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February 24, 2009

Regulatory Division

Action ID: AID 200110096

Mr. A. Stanley Meiburg  
Acting Regional Administrator, Region IV  
US Environmental Protection Agency  
Atlanta Federal Center  
61 Forsyth Street  
Atlanta, Ga. 30303-8960

Dear Mr. Meiburg,

This letter is in reference to the Potash Corporation of Saskatchewan Phosphate Division, Aurora Operation (PCS) application for Department of the Army authorization to impact Waters of the US including streams and wetlands associated with a mine advance into a 15,100 acre project area surrounding its current mining operation located north of Aurora, Beaufort County, North Carolina. Additionally, please reference the Final Environmental Impact Statement (FEIS) released by the Corps May 22, 2008, and the Environmental Protection Agency's (EPA) July 23, 2008 comment letter on the FEIS and the proposed project. This letter responds to issues raised in EPA's July 23, 2008 letter, and is submitted in accordance with 404(q) 3(c)(3). It is my determination that, considering the recent modifications and the compensatory mitigation proposed, the project should not result in substantial adverse impacts to aquatic resources of national importance.

#### **Project and Consultation History**

On November 2, 2000, PCS applied for Department of the Army authorization to continue its phosphate mining operation on the Hickory Point peninsula adjacent the Pamlico River and South Creek, north of Aurora, Beaufort County, North Carolina, once reserves are depleted under the existing permitted area. In response to public and agency comments on this original application, PCS elected to reduce proposed impacts to waters of the US and submitted a revised permit application. The Corps of Engineers, Wilmington District (Corps), placed this issued a public notice on the revised application on October 4, 2001. In response to this public notice EPA submitted a Section 404(q), Part IV, paragraph 3(a) letter on October 25, 2001 and a Part IV, paragraph 3(b) letter on November 20, 2001 stating that EPA had determined that the project as proposed would adversely affect aquatic resources of national importance.

As a result of comments received from EPA and others on the October 2001 public notice, the Corps began preparation of an Environmental Impact Statement (EIS) and established an interdisciplinary review team (Review Team). The purpose of the Review Team was to identify major issues to be addressed in the EIS and to provide input toward the development of potential, less damaging alternatives. The Review Team met over 20 times to discuss issues including range of alternatives, minimization of impacts, economic analysis, and compensatory mitigation. EPA has been an active participant on the Review Team.

On October 20, 2006 the Corps released the Draft Environmental Impact Statement (DEIS) for the project and by public notice, requested comments on both the document and the proposed action. The DEIS identified The AP/EAPA alternative as the applicant's proposed project. The DEIS described the purpose and need for the proposed action as developed with input from the Review Team. The DEIS also described a no action and 9 action alternatives, the process used to develop these alternatives and the framework the Corps used to determine alternative practicability. As part of the practicability discussion, the DEIS described the Marston Cost Model, a model used to predict mining costs for the various alternatives. This discussion included methods used for inputting and analyzing data and results and the Corps application and interpretation of this data. The Marston Cost Model had also been discussed in some detail during Review Team meetings prior to release of the DEIS.

Following release of the DEIS, EPA provided a memo and two formal comment letters. The memo dated January 17, 2007, prepared by Dr. Adam Daigneault, EPA Economist, specifically addressed the economic analysis provided in the DEIS. While this memo did provide suggestions for improving the presentation of the analysis, it did not question the validity of the model or the methods used for data input or analysis. By letter submitted February 9, 2007 EPA's NEPA Program Office provided further comment on the economic analysis as well as other concerns regarding the adequacy of the draft document. The EPA Water Management Division submitted comments by separate letter also dated February 9, 2007. This letter provided EPA comments on the impacts of the proposed action. All comments contained in both formal comment letters are addressed fully in the Corps' response to this letter found in Appendix J of the FEIS. None of these comment letters questioned the use of the Marston cost model.

After review of the comments and further discussion with review agencies and the applicant, the Corps determined it appropriate to evaluate an additional alternative (Alternative L), which is fully contained within the project area and alternative boundaries established in the DEIS. On November 6, 2007 the Corps released a Supplement to the DEIS (SDEIS) discussing Alternative L, and issued a public notice requesting comment on the completeness of the DEIS and SDEIS as well as the proposed action.

