



STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES
AND ENVIRONMENTAL CONTROL

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July 29, 2008

Mr. Lawrence B. Lank
Director of Planning and Zoning
Sussex County Planning and Zoning Commission
P.O. Box 417
Georgetown, DE 19947

RE: Conditional Use #1741, Application of David G. Horsey & Sons, Inc.

Lawrence
Dear Mr. Lank:

The Department is in receipt of your letter dated June 10, 2008, regarding Conditional Use #1741, Application of David G. Horsey & Sons, Inc. Thank you for giving us the opportunity to review the project and provide comments.

We have received comments from the Water Supply Section (WSS), the Surface Water Discharges Section, the Watershed Assessment Section, the Sediment and Stormwater Program, the Drainage Program, the Solid and Hazardous Waste Management Branch (SHWMB), and the Site Investigation and Restoration Branch (SIRB). Their comments and recommendations are reproduced below. The bulk of the concerns and recommendations relate to ground water supply.

Water Supply

DNREC's Water Supply Section will summarize the major ground-water concerns related to borrow pit operations and will address Sussex County's environmental requirements for borrow pits.

In early June 2008, the Department received many phone calls from members of the public expressing their concerns about the ground-water impacts which may result from a proposed borrow pit operation and which may be resulting from existing borrow pit operations. All of the callers were concerned that the borrow pit operations would in some way detrimentally affect their wells or their drinking water supply (the Columbia aquifer). The following specific concerns have been expressed to date:

Delaware's Good Nature depends on you!

- Borrow pits attract nuisance geese which release fecal matter which could contaminate the ground-water supply.
- Dewatering operations in the borrow pit will lower the water table of the unconfined aquifer and could cause domestic wells to go dry and reduce the availability of water for farm irrigation.
- The process of digging the borrow pit will introduce contaminants into the ground-water supply.
- Excavating to great depths could remove fine-grained strata (silts and clays) which provide protection to confined aquifers thus causing them to be interconnected with the Columbia aquifer and thus making them vulnerable to anthropogenic contaminants that occur in the unconfined aquifer.

Findings from the public hearing report

In order to begin evaluating the above-mentioned ground-water concerns, the Water Supply Section reviewed the Planning and Zoning Commission's findings report from the May 2008 public hearing. This report contains conditions that stipulate how the borrow pit operation must be conducted and contains language requiring the Department's assistance in evaluating the environmental impacts associated with the borrow pit. These conditions, language, and other pertinent information from the Planning and Zoning Commission's report follow:

1. A Phase 1 Environmental Site Assessment Report and a borrow pit reclamation plan was conducted and developed, respectively, for the proposed borrow pit.
2. David G. Horsey & Sons Inc. will be required to follow State sediment and storm water control requirements and federal and State wetland requirements.
3. Forested buffers of 100 feet and 200 feet will be maintained around the excavation.
4. Dewatering activities will not occur at the site.
5. No borrow pit activities will occur within 200 feet of a home of other ownership.
6. "Fuel shall be stored in storage tanks with confinement areas as required by DNREC and the office of the State Fire Marshal."

7. "No stumps, branches, debris or similar items will be buried on the site."
8. Before any excavation operation begins, a complete environmental impact study will be conducted.
9. The owner will be responsible for monitoring ground-water quality and shall install two monitoring wells (MWs), "one above the excavation and one below the excavation." "Monitoring shall be performed by a licensed geologist and the results filed on an annual basis with Sussex County and DNREC."
10. "The applicant shall be responsible for the cost of correcting any adverse impact on water quality which may be occasioned by the excavation operation. Necessary remediation shall be determined by Sussex County, upon guidance from DNREC."
11. "Every five years after the start of digging, the Planning and Zoning Department shall perform an inspection of the site, and shall request written comments from all appropriate State agencies so that the Planning and Zoning Commission can review the comments to verify compliance with all then existing regulations."
12. "After twenty years, the property owner shall complete and pay for an environmental impact study, as the phase is defined by DNREC or any successor. Upon certification by DNREC of the owner's compliance with then existing regulations, the permit shall be extended for an additional 10 years."

