DRAFT 30 Nov 2011

MEMORANDUM FOR RECORD

SUBJECT: Department of the Army Environmental Assessment and Statement of Finding for Permit Application SAJ-2010-02881

This document constitutes the Environmental Assessment, 404(b)(1) Guidelines Evaluation, Public Interest Review, and Statement of Findings.

1. Application as described in the public notice.

a. Applicant: Autoridad de Energía Eléctrica
P.O. Box 364267
San Juan, Puerto Rico 00936-4267

b. Waterway & Location: The Vía Verde natural gas pipe line project will pass through the municipalities of Peñuelas, Adjuntas, Utuado, Arecibo, Barceloneta, Manati, Vega Alta, Vega Baja, Dorado, Toa Baja, Cataño, Bayamón, and Guaynabo, Puerto Rico.[1]

c. Latitude and Longitude: Latitude 18º27'24.17" North
Longitude 66º40'15.93" West

d. Project Purpose and Need:

(1) Basic: Natural gas utility line.[2]

(2) Overall: Deliver an alternate fuel source to three existing electric power generating facilities located in Peñuelas, Arecibo, and Toa Baja operated by the Puerto Rico Electric and Power Authority (PREPA). [3]

e. Water Dependency Determination: Is not water dependent.

f. Proposed Work: The applicant proposes to construct and install a 24-inch diameter steel natural gas (NG) pipeline approximately 92 miles long with a construction right-of way (ROW) of 100 feet wide, that traverses the island of Puerto Rico from the EcoEléctrica Liquid Natural Gas Terminal in the municipality of Peñuelas, to the Cambalache Thermoelectric Power Plant in the municipality of Arecibo, then east to the Palo Seco power plant facility in the municipalities of Toa Baja and San Juan. The total project area is about 1,672 acres and the pipeline will traverse 235 rivers and wetlands, covering 369 acres of jurisdictional Waters of the United States. [4]

g. Avoidance and Minimization Information: The applicant has provided the following statement: "The applicant evaluated alternative methods to provide natural gas to the power stations. These options included building a terminal to receive liquid natural gas directly from tanker ships at, or near, the power plants; building storage and re-gasification facilities on the

north coast with pipelines to the power plants; and evaluating several different overland routes for a pipeline to deliver natural gas from the existing facility near Peñuelas to the power plants. Public interest and environmental factors were used to identify positive and negative actions with all of these alternatives. The applicant submits the proposed pipeline and the proposed route appear to be the most practical alternative with the least adverse impact to the environment and public safety/interest when considering all factors."[5]

h. Compensatory Mitigation: The applicant has provided the following statement: "The applicant will incur the costs of horizontal directional drilling (HDD) under all medium to large water bodies, i.e. any rivers and embayments, to avoid a discharge of dredged or fill material into waters of the U.S. Furthermore, the applicant has designed the construction of the pipeline to incorporate the use of vertical wall trenching whenever possible during placement of the pipe, to minimize the width of excavation and impacts in wetlands. If vertical trenching construction method is not practicable, standard ditch excavation with sloped walls will be utilized. Regardless of the method used, the project has been designed to avoid permanent impact and all wetland impacts will be temporary in nature. All excess fill or dredged material will be removed and preconstruction wetland elevations will be reestablished. Wetland organic topsoil will be separated during trench excavation and stockpiled in a separate area. This material will be re-used so that the top 6 inches of wetlands restored after the pipe is placed will be 100% organic material. All stream embankments where trenching occurs will be restored and covered with matting to prevent erosion until local wetland plant communities are reestablished. Clearing activities in waters of the U.S. will not incorporate mechanized equipment and mats will be used wherever possible to avoid the need for temporary fill. In situations where temporary roads are needed to construct HDD work pads in wetland areas, these roads and the work pads will be immediately removed after the HDD operation is completed at each crossing. Wetland conditions will be immediately reestablished at each crossing as the project moves forward. If it is determined that some type of additional compensatory mitigation is required to offset the minimal temporal impacts that will occur as the pipeline is constructed, the applicant is prepared to identify upland areas along the edges of existing wetland sites that will be crossed where the uplands can be lowered in elevation (scraped down) and additional herbaceous wetland habitat can be established on an agreed upon acreage ratio. Given the temporary nature of impacts expected to occur from construction, the applicant expects any such mitigation required by the U.S. Army Corps of Engineers (Corps) to be at or below 0.01 acres of compensatory mitigation per 1 acre of temporary wetland impacts."[6]

i. Existing Conditions: The pipeline route will encompass both private and public lands which include commercial, industrial, and agricultural land. In its route, the pipeline will pass along populated urban areas, roads, and highways. Within the north (San Juan to Arecibo) segment of the Project route, the majority of the areas are herbaceous wetlands, rivers, creeks and channel crossings. The north to south segment of the project (Arecibo to Peñuelas) includes mostly rivers, creeks and channel crossings. The wetland systems consist of Palustrine

SUBJECT: Department of the Army Environmental Assessment and Statement of Findings for Permit Application SAJ-2010-02881.

Herbaceous Wetlands dominated by herbaceous species, Estuarine Forested Wetland mainly dominated by mangrove trees, Estuarine Forested Canal mostly dominated by black mangroves (*Avicennia germinans*), and Estuarine Salt Flat dominated by dwarf black mangrove trees.[7]

2. Authority.

☒ Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. §403).

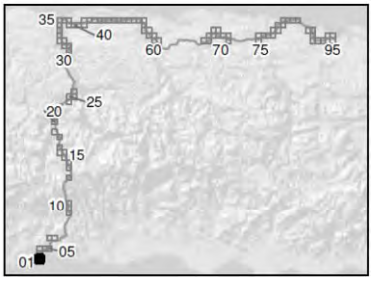
☒ Section 404 of the Clean Water Act (33 U.S.C. §1344).

☐ Section 103 of the Marine Protection, Research & Sanctuaries Act of 1972 (33 U.S.C. 1413).

3. Scope of Analysis. The laws listed in the previous paragraph require PREPA to seek the Corps' authorization for certain types of construction activities. These "regulated activities" include, but are not limited to: (1) temporarily placing the material excavated from the trench to the side of the trench where the trench is located in wetlands, streams or other waters; (2) placing fill in wetlands temporarily for drilling work areas and permanently for valve stations; and (3) placing pilings in and drilling under Waters of the United States. Obviously, PREPA will be performing many other activities besides those regulated by the Corps. This paragraph discusses whether the Corps' analysis should encompass areas outside the footprint of the regulated activities.

a. National Environmental Policy Act (NEPA).

(1) Factors.



(i) Whether or not the regulated activity comprises "merely a link" in a corridor type project. The figure here is from the index sheet of wetland impact maps provided with the application[8]. Each square represents a map sheet on which are found wetland or stream impacts (regulated activities). Observe that there are only a few stretches of pipeline with no regulated activities. In addition, the permit application described crossings of 99 streams and 141 wetlands.[9] The number of regulated activities and their distribution along the route causes the choice of the location of one crossing to constrain the choices of the location of the next crossing. Therefore each individual crossing is not merely a link, but should be analyzed as a group.

(ii) Whether there are aspects of the upland facility in the immediate vicinity of the regulated activity which affect the location and configuration of the regulated activity. The

following three subparagraphs consider whether the Corps' involvement in the construction of the pipeline extend to the facilities at the ends of the pipeline. There are three groups of endpoints. The first group are the three power plants receiving the gas: Cambalache Termoeléctricas Authority Central electric power plant (PES) in Arecibo, the Palo Seco facility in Toa Baja and the San Juan facility in San Juan.[10] The second group is three proposed connections located along the pipeline. The third group is the EcoEléctrica LNG Terminal in Peñuelas, the proposed source of the natural gas into the pipeline.

(a) Power plants. Examination of the aerials indicates plant-sites are uplands. Descriptions of conversion of the facilities describe piping and equipment internal to the existing facility therefore no additional land is needed, and therefore, no Department of the Army authorization is required.

(b) Proposed connections. The construction drawings show three proposed connections distributed along the route. Each consists of a "T" pipe fitting, two legs of the "T" are part of the pipeline and the third leg is simply a stub with no pipe extending laterally from the pipeline. The stubs of the "T" are annotated "Proposed <location> connection", one for Aguirre, Barceloneta, and Bayamón.[11] This implies there will be future additional pipelines extending laterally from these stubs. The following subparagraphs further discuss why the Corps is not including an analysis on the proposed connection stubs.

-1- The Corps analysis will not extend to these future additional pipelines because there is nothing to analyze. The connections were added at the request of Compañía de Fomento Industrial (PRIDCO) to serve various industrial areas.[12] However, the application states the pipeline serves only PREPA[13] The drawings at these locations do not show metering stations nor laterals, while the other "T's along the pipeline are shown as serving the power plants.[14] The applicant when questioned at a meeting stated the project remains as is described in the application, the stubs are being installed now since it would be much less expensive than cutting into existing pipe should a decision be made to provide such a supply connection, however there are no plans now.[15] The applicant by letter subsequently expanded that statement, confirming there are no plans to serve industrial users along the route.[16]

-2- If PREPA decided to pursue the industrial pipelines in the future, then pre-installation of these "T"s could potentially constrain the NEPA analysis of alternative alignments. The applicant recognizes they would have to perform whatever environmental analysis is required.[17] That future analysis will clearly see that in PREPA's application and the Corps' review of this pipeline did not include any evaluation whatsoever of alternatives to service those industries. Therefore, the Corps is confident that future review should not be constrained by PREPA's choices of locations. The Corps accepts as obvious PREPA's statements that adding a "T" and valves now will be a small fraction of the total cost of the 92 mile pipeline and less expensive than cutting the "T" into an active pipeline later if the Applicant

determined to supply industrial users.

-3- The proposed connections do not constrain the ability to avoid or minimize impacts to wetlands. The applicant's original plan for the Barcelonta station appeared to require the same footprint as the station to provide a lateral for Palo Seco (three valves, top of fill 50ft X 101ft) while the other single valve pads were smaller (top of fill is 50ft X 60ft) [18] The Applicant when questioned on this concern[19] subsequently submitted a revised set of wetland impact maps. For Barceloneta, the wetland impact map showed a reduction to conform to the previously submitted detail drawing showing a 50ft X 60ft fill pad for a single valve. For Bayamón, the fill

-4- Finally, while there is

-4- Finally, while there is not sufficient information to analyze the industrial connections as part of the Via Verde application, the analysis very likely would occur (if PREPA decides to supply industrial users) because the locations of the "T's" are such that those connections would likely require a Corps permits. The Aguirre stub is located on non-wetland at the edge of a farmfield but the stub is pointed toward a possible waterway 200+ feet away[21] that would have to be crossed. The Barceloneta stub is located in the midst of a large extent of wetland and the Bayamón stub is located on the edge of a waterway but enough wetlands are in the area that would probably require Corps permits.[22]

(c) EcoEléctrica LNG Terminal.. The Corps' analysis for the pipeline will start at the fence-line of the terminal. This is where the new pipeline connects to the existing "send out pipe". The following subparagraphs discuss the different questions raised and why the Corps is not including an analysis within the fence-line.

-1- The expansion of the terminal to supply PREPA with 93 million standard cubic feet per day (MM scf/day) has already been reviewed and authorized by another Federal agency and therefore the Corps analysis does not need to replicate this. The following statements are from the Federal Energy Regulatory Commission (FERC)'s 2009 authorization[23]. The Department of Energy Office of Fossil Energy granted EcoEléctrica authority to import 130 billion cubic feet of LNG per year for a 40 year term. FERC in May 1996 authorized EcoEléctrica to construct and operate a marine terminal for unloading LNG tankers, two 1-million-barrel LNG storage tanks, six vaporizers, and associated equipment. EcoEléctrica constructed the terminal, one tank and two vaporizers. EcoEléctrica must obtain permission to build more because the May 1996 authorization expired after three years. EcoEléctrica also constructed an electric generation plant using vaporized LNG for fuel, a desalination plant, and a pipeline to serve PREPA's Costa Sur power plant, a.k.a., South Coast Plant, (The FERC order indicates the pipeline was not constructed as of April 2009, but it was constructed by the time of the Corps site visit in 2011). These were not part of the FERC's section 3 authorization. FERC in April 2009 authorized EcoEléctrica to add two vaporizers and associated equipment to supply re-gasified LNG to PREPA's Aguirre power plant. The existing 1.2 mile 24 inch send-out pipe

that extends to EcoEléctrica's fenceline would be interconnected to PREPA's 42 mile pipeline to the Aguirre power plant. Construction of the pipeline started in 2008 as authorized by a Department of Army Permit. The 2009 authorization increases EcoEléctrica's peak send-out of regasified LNG by 93 MMscf/day for a total of approximately 186 MMscf/day and increases the number of LNG vessels by 12 per year for a total of 24 per year. FERC coordinated this increase with the U.S. Fish and Wildlife Service under the Endangered Species Act.

-2- The Corps does not need to analyze EcoEléctrica's supply of gas for the Via Verde pipeline since that supply is the same as described in the previous subparagraph. While the 93 MM scf/day supply under FERC's authorization was originally envisioned to be delivered to power plants on the south coast of Puerto Rico, the 93 MM scf/day will, in addition to the south coast, be also delivered to north coast power plants if the Via Verde pipeline is constructed. PREPA notified FERC that, instead of supplying the Aguirre power plant as described in the 2009 authorization, they would supply the Costa Sur power plant[24]. The Applicant more recently stated the following to the Corps (italicized notes between [ ] are additional text inserted by the Corps): "…the natural gas supply for the Project (approximately 93MM scf/day) [*Compare to 326f MMscf/day for all three north coast plants.*] will be purchased by PREPA in accordance with the Order and Authorization granted by FERC in 2009. This amount of gas will be utilized by PREPA in fueling the power plants that are part of its generating system, providing an option to dispatch the power generating units based on each unit's heat rate, as well as the overall operation cost. This will allow the selection, on a daily basis, of the most efficient operational scenario that yields a reduction in the power cost in Puerto Rico. At this time, and with the natural gas volumes mentioned above, PREPA will be able to fuel, on different operational and loads ratios, Units 5 & 6 of the San Juan Steam Plant [*one of the three north coast power plants*], Units 5 & 6 that recently were converted into dual fuel operation located at the South Coast Plant, and PREPA's other co-fired generating units. The selection of the specific operating scenario for these units that yields the lowest operational cost to PREPA will be undertaken daily through the use of the installed Smart Grid Technology that integrates the use of computer algorithm utilized by PREPA for the last twenty years. To accomplish the actual delivery of natural gas to PREPA's operational system in compliance with the FERC 2009 Authorization, PREPA will provide written notice to EcoEléctrica and FERC with respect to the change in the gas usage end point for the additional gas supply that has been authorized. Gas will be supplied through the use of an existing main header coming out from the gasifying units located within the EcoEléctrica facilities, as allowed by the FERC Order and Authorization. This infrastructure will be utilized in supplying natural gas to South Coast Plant units 5 & 6 in the forthcoming weeks. [*The infrastructure is a send-out pipe from the re-gasification units to EcoEléctrica's fenceline where it interconnects to the pipeline to the South Coast Plant*[25]*. If the permit for the 92 mile pipeline is issued, PREPA will replace the first mile of the existing pipeline starting at EcoEléctrica's fenceline and insert a metering station to interconnect both the South Coast Plant and the 92 mile pipeline to the north coast.*[26]]. It must be pointed out that all permits and authorizations required for the delivery of the volumes of

natural gas mentioned above are in place at EcoEléctrica as of the date of this communication. [*While the statement is correct that authorizations are "in place", FERC's authorization included certain environmental and other conditions prior to construction of the additional regasification units to enable a concurrent supply of gas to both EcoEléctrica's powerplant and to PREPA, FERC granted approval to commence initial site preparation on July 12, 2011.*[27] . *The operation of the South Coast Plant mentioned earlier in this letter used gas not needed by or by curtailing supply to EcoEléctrica's generating units.*] This permit also considers an increase in the amount of LNG deliveries to the Peñuelas LNG terminal from the actual number of vessels of 12 per year to 24 vessels per year. [*The FERC authorization and the Corps Permit for EcoEléctrica's LNG off-loading pier issued in 1996 reference the Biological Opinion from the U.S. Fish and Wildlife Service evaluating effects of up to 25 vessels per year.*[28]]"[29] FERC advised that their 2009 Order would not need to be modified due to the addition of the Via Verde pipeline up to 93MMscf/day.[30] [*The Applicant later stated that the EcoEléctrica generators at maximum will consume 77 MM scf/day, less than the capacity of the two existing regasification units, therefore if both the existing and new regasification units are operated at maximum capacity, the natural gas available for purchase by PREPA will be between 93 MM scf/day minimum to 120 MM scf/day maximum.*[31]]

-3- The Corps will not analyze the potential increase in supply of gas for two reasons.