EPA provided comments in response to the SDEIS and public notice by letter dated December 28, 2007, reiterating its concerns over potential impacts to aquatic resources of national importance. EPA also raised concern over what it considered a "new economic

model” and new interpretation of economics. Finally, EPA raised concern over the level of impacts associated with Alternative L within the Bonnerton and S33 Tracts. Much of this concern was focused on an area of hardwood wetland that was, at that time under consideration for listing by the North Carolina Natural Heritage Program as a Significant Natural Heritage Area of national importance. Responses to all specific comments included in this letter were fully addressed in the Corps’ response to this letter found in Appendix J of the FEIS.

The Final Environmental Impact Statement (FEIS) identifying Alt. L as the applicant’s proposal, was published on May 23, 2008. Simultaneous to this release, the Corps issued a public notice requesting comments on the final document and the proposed project. EPA provided comments in response to this notice by letter dated July 23, 2008, stating that the proposed action “would have significant and long-term, direct and cumulative impacts to biocommunities in various waters of the U.S. which support the nationally significant Albemarle Pamlico Estuary System”. EPA further stated that “Alternative L could be improved environmentally.” EPA concluded by stating that it’s remaining issues “can be successfully resolved” within the brackets of the comments provided and through modification of Alternative L, and that EPA “stands ready to further discuss these comments and alternatives.”

The Corps attempted to work with EPA and other Federal agencies to resolve these issues. On August 8, 2008 the Corps sent EPA a potential modification to Alternative L that further minimized impacts to waters of the US. EPA provided no substantive response to this proposed modification, and on September 16, 2008 EPA field staff informed the Corps that it would not continue discussions with the Corps until after the North Carolina Division of Water Quality (NCDWQ) acted on the 401 Certification. NCDWQ issued the 401 Water Quality Certification on January 15, 2009. Since that time, the Corps has attempted and been unable to engage EPA field level personnel in any meaningful dialogue toward resolution of issues. The Corps was informed in an e-mail from EPA field staff dated 2/17/09 that EPA field staff was now coordinating with “upper level management” to discuss options. Therefore, the Corps is providing its position on these issues and information which we feel is relevant in resolving EPA’s expressed concern.

### **Impacts and Alternatives**

In its July 23, 2008 comment letter on the FEIS and proposed project, EPA stated that its primary concerns are with the “wetland and stream impacts to watersheds supporting the Albemarle Pamlico Estuary system over an extended timeframe, together with the cumulative impacts of ongoing mining.”

Based on these and similar comments, the Corps has worked with the applicant to further minimize impacts associated with Alternative L, as depicted in the Modified Alternative L Boundary maps dated January 6, 2009 (Enclosed). Within the NCPC Tract, the 3.79 acres of tidal palustrine forest identified as Essential Fish Habitat (EFH) at the headwater of Huddy Gut has been eliminated from the mine boundary, and additional minimization has also been accomplished in the headwaters of Tooley Creek. Further minimization has

been achieved in the areas buffering Broomfield Swamp and Cypress Run in the S33 Tract and in the headwater area of Porter Creek in the Bonnerton Tract. In total, wetland impacts have been further minimized by approximately 158 acres. The modified Alternative L would allow mining and mine related activities to occur within approximately 11,454 acres, including 7,482 acres of uplands and 3,972 acres of wetland habitats over a period of approximately 37 years. While this activity will result in the long-term alteration and, in some cases, permanent loss of wetland and upland wildlife habitat within the mined footprint, the avoidance and minimization efforts incorporated into Alternative L will result in the maintenance of upland and wetland wildlife corridors along the Pamlico River, South Creek, Durham Creek and their tributaries.