Possible impacts to ground-water quality and quantity associated with borrow-pit operations

Like many land use practices, borrow pits have the potential to cause ground-water contamination. The aforementioned public concerns regarding ground-water impacts associated with the borrow pit operation are legitimate and could result in unacceptable ground-water contamination especially if the borrow pit operation is unregulated. At least two of these concerns, however, can be essentially dismissed provided that Sussex County enforces the conditions listed above. Discussions addressing each of the concerns expressed by the public follow:

Concern over Nuisance Water Fowl and Coliform Bacteria

Provided that Sussex County enforces the condition which states that a 100-foot isolation distance must be maintained from the borrow pit edge and a neighboring property

boundary, the risk that off-site ground-water supplies will be impacted by coliform bacteria associated with geese fecal matter becomes insignificant.

Concern over Dewatering and Reduced Ground-Water Supplies

Provided that Sussex County enforces the condition which states that dewatering will not be permitted at the site, the risk that off-site ground-water supplies will be significantly diminished and that the water table will be significantly lowered as a result of the borrow pit operation is significantly reduced and is not a major concern. In areas with naturally deep water tables, there is still the potential, however, that wells located close to the borrow pit operation and which utilize a suction lift centrifugal or jet pump could "go dry" as a result of excavating below the water table. Excavating below the water table generally causes local drops in the water table near the excavation. If the excavation causes the water table to drop to a depth greater than approximately 20 feet Below Ground Surface (BGS) in a supply well that utilizes a suction lift pump, the well will not be able to produce water.

Seasonal Low Water Tables (SLWT) in the Hardscrabble area are typical for the Columbia aquifer and range from approximately 8-10 feet BGS based on Hydrologic Atlas 120. Assuming that dewatering operations are not occurring, the risk that the borrow pit excavation will lower these water levels to a critically low level that prevents the well pump from procuring water from the well is relatively minimal.

Concern over Aquifer Contamination While Excavating Below the Water Table

Delaware's unconfined aquifer (the Columbia aquifer) is susceptible to contamination from human activities that occur at the ground surface. In most areas, the top of the Columbia aquifer (the water table) occurs at a depth greater than 5 feet BGS. The soils and sediments above the water table provide the Columbia aquifer a degree of protection from contaminants introduced at the ground surface.

A borrow pit operation almost always removes these protective soil and unsaturated sediment layers that overlay the water table, thus creating an "open window" to the unconfined Columbia aquifer. Exposing the Columbia aquifer in this manner makes it extremely vulnerable to being directly contaminated by releases at the surface. The open pit water that results from excavating below the water table is comprised almost entirely of ground water and the water surface is essentially the exposed surface of the Columbia aquifer.

An accidental occurrence (such as a fuel tank spill) which releases contaminants near a borrow pit in the subaqueous mining phase of the operation has a relatively great potential for circumventing the relatively slow process of percolating through the soil zone down to the water table and moving more directly through a fast process of overland flow into water of the pit. Obviously, a contaminant spill or release that occurs directly in the pit water instantaneously introduces contaminants into a water body that is in direct connection with the Columbia Aquifer.

The greatest threat to the ground-water quality of Columbia aquifer during borrow pit operations is posed by:

- A fuel storage tank leak near the excavation.
- A hydraulic fluid line and/or fuel line break on the excavator during mining below the water table.
- A hydraulic fluid line and/or fuel line brake on the dredge which is often used for mining when the pit bottom is too deep to reach with an excavator.
- Agricultural runoff from adjacent lands that may contain nutrients or pesticides

Any one of these occurrences has the potential to release significant quantities of contamination into the pit and to introduce dissolved phase hydrocarbons into the unconfined aquifer. The dissolved phase constituents have the potential to advect in ground water and contaminate off-site ground water.

Concern over Aquifer Interconnection

The use of dredges in borrow pit operations enable the excavations to extend to great depths BGS. Dredging operations in some of the Horsey pits have enabled the base of the pit to reportedly lie as deep as 70-90 feet BGS and extend to the base of the unconfined aquifer. These dredges have the capability of excavating through regional confining layers and causing the interconnection of the unconfined aquifer with the confined aquifer. The Department strictly prohibits aquifer interconnection in the "Delaware Regulations Governing the Construction and Use of Wells." Aquifer interconnection unseals the confined aquifer and can cause the introduction of anthropogenic contaminants into confined aquifers which under natural conditions are free of these types of contaminants.

The potential for aquifer interconnection occurring in the Hardscrabble area where the majority of the Horsey Pits occur is relatively low due to the thickness of the regional confining layer and the depth to the first confined aquifer. Excavations to these depths in

some portions of Sussex County could, however, result in the interconnection of the Columbia aquifer with a local confined aquifer.