-a- Background. The available supply (93-120 MM scf/day) is much less than what the northern power plants could consume (326 MM scf/day) operating with 100% natural gas.[32] In addition, the Applicant has two power plants on the south coast: The Costa Sur power plant can receive gas from EcoEléctrica regasification units through an existing 2 mile pipeline. The Aguirre power plant was intended to receive gas through a 42 mile pipeline but the Applicant has ceased construction and is dismantling it. One of the comment letters calculates the total for the three north coast plants differently from PREPA's above, namely 249 MM scf/day at 60% load factor and 416 MM scf/day at 100% load factor, and for Costa Sur 116 MM scf/day at 60% and 193 MM scf/day at 100% load factor.[33]

-b- The first reason is that there are no plans for increase for the Corps to analyze. This is based the Corps' interpretation of various Applicant's statements that the EcoEléctrica terminal is the sole source for the northern coast power plants and that there are no extant plans for expansion beyond the 93MM scf/day. These statements are as follows: "At this time PREPA intends to meet gas delivery requirements for the project using the existing EcoEléctrica Facility. There is no plan to construct a separate barge offload operation. It is the applicant's position that EcoEléctrica will be able to fully meet delivery needs."[34] "PREPA wants to reiterate that, considering the modifications already approved by the Federal Regulatory Commission (FERC), the EcoEléctrica facility will be able to supply the Via Verde natural gas needs; determined at full capacity, for the San Juan 5 & 6 and Cambalache Combined Cycled

SUBJECT: Department of the Army Environmental Assessment and Statement of Findings for Permit Application SAJ-2010-02881.

Units. Additional product will be available to fuel the Costa Sur 5 & 6 steam units based on PREPA's operating determination. Moreover, approved FERC modifications will allow PREPA to fully utilize available natural gas to fuel its entire north coast facilities based on the capacity established factor, which considers individual heat rates and predetermined fuel mixtures operating characteristics" [35] "Additional modifications to the EcoEléctrica terminal which may be required to provide natural gas to the Via Verde project have previously been reviewed and permitted by Federal Energy Regulatory Commission (FERC) during 2009 as parts of past projects. These modifications to be completed during the last quarter of 2011 can be constructed independent of the existence of the Via Verde project. The overall project purpose is to deliver an alternate fuel source, which already exists at the EcoEléctrica terminal, to the three existing electric power generating facilities located on the north coast of Puerto Rico. This will allow PREPA to select based on power demand and heat rates characteristics the most efficient unit to be utilized to meet the daily power generation demands to be serviced by PREPA." [36] The Vermont Law School in their comment letter references a news article that quotes a PREPA official stating their supplier is Gas Natural de España and not EcoEléctrica. The comment letter states the Corps must examine impacts of their ships and infrastructure. However, the Corps understands that Gas Natural de Espana's ships deliver the gas and EcoEléctrica provides the terminal and re-gasification services[37], therefore the vessels are already included in the FERC evaluations. The Vermont Law School also references another article where the reporter states to supply Via Verde's complete demand would require additional storage and vaporizers. The comment letter states the Corps must include such future projects in its analysis. However, the article did not state such a project was planned, only what such a project would entail.[38] Although there are no plans for expansion of supply to review today, the environmental analysis of such expansion if occurred in the future would still undergo review by FERC.[39]

-c- Secondly, the Corps will not analyze other actions (other than the pipeline) to achieve Puerto Rico's strategic goals of reducing dependency on oil. The proposed pipeline, by enabling delivery of gas to the northern plants, even if less than 100% capacity of those plants, will by itself achieve some reduction toward the strategic goal. The Corps analysis does not have to encompass any and all other actions that would also contribute toward achieving that goal. The Corps has established that the project purpose for the decision on this application is to deliver an alternate fuel source to three existing electric power generating facilities on the north coast. This purpose is a subset of a larger program, described in the "Overall Project Purpose" section of the application as follows "The strategic plan approved by PREPA Board of Directors, directs a reduction in dependence on oil used to produce electricity to below 50% by the year 2014. . . . .In July 2002, through resolution 3024, PREPA adopted a Strategic Plan for development and expansion to control the high cost of electricity and meet requirements under the Clean Air Act. This plan includes the following parameters: . . . To comply with these parameters, the plan required, among other things, increased generating capacity in western Puerto Rico using natural gas as a primary fuel. In addition, the plan contemplated the construction of a gas pipeline from Cambalache at Arecibo, the industrial area of Barceloneta, to

the Palo Seco and San Juan stations. Due to a reduction in demand for electricity, the project to increase capacity in the West has been delayed, but the PREPA decided it is still important to diversify fuels used in the Central Cambalache, Palo Seco and San Juan facilities. At the same time, it is important to reduce operating costs and maintain environmental compliance. The project's overall purpose is to reduce PREPA's dependence on oil for the production of electricity by converting electrical power generation facilities along the north coast of Puerto Rico from oil based fuels to natural gas (NG) in the most economical and practical method possible and using available infrastructure wherever possible." [40] Compared to the Strategic Plan of 50%, the goal is later stated to be 12% when describing the ramifications of the No Action Alternative: "A significant percent of Puerto Rico's generated electrical power depends on oil. At the moment, AEE [*this is the Spanish acronym to PREPA in English*] uses only No. 2 fuel (light distillate) and No. 6 (bunker C) in its generator units and it buys electricity, in turn, from the AES co-generators in the municipality of Guayama (coal) and EcoEléctrica in the municipality of Peñuelas (natural gas). With the introduction of the cogenerators, AEE began to buy electricity generated from NG or coal but internally AEE still depends exclusively on oil. The AEE aims to reduce its dependence on the use of oil, which currently is approximately 68%, to approximately 12% by 2014."[41] Whichever the actual % goal, the Applicant could implement actions in addition to the proposed 92 mile pipeline, such as the reports in the news of contracts being awarded to supply gas to the southern coast plants by ship,[42] to which the Applicant replies "would have to be evaluated at the appropriate time by PREPA in accordance with its Strategic Plan".[43]

(iii) The extent to which the entire project will be within the U.S. Army Corps of Engineers (Corps) jurisdiction. About 33% of the right-of-way of the pipeline is comprised of jurisdictional waters[44], of which 41% will be impacted temporarily[45] based on information submitted with the application. The power plants and EcoEléctrica's Terminal are located in uplands.

(iv) The extent of cumulative Federal control and responsibility. First, for the piping and other work within the power plants, the Corps is not aware of any other Federal control other than this work along with the supply of gas provided by the pipeline that would help PREPA reduce its air emissions to meet standards issued by the EPA. While this is a benefit ascribable to the pipeline project, there is no Corps role in the design or installation of the conversion of the plants. Second, the expansion of the EcoEléctrica terminal is controlled by the FERC authorization, but that authorization has already been made and that authorization is not based on whether the pipeline is built. Therefore, the terminal need not be included in the Corps review. Third, several of the non-wetland portions of the pipeline pass through habitat of species listed under the Endangered Species Act (ESA). For examples: between maps 05 to 10 (referring to the figure in paragraph 3.a.1.(i) above) in Peñuelas, these hills are considered the best quality habitat for the Puerto Rican nightjar; then between maps 10 to 20 where the alignment does not follow the road through the central mountains, it cuts through habitat for the Puerto Rican Sharp-

shinned Hawk and Puerto Rican Broad-wing Hawk; and then between maps 60 to 70 the alignment cuts through the northern karst/mogotes region by Manatí with potential habitat of the Puerto Rican Crested Toad[46]. Overall, 33 listed or candidate species occur through the length of the project.[47] Even if the pipeline avoided all Waters of the United States, the Applicant would have responsibilities under the ESA. In this case, the alignment in the upland ESA habitats is influenced by the choices made in the crossing of wetlands and waters, and vice versa.

(2) Determined scope. Over entire proposed project footprint. This includes the construction right-of-way and work areas for the entire length from the fenceline of EcoEléctrica's terminal to the fencelines of the three northern powerplants.

b. NHPA "Permit Area".

(1) Tests. Activities outside the Waters of the United States are included because all of the following tests are satisfied: Such activity would not occur but for the authorization of the work or structures within the Waters of the United States; such activity is not integrally related to the work or structures to be authorized within waters of the United States (or, conversely, the work or structures to be authorized must be essential to the completeness of the overall project or program); and such activity is directly associated(first order impact) with the work or structures to be authorized.

(2) Determined scope. The choice of the location of stream or wetland crossings directly influences the location of the pipeline route in the neighboring uplands where historic resources could be present. Therefore, the entire construction right of way and work areas for the entire route are included for purposes of the NHPA.

c. Endangered Species Act (ESA) "Action Area".

(1) Action area means all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action.

(2) Determined scope. The immediate area is the placement of fill in Waters of the United States, but the purpose of the work is to install a pipeline which then continues into the neighboring uplands with habitats of listed species. Therefore the entire construction right of way and work areas for the entire route are included for purposes of the ESA.

d. Public notice comments. Public notice was issued 19 Nov 2010, for 30-day comment period. Asociación de Legisladores Municipales de Puerto Rico, 2 Feb 2011, stated there was a failure to notify public of projects adjoining their property, however, all property owners along the right of way were mailed a notice[48]. The addresses were those provided in Appendix E of the Application. For notices returned undelivered, PREPA identified and delivered notices[49].

SUBJECT: Department of the Army Environmental Assessment and Statement of Findings for Permit Application SAJ-2010-02881.

(1) The public also provided comments by e-mail and using the Corp's "Facebook" webpage.

(2) Comments and issues raised.

Name & Date	Issue
David Vukusich,Yolanda Cafiero, and Zulma Clavell, 19 Nov 2010. Repeated by letter 13 Dec 2010.	1. U.S. Government has real property interests near the route. ¶7.i.(1). 2. Applicant's 150 foot separation between pipe and residences is smaller than the 628 foot potential impact radius under 49 CFR 192.903 and smaller than the distances determined to provide appropriate level of risk for a pipeline in Great Britain. ¶7.a.(1). 3. Difficult evacuation and emergency response, large number of evacuees. ¶7.a.(1). 4. Loss of dunes/erosion of Levittown Beach. ¶7.a.(2). 5. Proximity to road increases risk if a gas leak. ¶7.a.(1). 6. There are other alternatives. ¶4.d.
Lcdo. Pedro Saadé Lloréns, et al, 4 Nov 2010, Email of 7 Dec 2010, email of 8 Dec 2010, and letter of 29 Mar 2011	1. Request preparation of EIS. Three major wetland systems (Caño Tiburones, Ciénaga San Pedro, Reserva Natural Ciénaga Las Cucharillas). Studies or reviews not sufficient to know the impacts. ¶10.d. 2. Request Public Hearings to present evidence of impact of project. ¶10.a. - - - - - - - - - - - - - - - - - - - 1. Provided copy of Colegio de Ingenieros y Agrimensores de PR (CIAPR)'s report (see their submittal below dated 17 Dec 2010.) 2. Request EIS. ¶10.d. 3. Request Public Hearings. ¶10.a. - - - - - - - - - - - - - - - - - - - 1. Provided copy of report "MODEL FOR SIZING HIGH CONSEQUENCE AREAS ASSOCIATED WITH NATURAL GAS PIPELINES" ¶7.a.(1). - - - - - - - - - - - - - - - - - - - 1. Reiterate request preparation of an EIS (describes impacts). ¶10.d. 2. Request Public Hearings, necessity should be considered a basic civil and human rights issue. ¶10.a.

SUBJECT: Department of the Army Environmental Assessment and Statement of Findings for Permit Application SAJ-2010-02881.

Casa Pueblo de Adjuntas. Letter of 15 Nov 2010. E-mail of 19 Dec 2010. Letter of 2 Feb 2011. Letter of 28 Feb 2011. Letter of 25 May 2011. E-mail of 10 Aug 2011. E-mail of 15 Nov 2011. E-mail of 21 Nov 2011.	1. Serious damage to forests, wetlands, endangered species. 2. Many people at risk from pipeline from seismicity, tsunamis, fires, floods, landslides and corrosion. ¶7.a.(1). 3. EcoEléctrica does not have capacity or licenses to meet expectations of 70% natural gas usage. ¶3.a.(1). 4. Applicant's EIS deficient. ¶3.d.(7). 5. Petitions attached with many signatures. 6. Request denial of permit. - - - - - - - - 1. EcoEléctrica is located in a tsunami prone zone, error to rely on this for 70% of the fuel needed for the power plants and it also creates a monopoly. ¶7.a.(1). 2. Cross some 5,600 cuerdas of the guabairo habitat. ¶7.b. 3. Cross a coastal zone in Levittown, which is classified as hazard by FEMA. ¶7.a.(2). 4. HDD in karst zone, impacting caves, sinkholes and underground rivers. Involves Cueva Esmeralda which is part of Gran Acuífero del Norte. ¶7.a.(5). 5. PREPA should convert Aguirre and Costa Sur in order to generate 70% of the electric energy demand of the Island. ¶4.g. 6. Impacts to species, habitat and forests. 7. PREPA's document has contradictions and lacking rigor. ¶3.d.(7). 8. There is no emergency but accelerated process leaves unanswered questions. ¶3.d.(7). 9. EcoEléctrica does not have capacity, nor the infrastructure to supply natural gas to the project. ¶3.a.(1). 10. Encloses paper describing electricity from landfill gas, solar and concrete recycling. ¶4.g. - - - - - - - - 1. EcoEléctrica does not have the capacity, nor the infrastructure to supply natural gas to the project.¶3.a.(1). 2. PREPA spent $13million on contracts for northern pipeline before "Energy Emergency" declared. Spent more funds after announcement but prior to project approval. ¶3.d.(7). 3. "Energy Emergency closes door to public participation and endorses one company, EcoEléctrica. ¶3.d.(7). 4. Conflict of interest of participants and companies receiving contracts. ¶3.d.(7). - - - - - - - -

SUBJECT: Department of the Army Environmental Assessment and Statement of Findings for Permit Application SAJ-2010-02881.

	1. Public opposition is strong. 2. EcoEléctrica does not have the capacity. ¶3.a.(1). 3. PREPA should convert Aguirre and Costa Sur in order to generate 60% of the electric energy demand of the Island. ¶4.g. 4. Will only provide savings of 1 cents per kilowatt hour, less then PREPA's 12 cents claim. ¶7.a.(8). 5. FWS letter states project has environmental impact greater than others in decades. 6. Project will cause landslides, erosion and sedimentation that will affect bodies of water. ¶7.a.(5). 7. Affects water supply in karst region. ¶7.a.(5). 8. Fragment forests. 9. Impact habitat of 34 endangered species. ¶7.b. 10. Impact archeological sites. ¶7.d. 11. Hazard from seismicity, etc. . ¶7.a.(1). 12. Passes near schools, etc., puts 200,000 persons at risk. . ¶7.a.(5). 13. Lack of compliance in requirements for High Consequence Areas. . ¶7.a.(5). 14. Letter from environmental law clinics from University of Puerto Rico Law School, Interamerican University Law School and Vermont Law School urge denial of permit. 15. Transfer of review of project to Jacksonville, Florida makes imperative project comply with all relevant laws and host public hearings. - - - - - - - - E-Mail enclosed following critical information. 1. Copy of Dr. Carmen Ortiz Roque's 7 Aug 2011 letter to the Corps and the enclosure to that letter, "Risk Evaluation of Natural Gas Pipeline from the North" ¶7.a.(1). 2. News articles from Puerto Rico Day Sun and others regarding the resolution from the College of Physicians and Surgeons of Puerto Rico that the pipeline represents a serious threat to the islander's health based on this report. - - - - - - - - 1. Raises five fundamental points that suggest the Corps is biased and demonstrates that the Via Verde project should have been rejected a long time ago. 1.a. PREPA letter to Corps 7 Mar 2011 acknowledges that EcoEléctrica not able to simultaneously supply gas to the three

	power plants; 1.b. PREPA's statement in that letter that FERC's 2009 order allows the gas to be used for Via Verde is false; 1.c. PREPA's description in its letter that will distribute the gas among the various plants is contrary to the project purpose to deliver fuel to all three plants; 1.d. PREPA's letter says will receive gas under FERC's 2009 order, but FERC has not yet authorized construction and cannot operate until vapor-gas exclusion zone evaluation completed. The small partial supply of natural gas is still uncertain yet Corps continues evaluating the project; and 1.e. Corps aware that Via Verde pipeline lacked sufficient gas supply by letter from FWS dated 15 Dec 2010. ¶3.a.(1) 2. Via Verde is unable to comply with its stated purpose, is not a single and complete project and has been willfully fragmented. ¶3.a.(1) 3. False and incomplete and or misleading information supplements the FEIS and other documents, which renders the Via Verde project invalid and fraudulent. 4. Corps ordered the evaluation to be transferred from Puerto Rico office to Florida. Have provoked dubiousness and mistrust among the people of Puerto Rico. 5. Requests Corps deny the application. - - - - - - - - E-Mail enclosed the following resolutions against Via Verde. 1. Baptist Churches of Puerto Rico, Resolution IV, 4 Mar 2011. 2. Diocesan Pastoral Assembly of the Diocese of Caguas, Resolution, 8-9 Oct 2011
Clinica de Derecho Abmiental de La Facultad de Derecho de la Universidad Interamericana de Puerto Rico. Joint letter 28 April 2011 of Environmental Law Clinic, Inter American University School of Law, Environmental Law	1. Urge Corps to deny the permit. 2. Section 404 of the Clean Water Act 2.a. Description of impacts not complete, e.g., Corps not confirmed extent of jurisdiction ¶3.e.; differences in acreages between parts of the application and confusion in right of way width ¶4.c; effects on water circulation ¶5.a; question whether impacted areas can be completely restored ¶7(a)(10). 2.b. Corps should redefine project purpose as helping the Applicant achieve a generalized goal of reducing its dependence on oil. ¶3.a. 2.c. Analysis does not demonstrate is the least damaging