It is important to note that the mining and reclamation activities will take place incrementally, allowing mobile terrestrial and aquatic wildlife species to seek refuge in other areas as mining progresses. Additionally, reclamation efforts will result in reestablishment of terrestrial wildlife habitat in the mined areas. This incremental mine progression, combined with reclamation efforts, will also ensure over time that wildlife populations are not isolated by the work. To ensure minimization of temporal losses under modified Alternative L, any permit issued will be conditioned to require that impacts do not occur until necessary. Potential wording for such a condition is as follows:

*To ensure that temporal losses are minimized to the extent practicable, the applicant shall not undertake major land-clearing and/or land manipulating activities within any area sooner than 3 years prior to the initiation of mining activities. For example, major land clearing and manipulation activities for areas to be mined during 2012-2013 may not begin any sooner than January 1, 2011.*

This will further reduce cumulative direct impacts to fish and wildlife within the mining area.

Under the modified Alternative L, direct impacts to much of the headwaters and riparian areas of creeks within the project area, including all coastal marsh, are avoided. There is however, the potential for indirect impacts to Primary Nursery Areas (PNAs) and other surface waters within the project area. It is likely that these areas will experience some alteration in salinity and in nutrient input and cycling as a result of watershed reduction. However, existing data indicate that these reductions should be localized and should not result in a substantial loss of habitat value. As discussed in the FEIS, water quality parameters such as temperature and salinity within the small tributaries originating in the project area is largely influenced by and tends to track with the waters of South and Durham Creeks and the Pamlico River. Therefore, changes due to reduced surface and groundwater inputs should be localized within the upper reaches of these creeks. Nutrient inputs and cycling will be reduced but will continue to occur. On average, approximately 30% of the watershed of creeks originating in the project area will remain intact. Of the three inland Primary Nursery Areas (PNA) designated by the North Carolina Wildlife Resources Commission (NCWRC) approximately 20% of the Jacks

Creek watershed, 30% of the Drinkwater Creek watershed and 45% of the Tooley Creek watershed will remain intact. Additionally, the incremental advance of impacts and reclamation efforts discussed above will further minimize the duration of these impacts.

While loss of watershed area will likely have some localized affect on the tributaries originating in the project area, evidence indicates that the habitat value and nursery functions of these tributaries will not be lost. In fact, a recent article in the September 2008 edition of the NCWRC's publication "Wildlife in North Carolina" reported that recent sampling revealed a "similar mixture of fresh and saltwater species" from the PNA creeks and a man-made marsh and creek system located within the project area. This man-made marsh and creek system, known as "PA II" was created from uplands approximately 30 years ago and has functionally no watershed. As referenced in this article and in the FEIS, research conducted over 15 years ago on these same systems found little difference between the community assemblages within PA II and the surrounding creeks.

Impacts to South Creek should be minimal after consideration of the compensatory mitigation. South Creek has an approximately 49,700 acre watershed. Approximately 18% of this, including approximately 1,270 acres of wetlands and approximately 6,850 acres of uplands, will be affected by the proposed mining activities. As part of the compensatory mitigation plan, PCS will restore approximately 3,520 acres of wetlands previously in agricultural production, enhance approximately 380 acres of wetlands and preserve approximately 1,514 acres of wetlands within the South Creek watershed. As discussed in Appendix I of the FEIS, it is expected that any loss of estuarine function experienced by South Creek will be adequately mitigated by this activity.

Impacts to Durham Creek should be minimal. Durham Creek has an approximately 37,500 acre watershed. Approximately 7% of this watershed will be affected by the proposed mining activity. Otherwise, the Durham Creek watershed is relatively undisturbed and forested. The majority of impacts will occur within the Porter Creek watershed. Due to the relatively small percentage of watershed alteration and the fact that Porter Creek empties essentially at the mouth of Durham Creek, any impact to the estuarine functions of Durham Creek will be minimal.

Effects to the estuarine functions of the Pamlico River and greater Albemarle/Pamlico Sound Estuary as a result of this project should be minimal after consideration of the compensatory mitigation. The lower Pamlico River has an immediate watershed in excess of 800,000 acres; alternative L would impact less than 1% of this. While the Pamlico River and Sound do exert an influence on the salinity of the creeks within the project area as indicated by available data discussed in the FEIS, it is unlikely that the reduction of freshwater input in these tributary creeks will impact the salinity regime of the River or Sound. The contribution of nutrients including dissolved and particulate organic matter from the affected creeks may be decreased. However, this decrease should be adequately mitigated by the increased inputs from the mitigation areas. Finally, the reduction of habitat value within the tributaries of the project area, particularly those PNAs, may result in a decrease in their contribution to fish and

invertebrate population within the River and Sound. This decrease too should be adequately compensated for by the increased contribution made by creeks in and around the mitigation areas.

