: 30,000
 Typ. Number of Mix Tractors: 1
 Annual Hours of Operation: 4,000

Fuel Sulfur Content: 50 ppm_w

Pollutant	Emission Factor	Units	Emissions	
			150,000 TPY	
			Lbs/Yr	Tns/Yr
NO _x	18	lbs/1,000 Gals	492	0.25
CO	5	lbs/1,000 Gals	137	0.07
SO ₂	0.72	lbs/1,000 Gals	20	0.01
PM	2.00	lbs/1,000 Gals	55	0.03
VOCs	0.713	lbs/1,000 Gals	19	0.01

Notes:

- 1.) Sulfur content based on current US EPA thresholds for off-road diesel engines.
- 2.) Emission factors taken from US EPA AP-42 Table 1.3-7 (09/98 ed.)

Tapeta Footings, Inc.

New Castle, DE

Estimated Emissions from "Mix" Tractors

Engine Type: Diesel-Fired Internal Combustion

Engine Hp: 97

"Cycle Time" per Batch: 8 Minutes

Tons per Batch: 5 Tons

Annual Tonnage: 150,000

Batches per Year: 30,000

Annual Hours of Operation: 4,000

Fuel Sulfur Content: 50 ppm_w**Emissions Using US EPA Tier 2 Standards:**

Pollutant	Emission Factor	Units	Emissions	
			150,000 TPY	
			Lbs/Yr	Tns/Yr
NO _x & VOCs	5.6	g/BHp-Hr	4,791	2.40
CO	3.7	g/BHp-Hr	3,165	1.58
SO ₂	Note 1	g/BHp-Hr	16	0.01
PM	0.3	g/BHp-Hr	257	0.13
Totals:			8,229	4.11

Notes:

1.) Uses 8.09 E-03S from Section 3.4 of AP-42. Sulfur content is based upon current US EPA thresholds for off-road diesel engines.

ENVIRONMENTAL IMPACTS	(Applicant's Use) DESCRIBE ENVIRONMENTAL IMPACTS	PAGE NO.	(Applicant's Use) DESCRIBE ENVIRONMENTAL OFFSET PROPOSAL ¹	PAGE NO.	DNR/EC USE ONLY OFFSET SUFFICIENCY Yes, No or N/A
Air Quality (Applicant to List Below by					
NOx	Estimated increase of 2.64 tons per year.	10	Acquisition of emissions credits of 3 tons/year through DE Economic Development Office (EDO)	pp. 22 -	
SO2	Estimated increase of 0.02 tons per year.	10			
CO	Estimated increase of 1.65 tons per year.	10	Acquisition of emissions credits of 3 tons/year through DE Economic Development Office (EDO)	pp. 22-25	
PM	Estimated increase of 0.16 tons per year.	10			
VOC's	Estimated increase of 0.01 tons per year.				
			The applicant is proposing a financial contribution of \$2,500 to assist in the establishment of a trust fund to assist in the maintenance of street trees planted as part of the South Wilmington Special Area Management Plan (SAMMP) community revitalization effort.	pp. 24-25	
Water Quality					
Surface	No impact.	pp. 11-			
Groundwater	No impact.	pp. 11-			
Water Quantity					
Surface	No impact.	15			
Groundwater	No impact.	15			
Water Use For:					
Processing	Not applicable	pp. 13-			
Cooling	Not applicable.	pp. 13-			
Effluent Removal	Not applicable.	14			
Solid Waste	There will be a very slight increase in solid waste as a result of the race track surface material processing.	pp. 15- 16	All solid waste will be collected, stored in covered dumpsters as appropriate and transported off-site for either recycling or proper disposal in a permitted facility.	25	
Hazardous Waste	Not applicable.	16			
Habitat					
Wetlands	No impact.	pp. 16- 18	The applicant is proposing a financial contribution of \$2,500 to assist in the implementation of the recommendations of the Wetlands & Hydrologic Assessment Summary Report of the South Wilmington Special Area Management Plan (SAMMP) (October 2007)	24	
Flora Fauna	No impact.	pp. 16-			
Drainage/Flood Control	No impact.	pp. 16-			
Erosion	No impact.	pp. 16-			
Land Use Effects					
Glare	No impact.	18			
Heat	No impact.	18			
Noise	No impact.	18			
Odors	No impact.	18			
Vibration	No impact.	18			
Radiation	No impact.	18			
Electro-Magnetic Interference	No impact.	18			
Other Effects	None	18			
Threatened & Endangered Species	No impact.	17			
Impacts From:					
Rare Material	Not applicable.				
Intermediate Products	Not applicable.				
By-Products	Not applicable.				
Final Products	Not applicable.				

ATTACHMENT J

**SOUTH WILMINGTON SPECIAL AREA
MANAGEMENT SUMMARY REPORT**

**WETLANDS & HYDROLOGIC
ASSESSMENT SUMMARY REPORT**

SEPTEMBER 2007

SOUTH WILMINGTON SPECIAL AREA MANAGEMENT PLAN

NEW CASTLE COUNTY, DELAWARE



SUMMARY REPORT

September 2007



This project was funded, in part, through a grant from the Delaware Coastal Programs with funding from the Office of Ocean and Coastal Resources Management, National Oceanic and Atmospheric Administration under award number NA05NOS4191169





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EXECUTIVE SUMMARY

Rummel, Klepper & Kahl, LLP conducted a wetland survey from February to August 2007 on a 27 acre *Phragmites* wetland located between Walnut Street, A Street, S. Buttonwood Street, and Garasches Lane in South Wilmington, New Castle County, Delaware. Existing wetlands and their connection to the Christina River and other outside sources of water were identified and assessed for functionality for the Delaware Department of Natural Resources and Environmental Control (DNREC) as part of the South Wilmington Special Area Management Plan (SAMP) in Wilmington, Delaware.

A wetland assessment was performed using the Evaluation of Planned Wetlands (EPW) method, which allows for a pre- and post-restoration comparison. Hydrological conditions in the marsh were evaluated through surface water and groundwater HOBO data loggers, surface water YSI data sondes, tide gate inspections, and dye tests to evaluate the current and possible connections of the marsh to the Christina River and other water sources.

Wetland assessment results found that the existing wetland functions well in stabilizing sediments and improving water quality, but provides poor wildlife and fish habitat. Water quality function scores a little low due to the absence of fine sediment materials and the presence of water flow constrictions at pipes. The wildlife function scores low due to presence of contamination, no vegetative diversity, and little or no open water or habitat interspersion. Fish habitat receives a low score due to barriers to fish movement, few open water areas, encroaching urban development, and known sources of contamination. Wetland restoration efforts should focus on *Phragmites* eradication and control, increasing vegetation diversity, creating more open water areas, and increasing water connectivity.

To increase open water areas and water connectivity, the current ditches and culverts need to convey more water to the marsh. A tide gate inspection revealed that one gate needs to be repaired, while the other two need to be replaced. The current malfunctions led to present tidal influence in the ditch system. Dye tests and field observations found that it is possible that water from the Christina River can reach the main ditch from the north, though it is unknown whether there is a current tidal influence on the marsh. The connection to the Christina River to the west and the open-water area to the south is hindered by accumulation and debris in the culverts that connect the Norfolk Southern Railroad ditches to each other and to the wetland area. Preliminary water quality data found that there are no detrimental conditions in the water and that fully connecting the ditch to the river system will not change conditions much. No connections were found from the wetland to the South Wilmington community.

It is recommended that the tide gates be repaired or replaced, either in-kind or with an automated system. The automated system will allow for easier flood attenuation and control over water levels. Also, the installation of another tide gate near the wetland/community line will be beneficial for wetland flushing and to attenuate current or potential flooding in the South Wilmington community. Before design can begin, the following needs should be addressed: defining the limits of the wetland, defining and discussing the extent of contamination and disposal issues, conducting an H&H study, and assessing pipe hindrances.

1.0 INTRODUCTION

The South Wilmington Special Area Management Plan (SAMP) is a cooperative effort of community members, business leaders, not-for-profit organizations, and agency staff to create a comprehensive plan for the revitalization of South Wilmington. A major recommendation of the SAMP Neighborhood Plan and SAMP Drainage Study is the restoration of the South Wilmington Wetland. Investigations into the feasibility of restoring the marsh are currently being led by the DNREC, Division of Soil and Water Conservation, Delaware Coastal Programs and the City of Wilmington. The wetland is located within South Wilmington, between Walnut Street, A Street, S. Buttonwood Street, and Garasches Lane. The objective of the project is to rehabilitate degraded wetland habitat and create a multi-functional natural area and open space that provides wetland habitat, recreational opportunities, and storm-water management for the adjacent areas of South Wilmington.

A functional assessment of the existing wetland is one of the initial project tasks undertaken by DNREC towards the restoration of the South Wilmington Wetland. The wetland assessment was performed using the Evaluation of Planned Wetlands (EPW) method, which was chosen because it allows comparison of weighted functional values between an existing wetland and the planned, restored wetland. This will provide useful guidance in the design process to maximize the wetland functions that will be provided by the planned wetland.

Field investigations were also conducted to assess the current hydrologic connection of the wetland to outside water bodies, such as the Christina River. HOB0 depth data loggers, YSI data sondes, tide gate inspections, and dye tests were employed to analyze both current water conditions and flow patterns in the vicinity of the marsh. This will supply information on current connections throughout the marsh, as well as the feasibility of future connections.

2.0 BACKGROUND AND EXISTING CONDITIONS

Rummel, Klepper & Kahl, LLP conducted a wetland and hydrological assessment in April and May 2007 on the South Wilmington wetland, located between Walnut Street, A Street, S. Buttonwood Street, and Garasches Lane in Wilmington, New Castle County, Delaware (Figure 1). The study area consists of approximately 27 acres of wetland and uplands that are bounded by developed land. The development to the north, south, and west is predominately industrial or commercial, while the residential community of Southbridge is located to the east.

