PERMITTING PROCESS REGARDING MINING IMPACTS WITHIN THE EAA

September 2007

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ACKNOWLEDGEMENTS

This report could not have been written without the input from several representatives of the permit reviewing Agencies, several representatives of the rock/mining industry, and numerous stakeholders who have all been a source of information for the content contained within this report. Among the reviewing Agencies, I want to specifically thank Paul Linton, Tommy Strowd, Shawn Waldeck, Damon Meiers, and Tom Colios of the South Florida Water Management District for their help in describing the SFWMD's review process from the regulatory and CERP perspective. I would also like to specifically thank Howard Hayes and Tom Scott of the Florida Department of Environmental Protection for their help in preparing this report. Howard was extremely helpful in describing DEP's review process during the permitting of a commercial mine and Tom provided invaluable geological information of the area. Kenny Wilson of the Palm Beach County Health Department was instrumental in presenting the Health Department's role in the review process. Fred Chaplin of the State Fire Marshal's office helped describe the role of their office in the mining permit review process as it related to blasting. Ananth Prasad, John Shoucair, and Joe Besharat of the Florida Department of Transportation (FDOT) provided invaluable information on FDOT's efforts to provide quality rock for the State of Florida. Additionally, I would also like to thank Tom Herbert of Lampl Herbert Consultants for providing a copy of their recently completed study for the FDOT on sources, constraints and the economic value of rock in Florida. Finally, I would like to thank my fellow colleagues at Palm Beach County for their help in describing the County's efforts in permitting a commercial mine in the EAA. Specifically acknowledged is Isaac Hoyos of Planning; Carrie Rechenmacher of Zoning; Rob Robbins, Brian Gentry, and Bonnie Finneran of ERM; and Ken Rogers and Dan Weisberg of the Engineering Department.

EXECUTIVE SUMMARY

On February 6, 2007 the Palm Beach County Board of County Commissioners (BCC) approved Staff's recommendation to perform a study that would provide decisional information to the BCC concerning the impacts of large scale mining in the Everglades Agricultural Area (EAA). This study is generally intended to characterize the issues, review the existing permitting process, identify any additional data needs, and identify any needs for better permitting requirements or coordination**.** If gaps in the current permitting process exist amongst the agencies that require additional coordination and regulatory requirements at the County level, then staff is to identify those gaps.

Recently, the State legislature passed a bill that was signed into law by the Governor dealing with rock mining within the State of Florida. This law requires the formation of a 15 member Statewide Mining Task Force to develop recommendations for mining within the state. The law also requires all local governments to take into account information provided by the FDOT about the sources of aggregate when evaluating mining operations during the local review and approval process. The law also limits mining moratoria by a local government to one year. This report should be beneficial to the Statewide Mining Task Force as they develop recommendations to provide sufficient aggregate for the state's future needs.

The issues were characterized based on meetings with stakeholders. There were several issues raised at an EAA Stakeholders meeting conducted on November 2, 2006 and at the Comprehensive Plan Amendment public meetings held on July 19, 2006 and November 13, 2006. These mainly technical issues are listed below:

Issues Raised

1. What are the environmental impacts associated with mining?
2. What are the economic impacts associated with limiting mining?
3. What are the impacts of blasting associated with mining?
4. What are the groundwater contamination /water quality issues associated with mining?
5. Should there be long term monitoring of mines for water quality purposes?
6. What areas of the EAA may be beneficial for existing CERP projects or other future restoration projects? Evaluate interference between mining and these projects.
7. How should the mining areas be reclaimed?
8. Should there be additional criteria used for future mining operations?

This report attempts to address whether or not these main issues are adequately addressed during the permitting process of a mining operation. When a mine is proposed in a particular area, there are numerous agencies involved in the review of the permit application. Each agency involved addresses specific criteria to ensure the protection of surrounding surface waters, groundwater and other public interests.

This study describes the hydrogeology, drainage, and mining resources of the EAA to provide the BCC with sufficient background for decision making. This study provides a list of identified issues/concerns, an explanation of those issues/concerns, and descriptions of how those issues/concerns have been addressed by the existing permitting process during review by the responsible agency or agencies.

In addressing the hydrogeology of the EAA, it is noted that the EAA covers approximately 700,000 acres of which about 500,000 acres (over 750 square miles) are cultivated. See Figure 1 for a location map of the EAA. The geology of the EAA is heterogeneous meaning that it varies substantially throughout the EAA. However, all sediment borings (sediment borings are shallow holes penetrating only the depth of the rock formation expected to be mined) done to date have not shown rock formations with as great a porosity as would be found in Miami-Dade County. This tighter geological formation and more importantly the lower water elevation of the EAA compared to surrounding lands tend to severely restrict water flow out of the EAA. Nothing has occurred over the last 50 years that would have caused the geology or hydrogeology to change from it current existing condition. These conclusions are borne out in several geological studies done in the EAA throughout the years starting with the Garald Parker study on the water resources of south Florida in 1955. Additionally, the material contained in this current study has been reviewed by the Assistant State Geologist for FDEP, a consulting geologist working for the mining industry, the geological consultant for FDOT who recently completed the FDOT aggregates study, and the SFWMD's chief engineer from the Watershed Management Department.

Permeabilities of the transmissive sediment layers within the EAA are generally several magnitudes lower than those in Eastern Palm Beach County due to the limited occurrence of highly permeable sediments. In addition, the water levels in the EAA that are usually maintained only slightly below ground surface are several feet below the water levels maintained in the surrounding areas (Conservation Areas to the south and east, ranch lands to the west and Lake Okeechobee to the north). The lower transmissivity and water levels make the hydrogeology and resulting interactions completely different than those of the Miami-Dade County Lake Belt Area. What this means from a hydraulic standpoint is the flow gradient tends to be from the perimeter of EAA toward the middle of the EAA. This information provides the technical reasoning why the movement of high chloride water from the EAA is not likely. Additionally, the permitting process currently in place provides an opportunity to evaluate all mines (by applying specific criteria) to determine if adverse water quality impacts are possible.

Several meetings were held with the permitting agencies to discuss the permitting process as related to mining activities within the EAA. It was determined that current permitting criteria exist to address groundwater and surface water movement of water containing high chlorides, impacts to wetlands, impacts to surrounding lands due to blasting, and impacts to CERP projects.

However, the conclusion among the agencies was that while the current permitting process was generally sufficient to adequately address the issues that have been raised, there were some improvements that could be made to the permitting process that would provide an improved coordinated review. It was obvious to all that better coordination was needed among the agencies. Certain improvements were identified (discussed in detail in the Conclusion section of this report) that would make for an improved coordinated review during the permitting process.

Additionally, it was agreed by the Agencies involved in CERP process that the existing regulatory programs provide reasonable assurance that future mining operations will not impact the performance of proposed CERP projects. Based on the flexibility of the existing water resources system, it is apparent that future mining operations could be incorporated into the regional water resource alternatives. Those alternatives could include additional storage, conveyance systems, sedimentation basins, etc. Therefore, mining within the EAA should not be an impediment to the CERP projects.

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I. INTRODUCTION

On February 6, 2007 the Palm Beach County Board of County Commissioners (BCC) approved Staff's recommendation to perform a study that would provide decisional information to the BCC concerning the impacts of large scale mining in the Everglades Agricultural Area (EAA). The study effort is generally described below:

Characterize the issues, review the existing permitting process, identify any additional data needs, and identify any needs for better permitting requirements or coordination.

This study describes the hydrogeology, drainage, and mining resources of the EAA to provide the BCC with sufficient background for decision making. This study provides a list of identified issues/concerns, an explanation of those issues/concerns, and a description of how those issues/concerns has been addressed by the existing permitting process during review by the responsible agency or agencies. Finally, this study addresses the impacts mining may have on the Comprehensive Everglades Restoration Plan (CERP) projects.

This study of the potential EAA mining impacts took advantage of the previously established procedures by all of the governing Agencies involved in the approval process of a mining operation. In order to obtain approval to mine on a particular site, the current permitting process requires the existing landowners whom have applied for a mining permit to accomplish all the analyses discussed in the Backgrounds section of this report. The possible Agencies involved are the South Florida Water Management District (SFWMD), Florida Department of Environmental Protection (FDEP) -Bureau of Mine Reclamation, FDEP-Industrial Wastewater Program, State of Florida -Division of State Fire Marshal, Palm Beach County Environmental Resources Management Department (ERM), Palm Beach County Planning, Zoning, and Building Department (PZB), Palm Beach County Engineer's Office, Palm Beach County Health Department, Department of Community Affairs (DCA), Treasure Coast Regional Planning Council (TCRPC) and the U.S. Army Corps of Engineers (ACOE).

Identify any needs for better permitting or coordination requirements.

If gaps in the current permitting process among the Agencies exist, then staff was to identify those gaps. Staff was to also evaluate whether it is warranted to develop requirements for more proactive communication of the information required by the existing permitting process to Palm Beach County's Planning Department. Finally, suggestions for new permitting/coordination requirements among the Agencies were to be developed.

BACKGROUND

There were several issues raised at an EAA Stakeholders meeting conducted on November 2, 2006 and at the Comprehensive Plan Amendment public meetings held on July 19, 2006 and November 13, 2006. These mainly technical issues are listed below:

Issues Raised

1. What are the environmental impacts associated with mining?
2. What are the economic impacts associated with limiting mining?
3. What are the impacts of blasting associated with mining?
4. What are the groundwater contamination /water quality issues associated with mining?
5. Should there be long term monitoring of mines for water quality purposes?
6. What areas of the EAA may be beneficial for existing CERP projects or other future restoration projects? Evaluate interference between mining and these projects.
7. How should the mining areas be reclaimed?
8. Should there be additional criteria used for future mining operations?

It is helpful in understanding the issues to have an explanation concerning the amount of review effort that is given to a mining project application and to have a brief explanation of the geology and topography of the EAA.

It should be understood that when a mine is proposed in a particular area, there are numerous agencies involved in the review of the various permit applications that address specific criteria to ensure the protection of surrounding surface waters and groundwater. Additionally, the reviewing agencies, including Palm Beach County, complete an environmental and traffic analysis to ensure that if there are impacts to the surrounding area, they are mitigated. Listed below are the primary State and federal agencies involved in the mining project review and the issues they address:

Permits Required:

- **State of Florida Environmental Resource Permit (ERP) and Mine Reclamation Programs, Florida Department of Environmental Protection** – Bureau of Mine Reclamation (BOMR) (approval Agencies-SFWMD or FDEP)
    - Addresses onsite and offsite effects on water quality (ground and surface waters) –
    - Addresses onsite and offsite effects on water quantity (ground and surface waters) -
    - Addresses/ensures stormwater management system meets water management district requirements

- Addresses onsite and offsite impacts to wetlands and other surface waters, including wetland mitigation and financial assurances for wetland mitigation
- Addresses safe and appropriate reclamation, including but not limited to post mining site clean up, contouring and stabilization of uplands and littoral zones
- Addresses impacts to State protected wetland dependant wildlife species
- Solicits input from other State agencies related to potential impacts to historical and/or archaeological resources from activities conducted in wetlands or other surface waters, and impacts to State protected wildlife such as Florida Fish and Wildlife Conservation Commission, and Department of State Division of Historical Resources

FDEP/BMR (State rules) require the following information and/or evaluations, as appropriate for the site conditions, be conducted/provided in association with the ERP application review:

- Boundary survey, legal description and ownership authorization;
- Locations of rights of ways of easements associated with on or offsite water management areas, or areas to be reserved for same;
- Preparation of USGS topographic map of project area and adjacent lands – site specific survey required for some types of evaluations;
- Preparation of FEMA based map illustrating the location of designated flood zones in relation to the property and project;
- Hydrogeologic evaluation to address existing surface and/or groundwater regime and geology, and how mine operation will affect same both on and off site;
- Stormwater calculations and analysis to address stormwater management system meets State standards during and post mining (pre and post development calculations);
- Location and calculations related to compensatory flood storage if development proposed within flood zones;
- Identification of State jurisdictional wetlands onsite (via onsite flagging, surveying and State and/or federal verification);
- Identification of seasonal high water elevations and or hydrologic indicators for wetland systems occurring onsite;
- Identification, quantification and qualification of proposed impacts to wetlands and or waters of the State;
- Preparation of surface and groundwater monitoring plan to ensure no onsite or offsite impacts to existing surface waters;
- Preparation of water quality monitoring plan, when necessary, to ensure no onsite or offsite impacts to ground and surface waters;
- Identification of efforts taken to eliminate and or reduce direct impacts to waters of the State;

- Identification of compensatory mitigation plan proposed to offset unavoidable impacts to wetlands and or waters of the State;
- Preparation of land use map (FLUCCS, FDOT 1999) and associated narrative descriptive analysis of existing land use designations based on the FDOT land use category guide;
- Identification of presence of wetland or water dependant species onsite (requires onsite species specific surveys) or adjacent to the site that could be affected by proposed activities;
- Preparation of habitat management plan to address direct and or indirect impacts to State protected water dependant wildlife species;
- Identification of existing/pre-mining land use designations, and post-mining post-reclamation land use designations;
- Historical/archaeological survey (Level I) if impacts proposed to wetlands;
- Preparation of mining site plan that includes limits of mining, depth of mining information, cross section drawings illustrating mining depths, mine progression plan, reclamation plan, and when necessary wetland mitigation plan;
- Map/exhibit illustrating location and specifications for all water control structures and associated control elevations associated with the stormwater management system;
- Map and discussion of dewatering plans, if applicable;
- Application review fee based on project size and/or acreage of wetland impacts;
- Identification of schedule and party responsible for completing monitoring;
- Requires all hydrologic and geologic evaluations be signed and sealed by Florida registered P.E. and/or P.G., as applicable;
- Requires all permit drawings be signed and sealed by Florida registered P.E.

