REVISED FACT SHEET for FINAL PERMIT DEVELOPMENT NPDES PERMIT No. NC0089168

Facility Information			
Applicant/Facility:	Martin Marietta Materials, Inc Vanceboro Quarry		
Applicant Address:	P.O. Box 30013, Raleigh, NC 27622		
Facility Address:	Welbourn Road, Vanceboro, NC		
Permitted Flow (MGD):	12 MGD Total Daily Maximum, split evenly between Outfall 001 (6 MGD) and Outfall 002 (6 MGD)		
Type of Waste:	Groundwater and Stormwater		
Facility Classification:	1		
Permit Status:	New Proposed Discharge		
County:	Beaufort		
Miscellaneous			
Receiving Stream:	UT to Blounts Creek	Regional Office:	Washington
Stream Classification:	C-Sw NSW	NC Grid/USGS Quad:	Bath
River Basin:	Tar-Pamlico	Date:	July 9, 2013
Subbasin	030307	Facility Location:	
303 (d) listed?	No		
Summer 7Q10 (cfs)	Zero		
8-digit HUC	03020104		
IWC (%):	100%		

Overview:

- This is a new NPDES permit application from Martin Marietta Materials for a proposed discharge of comingled groundwater and stormwater from a new mining operation. The mining operation is anticipated to include a 649-acre open pit aggregate mine (at buildout) located within a 1,664 acre quarry footprint. The entire quarry operation is to be located within a 90,000 acre tract owned by Weyerhaeuser Company and managed as a pine plantation. The area has been extensively ditched.
- Although a facility of this type typically obtains coverage under the NCG020000 General NPDES stormwater permit, it was decided that the discharge volume and proximity to coastal waters warranted that the facility obtain an individual NPDES wastewater permit.
- The extracted mineral is crushed limestone for use in the construction industry. Pit dewatering, required to extract this material, will create a discharge of comingled groundwater and stormwater. The flow from pit dewatering and comingled stormwater during full production is estimated to be 12.0 MGD. It is projected that full production may take decades to reach.
- The proposed discharge will mostly come from the Castle Hayne aquifer. Based on aquifer testing data, this discharge is expected to have a pH of 6.9, an alkalinity of 321 mg/L, and a hardness of 316 mg/l.
- The facility will have two outfalls which discharge to separate tributaries of Blounts Creek in the Tar Pamlico River Basin. Each outfall has a projected discharge of 6.0 MGD (Daily Maximums). Distributing flow to two separate ditches will act to minimize potential geomorphic impacts.

- This site will not discharge any domestic wastewater, and does not include oxygen-demanding waste.
- Wastewater treatment will consist of two pit clarification ponds. These ponds have a capacity of about 50 million gallons each.
- There will be a series of closed-loop settling cells which will provide 125 million gallons of plant makeup water.
- No chemicals will be used in the processing of crushed stone or added to the discharge.
- Due to heightened public interest, a public hearing on the draft NPDES permit was held in conjunction with a hearing for an Individual Section 401 water quality certification (which was subsequently issued on May 15, 2013). In addition to these permits, the applicant will need to secure permits from other agencies in order to proceed forward.

Receiving Stream- Blounts Creek

- Both outfalls discharge to UTs to Blounts Creek. These discharge locations are considered zero-flow freshwater streams. They are located approximately 1100 feet apart.
- Blounts Creek is tributary to Blounts Bay, which flows into the Pamlico River.
- The outfalls are located at the headwaters of Blounts Creek. Blounts Creek from its source to Herring Run is classified C-Swamp Nutrient Sensitive Water (NSW); from Herring Run to Blounts Bay it is classified SB-NSW. Herring Run is approximately three miles downstream from the confluence of the outfalls.
- The outfalls are not located in a primary nursery area (PNA).
- Blounts Creek is not on the 2012 303(d) list. However, Blounts Bay is listed as being impaired for chlorophyll-a and for copper. This discharge is not expected to contribute to this impairment. The wastestream is not considered a nutrient source, and should not stimulate algal growth.
- USGS does not currently provide low-flow characteristics for streams affected by tidal influences. Therefore low-flow characteristics cannot be determined for the location where Blounts Creek discharges into Blounts Bay nor for the Pamlico River at Blounts Bay.