Clinic, University of Puerto Rico School of Law, and Puerto Rico Legal Services, Inc.	practical alternative. ¶4. 2.d. Not demonstrated avoidance and minimization. ¶4, ¶5. 2.e. No adequate mitigation plan. ¶7.a.(10) 3. Corps must comply with the Endangered Species Act, including inquiring of NMFS what species may be present, preparing a Biological Assessment (letter provides comments on deficiencies of applicant's information), engage in Formal Consultation, not authorize any actions during the consultation process, incorporate into the permit the Terms and Conditions required by FWS. ¶7.b. 4. Corps must prepare an EIS because: is a "Major Federal Action", the project "Significantly Affects the Quality of the Human Environment", mitigation will not reduce impacts below the significance threshold, Corps cannot tier off the Puerto Rico EIS. ¶10.d. 5. EIS should include the analysis of the following. 5.a. Applicant's information on supply and methods of natural gas delivery to the Via Verde project and incorporate any interrelated activities that must occur to supply the project. ¶3.a. 5.b. Alternatives involving conversion of the Aguirre and Costa Sur power plants and renewable energy ¶4. The Corps analysis includes additional modifications of the LNG terminal.¶3.a 5.c. Direct and indirect effects, application includes inaccuracies in direct impacts, not adequately addresses safety concerns from seismic activity, impacts to species by increased access of predators, risk of explosion to communities, noise and pollution from maintenance, and impacts of increased population growth facilitated by expanding energy capacity, and forseeable expansion of the LNG terminal. 5.d. Cumulative Impact. ¶7.e 5.e. Include FWS and NMFS as cooperating agencies. 6. Include public input in every stage in development of the EIS.
Teresa Clemmer, Vermont Law School, 8 Aug 2011	1. Unclear what is supply of natural gas for the project. News article states Gas Natural, not EcoEléctrica, will supply the project. If so, Corps must examine impacts of their ships and infrastructure. Another news article indicates additional modifications to EcoEléctrica terminal necessary to enable long-term viability of the pipeline, the Corps must include

SUBJECT: Department of the Army Environmental Assessment and Statement of Findings for Permit Application SAJ-2010-02881.

	such future projects in its analysis. ¶3.a 2. Initiate formal consultation with NMFS. ¶7.b 3. Quantity and nature of impacts unclear. 4. Corps must evaluate wider range of alternatives, including the existing pipeline to Costa Sur, FSRU's, and renewable energy. ¶4. 5. An EIS is required. EA is not appropriate for the impacts of this project. ¶10.d. 6. Process of purchasing homes is causing emotional anguish and financial stress. ¶7.a.(4). 7. Harrassment (of home purchases) and threat of danger fallen disproportionately on the elderly and low-income citizens. ¶10.c. 8. Corps should issue a supplemental public notice. 9. Corps should hold public hearings. ¶10.a.
Legislatura Municipio Autónomo de Coamo, 3 Mar 2011, Resolución número 26, 3	1. PREPA's lack of experience demonstrated by opposition, errors, etc. in construction of Southern Gas Pipeline. ¶7.a.(3). 2. Accidents have caused death and injuries and destroyed and damaged property. ¶7.a.(1). 3. Have witnessed other projects constructed in an expeditious manner whose cost exceeded budgets affecting financial health of Puerto Rico. ¶7.a.(3). 4. They reject this project. 5. Study other ways to reduce energy, such as better efficiency and alternative sources, such as renewables. ¶4.g.
Alex Natal Santiago, 8 Feb 2011	1. Front of our house, a safety risk. ¶7.a.(1). 2. Construction in peaceful place. ¶7.a.(3). 3. Environmentally damaging alternative. ¶4. 4. All communities are scared and worried. ¶7.a.(3). 5. Will lower value of my home. ¶7.a.(4). 6. Deny permit because no positive benefits.
Asociación de Legisladores Municipales de Puerto Rico, 2 Feb 2011, Reinaldo Castellanos, Presidente Interino and Lillian Maldonado, Directora Ejecutiva. Enclosure is	1. U.S. Fish and Wildlife Service emphasized concerns regarding 32 endangered species. ¶7.b. 2. Fails to consider alternatives. ¶4. 3. Not provide adequate compensatory mitigation. ¶8.a. 4. Concerns with appropriate connections to natural gas supply. ¶3.a.(1). 5. Failure to notify public of projects adjoining their property. ¶3.d.

SUBJECT: Department of the Army Environmental Assessment and Statement of Findings for Permit Application SAJ-2010-02881.

Resolución 2010-2011-01	6. Risking water supply with impact to rivers and karst region. ¶7.a.(5) & (11) 7. 75 ft distance less than 660ft recommended distance. ¶7.a.(1). 8. Request denial of application. - - - 1. PREPA's lack of experience demonstrated by opposition, errors, etc. in construction of Southern Gas Pipeline. ¶7.a.(3). 2. Accidents have caused death and injuries and destroyed and damaged property. ¶7.a.(1). 3. Have witnessed other projects constructed in an expeditious manner whose cost exceeded budgets affecting financial health of Puerto Rico. ¶7.a.(3). 4. They reject this project. 5. Study other ways to reduce energy, such as better efficiency and alternative sources, such as renewables. ¶4.g.
Municipal de Peñuelas, 2 Feb 2011. Enclosure is Resolution.	1. Oppose project. 2. Reject based on judgment of many scientific assessments, rejection by communities, and negative evaluations by agencies. 2. Governor and PREPA study other ways to reduce the cost of energy, including greater efficiencies and other energy options such renewable energy alternatives. ¶4.g.
Municipal de Caguas, 25 Apr 2011. Enclosure is Resolution.	1. Oppose project. 2. Resolve the energy crisis with renewable energy alternatives. ¶4.g.
Carla Restrepo, Associate Professor, Universidad de Puerto Rico, 26 Jan 2011 and 2 Jun 2011.	1. The Rio Grande de Arecibo Watershed will be adversely impacted by Vía Verde. ¶7.a.(7). ' - - - - - - - - - - - -- - 1. Impact by linear fragmentation and edge effect of habitat. . ¶7.a.(6).
Johanna Delgado Acevedo, Ph.D., Ecóloga del Paisaje, 29 Jan 2011,	1. Habitat fragmentation and the limits for dispersion, migration, and movement of some species. ¶7.a.(6). 2. The Puerto Rican parrot, the Puerto Rico Nightjar, and the species of the coqui will be impacted. ¶7.b. 3. Two species new to science and endemic to Puerto Rico are endangered because their habitat within the karst region is threatened: Tabebuia karsoana and Pisonia taina. ¶7.a.(6). 4. Do not approve the permit.

Concepción Rodríguez Fourquet, Universidad de Puerto Rico, 1 Feb 2011	1. Land crabs will be impacted by loss of wetland. ¶7.a.(6). 2. Do not approve the permit.
Dr. Gerson Beauchamp, Ph.D. and Professor Electrical and Computer Engineering Department University of Puerto Rico, 2 Feb 2011	1. Supply from EcoEléctrica not sufficient for Via Verde project. ¶3.a.(1). 2. Instead of Via Verde, propose use EcoEléctrica's output for Costa Sur (potential for 30-to-40% of electricity generated in Puerto Rico) and use of LNG regasification vessel for Aguirre plant (40%), that with EcoEléctrica (15%) totals 85-95%, with added benefit of two points of natural gas entry. ¶4.g. 4. The project lacks serious economic analysis to support claim of a reduction of electrical energy costs. ¶7.a.(8). 5. Propose invest $500million in Photovoltaic Solar Energy installations at government facilities would provide savings that could be passed to the consumer. ¶4.g.
Dr. Reniel Rodríguez Ramos, Universidad de Puerto Rico en Utuado, 14 Dec 2010, 16 Dec 2010, 2 Feb 2011, , 8 Nov 2011.	1. Request to be an interested party in the Section 106 review process. ¶7.d. - - - - - - - - - - 1. Omissions in inventory of archeological sites. ¶7.d. 2. No systematic protocol for reconnaissance. ¶7.d. 3. Only portion of route surveyed. ¶7.d. 4. Access roads not surveyed. ¶7.d. 5. No subsurface testing. ¶7.d. - - - - - - - - - - 1. The USACE only has a Phase IA archaeological study, and therefore does not have all needed information to authorize the project. ¶7.d. 2. No archaeological inspections have been made of the access roads. ¶7.d. 3. Because the project crosses some alluvial plains, a deep testing program needs to be implemented during the Phase IB survey in order to detect buried archaeological contexts. ¶7.d. - - - - - - - - - - 1. A Programmatic Agreement is unwarranted as an alternative to regular Section 106. There is no urgency to issue a permit and no need to incur this type of agreement prior to completion of identification efforts. ¶7.d. 2. Programmatic Agreement divides project into segments, problematic if any segment liberated for construction prior to completion of ones contiguous. ¶7.d.
Joan Klakow Foreman, 1	1. House designed by the Architect Henry Klumb. Lands with

Feb 2011	a perpetual conservation easement. ¶7.a.(9). 2. Scars from bulldozers that do not heal (like PR-10). ¶7.a.(7). 3. Dangers of earthquakes crossing a mountainous area ¶7.a.(1).
Shelag Foreman, 9 Dec 2010, E-mail of 20 Dec 2011 and letter 2 Feb 2011. Similar letter from Gillian Ware 18 Dec 2010.	1. House designed by the Architect Henry Klumb. Land is in conservation and is home to the headwaters of Rio Grande de Arecibo and Rio Portugués and home to endemic species of birds and to other species. ¶7.a.(9). 2. The project has had improper environmental evaluation 3. Other options were not considered. ¶4. 4. Worried about possible negative impacts to communities (like gas explosion in San Bruno, CA) ¶7.a.(1).
Myra Ramos and Ben Rogers, 18 Dec 2011	1. Concerned with pipeline explosion. ¶7.a.(1). 2. Pipeline to destroy Foreman property. ¶7.a.(9).
Russell Stetler, 14 Dec 2011	1. Concerned with pipeline explosion. ¶7.a.(1). 2. Pipeline to destroy Foreman property. ¶7.a.(9).
Dr. Pedro Jiménez Quiñones, Goetechnical Engineering Services, 11 Jan 2011	Provides a 22 page geotechnical evaluation with 24 conclusions & recommendations. These include: the application lacks a complete set of engineering plans and geotechnical investigation report. ¶7.a.(1).
Hon. Alejandro García Padilla, Member of the Senate of the Commonwealth of Puerto Rico, 20 Dec 2010	PREPA overstates 20% savings in consumers' bills and Corps should scrutinize project "so that a proper cost-benefit analysis" is performed. ¶7.a.(8).
Hon. Antonio Fas Alzamora, President, Puerto Rico Senate, letter to Corps 2 Feb 2011, enclosing his letter of 23 Dec 2010 to the President of the Senate that forwarded the First Progress Report on Senate Resolution 889.	1. Letter to the Corps asks to stop construction of the project . 2. The letter to the President of the Senate states the Report describes inconsistencies between public information and actual statements, highlights a premature decision-making process, and presents a better alternative. ¶3.d.(7). 3. The Report concludes with recommendation to study further conversion of the southern plants to natural gas and modernizing the transmission lines from the south to the north. ¶4.g.
Comité Bo. Portugués contra el Gasoducto Adjuntas, 17 Dec 2010 and 2 Feb 2011	1. Concern with rugged topography and high rainfall that construction would cause sedimentation of streams that provide our water supply. ¶7.a.(11). 2. Concerned with risk of failure. In Adjuntas only one fire station, small emergency room. Pipeline crosses entries to our

	neighborhoods. ¶7.a.(1). 3. Anxiety with helicopters and surveyors and uncertainty with hazard close to homes. ¶7.a.(3). 4. Propose alternative of constructing another LNG tank in north coast. ¶4.
Héctor E. Quintero Vilella, Ecólogo, 20 Oct 2010, 2 Feb 2011, 5 Feb 2011, 17 Feb 2010, 10 June 2011, 25 Aug 2011, 27 Sep 2011, 13 Oct, 2011, 26 Oct 2011.	1. Letter 20 Oct 2010 noted discrepancy in calculation of wetland impact, that the EIS does not evaluate impact to wetlands and that the EIS states mangroves will be impacted. ¶7.a.(10). ‘- - - - - - - - - - - - 2. Describes Puerto Rico Nightjar (Guabairo) will be affected by removal of forest, introducing vehicles, predators and exotics through the easement. ¶7.b. - - - - - - - - - - - - - 3. Energy emergency does not exist. 4. Reviews by local agencies not rigorous. 5. Hundreds of acres of wetlands will be impacted. ¶7.a.(15). 6. Endangered Species will be impacted. ¶7.b. 7. A wiser alternative is to build storage tanks adjacent to the power plants. ¶4. - - - - - - - - - - - - - - - 1. Of 224 field data sheets for wetland jurisdiction, only 121 based on on-site field. ¶3.d. - - - - - - - - - - - - - - 1. Provided copy of letter to FWS of 26 June providing comments on the Biological Assessment in particular regarding the Puerto Rico Nightjar. Will cause significant impacts. - - - - - - - - - - - - - - - 1. Provides comments on deficiencies, including some calculation errors, in the Biological Assessment. - - - - - - - - - - - - - - - 1. Request withdrawal of hiscomment letter of 2 Feb and return to him for destruction. ¶3.d.(7). ‘- - - - - - - - - - - - 1. Information presented by Applicant inadequate and very limited. 2. Biological Opinion raises may questions and uncertainties on the real impacts. ¶7.b 3. Corps should require a full EIS. 4. Provide the final ROW of the project, shape file or Google

	map file. ‘- - - - - - - - - - - - 1. Provides comments on the FWS Press Release regarding their Biological Opinion regarding the Puerto Rican Nightjar. 1.a. Misrepresentation or suppression of data from referenced reports, including a math error in the BA; 1.b. Impacts to habitat not correctly characterized and mitigation proposal not match recommendations by species expert; and. 1.c. BO states an emergency could be declared and vegetation removed, but this will be detrimental to the species. ¶7.b 2. Corps should prepare an EIS.
Sociedad Espeleológica de Puerto Rico, 2 Feb 2011	1. Impact to the Karst area: recharge; biodiversity and the structural integrity of underground cavities. ¶7.a.(7). 2. Economic, social and cultural impact is very high for 50 years of useful life. ¶9.f 3. There are terminals next to Palo Seco that receive propane, which will be enough to gasify the plants on the North. ¶4.g. 4. Mistake to continue reliance on fossil fuel. ¶4.g. 5. Sufficient to just use plants in the south. ¶4.g. 6. Mistake to rely only on EcoEléctrica, establishing a private monopoly. ¶3.d.(7). 7. Risk for communities within 2 km. ¶7.a.(1). 8. The energy emergency is not real. ¶3.d.(7). 9. Local review process too fast. ¶3.d.(7). 10. Majority of people do not want the pipeline.
Sindicato de Bomberos de Puerto Rico, 2 Feb 2011	1. Main concern is risk of explosions and fire to residents. ¶7.a.(1). 2. Pipeline susceptible to similar causes of failure as described in enclosed study (e.g., corrosion). ¶7.a.(1). 3. No hydrants and limited firefighting personnel in central area of island. To be constructed in areas prone to landslides and with no access for the firefighting equipment. Roads and highways have no phones, water hydrants, nor light poles for handling emergencies. ¶7.a.(1). 4. Understand there are other alternatives less costly and dangerous. ¶4. 5. Ask Corps to deny the permit.
Colegio de Ingenieros y Agrimensores de PR	CIAPR provided comments on the DIA-P (Draft EIS) in the following broad headings. Comments without references to