Compliance monitoring on the part of BOMR includes:

- Annual mine inspections conducted by BOMR staff;
- Annual report to be submitted to BOMR addressing:
  - Acres conducted during the previous year;
  - Acres to be conducted during the subsequent year;

- Annual hydrologic monitoring reports:
  - Data/results from hydrologic monitoring (ground and or surface water);
  - Data/results from water quality monitoring (as required per permit conditions);
  - Mitigation monitoring reports (when applicable).

- **Annual wetland mitigation vegetation monitoring report;**

- **Water quality monitoring report**

- **State of Florida Division of State Fire Marshal Construction Mining Permit** (for blasting)
  - Sets ground vibration and air blast limits for the use of explosives at commercial limestone and sand mines producing construction aggregates, sand, cement, and road base.

Information required:

- Nature of business;
- Type of blast media to be used;
- Name and licensing information of blast contractor;
- Site Plan as permitting for ERP that includes mine progression;
- Zoning classification of all lands within 1 mile of mining area;
- Name and licensing of seismologist contractor;
- Application fee;
- Annual renewal form and fee to be paid.

Compliance monitored via:

- Annual inspection by State Fire Marshal office;
- Annual reports and permit renewal fee.

- **Consumptive Use Permit (CUP) –** South Florida Water Management District
  - Addresses consumptive uses of water related to pumping, recirculation and/or discharge of water associated with the mine operation
  - Addresses onsite and offsite effects on water quantity (ground and surface waters)

Information required:

- Complete description of the project and need for permit, the source, and how it will be used;
- The location of wells (groundwater) or points of withdrawal (surface water);
- Proof of ownership for withdrawal location (deed, lease, articles of incorporation);
- History of previous permitting for the project site;
- Identification of any pre-application discussions with permitting staff;
- Complete location information, including maps showing major roads and other landmarks, and site maps showing streets, canals and water bodies, property boundaries, buildings, on-site lakes/ponds, and the location of all pumps and wells
- Name of the aquifer, lake, canal, or other source of the withdrawal;
- Evaluation of reclaimed water use criteria, for the purpose of utilizing reclaimed water whenever possible;
- Identification and current condition of all wetlands and other surface waters that occur within the area of influence of the water use, utilizing scaled maps and aerial photographs including those lying outside the applicant's property boundaries;

- Description of all wells and/or surface water pumps (as appropriate), including size, depth, capacity, purpose, calibration information, and location;
- Water balance flow chart and recycling plan, to describe the proposed system of withdrawals, movement and disposition of water, any dewatering activities, and to account for any losses;
- Water conservation plan that incorporates a leak detection and repair program, a recovery/recycling program, processes to decrease water consumption, and an employee awareness program;
- Evaluation of potential impacts to on-site and off-site wetlands and other surface waters, and what steps are proposed to eliminate or reduce those potential impacts;
- Mitigation plan to offset any unavoidable impacts due to the water use;
- If dewatering is proposed, the applicant must provide reasonable assurance that the project will not cause harm to the resource, existing legal uses, off-site land uses, or wetland environments. All dewatering water must be retained on-site, or assurance must be provided to show that any off-site discharges will not adversely affect the receiving water body or other legal users;
- If dewatering is proposed, a separate mining/dewatering permit application must be submitted (along with a fee of up to $4,000.00) for all dewatering water uses for mining or construction;
- Monitoring plan to assess the effects of the water use, and to verify that no harm is occurring due to that use.

  Compliance monitored via:
  - Annual inspections by WMD staff
  - Monthly report of daily water withdrawals for each pump, water body, well, or wellfield, submitted to WMD as appropriate;
  - Quarterly report of withdrawals, along with descriptive information about source, treatment, method of measurement, meter calibration, etc.;
  - Quarterly report of monitoring requirements for water levels, turbidity, ions, or other parameters required by specific permits;
  - Any other project-specific permit conditions to address water use issues, environmental impacts, mitigation, or monitoring as deemed appropriate by the WMD.
  - Annual monitoring reports compiling previous year of data to illustrate compliance with permit and associated conditions.

- **State of Florida Industrial Wastewater (IWG) –** Department of Environmental Protection
  - Addresses water quality for water re-circulated onsite and not discharged

Information required:

- Copy of ERP permit
- Mine site plan
- Owner and operator information
- Description of operation
- BMP's
- Certification by PE that project does not discharge stormwater or mine process water offsite
- Other information as deemed appropriate to illustrate conditions for issuance met

Compliance monitored via:

- Annual inspections conducted by FDEP staff
- Site inspections by mine operator per BMP's
- Five year renewals of permit

State of Florida Air General Permit – Florida Department of Environmental Protection

- Addresses permanent and portable crusher equipment for State Visible Emissions standards
- Emission of hazardous and non-hazardous air pollutants related to the function of the facility;
- Consumption of accessory materials, including gasoline, diesel, propane, and natural gas;
- Unconfined emissions;
- Prohibitions on any demolition or renovation of the facility which involves asbestos removal;
- Limitations on open burning;
- Maintenance of the facility in good operating condition, and proper use of air pollution control devices;
- Monitoring of the facility by FDEP.

Information required:

- Applicant must complete the Air General Permit Registration Form, as provided in subsection 62-210.920(1) or (2), F.A.C., and submit it to the Florida Dept. of Environmental Protection along with the appropriate permit processing fee pursuant to Rule 62-4.050, F.A.C.

The Registration Form must include:

- Identification (name, address, phone number, etc.) of the owner of the facility, as well as similar contact information for the operator, if different from the owner;
- Facility name and location, start-up date, and list of functional components;
- Description of all operations of the facility in sufficient detail to demonstrate the facility's eligibility for use of the air general permit and to provide a basis for tracking any future equipment or process changes at the facility;
- Description of all air pollutant-emitting processes and equipment at the facility, as well as a description of any air pollution control measures or equipment to be used;
- Descriptive details of all reasonable precautions to be used to prevent unconfined emissions at the facility;
- Certification of accuracy by responsible person.
- Any existing individual air operation permit(s) authorizing operation of the facility must be surrendered by the owner or operator;
- Plans must be developed and implemented to control unconfined emissions of particulate matter:
- Unconfined emissions from processing plants shall be controlled by using a water suppression system with spray bars located wherever unconfined emissions occur;
- Unconfined emissions generated by vehicular traffic or wind shall be controlled by applying water (by trucks equipped with spray bars) or effective dust suppressant(s) on a regular basis to all stockpiles, roadways, and work yards.

Compliance monitored via:

- Use of an air general permit is non-transferable, and each permit is limited to five (5) years;
- Visible emissions from any processing operation not subject to 40 CFR Part 60, Subpart OOO shall be less than twenty percent (20%) opacity, pursuant to Rule 62-296.320, F.A.C. Additional specific requirements apply to facilities that are subject to 40 CFR Part 60, Subpart OOO;
- DEP representatives may access the facility to conduct inspections and tests to determine compliance with the air general permit and DEP rules;
- Specific actions by the owner/operator are required in the event of non-compliance (62-210.310(3), F.A.C.);
- DEP must be notified prior to the relocation of any mineral processing plant;

- Applicants must re-register for permit coverage under the following conditions:
  - Impending expiration of the term for air general permit use;
  - Change in ownership of all or part of the facility;
  - Proposed new construction, modification, or other equipment change pursuant to 62-210.310(2)(e);
  - Any other change not considered an administrative (minor) correction pursuant to 62-210.310(2)(d);
  - Every five (5) years.

- **Stationary Storage Tank Registration –** Florida Department of Environmental Protection

  Information required:
  - Size, number and location of tanks
  - Compliance information related to secondary containment, overfill protection, etc…

  Compliance demonstrated by:
  - Annual registration update
  - Annual inspection by DEP personnel

NPDES Stormwater Permit (if needed) – Florida Department of Environmental Protection (has federal delegation for this permit)

- addresses water quality for stormwater discharged into waters of the United States
- Point source discharges of stormwater runoff from industrial facilities (including mines);
- Discharges of stormwater to surface waters of the State or into municipal separate storm sewer systems;
- Pollution prevention techniques;
- Reduction of contaminants in stormwater runoff;
- Monitoring;
- Reporting.

Information required for permit review:
- Applicant must complete the MSGP Notice of Intent (DEP Form 62-621.300(5)(b) and submit to the Florida Dept. of Environmental Protection with a $500.00 application fee; the Notice of Intent must include:
- Identification (name, address, and other descriptive information) of the operator of the facility;
- Facility Location Information (physical address, geographic coordinates, Water Mgt. District, contact information);

- Facility Activity Information (industrial code(s), monitoring requirements, construction information, ERP and/or NPDES permits);
- Discharge Information (identification of all associated receiving waters, outfalls, and/or municipal separate sewer systems);
- Certification of accuracy by responsible person.
- Applicant must develop and implement a Stormwater Pollution Prevention Plan (SWPPP), and must keep an updated copy of the Plan on-site; the SWPPP must include:
- site evaluation of how and where pollutants may be mobilized by stormwater and discharged;
- site plan for managing stormwater runoff;
- identification of appropriate controls to reduce stormwater pollution (e.g., timely cleanup of spills, covering exposed materials, installing a detention pond);
- maintenance, visual monitoring, and inspection schedule;
- recordkeeping process;
    - Compliance with the requirements of sector-specific (Sector J) directives for the mining industry regarding issues and pollutants (including pollutant control options, pollution plan requirements, monitoring and reporting requirements, special conditions) as specified in the Federal Register, Vol. 60, No. 189, Friday, September 29, 1995;
    - Compliance with MSGP Permit Language for Sector J (Mineral Mining and Processing Facilities) as specified in the Federal Register, Vol. 60, No. 189, Friday, September 29, 1995.

Compliance through:

- Analytical monitoring is required for certain industry sectors determined to have a high potential to discharge pollutants at concentrations of concern. The MSGP specifies benchmark values for industry-specific pollutants. Sector J (mining) requirements include monitoring of Total Suspended Solids and certain nutrients. Monitoring must be performed quarterly and submitted at the end of the year along with an annual summary form in years 2 and 4 of the permit cycle. Benchmark values are established to gauge the effectiveness of the SWPPP and determine whether there is a need to continue monitoring.
- Compliance monitoring is required annually for certain types of stormwater discharges that are subject to numeric stormwater effluent limitations.
- Visual monitoring is required of most facilities covered under the MSGP. Visual examinations must be performed at least once per quarter for the life of the permit and the results must be recorded in the SWPPP.
- Applicants must re-apply for permit coverage every five (5) years.

Department of Community Affairs (DRI)

- Presumed to be subject to DRI review if mining associated disturbance of more than 100 acres per year - otherwise, no involvement

United States Army Corps of Engineers - Statement of No Jurisdiction, Nationwide Permit, General Permit or Individual Permit, as applicable

- Addresses federal jurisdiction over site for impacts to Waters of the U.S., or wetlands connected to or adjacent to Waters of the U.S.
- Solicits input from other federal agencies including but not limited to U.S. Environmental Protection Agency and U.S. Fish & Wildlife Service
- Requires issuance of State ERP for Federal Water Quality Certification under Section 404(b) and a finding of consistency with Florida's Coastal Zone Management Program, as required by Section 307 of the Coastal Management Act

Type IIIB Excavation Authorization - Palm Beach County – Conditional Use Permit, Mining/Excavation Permit/Site Plans

- Land use analysis/concurrency
- Traffic analysis-haul routes and road impacts
- Operation Plans – hours of operation, project maintenance and monitoring reports
- Particulate Erosion Control and water quality and depth regulations
- Economic Impact and Employment Analysis
- Setbacks, buffers from adjacent land uses and landscape plan
- Emergency Contingency Plan, in case of onsite spills or contamination
- Wetland impacts
- Mining Site plan specifics (acres mined per year, mechanics of excavation/processing, mine progression plans, Archeological Certificate to dig)
- Reclamation plans (final water body side sloping, revegetation/vegetation removal plans)
- Construction plans for office/support structures and roads/driveways etc.
- Project survey and legal description
- Fuel and Chemical Storage Report, Well field identification and protection

Recently, the State legislature passed a bill that was signed into law by the Governor dealing with rock mining within the State of Florida. This law requires the formation of a 15 member Statewide Mining Task Force to develop recommendations for mining within the state. The law also requires all local governments to take into account information provided by the FDOT about the sources of aggregate when evaluating mining operations during the local review and approval process. The law also limits any mining moratoria by a local government to one year. This report should be beneficial to the Statewide Mining Task Force as they develop recommendations for providing sufficient aggregate for the state's future needs.