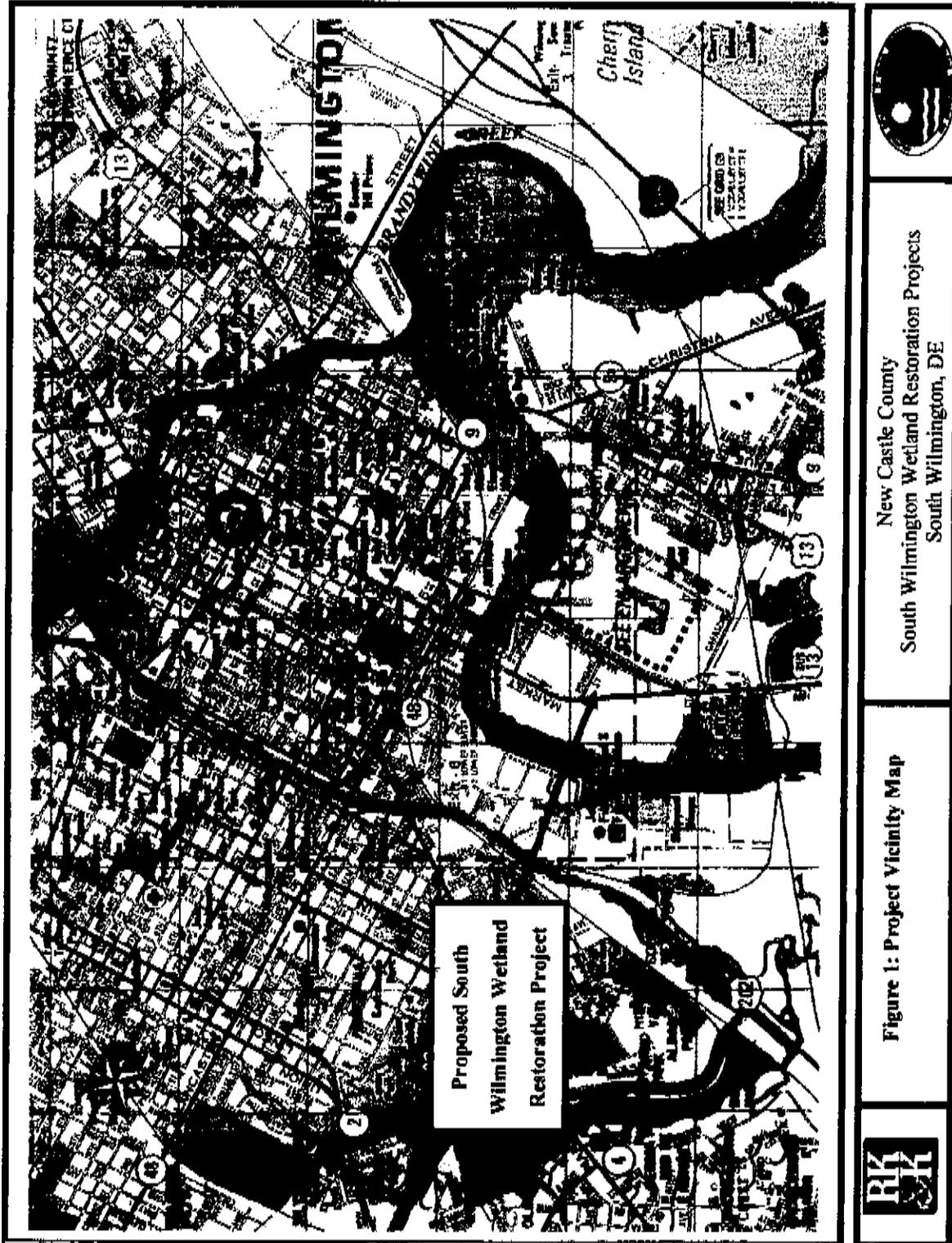
The study area encompasses several natural communities, although a dense *Phragmites* marsh covers the majority of the area. Open-water ditches, small forested areas, shrub thickets, and an area of maintained lawn within a radio tower site also occur within the study boundaries. Numerous debris piles and slag heaps, the byproduct of ore-smelting operations, are located around the perimeter of the existing wetland (Figure 2).

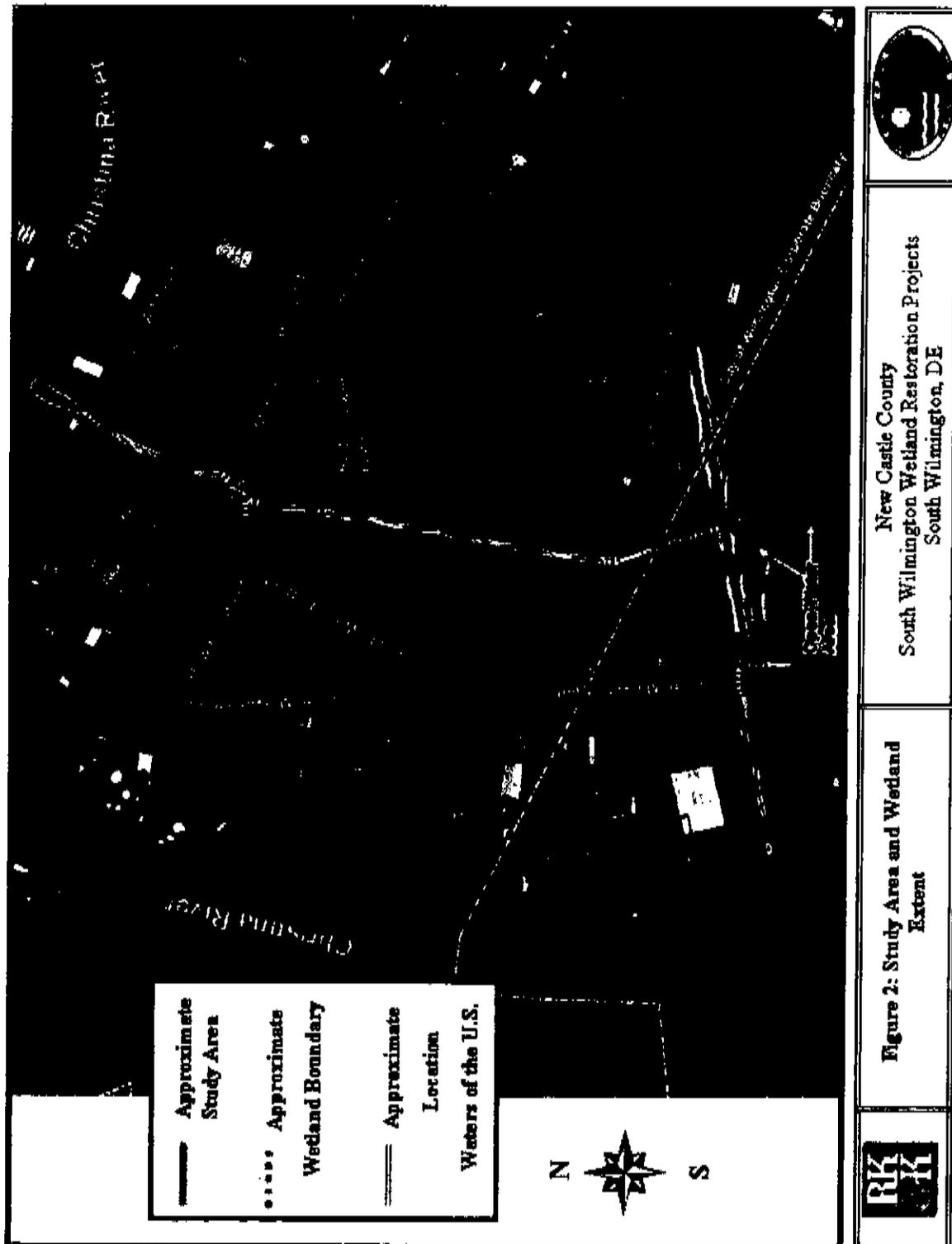
Research was conducted on existing environmental conditions within the study area prior to field investigations. Documents reviewed included the USGS 7.5 minute topographic map for the Wilmington South Quadrangle, the soil map from the U.S. Natural Resource Conservation Service Soil Map, the U.S. Fish and Wildlife Service's (USFWS) National Wetland Inventory (NWI) map, and the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) panel number 10003C0160J for New Castle County, Delaware, located in Appendix A.

2.1 Topography and Geology

The study area is mostly low-lying, flat ground surrounded by industrial development. Elevations range from approximately -3 feet to 12 feet above mean sea level, with the higher elevations located on debris piles or fill areas that encircle the existing wetland (Figure 2).

The study area lies within the Delmarva Coastal Plain physiographic province. The Coastal Plain is typified by sedimentary deposits that dip gently and increase in thickness toward the southeast. The dominant geologic formation within the center of the study area is Holocene marsh deposits, which are composed of structureless to finely laminated, black to dark-gray, organic-rich silty clay to clayey silt with discontinuous beds of peat and rare shells. Fragments of marsh grasses, such as *Spartina*, are present, as are clayey silt deposits originating from estuarine channel formation and migration. The Scotts Corners Formation surrounds the Holocene marsh deposits and is located on the edges of the study area. This Formation is a heterogeneous unit of light-gray to brown to light yellowish brown, coarse to fine sand, gravelly sand and pebble gravel with discontinuous beds of organic-rich clayey silt, clayey silt, and pebble gravel. It is commonly capped by one to two feet of silt to fine sandy silt. Sand grains present within the formation are predominantly quartz, with minor amounts of feldspar and muscovite (Ramsey 2005). Extensive areas of debris, fill, and industrial slag deposits overlay the naturally occurring geologic formations in many locations, especially around the perimeter of the existing marsh.





2.2 Soils

The South Wilmington area is located within the Delmarva Coastal Plain Province, which is dominated by sands, gravels, and clays. Like many urban areas, most of the original soils in the South Wilmington area have been extensively disturbed, making classification of the soils difficult. Old fire insurance maps and aerial photographs show that the area was undeveloped open space with a rail line on C Street until 1901. In 1937, parts of the marsh were cultivated for hay or other crops and there is evidence of roads and dirt trails. It was not until 1954 that fill activities were evident (Hendershot and Asreen 2005a and 2005b). A small portion of the South Wilmington area remained undisturbed wetland, the center of the South Wilmington Wetland, which is an area of silty clays. The four soil extents that occur within the study area are shown in Appendix A, and descriptions for each are listed in the table below.

TABLE 1: SOILS WITHIN SOUTH WILMINGTON WETLAND
(NRCS and South Wilmington SAMP Ecological Characterization Workgroup 2006)

Made Land (Ma)	Areas that have been filled with soil material, trash, or both that have been so altered or disturbed that classifying the soil is no longer feasible. Original soil may have been removed completely or filled with 18" or more of other material. Available water capacity is very low and shrink swell potential is low. The suitability of a given area for any use must be determined by an onsite examination.
Othello silt loam (Ot)	The Othello series consists of very deep, poorly drained, moderately slowly permeable soils on upland interfluvies, lowlands, marine terraces, and depressions. Slope ranges from 0 to 5 percent. Shrink-swell is low and water capacity is high. Corrosion of untreated pipe is high. This soil is hydric.
Othello-Fallsington- Urban Land Complex (Ou)	Consists of poorly drained, level Othello or Fallsington soils that have been used for residential, commercial, or industrial development. Shrink-swell is low and water capacity is high. Both Othello and Fallsington are hydric soils. Much of this complex has been covered by as much as 18" of fill, which has a low water capacity and shrink-swell potential.
Tidal Marsh (Tm)	Very poorly- drained soils that are regularly flooded (usually readily apparent to most people in the field) by tidal waters and also have an odor from hydrogen sulfide. Available water capacity and shrink-swell potential are moderate. All development is severely limited and discouraged.

2.3 Soil Contamination

Historical heavy and light industrial and commercial activities in South Wilmington have resulted in soil contamination. Soils sampled near South Wilmington as part of an environmental assessment by the DNREC Superfund Branch prior to 1996 showed industrial sites containing elevated concentrations of arsenic, lead, chromium, and other inorganic materials. Additionally, samples taken from South Wilmington scrap salvage yards contained PCBs above industrial and residential risk levels (Breslin 1996 in South Wilmington SAMP Ecological Characterization Workgroup 2006). A list of known and suspected contaminants at nearby brownfield sites is supplied in Appendix A. Known contaminants are those that have been tested and confirmed on site, while suspected contaminants are those that have not been tested, but have been historically found on site. The location of the properties and lot numbers are indicated in Appendix A. In 2005, sediment samples taken in the marsh as part of a DNREC Site Investigation indicate that

the sampling sites have been impacted by metals, such as arsenic, mercury, lead, copper, and zinc, semi-volatile organic carbons (SVOCs), such as benzo(a)anthracene, benzo(a)pyrene, benzo(k)fluoranthene, dibenz(a,h)anthracene, Est PAH TICS, and Est Total TICS, and, to a limited extent, PCBs, such as arochlor-1248 (Hendershot and Asreen 2005a and 2005b).