Permit Development for New Discharge

- Federal effluent guidelines at 40 CFR 436.22 apply to the crushed stone subcategory of mineral mining and processing. The only parameter applicable in these guidelines is pH, which is limited to a range of 6.0- 9.0 standard units similar to State freshwater standards. Both the Federal effluent guidelines and NC Water Quality Standards provide for a lower pH range, when pH in the receiving stream is lower. Based on concerns expressed about pH in the receiving waterbody, the pH range limit in the Final permit has been modified from 6.0-9.0 to 5.5-8.5.
- NC General Stormwater Permit No. NCG020000 for mine dewatering discharges was used as a guideline for permit development. Applicable conditions from the general permit, including the pumping operation and monitoring plan and relevant best management practices (BMPs), were included as special conditions.
- As a limestone mining operation this facility falls under SIC code 1429 for crushed and broken stone. 15A NCAC 2B.0508 specifies monthly monitoring for turbidity, settleable matter, TSS, and pH.
- A toxicity testing requirement was not proposed for this application. The discharge consists solely of mine dewatering groundwater and stormwater, with no chemicals added. Division guidance does not stipulate a toxicity test requirement for mine dewatering.
- Settleable solids were limited to 0.1 ml/L, consistent with the stormwater general permit.
- Effluent Turbidity was limited to that which would not cause the concentration in the receiving waters to exceed 50 NTU. This is in accordance with standards for freshwater Class C waters.
- The data set for a new discharge is limited to one groundwater sample collected from the Castle Hayne aquifer (untreated) and one dewater effluent sample collected from a similar limestone

quarry operation (Clark Quarry). NC does not routinely conduct a statistical RPA evaluation for one data point, and our most recent Monitoring/RPA procedures update (dated July 15, 2010, attached) reserves a statistical RPA procedure to data sets > 8 samples, consistent with EPA's Technical Support Document (1991). Given the lack of site-specific effluent data for the proposed discharge, a new Special Condition A (7)- Effluent Data Characterization- has been added to the Final permit, requiring the permittee to complete and submit items V and VI of Application Form 2C within one (1) year of commencement of discharge. The permit may be reopened and modified if there are any parameters detected at levels of concern.

- Based on review of the data as well as other State NPDES permits for limestone quarry operations, the key pollutants of concern associated with this proposed dewatering discharge include turbidity, pH, and iron. These parameters were also identified as key parameters via the public input process. The draft permit included monitoring and limits for pH and turbidity, while iron was a monitoring-only condition. Iron was found in high concentration in the Castle Hayne groundwater aquifer (21.8 mg/l), but at much lower levels (0.587 mg/l) in the treated effluent from the Clark Quarry operation. The NC chronic Action Level for iron is 1.0 mg/l, based on protection for aquatic life. In lieu of the Action Level Policy with associated toxicity testing, and given the local concerns expressed about high iron concentrations in groundwater, an iron limit of 1.0 mg/l has been added to the Final permit.
- Based on public input, a Monthly effluent nutrient monitoring requirement for total nitrogen (TN) and total phosphorus (TP) was added to the Final permit. Although groundwater data does not indicate this wastestream as a nutrient source, the receiving stream is classified as nutrient sensitive water (NSW), and downstream Blounts Bay is listed as impaired for chlorophyll.
- Based on public input, a Monthly effluent temperature monitoring requirement was added to the Final permit.
- Based on public input, a Monthly instream monitoring requirement was added to the Final permit for pH, temperature, salinity, and turbidity. Instream sampling at two downstream locations will provide information on any chemical trends following commencement of quarry discharge.
- The flow limit in the draft permit was based on the applicant's NPDES application form, and was
 presented as a Monthly Average of 9 MGD, split evenly between Outfalls 001/002. Based on
 public input, the effluent flow limit for the Final permit was modified to a Daily Maximum limit of
 12 MGD, split evenly between outfalls 001/002. The 12 MGD limit is consistent with the daily
 maximum groundwater withdrawal rate incorporated into the draft groundwater withdrawal
 permit, and was used as an assumption in the water quality modeling efforts conducted by the
 applicant. The daily maximum limit also sets an upper cap on discharge volume.
- The draft permit included a Special Condition A(6)- Benthic Monitoring Requirement- for evaluation of benthic community following discharge. The Final permit was modified to require a Benthic Sampling Plan be approved by the Division prior to commencement of sampling.
- The Division believes that the effluent limits proposed in the Final permit will be protective of state surface water quality standards. The permit may be reopened and modified as more effluent characterization is conducted and submitted.
- Effluent Limitations Summary: Water Quality-Based Effluent Limits = iron, turbidity, pH.
- Effluent Limitations Summary: Technology-Based Effluent Limits = settleable solids.