(CIAPR), 17 Dec 2010.	paragraph numbers because they referenced the Draft and not necessarily applicable to the EIS. 4.0 Cost estimate appears optimistic. ¶7.a.(8). 5.0 Possible to build relatively safe pipe, however potential for accident always exists. ¶7.a.(1). 6.0 Include in final EIS estimate of time for federal permits. 7.0 Utilize consistent units of measure and terminology. 8.0 DIA-P subject to CIAPR's comments, basically meets guidelines for such a document. 9.0 Alternatives. 9.1 Clarify no-action alternative. ¶4.g. 9.2 Alternate locations of import terminal on north coast. ¶4. 9.3 Consider Tanker & Buoys as alternative. ¶4. 9.4-9.7 Clarify details, maps and economics of alternatives. ¶4. 9.8. Convert ports to use LNG at south coast powerplants. ¶4.g. 9.9 Use CAPECO for LNG storage location. ¶4. 10.0 Security. 10.1.1-10.1.8 Construction follow regulations for design and construction. ¶7.a.(1) 10.1.9 Consider adding an Earthquake Early Warning System. ¶7.a.(1). 10.1.10 Follow local law if explosives are used. 10.1.11 Prepare a Risk Analysis. ¶7.a.(1). 10.2 Describe remote monitoring system. ¶7.a.(1). 11. Pipeline Route. 11.1. Comments on discrepancies and various suggestions for updating maps, discrepancies in text and tables, and suggested corrections and additions to text. 11.2. Soils and Geology. Pipeline crosses many different soil and geologic types, some susceptible to erosion, some to subsidence, some unstable, etc. ¶7.a.(1). 12. Land Use and Zoning. 12.1-2 In the DIA-P , some confusion in presentation of land uses, some maps old, and not clear whether wetland data came from Corps or other. 12.3 Maintenance. Suggest expanding patrols to detect growth of deep-rooted vegetation. Suggest a system to detect the pipe if surface markers removed. Suggest more detail on

	the cathodic protection system. 13. Cumulative Impacts. Include more details. ¶7.e. 14. Environmental Justice. Include views of communities to assess compliance with this principle. ¶7.e.
Luis J. Ramos Santiago, 16 Dec 2010	Avoid construction through the Hacienda Central Pellejas, an ecological, agricultural, hydrological, scenic and historical property with agreements for the establishment of a conservation easement. ¶7.a.(9)..
Zulma Clavell, 16 Dec 2010	1. Corps should prepare detailed assessment of the application. 2. Hold public hearings for public participation. ¶10.a. 3. Evaluate effects to shoreline from Punta Salinas through Boca Vieja Cove in front of Levittown and present publicly. ¶7.a.(2). 4. Evaluate alternatives to deliver natural gas that does not affect the shoreline. ¶4. 5. Consider comments of the FWS. 6. Not approve the permit.
Conservation Trust of Puerto Rico. Email of 15 Dec 2010 and 17 Dec 2010.	1. Provided inventory of flora and fauna within the Foreman property. ¶7.a.(9). ‘ - - - - - - - - - - 1. Concerns about impacts to the La Esperanza Natural Reserve and projects therein. ¶*7.a.(9).* 2. Request study of alternatives that would meet applicant’s goals. ¶4.
Aerial photo overlaying Cueva Jaguar over project route., undated and separated from whatever letter was attached to.	Aerial photo overlaying Cueva Jaguar over project route., undated and separated from whatever letter it was attached to. Map shows pipeline crosses above cave. ¶7.a.(7).
Neftalí García Martínez, SCT, Inc., 17 Dec 2010. Also 16 Oct 2010.	1. An EIS under NEPA is required 2. Natural Gas is unlikely to remain low cost and abundant, not suitable for long-term energy strategy. Not advisable to break dependence on oil by falling into dependence on gas. ¶7.a.(8). 3. About 2/3 of electric production capacity is in the south, but energy lost in transmission and vulnerable to storms. Need to increase generation in the east and west. ¶4.g 4. Unlikely reduction reaches 20% predicted by PREPA. ¶7.a.(8). 6. Consider as alternatives other port locations for receipt of

	natural gas, and construct/convert power plants. ¶4.g 7. EcoEléctrica plan cannot supply all three northern plants. ¶3.a.(1). 8. Convert South Coast plant with current EcoEléctrica plant would put 41% of production on natural gas. ¶4.g 9. Increase energy efficiency in building and industrial systems. ¶4.g 10. Increase use of solar and wind energy. . ¶4.g 11. Not wise to rely on a single port and single pipeline that could break in earthquakes or landslides, disrupting supply and causing fires. ¶7.a.(1). 12. Corrosion more rapid in acid soils and humid environments. ¶7.a.(1). 13. Risk to population living nearby and driving on roadways with the pipe along its ROW. Accidents do occur. ¶7.a.(1). 14. Distance within which Applicant purchased property much less than distances where there would be impacts from fire and injury. ¶7.a.(1).
Legal Aid Clinic of the University of Puerto Rico, E-mail 4 Nov 2010, with attachments.	1. Impacts wetlands and streams, particularly three reserves: Caño Tiburones, Ciénaga San Pedro, and Reserva Natural Ciénaga Las Cucharillas. ¶7.a.(10). 2. DIA-P's insufficient evaluation of public safety and flora and fauna. 3. Request public hearings. - - - - - - 4. Attachment describes DIA-P's methodologies and evaluation of impacts to flora and fauna does not comply with local rules for such documents. . ¶3.d.(7). - - - - - - 5. Attachment describes DIA-P's methodology for economic benefits incorrect, estimate of cost of project does not include conversion of the power plants and advertising campaign, and disputes conclusion that there is no disproportionate burden on a particular economic group. ¶10.c.(3). '- - - - - - - - - 6. Attachment describes DIA-P's procedural and substantive deficiencies under Commonwealth's rules and law. ¶3.d.(7).
Ricardo Fernández, E-mail 20 Dec 2010.	1. Suggests Corps consider an offshore buoy system for delivery of LNG provided by Repsol. ¶4.a.

SUBJECT: Department of the Army Environmental Assessment and Statement of Findings for Permit Application SAJ-2010-02881.

USDA Forest Service, International Institute of Tropical Forestry, 3 Dec 2010	1. Do not find adequate discussion of wetland effects. ¶7.a.(10).
W.M.R. Group, Inc., 3 May 2011	1. They project that without Via Verde for the period 2011 to 2018 the rising cost of oil will result in $17.52 Billion compared to if cost remained at 2005 level. Via Verde would result in a reduction of $12.58 Billion. ¶7.a.(8).
Mr. Mario Soriano Ressy, Geological Engieering and Environmental Services, 20 May 2011, 27 May 2011	1. The geologic and hyrodogeology description in the DIA is superficial. 2. Adverse impacts include: some formations susceptible to erosional and translational problems; crossing Juana Diaz formation with landslide & rock fall prone slopes; some bodies of waters are creeks on steep slopes; part of route is along PR-10 in segment experiencing numerous landslides. ¶7.a.(1). 3. Many communities impacted physically and psychologically. ¶7.a.(3). 4. Intense storm surges overwhelm the floodplains, very often roads and bridges are undermined. Rio Arecibo's sandy soils is highly erosive. Pipeline crossesseveral rivers that are meandering ones with often changing channels. ¶7.a.(1). 5. Earthwork in steep mineralized terrain will create sedimentation problems. ¶7.a.(11). 6. Beach front affected by erosion and has receded. ¶7.a.(2). 7. Crossing near beach most oppressive due to high concentration of population and traffic. ¶7.a.(1). 8. Project will cost people of Puerto Rico over $1 billion. ¶7.a.(8).
Dr. Carmen Ortiz Roque, President of the Environmental and Public Health Committee of the College of Physicians and Surgeons of Puerto Rico, 7 Aug 2011	Provided a "Risk Evaluation of Natural Gas Pipeline From the North (Via Verde) to the Human Population of Puerto Rico". 1. Uses records to conclude a 2% chance per year of an incident due to the proposed pipeline and further estimates as many as 533 peoplein Toa Baja will die in the first 30 seconds of an explosion/fire incident. ¶7.a.(1). 2. 90% of the incidents in the U.S. occur in sparsely populated areas but 72% of Via Verde has human populations within 650 feet. ¶7.a.(1). 3. Recommend setback of 200 meters. 4. A preventable danger is unacceptable. Risk to human population can be reduced by designing a pipeline that crosses low population density areas for example using primarily a

	maritime approach. ¶4.
Rafael L. Joglar, Professor, Universidad de Puerto Rico, 7 June 2011.	Comments on the information in the Biological Assessment, with specific comments on the Coquí Llanero, Puerto Rican Boa, and Puerto Rican Crested Toad. ¶7.b.
Ariel Lugo, 9 Sep 2011	Provides comments on information in the Biological Opinion. ¶7.b.
Carlos Delannoy, 6 Sep 2011	Provides comments on information in the Biological Opinion. ¶7.b.
Sierra Club, 19 July 2011	1. Corps must comply with relevant statutes. 2. Corps should circulate a draft EIS. ¶10.d. 3. The mitigation proposal is inadequate. ¶7.a.(10)
Labor Council for Latin American Advancement, AFL-CIO, email 11 Aug 2011.	1. There is too great a risk for the life, property and natural resources. 2. Public Hearings should be held. ¶10.a. 3. Corps should deny permit. 4. Corps should conduct an EIS. ¶10.d.
Lafayette Avenue Presbyterian Church, Brooklyn, NY, 16 June 2011	1. Appeal to Corps to withdraw support for this project. 2. Consider safer, more efficient alternative solutions which have been proposed. ¶4.
Senatgor Gustavo Rivera, New York State Senate, 14 July 2011	1. There is too great a risk for the life, property and natural resources. 2. Corps should deny permit until Public Hearings held and an EIS conducted. ¶10.a., 10.d.
Institute of Puerto Rican Culture, 19 Oct 2011	1. Request to be a consulting party in the Section 106 process. ¶7.d.
University of Puerto Rico, Miguel A. Muñoz, President, 16 Sep 2011	1. Endorses the project as it will bring significant energy cost savings to our Institution. ¶7.a.(8). 2. Confident that the SHPO has and will require all appropriate steps and actions to ensure the requirements of the NHPA are met. ¶7.d.
Neftalí Ríos-López, 1 Nov 2011	1. Circumstances changed since the FWS BO: FWS has announced its intention to list the Coqui Llanero. ¶7.b. 2. The addition of valves makes the BO incomplete as it cannot assess the magnitude and extent of wetland areas impacted. ¶3.a.(1). 3. The trench for construction of the project could affect hydrology and therefore change the desireable plant cover for the species. ¶7.b. 4.
National Marine Fisheries	1. Describes Essential Fish Habitat (EFH) at the Proposed

SUBJECT: Department of the Army Environmental Assessment and Statement of Findings for Permit Application SAJ-2010-02881.

Service, 19 Dec 2010.	Project Site and provides EFH Conservation Recommendations. ¶7.c.
National Marine Fisheries Service, 24 Mar 2011	1. Request Corps prepare a Biological Assessment that evaluates potential impacts to listed corals, sea turtles and ESA-designated coral critical habitat. Describes information to be included.
U.S. Environmental Protection Agency, 21 Dec 2011, 1 Apr 2011, 28 Oct 2011	1. Need a more thorough Alternatives Analysis. ¶4. 2. Concern with leakage of drilling mud into environment from directional drilling. ¶7.a.(5). 3. Compensatory mitigation for jurisdictional impacts not adequate. ¶8.a. 4. Recommend an EIS. - - - - - - - - - - - 1. With additional information provided by applicant, feels the alternatives analysis issues have been addressed. ¶4. 2. The additional information provided by the applicant on the re-routing of alignment to reduce HDD in the karst region, best management practices, and commitment to an independent geologist/engineer with expertise on karst, minimizes impacts. ¶7.a.(5). 3. Need a robust description of the compensatory mitigation and monitoring plans. ¶8.a. 4. Provide detailed description of right of way widths. - - - - - - - - - - - 1. Various concerns regarding the draft mitigation plan. ¶8.
U.S. Fish and Wildlife Service, 15 Dec 2011, 23 Aug 2011, 13 Oct 2011	1. Expansion of EcoEléctrica's terminal should be part of the review. ¶3.a.(1). 2. Alternatives Analysis does not include the Costa Sur plant. ¶8.a. 3. Concern with the clearing of the 150-foot right of way through karst and mountain. a. No mitigation proposed. ¶7.a.(7). b. Highly erodible soils, runoff will affect streams. ¶7.a.(11). c. Effects from maintenance activities. 4. Concern with leakage of drilling mud into karst from directional drilling. ¶7.a.(5). 5. Provides technical assistance on Endangered Species. ¶7.b. 6. Corps not yet verified jurisdictional determination. ¶3.e. 7. Applicants mitigation plan inadequate. ¶8.a. - - - - - - - - - - -

SUBJECT: Department of the Army Environmental Assessment and Statement of Findings for Permit Application SAJ-2010-02881.

	1. Provided Biological Opinion. . ¶7.b. - - - - - - - - - - - 1. Provide information on impacts by MLVs. ¶4.c. 2. Recommend HDD pullback area impacts be assessed. ¶7.(a)(10). 3. Not all stream crossings may have been identified. ¶3.e. 4. Three valves for proposed future connections. ¶3.a.(1). 5. FWS suggested BMPs for erosion control. ¶7. 6. Provide complete updated project impact drawings. ¶3.e. 7. Maps show impacts to mangroves. ¶3.e. 8. Various concerns regarding the draft mitigation plan. ¶8.
The Honorable Luis V. Guiterrez, U.S. House of Representatives. 6 Apr 2011, 9 Sep 2011, 2 Jun 2011.	1. Urge Corps consider denying the permit. 2. Request Public Hearings. ¶10.a. - - - - - - - - - - - The 9 Sep 2011 letter enclosed a summary of "very significant concerns", listed here: 1. Need Public Hearings. ¶10.a. 2. Need Environmental Impact Statement. ¶10.c. 3. PREPA still in the process of submitting required information. 4. EcoEléctrica does not possess the capacity to supply the gas. ¶3.a.(1) 5. Applicant not provided a complete risk and security assessment. Very serious concerns regarding the security of the * * * people who reside near the path of the pipeline are yet to be addressed. ¶7.a.(1) 6. Rivers overflowing their banks would have severely impacted the gas pipeline had it been in place or under construction. ¶7.a.(1) 7. There is widespread mistrust in PREPA's ability to build and operate a safe and secure natural gas pipeline. ¶7.a.(3). 8. The impact of deforestation * * * begs the question of the serious threat of Hurricanes and extended periods of heavy rains over these unstable, steep terrains to people and the environment close to the pipeline. ¶7.a.(7) 9. Puerto Rico is seismically active, and therefore subjected to potential tsunamis. ¶7.a.(1) 10. Letter from Dr. Carmen Ortiz Roque with document "The Risk Evaluation of Natural Gas Pipeline from the North (Via Verde) to the human population of Puerto Rico". ¶7.a.(1). 11. USACE would be disregarding requiring the applicant to

	submit another Public Notice. 12. Allow people the right to all information * * * and to express themselves. 13. Formal consultation on three endangered species to be conducted on a project of this magnitude was just a few weeks. ¶7.b.. 14. The documents you submitted to FWS on July 11, 2011 for this consultation did not include any of the several scientific and technical analysis submitted by some of the many experts opposed to this permit application. ¶7.b. 15. The FWS Biological opinion has raised many questions about the transparency of the process. 16. Very distinguished scientists and species experts * * * have raised serious methodological and scientific questions about FWS's conclusions. ¶7.b. 17. Three valve connections on the project plans have been identified * * * may lead to new pipelines and developments. ¶3.a.(1) 18. Given all of the above, I am more convinced than ever that public hearings are indispensible and mandatory. ¶10.a. 19. Require the applicant to submit a new application and issue a new Public Notice. - - - - - - - - - - - 1. Request status of the Environmental Assessment. 2. FWS letter dated 13 Oct and EPA's letter dated 28 Oct letter raise very serious concerns. 2.a. Several additional valves suddenly appearing. ¶3.a.(1) 2.b. FWS not received an updated complete set of drawings. . ¶3.e. 2.c. FWS and EPA both believe a performance bond should be required for the restoration and mitigation work. . ¶8.a.(5). 2.d. EPA states a comprehensive mitigation plan remains to be evaluated. ¶7.a.(10). 3. The Corps should study the legal analysis in the Environmental and Natural Resources Law Clinic with Vermont Law School's filing of a Notice of Intent to Sue. 4. Is it accurate that in order to obtain the permit from the Corps that PREPA must have expropriated all lands in question on which this pipeline would be built? ¶3.d.(7). 5. EcoEléctrica will be able to provide PREPA with only one-

SUBJECT: Department of the Army Environmental Assessment and Statement of Findings for Permit Application SAJ-2010-02881.

	third of the gas it would need to meet the stated project objectives. ¶3.a.(1) 6. If PREPA's real objective is to commence transition to natural gas, it would use the Costa Sur power plant. Aguirre and Costa Sur that are near EcoEléctrica combined produce 70% of Puerto Rico's electrical power. EcoEléctrica will not have additional gas for at least several years. "I fail to understand how building a pipeline for which there is very little gas could be construed as …means to reach the project's stated goals." ¶4. 7. The current version of the project bears very little resemblance to the one in the November 19, 2010 Public Notice. ¶3.d.(7). 8. Project requires an EIS. ¶10.d. 9. Ask Corps conduct public hearings. ¶10.a.

In addition to above, the Corps received thousands of petitions, emails, letters and comments on Facebook that expressed opposition to the project and listed multiple issues. The below list encompasses those issues.

	Issue
	Risk of injury/damage from pipeline accidents. ¶7.a.(1).
	Safety risk proximity to houses. 150 foot separation between pipe and residences is smaller than other recommended distances. ¶7.a.(1).
	Risk causing anxiety in communities. ¶7.a.(3).
	Inadequacy of emergency response if accident. ¶7.a.(1).
	Accident may block roads for evacuation. ¶7.a.(1).
	Risk of earthquakes and tsunamis. ¶7.a.(1).
	Risk to pipe during flooding. ¶7.a.(1).
	Pipeline going through landslide, etc. areas. ¶7.a.(1).
	Impact to environment (wetlands, endangered species habitat, forests, habitat fragmentation).
	Impact to streams and water supply from sedimentation and drilling. ¶7.a.(5).
	No adequate mitigation plan. ¶8.a.
	Impact to aquifers in karst areas. ¶7.a.(5).
	Use renewables (solar, etc) instead of pipeline. ¶4.g.
	Use south coast plants and convert (Aguirre and Costa Sur) as an alternative to pipeline. ¶4.g.
	Encourage energy efficiency. ¶4.g.

SUBJECT: Department of the Army Environmental Assessment and Statement of Findings for Permit Application SAJ-2010-02881.