Finally, on January 15, 2009 NCDWQ issued a Water Quality Certification pursuant to Section 401 of the Clean Water Act, finding that Alternative L will not result in a violation of applicable Water Quality Standards. The certification includes conditions requiring the monitoring of surface waters, benthic and fish communities in and around the project area. Any permit I issue will incorporate these conditions. Additionally, the Corps will require that PCS develop an appropriate plan for more expansive monitoring of salinity and fisheries within South and Durham Creek and the Pamlico River. The results of this monitoring will be submitted to the Corps, NMFS, the US Fish and Wildlife Service, EPA and the NCDWQ annually and will be made available either in whole or in summary to any other agency or member of the public so desiring. Analysis of this data will be used by the Corps to determine whether further or additional action is needed.

### **Preferred Alternative**

In the July 23, 2008 comment letter, EPA identified the S33AP Alternative as the "environmentally preferable alternative" and stated that EPA's "economic evaluation" has resulted in a determination that this alternative is practicable. The Corps agrees with EPA that of the action alternatives, S33AP alternative is the environmentally preferable alternative in terms of total acres of impact. I do not agree with EPA's practicability determination. At Review Team meetings, and in the DEIS the Corps introduced the cost model to be used in evaluating costs and the framework used to make the determination of cost practicability. Using this method, the Corps determined that several alternatives, including the S33 Alternative, were not practicable. In its January 17, 2007 memo, EPA provided comments on the cost model and its use, prepared in consultation with an EPA economist, and agreed that the S33 alternative is not practicable.

EPA further stated in its July 23, 2008 letter that although it finds S33AP the 'environmentally preferable alternative,' it prefers Alternative L from a NEPA perspective "since it avoids valuable wetland habitat, mainly on the NCPC Tract." EPA did however, suggest that additional minimization of Alternative L be explored; particularly in the area of the Bonnerton Tract listed by the North Carolina Natural Heritage Program (NCNHP) as a Significant Natural Heritage Area (SNHA) of national importance. As presented in the FEIS, Alternative L avoided approximately 58 acres (21%) of the 271 acre SNHA. Through efforts led by the NCDWQ, Alternative L has been modified to now avoid approximately 174 acres (64%) of the area.

Finally, EPA suggested modifying the Alternative L boundary presented in the FEIS by adopting the boundary used in the SCRA alternative on the S33 Tract. EPA found that this would reduce impacts by approximately 38 acres of wetland and 10,167 linear feet of stream. The Corps has worked with the applicant to further minimize the impacts of

Alternative L on the S33 Tract. This modification has resulted in avoidance of approximately 19 acres of wetland and 3,227 linear feet of stream. This additional minimization has increased the buffer area around Broomfield Swamp and Cypress Run. The majority of the wetland area and streams remaining in the impacted area of the S33 Tract are of reduced value and further avoidance would result in loss of mineable resource with no substantial change in overall impact of the Alternative.

### **Compensatory Mitigation and Reclamation.**

EPA raised concerns over the compensatory mitigation and reclamation schedules and how compliance will be tracked and monitored. Table 1 depicts timing of initial impacts to wetlands and construction of mitigation. As compensatory mitigation for the proposed impact, PCS would provide 2:1 restoration or restoration equivalent for each acre of wetland impacted, the majority (more than 7,000 ac.) being restoration. Stream mitigation would be provided in several of the mitigation sites, and the ratio of linear feet impacted to linear feet mitigated will meet or exceed the ratios suggested in the Wilmington District's April 2003 Stream Mitigation Guidelines (1:1 for poor quality streams, 2:1 for good quality streams and 3:1 for excellent quality streams).