2.4 Hydrology

The South Wilmington Wetland is approximately 1,300 feet south the Christina River and 2.5 miles west of the Delaware River. The area is located within the Brandywine Christina Watershed (NWDB 02040205), which is part of the Lower Delaware Sub-Basin (02-04-02).

According to the USGS Topo Map, there is a ditch along the western side of the proposed restoration project that appears to connect to the Christina River just east of the Walnut Street Bridge, regulated by a tide gates located on both sides of A Street. This ditch appears to run under Garasches Lane and connect to open-water ponds south of the railroad tracks shown on Figure 1. This area connects to the Christina River via ditches on the northern side of the Norfolk Southern (NS) Railroad, regulated by another tide gate. The USGS Quad and the ADC vicinity map show open water in the southeastern portion of the existing wetland. This open water is not visible on the aerial photography (Figure 2).

According to the New Castle County National Flood Insurance Rate Maps, most of the site is located within the 100 year flood zone (Zones A and AE), with small pockets in the 500 to 500+ year flood zone (Shaded Zone X and Zone X, Appendix A).

The National Wetland Inventory Map (NWI) is a digital resource that gives a general delineation of wetlands based on the analysis of high altitude imagery; wetlands are identified based on vegetation, visible hydrology, and geography. This is a general resource that can be incorrect and thus does not replace actual field reconnaissance efforts. The mapping resource identifies four wetland types within the study area (Appendix A). The southernmost large wetland is classified as a palustrine, emergent, persistent, semi permanently flooded (PEM1F) wetland. The smaller, southern wetland is a palustrine, unconsolidated bottom, permanently flooded, diked/impounded (PUBHh) wetland. The northern wetland is classified as a combination palustrine, emergent, persistent (PEM1) and scrub-shrub, broad-leaved deciduous, seasonally flooded/saturated (SS1E) wetland. The smaller, eastern wetland is a palustrine, scrub-shrub, broad-leaved deciduous, seasonally flooded (PSS1C) wetland.

The *State of Delaware 2006 Delaware Watershed Assessment Report (305(b)) and Determination for the Clean Water Act Section 303(d) List of Waters Needing TMDLs* (Total Maximum Daily Loads) identifies the pollutants/stressors in the Middle Christina River segment, which runs along the South Wilmington study area until the Brandywine River, to include: nutrients (nitrogen and phosphorus), polychlorinated biphenyls (PCBs), bacteria, and dieldrin (a pesticide). The study area is adjacent to the tidal Christina River watershed, which was characterized by the Water Resource Agency in 1998 as having extremely high total suspended sediment (TSS) loads, amounting to 928 lb/ac/yr in 1998, the second highest TSS load in the entire Christina Basin. The Christina River watershed also exhibited high levels of bacteria, iron, phosphorus, and polychlorinated biphenyls (PCBs) (Water Resources Agency 1998 in DNREC

2007). There is a fish consumption advisory in the tidal Christina River, where consumption of all finfish is prohibited due to PCB and dieldrin contamination.

Surface water samples taken as part of an environmental assessment by the DNREC Superfund Branch showed levels of aluminum, iron, lead, PCBs, and metals, including arsenic, chromium, cyanide, and mercury, that exceeded risk-based concentrations (Breslin 1996 in South Wilmington SAMP Ecological Characterization Workgroup 2006). In 2005, surface water samples taken in the marsh south of old C Street as part of a DNREC Site Investigation indicate that the sampling sites have been impacted by metals, volatile organic carbons (VOCs), semi-volatile organic carbons (SVOCs) and pesticides (Hendershot and Asreen 2005a and 2005b).

Ground water samples, taken as part of an environmental assessment by the DNREC Superfund Branch, showed levels of arsenic, iron, and manganese that exceeded risk-based concentrations (Breslin 1996 in South Wilmington SAMP Ecological Characterization Workgroup 2006). In 2005, shallow ground water samples taken in the marsh as part of a DNREC Site Investigation indicate that the sampling sites have been impacted by VOCs, pesticides, and metals, especially arsenic, iron, and manganese (Hendershot and Asreen 2005a and 2005b).

2.5 Ecology

Little information is currently available on species or habitat utilization within the South Wilmington wetland. The Russell W. Peterson Urban Wildlife Refuge is a restored, tidal, freshwater marsh located west of the study area, across the Christina River (Appendix A). Zoological and botanical surveys completed in 1999 at this restored tidal wetland can provide a general idea of the species that might utilize restored wetland habitat at the South Wilmington Wetland Restoration Project.

The botanical survey conducted by the Delaware Natural Heritage Program found no state or federally listed rare and/or endangered plant species in the Petersen Wildlife Refuge, however, eight exotics plants were observed, including purple loosestrife *Lythrum salicaria*, mile-a-minute *Polygonum perfoliatum*, common reed grass *Phragmites australis* and the reed canary grass *Phalaris arundinacea* (South Wilmington SAMP Ecological Characterization Workgroup 2006). These species are all common invasive plants and their presence in mitigation and restoration wetlands projects must be controlled. A complete list of species within the Russell W. Peterson Urban Wildlife Refuge is located in Appendix A.

3.0 WETLAND ASSESSMENT

RK&K conducted a wetland delineation on the northwestern corner of the study area in October 2006 and a wetland assessment of the entire study area in early April 2007. On April 24, 2007, fire burned much of the standing, dead biomass of *Phragmites* in the South Wilmington Wetland. RK&K investigated the extent of the burn damage on May 2, 2007. A summary of field observations and the results of the assessments follow.

3.1 Methods

Natural resource scientists visited the project area and walked throughout the marsh and the surrounding uplands. Notes on topography, existing vegetation, hydrology, and wildlife were collected to understand the existing wetland and its extent. This overview of the entire wetland system was required to perform the wetland assessment, which was conducted using the EPW method (Bartoldus et. al 1994). Potential surface water connections were located and dye tests were employed to trace potential flow pathways. The site was revisited after the fire and additional observations were made, especially on site topography and hydrology, which were more apparent without the dense stand of dead *Phragmites*.

The EPW approach was utilized to evaluate the condition of the South Wilmington Wetland. EPW is a rapid and comprehensive method, designed to compare existing habitats or wetlands to a planned wetland. The method assesses a comprehensive list of wetland functions that are weighted to allow comparisons between an existing wetland assessment area (WAA) and a planned wetland design.

The weighted functional value is called the Functional Capacity Index (FCI). It is a value from 0.0 to 1.0, with a score of 1.0 indicating that the wetland performs the assessed function at optimal capacity. EPW assesses the following functions: shoreline bank erosion control (SBEC), sediment stabilization (SS), water quality (WQ), wildlife habitat (WL), fish habitat (tidal (FT), non-tidal (FS), and non-tidal lakes and ponds (FP)), and uniqueness/heritage (UH). Each FCI can also be weighted by the size of the assessed wetland area to provide Functional Capacity Units (FCUs).

Specific elements comprise models used to calculate each FCI. Each model is composed of 7 to 21 elements, which are based on concepts derived from scientific literature relevant to the assessed wetland function. Each element of the model is given a score based on presence/absence or best professional judgment. Many of the elements are specific such that they can act as design points for creating a planned wetland that will optimize the FCI.

3.2 Field Observations

The entire study area was investigated to understand the overall land cover and conditions, and to establish the extent of existing wetland for the assessment. The study boundary encompasses several natural communities, but most of the area is covered by a large wetland dominated by dense *Phragmites australis* (Figure 2). The existing wetland also includes a small fringe of forested wetland in its northeast corner. There is an open-water ditch along the west side of the study area, young forests and shrub thickets along the perimeter of the wetland, an area of maintained lawn inside the wetland, and several industrial lots. There are numerous large, old, debris and rubble piles located around the perimeter of the wetland and a few small piles within the *Phragmites* marsh. After the marsh fire on April 24, 2007, the area was revisited to investigate damage to existing habitats and to observe what new features may have been exposed by the fire. All photos are contained in Appendix B.

3.2.1 General Landscape

The study area is generally flat, with a center dominated by a dense *Phragmites* marsh. There is a large area of maintained lawn in the center of the marsh at the site of a radio tower (Figure 2). *Phragmites* extends to the east and south of this lawn, ending at the wetland-upland boundary. The wetland-upland boundary is formed by a steep, concrete-lined slope along the southern edge of the marsh, while the eastern boundary is a more gradual slope up and out of the wetland. The western edge of the wetland is formed by a low berm separating the marsh from an open-water ditch. Remnant C Street, which appears to be maintained, cuts across the marsh and physically separates the northern third of the wetland from the southern two-thirds. An abandoned, raised, railroad bed is immediately north of old C Street. The *Phragmites* marsh extends north of the rail bed until it meets an abrupt upland slope.

3.2.2 Existing Vegetation

The existing wetland is predominately a dense, single-species stand of *Phragmites* (Photos B1-B2) with a small fringe of forested wetland in the northeast corner (Photo B3). This forested wetland is dominated by mature green ash (*Fraxinus pennsylvanica*), red maple (*Acer rubrum*), and silver maple (*Acer saccharinum*). There are also a few scattered, small trees and shrubs on small mounds within the *Phragmites* marsh and on the uplands around the wetland. The young, scrubby, shrub and tree uplands along the northern, eastern, and southern side of the wetland are dominated by species such as shrub honeysuckle (*Lonicera sp.*), box elder (*Acer negundo*), red maple (*Acer rubrum*), red mulberry (*Morus rubra*), and black locust (*Robinea pseudoacacia*) (Photo B4). There are also small, scattered pin oak (*Quercus palustris*), green ash (*Fraxinus pennsylvanica*), and sycamore (*Platanus occidentalis*) within these forests. The upland berm that separated the *Phragmites* marsh from the open-water ditch along the west side of the study area is covered in dense rose (*Rosa multiflora*) and blackberry (*Rubus sp.*) shrubs and scattered small trees (Photos B5-B6). This berm may be mowed to maintain access to the utility poles and lines that run along it.

3.2.3 Existing Wildlife Habitat

The dense *Phragmites* appeared to provide poor wildlife habitat (Photo B7), and most wildlife was observed on the edges of the marsh or in the surrounding uplands. Small top minnows and

turtles were observed in the open-water ditches, but no aquatic organisms were seen within the *Phragmites* marsh. Sparrows, red-wing blackbirds, catbirds, and several other song bird species were heard along the perimeter of the marsh. No traces of common mammals, such as deer bedding, woodchuck burrows, or fox tracks, were observed.

3.2.4 Wetland Disturbances

Evidence of human disturbance was common along the perimeter and within the edges of the wetland. The slope along the entire southern edge of the wetland is composed of concrete rubble with additional rubble, construction debris, and trash extending back into the forest. The southeastern corner of the wetland and the adjacent uplands contain slag piles and fill materials (Photos B8-B14). Debris has been dumped along the northern edge of the wetland, and the elevated ground in the northwestern corner of the study area is largely composed of fill materials containing chunks of brick, concrete, and slag. Debris, fill materials, and slag along the perimeter and in the wetland appear to be relatively old.

3.2.5 Observations Made After the Wetland Fire

RK&K scientists visited the South Wilmington Wetland Restoration Project area on May 2, 2007, approximately a week after the marsh burned. Most of the dead, standing biomass of *Phragmites* was eliminated down to the soil surface or water line. Some low trees and shrubs on the uplands along the eastern side of the wetland were also burned (Photo B15). New shoots and rhizomes of *Phragmites* appeared to be impacted minimally by the fire, and a new crop is likely to dominate the wetland within a few weeks (Photo B16). The removal of the dead, standing biomass provided an unencumbered view of the surface and revealed additional slag and debris piles, the railroad bed north of old C Street, old DNREC monitoring wells, and the slope along the western side of the wetland (Photos B9-B14, B17, B18). Several discontinuous berms, most likely spoil piles from previous mosquito ditching activities, were visible within the southern portion marsh, as were two rows of slag debris (Photos B19-B20). The loss of standing biomass also revealed the full extent of standing water within the *Phragmites* marsh and showed that there are no large drainages through the center of the marsh.