Existing EAA Geology/Hydrogeology

The EAA covers approximately 700,000 acres of which about 500,000 acres (over 750 square miles) are cultivated. See Figure 1 for a location map of the EAA. The geology of the EAA is heterogeneous meaning that it varies substantially throughout the EAA. However, all sediment borings (sediment borings are very shallow holes penetrating only the soil horizons) done to date do not show rock formations with great porosity as would be found in Miami-Dade County. This tighter geological formation and more importantly the lower water elevation of the EAA compared to surrounding lands tend to severely restrict water flow out of the EAA. Nothing has occurred over the last 50 years that would have caused the geology or hydrogeology to change. The CERP projects have included Stormwater Treatment Areas (STA's) and Reservoirs to treat agricultural runoff from the EAA. The SFWMD/ACOE are looking into the possibility of adding STA's or reservoirs for future CERP expansion. Their staff has said that a mining operation will not stop the ability of the Corps of Engineers and SFWMD from sending more water south if it is warranted in the future. They believe mined areas within the EAA will be able to be incorporated into any future CERP plans.

Permeabilities of the transmissive sediment layers within the EAA are generally several magnitudes lower than those in Eastern Palm Beach County due to the limited occurrence of highly permeable sediments. Even with the generally lower overall transmissivity (ability to move water) there is considerable spatial variation in permeability in the EAA. The lower overall transmissivity requires a more extensive network of canals and ditches to provide drainage. In addition, the water levels in the EAA that are usually maintained only slightly below ground surface are several feet below the water levels maintained in the surrounding areas (Conservation Areas to the south and east, ranch lands to the west and Lake Okeechobee to the north). This hydrology can be seen in Figures 5 and 6 included in this report. These two Figures come from a report describing the surficial aquifer system of Palm Beach County, Florida, written by Wesley L. Miller of the U.S. Geological Survey in 1988.[1] This is typical for the entire EAA area and requires pump stations like the S-5A in order to lift the water out the EAA to provide drainage. The lower transmissivity and water levels make the hydrogeology and resulting interactions completely different than those of the Miami-Dade County Lake Belt Area.

What this means from a hydraulic standpoint is the flow gradient tends to be from the perimeter of EAA toward the middle of the EAA. Only if the entire EAA were flooded to a substantial depth would there be enough head differential to cause both surface water and ground water to move in an outward direction. Additionally, because the water table has been lowered to enable agriculture to occur, the existing muck was exposed to the air, thereby oxidizing. This has caused the muck depths to lessen over the years, creating a "bowl" effect within the EAA. The movement of water out of the EAA must be accomplished by pumping.

Figure 1

Everglades Agricultural Area - Existing and Proposed Mines

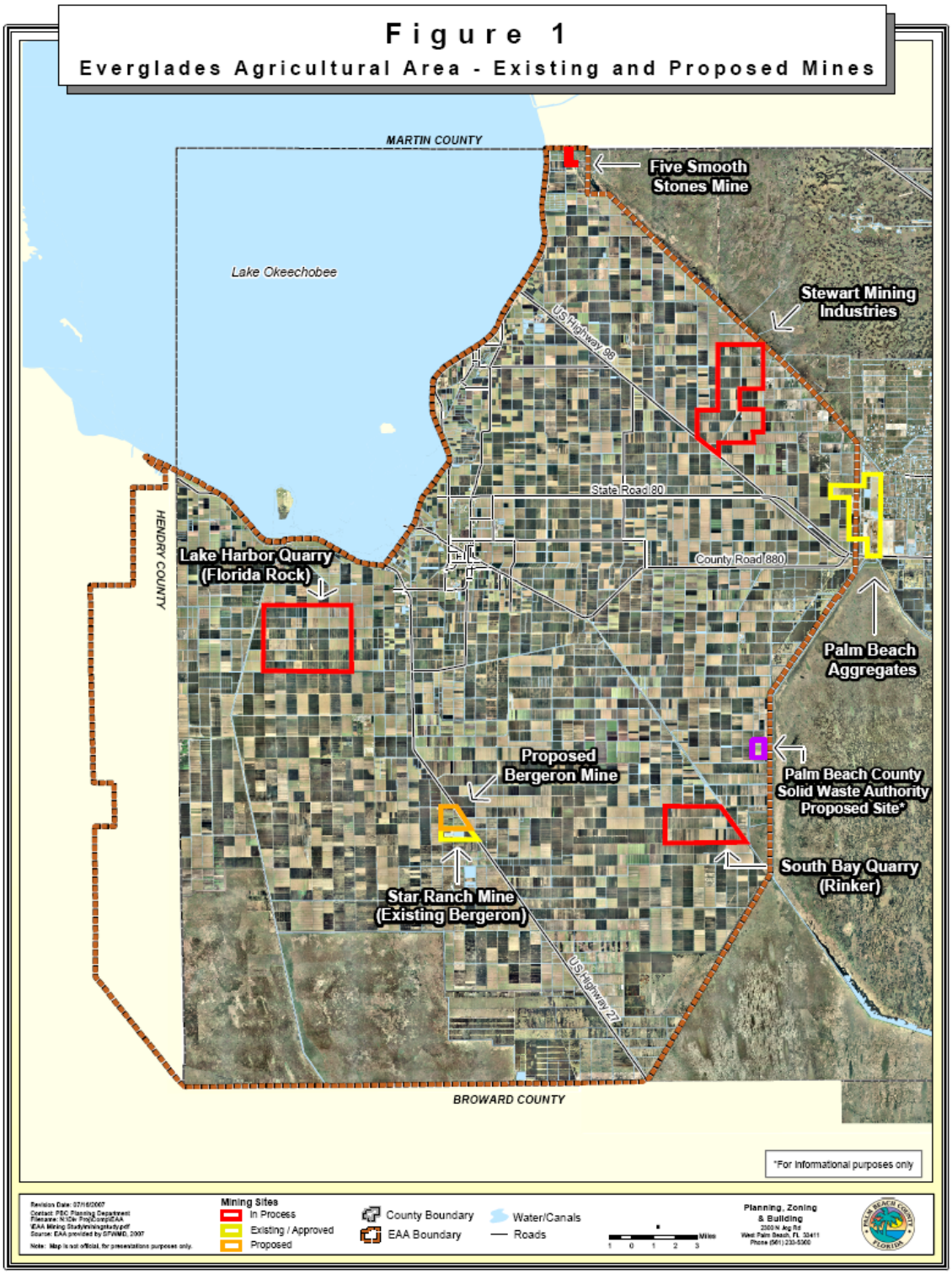

Figure 5
April Water Table Gradients - Miller Report

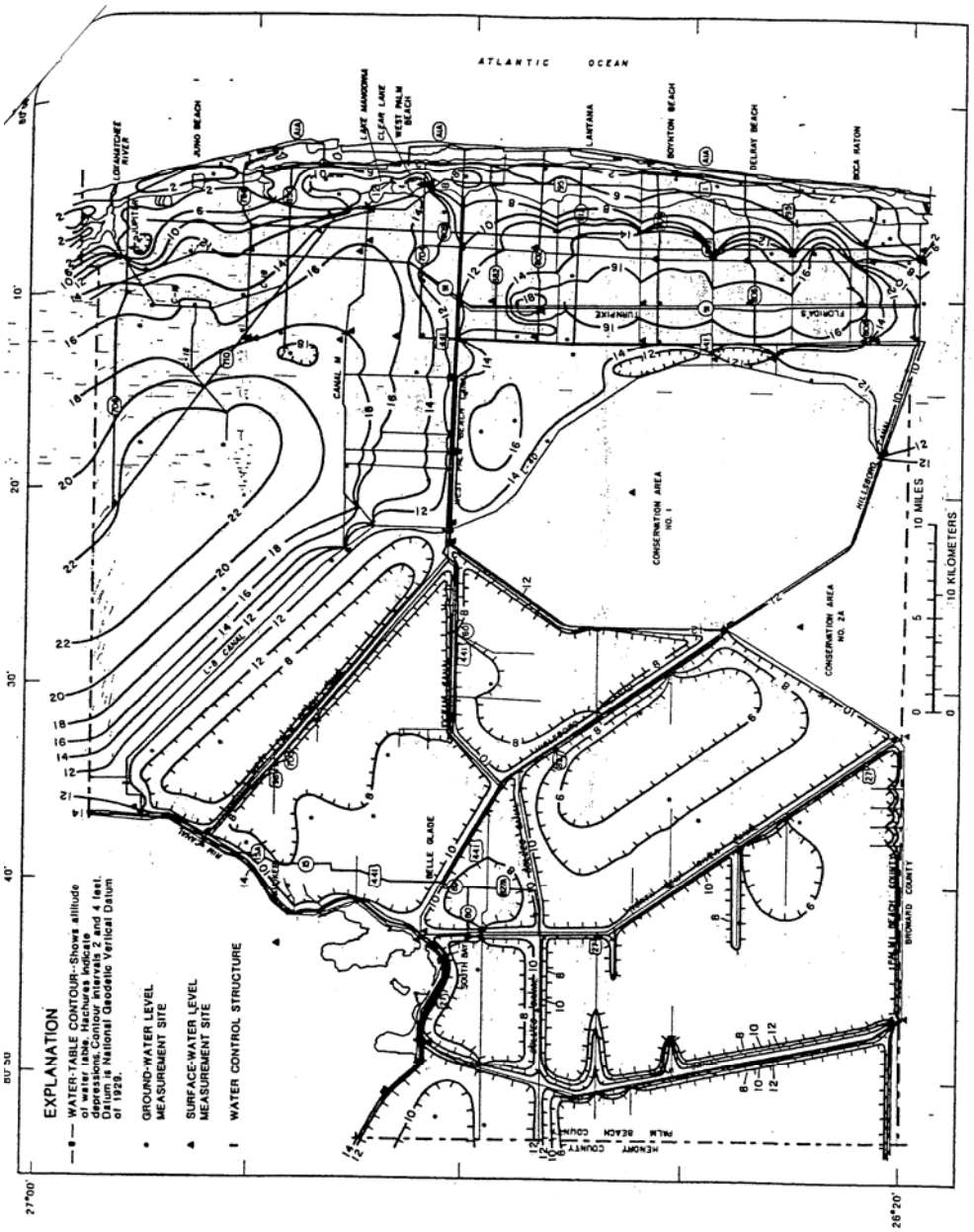

Figure 5.--Altitude of water table, surficial aquifer system, Palm Beach County, April 1984. (Modified from Miller, 1985a.)