Within the South Creek watershed, the applicant would restore approximately 3,445 acres of wetland and 3,000 linear feet of stream, enhance approximately 162 acres of wetland and preserve approximately 1,575 acres of wetland and 31,008 linear feet of stream. As further compensatory mitigation, PCS would restore approximately 885 acres of wetland and 19,783 linear feet of stream, enhance 46 acres of wetlands and preserve 41 acres of wetlands in the watershed of Pungo Creek, which flows into the Pungo River, a tributary to the Pamlico River. PCS would also restore 221 acres of wetland and 12,467 linear feet of stream, enhance 38 acres of wetlands and preserve 20 acres of wetland and 2,155 linear feet of stream within the upper watershed of 2 creeks tributary to the Pamlico River. All remaining required mitigation would come from an approximately 4,200 acre site also located in the watershed of the Pungo River and comprised of 3,342 acres of wetland and 8,793 linear feet of stream restoration, 129 acres of wetland and 7,994 linear feet of stream enhancement and 701 acres of wetland preservation.

The majority of the mitigation work would take place within the same 8-digit hydrologic unit (HUC) as the project (HUC 03020104). The only exception is a 481 acre portion of the Parker Farm, one of the South Creek watershed projects, which is located within an adjacent hydrologic unit (HUC 03020105) immediately to the south of HUC 03020104. It should be noted that due to existing manmade drainage features in combination with topography, surface waters are routinely exchanged between these sub-basins.

The mitigation sites are thoroughly described in Appendix I of the FEIS. The detailed mitigation site plans for several of the sites (Bay City Farm, Upper Back Creek, Sage Gut and Rutman Creek) have been circulated to the Federal and state review agencies. All agencies, including EPA have been given the opportunity to visit each site and provide comment, however, few have provided input. EPA has not participated in any of the site visits or provided comment on any of the site specific mitigation plans. Construction on several of the sites has been completed (Parker Farm, Gum Run, Bay City Farm and



Upper Back Creek). Currently, PCS proposes to have all sites constructed no later than 2015. Table 1 depicts mitigation available and construction completion date.

PCS's current mitigation plan includes an approximately 10% overbuild on wetlands as a contingency in case adjustments are needed in the future. Therefore, there may ultimately be more mitigation created than is necessary to offset impacts to the proposed project.. PCS proposes to fully construct and preserve all sites as described in Appendix I and subsequent Corps approved site specific mitigation plans. If all sites are 100% successful, resulting in more wetland mitigation acreage than is necessary to compensate for the authorized impacts, a portion of Rutman Phase II and the entirety of Rutman Phase I will not be used as mitigation for this impact. The success of Rutman Phase III and the remaining portion of Rutman Phase II is not dependant upon the existence or success of the potentially excess portions of the Rutman site. Therefore, these areas, if success criteria are met, will constitute fully functioning and acceptable mitigation regardless of any alteration that may occur within those areas not used as mitigation (Remainder of Phase II and all of Phase I). Currently, all stream mitigation, except that contained in any portion of Rutman not committed for mitigation of this impact, will be incorporated into the mitigation plan for this project.

A permit for this project would be conditioned to require the applicant to adhere to the mitigation construction timelines indicated in Table 2, and to periodically submit information demonstrating compliance with construction and monitoring timetables and achievement of success criteria. These reports will be submitted for review prior to pre-determined impact milestones, likely annually. Potential wording for such a condition is as follows:

*"Table XX lists the impacts as they would occur during 2-year timeframes. By Nov. 1<sup>st</sup> of year preceding the impact, PCS shall submit to the Corps a mitigation ledger demonstrating that all mitigation work is complete as described in the mitigation plan (pursuant to identified timetable). This report will be used to determine whether sufficient, 1 mitigation is available for impacts occurring over the next 2 year timeframe. (E.G. by November 1<sup>st</sup> 2009, PCS shall submit a ledger demonstrating that the mitigation for impacts occurring during the 2010 - 2011 timeframe (529.13 ac) is available)."*

Similar conditions will be developed in coordination with the applicant and the North Carolina Division of Land Resources to ensure that reclamation efforts are timely and successful. These reports will be made available either in whole or in summary to any agency or member of the public so desiring. The information in these reports and any comments received on these reports will be used by the Corps to determine whether impacts schedules need be adjusted or halted.