3.2.6 Observations on Functions Performed by the Existing Wetland

A number of conclusions regarding wetland functions can be drawn from the observations collected during field investigations. The flat topography and dense, emergent vegetation of the *Phragmites* marsh should provide excellent sediment stabilization. The lack of open water and the large amount of concrete and slag rubble at the edge of the wetland suggests that the "shoreline" is very stable. The dense vegetation and slow-flowing or stagnant surface water suggests that the existing wetland also provides excellent filtration and water quality benefits. Unfortunately, the large amount of trash and debris, potentially hazardous slag, and other, unknown contaminants may result in a net release of toxic or hazardous materials to the surface water. The dense *Phragmites* marsh provides limited habitat for both terrestrial and aquatic organisms. The vast expanse of dense vegetation with no open or deepwater areas provides poor habitat for fish and aquatic vertebrates. While wetland birds will utilize the edge of the marsh for nesting and foraging, much of the marsh interior provides little or no habitat. The existing wetland vegetation has little species or structural diversity, therefore providing minimal wildlife habitat.

3.3 EPW Assessment Results and Discussion

Based on field observations, it was determined that the South Wilmington Wetland would be assessed as a single unit, or wetland assessment area (WAA). The existing wetland is a uniform community of *Phragmites* with little variability in the vegetation community, topography, or hydrology. The small area of forested wetland fringe in the northeastern corner of the study area is too small to warrant a separate assessment or to weigh heavily in the assessment results. It was assumed that the wetland is not subject to tidal hydrology.

The EPW method allows comparison of the FCI for each assessed function between the WAA (the existing wetland) and the planned, restored wetland. The comparison of the FCIs and the elements of the model from which they are calculated provides useful guidance in the design process to maximize the wetland functions provided by the planned wetland. The assessment data sheets in Appendix B do not have assigned FCI values for the planned wetland, but the desired goal is to optimize all wetland functions to the greatest extent possible in any wetland restoration design.

The South Wilmington wetland scored high for functions relating to physical and chemical processes but scored poorly for wildlife and fish habitat. Table 2 summarizes the functional capacity of the existing wetland. These results suggest the wetland has low biological value and that restoration goals should focus on significant improvements in wildlife and fish habitat. The following discussions provide a detailed analysis of the scoring elements for each function.

TABLE 2: SOUTH WILMINGTON WETLAND ASSESSMENT AREA - EPW RESULTS

<i>Shoreline Bank Erosion Control</i>	1.0
<i>Sediment Stabilization</i>	1.0
<i>Water Quality</i>	0.8625
<i>Wildlife</i>	0.135625
<i>Fish (nontidal, stream/pond)</i>	0.305/0.56875
<i>Uniqueness/Heritage</i>	NA

*1.0 = optimal function

The wetland assessment area scored optimally for shoreline bank erosion control (SBEC) and sediment stabilization (SS). Examination of the model used to calculate SBEC shows that the dense vegetation and shallow water in the wetland both limit physical disturbance that causes erosion and hold the sediments or substrate in place with vegetative biomass. Examination of the SS model shows that the dense vegetation, infrequent disturbance, and stable slopes around the wetland optimize the stability of the sediments and substrate.

The functional capacity score for water quality (WQ) was relatively high, at 0.8625. The assessment suggests that the coarse fill materials and sandy soils that compose most of the substrate in the wetland reduces the opportunity for water-substrate contact, nutrient retention, or chemical transformation because of rapid movement and high conductivity of water through

these coarse materials (Bartoldus et al. 1994). The model suggests that the addition of fine mineral soils in the planned wetland would optimize the water quality function of the wetland. In addition, much of the surface flow in the wetland occurs as sheet flow, but constriction at pipes under remnant C Street and into the open-water ditch reduces sheet flow and inhibits the surface water interaction with vegetation and soils. Sheet flow has a greater potential to improve water quality due to increased frictional resistance which increases sedimentation, and increased surface area which increases the water interaction with soil/vegetation (Bartoldus et al. 1994). The replacement of existing pipes with wider, vegetated outlets may provide improvement in water quality.

The wildlife function (WL) of the existing wetland is poor. This FCI scores low due to several factors: there is presence of contamination; there is no diversity in the vegetation structure or species composition; and there is little or no open water or habitat interspersion. The greater the diversity of plant species and vegetative structure, the more likely an area is to harbor a diverse wildlife contingent. Monocultural stands, especially of *Phragmites*, are considered to have a very low diversity of wildlife and thus score low (Bartoldus et al. 1994). Minimal open water reduces the abundance of water-dependent birds and amphibious vertebrates such as turtles and muskrats. Fifty percent cover has been found to support a high diversity and abundance of water dependent birds, with either extreme cover supporting very little (Bartoldus et al. 1994). This poor functional index suggests that a diverse vegetation community, containing herbaceous and wood vegetation interspersed with open water and upland islands, would maximize wildlife habitat in a planned wetland.

Fish habitat (FP) also scores low due to multiple elements in the FCI model. The two fish FCIs are looked at together for similar detrimental factors. Tide gates, culverts, pipes, and debris piles act as barriers to fish movement. Fish may not occupy an area because an obstacle imposes an absolute physical or behavioral barrier (Bartoldus et al. 1994), and while top minnows were observed in the open-water ditch along the west side of the wetland, none were seen within the marsh because the only surface water connection appeared to be a single 12-inch pipe. Another detriment is the lack of habitat due to relatively few open-water areas and extensive local development. All these factors limit the diversity and abundance of fish that can utilize the area and reduce effective habitat size. High nutrient, sediment, or contaminant sources limit the sites potential as fish habitat as well. Pollutants can cause high fish mortality directly or indirectly by contaminating or reducing the abundance of food sources concentrations- the higher the contamination, the less likely fish survival (Bartoldus et al. 1994). The potential for fish habitat at the existing marsh is limited because there are barriers to migration into the wetland, there is very limited open-water habitat, and habitat that is present may be contaminated. The assessment suggests that better connectivity to adjacent open water, the creation of more open and deep-water areas within the marsh, and the removal of contaminants would greatly improve fish habitat in a planned wetland.

4.0 WETLAND DELINEATION

RK&K contracted with the City of Wilmington to conduct a wetland delineation and jurisdictional determination for the South Wilmington Wetland Restoration Project. Delineation was performed September 19 and 20, 2007. Wetland and water flags will be surveyed by October 1, 2007. The wetland delineation report is forthcoming.

5.0 HYDROLOGIC ASSESSMENT

RK&K conducted a hydrologic assessment of the entire wetland and surrounding area April 4, 2007. This included dye tests and a visual inspection of culverts and flow direction. In addition, underwater inspection of the tide gates on the west and north of the wetland occurred May 4, 2007 and additional observations were collected on May 4, 2007. HOBO depth data loggers and YSI data sondes were also deployed to collect groundwater and surface water depth data, as well as surface water conditions. A summary of field observations and the results of the data collection follow.

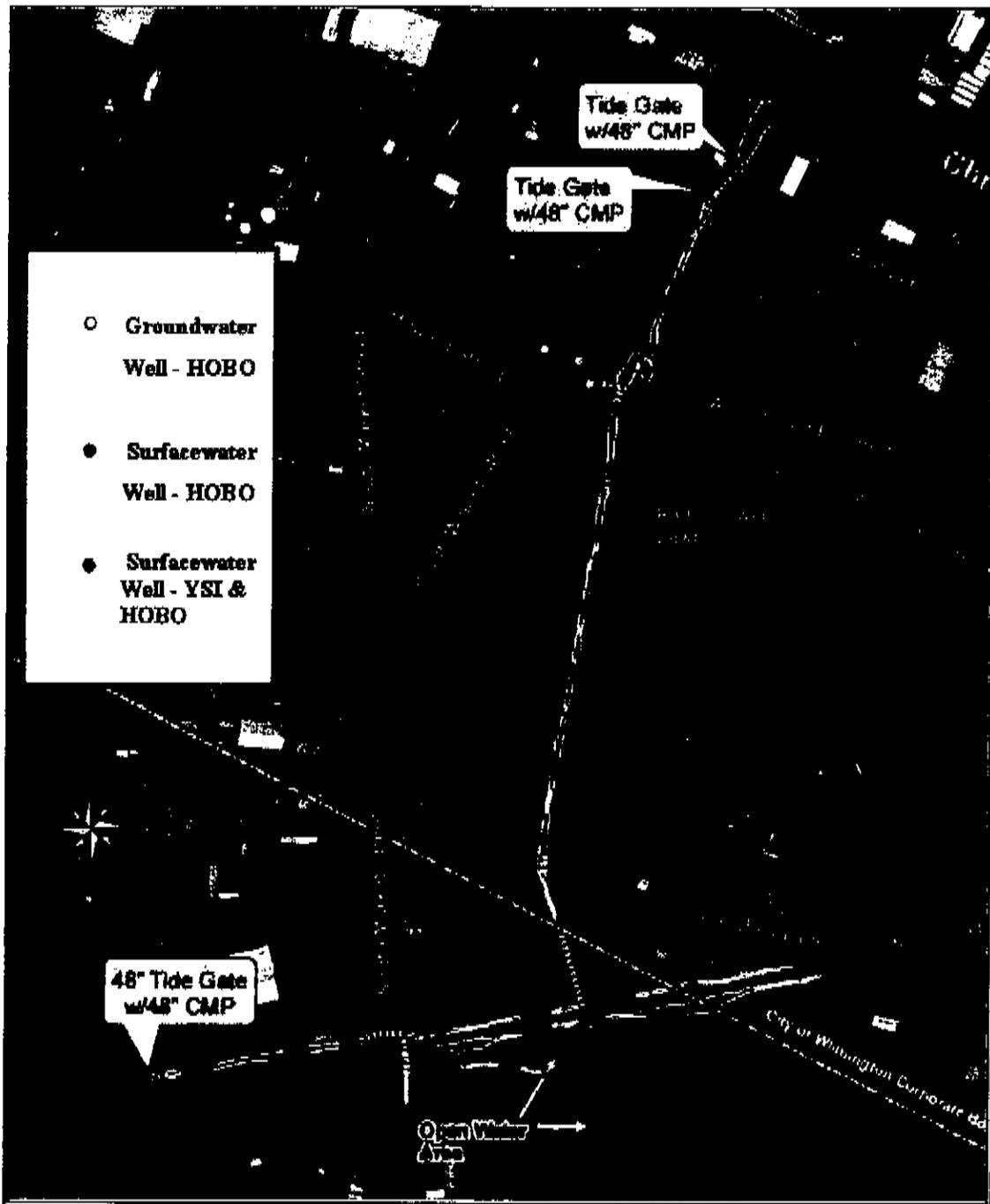
5.1 Methods

Water resource and natural resource scientists visited the project area and walked throughout the marsh and the surrounding ditches. Photos from the area are located in Appendix C and D. Notes on culvert size, type, and condition were taken to assess hydrologic connectivity. Dye tests were conducted April 4, 2007 to assess flow direction and relative speed south and north of the marsh. Complete results from the dye test are located in Appendix D. Subsequent investigations assessed tidal effects on flow. Culvert locations can be seen on Figure 3.