Conclusions

The greatest concern that active borrow pit operations pose to ground-water resources in Sussex County is that direct contamination of the unconfined aquifer via accidental hydrocarbon releases or other contaminants will occur during the subaqueous mining phase of the operation. Another significant concern at borrow pit operations that allow dewatering is that significant water-table drawdown will reduce the yields of neighboring off-site wells and the availability of water for future supplies.

These concerns merit criteria designed to minimize the ground-water impacts associated with borrow pit operations. Based on information provided in the public hearing's findings report, Sussex County has developed criteria for the proposed David G. Horsey & Sons Inc.'s borrow pit that will (if enforced) help reduce the potential for ground-water impacts associated with the borrow pit operation. In the hearing report, Sussex County has also requested that:

- The Department be involved in assessing whether detrimental environmental impacts are occurring as a result of the borrow pit operation,
- The Department provide guidance on remediation measures at borrow pit operations when necessary, and that
- The Department review the 20 year environmental impact study and certify whether the borrow pit is in compliance with applicable regulations.

Recommendations from the Water Supply Section

The Water Supply Section believes the Department should have limited involvement in assessing the environmental impacts -- especially the ground-water impacts -- associated with these operations, and recommends that a formal MOU be established between the County and the Department outlining the role the Department will have in these assessments. The MOU should also address the existing borrow pits whose operating conditions, required by the Planning and Zoning Commission's Conditional Use approval, include participation by the Department. In addition, we recommend the following:

- One exploratory well should be drilled to the base of the unconfined aquifer at the site and logged using the natural gamma method to directly measure the unconfined aquifer thickness at the site. The borrow pit excavation should not exceed a depth that is greater than 5 feet above the base of the unconfined aquifer.
- At least three ground-water monitoring wells (MW) s should be installed in strategic locations around the borrow pit excavations. One well should lay upgradient of the excavation and two wells should lay downgradient of the excavation.
- The MWs top of casing elevations must be established to the closest 1/100th of a foot by surveying them into a known benchmark.
- At a minimum, the wells should be sampled for the following parameters prior to excavating below the water table and annually thereafter (except for depth to water [DTW] which should be sampled monthly thereafter) for the following: typical field parameters (pH, specific conductance, and temperature) DTW, chloride, total dissolved solids, nitrate, total iron, total coliform, fecal coliform, volatile organic compounds and diesel ranged organic compounds.
- A maximum borrow pit depth should be specified as a condition of approval. This depth should be based on information obtained from the aforementioned exploratory well advanced at the site and on available geological information for the area where the borrow pit operation is proposed. The excavation should not extend deeper than a depth that is greater than 5 feet above the base of the unconfined aquifer.
- Borrow pit excavation activities should not occur within 200 feet of any boundary of property of other ownership.
- Periodic inspections of the site should occur at least once every year and the Department should be invited to accompany the County's Planning and Zoning Department during the inspections.
- The Department should be giving permission to enter the borrow pit site at any time provided that prior notice is giving to the borrow pit operator or owner.

If you have any questions, concerns, or comments regarding these comments, please feel free to contact the Water Supply Section at 302-739-9945.

Watershed Assessment/Water Quality

DNREC's Watershed Assessment Section made the following observations with respect to water quality:

- Removing forest cover from this parcel is likely to increase particulate and soluble phosphorus runoff from the natural soils into adjacent wetlands and/or surface waters. Since the existing natural forest cover and vegetation on this parcel is the most naturally effective means to reduce nutrient runoff to surface and ground waters, its removal, as currently proposed, will contribute to further declines in water quality of those receiving waters of the greater Chesapeake Bay drainage. The nutrient budget protocol shows that this project will increase nitrogen (N) loading by 100%, and increase phosphorus (P) loading by 175%. The Total Maximum Daily Load (TMDL) loading rates reductions for the Deep Creek watershed calls for nitrogen and phosphorus reductions of 30 and 50% below baseline conditions. Therefore, the project as currently conceived not only does not decrease the N and P loading rates below baseline conditions, it dramatically increases N and P loading well above the baseline.
- Soil mapping by the Natural Resource Conservation Service (NRCS) indicates that the majority of the soils (e.g., Rosedale) on this parcel have a seasonal high water table between 40-72 inches. Moreover, some of the mapped soils (e.g., Hurlock and Longmarsh) on this parcel have a seasonal high water table depth that occurs or approaches the soil surface. Therefore, it is our view that the project's expected depth of borrow fill excavation is likely to intersect the depth at which the seasonal high water table naturally occurs; creating a ponded impoundment similar to the one immediately adjoining this project. This impoundment is likely to function as a "sink" for nutrients and other contaminants from surface and subsurface runoff from this and adjoining parcels. Another likely undesirable effect is the creation of more breeding habitat for mosquitoes and nuisance geese.
- The excavation of the borrow pit will alter the hydrology in the adjoining wetland ecosystems by lowering the existing water table; this is likely to negatively impact the sensitive vegetative communities (alter plant composition) in the surrounding wetland habitats and increase the spread of undesirable and noxious invasive plant species.