### **Economic Analysis**

There has been much discussion over the cost model and approach used in determining the cost practicability of alternatives. In Review Team meetings, and again in the DEIS, the Corps introduced the Marston Cost Model as a method for estimating cost of the various alternatives. The Corps also explained its approach for determining whether alternatives were practicable from a standpoint of cost. As discussed above, EPA commented on the Cost Model and the practicability determinations presented in the DEIS in a January 17, 2007 memo and February 9, 2007 letter. While EPA did suggest revisions in the presentation to further clarify the results and conclusions, neither correspondence questioned the validity of the Cost Model or the method of analysis. Additionally, EPA agreed with the Corps that the No Action, S33AP, and DL1B alternatives were not economically practicable.

After review of the comments received on the DEIS, the Corps determined it was necessary to explore an additional alternative (Alternative L) with mining and impact levels between the EAP and SCR alternatives. One reason for the development of this alternative was that further analysis of the cost data appeared to indicate that several of the alternatives having lesser impacts to waters and wetlands were not economically practicable. Since that time some commenters, including EPA have attempted to identify an approach to the economic analysis of alternatives that would demonstrate that those alternatives are indeed practicable. The Corps has met numerous times with these groups and has analyzed each alternate approach recommended. The concerns expressed regarding the Corps' approach and other suggested approaches were fully addressed either in Section 2.7 of the FEIS or in the response to comments section of the EIS (Appendix J).

The Corps has determined that the original approach using the Marston model and amortizing major capital expenditures over the mining for which those expenditures are necessary, is most appropriate. The Corps has also concluded that comparison of these cost estimates to an independently generated industry estimate of product value (the USGS value) is the most appropriate gauge available for determining cost practicability. Finally, the Corps has determined that alternatives that give the applicant approximately 15 years of operation within the less costly Tracts (NCPC and Bonnerton) are practicable while alternatives that would require mining within the S33 Tract within the initial approximately 15 years are not practicable.

EPA, in its comments on the FEIS suggests comparing the net present value (NPV) of costs as calculated by the cost model to the NPV of the USGS value estimates. The NPV method is an important tool in evaluating major capital expenditure projects because it allows for the time value of money. Ideally, it allows one to compare the net cash flows of various projects as well as the amount of money in today's dollars needed to implement each project. The NPV arguments presented to the USACE were largely cash flow analyses (i.e., sales less cost) and should not be confused with final income statements or profits.

Commenters suggested use of NPV by calculating the NPV of each annual cost of the alternative, and then considering the total of those costs. Using this total NPV for each

alternative suggests that practically all of the alternatives can yield profitable results over the period of the life of the mine. The problem with this approach is that it obviously does not allow consideration of costs on an annual basis. In this case we are considering a private enterprise, costs extended over very long periods of time, and costs which fluctuate substantially over the years. Regardless of the analysis used, it is clear that while many years of mining are likely to be profitable under most of the alternatives, there are also many consecutive years in which mining is likely not to be cost effective. I do not consider it economically practicable to require this private company to operate at costs equal to or exceeding the value of the product over extended periods of time.

In conclusion, while the Corps disagrees with the EPA's latest suggested approach to analyzing cost practicability of alternatives, we believe that further minimization efforts have adequately addressed EPA's concerns. Efforts undertaken by the Corps and NCDWQ have resulted in further avoidance of the SNHA in the Bonnerton Tract. Additionally, increased avoidance on the S33 Tract has resulted in impacts comparable to those experienced with the SCR boundary. Further, to minimize temporal impacts, conditions will be added to any permit to ensure that direct impacts do not occur until necessary, and that reclamation of mined areas progresses as appropriate. Finally, with regard to compensatory mitigation, site specific plans have been developed that will result in adequate mitigation for all impacts, ratios have been adjusted as appropriate and conditions will be added to any permit to ensure that mitigation occurs concurrent with or for the most part, in advance of all impacts. Should you have any additional comment, please feel free to contact me at 910-251-4631.

Sincerely,

JEFFERSON M. RYSCAVAGE  
Colonel, U.S. Army  
District Commander

Enclosure

Cc w/ enclosure

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