	Insufficient analysis. Prepare an EIS. ¶10.d.
	Request a public hearing. ¶10.a.
	Will not reduce electric bills as much as claimed. ¶7.a.(8).
	Economic benefit not worth impacts.
	The energy emergency is not real.
	EcoEléctrica is not able to supply natural gas to the project. ¶3.a.(1).
	Constructing in a peaceful place. ¶7.a.(3).
	Will lower value of my home.
	Losing my agricultural land. ¶7.a.(4).
	Vegetation and trees will be destroyed, adding to the global warming. ¶7.a.(7).
	Impact to shoreline of Levittown. . ¶7.a.(2).
	Impact to migratory birds. ¶7.a.(6).
	Will expropriate homes and businesses.
	Pipeline violates state law. ¶3.d.(7).

(3) Site was visited by the Corps to obtain information in addition to delineating jurisdiction: A team of Corps, FWS and applicant representatives visited 27 sites in June and July to perform wetland functional assessments. The Corps archeologist visited some of the known archeological sites in May and September to support the review. The Corps Project Manger visited various points along the route to gain familiarity with the constraints on alternatives.

(4) Issues identified by the Corps: Alternatives analysis; Project Purpose; Endangered Species Act (FWS and NMFS); National Historic Preservation Act; Wetland impacts and mitigation; public safety; need for public hearing.

(5) Issues/comments were forwarded to the applicant.

(6) Applicant replied/provided views throughout the process.

(7) The following comments are not discussed further in this document as they are outside the Corps purview.

Name & Date	Issue
Juan F. Delgado López, 2 Feb 2011S	He states being witness to misinformation, intimidation and abuse to which landowners have been subjected by PREPA and New Star Acquisition. "If PREPA intentionally skirts the boundaries of federal and state laws to expedite acquisition of property for the project, what other boundaries they may be

	willing to disregard." Corps response. The Corps acknowledges the comment, however, the manner in which the land is acquired is not part of the Corps' review of the permit application.
United Confederation of Taíno People, 21 Dec 2010 and	After describing impacts of the project, the letter concludes "Consistent with the UN Declaration on the Rights of Indigenous People, the UCTP calls upon the Federal and Puerto Rican Government to ensure no further development takes place within ancestral Taíno Territory without consultation of, and obtaining the free, prior and informed consent of Taino Peoples." Corps response. This group is not a federally recognized tribe and therefore is not consulting with the members as a group. However, the members individually have full opportunity to express their views and have their issue addressed as provided by law.
International Indian Treaty Council, 22 Dec 2010	Refers to the United Confederation of Taíno People's letter, describes impacts of the project, welcomes President Obama's 16 Dec announcement supporting the UN Declaration on the Rights of Indigenous People, and "…urges the Federal and Puerto Rican Government to ensure no further gas development projects takes place within Boriken without consultation of, and obtaining the free, prior and informed consent of Taino Peoples." Corps response. See above.
Hon. Antonio Fas Alzamora, President, Puerto Rico Senate, letter to Corps 2 Feb 2011, enclosing his letter of 23 Dec 2010 to the President of the Senate that forwarded the First Progress Report on Senate Resolution 889.	2. The letter to the President of the Senate states the Report describes inconsistencies between public information and actual statements, highlights a premature decision-making process, and presents a better alternative. - - - - - - - - Corps response. The Corps will not review adequacy of local administrative actions.
Casa Pueblo de Adjuntas.	4. Applicant's EIS deficient.

SUBJECT: Department of the Army Environmental Assessment and Statement of Findings for Permit Application SAJ-2010-02881.

Letter of 15 Nov 2010. Letter of 2 Feb 2011. Letter of 28 Feb 2011.	- - - - - - - - 7. PREPA's document has contradictions and lacking rigor. 8. There is no emergency but accelerated process leaves unanswered questions. - - - - - - - - 2. PREPA spent $13million on contracts for northern pipeline before "Energy Emergency" declared. Spent more funds after announcement but prior to project approval. 3. "Energy Emergency closes door to public participation and endorses one company, EcoEléctrica. 4. Conflict of interest of participants and companies receiving contracts. - - - - - - - - Corps response. The Corps will not review adequacy of local administrative actions.
Sociedad Espeleológica de Puerto Rico, 2 Feb 2011	6. Mistake to rely only on EcoEléctrica, establishing a private monopoly. 8. The energy emergency is not real. 9. Local review process too fast. - - - - - - - - Corps response. The Corps will not review local administrative actions. The Corps has independently analyzed applicant submissions in support of its permit application.
Legal Aid Clinic of the University of Puerto Rico, E-mail 4 Nov 2010, with attachments.	4. Attachment describes DIA-P's methodologies and evaluation of impacts to flora and fauna not comply with local rules for such documents. - - - - - - 6. Attachment describes DIA-P's procedural and substantive deficiencies under Commonwealth's rules and law. - - - - - - - - Corps response. The Corps will not review local administrative actions.
Héctor E. Quintero Vilella, Ecólogo, 5 Feb 2011 and 27 Sep 2011.	3. Energy emergency does not exist. 4. Reviews by local agencies not rigorous. - - - - - - - - Corps response. The Corps will not review local administrative actions. - - - - - - - - 1. Request withdrawal of my comment letter of 2 Feb and return to me for destruction. . Further, want it clear I filed the papers on my own personal capacity and never intended that

	Waste Management of Puerto Rico endorsed my submission or my opposition to the project. - - - - - - - - Corps response: The Corps cannot remove documents once submitted. However, the Corps understood at the time of receipt of the letter that your submission and reference to the species performed at the landfill to be providing evidence that the proposed route of the pipeline crosses habitat of the Puerto Rico Nightjar. The U.S. Fish and Wildlife Service was independently aware of the value of the habitat in this area and was the topic of extensive discussion with the Corps. We acknowledge that receipt or characterization of this report represented no endorsement of any kind by Waste Management of Puerto Rico.
The Honorable Luis V. Guiterrez, U.S. House of Representatives. 2 Jun 2011	4. Is it accurate that in order to obtain the permit from the Corps that PREPA must have expropriated all lands in question on which this pipeline would be built? - - - - - - - - Corps response. No, this is not a requirement of the permit. - - - - - - - - 7. The current version of the project bears very little resemblance to the one in the November 19, 2010 Public Notice. - - - - - - - - Corps response. Changes described by Public Notice and draft EA dated November 30, 2011.
Multiple.	Pipeline Violates State Law. - - - - - - - - Corps response. The Corps does not review adequacy under State law.

e. Determination of Jurisdiction. The Corps is evaluating the information provided by the applicant (the datasheets and impact maps of extent of wetlands within project corridor). Héctor E. Quintero Vilella noted that of 224 field data sheets for wetland jurisdiction, only 121 were based on on-site field work and the on-site field work was performed in 13 days (one day with 18 inspections). However the Corps did not rely only on these datasheets. The Corps is comparing the wetland maps to other information and own experience, including that gained during the visits to perform functional assessments. A few locations were found to be in disagreement and the applicant provided updated wetland impact maps (Map sheets #27, 30, 40, 41, and 77) and for another site provided data to confirm the determination (Map sheet #2). At one location the maps indicated mangrove impacts but the Applicant confirmed construction on the would remain

within the existing road footprint and provided a revised drawing (Map sheet #81) The Corps is finalizing its review but expects changes, if any, will have a very minor effect to the total acres and will require revision of the tables found in the draft mitigation plan in Paragraph 7.a.(10) but is not expected to affect the overall evaluation of the application. The Corps is coordinating meetings with the other Federal agencies to review these before the final decision on the permit.

4. Alternatives Analysis.

a. Basic and Overall Project Purpose and Need (as stated by applicant and independent definition by Corps). The Project Purpose stated in the original public notice is to deliver an alternate fuel source to three existing electric power generating plants on the north coast. The need is to reduce the reliance on fuel oils for those plants. Many have suggested the Corps to expand the project purpose to encompass the reduction of reliance of the entire Puerto Rico economy on fuel oils for power. However, the Corps' role is not to usurp PREPA's role, as a public utility, to select fuels and to select how to operate its power plants. Since the Applicant is a government organization, the Corps gives deference to how they meet the needs of the public. PREPA has explained that providing natural gas to the north coast power plants will provide additional flexibility to select the most efficient operational scenario.[50] The entire available natural gas supply of 93 to 120 MM scf/day can be utilized by the Costa Sur power plant connected by an existing pipeline (or the Aguirre power plant for which a pipeline was authorized by the Corps). Many question why PREPA is spending money to route this gas to the north coast power plants. The Corps' role is to determine whether or not to issue a permit that enables PREPA to implement its decision to deliver natural gas to its north coast power plants.

b. Water Dependency Determination. Same as in Paragraph 1 (Page 1).

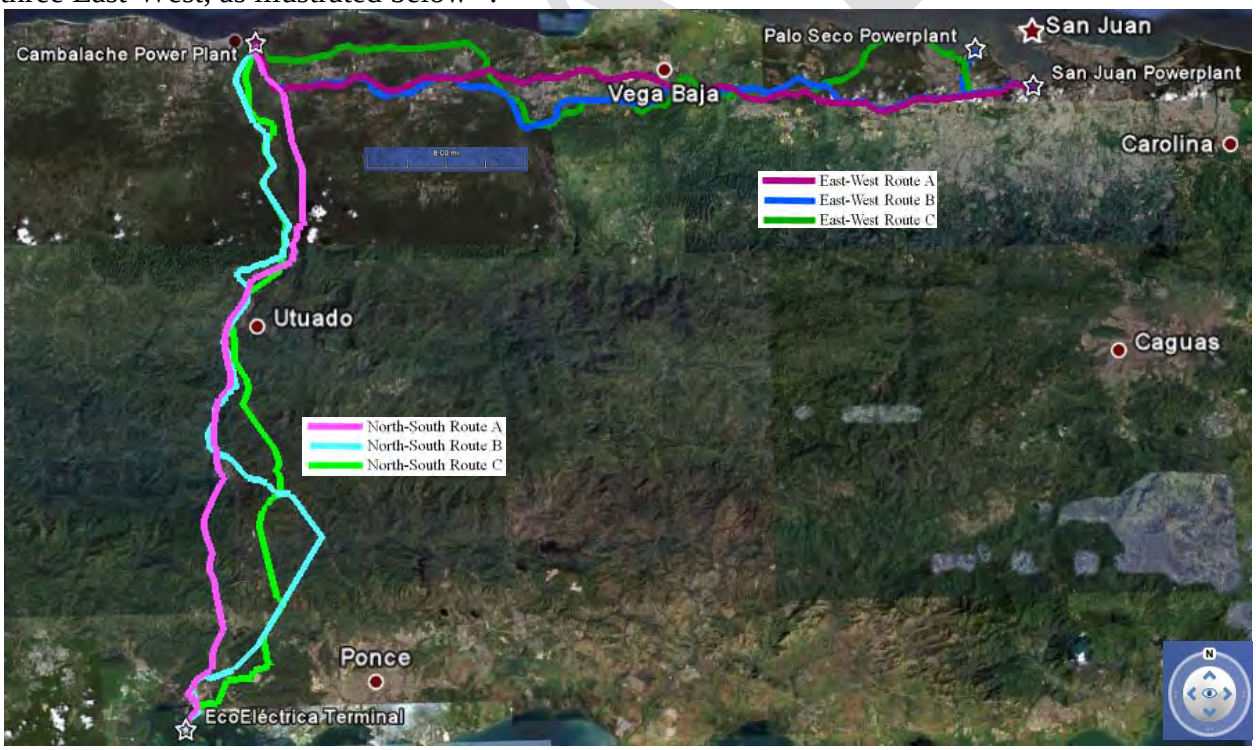
c. Applicant's preferred alternative site and site configuration. The Project has been revised. The beginning and end points of the pipeline remain the same but the construction ROW has been reduced to 60 feet where the alignment crosses wetlands (except where additional work area is needed such as at river and road crossings). The alignment has shifted at several locations in response to issues raised during the review. The application showed 0 acres of permanent and 143.92 acres temporary impacts in wetlands, plus 7.84 acres in open water.[51] For the permanent impacts, it was discovered that the Main Line Valves along the route will require 1.68 acres of permanent fill. For temporary impacts, the Applicant revised their calculation to 289.53 acres based on a 60 foot right-of-way (while the application was based on 50 foot) [52], including 3.09 acres of open water impacts.

d. Alternatives Analysis Process. The next paragraph, 4.e., will describe the alternatives. The subsequent analysis is a multi-tier process. Level 1, paragraph 4.f., identifies those alternatives that do not meet the Project Purpose. Remaining alternatives are advanced to Level 2. Level 2, paragraph 4.g., focuses on quantifying impacts by applying criteria for natural and community

environments to conclude the reasonableness and practicability of the alternatives. Remaining alternatives are advanced to Level 3, pagraph 4.h., for comparison. The Applicant provided an analysis based using Geographic Information System (GIS) software. For example, the "Bodies of Water" are the number of mapped streams, rivers or canals that were crossed by Routes A, B and C. For the Tanker & Buoy and LNG Import Terminal alternatives, the Applicant introduced "threshold scores" whether the raw score went above or below a threshold (assigned a "5" if above threshold, so more impact, "10" less impact so a better alternative). The Applicant concluded that the alternative with the lowest sum of "raw score" or highest sum of "threshold score" is preferred. The Applicant also applied some multipliers to weigh some of the scores. The Corps is not using Applicant's scoring system for two reasons. First, the choice of thresholds can mask real differences between alternatives. Second, the applicant introduced additional criteria when evaluating the Tanker & Buoy and LNG Terminal that introduced double-counts, for example, the effects on coral species counted under Endangered Species and again under the Coral criteria.

e. Description of Alternatives.

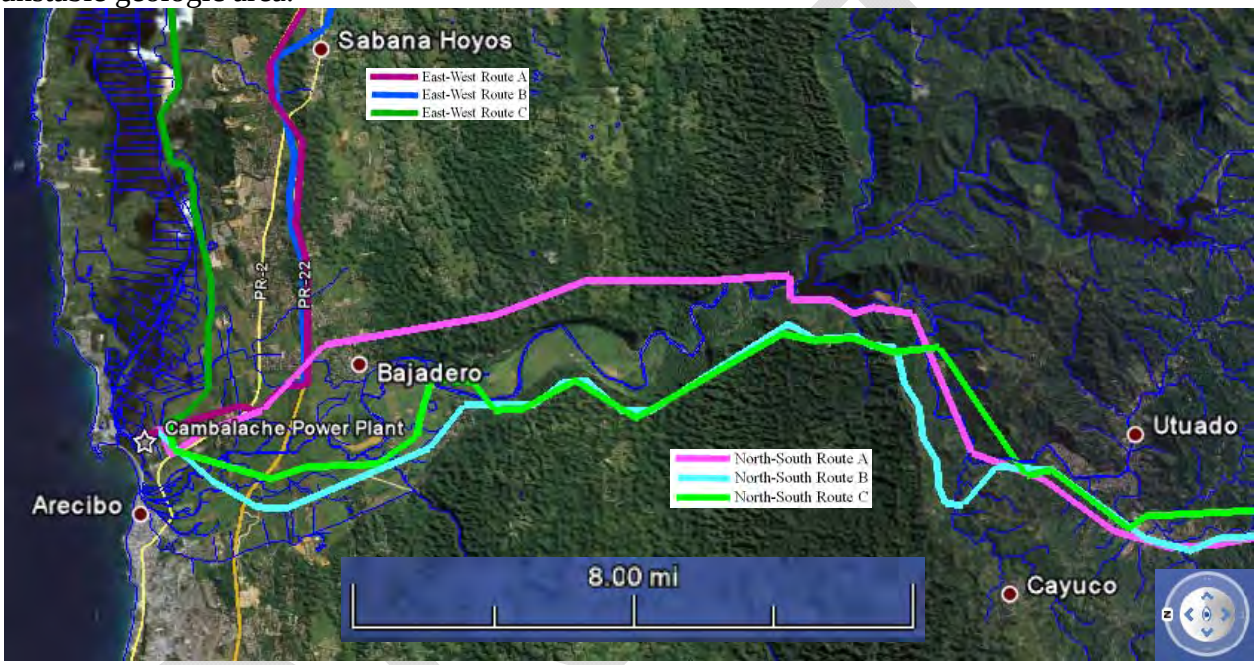
(1) Terrestial Pipeline Routes. There are six terrestrial alignments, three North-South and three East-West, as illustrated below[53].



(i) North South Routes.