Three tide gates were inspected: one at the northeast corner of A Street and Walnut Street on the Christina River, one at the southeast corner of A Street and Walnut Street, and one west of South Market Street, along the Norfolk Southern Railroad (Figure 3). Inspection work was conducted by a 4-man dive crew experienced in underwater inspection and included a registered Professional Engineer for direction and supervision.

Groundwater and surface water data was also obtained for the site. Three groundwater wells were installed near the intersection of Howard Street and South Walnut Street (Figure 3). One is near the northwest corner of the intersection parallel to remnant C Street, while the other two are located on the north and south sides of remnant C Street, west of the ditch. Data was collected from February to September. Four HOBO depth loggers were installed in the ditch system leading to the South Wilmington wetland to measure surface water (Figure 3). One is located in the Christina River, two are located in the ditch south of A Street, and one HOBO is located in a ditch west of Market Street and north of the Norfolk Southern Railroad. Data collection occurred from May to September except in the ditch near Norfolk Southern Railroad, which only collected data from August to September. All depth logger data was corrected to NAVD88.

Two YSI data sondes were installed at the same time and locations as the HOBO surface water depth loggers (Figure 3) to monitor the water condition. One is located in the Christina River and the other is in the ditch south of A Street, parallel to the Shell gas station. Data recorded includes temperature, specific conductivity, salinity, dissolved oxygen (percent and mg/l), pH, and turbidity.



	<p>Figure 3: Tide Gate and Well Locations</p>	<p>New Castle County South Wilmington Wetland Restoration Project South Wilmington, DE</p>	
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5.2 Tide Gate Inspection

An underwater inspection of the tide gates on May 4, 2007 confirmed that the tide gates are malfunctioning and not operating as designed (see Appendix C for the Tide Gate Inspection Report and Repair Recommendations and Cost Estimates for Tide Gates).

The tide gate at the northeast corner of A Street and Walnut Street on the Christina River is approximately 6 feet wide by 4 feet high overall. The interior and exterior faces of the steel gate have light to moderate corrosion and the concrete headwall has moderate scale throughout and a 1-foot by 1-foot by 8-inch deep spall at the top northeast corner. The tide gate does not close properly at high tide due to anaerobic bacteria corrosion nodules that have roughened the sealing surface and to improper adjustment of the alignment hardware at the upper hinges. It is recommended that the seals be cleaned, the hinges adjusted, debris cleared, and grease fittings replaced. This is estimated to cost \$6,600. There should also be annual maintenance of inspecting, clearing, exercising, and greasing which will cost \$3,000.

The circular steel tide gate at the southeast corner of A Street and Walnut Street in an access hatch has an approximate 4-foot diameter sealing surface. The interior and exterior faces of the steel gate have light to moderate corrosion and the wall surfaces of the concrete hatch have moderate scale throughout. The steel gate does not seal tightly during high tide due to anaerobic bacteria corrosion nodules that have roughened the sealing surface and to improper adjustment of the alignment hardware at the upper hinges. It is recommended that the tide gate is replaced and the headwall receive minor preparation or replacement. There are two replacement options: one is a cast iron flip valve and the other is a flexible flap valve, which is the preferred alternative by M&N Diving and Engineering Services. The first option costs \$34,300 and the second option costs \$34,200. There should also be annual maintenance of inspecting, clearing, exercising, and greasing which will cost \$3,000.

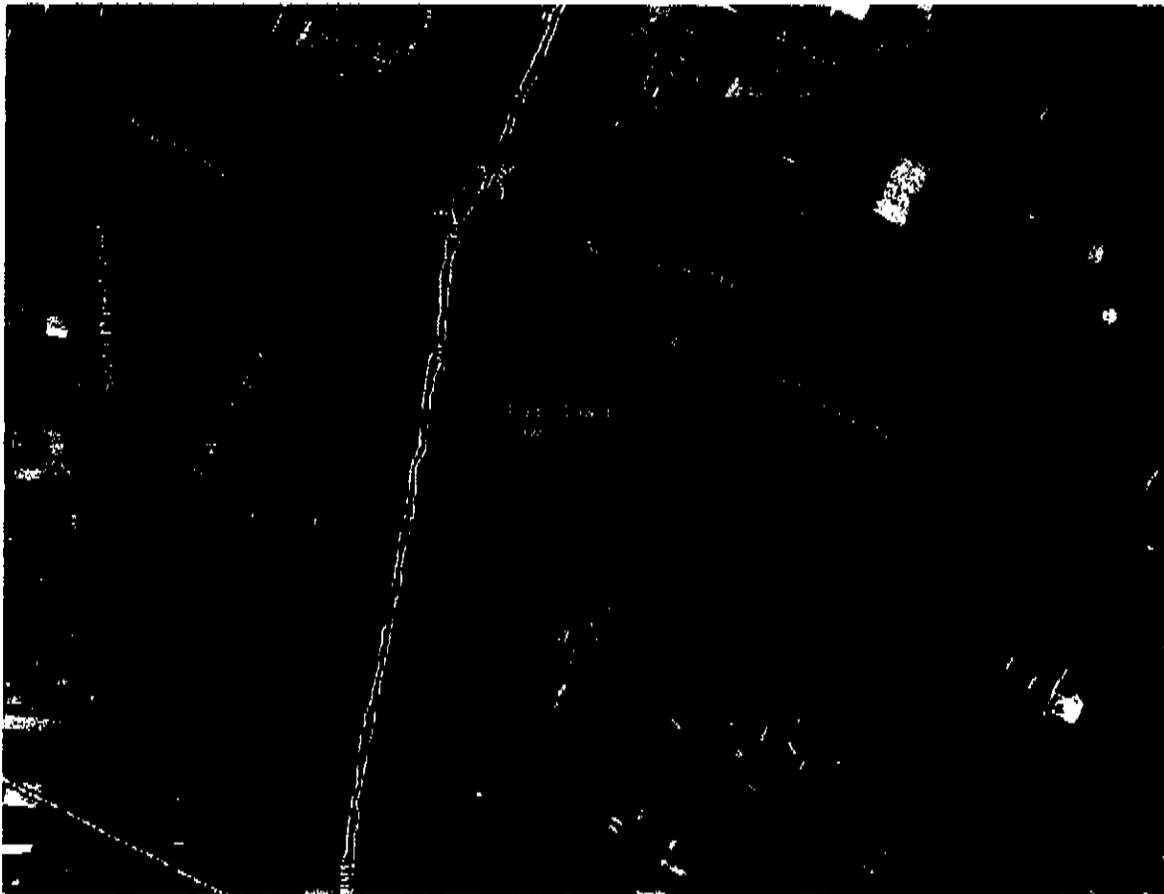
The circular aluminum tide gate west of Market Street along the railroad tracks on the Christina River has an approximate 4-foot diameter sealing surface. The aluminum tide gate has little to no corrosion. The gate can only open 2 feet due to a large amount of debris at the outlet and cannot close fully due to large rocks located in the sleeve. There is also a broken 2-inch mounting angle at the north hinge. It is recommended that the tide gate is replaced and the headwall receive minor preparation or replacement. There are two replacement options: an aluminum flap valve and the other is a flexible flap valve, which is the preferred alternative by M&N Diving and Engineering Services. The first option costs \$21,500 and the second option costs \$27,200. There should also be annual maintenance of inspecting and clearing which will cost \$1,000.

Another option not set forth in the Tide Gate Repair Recommendations is the replacement of the tide gates with an automated system. This would allow for easier regulation of surface water levels and would allow for better water level control during flood events. This is an important consideration given that the South Wilmington communities currently have flooding problems. The option of adding another tide gate north of A Street between the wetland and the community should also be entertained to mitigate flood flows and help in the flushing of the northern part of the wetland.

5.3 Dye Test Results and Field Observations

5.3.1 Hydrology Within the Marsh

Several inches of standing water were observed throughout the *Phragmites* marsh, with a few areas in the southern portion of the wetland with greater than six inches of surface water (D1-D2). The surface water within the wetland did not appear to fluctuate regularly, which suggests that it is not tidally influenced. No standing water was observed on the radio tower lawn, on remnant C Street, or on the raised, abandoned rail bed, all of which appear to be slightly elevated when compared to the surrounding wetland (Photo D3-D5). The only elevated area that creates a hydrological divide in the marsh is the abandoned rail bed. Overall, field observations suggest that surface water within the wetland is derived from runoff and shallow groundwater discharge. However, five culverts were found that could affect flow patterns within the marsh.



Two drainage pipes are located under remnant C Street, allowing flow north and south. One 12-inch corrugated metal pipe (CMP) is located north of the eastern extent of the radio tower (Photo D6; Pipe 1). The pipe seems to be covered with debris, but evidence of flow was seen. The other pipe is a 48-inch CMP which connects the ditch on the western side of the marsh (Ditch 1) to a ponded area (Pipe 2). The south end of culvert under remnant C Street has no signs of corrosion, but water flow was slightly stagnant (Photo D7). The north end of Pipe 2 is slightly corroded, possibly sliced, and a metal box with wheels is located within the pipe (Photo D8). Flow out of

the pipe was very slow, but there seems to be a second feeder, possibly from the Howard Street side of Walnut Street (Pipe 3). The runoff has lots of iron oxide flocculate and flows quickly (Photo D9), but the pipe was not found.

Other than Pipe 2 under remnant C Street, there are three more drainage pipes that connect Ditch 1 to water sources north and south of the marsh. One 48-inch CMP connects the ponds north of remnant C Street to one another (Pipe 4). Another 48-inch CMP connects the small ponds north of C Street to the ditch (Ditch 2) directly south of A Street (Photo D10; Pipe 5). There is also a 48-inch culvert located under the access road to the radio tower that runs over Ditch 1 (Photo D11; Pipe 6). All of these pipes appear to be in good condition and are transporting water.

One more culvert is located within the marsh. A 12-inch CMP, located west of the radio tower, provides a connection between the marsh south of the railroad bed and the open-water ditch to the west (Photo D12; Pipe 7).

5.3.2 Hydrology North of the Marsh



On April 4, 2007 dye was applied to Ditch 3, north of A Street, near high tide. The dye migrated upstream, south towards A Street, which leads into the marsh. This suggests that the two tide gates downstream are not completely water-tight and that some tidal flow enters this ditch. When

investigating flow south of A Street, conclusive results on flow direction in Ditch 2 and the ponds were not obtained. Therefore, the wetland north of the rail bed may be subject to inundation from Ditch 2, meeting in the northwestern corner of the wetland (Photo D13).

Ditch also receives flows from two culverts. A small 15-inch PVC pipe emanates from a new building on the east side of the ditch (Photo D14; Pipe 8). Also, a 36-inch CMP originates from under the Shell station on the west side of the ditch (Photo D15; Pipe 9). This culvert is half-covered, so may not contribute much runoff to the ditch.

5.3.3 Hydrology South of the Marsh

South of the marsh area, there is a system of culverts around the Norfolk Southern (NS) Railroad near South Market Street. Though most of the flow is west, there is a possibility of eastern flow towards the wetland area due to the failure of a tide gate. The marsh could therefore receive flow from a large open-water area to the south or directly from the tidal Christina River to the west, both of which meet in the ditches alongside the NS Railroad, east of South Market Street. The open water area will be discussed first.