Figure 6
November Water Table Gradients - Miller Report

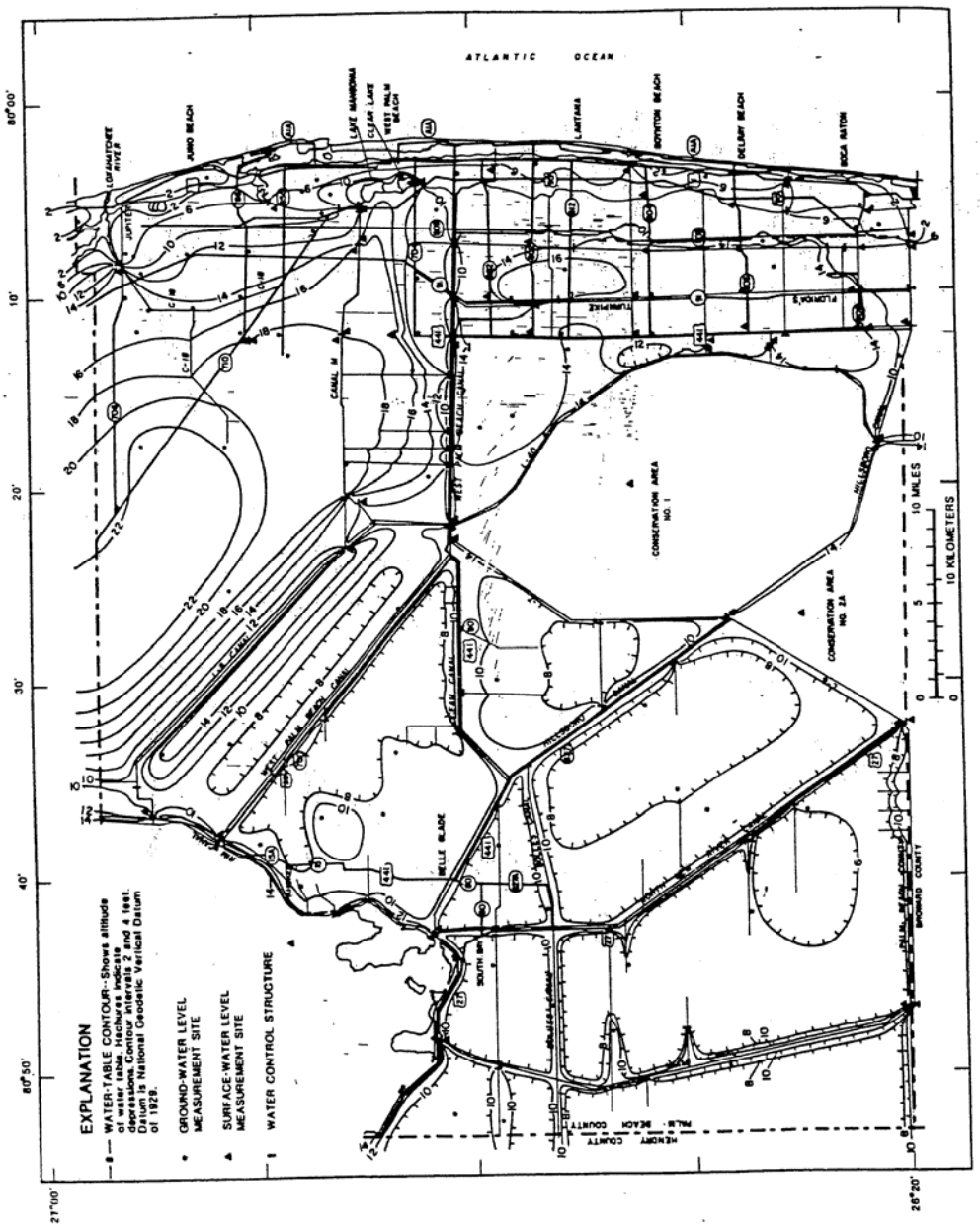

Figure 6.--Altitude of water table, surficial aquifer system, Palm Beach County, November 1984. (Modified from Miller, 1985b.)

One of the concerns that have arisen deals with the question of possible movement of residual seawater containing high chlorides toward wellfields because of the construction of several mine pits within the EAA. Residual seawater is seawater trapped in sediments deposited during the Pleistocene age (1.8 million years ago to 10,000 years ago) when this area of Florida was underwater. The concept that this trapped seawater still exists today because it was not flushed out due to the low soil permeabilities of the area was first introduced by Garald Parker of the U.S. Geological Survey in his 1955 study entitled "Water Resources of Southeastern Florida".[2] This concept has been mentioned in several other reports including the previously mentioned report by Wesley Miller. The Miller report also divided SAS (Miller's water table aquifer) into three hydraulically connected zones in the bases of relative permeabilities with Zone I being the most permeable. Zone II is somewhat less permeable and Zone III is the least permeable of the three zones with some components being virtually impermeable. Permeability is defined as the ease with which a porous medium can transmit a fluid under a potential gradient. Miller states in his report that greater permeabilities within Zones I & II have generally allowed near total removal of the trapped seawater in the surficial aquifer system. However, the low permeabilities of Zone III have greatly retarded dilution of the residual seawater by limiting infiltration of rainfall and fresh surface water. Figure 2 of the Miller study (included in the Appendix) mentioned above shows the limits of the zones of permeabilities within the County.[3] As can be seen by this Figure, almost all of the EAA is within Zone III. Miller states in his report that Zone III of the aquifer system is typified by low permeabilities as reflected by the steep hydraulic gradients adjacent to canals (Figures 5 & 6). He goes on to say that low areal groundwater gradients toward the interior of the area indicate that horizontal migration of the residual seawater has been minimal. As stated earlier, the sediment permeability of this area is quite different from Miami-Dade County.

Even water movement through the muck soils of the EAA is poor. Parker of the U.S. Geological Survey indicated in his 1955 study that the organic soils of the Everglades have a comparatively low coefficient of permeability and water moves through very slowly under the low gradients that exist there.[4] As mentioned earlier, those gradients are even less conducive to flow today than in 1955 because of the drainage changes that have occurred over the years. In fact, Darcy's law of groundwater movement through soils demonstrates this mathematically through the formula q= kia, where q is the unit flow, k is the soil permeability, i is the hydraulic gradient, and a is the unit area of flow. If the gradient (i) is zero due to no head differential, then there is no flow in or out of the area regardless of the soil permeability. If the gradient is negative, as is the case today, then there would be flow moving into the EAA from the surrounding areas. However, the soil permeabilities would make such flow minimal. Miller confirms this in his 1988 study by stating that water pumped from drainage canals to primary canals tends to flow to the area rather than infiltrate because of low permeabilities in canal bottom sediments and surficial aquifer system materials.[5]

Figure 2
EAA Permeabilities - Miller Report

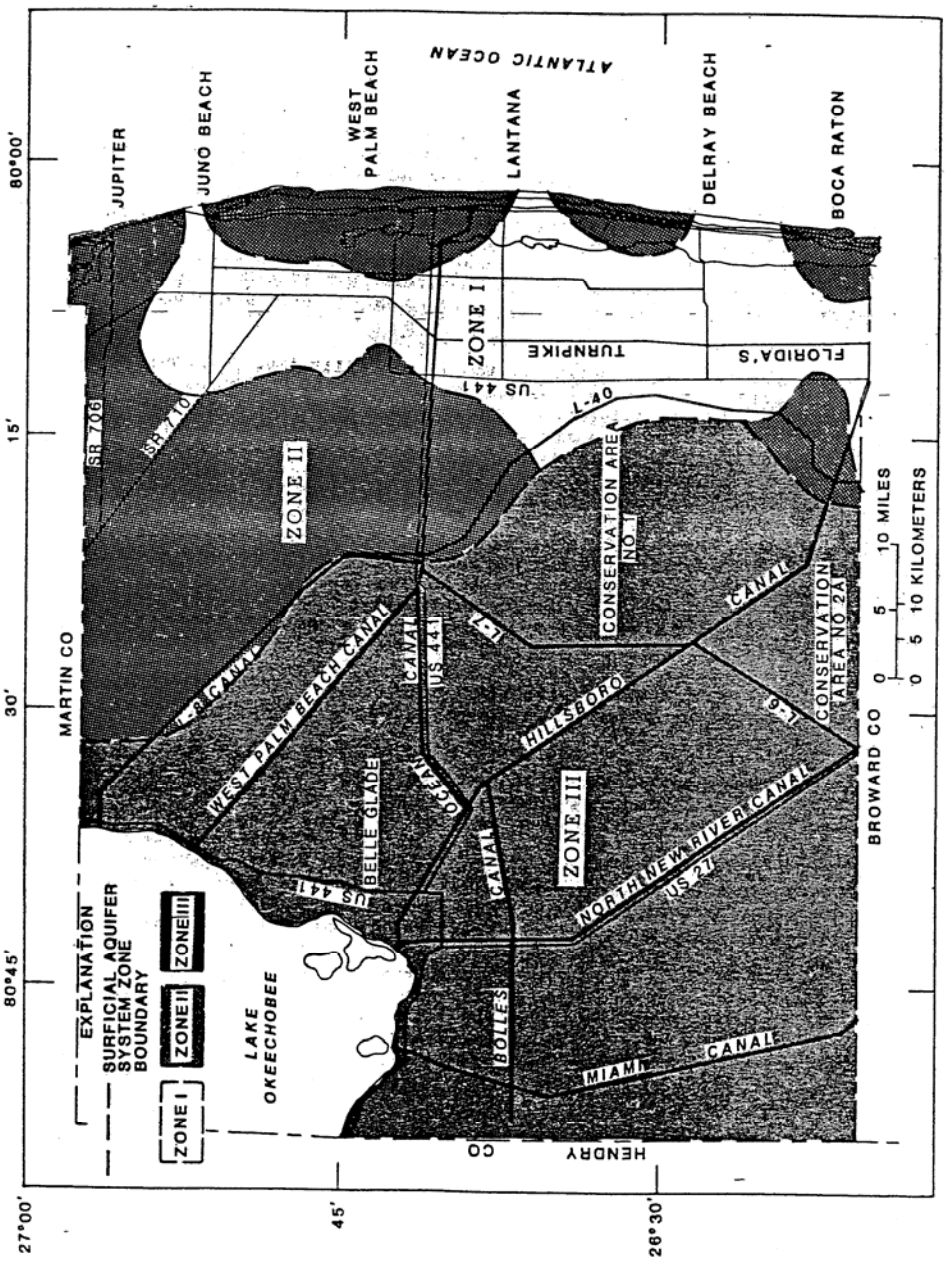

Figure 2.--Location and boundaries of zones I, II, and III of the surficial aquifer system in Palm Beach County.

Since the use of the Floridan aquifer system (FAS) is being touted as a possible alternative water supply source, there has been some concern expressed about the possible contamination of that aquifer as was similarly expressed with the surficial aquifer system (SAS). The County's western water supply for the Cities of Belle Glade and Pahokee are being developed in the Floridan aquifer system. The hydrogeologic units encountered underlying the EAA are composed of the SAS which are underlain by the Intermediate Confining Unit/ Intermediate Aquifer System (ICU/IAS) and the FAS. The ICU/IAS consists of geologic formations comprised of sediments with very low permeability (relatively impermeable sequence of clays, silts and limestones of the Hawthorn Group) effectively preventing vertical movement of water. Parker in his 1955 study states that the FAS (his Floridan Aquifer) is capped by the ICU/IAS (his Floridan aquiclude), which confines the FAS water under artesian pressure.[6] This information is corroborated in the 1973 U.S. Geological Survey entitled "Appraisal of the Water Resources of Eastern Palm Beach County, Florida" conducted by Larry Land, et al. In this study, it is stated that the FAS underlies all of Florida and that in Palm Beach County the FAS, whose top is about 800 feet below the ground surface, is separated from the SAS by several hundred feet of impermeable clay and silt. The report goes on to say that the FAS is highly mineralized with chlorides being in excess of 1000 ppm in most of the County.[7] Given this, it is hard to imagine the possibility of digging a pit that deep that would cause a downward exchange of high chloride water from the SAS into the FAS. Besides, as the Parker study points out, the FAS is under artesian pressure meaning the flow would be upward should there be a connection between the two aquifers. This is the very reason the SFWMD has a program for capping artesian wells.

The preceding information provides the technical reasoning why the movement of high chloride water from the EAA is not likely. Additionally, the permitting process currently in place will provide an opportunity to evaluate the design of all mining activities to determine whether or not adverse water quality is possible and addressing the concerns by applying specific criteria. This process is described in detail in the following sections of this report.

PERMITTING PROCESS

PBC Zoning Division Involvement

When a zoning application is submitted for commercial mining within the EAA, the Zoning Division of the Palm Beach County Planning, Zoning, and Building Department (PZB) acts as the coordinating Agency. The zoning application is sent to the Development Review Organization (DRO), formerly known as the Development Review Committee, for comments. The DRO is made up of those County Departments that would be involved in the review of a development, of which commercial mining is included. Some of the commenting members of the DRO are the Environmental Resource Management Department, the Traffic and Land Development Divisions of the County Engineer's Office, the County Health Dept., and the Planning Division of PZB. These reviewing Agencies review the application for compliance with County regulations concerning mining. Any comments that a reviewing Agency may have is sent to Zoning as the Coordinating Agent within the Zoning process. The applicant will work directly with the commenting Agency in order to have the application meet County Regulations (the specifics of this process are discussed a little later in this document). Once the application has met all County regulations that deal with mining, it is given the status of certified. Once a project has been deemed certified it goes to public hearing with the County Commission sitting as the Zoning Board, whereby the Public is given an opportunity to comment on the application. After the Public Hearing, the application returns to the DRO for final approval. Based on comments at the Public Hearing, the DRO can accept the application as is or can require some revisions to be accomplished based on the comments at the Public Hearing. This whole process of approval can take anywhere from nine months to two years to complete.

When an application is submitted to the Zoning Division the project manager must review the request for compliance with the Unified Land Development Code (ULDC). Article 4.D. of the ULDC has specific criteria in regards to excavation in general and Type III B excavation in particular, which includes the use of explosives. Standards for the West County Agricultural Area (WCAA) aka EAA defines excavation in the WCAA as; 'the minimum necessary to implement the bona fide agricultural use.' Large scale excavation projects in the EAA that have been approved recently and new mines that are currently under review were not anticipated by the Code. Previously the Code did exempt projects in the EAA from littoral planting requirements. The Code was revised via Ordinance 2006-004 and now states; 'exempted excavation in the WCAA shall provide a littoral zone if the excavation ceases to be agricultural.'