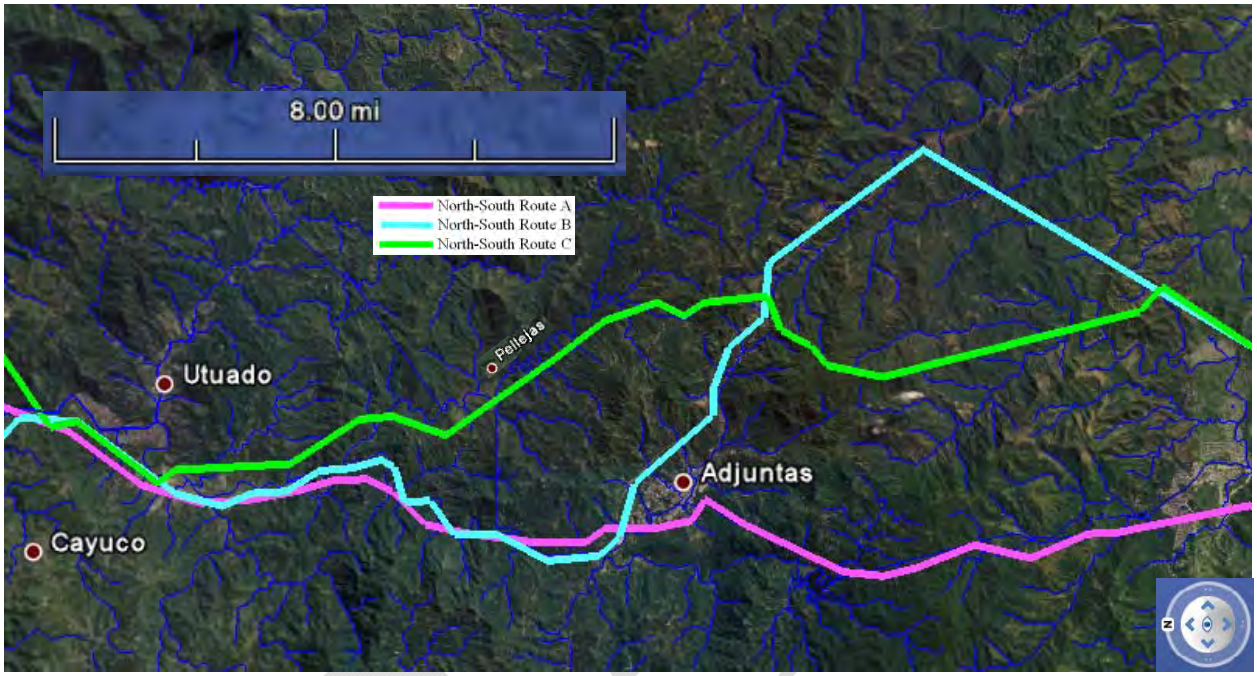
SUBJECT: Department of the Army Environmental Assessment and Statement of Findings for Permit Application SAJ-2010-02881.

(a) From Arecibo south to Utuado. Route A cuts past the town of Bajadero and then traverses mogotes terrain until it reaches the reservoir, after which it generally follows the river into Utuado. Routes B crosses the Rio Arecibo alluvial areas for approximately 2.0 miles then follows PR-10 all the way into Utuado. Route C from Arecibo stays in the alluvial areas (although agricultural land use is mostly wetland) approximately 5.5 miles before joining PR-10 (3.5 miles more than Route B). Route C follows PR-10 except for a 3 mile portion that departs PR-10, crosses the river and follows a mountain ridge before returning to PR-10 to avoid an unstable geologic area.



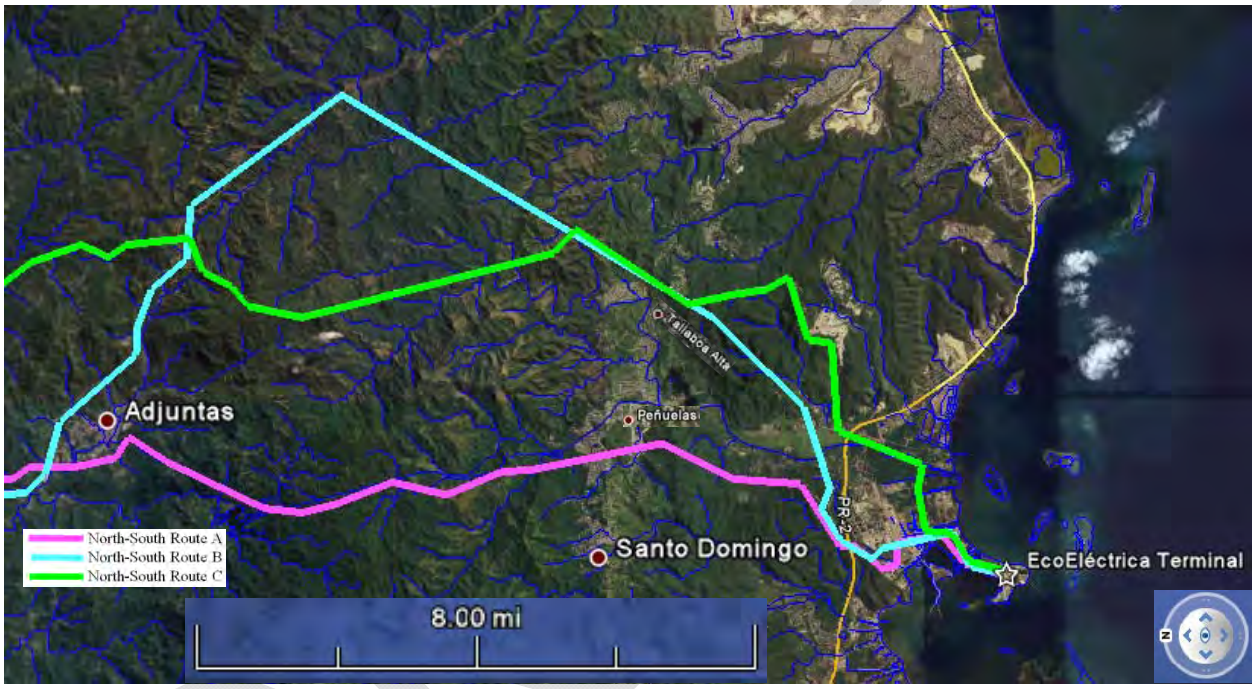
SUBJECT: Department of the Army Environmental Assessment and Statement of Findings for Permit Application SAJ-2010-02881.

(b) From Utuado south to Adjuntas. Routes A and B traverse the mountains following PR-123 to cross the mountains. Route C does not follow a road by crossing more rural areas but does cross the Pellejas valley. All routes will impact wetland vegetation within the fringe of numerous mountain streams.



SUBJECT: Department of the Army Environmental Assessment and Statement of Findings for Permit Application SAJ-2010-02881.

(c) From Adjuntas south to EcoEléctrica Terminal. Route A once it reaches Adjuntas departs PR-123 and crosses the mountain area directly to the terminal. Route B follows PR-123 then PR-10 past Adjuntas, then makes a straight southwest crossing through the mountains to just north of PR-2. At that point it crosses approximately 0.4 miles of wetlands that are currently in agricultural use. Route C does not follow any roads and also ends in the wetlands north of PR-2, though for only approximately 1/50.2 miles. All routes, south of PR-2, traverse industrial lands to the EcoEléctrica Terminal.

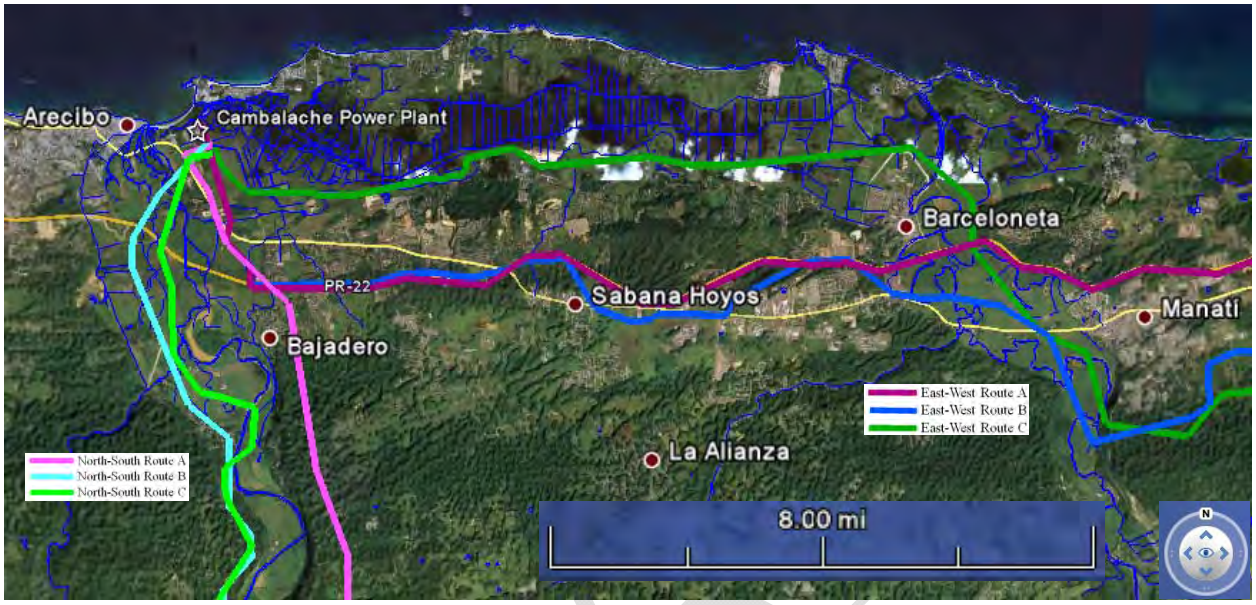


(ii) East-West Routes.

(a) From Arecibo east to Manatí. For the first approximately 2 miles, all three routes follow the Rio Arecibo alluvial areas crossing wetlands that are currently in agriculture use. After the first 2 miles, Route A follows the limited access highway PR-22 with no wetland impacts except for three locations: where PR-22 crosses two small rivers; and, east of Barceloneta, the approximately 1.5 mile crossing of the Rio Manatí and associated wetlands that are in agricultural use. Route B is same as Route A except where it departs PR-22 at two locations: first, near Sabana Hoyos for about 4 miles passing through some mogotes terrain and farm fields (non-wetland); and, second, departs the highway at Barceloneta to cross a small area of mogotes terrain and then a 4 mile crossing of the Rio Manatí associated wetlands/agricultural lands (this crossing is approximately 2.5 miles greater than Route A). Route C, after the first 2 miles, crosses approximately 9 miles of agricultural fields, mostly wetland, along the southern

SUBJECT: Department of the Army Environmental Assessment and Statement of Findings for Permit Application SAJ-2010-02881.

edge of the Caño Tiburones Natural Reserve. At Barceloneta, it then follows the course of and crosses the Rio Manatí and associated agricultural lands (mostly wetland) for approximately 5 miles (3.5 miles greater than Route A and 1 mile greater than Route B).



SUBJECT: Department of the Army Environmental Assessment and Statement of Findings for Permit Application SAJ-2010-02881.

(b) From Manatí to east of Vega Alta. Route A continues to follow PR-22 and has no wetland impact. Route B traverses mogotes terrain and agricultural areas (non-wetland) for the entire route. Route C is similar to Route B at first (traverses mogotes terrain and agricultural areas between Manati and Vega Baja), then at Vega Baja adds 1.5 miles of wetland crossing (compared to Routes A and B) by following the river, and then follows PR-22 (matching Route A, thereby less karst than Route B).

SUBJECT: Department of the Army Environmental Assessment and Statement of Findings for Permit Application SAJ-2010-02881.

(c) From Dorado to San Juan. All three routes cross the river and associated wetlands southeast of Dorado. Routes A and B follow PR-22 into San Juan, however Route C instead traverses wetlands up to the coast at Levittown (adding approximately 5 miles of wetlands compared to Routes A and B) then through the Levittown beachfront (the alignment on the north/beach side of a four-lane highway, the community on the south side). East of Levittown, all three Routes follow the Rio Bayamón between PR-22 to the Palo Seco power plant.

(2) Tanker and Buoy System. This alternative utilizes ships that not only transport the LNG gas to Puerto Rico but also have on-board units to re-gasify the liquid and has the capability to deliver the gas through a buoy located 3 to 5 miles off the coast. An underwater pipeline transports the gas from the buoy to a receiving terminal. From the receiving terminal the gas is transmitted through a terrestrial pipeline. The Tanker and Buoy System essentially is a substitute for EcoEléctrica's terminal on the south coast by which: ships deliver LNG to EcoEléctrica's dock; the liquid gas is offloaded to a storage tank; regasification units adjacent to the tank deliver gas though a send-out pipe that would connect to the terrestrial pipeline (Route A, B, or C) to transmit the gas to the power plants on the north coast. The Tanker and Buoy System goes by a variety of names including the following: Floating Storage and Regasification Units (FSRUs) as used in an industry publication news article describing the Applicant's award of a contract to Excelerate Energy for delivery to two south coast powerplants,[54] Excelerate Energy's tradename Energy Bridge Regasification Vessels (EBRVs),[55] Submerged Turret Loading (STL) by Reposal described in a comment letter submitted to the Corps, and the acronym LSRU by which the Applicant, when responding to the Corps question about FSRUs, referred to the system described in the application, further indicating the LSRU was for a fixed

platform/buoy compared to a submerged buoy mounted on the seafloor and stating that the impacts and technology are similar.[56]

(i) Applicant's Scenarios. The following are the Applicant's conceptual site plans to place three Tanker and Buoy Systems, one outside each power plant.[57] The Applicant presented the following three scenarios.[58]

(a) Scenario 1 (S1) is a single Tanker and Buoy System at Palo Seco distributed to the other two power plants via terrestrial pipeline (this would be one of the East-West Routes).

(b) Scenario 2 (S2) is two FSRUs, one at Cambalache and the other at Palo Seco with the pipeline to San Juan (or vice versa).

(c) Scenario 3 (S3) is three FSRUs, one per plant.

(ii) Others.

(a) Aguirre. Excelerate, Inc. presented at the Corps' monthly interagency meeting in November their plan to establish a mooring platform approximately 4 miles off the coast of the Aguirre power plant. A vessel providing storage and re-gasification would be continuously moored at the platform. LNG supply vessels would periodically moor and transfer the product to this vessel. The environmental and other studies are now commencing.

(b) Guayama. Mr. Neftalí García Martínez suggested adding a LNG import buoy and

SUBJECT: Department of the Army Environmental Assessment and Statement of Findings for Permit Application SAJ-2010-02881.

convert the existing AES Guayama 454 MW power plant

(3) LNG Import Terminal. This would essentially replicate EcoEléctrica's terminal. The terminal would require a site of approximately 25 acres for storage tank, regasification units, water treatment, and cooling towers and plus a pier for offloading the LNG. Dredging of the harbor channel would also be needed. Certain activities within an "exclusion zone" surrounding the site would have to be restricted. This distance is unknown but would be based on site-specific analysis of vapor dispersion and effects of fire in case of an accident, though the applicant states this zone may be 1 to 2 mile in radius around the storage tank.[59]

(i) San Juan. The photos below provide the Applicant's conceptual location of a new import terminal utilizing the harbor near the San Juan power plant. The photos show the 38 acres occupied by the power plant and that displacement of other port operations would be required. The Colegio de Ingenieros y Agrimensores de PR suggested using the CAPECO for LNG storage location, indicated by the dotted circle in the photo below that also replicates the boundary of the San Juan power plant. This would still require a connecting pipeline to and space for the offload pier.

(ii) Ceiba or Mayaguez. Mr. Neftalí García Martínez suggested Ceiba, located 54 miles from San Juan, because it was considered by EcoEléctrica in the mid-1990 for building their port and generating facility. He also suggested constructing a pipeline and power plant at Mayaguez.

(4) Use Propane Plants at Palo Seco. Sociedad Espeleológica de Puerto Rico, suggested using the terminals next to Palo Seco that receive propane as enough to gasify the plants on the North. Would also require a pipeline (one of the terrestrial routes A, B or C) to connect to the three power plants.

(5) Alternatives not requiring a Corps Permit (No Action).

(i) Use Power Plants on South Coast Only. Costa Sur power plant is already connected to the EcoEléctrica by a pipeline that has been converted to utilize natural gas. PREPA could use

the entire 93 MM scf/day supply from the EcoEléctrica Terminal available under FERC's 2009 order at this plant. The Aguirre power plant had a pipeline constructed under a Corps permit but is being dismantled. This would enable spreading the supply across two plants. Dr. Gerson Beauchamp estimates that using EcoEléctrica's supply for Costa Sur (potential for 30-to-40% of electricity generated in Puerto Rico) the Aguirre power plant (40%) combined with EcoEléctrica's existing plant (15%) results in 85-95% of Puerto Rico's demand using natural gas. The Primer Informe Parcial de la R. del S 889 (First Progress Report on Senate Resolution 889) provided by Hon. Antonio Fas Alzamora recommends a study of the conversion of the southern plants to natural gas and modernizing the transmission lines from the south to the north.

(ii) Renewable Energy Sources. Legislatura Municipio Autónomo de Coamo, suggested evaluating alternative sources. Dr. Gerson Beauchamp suggested investing the $500 million in Photovoltaic Solar Energy installations at government facilities to provide savings that could be passed to the consumer. Casa Pueblo provided a paper describing generating electricity from landfill gas, solar and concrete recycling.

(iii) Energy Efficiency. Legislatura Municipio Autónomo de Coamo in their resolution suggested the Government and PREPA should develop plans and encourage efficiency in agencies and corporations.

(iii) Status Quo. PREPA could continue operations using fuel oils.

f. First Level (Project Purpose). To meet Level 1, the alternative must deliver an alternate fuel source to the three existing electric power generating facilities on the north coast as stated in the Project Purpose at paragraphs 1.d and 4.a.

(1) Terrestial Pipeline Routes. Combining any one of the North-South Routes with any one of the East-West routes enables delivery of natural gas to the north coast power plants, thereby meeting Screen Level 1. These are advanced to Level 2.