Engineering Alternatives Analysis (EAA)

- In accordance with state regulations concerning antidegradation (15A NCAC 2B.0201), the permittee must consider non-discharge alternatives. The permit application contained an EAA dated September 2011 to consider these options.
- In response to a request for additional information regarding non-discharge alternatives, the applicant submitted a revised EAA on September 14, 2012 prepared by Groundwater Management Associates (GMA). The following options were considered: connection to an existing public water supply system, land application, groundwater injection, direct discharge, and combinations of direct discharge with each of the other alternatives. As shown on the

following table, it was demonstrated that the most economical and technically feasible alternative was a direct discharge of all effluent to surface waters. The Division concurs with the conclusions of the revised EAA.

Discharge Alternative	Present Value of Costs Analysis (20 Year)	
100% Discharge to Blounts Creek	\$2,997,928	
Raw Water to Vanceboro &	\$6,775,594	
Discharge to Blounts Creek		
Groundwater Reinjection &	\$7,698,116	
Discharge to Blounts Creek		
100% Groundwater Reinjection	\$11,919,365	
Raw Water to Vanceboro & Land	\$21,410,542	
Application Discharge		
100% Land Application	\$23,002,364	

Water Quality Impacts Evaluation

The two major water quality parameters that may be influenced by a quarry dewatering discharge at this location are pH and salinity. Due to heightened public interest and the complex nature of these issues, the Division requested that the applicant conduct further studies. Martin Marietta Materials, Inc. subsequently contracted for the studies summarized below:

- <u>Aquatic Habitat Assessment of the Upper Headwaters of Blounts Creek in the Vicinity of a</u> <u>Potential Quarry Site near Vanceboro, Beaufort County, NC (CZR Incorporated, August 2011).</u> This study evaluated Blounts Creek and associated unnamed tributaries for aquatic habitat at four locations - two potential impact locations and two control (no planned impact) locations. The habitat assessment included a collection of water quality data (salinity, dissolved oxygen, and pH), fish data (species richness), and macroinvertebrate diversity. Water quality data were within expected ranges for coastal plain swamp streams.
- <u>Technical Memorandum from Kimley-Horn and Associates (Kimley-Horn) dated September 6, 2012.</u> This report summarized the results of several analyses regarding stream stability, potential flooding, and water quality issues. It also provided predicted zones of impact for further analysis. There were four major conclusions: (1) Modeling indicated that there is no substantial off-site impact to flooding from the addition of a maximum 18 cfs (12 MGD) discharge; (2) The results of the bank stability analysis showed that only minor changes would be anticipated from this discharge; (3) The pH would be raised from the 4.0-5.5 range to 6.3-6.9 in Blounts Creek above the confluence with Herrings Run; and (4) Predicted changes in salinity would not be enough to affect mobile aquatic species. It was concluded that potential increases in pH in upper Blounts Creek may result in increases to the numbers and diversity of acidic-intolerant species. It was also recommended that the further planned study by CZR Incorporated provide a narrative discussion of potential impacts to immobile plants and invertebrates.
- <u>Water Quality Analysis Technical Memorandum by Kimley-Horn dated October 10, 2012.</u> This report addressed comments from the Division and from the US Army Corps of Engineers (USACE), and provided CZR Incorporated with predicted zones of potential impact for further analysis. The report concluded that an increase in pH (from 4.0-5.5 to 6.3-6.9) would be noticeable from the discharge point to the confluence with Herrings Run. Regarding salinity, a volumetric displacement model predicted no significant changes at the affected area downstream of Herrings Run. Such changes may be masked by the natural variability from tidal effects and runoff events. For example, actual salinity measurements taken after Tropical Storm Beryl in May 2012 and other storm events showed much lower salinity than that predicted to

occur from the permitted discharge. Model predictions generally show less than one part per thousand (1 ppt) difference in salinity between base flow conditions and base flow plus full discharge conditions (12 MGD), at several distances and depths below Herrings Run.