New mines in the WCAA that exceed Code thresholds and are clearly not established for a bona fide agricultural use (which would allow a maximum 15 feet in depth) are reviewed under the standards of the Type III B excavation. The proposal must provide an application that would include a justification statement, submittal of a mining impact statement, operation and maintenance statement, soil statement, and certificate to dig certified by an archeologist. The project manager reviews the site plan and supportive documentation for compliance with the ULDC and compatibility. Documentation to be reviewed would include an aerial, site plan and regulating plan which are to indicate graphic depictions for frontage, access, location, size, acreage of site and excavated area, accessory uses, landscape buffers and details, slope and depth, littoral zones, phasing, setbacks and separation, BCC conditions of approval (after the Public Hearing) and a reclamation plan. A yearly monitoring report which includes graphs and aerials is required to be provided to the Zoning Division to assure the excavation activity progresses in compliance with the phasing and time frames consistent with the development order or BCC conditions of approval and as indicated on the site plan.

Once the project has been approved and granted a Notice of Intent to Construct (NIC), the County requires performance bonds to ensure the work is done prior to the project being granted an NIC. ERM requires an excavated area and littoral zone bond and the Land Development Division of the County Engineer's office requires a road maintenance bond. There is one performance bond that is required earlier in the process, specifically the bond for upland reclamation. Zoning requires the uplands bond be signed to ensure a reclaimed upland area and upland planting areas before the certification of the Project is granted. All three of these performance bonds remain in effect for two years after the reclamation is completed.

PBC Planning Division Involvement

The Palm Beach County 1989 Comprehensive Plan (Comp Plan) allows mining in commercial, industrial, rural residential and agricultural production land use designations. However, for the purposes of this study, areas within the Agricultural Production (AP) designations, which coincide with most of the EAA, are the only areas to be addressed in the study, as these are the only land use designations within the County with available land feasible for commercial mining.

As for industrial designated areas, there is a tract of land within the Urban Area around the City of Belle Glade with an industrial land use designation where mining could occur in theory. However, the "Sugar Cane Growers Area Protection Overlay" protects most of this area from encroachment by incompatible uses. This industrial area is also located within the "Glades Economic Development Overlay" which may limit mining activities. Finally, the proximity of this industrial area to existing residential areas and institutional hubs, make this area not likely for large-scale commercial mining operations.

The County's urban area is in the process of reaching build-out. There are very few smaller vacant commercial or industrial sites viable for large-scale commercial mining in this area of the County. As for the Exurban and Rural tiers where rural residential designations are found, most of these areas have a very large existing population, close to 40,000 people, and the few large undeveloped tracts have been seeking permits for urbanization through several DRI's. The remaining rural residential areas are within the Palm Beach Aggregates mine immediately west of the L-8 Canal, most of which have been reclaimed for CERP water reservoirs and a new FPL power plant.

Therefore, the AP designation in the EAA is the only designation to be addressed in this study. The Palm Beach County 1989 Comprehensive Plan (Comp Plan) allows commercial mining in the EAA to support: (1) public roadway projects (2) agricultural activities (3) ecosystem restoration or water management projects. FLU Objective 2.3 in the Comp Plan, lists the current criteria for the review of mining applications for consistency with the Comp Plan.

Since this process does not require an amendment to the Comp Plan, the Planning Division within the Palm Beach County Planning, Zoning, and Building Department is involved as a commenting agency when the County receives a petition through the Zoning Division for commercial mining in the EAA. The County Commission has expressed concern with the proliferation of mining because the piecemeal approval of mining operations does not address cumulative environmental impacts on natural systems and residential water supplies.

Historically, there has been little mining activity in the EAA. Prior to the 1989 Comp Plan, only the approximately 400-acre Star Ranch mine existed along SR 27 in the southeast portion of the EAA. Since the County adopted the Comp Plan in 1989, there have been five applications for mining received by the County in the EAA (See Figure 1 for a location of the mines). The first application was for the Five Smooth Stones Mine located in the northeast corner of the EAA near the Martin County line. This approximately 100-acre mine was approved in 2000 to supply road-building material out of the county. The second mine in the EAA (approved in 2003) was for the westward expansion of the Palm Beach Aggregates mine just west of Twenty Mile Bend. The Palm Beach Aggregates mine is located just to the east of the official EAA boundaries. The mining operation at this site was for water management purposes. The third mining site approved was the 5400-acre Stewart Mine located in the Northeast corner of the EAA near the SFWMD L-10 Canal. This mine was approved in 2006 as a 40-year endeavor that would also supply road-building material out of the County, as well as serve as a reservoir for existing agricultural operations. The fourth mine, the South Bay Quarry which is located about 12 miles south of CR 880 and to the west of Brown's Farm in the southeastern portion of the EAA, may be approved in 2007 as a road building material/construction material mine and as a water management facility. The last mine, the Lake Harbor Quarry which is located about one mile south of S.R. 80 between the Miami Canal and the North New River Canal, may also be approved as a road building material/construction material source, as well as to serve ultimately as a reservoir for existing agricultural operations.

Once a zoning petition for commercial mining is received, the Planning Division must determine if it meets the Comp Plan criteria. Once these criteria have been verified by the Planning Division, then the Zoning Division coordinates with several other County Departments to complete a technical review of the Comp Plan requirements to verify that all the criteria spelled out in the Comp Plan for Commercial Mining have been satisfied.

PBC Traffic Division Involvement

As part of the zoning petition process for commercial mining in the EAA, the Traffic Division within the Palm Beach County Engineer's Office reviews the applicant's traffic analysis to ensure the ULDC guidelines for traffic have been met for all roadways within a five mile radius of the mining site. Florida Department of Transportation (FDOT) establishes a level of service for the two major roads in the EAA, S.R. 80 and S.R. 27. Due to traffic concurrency state law, FDOT does not review the traffic analysis for zoning petition applications. The Traffic Division reviews the analysis on behalf of the FDOT to ensure that the road level of service is met. If concurrency is not met then the applicant's certification is denied or the project must be scaled back in order to meet traffic concurrency standards. There is normally no coordination with FDOT during the review of the zoning petition.

Because the traffic characteristics of a mining operation are unique, the Traffic Division recommends that the applicant meet with them prior to submittal, although it is not a requirement. The review is straight forward with the level of service for the roadway network having to meet concurrency. However, during the course of review, if the Traffic Division believes some of the traffic assumptions are out of line based on the operation laid out in the traffic analysis, Traffic Division staff will coordinate with the applicant in order to resolve the differences. The bottom line is that traffic concurrency standards must be met or the project can not move forward through the approval process. Once the traffic concurrency standards have been met, the Zoning Department will be notified as such. Traffic concurrency is one set of standards that must be met before certification of the project is issued.

PBC Land Development Division Involvement

In addition to the Traffic Division reviewing the traffic analysis to ensure the roadway traffic level of service standards have been met; the Land Development Division of the Palm Beach County Engineer's Office also reviews the zoning petition. The Land Development Division, together with the Traffic Division, reviews the zoning petition to determine turning lane requirements and the necessity for a roadway access (driveway or turn out) permit. If the zoning petition application shows that the proposed mining operation accesses onto a County maintained road, then a hauling permit from the County is required. If a turn out is requested onto a County roadway, then the Land Development Division will determine if a turning lane is required and establish the criteria for the design of the turning lane improvements.

If the zoning petition requests a turn out permit onto a FDOT roadway, then the Land Development Division requires the applicant obtain a letter from FDOT that agrees to the access onto the FDOT roadway at the location shown in the application. The Land Development Division, together with the Traffic Division, then reviews the traffic analysis to determine turning lane requirements. If a turning lane is required, then FDOT will establish the design criteria and will issue the turn out permit. It is possible that with an existing turn out, an access permit is not required.

Additionally, if there are any land development features, such as roads and buildings, associated with the mining project, then legal positive outfall must be established for the land development portion(s) of the project. This system needs to be separate from the mining portion of the project.

PBC Environmental Resource Management Dept. Involvement

As part of the technical review process of the commercial mining zoning petition within the EAA (WCAA per the Uniform Land Development Code), the Environmental Resources Management Department (ERM) reviews the application in order to grant certification at Development Review Office (DRO) meetings. This means that the zoning codes can be met for the proposed site plan. Additionally, ERM works with the applicant to provide a Notice of Intent to Construct for Excavation (NIC), which must be obtained prior to the commencement of any on-site excavation activities.

As part of the DRO process, ERM reviews details of the mining plans to address:

(1) wellfield protection, (2) vegetation protection, and (3) protection from non-native invasive vegetation and (4) potential impacts to County owned natural areas, properties, or water bodies of interest. As an advance clearance measure for the NIC review, ERM reviews chloride data for the proposed mining site to ensure that the code criteria is met. For a proposed site that is to be excavated, the chloride concentration must be less than 250 ppm at all excavated depths of the mined cell. This limit of 250 ppm for chloride is a secondary drinking water standard established to protect potable water supplies from having the aesthetic quality of drinking water adversely affected via a brackish taste. If the chloride concentration is greater than 250 ppm in a mined cell in a particular area, then the code allows excavation to take place in that area of the WCAA to a maximum depth of 15 feet, unless a plan is developed that will reduce the chloride concentration by blending the water from that mined cell with the water of an adjacent mined cell that has a lower chloride concentration. This depth criteria has been established because it has been shown that cap rock generally occurs at this depth in the WCAA. The cap rock acts as an aquitard which significantly restricts upward movement of the generally high chloride groundwater that is below the cap rock. Previous data from the EAA has shown that not all areas have a high chloride concentration.

As part of the NIC review process, ERM staff works with the applicant to determine the appropriate locations for soil borings and monitoring wells for the obtainment of the water quality data. ERM reviews the relationship of Total Dissolved Solids (TDS) and chlorides with the depths of the rock formations. In most cases, by this time in the permitting process, the applicant's consultant will have already completed soil borings and an associated water quality analysis to demonstrate what the water quality is for the general area of mining that administrative waiver is being sought. Based on that information, ERM staff may request additional soil borings to obtain a better understanding of the geology and water quality.

ERM focuses on the water quality within the pits on-site providing there is no discharge off-site and FDEP (through the ERP permit) requires long-term monitoring of off-site subsurface conditions. Should off-site discharge be necessary, additional surface water monitoring at point of discharge may be required, if not addressed by FDEP. The applicant may take this (mine plan and water quality monitoring plan) to FDEP for simultaneous review. Although blasting may fracture the rock, ERM staff does not evaluate any blasting criteria. ERM does evaluate the planted littoral zone and slope reclamation.

After the NIC approval has been issued, ERM staff continues to monitor the excavation through annual reports. Testing of each mined cell on the site is required before that cell can be brought on line. As part of the review process during mining, it must be determined that the mined cell has a chloride concentration at or below 250 ppm. If water quality testing for a portion of the cell does not show a chloride concentration below 250 ppm, then that portion of the cell can only be excavated to a depth that shows the chloride concentration is below 250 ppm. In addition, should chlorides exceed 250 ppm, the Administrative Wavier to excavate to depths greater than 15 feet would be automatically rescinded immediately from the time of discovery. Excavation to 15 feet maximum may continue. Possible remedial actions may include additional monitoring at new locations, restrictions on mining depth or on mining locations, or the suspension or revocation of the permit with restoration of disturbed areas. Should this be the case, the applicant could apply for a second Administrative Waiver for depth by providing supplemental materials to ensure that excavation in a new area can reduce Chloride and or TDS concentration so as to meet the criteria.

Therefore, it is possible that the bottom profile of a pit will have varying depths with the minimum depth being 15 feet as allowed by code. As mentioned earlier, the applicant can submit calculations to show that two or more cells, when combined, will have an average chloride concentration of 250 ppm or less. This scrutiny is all done in an effort to ensure the resulting water body on-site chloride concentration is below 250 ppm.

In addition to the water quality monitoring evaluation that ERM does, a Phase I environmental audit is required of the site. This audit addresses any potential contamination, such as fuel, agricultural chemicals and pesticide storage, mixing and loading areas that exist or may have existed from previous land uses. In addition, the audit must reveal the current and historical use of pesticide, fungicide, rodenticide, herbicide, and other agricultural chemical application activities from land uses on site as well as on adjacent lands. If soil or groundwater contamination is suspected based on Phase I findings, then a Phase II evaluation is required. Phase II involves soil and/or groundwater testing to establish 1) if contamination is present, and then 2) the horizontal and vertical extent of same if it exists. Following Phase II evaluations, a plan to clean up the site must be submitted and approved. So, a Phase II audit would be dependent on what, if anything, is identified during the investigation associated with in the Phase I

audit. An on-site surface water monitoring plan for the resulting water body must be implemented based on current and historical application to the farm fields.

Finally, ERM does review the proposed mining plans for reclamation. The review follows sections 1 and 2 of the Reclamation Standards spelled out in the ULDC. ERM staff checks to make sure that the side slopes of the mined cells and the lake depths meet code. This is done as part of the plan review and then again after construction when the record drawings are submitted to ERM. ERM staff also review the planting scheme for the littoral shelf -around the perimeter of the mined cells and conducts follow-up compliance. One other reclamation item that ERM can request is a $0.05 per ton fee for excavation that is used to purchase other natural lands. No other reclamation effort is accomplished by ERM.