(2) Tanker and Buoy System.

(i) Applicant's Scenarios. All three scenarios meet Screen Level 1 and advance to Level 2.

(ii) Others. These deliver natural gas to the south coast plants, not the ones on the north coast. They do not meet Level 1 and are not advanced to Level 2.

(3) LNG Import Terminal.

(i) San Juan. This delivers natural gas to the north coast power plants, thereby meeting

SUBJECT: Department of the Army Environmental Assessment and Statement of Findings for Permit Application SAJ-2010-02881.

Screen Level 1 and advanced to Level 2.

(ii) Ceiba or Mayaguez. These envision adding new power plants. This does not deliver fuel to existing plants. They do not meet Screen Level 1 and are not advanced to Level 2.

(4) Use Propane Plants at Palo Seco. The Applicant states there are no such terminals close to Palo Seco. The Corps presumes that if there is a terminal, that it would not likely have the excess capacity sufficient to supply a power plant nor the existing pipelines to serve the three plants. This does not meet Level 1 and is not advanced to Level 2.

(5) Alternatives not requiring a Corps Permit (No Action).

(i) Use Power Plants on South Coast only. This does not deliver natural gas to the north coast power plants, and therefore does not meet Level 1. The Primer Informe Parcial de la R. del S 889 (First Progress Report on Senate Resolution 889) describes that currently 70% of the electricity is generated on the south coast while 70% of the demand is consumed in the north coast, and further describes some upgrades in the transmissions lines underway or planned.[60] However, the Applicant states that " due to technical aspects of our generation and transmission systems, PREPA cannot generate alone in the South coast such a large percentage of the energy needed for the Island[61] The Corps believes this is also confirmed by the Senate Report's recommendations to upgrade the transmissions lines.

(ii) Renewable Energy Sources. This does not deliver natural gas to the north coast power plants, and therefore does not meet Level 1. This has the potential to contribute to reducing Puerto Rico's reliance on fuel oils for power. The Applicant provided estimates in section 4.4 of their EIS on how much electricity could be generated spending $447million on photovoltaic, wind turbines and solar heaters. The quantity will be less than that produced using the natural gas supply by the pipeline and will be intermittent. This alternative is not advanced to Level 2.

(iii) Energy Efficiency. This does not deliver natural gas to the north coast power plants, and therefore does not meet Level 1. The Applicant advises that the government already has such incentives, like tax credits for the installation of water heaters and photovoltaic systems. The Corps believes that the high cost of electricity is already encouraging efficiencies, therefore believes that it is not likely that much more is to be gained. This alternative is not advanced to Level 2.

(iii) Status Quo. This does not deliver natural gas to the north coast power plants, and therefore does not meet Level 1.

g. Second Level (Practicability/Reasonability). This level focuses on quantifying impacts by

applying criteria for natural and community environments to conclude the reasonableness and practicability of the alternatives.

(1) Terrestrial Pipeline Routes.

(i) Wetlands & Waters (miles).

(a) North South Routes A and B crosses approximately 2.0 miles of wetlands. North-South Route C crosses approximately 5.7 miles.

(b) East West Route A crosses approximately 3.5 miles of wetlands. East West Route B crosses approximately 6.0 miles. East West C crosses approximately 22.5 miles.

(c) The use of miles as a measurement is appropriate because the extent of aquatic impacts generally correlate to the length of the linear corridor. The extent of upland impacts generally will correlate with the length of corridor not crossing wetlands. Transporting gas from EcoElectrica Terminal to the three north coast power plants will require combining a North South Route and an East West Route. Since there are 3 choices for each direction, there are 9 possible combinations. However, for both directions, A crosses the least miles of wetlands, C crosses the greatest, and B is between the two. Instead of 9 combinations, the remainder of this document will discuss 3 combinations: the term 'Route A' is combination of North South Route A and East West Route A; the term 'Route B' is combination of North South Route B and East West Route B; and the term 'Route C' is combination of North South Route C and East West Route C.

(ii) Wetlands & Waters (acres). The application did not include acre estimates but the Applicant later submitted an analysis.[62] The acreage for North South Route C is calculated as the sum of the 45 wetland impact maps, namely 35.13 acres of temporary and 0.01 acres of permanent impacts to wetlands and other waters. The acreage for North South Route A is the sum of the wetland impact maps where A and C converge, namely, 10.25 acres of temporary and 0.01 acres of permanent impact. North South Route B is same as North South Route C less the 3 wetland impact sheets where they diverge, namely, 9.41 acres of temporary and 0.01 acres of permanent.[63] The acreage for East West C is calculated as the sum of the 37 wetland impact maps, namely 246.23 acres of temporary and 1.67 acres of permanent impacts to wetlands and other waters. The acreage for East West Route A is the sum of the wetland impact maps where East West Route A and East West Route C converge, namely, 58.13 acres of temporary and 1.32 of permanent impact. East West Route B has 84.95 acres of temporary and 1.41 acres of permanent impact.[64]

(iii) Wetlands & Waters (characterization). Impacts will mainly be to palustrine wetlands and streams. Many of the wetlands are current or abandoned agriculture and the

impacts are generally are temporary presuming reestablishment of the wetland functions

(iv) Use of Land, Highway Crossings, Zoning and Residences. The land use that is most unfavorable for locating an alternative are those with the presence of residences, other vacant lands zoned for residences, and other land uses associated with such, to include highway crossings. Routes A and B follow highways to a greater extent than Route C, and therefore are closer to denser populated areas served by those highways. Based on the observation of the aerial photos above, Routes A and B have greater number of residences, and greater extent of unfavorable land uses, greater number of roads to cross, and more unfavorable zoning than Route C. The Applicant clarified the number of residences for Routes A/B "are in the order of hundreds"[65], while Route C will have 92 residences within the 150 foot setback from the pipeline centerline.[66]

(a) Safety. There will always be a certain amount of risk of injury or fatality depending on how close you are to a natural gas pipeline. This will be true no matter how extensive the design and operation measures implemented. The Federal regulations for pipelines do not establish a minimum setback distance or minimum level of risk. This is discussed further in paragraph 7(a)(1). The Applicant in their alternative analysis stated an alternative that avoids residences is preferred due to "general public safety factors".[67] The Applicant verbally stated there is much concern in the communities regarding locating a pipeline nearby.[68] Indeed, while Routes A and B were developed in an earlier study, the Applicant designed Route C for the purpose of avoiding residential areas.[69] The Corps also has received many comments from the public concerned with the safety of the pipeline near communities. Therefore, the Corps recognizes the compelling reason to move the pipeline, wherever possible, away from communities.

(b) Difficulty of construction. The presence of highways and residences also indicates there are other infrastructure such as smaller roads and utilities. This increases the cost of the project, including the need for temporary removal and replacement of roads, adjusting pipe to avoid utilities, and delays due to constrained access for construction equipment. This also increases the potential for added costs due to unanticipated utilities and site conditions. Following is some information specific to certain routes.

-1- East West Routes A and B follow PR 22 to a greater extent than Route C. This location, however, presents several constraints as the limited construction area would require "borrowing" space from the expressways, which has the potential to create traffic jams, thereby delaying the construction schedule and increasing construction costs.[70] The Corps observed many portions of the highway are elevated on fill with narrow shoulders, therefore presumably the pipe would need to be located at the base of the fill. The Corps also observed that these are areas of dense development and that the development is present up to the base of the fill and/or right-of-way fence. As a result, construction will be more difficult due to limited

access and proximity to occupied structures.

-2- East West Route C, by not following PR-22, is located within a clay substrate in the alluvial wetlands and flood-prone valleys that enable for faster, less expensive and safer construction and operation of the pipeline. [71]

-3- North South Route B follows a greater length of PR10 (south of Adjuntas) than Route C resulting in less impact to undeveloped forest habitat. However, the geology along PR 10 would require the use of explosives that could damage the road and adversely affect traffic flow.[72]

(v) Endangered Species & Coral. During consultation, the following non-plant species were determined to be potentially affected by the alignment in the application (Route C): Puerto Rican Nightjar, Puerto Rican Boa, Puerto Rican Broad-winged hawk, Puerto Rican Crested toad, and the Puerto Rican sharp-shinned hawk. Routes A and B were compared to Route C using maps of predicted habitat and/or ranges for these species obtained from the Puerto Rico Gap Analysis Project (PRGAP). Routes A, B, and C all cross mapped habitat areas for each of the five species, therefore the number of non-plant species between the Routes would not be different. However, for the Puerto Rican Nightjar, Routes B and C cross what is considered the highest quality of habitat for that species. For plants, during consultation with FWS, certain portions of the alignment were identified as having higher probability to find individuals due to the nature of the plant cover and level of disturbance by human activities. These locations were later found to correlate with three of the land covers mapped by the PRGAP. A comparison of Routes A, B and C found that all three cross areas that are mapped with these land covers, therefore, the number of plants species potentially present would not be different. All three Routes A, B and C have stream crossings. None of Routes A, B or C are expected to affect coral due to implementation of sediment controls and additional monitoring of the HDD at stream crossings. Each HDD crossing will utilize downhole monitoring that provides more rapid indication, compared to normal standpipe monitoring, of a change in pressure that could indicate a loss of drilling fluid. The change in pressure is that compared to the pressure predicted by an HDD professional in advance of the drilling. The Applicant will also have a third party specialist monitoring the operation. Except for one location of Route C, the crossings are away from the coast giving time to react to spillage before sediment reaches the open water. The one location for Route C is the beach at Levittown. At that location, the work areas will be above the mean high tide line, will have barriers to prevent sediment from washing into the open water, and a double barrier around the HDD work pads.

(vi) Transportation/Traffic. Routes A, B, and C each have the potential to temporarily disrupt traffic flow during construction. The Via Verde Master Utility Agreement between the Applicant and Federal Highway Administration (FHA) requires a Maintenance of Transportation (MOT) plan. Any disruption in traffic flow or access on major roadways, and in particular, the

SUBJECT: Department of the Army Environmental Assessment and Statement of Findings for Permit Application SAJ-2010-02881.

National Highway System, may have severe economic and safety impacts. Since the PR-22 and PR-10 were constructed using Federal funds, the FHA policy for 'Accommodation of Utilities' at 23 CFR 645.205 would apply. This policy states that the proposed utility line must preserve the operational safety and functional and aesthetic quality of the highway. Route C has the least extent along the highway compared to Routes A and B and, therefore, preserves to a greater extent the safety and functionality of the highway system.

(vii) Cost. The estimated design and construction cost of the terrestrial pipeline is $447 million.[73]This total cost estimate does not include operating costs. The Applicant subsequently provided a comparison of the terrestrial pipeline proposal and Tanker and Buoy proposal based on a 20-year construction and operation cost analysis. This analysis reported the 20 year construction and operation cost for the Route C is $980 million.[74] These figures do not include the cost of the gas itself but just the infrastructure to enable delivery.

(vii) Conclusion. This alternative is considered practicable and therefore advanced to Level 3.

(2) Tanker and Buoy System.

(i) Wetlands & Waters (miles).

(a) The Applicant's Scenario 1 (S1) requires one of the East-West Routes in order to connect all three power plants to provide the same flexibility in distributing the gas among all three plants. While S1's pipeline would not include the wetland impact associated with the North-South Routes south of Arecibo (in the alluvial wetlands along the Rio Arecibo), it would have 3 to 5 miles of pipe out to the submerged buoy.

(b) Applicant's Scenario 2 (S2) has two offshore pipelines of 3 to 5 miles each plus approximately 6 miles of pipeline between the Palo Seco and San Juan power plants.

(c) Applicant's Scenario 3 (S3) has three sets of offshore pipelines 3 to 5 miles each.

(ii) Wetlands & Waters (acres). The application did not include acre estimates for the pipeline trenching and buoy anchoring offshore.

(a) A rough estimate for S1 would be 24 acres based on 5 miles of pipeline multiplied by 40 feet for the trenching. This will be in addition to the wetland and water impacts for East West Route A, B, or C, whichever is selected.

(b) A rough estimate for S2 would be 48 acres based on 5 miles of pipeline multiplied

by 40 feet for the trenching multiplied by 2 buoys. This is in addition to the wetland and water impacts for the pipeline between Palo Seco and San Juan power plants. These impacts are based on the sum of the 6 wetland impact maps, namely 22.69 acres of temporary impacts and 0.04 acres of permanent impacts.

(c) A rough estimate for S3 would be 72 acres based on 5 miles of pipeline multiplied by 40 feet for the trenching multiplied by 3 buoys.

(iii) Wetlands & Waters (characterization).

(a) S1 has BOTH marine/estuarine impacts as well as the palustrine impacts associated with either East West Routes A, B or C. A large proportion of palustrine wetlands are abandoned agriculture and the impact is generally temporary presuming reestablishment of the wetland functions. Marine system includes coral habitat that are more sensitive to being impacted permanently and more difficult to mitigate.

(b) S2 has both marine/estuarine impacts as well as the palustrine impacts. The palustrine wetlands are largely associated with a remnant river in the vicinity of the Palo Seco power plant. Marine system includes coral habitat that are more sensitive to being impacted permanently and more difficult to mitigate.

(c) S3 will have marine impacts, including coral habitat that are more sensitive to being impacted permanently and are more difficult to mitigate.

(iv) Use of Land, Highway Crossings, Zoning and Residences. For all three Scenarios, there is little or no available space for the receiving terminal(s), which require about 0.6 acres, based on examination of aerials and information from the Applicant. The Cambalache and Palo Seco power plants are located in an area with a mix of coastal and dense residential areas. For the San Juan power plant, land could be made available by displacing other port activities.[75]

(a) Safety. There will always be a certain amount of risk of injury or fatality depending on how close you are to a natural gas pipeline. In addition to the information above relative to the terrestrial routes, there will also be a risk of the additional piping and equipment at the receiving terminal.

(b) Difficulty of construction. The terminal will probably result in relocation of existing infrastructure and structures, this increases the cost of the project, including delays due to constrained access for construction equipment and increases the potential for added costs due to unanticipated utilities and site conditions.

(v) Endangered Species & Coral. All three Scenarios of Tanker & Buoy are located in

areas with swimming turtles and whales. NOAA's benthic mapping suggests routes may be available to avoid known coral. However, installation involves placing the pipe in a trench and installing anchoring systems. Sediment plumes will form and the control is only in the care of the construction and timing relative to currents, therefore it is likely that impacts to the coral would occur.

(vi) Transportation/Traffic. For all three Scenarios of Tanker & Buoy, the USCG would require no navigation within 500 meter of the moored vessel. This may not pose much of a constraint considering its offshore location 3 to 5 miles off the coast, but there is a potential for a disruptive effect on traffic into San Juan harbor. Scenario 1 would require one of the East-West Routes A, B or C and the resulting disruption on PR-22.

(vii) Cost. The Tanker & Buoy system would require signing a 20 year contract of $70 to $80 million dollars a year for a total $1,600 million which covers the design, construction and operation of the Tanker & Buoy system.[76] The Applicant subsequently provided a comparison of the Terrestrial Routes and the Tanker and Buoy Scenarios based on a 20-year construction and operation cost analysis. Scenario 1 is $1,847.6 million (one Tanker and Buoy system at $1,600 million and $247.6 million for the terrestrial pipeline to connect the three plants). Scenario 2 is $3,227 million (two Tanker & Buoy systems for $3,200 million plus $27 million for the shorter pipeline between Palo Seco and San Juan power plants). Scenario 3 (one Tanker & Buoy system at each plant and no pipeline) is $4,800 million.[77] Although the Applicant's submittal shows a total consumption of 232 MM scf/day for all three Tanker & Buoy scenarios, the above figures do not include the cost of the gas itself but just the infrastructure to enable delivery.

(vii) Conclusion. This alternative is considered practicable and therefore advanced to Level 3.

(3) LNG Import Terminal (San Juan).

(i) Wetlands & Waters (miles). The LNG Import Terminal will require either East-West Route A, B or C to connect the power plants and the associated miles of impacts.

(ii) Wetlands & Waters (acres). The LNG Import Terminal's direct impact will only be that of either East West Route A, B or C, presuming its location displaces some current activity along the piers. There will be some associated impact for dredging of the harbor.

(iii) Wetlands & Waters (characterization). The LNG Import Terminal direct impact will be to the palustrine wetlands of either East West Route A, B or C presuming its location displaces some current activity along the piers. Dredging of the channel would potentially impact many benthic species and their habitat.

SUBJECT: Department of the Army Environmental Assessment and Statement of Findings for Permit Application SAJ-2010-02881.

(iv) Use of Land, Highway Crossings, Zoning and Residences.

(a) Safety. The LNG Import Terminal requires approximately 25 acres [78]as well as restrictions on land use surrounding it to provide an exclusion zone of up to 2 miles. The Colegio de Ingenieros y Agrimensores de PR suggested using the CAPECO for LNG storage location; however, that site was determined to be inadequate as it does not allow for the required exclusion zones.[79]

(b) Difficulty of construction. Siting of the LNG Import Terminal at this location would require displacement of considerable extent of existing port activities as well as possible displacement of surrounding residential areas.

(v) Endangered Species & Coral. The bulk of the impacts would be to those species that would be affected by the dredging and subsequent ship movements for natural gas deliveries..