- <u>Flood and Stability Technical Memorandum by Kimley-Horn dated October 10, 2012.</u> This
 report addressed concerns from comments made by the Division, by USACE, and by residents
 of the Cotton Patch Subdivision regarding flood elevations and stream stability. The results of
 this study found that the discharge from the proposed quarry would have little effect on flood
 elevations. In addition, the maximum dewatering discharge (12 MGD) from the two outfalls was
 predicted to result in little or no changes to the channel geometry of the upper reaches of
 Blounts Creek. The limited amount of stream bank erosion would not be expected to result in a
 significant increase in instream turbidity.
- <u>Technical Memorandum by CZR Incorporated, October 30, 2012</u>. This report addressed potential effects on identified fish populations from predicted changes in Blounts Creek water quality. The report findings include: (1) No adverse effects are likely to occur to fish species. Increases in pH provide more habitat and less stress to freshwater species; and diadromous species may also have a more suitable habitat for spawning: (2) No adverse effects are likely to occur to macroinvertebrates or managed invertebrates (e.g. blue crabs, hard clams, shrimp); (3) No adverse effects are likely to essential fish habitat (EFH) in Blounts Creek due to predicted changes in pH, salinity, and flow velocity from the proposed maximum design quarry discharge (12 MGD). EFH includes submerged aquatic vegetation (SAV), aquatic beds, wetlands, and the water column. The report also notes that the only Federally-listed endangered , threatened, or special-concern fish species known or expected to regularly occur in the vicinity of Blounts Creek is the American eel (Anguilla rostrata), currently listed by USFWS as a species of concern.

On the basis of the above reports, DWQ concludes that the proposed discharge will have no likely significant adverse effects to aquatic life.

Antidegradation Evaluation

- In accordance with 15A NCAC 2H.0105(c)(2), non-discharge alternatives were considered in the Engineering Alternatives Analysis (refer to EAA Section above).
- A Public Notice was placed in a local newspaper. The notice stated 1) the intent to issue an NPDES Permit, 2) the intent to hold a public hearing, and 3) the proposed discharge may affect future discharge allocations.
- The NC Antidegradation Policy at 15A NCAC 2B.0201 does not require an evaluation of socioeconomic considerations. Nevertheless, the proposed quarry operation is anticipated to provide approximately 20 jobs in the direct mining operation and an additional 20 jobs in support services (Steve Whitt, Martin Marietta, personal communication 6/4/2013), and will provide a long-term supply of aggregate material for road construction to meet local demand.
- Based on evaluation of all data, the Division concludes that the level of water quality necessary to protect the existing uses will be maintained and protected.

Public Input

A public hearing was held on March 14, 2013 at Beaufort County Community College in Washington, NC. Paul Rawls with the Division's Fayetteville Regional office served as Hearing Officer for the draft NPDES permit. Approximately 144 individuals attended, and 22 attendees provided oral comments. Most speakers were against the proposed discharge to surface waters. The written comment period was extended for an additional 30 days (through April 12, 2013). Overall, the Division received 72 written comments, most expressing positions against the proposed

action. A petition signed by 1,218 individuals against the proposed discharge was also submitted to the Division. A complete Hearing Officer report, with recommendations from the Hearing Officer to the Division Director, is attached to this Fact Sheet.

Summary- Final Permit Action

Based on consideration of comments and recommendations received from the US EPA, public input process, and staff, the Division proposes to issue a Final NPDES permit with incorporation of the following changes:

- 1. Addition of a Monthly Average effluent iron limit of 1.0 mg/l, based on the NC Action Level for aquatic life protection. Iron has been identified as a primary pollutant of concern.
- Addition of a new Special Condition A (7)- Effluent Data Characterization- requiring the permittee to complete and submit items V and VI of Application Form 2C within one (1) year of commencement of discharge.
- 3. Addition of monthly effluent nutrient monitoring (TN, TP) since receiving waterbody is classified Nutrient Sensitive Water (NSW) and the downstream Blounts Bay is listed as impaired for chlorophyll.
- 4. Addition of Monthly effluent temperature monitoring.
- 5. Addition of Monthly instream water chemistry monitoring- pH, salinity, temperature, turbidity- at two downstream locations.
- 6. Modification of the permitted flow limits from Monthly Average flow limits of 4.5 MGD (for each outfall), to Daily Maximum flow limits of 6.0 MGD (for each outfall). Daily maximum limits provide upper cap on discharge volume, and the 12 MGD daily maximum total is consistent with the draft groundwater withdrawal permit as well as the basis for water quality modeling predictions.
- Modification of Special Condition A(6)- Benthic Monitoring Requirement- to require submittal of sampling plan and approval by Division's Environmental Sciences Section prior to commencement of sampling.
- 8. Modification of effluent pH limit range from 6.0-9.0 to 5.5-8.5.

NPDES CONTACT

If you have questions regarding any of the above information, please contact Tom Belnick at (919) 807-6390 or via email at tom.belnick@ncdenr.gov.