The large open water area is located south of the NS Railroad, south of the abandoned east-west running railroad spur and west of the abandoned north-south running railroad spur (Photo D16). Dye testing indicates that the area is nontidal and that water flows either northerly or north

westerly towards two culverts that drain into a ditch on the south side of the NS Railroad (Ditch 4). One 36-inch CMP is located south of the abandoned east-west running railroad spur, less than 800 feet east of South Market Street (Photo D17). This culvert is approximately 75% filled with sediment, but the northern flow velocity was strong (Photo D18; Pipe 10). Another 36-inch CMP is located just west of the abandoned north-south running railroad spur (Photo D19; Pipe 11). This culvert is flowing well, allowing water to travel north into Ditch 4.

Another culvert drains into Ditch 4. A 36-inch CMP runs parallel on the east side of South Market Street and drains a ditch (Ditch 5) northerly towards Ditch 4 (Photo D20; Pipe 12). On both field visits, the flow passed north through the culvert, thus leading to the conclusion that Ditch 5 is nontidal. Pipe 12 is in good condition and seems to be flowing well.

Dye was applied in Ditch 4 on April 4, 2007 near high tide. Flow moved slowly to the east, suggesting tide was coming in. Tidal influence was confirmed on the May 4, 2007 visit during low tide, when water was quickly moving westerly. The flow connecting Ditch 4 to the northern ditch alongside the NS Railroad, east of South Market Street (Ditch 6) is also tidal. The culvert connecting these two areas looks to be a 36-inch terra cotta pipe (TCP), though a contact from Norfolk Southern has indicated that the pipe under the railroad is cast iron (Photo D21; Pipe 13). During high tide on April 4, 2007, Pipe 14 was not visible, but bubbling was noted on the northern side where the culvert was believed to be located, indicating a south-north flow. On May 4, 2007, the pipe was visible on the north side, but the south side was covered with debris. Flow moved swiftly from south to north towards the tidal Christina River.

The ditches north and south of the NS Railroad, east of the abandoned north-south running railroad spur, do not seem hydrologically connected to Ditch 4 or 6 or to each other. The ditch to the north (Ditch 7) does not seem to convey water (Photo D22), but the southern ditch (Ditch 8) is fed by the open water area (Photo D23). The water in the ditch was not visibly flowing wither direction.

The tidal Christina is located west of the study site, just north of the NS Railroad. Dye was applied to the ditch north of the NS Railroad, west of south Market Street on April 4, 2007 slightly past high tide (Ditch 9). The dye migrated slowly to the east, indicating that the tide gate where the Christina River meets with Ditch 9 does not seal completely and that the tide was still coming in.

Ditch 9 is then connected to Ditch 6, east of South Market Street by two culverts. Going east, the flow passes through a 58-inch wide by 36-inch high corrugated metal pipe arch (CMPA) to a drainage inlet (Photo D24; Pipe 14). The exposed portion of this pipe shows signs of deterioration (Photo D25). From the drainage inlet, the flow travels east through a 50-inch wide by 31-inch high CMPA (Pipe 15). The eastern end of this pipe was not found during investigations (Photo D26). During the April 4, 2007 field visit, dye applied to the ditch flowed east, suggesting tide was still coming in. On the May 4, 2007, visit, however, flow was travelling to the west. The western drainage through Pipe 14 and Pipe 15 is rather slow. Measurements taken at the site show that the solid resistance was encountered approximately 12-inches below the water level at the drainage inlet. This, along with the slow velocity through the pipe system suggests the drainage inlet and/or pipes have accumulated silt or have another form of blockage.

As mentioned above, Ditch 6 can flow two ways. One is west towards the Christina River through the Pipe 14 and 15. The other is east from South Market Street through a corrugated metal pipe (Pipe 16) that passes through an automobile junkyard across from the abandoned north-south running railroad spur. The 48-inch CMP is approximately 280 feet long and terminates into a 240-foot ditch (Photo D27; Ditch 10). Dye was placed at the inlet of Pipe 16 on April 4, 2007, but there was no evidence of water movement in the area due to little or no flow moving through the pipe and its entrance being partially blocked by numerous tires (Photo D28). Ditch 10 then connects to a triple 22-inch by 13-inch CMPA (Pipe 17) that carries flow under Garasches Lane through to Ditch 1 (Photo D29). Pipe 17 is slightly corroded and it is hard to tell if the three pipes are blocked or not due to the lack of water flowing through the area.

There may have been at one time a culvert under the railroad that passed flow from south of the railroad to Pipe 16, but all the flow south of the railroad is now diverted towards the drainage ditches along the railroad flowing west to the Christina River. It appears that this connection from the open-water area south of the NS Railroad to the ditch west of the marsh area serves little purpose today.

5.4 Surface Water Data

5.4.1 HOBO Data

Four HOBO depth loggers were installed in the ditch system leading to the South Wilmington wetland (Figure 3). One is located in the Christina River, two are located in the ditch south of A Street, and one HOBO is located in a ditch west of Market Street and north of the Norfolk Southern Railroad. All charts and the associated metadata report are located in Appendix E.

The HOBO site on the Christina River north of A Street (River Site; near Ditch 3) shows a significant tidal influence. There is evidence of 5 to 8 feet of tidal fluctuation, with low tide between -2 to -1 feet above mean sea level and high tide ranging from 3 to 6 feet above mean sea level. The average water level is 1 foot above mean sea level.

The HOBO site south of A Street at the northern end of the ditch (Ditch Site #1; in Ditch 2) also shows tidal influence, but water level is more influence by rain events. Tidal range seems to be about 0.5 feet, with a few peaks. There is an unexplained peak in flow on May 22 and September 5. Surface water elevation is decreasing over the time period due to seasonal change, with an average height of -0.6 feet above mean sea level decreasing to -1 foot above mean sea level.

The HOBO site south of A Street parallel with the Shell gas station (Ditch Site #2; in Ditch 2) shows a similar hydrograph to the previous station, just transformed a little lower above sea level (approximately 0.1 to 0.2 feet lower above sea level). Tidal range is about 0.5 feet and surface water elevation is decreasing over the time period, from -0.8 feet above mean sea level to -1.1 feet above mean sea level.

The HOBO site west of South Market Street along the Norfolk Southern Railroad (Ditch Site #3; in Ditch 9) only has a hydrograph from August to September, so it is not directly comparable to the other sites' trend lines. Also, the site experience many out-of-water incidents, so low tide elevations were not obtained. Tidal range is about 3.5 feet and water surface elevation averages

around 1.65 feet above mean sea level. It does not seem that storm events do not affect this ditch's hydrology.

All four HOBOs show that there is tidal influence in the ditches located in the South Wilmington Wetland, but the tide gates dampen the tidal range that is seen within the river, since they are not functioning properly. Even under current conditions, tidal influence is overridden by even a 0.1-inch storm event in Ditch 2, but the same storm event seems to have no effect in Ditch 9. This may be due to Ditch 2 being a lower elevation above sea level (approximately 2 to 3 feet lower), making Ditch 2 a capture area for surrounding runoff. It appears possible that, with the opening or replacement of the tide gates, tidal influence could extend throughout the ditch system. This effort, however, would have to be entertained in concert with potential adverse affects on flooding, flood attenuation, pollution control, and other factors. We also do not know if the existing culverts can physically transport water into the wetland or if the ditches along the NS Railroad could handle the water capacity associated with full tidal influence, precipitation events, and hydrologic connection with Ditch 1, 2, and 3 without overtopping the railroad tracks.

5.4.2 YSI Sonde Data

Two YSI data sondes were installed at the same locations as the HOBO depth loggers (Figure 3). One is located in the Christina River and the other is in the ditch south of A Street, parallel to the Shell gas station. Data recorded includes temperature, specific conductivity, salinity, dissolved oxygen (percent and mg/l), pH, and turbidity. All charts and the associated metadata report can be found in Appendix E. Some erroneous data were retained in the charts but ignored during analysis.

Temperature follows a similar trend at both sites, but the river, after June 5, is warmer than the ditch (approximately 70 to 83F in the river, 65 to 78F in the ditch), though the ditch temperature varies widely throughout the day. Ditch temperatures may be cooler due to rain events affecting the smaller ditch's temperature more drastically than the larger Christina River.

Specific conductivity is mostly different in the river and ditch sites. The ditch had a higher specific conductivity than the river from May 8 to June 11 (approximately 0.2 to 0.4 mS/cm at the river, 0.4 to 1.1 mS/cm at the ditch), but then the Christina River's specific conductivity became highly variable due to tidal ebb and flow and, in general, higher, most likely due to the seasonal decrease in freshwater discharge into the system, leaving the river water more brackish. It also seems that the ditch's specific conductivity is decreasing over the time period, which may be caused by a decreased tidal influence in the ditch or an increase in rain events that flushed the system.

Salinity is highly variable at both sites, ranging from 0 to 0.6 parts per thousand for the ditch site and 0 to 1 part per thousand for the river site. The river had a lower salinity than the ditch site from May 8 to June 14 (approximately 0.1 to 0.2 parts per thousand at the river, 0.2 to 0.5 parts per thousand at the ditch), but then salinity became highly variable at both sites, with salinity increasing in the river and decreasing in the ditch. Salinity in the river shows a seasonal increase due to decreased freshwater discharge into the system, while salinity is decreasing in the ditch because tidal influence may have lessened.

Dissolved oxygen concentrations seem to be, on average, higher at the river site than the ditch site (by 40% air saturation, 4 mg/L) because the river has a larger surface area. Overall, dissolved oxygen is extremely variable in the ditch when compared to the river due to temperature variations and large algal quantities, and generally in lower concentration (approximately 100% to 75% air saturation, 9 to 6 mg/L in the river; 48% to 50% air saturation, 4 mg/L in the ditch). Dissolved oxygen levels are decreasing over time in both the river and the ditch due to seasonal changes.

For pH, the ditch site is at a rather constant level at 7.5 with only a few spikes in pH, while the river site fluctuates a bit around that level. In the river, there is an increase in pH over 7.5 from May 14 to May 27 and then a slight drop below it from June 4 to June 20. The increase corresponds with an increase in dissolved oxygen, most likely pointing to an algal bloom, while the decrease may be due to the large number of storm events in June. The spike in pH at the ditch site in July corresponds to an increase in dissolved oxygen as well, most likely due to an algal bloom.

Turbidity is low at both sites, with values fluctuating more often at the ditch site due to its size. Turbidity in the river ranges mostly from 6 to 30 NTU, while the ditch ranges from 10 to 80 NTU. On average, turbidity is approximately 5 NTUs higher at the ditch site than the river site due to algal blooms. Peaks in the ditch site happened from May 26 to June 3, June 15 to June 22, June 26 to June 27, June 30, and July 2 to July 4. This can be due to either algal productivity or the presence of storm events and surface water runoff.

Though water quality parameters at the river site and ditch site vary, neither site has conditions that are detrimental to aquatic life. There is more algal production in the ditch than the river, and the ditch system is more readily affected by stormwater and runoff inputs than the river. Removing or replacing the tide gates and connecting the ditch system to the Christina from the north and west may affect the current condition of the ditch by steadying and possibly raising water temperature and increasing specific conductivity and salinity. This may affect the amount of algal blooms in the ditch, which would steady dissolved oxygen levels and turbidity. None of these changes, however, would be harmful to the system. This analysis, however, does not take into consideration the presence of contaminants in the system (PCBs, VOCs, etc.). The wetland is known to contain various hazardous materials and measures must be taken to ensure that the contaminants would not harm the Christina River or create contamination issues near or in the surrounding community.