PBC Health Department Involvement

After receiving an application for a mining operation, the Zoning Division sends a copy of the application to the Health Department for their review and comment. It is noted that several items reviewed by the Health Department overlap with the review provided by some of the other Agencies. However, there is one major distinction. The Health Department reviews all the items from a public health viewpoint.

With that in mind, the Health Department will review whether or not a mining operation requires a potable water supply system and/or a sanitary sewer or septic system. If required, Health Department staff review the plans to ensure that the Environmental Code Rule requirements dealing with these two items are met. This ensures that there is not a public health issue by having a safe drinking water supply for the workers on site and not having a health hazard due to a sewer system that does not function properly.

Another item addressed by the Health Department is the dust and air pollution control. Health Department staff then reviews the health related considerations associated with dust or air pollution as a result of the mining operation. They use the Guidelines provided within Chapter 62.296.302, F.A.C. Should the Health Department have a specific concern during the application process regarding dust and air pollution they will forward the concern to the Zoning Department. Should the mining site, during the operation of the mine, create a dust or air pollution concern, then the Health Department will require mitigation measures be taken.

The Health Department also deals with hydrology and geology. The main concern of the Health Department is the health issue associated with pesticides, poisons, or spills as a

result of the mining operation. Health Department staff also reviews the proposed on-site drainage facilities to ensure no standing water will occur that might cause a mosquito health problem. Should the Health Department have a specific concern regarding pesticides, poisons or spills during the application process, they will forward the concern to the Zoning Department. Should the mining site, during the operation of the mine, create a pesticide, poison or spill concern, then the Health Department will require mitigation measures be taken.

The Health Department will also look at the traffic impacts associated with the mining operation. They review the plans to determine the health concerns associated with the proposed traffic. Specifically, they are interested in high Carbon Monoxide levels that may result from too many vehicles in the area. They refer to EPA's National Air Quality Standards for guidance. Should the Health Department have a specific concern regarding Carbon Monoxide levels during the application process, they will forward the concern to the Zoning Department. Should the mining site, during the operation of the mine, create a Carbon Monoxide level concern, then the Health Department may require mitigation measures be taken.

Finally, the Health Department reviews noise pollution. They look to see how close neighborhoods are to the mining operation and try to limit noise per Chapter 64, F.A.C. Should the Health Department have a specific concern regarding noise pollution during the application process they will forward the concern to the Zoning Department. Should the mining site, during the operation of the mine, create a noise pollution concern, then the Health Department will require mitigation measures be taken (with the exception of blasting which is handled solely by the State Fire Marshal). One possible **s**olution, if a problem were to occur, may be to limit the hours of operation for the mine.

FDEP Involvement

As part of the permitting process to obtain approval for a mining operation, an applicant is required to obtain an Environmental Resource Permit (ERP) from either the South Florida Water Management District (SFWMD) or the Florida Department of Environmental Protection (FDEP). This permit review is accomplished with the primary goal of meeting SFWMD water resource objectives as set forth in Chapter 373, Florida Statutes and to ensure the water resources of the state are not adversely impacted as a result of the mining operation. There exists a formal operating agreement between the two Agencies that determines which Agency will process the ERP. According to the Agreement, the SFWMD will handle the review of the permit application for sand, shell, or clay mines if there is no on-site material sorting or grading planned for the mining site. These types of mines are commonly called "borrow pits." The SFWMD would also process the permit if the mining is part of a subdivision development. For all other mines, FDEP will handle the permit review.

The FDEP encourages applicants to provide a draft application and schedule a pre-application site inspection prior to submittal of the formal application. FDEP staff can provide nonbinding comments about the application process and advise the applicant regarding the minimum level of information required for the application. Although the FDEP prefers to have pre-application meetings with the applicant, it is not required by law.

The miner seeking an ERP should have already completed the investigation of the hydrogeology on the proposed site, land use and land covers, wetland evaluations, wildlife surveys and the land use agreement for the property (such as, a lease) prior to submitting an ERP application to FDEP. If the site investigation is not complete, it will be completed during the permit application review process. If there will be dredging or filling in wetlands or other surface waters, the FDEP encourages the applicant to obtain a formal wetland jurisdictional determination. However, there is no law that requires this be done before submitting an application. If the formal wetlands jurisdiction is done prior to the submission of the application, there is no debate during the application process as to where wetlands exist on-site.

In processing the ERP mining application, if it is determined that there are wetlands on-site, FDEP sends a copy of the application to the U.S. Army Corps of Engineers (ACOE) for review and permitting. If the wetlands are within the federal jurisdiction, the ACOE will contact U.S. Environment Protection Agency (EPA) and the U.S. Fish & Wildlife Service for comments that Federal regulations are met. The ACOE cannot issue their permit until the state has issued or waived the water quality certification.

For all mine applications, FDEP sends a notice of application to the FDEP district office, the SFWMD, and the county to solicit comments.

For applications within coastal counties, FDEP sends a notice of application to the Department of Community Affairs (DCA). DCA conducts a consistency review under Florida's Coastal Zone Management Program, as required by the federal Coastal Management Act. The ACOE also requires consistency with the Coastal Zone Management Program for the federal wetlands permit. For all mines, DCA also determines whether a Development of Regional Impact (DRI) Review is required. Based on the DRI thresholds, no limestone, shell or sand mine has been required to go through the DRI review, except when the mining was part of a large subdivision development project that exceeded DRI thresholds.

If there are wetlands involved, FDEP also sends a copy of the notice of application to the Department of State, Division of Historic Resources. This Agency looks for historic and archeological resources that may be impacted as a result of the proposed mining operation. This Agency may request a formal survey of the site conducted by a certified archeologist. The finding of historic or archeological artifacts may require the project to be revised to mitigate for the impacts. If there are no wetlands on-site, there is no requirement for this historic and archeological review to take place.

If there are wetlands involved, FDEP also sends a copy of the notice of application to the State Fish and Wildlife Conservation Commission. This Agency will review the application to determine if there are any potential for impacts to the state listed animal species. If it is determined that there could be impacts, these impacts must be mitigated in a manner acceptable to the Agency. The Commission may require a separate takings permit.

If navigable waters are in the proposed site, FDEP will send a copy of the notice of application to the FDEP, Division of State Lands to determine if there are impacts to any sovereign submerged lands. These are lands under navigable waters that are owned by the State. As a rule of thumb, if a natural water body could be canoed, then it could be considered navigable waters. The proprietary determination is made by the Division of State Lands. If there are impacts, they will decide what type of lease agreement will be needed. If the proposed mining were to be on state uplands or submerged lands, then the mining lease would have to be competitively bid. The state Cabinet has the authority to grant the lease without competitive bidding, if there is clear public benefit.

Depending on the location of the project, FDEP will notify other regulatory agencies that may have an interest in the permit application. For example, in the vicinity of proposed CERP projects, FDEP staff coordinates internally with CERP staff to determine whether or not a proposed mine could impact a CERP project. Other such commenting agencies could include FDEP, Division of Recreation and Parks, FDEP Springs Coordinator, FDEP Office of Greenways and Trails, and land managers for adjacent public lands.

FDEP staff will review the application to ensure the conditions of issuance and additional conditions for issuance as listed in sections 40E-4.301 and 40E-4.302, F.A.C. are met. FDEP staff will also use the Basis of Review (also incorporated in Chapter 40E-4, F.A.C.) to determine if the technical criteria has been met. FDEP did not adopt all of the sections of the SFWMD rules. FDEP is looking to have compliance mainly with these items: (1) water quality, (2) water quantity, (3) wetlands and other surface water impacts. If a project will meet all of the conditions and additional conditions for issuance, then an ERP must be issued.

The applicant must consider practicable design modifications to eliminate or reduce impacts to wetlands and other surface waters. If after practicable design modifications are considered, adverse impacts cannot be avoided, FDEP requires wetland mitigation, unless the rules specifically do not require mitigation. Wetland mitigation is based on the Uniform Mitigation Assessment Method of Chapter 62-345, F.A.C.

As part of the water quality review, FDEP checks for potential turbidity problems. A plan is required to protect adjacent property, and avoided wetlands and other surface waters from turbidity and sediment. The project must be designed to contain the 25-year, 3-day storm within the project area. FDEP also is concerned about possible spills on-site due to the storage and handling of petroleum products needed for the operation of the mine. A plan of BMP's is reviewed and approved to provide reasonable assurance that impacts due to spills are eliminated. A separate petroleum storage permit may be required from the FDEP district office.

Although FDEP does not regulate blasting as part of the ERP, they indicated they have found no literature to indicate that blasting causes any water quality impacts. It is noted that an exhaustive research of the subject was not done.

FDEP noted that criteria for the prevention of contamination of a well is set in Chapter 62-532, F.A.C., and the maximum setback requirement for a public well is 500' from the worst possible contamination. The Basis of Review requires that wet retention/detention areas be no closer than 300 feet to public water supply wells. Also, the project must maintain existing water table elevations in the cone of depression.

There is no specific standard for setbacks of mines from natural water bodies. The lake-wetland separation is based on computer models using standards provided in the Basis of Review. When wetlands are adjacent to a mining operation, the permittee is required to monitor the adjacent wetlands for impacts to water levels that may be associated with the mining operation. If needed due to dewatering on-site, recharge wells or ditches are utilized and the wetlands are monitored for impacts**.** Water quantity monitoring that is required by the SFWMD's Water Use Division is usually more extensive than that required by FDEP.

After obtaining the ERP, the applicant must obtain an Industrial Wastewater Permit from the FDEP district office, per Chapters 62-620 or 62-660, F.A.C., if water will be used in the processing or transport of materials. The project may qualify for a General Industrial Wastewater Permit if it can contain the 25 year, 24 hour storm event, will not use chemicals other than FDEP approved water conditioners or pH adjusters, and obtain an exemption from groundwater monitoring. If the proposed operation does not qualify for a General Wastewater Permit, then an Individual Wastewater Permit must be obtained.

Also, FDEP requires the reclamation of the land disturbed by mining under the requirements of Chapter 378, F.S. The reclamation program is not a permit program and does not regulate activities related to mining or material processing. Before mining begins, the operators of limestone mines must provide a reclamation plan, and the operators of other resource mines must provide a mining notice. The final reclamation of the land must also meet the water resource protection requirements of the ERP.

SFWMD Regulation Department Involvement

As part of the permitting process to obtain approval for a mining operation, an applicant is required to obtain an Environmental Resource Permit (ERP) from either the South Florida Water Management District (SFWMD) or the Florida Department of Environmental Protection (FDEP). This permit review is accomplished with the primary goal of meeting SFWMD water resource objectives as set forth in Chapter 373, Florida Statutes and to ensure the water resources of the state are not adversely impacted as a result of the mining operation. There exists a formal operating agreement between the two Agencies that determines which Agency will process the ERP. According to the Agreement, the SFWMD will handle the review of the permit application for sand-shell mines if there is no on-site material sorting or grading planned for the mining site. These types of mines are commonly called "borrow pits." For all other mines, FDEP will handle the permit review.

Assuming the review conditions are met for SFWMD to be the review Agency, SFWMD staff will review the ERP application using the technical criteria listed in Chapter 40E-4, F.A.C. The miner seeking an ERP should have already completed the investigation of the geology on the proposed site and the land use agreement for the property (such as, a lease) prior to submitting an ERP application to SFWMD. If the site investigation is not complete, it will be completed during the permit application review process. Although the SFWMD prefers to have pre-application meetings with the applicant, it is not required by law. While the review process with SFWMD is on-going, the applicant has the option of parallel processing with Palm Beach County ERM, if they so desire.

In processing the ERP mining application, if it is determined that there are wetlands on-site, then SFWMD sends a copy of the application to the U.S. Army Corps of Engineers (ACOE) for review and permitting. If the wetlands are within the federal jurisdiction, the ACOE will contact EPA and the U.S. Fish & Wildlife Service for comments that Federal regulations are met. The ACOE cannot issue their permit until the state has issued or waived the water quality certification. If SFWMD determines there are wetland impacts, they require mitigation.

When wetlands are adjacent to a mining operation, SFWMD monitors the adjacent wetlands for impacts that may be associated with the mining operation. If needed due to dewatering on-site, recharge wells or ditches are utilized and the wetlands are monitored for impacts. SFWMD noted that there is no specific standard for setbacks of mines from natural water bodies. The lake-wetland separation is based on standards provided in the Basis of Review. Water quantity analyses are accomplished by the SFWMD's Water Use Division. A copy of the permit application is sent to the Water Use Division for their comment and may require a separate Consumptive Use Permit.

If there are wetlands involved, SFWMD also sends a copy of the application to the Division of State Historic Resources. This Agency looks for archeological information on- site that may be impacted as a result of the proposed mining operation. The finding of any archeological artifacts may require the project to be revised to mitigate for the impacts. If there are no wetlands on-site, there is no requirement for the archeological review to take place.