We recommend utilizing all available Best Management Practices (BMPs) to address the issues of TMDLs, mosquito control, nuisance waterfowl, and vegetation/landscaping.

Sediment and Stormwater/Surface Water Discharges

- A detailed sediment and stormwater plan will be required prior to any land disturbing activity taking place on the site. The applicant should contact the reviewing agency to schedule a pre-application meeting to discuss the sediment and erosion control and stormwater management components of the plan as soon as practicable. The site topography, soils mapping, pre- and post-development runoff, and proposed method(s) and location(s) of stormwater management should be brought to the meeting for discussion. The plan review and approval as well as construction inspection will be coordinated through the Sussex Conservation District. Contact Jessica Watson at the Sussex Conservation District at (302) 856-2105 for details regarding submittal requirements and fees.
- If the proposed borrow pit discharges directly to a surface water body, the discharge will be considered an industrial activity, identified by SIC Code 1442, and will require a General Storm Water Permit. The activity will be regulated by the State of Delaware under Regulations Governing Storm Water Discharges Associated with Industrial Activities under the National Pollutant Discharge Elimination System (NPDES).

Drainage

- The property is located within the Tyndall Branch Tax Ditch and has tax ditches with established tax ditch rights-of-way. The Drainage Program conducted a review of the Tax Ditch rights-of-way for this project in May 2008 and the results were submitted to Jeff Clark of Land Tech LLC. A copy of the review findings is included at the end of these comments. Any forested buffer required on this property shall be placed outside of the tax ditch rights-of-way. The placement of permanent obstructions within tax ditch rights-of-way is prohibited. Any modification to the location of a tax ditch, or tax ditch rights-of-way, will require a change to the Tyndall Branch court order. Please contact the Drainage Program office in Georgetown at (302) 855-1930 to discuss any proposed modifications to the tax ditch on the property. We recommend including Brooks Cahall of the Drainage Program in the pre-application meeting with the Sussex Conservation District to discuss drainage, stormwater management, tax ditch maintenance, and the possible release of stormwater into the tax ditch.