5.5 Groundwater Data

Three groundwater wells were installed near the intersection of Howard Street and South Walnut Street (Figure 3). One is near the northwest corner of the intersection parallel to remnant C Street, while the other two are located on the north and south sides of remnant C Street, west of the ditch. Data is missing most of July due to a failure in memory capacity. All other data is missing for unknown reasons. Charts are located in Appendix E.

Well BR-1 is located near the northwest corner of Howard Street and South Walnut Street. It has a relatively high groundwater level, ranging from 0.35 to 3 feet above mean sea level. The

average water elevation ranged from 0.8 to 1.4 feet above sea level until April 15, when a large storm hit, dumping 4.36 inches in the area. Water level began decreasing after that event, with a 0.9 foot decrease from May 6 to July 11, which is a typical seasonal occurrence. Groundwater level continued to decrease through to September, where the last value recorded was near -0.05 feet above sea level.

Well BR-2 is located northeast of the intersection of remnant C Street and South Walnut Street. The hydrograph from this well looks more volatile than the other two wells. Groundwater elevation ranges from -0.6 to 3.25 feet above mean sea level. The average water elevation before April 16 ranged from 0.4 to 1.2 feet above mean sea level, with a gradual decline from 0.65 feet above mean sea level at the end of May to -0.6 feet above mean sea level by early July. The portion of the hydrograph after May 27 is more variable than the rest of the hydrograph and does not seem to match the data from the other wells, though it follows the same average trajectory. The reason for the oscillation in the data is unknown, but could be related to the construction going on in the immediate area. Groundwater levels continued to decline to an average of -0.5 feet above sea level in late September.

Well BR-3 is located south of remnant C Street, midway between South Walnut Street and the ditch. Groundwater elevation ranges from -0.84 to 3.1 feet above mean sea level. The average water elevation before April 16 ranged from -0.4 to 0.6 feet above mean sea level, with a decline from -0.2 to -0.84 feet above mean sea level from mid May to early July. There is a large amount of missing data from early May to June for unknown reasons. However, the overall groundwater elevation trend matches closely with that of Well BR-1 until mid August, where Well Br-3 experiences a groundwater high, followed by a low within the course of six days (groundwater elevation change of 1.47 feet above mean sea level). The reason for this fluctuation is unknown, but may also be related to the construction going on in the area. Water level continued to decrease through September, where the last recorded value was near -1.20 feet above sea level.

Based on these groundwater elevations, it would seem that there is recharge west of Walnut Street that flows east toward Ditch 1. This is supported by the fact that there is a low area west of Well BR-1 that accumulates surface water. Since groundwater elevations range from -0.84 feet to 3.25 feet above mean sea level at the two wells near the marsh, it is likely that a created wetland can tie into groundwater sources as well as surface water sources.

6.0 CONCLUSIONS

6.1 Wetland Assessment

The field observations and the wetland assessment both indicate that the existing wetland provides excellent sediment stability and good water quality benefits, but poor habitat for fish and wildlife. The features of the existing wetland that most limit its habitat potential are its monotypic vegetation community, its limited physical habitat diversity, and the presence of contaminants. Analysis of the element scores within the functional capacity assessment models provides insight into these limiting factors, which then can be incorporated in a restoration design to optimize wetland functions. The assessment suggests that an increase in vegetative diversity and structure and the creation of open-water habitat would improve the existing marsh, as would greater connectivity to adjacent surface waters, including tidal flushing, and the removal of contaminated debris. Changes to the existing wetland intended to improve habitat may, however, lead to decreases in the sediment stabilization or shoreline erosion control capacity of the wetland. A trade-off is likely in any restoration design. Therefore, the results of this wetland assessment should be placed in the context of the greater goals of the South Wilmington Special Area Management Plan. Since the objective of this project is to discuss the feasibility of restoring the marsh, and to increase stormwater management opportunities, the feasibility of reconnecting the wetland to the Christina River or the open water area to the south should be analyzed.

6.2 Hydrologic Assessment

The results of the field investigations show that there is a limited tidal connection from the Christina River to the South Wilmington Wetland. From the west, drainage south of NS Railroad is directed into the drainage ditches paralleling the railroad and towards the Christina River to the west of South Market Street. The only time that some of the flow from the south of NS Railroad bypasses the drainage ditches along the railroad would be during storms events when the water level becomes high enough to overtop the railroad. From the north, drainage from the Christina enters through the broken tide gate to the ditch that runs parallel to the western side of the marsh. Both of these areas show the opportunity for tidally connecting the marsh, but the northern entrance seems more feasible due to less physical blockages (within the pipes and the NS Railroad).

The tide gate inspections and surface water data show there is tidal influence in the ditches located in the South Wilmington Wetland, but the tide gates dampen the tidal range that is seen within the river. It is possible that, with the opening of the tide gates, that tidal influence could extend throughout the ditch system. We do not know, however, if the existing culverts can physically transport water into the wetland or if the ditches along the NS Railroad could handle the water capacity associated with full tidal influence without overtopping the railroad tracks.

It is important to note that fixing the tide gates could cost up to \$70,000 initially, with \$7,000 worth of maintenance annually. From a preliminary look at the culvert and ditch system in the area, current tidal influence would most likely come from the northern ditch connection to the Christina River. There is also a water influence coming from a western recharge area, as seen in the groundwater data, which shows that wetland design will be affected by western development and runoff. It may not be monetarily or physically feasible to connect the wetland to the western tide gate due to a current lack of connection south of the Norfolk Southern Railroad to the north and no current evidence of flow north toward the marsh from this area.

No connections were found from the marsh to the communities of South Wilmington. If, however, the wetland will be used for stormwater management purposes, the increased water in the area from full tide may hydrologically connect this area to the eastern community area. This may open the opportunity for using the marsh as stormwater management for the communities as well, but it could also increase flooding problems in the area, though this is unlikely since most of the problems found in the *South Wilmington Drainage Study* pointed to debris accumulation and undersized pipes as the problem (2006). However, if this is the most feasible option, then it may be beneficial to install another tide gate to the north of A Street, near the wetland/community boundary. This could act to not only facilitate in flushing the northern end of the marsh, but it will help mitigate flooding issues in the community. An H&H study will be needed to analyze the effects of increasing water levels in the wetland.

6.3 Future Needs

Before planning can begin within the wetland, the condition of wetland soils must be analyzed for contamination. If contaminated, state agencies need to be consulted about the location and cost of disposal. It is also important to define the limits of the wetland. This is currently being completed through a contract with the City of Wilmington.

In addition, an H&H study must be conducted to confirm the best way to connect the wetland to the Christina River. The following is a list of survey requirements for conducting a hydraulic analysis of the drainage system in the vicinity through South Wilmington Wetland. Refer to the figures in section 5.3, "Dye Test Results and field Observations", for location of the ditches and pipes identified below:

From Christina River to Market Street Along Ditch 9 on North Side of NS Railroad:

1. Obtain invert elevations on east and west ends of the pipe connected to the tide gate, a reinforced concrete pipe (RCP) at western end of ditch.
2. Obtain four cross-sections at 100-foot intervals along Ditch 9 north of NS Railroad. Information shall include, at a minimum, the invert of the ditch, the width of the ditch, and top-of-bank elevations. Cross-sections shall extend to 10 feet beyond the top of bank on both sides.

Below Market Street Overpass:

3. Obtain type, size and length, and invert elevations of Pipes 14 and 15 at the east and west ends of the culvert system under Market Street. Obtain size if inlet and invert elevations of pipes entering and exiting the storm drain inlet under the Market Street overpass.

Pipes Just East of Market Street:

4. Obtain invert elevations on both north and south ends of Pipe 13, a culvert under NS Railroad just east of Market Street. Also obtain size and type for this culvert.
5. Obtain invert elevations on both north and south ends of Pipe 12, located at end of ditch paralleling Market Street. This pipe is shortly upstream of Pipe 13. Also obtain size, type and length of this culvert.

Ditch 4 on South Side of NS Railroad:

6. Obtain seven cross-sections at 100-foot intervals along Ditch 4 on south side of NS Railroad. Information shall include, at a minimum, the invert of the ditch, the width of the ditch, and top-of-bank elevations. Cross-sections shall extend to 10 feet beyond the top of bank on the both sides.
7. Obtain invert elevations, type, size and length of Pipe 11, a culvert located approximately 700 feet east of Market Street on the south side of the NS Railroad.

Ditch 6 on North Side of NS Railroad:

8. Obtain seven cross-sections at 100-foot intervals along Ditch 6 on south side of NS Railroad. Information shall include, at a minimum, the invert of the ditch, the width of the ditch, and top-of-bank elevations. Cross-sections shall extend to 10 feet beyond the top of bank on the both sides.
9. Obtain invert elevations, type, size and length of Pipe 16, a culvert located approximately 700 feet east of Market Street on the north side of the NS Railroad.

Ditch on South Side of Old Railroad Spur:

10. Obtain three cross-sections at 100-foot intervals along the ditch along the old railroad spur. Information shall include, at a minimum, the invert of the ditch, the width of the ditch, and top-of-bank elevations. Cross-sections shall extend to 10 feet beyond the top of bank on the south side and to the middle of the railroad spur on the north side.
11. Obtain invert elevations at the north of south ends, type, size and length of Pipe 10, a culvert under the old railroad spur.

Ditch 10 South of Garasches Lane

12. Obtain three cross-sections at 100-foot intervals along Ditch 10. Information shall include, at a minimum, the invert of the ditch, the width of the ditch, and top-of-bank elevations. Cross-sections shall extend to 10 feet beyond the top of bank on both sides.
13. Obtain invert elevations at the north of south ends, type, size and length of Pipe 17, a triple-celled culvert under Garasches Lane.

Ditch 1 from Radio Tower Access Road to Garasches Lane

14. Obtain seven cross-sections at 100-foot intervals along Ditch 1. Information shall include, at a minimum, the invert of the ditch, the width of the ditch, and top-of-bank elevations. Cross-sections shall extend to 10 feet beyond the top of bank on both sides.
15. Obtain invert elevations at the north of south ends, type, size and length of Pipe 6 and 7, a culvert under the access road to the radio tower and one southeast of it.

Ditch 1 from Remnant C Street to Radio Tower Access Road

16. Obtain three cross-sections at 100-foot intervals along Ditch 1. Information shall include, at a minimum, the invert of the ditch, the width of the ditch, and top-of-bank elevations. Cross-sections shall extend to 10 feet beyond the top of bank on both sides.
17. Obtain invert elevations at the north of south ends, type, size and length of Pipe 2, a culvert under Remnant C Street, and Pipe 1, a culvert under remnant C Street, north of the radio tower.

Ditch 2 from A Street to Remnant C Street

18. Obtain six cross-sections at 100-foot intervals along Ditch 2 and the two ponded areas. Information shall include, at a minimum, the invert of the ditch and ponds, the width of the ditch and ponds, and top-of-bank elevations. Cross-sections shall extend to 10 feet beyond the top of bank on both sides.
19. Obtain invert elevations at the both ends, types, sizes and lengths of Pipes 4 and 5, culverts within the marsh.

Vicinity of A Street

20. Obtain invert elevations at the both ends, types, sizes and lengths of Pipes 8 and 9 and the two culverts under A Street, connecting to the tide gates.

A detailed assessment of the pipe hindrances should also be conducted before planning to reconnect the wetland to any other water source. It is therefore recommended that these pipes be investigated using CCTV or other suitable method. This especially includes Pipes 10, 14, 15, and

16. Monitoring of wetland surface water/groundwater levels may also be necessary to gain an accurate picture of flow patterns through the marsh itself.