When wetlands are involved, SFWMD also sends a copy of the application to the State Fish and Wildlife Conservation Commission. This Agency will review the application to determine if there are any impacts to the state listed animal species. Impacts must be mitigated in a manner acceptable to the Agency. It should be noted that the applicant can request a formal wetland jurisdiction prior to submission of the ERP application in order to identify the location of wetlands. However, there is no law that requires this be done before submitting an application. If the formal wetlands jurisdiction is done prior to the submission of the application, there is no discussion as to where wetlands exist on-site.

If navigable waters are in the proposed site, SFWMD will send a copy of the application to the Division of State Lands to determine if there are impacts to any State owned lands. These are lands under navigable waters that are owned by the State. If there are impacts, they will decide what type of lease agreement will be needed. As a rule of thumb, if a natural water body could be canoed, then it could be considered navigable waters. The proprietary determination is made by the Division of State Lands. If the proposed mining were to be on state uplands or submerged lands, then the mining lease would have to be competitively bid. The state Cabinet has the authority to grant the bid to one entity if there is clear public benefit.

SFWMD staff will use the Basis of Review (also incorporated in Chapter 40E-4, F.A.C.) to determine if the technical criteria has been met. SFWMD is looking to have rule compliance mainly with these items: (1) water quality, (2) discharge requirements, (3) wetlands. They are also looking for any impacts to natural streams. If a project meets all of the technical criteria and is not inconsistent with the objectives of the SFWMD, then an ERP can be issued.

As part of the water quality review, SFWMD checks for potential turbidity problems. As a result of this review, the applicant may be required to provide a plan that eliminates the impacts due to: turbidity to off-site property, avoided wetlands and other surface waters. SFWMD also is concerned about possible spills on-site due to the storage and handling of petroleum products needed for the operation of the mine. A plan of BMP's is reviewed and approved to provide reasonable assurance that impacts due to spills are eliminated. A separate petroleum permit may be required from FDEP. District staff will also coordinate with Everglades WOD staff for water quality purposes.

Finally, District Regulatory staff coordinates internally with CERP staff to determine whether or not a proposed mine is within a CERP project footprint. If it is, then the project must be revised. It is also discussed as to whether or not the proposed mining operation is consistent with the goals and objectives of CERP. If it is not, then the mining operation is required to be revised to make it consistent or will be denied.

SFWMD does not review blasting as part of their review process.

SFWMD Water Use Division Involvement

Regardless of which Agency (SFWMD or FDEP) does the review for an ERP application, the SFWMD Water Use Division always does the review for a consumptive use permit application. The definition of consumptive use is any use of water which reduces the supply from which it is withdrawn or diverted, either surface water or groundwater. The SFWMD will issue a consumptive use permit for dewatering or an industrial water use permit for rock washing or both. All consumptive use permits associated with mining are issued for a duration of five years, but are eligible to be renewed.

There are two types of mining techniques used for excavation of rock, dewatering (lowering the groundwater table locally) to mine the rock with pans or excavation in the wet (using a dragline/dredge to remove the rock from the excavated area) that the Water Use Division reviews in the permit application. When a mining pit is not dewatered, the applicant must demonstrate that the water is being held on-site or provide technical infeasibility that water can not be held on-site. Water that is held on-site does not create a problem for off-site water bodies, which is a goal of permitting the mine from a water use standpoint.

If the applicant can demonstrate infeasibility for holding the water on-site and needs to have discharge off-site, he must provide a monitoring plan for turbidity and chlorides. This plan must provide a dilution/blending program with technical data to demonstrate that the discharge off-site meets state water quality standards for chlorides, suspended

solids, and other constituents. The plan will include a schedule for monitoring discharges for an approved interval and show the exact routing of water both on-site and off-site. The analysis will demonstrate how the high chloride water is blended with water on-site to reduce the chloride level to meet standards before being discharged into an off-site water body. The routing plan will show how the turbid water is handled.

If the mining operation is to be accomplished using dewatering, then the primary interest of the Water Use Division is to determine what the impacts of lowering the water table locally will be. The Water Use Division uses as the "area of influence" anywhere where the water table has been lowered by 0.1 foot (0.1 foot drawdown). The review will include a determination as to what resources would be impacted or harmed by the proposed drawdown. For example, the following resources are reviewed in detail to ensure no adverse impacts to:

(1) wetlands
(2) salt water intrusion (if applicable)
(3) existing legal users
(4) domestic uses (single family homes with a single withdrawal facility)
(5) minimum flows and levels (if established)
(6) regional water availability (if applicable)
(7) movement of pollution- SFWMD's criteria is no movement within the "area of influence"

An industrial water use permit is issued if water is needed for rock washing as part of the mining process to prepare the rock for market. The review process used by the Water Use Division is roughly the same process as the dewatering review process mentioned above, with one exception. The water from the rock washing process must stay on-site because of the potential adverse water quality impacts to off-site water bodies if this processed water were to be discharged. Rock wash water is very turbid and usually high in a number of water quality parameters. The Water Use Division will not issue a permit to discharge water off-site from a mining operation that does not meet state water quality standards.

Department of Financial Services
Division of State Fire Marshal
State of Florida Bureau of Fire Prevention Involvement

The State Fire Marshal has the sole and exclusive authority to promulgate standards, limits, and regulations regarding the use of explosives in conjunction with materials during mining activities. Statewide blasting limits are established in Section 552.30, Florida Statutes, and Florida Administrative Code 69A-2.024**.** Blasting shall be under those established limits when accomplished by those firms licensed by the Division of State Fire Marshal to engage in construction mining. Construction mining is defined as the extraction of limestone and sand suitable for production of construction aggregates, sand, cement, and road base materials for shipment offsite by any person or company primarily engaged in the commercial mining of such natural resources.

The Bureau of Fire Prevention within the Florida Department of Financial Services is the only agency that reviews the blasting procedures used at a mining site during excavation. Their authority to perform this review comes from Section 552.30, Florida Statutes. The initiation of submitting an application to obtain a blasting permit rests with the mining company. This permit is separate from all other permits that the mining company must obtain to accomplish excavation on a particular mining site.

As part of the blasting application, the mining company identifies who they will contract with to perform the blasting necessary to loosen the rock for excavation. The blasting contractor must be licensed by the State and as part of his license must declare what is the purpose of the blasting to be performed, such as construction mining. All applicants for a license to manufacture, distribute, use, or store explosives must be cleared by a criminal background investigation and successfully pass a competency examination prior to a license being issued.

A construction mining firm must contract with a firm or individual holding a current explosives license. The Construction Mining Permittee, as well as the licensed explosives firm, must post a bond or letter of credit issued in compliance with Section 552.38, Florida Statutes, with the State Fire Marshal prior to the commencement of any blasting. The bond or letter of credit specifically authorizes recovery by the Department of Financial Services on behalf of a prevailing party in an action for damages sustained under the Florida Construction Materials Mining Activities Administrative Recovery Act, Sections 552.32-.44, Florida Statutes. The user of the detonating materials is responsible for the safe storage and use of the detonating materials at the mining site.

Additionally, the mining company must contract with a seismologist who will monitor every blast performed at a mining site. Seismologists must use equipment that meets the requirements of section 69A-2.024 of the Florida Administrative Code. The seismologist must keep a record of all that was done for each blast, including the time and date of each blast, peak particle velocity (PPV) per blast, sound decibels, and the position of the system including direction and distance in feet to the nearest building. The records will also show the amount of detonating material used for each blast, as well as, keeping a log of the seismograph generated by the blasts. In order to prevent damage to homes, blasting ground vibrations are set statewide in accordance with the mandate of FSS 552.30(2) which requires the limits conform to the United States Bureau of Mines, Report of Investigations 8507, appendix B, Alternative Blasting level criteria (Figure 1). Based on the safe level of blasting vibrations for houses, as shown in Figure B-1, the use of explosives within two miles of an urban development shall not exceed a peak particle velocity of more than 0.5 inch per second. In order to meet the urban development criteria there must be 25 or more homes. Anything less than that, such as a rural home, the blasting limit would be 0.75 PPV. In addition to residential development the requirement to limit the peak particle velocity to less than 0.5 inch per second applies to highways, bridges and pump station facilities and other structures. SFWMD experience with blasting within the EAA indicates that velocities ranging to 0.5 inch per second are readily obtainable provided sufficient clearance (usually between 1000'- 2000') from structures has been obtained. Both SFWMD and FDOT limit the PPV to 0.5 inch per second for all structures. While there are no specific requirements for roads, FDOT does require a blasting permit and a pre-blast survey near highway facilities. For levees, dams and other earthen facilities the limiting criteria is higher to mitigate against damage to the foundation (caprock) in close proximity to a blasting operation. The SFWMD has found, through blasting experience in the EAA with CERP projects, that velocities up to 3 inches per second are permissible without damage to the caprock foundation. In most locations, the EAA caprock layer has been "cut" to create the network of irrigation and drainage canals used for previous agricultural operations. These discontinuities in the caprock layer create manmade buffers to the traveling waves through the rock during blasting. This results in pronounced reductions of the peak particle velocity beyond the canals for normal powder factors used in excavation of rock in the EAA.

Any complaints home owners or property owners have about possible damage from blasting or about anything related to the construction mining blasts can be registered with the Regulatory Licensing Section of the Bureau of Fire Prevention, Division of State Fire Marshall. Division personnel will respond to each complaint to determine if a violation of the statute or rule has occurred. The Division lacks the authority to reduce statewide blasting limits, however, the Division does have the ability to impose administrative penalties against a mining company that exceeds those limits or violates other provisions of the law or rule chapter. If a violation of the law or rules has not occurred, should a home owner or property owner believe they have sustained damage as a result of the construction mining blasting, they can seek relief through the Department of Administrative Hearing.

ACOE Involvement

As mentioned previously in the FDEP Involvement section, as part of the ERP review process the FDEP sends a copy of the application to the Army Corps of Engineers (ACOE) if it is determined that there are wetlands on-site. This is generally how applications are received by the ACOE. However, the applicant can also provide the ACOE with a completed copy of the ERP application to expedite the review process.

The ACOE evaluates each project to determine if there are wetlands or waters of the United States (U.S.) (jurisdictional to the ACOE) that are being affected/altered/impacted by same. The ACOE also requires consistency with the Coastal Zone Management Program for the federal wetlands permit.

Currently, the ACOE asserts jurisdiction in the EAA canals which may be considered waters of the U.S. based on past and recent court rulings. Pursuant to the Food Security Act of 2002, as long as the existing (prior converted) farmed lands within the EAA remain in agricultural use, the ACOE does not claim jurisdiction/require permitting over lands for the farming activities. If a land use change is proposed for an agricultural site, then the ACOE will evaluate the involved lands for jurisdiction as they would for any other non-farmed parcel.

Entities requesting impacts and or alterations to wetlands and other waters of the U.S. under the jurisdiction of the ACOE are required to sequentially evaluate the project for:

- Practicable alternatives that result in avoidance of wetland impacts;
- Practicable alternatives that result in reduction of impacts to wetlands;
- Sufficient and appropriate compensatory mitigation for projects that meet the avoidance and minimization analysis.

If an applicant meets these requirements, a permit will be issued. If an application does not meet the Corps rules it must be revised to do so to receive a permit.

The basic premise of the ACOE regulatory program is that no placement of fill materials into the waters of the United States may occur if there is a practicable alternative that is less damaging to the aquatic environment or if the nation's waters would be significantly degraded by the proposed activity. The ACOE utilizes both a public interest test and environmental review criteria set forth in Section 404(B)(1) Guidelines to review and evaluate permit applications. The public interest test considers the extent of the need for the proposed work, as well as other broad factors including, but not limited to: economics, aesthetics, environmental concerns, wetlands, fish and wildlife values, water supply, water quality, mineral needs, and historic properties. Additionally, all projects must demonstrate compliance with the National Environmental Policy Act (NEPA).

Listed below are initial concerns and considerations that would need to be addressed through the Corps' regulatory review associated with potential mining in the EAA. This list is not inclusive and the issues are not ordered by priority.

• Alternatives: A comprehensive alternatives analysis of other sites would be required. Because mining is a non-water dependent activity it is presumed that alternatives to impacting wetland areas are available.

• Threatened and Endangered Species: A number of federally listed species including but not limited to Florida panther, eastern indigo snake, wood stork, Audubon's crested caracara, and Everglades snail kite are known to be present in the EAA.

• Cultural Resources: Mining activities in the EAA may adversely affect sites that are potentially eligible for listing in the *National Register of Historic Places*.

• Cumulative Impacts

• Irreversible/irretrievable commitment of resources

• Location: Mines proposed near Herbert Hoover Dike (HHD), Comprehensive Everglades Restoration Plan (CERP) features, stormwater treatment areas (STA's) or canals may affect seepage beneath levees, from reservoirs and STA's, and to/from canals.

• Depth of mining: Excavations may affect the quality of water entering/leaving the quarry through the quarry walls and floor (depending on water levels maintained in the quarry).