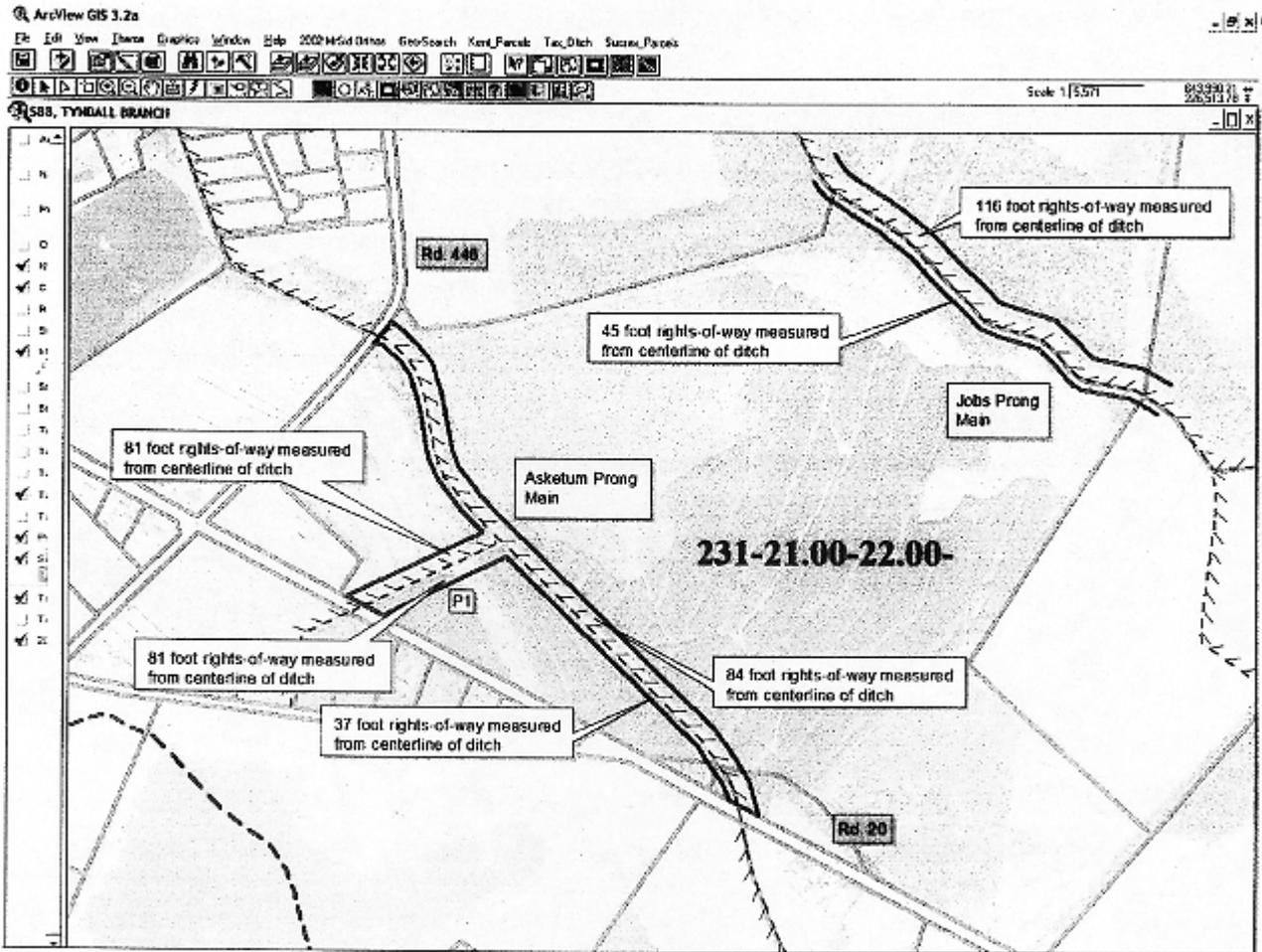
Findings of Tax Ditch Right-Of-Way Review

Parcel # 231-21.00-22.00, Inquiry #1999

- This parcel lies in the Tyndall Branch Tax Ditch watershed. There are rights-of-way from Asketum Prong Main, Prong 1 of Asketum Prong Main (P1), and Jobs Prong Main on the property.

Ditch	Left Side	Right Side
Asketum Prong Main	84'	37'
Prong 1 of Asketum Prong Main	81'	81'
Jobs Prong Main	116'	45'

- All rights-of-way distances are measured from the centerline of the ditch. Left and right side designations are made looking upstream.



Solid and Hazardous Waste

According to Solid and Hazardous Waste Management Branch representatives that manage the DSWA Southern Solid Waste Landfill, there has never been a groundwater issue at the landfill. Ground water movement is towards Beaver Dam Run Creek, which is between the proposed Horsey pit site and the landfill; the sites are also 2 miles apart. It is unlikely that groundwater would travel from the landfill to the pit.

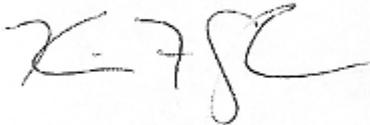
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Site Investigation and Restoration

SIRB has reviewed the proposed project and found no SIRB sites or salvage yards within a 1/2-mile radius of the proposed project. Should a release or imminent threat of a release of hazardous substances be discovered during the course of development (e.g., contaminated water or soil), construction activities should be discontinued immediately and the Department should be notified at the 24-hour emergency number (800-662-8802). SIRB should also be contacted as soon as possible at 302-395-2600 for further instructions.

If you have any questions about these comments, please do not hesitate to call me at 302-739-9071. Again, thank you for providing us the opportunity to submit comments.

Sincerely,

A handwritten signature in black ink, appearing to read 'K. F. Coyle', with a stylized flourish at the end.

Kevin F. Coyle, AICP
Principal Planner