Once the hydrologic investigation is completed, designs can be created that can feasibly connect the wetland to the tidal Christina River. A dialogue with the City and agencies about stormwater management needs versus park needs will ultimately define the area's design.

7.0 REFERENCES

Bartoldus, C.C., E.W. Garbisch, and M.L. Kraus. 1994. Evaluation for Planned Wetlands: A procedure for assessing wetland functions and a guide to functional design. St. Michaels, MD: Environmental Concern Inc.

Delaware Coastal Programs. 2005. Delaware Brownfield Inventory. Dover: Delaware Coastal Programs, DNREC.

DNREC. 2007. State of Delaware 2006 Delaware Watershed Assessment Report (305(b)) and Determination for the Clean Water Act Section 303(d) List of Waters Needing TMDLs.

Hendershot, K.D. and R.C. Asreen. 2005a. Site Investigation of the South Wilmington Marsh Area 1. New Castle: Site Investigation and Restoration Branch, DNREC.

Hendershot, K.D. and R.C. Asreen. 2005b. Site Investigation of the South Wilmington Marsh Area 2. New Castle: Site Investigation and Restoration Branch, DNREC.

M & N Engineering and Diving Services. 2007. South Wilmington drainage Study Underwater Inspection of Tide Gates. Forest Hill: M & N.

Ramsey, K.W. 2005. Geologic Map of New Castle County, Delaware. Newark: Delaware Geological Survey.

Rummel, Klepper & Kahl, LLP. 2006. South Wilmington Drainage Study. Prepared for the City of Wilmington, Department of Public Works. Baltimore: RK&K, LLP.

South Wilmington SAMP Ecological Characterization Workgroup. 2006. South Wilmington Environmental Profile. Dover: Delaware Coastal Programs, DNREC.

ATTACHMENT K

**APPLICANT BACKGROUND
STATEMENT**



DELAWARE DEPARTMENT OF NATURAL RESOURCES
AND ENVIRONMENTAL CONTROL ("DNREC")

ENVIRONMENTAL PERMIT APPLICATION
BACKGROUND STATEMENT

Pursuant to 7 Del. C. Chapter 79

FILING STATUS:

This Background Statement is being filed with DNREC because:

- 1. It is an initial application for a new permit (or permits) and the applicant or applicant company has not been issued any permits by DNREC in the previous five (5) years [See 7 Del. C. § 7902(a) and (b)];
- 2. It is required on an annual basis because the applicant or applicant company has been designated a chronic violator pursuant to 7 Del. C. § 7904 [See 7 Del. C. § 7902(a)(7) and (b)(2)]; or
- 3. It is required on an annual basis as the applicant or applicant company has been found guilty, pled guilty or no contest to any crime involving violation of environmental standards which resulted in serious physical injury or serious harm to the environment as defined in 7 Del. C. § 7902(c) [See 7 Del. C. § 7902(a)(7) and (b)(2)].

<p>APPLICANT OR APPLICANT COMPANY'S NAME OR COMPANY'S NAME FILING STATEMENT</p>	<p>TAPETA FOOTINGS, INC.</p>
<p>DATE OF APPLICATION OR DATE OF STATEMENT</p>	<p>3/16/07</p>
<p>PERMIT(S) BEING APPLIED FOR OR STATEMENT FOR FILING STATUSES 2 OR 3</p>	<p><input checked="" type="checkbox"/> Permit Type(s) <u>COASTAL ZONING</u></p> <p><input type="checkbox"/> Statement for filing Statutes 2 or 3—If filing under these statuses, attach a statement of the date of designation as Chronic Violator or the date of Conviction/Plea.</p>
<p>OTHER DNREC PERMITS HELD</p>	<p><input checked="" type="checkbox"/> N/A – No other permits held with DNREC</p> <p><input type="checkbox"/> List of all DNREC permits currently held with dates of issuance and expiration attached.</p>

ENVIRONMENTAL PERMIT APPLICATION BACKGROUND STATEMENT

Please note: Companies filing statements pursuant to Chapter 79 have the right to identify information to be afforded confidential status pursuant to 7 Del. C. § 7903(b) and the requirements set forth in Section 6, "Requests for Confidentiality" of the DNREC *Freedom of Information Act Regulation*.

PROVIDING ALL OF THE INFORMATION REQUESTED IN THIS FORM SATISFIES THE REQUIREMENTS OF 7 DEL. C. CHAPTER 79 (ENVIRONMENTAL PERMIT APPLICATION BACKGROUND STATEMENT) UNLESS THE DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL (DNREC) OR THE DELAWARE DEPARTMENT OF JUSTICE DETERMINES THAT ADDITIONAL SUBMISSIONS ARE NECESSARY. FAILURE TO PROVIDE THE INFORMATION REQUESTED OR PROVIDING ERRONEOUS INFORMATION IS GROUNDS FOR DENYING OR REVOKING AN ENVIRONMENTAL PERMIT/APPROVAL/LICENSE, AND FOR CIVIL AND/OR CRIMINAL PENALTIES.

A. (Authority - 7 Del. C. § 7902(a)(1&2) & § 7905) Attach a complete list (full names) of all current members of the applicant company's board of directors, all current corporate officers, all persons owning more than 20% of the applicant's stock or other resources, all subsidiary/affiliated companies with type of business performed, street addresses, all parent companies with addresses, all companies with which the applicant's company shares two or more members of the board of directors, and the name(s) of the person(s) serving as the applicant's local chief operating officer(s) with respect to each facility covered by the permit in question or for the statement required for filing Statuses 2 or 3. [Note: For companies that do not have a *facility* located in Delaware, no listing for the local chief operating officer(s) is required].

- Information attached
- Information attached, except for local chief operating officer as there is no facility located in the State of Delaware.

B. (Authority - 7 Del. C. § 7905) Please check one of the following selections below, showing type of ownership for the applicant or applicant/statement company:

- Proprietorship List the state, county, book record and page number where the certificate is found (Attach hereto).
- Partnership List the state, county, book record and page number where the certificate is found (Attach hereto).
- Corporation (LLCs included) List the city, state, date of incorporation, corporation file number, current corporate standing, registered agent, and address of the registered agent (Attach hereto).
- Municipality
- Public Institution/
Government Agency
- Other _____

C. (Authority - 7 Del. C. § 7902(a)(3) & § 7905) Have any of the following been issued to or agreed to by the applicant or applicant/statement company, any employee, person, entity, or subsidiary/affiliated company, specified in response to Item A, for violation of any environmental statute, regulation, permit, license, approval, or order, regardless of the state in which it occurred, during the five years prior to the date of this application/statement

OFFENSE	YES	NO
Notice of Violation(s)		X
Administrative Order(s)		X
Administrative Penalty(ies)		X
Civil Action(s)		X
Civil Penalty(ies)		X
Civil and/or Administrative Settlement Agreement(s)		X
Permit/License/Approval Revocation		X
Arrest(s)		X
Conviction(s)		X
Criminal Penalty(ies)		X
Criminal Plea Bargain		X

D. (Authority - 7 Del. C. § 7902(a)(3), (a)(4) & § 7905) If you answered "yes" to any of the actions listed in Item C above for the applicant or applicant company or any other person identified in Item A, attach a description of the incidents or events leading to the issuance of each action, regardless of the state in which it occurred, for the 5 years prior to the date of the statement, and the disposition of each action, what state the action/offense occurred in, and any actions that have been taken to correct the violations that led to such enforcement action.

N/A

Information attached

E. (Authority - 7 Del. C. § 7902(a)(5) & § 7905) Attach a description of any felony or other criminal conviction for a crime involving harm to the environment or violation of environmental standards of any person or entity identified in Item A above that resulted in a fine greater than \$1,000 or a sentence longer than 7 days, regardless of whether such fine or sentence was suspended.

N/A

Description attached

F. (Authority - 7 Del. C. § 7902(a)(6) & § 7905) Attach copies of any and all settlements of environmental claims involving the applicant, associated with actions identified in response to Item D above, whether or not such settlements were based on agreements where the applicant did not admit liability for the action.

N/A

Information attached

Items for Filing Statuses 2 or 3 Only

G. (Authority - 7 Del. C. § 7902(a)(7) and § 7905) If the applicant or applicant/statement company has been found guilty, pled guilty or no contest, to any crime involving violation of environmental standards which resulted in serious physical injury or serious harm to the environment attach a summary of the events involved and a copy of the disposition of the action (See 7 Del. C. § 7902(c) for definitions of "serious physical injury" or "serious harm to the environment" before answering this question.)

N/A

Yes – Information Attached.

H. (Authority - 7 Del. C. § 7902(a)(8)) – If the applicant or applicant/statement company has been designated a chronic violator under 7 Del. C. § 7904, a detailed written report from an independent inspector who has inspected the applicant's premises for the purpose of detecting potential safety and environmental hazards to employees and the surrounding community. The Secretary may waive the duty to submit a detailed written report upon a showing of good cause by the applicant. A showing by the applicant that the acts which caused it to be designated as a chronic violator did not jeopardize public health shall constitute "good cause" under this paragraph.

I. (Authority - 7 Del. C. § 7902(a)(7)) – If the applicant or applicant/statement company has been designated a chronic violation under § 7904 of this Title, **OR** has been found guilty or pled no contest to any crime involving violation of environmental standards which resulted in serious physical injury or serious harm to the environment, a statement made under oath by the applicant or applicant/statement company's local chief operating officer with respect to the facilities covered by the permit, stating that: (a) disclosures made by the applicant/reporting company under federal and state environmental statutes and regulations during the preceding calendar year have been, to the chief operating officer's knowledge, complete and accurate, and (b) that the facility has implemented policies, programs, procedures, standards or systems reasonably designed, in light of the size, scope, and nature of facility operations to detect and promptly correct any noncompliance with state environmental statutes and regulations. The statement filed pursuant to this paragraph shall include an acknowledgement by the affiant that intentionally false statements submitted in compliance with this paragraph constitute criminal perjury as defined at 11 Del. C. §§1221-1222.

STATE OF DELAWARE - DEPT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL
ENVIRONMENTAL PERMIT BACKGROUND STATEMENT

CERTIFICATION

I HEREBY CERTIFY THAT I HAVE READ THE PRECEEDING SUBMISSION, HAVE PROVIDED ALL OF THE INFORMATION REQUESTED, AND THAT ALL OF THE INFORMATION PROVIDED IS TRUE AND ACCURATE TO THE BEST OF MY KNOWLEDGE AND BELIEF.

J. Wakefield DATE: 3/20/07
SIGNATURE—APPLICANT OR
OFFICER OF APPLICANT / STATEMENT COMPANY

NAME: JOAN WAKEFIELD.

TITLE: VICE PRESIDENT

COMPANY NAME: TAPETA FOOTINGS INC.

ADDRESS: 102 PINEY CREEK LANE
NORTH EAST MD 21901

TELEPHONE: 410 287 8091

FAX NUMBER: 410 287 8410

REGISTERED AGENT NAME: _____

ADDRESS: _____

TELEPHONE: _____

FAX NUMBER: _____

SWORN TO AND SUBSCRIBED

BEFORE ME THIS 20th DAY OF

March, 2007.

Tracy L. Cicino commissioned as
NOTARY PUBLIC SIGNATURE (SEAL)
Tracy L. Cicino commissioned as Settlement
PRINTED NAME OF NOTARY PUBLIC
Maryland / Cecil
STATE / COUNTY

MY COMMISSION EXPIRES ON: 6/1/2010.