• Excavation methodology to be employed (Dewatered or wet excavation). There are specific methods for managing water from dewatering activities that should be employed.

• Will additional water be lost to evaporation?

• Use of quarries for water storage: One of the issues being raised in support of mining is that the quarries will potentially store water which will be available for stakeholder use.

• Water quality: Analysis of potential impacts from mining to surface and groundwater. Analysis of current and reasonably foreseeable future consumptive uses of surface and groundwater. Quality of water seeping (upwelling) into or from quarry and its effects on flora and fauna of receiving and downstream waters, including STA's.

As mentioned previously, the ACOE also coordinates with the SWMD/FDEP on whether or not a particular mining project will have an impact to a proposed CERP project. If it is determined that an adverse impact exists, then a revision to the mining project is required to eliminate the impact.

FDOT STRATEGIC AGGREGATE STUDY

The Florida Department of Transportation (FDOT) recently completed a study (Strategic Aggregates Study: Sources, Constraints, and Economic Value of Limestone and Sand in Florida, dated March 12, 2007) that evaluated the current and future availability of crushed stone in Florida for road building and the impacts to the economy associated with the curtailment of aggregate production within the state. FDOT is the single largest contractor/user of crushed stone within the state, although a significant amount of crushed stone is used for commercial/home building. The FDOT investigation also looked at issues related to the quality and location of rock formations presently mined throughout the state of Florida. This is important because approximately 93 per cent of all crushed stone used for road building within the state is mined in the state. Close to 43 percent of all crushed stone is excavated from the Lake Belt Region in Miami-Dade County. The research for FDOT's study was done over an 11 month period from March 2006 through February 2007. A large range of stakeholders contributed to the study.

As mentioned above, the study focused on two issues: (1) availability of rock and (2) the economic impacts of curtailed mining within the state. The key findings of this study are:

1) Florida is heavily dependent on resources from the Lake Belt Region of Miami-Dade County
2) For many applications, the quality of rock outside the Lake Belt Region is declining
3) Identified Aggregate reserves do not appear adequate for the future
4) Infrastructure for increasing imports is not in place- either by ship or by rail
5) Some residential developments in rural areas impinge on existing mine operations

FDOT made the following preliminary recommendations within their report pertaining to future planning for providing aggregate for the state in the coming years:

1) Regulatory changes are needed to continue mining existing reserves efficiently and cost effectively
2) Florida needs to consider limestone from a statewide perspective
3) Port capabilities will need to be increased 5-10 fold, and
4) Rail infrastructure improvements and additions will be needed to handle imports and efficient intrastate distribution of aggregates.

The FDOT study indicated several challenges that need to be addressed by policy makers at all levels of government. FDOT believes that if the recently created Statewide Mining Task Force will look closely at these issues that will be a good forum to start addressing these challenges. Some of the challenges mentioned were: inadequate in-state aggregate reserves, Florida's dependence on the Lake Belt Region for aggregate, regulatory considerations of the aggregate resource locations, lack of transportation improvements needed to move aggregates through the state, and funding infrastructure needs.

Availability of Rock

According to the FDOT study, there are three types of mines in use today in Florida and they can be characterized by their size; mega-mines, regional mines and local mines. There are only six mega-mines located within the state, with five being in Miami-Dade County (all within the Lake Belt Region). These mega-mines serve very large markets by producing more aggregates that can be utilized locally. These mines have infrastructure in place to be able to export aggregate that serve markets throughout Florida. The sixth mine, located in Ft. Myers, does not have rail access and therefore, serves only the southwest Florida area. These mega-mines usually have reserves that last 30-50 years. However, in the case of the Ft. Myers mine, it is estimated the reserve will last only eight more years.

Regional mines serve a market that is within 80-100 miles of the mine. These mines usually provide the highest quality material with significant reserves, but many times are restricted from expansion due to surrounding development. An example of a regional mine near the EAA is the Palm Beach Aggregates mine.

Local mines are small scale and generally produce materials for local markets. Many times these mines are owned by a road construction company or a local government and have a small reserve area. One problem identified in the FDOT report with small mines is that many are planned from the start to be a waterfront real estate development. Much of the mined material is used in preparation for the development and some materials are sold to others. The mining is done in such a way as to create curvilinear lake banks to maximize waterfront property rather than maximize recovery of the rock resource.

Although there are limerock mines currently in operation in 22 counties, there are only six multi-county clusters that have been identified by FDOT as having significant reserves of high quality rock to be considered a materials resource area. These multi-county cluster areas are: (1) Miami-Dade/Broward, (2) Palm Beach, (3) Collier/Lee, (4) Lake/Polk, (5) Hernando/Sumter/Citrus, and (6) Taylor/Dixie.

The FDOT report defines a materials resource area as: "A geographic area where the geologic conditions have been evaluated and suggest a high likelihood that limestone or sand is present that will meet FDOT-standards for construction materials and that the deposits are of a size to economically justify the creation of large mines with significant reserves."

The study identified the western Palm Beach County area (EAA) as having several thousand acres of land that contains limestone suitable for crushed stone based on recent drilling in the area. The FDOT report recognizes that new mines in this area must take into consideration any restoration efforts in the area, but also recognizes the potential this area has for producing quality rock. The FDOT study is suggesting that these materials resource areas should be considered as "areas of critical concern" as a natural resource planning tool.

Economic Impacts of Curtailed Mining

The FDOT study indicates there are two key modes of transportation for moving aggregates within the state: trucks and rail. Both of these modes of transportation affect greatly the cost of aggregate. According to the FDOT study, trucks are the prime movers of crushed stone within the state. Most rock deliveries are from mines less than 30 miles away. In areas served by regional mines the truck hauls can be as much as 80-100 miles with no back haul opportunities. The cost of crushed stone is most influenced by the haul distance and fuel costs.

Rail transportation also plays a key role in the movement of crushed rock within the state. The majority of locomotive power and rails to move aggregate currently within the state are provided by the CSX Railroad and the Florida East Coast Railroad. The South Central Florida Express is a shortline railroad located in south Florida that almost exclusively serves the sugar industry in the EAA. Improvements would be needed to be made to the shortline railroad in the EAA in order to allow larger hopper cars to carry crushed stone to the main rail lines to bring the stone to the east and central markets.

The FDOT has identified future potential problems within the aggregates supply chain. Of particular concern mentioned in the report is the challenge to the existing mining permits for mines within the Miami-Dade Lake Belt Region. As mentioned previously, a large portion of the crushed stone used in the state comes from this area. The economic review, done as a part of the study, looked at the impacts of the shut down of the mines within the Lake Belt Region. The study states that any scenario that causes a shut down of production within these mines will have serious economic consequences within 30 days of the shut down. The worst case modeling of a complete shut down would have a total annual impact to the state of $ 28.6 billion in lost economic output, and a loss of $11.2 billion in lost wages due to the loss of 288,000 jobs. Although no dollar figures were given, the study states that further modeling done showed that even a 5 percent reduction in the Lake Belt Region mine productivity will have significant and cumulative impacts because replacement of the material within the supply chain is not often available.

Conclusions

This report attempts to address whether or not main issues raised by stakeholder groups are adequately addressed during the permitting process of a mining operation. There are numerous agencies involved in the review of the permit application. Each agency involved addresses specific criteria to ensure the protection of surrounding surface waters, groundwater and other public interests. Permitting criteria currently exists to address potential groundwater and surface water movement of water containing high chlorides, potential impacts to wetlands, potential impacts to surrounding lands due to blasting, and potential impacts to CERP projects. Table 1 shows which agencies address which issues in their review process. **After holding several meetings with the permitting agencies, the conclusion among the agencies was that while the current permitting process was generally sufficient to adequately address the issues that have been raised (shown below), there were some improvements that could be made to the permitting process that would provide an improved coordinated review.**

Issues Raised

1. What are the environmental impacts associated with mining?
2. What are the economic impacts associated with limiting mining?
3. What are the impacts of blasting associated with mining?
4. What are the groundwater contamination /water quality issues associated with mining?
5. Should there be long term monitoring of mines for water quality purposes?
6. What areas of the EAA may be beneficial for existing CERP projects or other future restoration projects? Evaluate interference between mining and these projects.
7. How should the mining areas be reclaimed?
8. Should there be additional criteria used for future mining operations?

The agency representatives agreed that better coordination was needed among the agencies. Certain improvements were identified that would accomplish this. These improvements to the process are listed as follows:

1. Have the County Engineer's Office evaluate the need to have the traffic & transportation analysis extended to greater than 5 miles during reviews.
2. All Agencies, including the County, should work with the newly created Statewide Mining Task Force to develop better terminology and more comprehensive standards for reclamation efforts at mining operations. The County staff should also work with the Statewide Mining Task Force on mining of wetlands/mitigation areas within the EAA, as part of a regional reclamation effort, to eliminate piece meal construction of wetlands that have limited or no value.
3. Establish procedures for improved coordination between Agencies during reviews. The County could develop a white paper on this subject for the Statewide Mining Task Force.

4. Ask ACOE to establish setbacks for excavation and the Herbert Hoover Dike, CERP Projects and the C&SF Flood Control Project.
5. Establish a procedure whereby the County coordinates a Pre-application meeting for all agencies (if requested by the applicant) to identify issues for any mining site.
6. County shall work with the SFWMD to further clarify mechanisms/technical criteria that identify how/when a mine would benefit a CERP project and District ownership.
7. County shall work with the SFWMD to further clarify whether an EAA mining project can be used for water management purposes.
8. County shall work with SFWMD to further clarify the three criteria in the Comp Plan for determination of the allowance of mining in the EAA.
9. County shall work with the SFWMD to establish guidance for bleeding down reservoirs within the EAA during wet seasons and for wind fetch across reservoirs.
10. County shall work with all Agencies involved in hydrologic analysis of mining to evaluate the need for a more detailed analysis of seepage impacts (including cumulative impacts).
11. County shall support having the FDEP and the Statewide Mining Task Force develop a mechanism whereby there is agreement and acceptance of permit conditions by both the owner of the land and lessee (miner).
12. County shall support having the Statewide Mining Task Force develop statewide mine construction BMP's.
13. County shall work with the Statewide Mining Task Force and other agencies to identify specific agency responsibilities to eliminate review overlap.
14. County shall work with the Statewide Mining Task Force to further clarify which Agency is responsible for addressing impacts to roads, railroads, and utilities.
15. County shall establish better time frames for the review process to ensure a timelier permit review.
16. County shall address the need for landscaping in EAA.

The existing regulatory programs provide reasonable assurance that future mining operations will not impact the performance of proposed CERP projects. Based on the flexibility of the existing water resources system, it is apparent that future mining operations could be incorporated into the regional water resource alternatives. Those alternatives could include additional storage, conveyance systems, sedimentation basins, etc. Therefore, mining within the EAA should not be an impediment to the CERP projects.

The geology of the EAA is heterogeneous meaning that it varies substantially throughout the EAA. However, all sediment borings (sediment borings are shallow holes penetrating only the soil horizons) done to date have not shown rock formations with a great porosity as would be found in Miami-Dade County. This tighter geological formation and more importantly the lower water elevation of the EAA compared to surrounding lands tend to severely restrict water flow out of the EAA. Nothing has occurred over the last 50 years that would have caused the geology or hydrogeology to change.

Permeabilities of the transmissive sediment layers within the EAA are generally several magnitudes lower than those in Eastern Palm Beach County due to the limited occurrence of highly permeable sediments. Also, the water levels in the EAA are usually maintained only slightly below ground surface are several feet below the water levels maintained in the surrounding areas (Conservation Areas to the south and east, ranch lands to the west and Lake Okeechobee to the north). The lower transmissivity and water levels make the hydrogeology and resulting interactions completely different than those of the Miami-Dade County Lake Belt Area. What this means from a hydraulic standpoint is the flow gradient tends to be from the perimeter of EAA toward the middle of the EAA. Based on this information, is not likely there will be any movement of high chloride water from the EAA as a result of mining operations. Additionally, the permitting process that is currently in place will provide an opportunity to evaluate the design of all mining activities to determine whether or not adverse water quality impacts are possible and addressing the concerns by applying specific criteria.

Table 1
Agency Review Matrix
EAA Mining

Agency	Environmental Impacts	Economic Impacts	Blasting Impacts	Groundwater Impacts	WQ Monitor	CERP	Reclamation Impacts
FDOT		**x**					
SFWMD	**x**			**x**	**x**	**x**	**x**
FDEP	**x**			**x**	**x**	**x**	**x**
PBC	**x**	**x**	**x**	**x**	**x**	**x**	**x**
State Fire Marshal			**x**				
Health Department		HEALTH RELATED ISSUES					
*ACOE	**x**	**x**	**x**	**x**	**x**	**x**	**x**
**DCA		DRI	REQUIREMENTS				
**TCRPC		DRI	REQUIREMENTS				

* If Jurisdiction is claimed

** If DRI thresholds are exceeded

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