(vi) Transportation/Traffic. There would also be restrictions on other traffic during the transit of the LNG vessels with potential disruption of the import/export activity for the economy.[80]

(vii) Cost. For the LNG Terminal, since the cost of the EcoElectrica facility in 1995 dollars was over $570 million the current cost to replicate that would be much greater.[81] The LNG Terminal would then be $570 million in 1995 dollars plus the $247.6 million cost of the pipeline to connect the plants (using the cost for Tanker and Buoy Scenario 1).

(vii) Conclusion. The immense costs and disruption to the port of San Juan and therefore Puerto Rico's economy render this alternative impracticable and therefore is not advanced to Level 3.

(4) Alternatives not requiring a Corps Permit (No Action). A detailed Level 2 analysis was not performed for these since they did not meet Level 1 (they do not deliver an alternate fuel to the north coast power plants).

(i) Use Power Plants on South Coast only. The Primer Informe Parcial de la R. del S 889 (First Progress Report on Senate Resolution 889) describes that currently 70% of the electricity is generated on the south coast while 70% of the demand is consumed in the north coast, and further describes some upgrades in the transmissions lines underway or planned.[82] However, the Applicant states that "due to technical aspects of our generation and transmission systems, PREPA cannot generate alone in the South coast such a large percentage of the energy needed for the Island".[83]

(ii) Renewable Energy Sources. This has the potential to contribute to reducing Puerto

Rico's reliance on fuel oils for power. The Applicant provided estimates in section 4.4 of their EIS on how much electricity could be generated spending $447million on photovoltaic, wind turbines and solar heaters. The quantity will be less than that produced using the natural gas supply by the pipeline and will be intermittent.

(iii) Energy Efficiency. The Applicant advises that the government already has such incentives, like tax credits for the installation of water heaters and photovoltaic systems. The Corps believes that the high cost of electricity is already encouraging efficiencies, therefore believes that it is not likely that much more is to be gained.

(iii) Status Quo. This does not enable a use of alternative fuel or reduce costs.

h. Third Level (Comparison). This level evaluates the key differences between the alternatives to arrive at a selection.

(1) Terrestrial Pipeline Routes.

(i) Aquatic environment. The difference in herbaceous wetland impacts between the Routes A, B and C, as measured in ecological terms and not acres, are not large. First, there will be temporary impacts due to fill material being excavated from the trench and side-cast in windrows within the wetland adjacent to the trench. There will also be temporary fill impacts for construction of the work pads. The fill is considered temporary because it is expected to be either removed from the impacted wetland area to backfill the trench or be hauled away to a suitable upland disposal site within a week or few weeks. This expectation is based on the typical construction management employed for pipelines: first, the earthmoving equipment performs the excavation and backfilling task in one location and then moves on to the next; and, second, there is an expense to remobilize equipment back to a location. Unlike typical highway or development projects, there will be no resulting loss in the spatial extent of wetlands and the impacted wetlands are returned to their original condition. There will be a temporary loss of ecological functions during the period of time between when the impact occurs and when the wetland functions are restored. There is concern, as discussed in Paragraph 7(a)(10), that the original wetland functions will not be completely restored. If the Applicant is not successful in fully restoring these herbaceous wetlands, then the Applicant will be required to provide compensatory mitigation for the subject impacts. It should be noted that the proposed impacts within the 60 foot project ROW are largely through disturbed agricultural fields, which increases the likelihood of successful restoration of the current wetland functions. This is exemplified in ex-agricultural fields where it was observed that wetlands have re-established without human intervention. Second, the barriers to water and wildlife movement are expected to be of short duration (some wildlife will still be constrained until the vegetation re-grows, however, this would not be dissimilar from the effects of existing roads, etc within the landscape). Third, Routes A, B and C cross the same major rivers and there is not much difference in the number of

minor tributary crossings. Therefore, the effects on benthic and open water habitats are similar between the Routes. Fourth, the acreage of permanent wetland impacts are small (1.33 acres for Route A, 1.42 acres for B and 1.68 acres for C) and the difference in the amount of permanent impact between each alternative is insignificant.

(ii) Safety. There is a greater degree of risk of public injury or fatalities with the selection of Routes A or B. Route C reduces the risk of injury and fatality by moving the pipeline away from communities with a resulting increase in the amount of temporary impact to wetlands and waters. This concern is similar to that of highways, where we include safety lanes to reduce injuries and fatalities due to traffic accidents at the expense of additional wetland impact. There may be technological solutions, for example, to increase the design of the pipeline, but these will not eliminate the risk to the same degree as simply as relocating the pipeline away from populated areas.

(iii) Technology of pipeline design is limited in its capability to address the increased risk to public safety in developed areas. Paragraph 7(a)(1) describes how additional design measures are included near populated areas (e.g., increasing the pipe's wall thickness) to meet the Federal standards for pipelines. Additionally, the Applicant has implemented a certain degree of design measures to further reduce public safety risks, as detailed in Paragraph 7(a)(1).

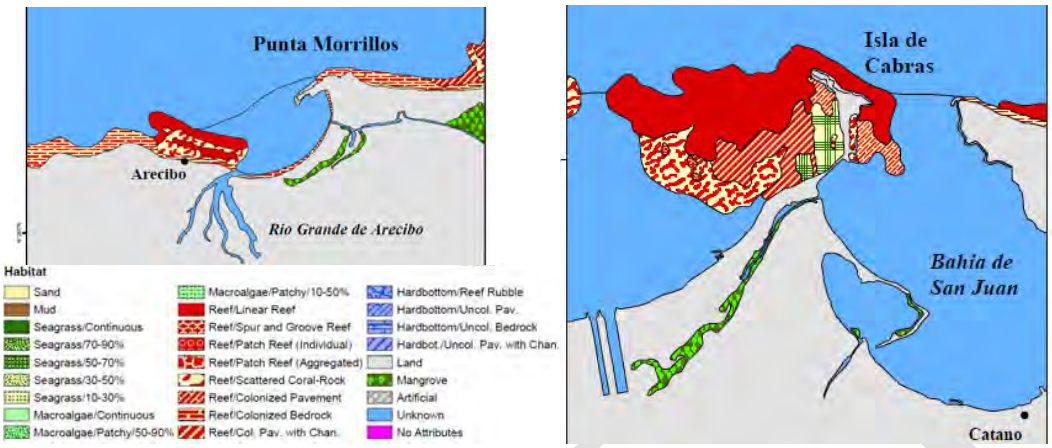
(iv) Costs for Routes A and B are greater due to construction logistics associated with working in developed areas, including temporary removal and replacement of small roads, disruption and management of traffic flows, adjustments for existing utilities, and delays due to constrained construction access. There is also the potential for increased costs caused by finding unanticipated utilities and site conditions. Route C, in contrast, passes through large agricultural parcels which serves to: (1) increase the efficiency of pipeline construction due to a reduction in infrastructure constraints and presence of favorable alluvial soils; (2) reduce displacement of people's homes because there are less private properties within the 150-foot setback; and (3) reduce costs for implementing technological solutions. Examples of the latter include: the Applicant is adding additional valves in developed areas, providing greater pipe wall thickness, and installing a concrete cap along certain segments of the pipeline alignment.

(v) Conclusion. There are no significant differences between A, B and C's damage to the aquatic environment. Route C has the lesser concern for safety and least cost.

(2) Tanker and Buoy System.

(i) Aquatic environment. All three Tanker and Buoy scenarios would result in a greater level of adverse impacts to aquatic resources than the terrestrial pipeline routes. This includes permanent impacts to coral systems as illustrated by the below maps of the coasts at the Cambalache and Palo Seco power plants). The corals could be impacted

SUBJECT: Department of the Army Environmental Assessment and Statement of Findings for Permit Application SAJ-2010-02881.



Tile 11 (Arecibo) and Tile 23 (Palo Seco) maps (based on 1999 aerial photos)
From NOAA's Benthic Habitat Mapping of Puerto Rico and the U.S. Virgin Islands[84]

directly by the pipe between the shoreline and the offshore buoy. There is a possibility of routing the pipeline around the coral depending on whether benthic surveys find a route completely clear of the substrate suitable for coral. However, this is unlikely simply due to the extensive known presence of corals. The corals could be indirectly impacted by deposits from sediment plumes from the trenching and installation of the anchors due to the difficulty of controlling sediment plumes in open coastal waters. The potential for sediment resulting from the terrestrial trenching to enter streams and then reach the corals is considered unlikely due to the proven effectiveness of terrestrial erosion/turbidity control methods. Corals are more sensitive to smothering by sediment and more difficult to restore than the herbaceous wetlands proposed to be impacted by the terrestrial route alternatives. In addition, many species of corals and suitable substrate are listed under the Endangered Species Act, which is not the case for the terrestrial wetland species. Any impacts to the corals or their habitat could further imperil chances of recovery of these species.

(ii) Applicant's Scenario 1 (S1) will affect both the marine and terrestrial aquatic systems. S2 involves less fill of wetlands than S1, but is more costly. S3 will affect the marine ecosystem the greatest and is the most costly of the three scenarios, and much more costly than any individual terrestrial alternatives alone.

(iii) The wave energy on the north coast would prevent continuous mooring of the FSRU vessels thereby resulting in periods of time when an alternative fuel supply would not be available to the power plants. This is not an issue with the terrestrial Routes A, B or C because the on-site storage tank at the EcoEléctrica terminal provides a supply between deliveries.

(iv) Conclusion. The Tanker and Buoy system has more adverse effect on protected aquatic resources than Routes A, B or C.

(3) Alternatives not requiring a Corps Permit (No Action). None of them deliver an alternate fuel to the north coast power plants.

(4) Conclusion. Based on the above analysis, Route C is selected due to the Corps' concern for public safety.

5. Evaluation of the 404(b)(1) Guidelines.

a. Factual determinations.

(1) Physical Substrate. The primary impact is the temporary side-cast of material excavated from the pipeline trench. The substrate will be temporarily buried until the side-cast material is removed and the surface leveled to match the adjacent grade. Some locations will be buried by topsoil that is being segregated for backfilling the trench. The rest of the side-cast will consist of the material from the trench underlying the topsoil, of which some will be used for temporary work pads for HDD. The underlying material may be somewhat different in the organics and other such characteristics from the topsoil but not by much since the trench is only 6 feet deep and 9 feet at highway crossings. A second impact is open trenching through streams. The material will be side-cast to the banks and then replaced and contoured. Since the trench is only approximately 4 feet wide it should not be difficult to achieve the same contour and characteristics as the rest of the stream bottom. A third impact will be the disposal of the "cuttings" from the HDD boring, which the Applicant proposes to spread and mix with the topsoil. The cuttings will be clay and other deep substrates mixed with Bentonite (a clay is used as "drilling mud"). Since the Applicant is committed to complete restoration of impacted wetlands, the Corps presumes that the intent is to disperse this material sufficiently so the topsoil retains the appropriate wetland characteristics. A fourth impact is the permanent placement of gravel to form pads for the Main Line Valves (MLVs) and access roads.

(2) Water circulation, fluctuation, and salinity. To minimize impacts, the Applicant proposes to work in the wetlands during the dry season when there is no surface water or at worst the presence of shallow surface water that slowly sheet flows. The trenching and backfilling will take place in the order of weeks, so any disruption to surface water flows will be short. For stream crossings, there will be some temporary change or diversion in the flow as a result of open trench crossings or construction of temporary dikes, respectively. For the MLV pads, the Applicant proposes to use gravel placed at a depth of6 inches deep to minimize the potential to hinder sheet flow in the wetlands in which the pads are located.

(3) Suspended particulates/turbidity. In wetlands, the shallow slow sheet flow condition will limit the extent of turbidity plumes. In streams, trenching is not proposed to be performed in high flow conditions. For both operations, the erosion control plans provide for various

measures to retain the sediments within the work areas.

(4) Contaminant availability. Since the deposited material is coming from the trench immediately adjacent, it is not expected that any contaminants will be introduced into affected aquatic resources. If any contaminants are present (e.g., such as may be found in agricultural lands), then they will be moved from the trench to the adjacent lands and back. The "cuttings" from the HDD is expected to be virgin material due to the depth of the bores. Quoting from the Applicant's HDD Plan: "Bentonite is a naturally occurring, non-toxic, inert clay that meets NSF/ANSI 60 NSF Drinking Water Additives Standards and is frequently used for drilling potable water wells. Environmentally benign additives, such a polymers and soda ash, may be added to the drill fluid to optimize its properties."[85] For the MLV pad gravel, the source is expected to be clean quarry material.

(5) Aquatic ecosystem and organisms. Paragraph 7.a.(10) describes the results of the numeric functional assessment used to assess the impacts to the wetlands and appropriateness of the compensatory mitigation. There will be a spatial loss of 1.68 acres of wetlands for the permanent impacts of the MLVs, which is assessed at 0.99 "units" of ecological function. This loss of ecological function is proposed to be compensated by the enhancement of 20 acres of wetlands through removal of current agricultural activities. For the areas of temporary impact, there is no direct loss of spatial extent of wetlands, only a temporary loss of ecological functions until the locations are restored or, if not fully restored, then mitigated off-site. The known habitat of the Coqui llanero (*Eleutherodactylus jaunariveroi* or Plains Coqui) is some wetlands near Toa Baja. Six individual Coqui IIanero were found during a survey of the pipeline alignment, though outside the known range. To minimize potential impacts on this species, the Applicant proposed that during construction certain surveys and other actions will be taken to identify and relocate individuals out of the path of the construction.. One comment letter noted that land crabs could be affected by loss of wetlands, however, any potential impacts are expected to be minimized by the expected short duration of the construction operations and immediate wetland restoration actions.

(6) Proposed disposal site. The mixing zone will be normally in the immediate vicinity of the trench, but in any case will not extend beyond the construction work area. There is not expected to be a loss of quantity of water or flow, thereby not affecting other human uses of the wetlands or streams impacted by the project.

(7) Cumulative effects on the aquatic ecosystem. See Paragraph 7.e.

(8) Secondary effects on the aquatic ecosystem. Concern has been expressed of the potential for impacts downstream of sediment or HDD "drilling mud". This potential is considered very small as discussed in Paragraph 7.a.(11)

SUBJECT: Department of the Army Environmental Assessment and Statement of Findings for Permit Application SAJ-2010-02881.

b. Restrictions on discharges (230.10). *The following describes the basis for the finding at the time this document was written. The final finding will be made after review of comments on this draft document.*

(1) It has been demonstrated in Paragraph 4, Alternatives Analysis, that there are no practicable nor less damaging alternatives which could satisfy the project's basic purpose. The proposed activity is located in a special aquatic site (wetlands, sanctuaries, and refuges, mudflats, vegetated shallows, coral reefs, riffle & pool complexes). It was determined that he proposed activity does not need to be located in a special aquatic site to fulfill its basic purpose.

(2) The proposed activity is not expected to violate applicable State water quality standards or Section 307 prohibitions or effluent standards. The proposed activity does not jeopardize the continued existence of federally listed threatened or endangered species or adversely affect their critical habitat. The proposed activity does not violate the requirements of a federally designate marine sanctuary.

(3) The activity will not cause or contribute to significant degradation of Waters of the United States, including adverse effects on human health; life stages of aquatic organisms' ecosystem diversity, productivity and stability; and recreation, esthetic, and economic values.

(4) Appropriate and practicable steps have been taken to minimize potential adverse impacts of the discharge on the aquatic ecosystem.

6. Public Interest Review.

All public interest factors have been reviewed as summarized in the below table. Both cumulative and secondary impacts on the public interest were considered. Public interest factors that have had additional information relevant to the decision are further discussed in Paragraph 7.

+ Beneficial effect
0 Negligible effect
- Adverse effect
M Neutral as result of mitigative action
Not applicable / relevant to this review

+	0	-	M	n.a.	
☐	☒	☐	☐	☐	Conservation. ¶7.a.(9).
☒	☐	☐	☐	☐	Economics. ¶7.a.(8).
☐	☐	☐	☐	☒	Aesthetics.
☐	☐	☒	☐	☐	General environmental concerns. ¶7.a.(7).
☐	☐	☐	☒	☐	Wetlands. ¶7.a.(10).
☐	☐	☐	☒	☐	Historic properties.

SUBJECT: Department of the Army Environmental Assessment and Statement of Findings for Permit Application SAJ-2010-02881.

☐	☐	☒	☐	☐	Fish and wildlife values. ¶7.a.(6).
☐	☐	☐	☐	☒	Flood hazards.
☐	☐	☐	☐	☒	Floodplain values.
☐	☐	☐	☐	☒	Land use.
☐	☐	☐	☐	☒	Navigation.
☐	☒	☐	☐	☐	Shore erosion and accretion. ¶7.a.(2).
☐	☐	☐	☐	☒	Recreation.
☐	☐	☐	☒	☐	Water supply and conservation. ¶7.a.(5).
☐	☐	☐	☒	☐	Water quality. . ¶7.a.(11).
☒	☐	☐	☐	☐	Energy needs.
☐	☐	☒	☐	☐	Safety. ¶7.a.(1).
☐	☐	☐	☐	☒	Food and fiber production.
☐	☐	☐	☐	☒	Mineral needs.
☐	☐	☒	☐	☐	Considerations of property ownership. ¶7.a.(4).
☐	☐	☒	☐	☐	Needs and welfare of the people. ¶7.a.(3).

7. Effects, policies and other laws.

a. Public Interest Factors.

(1). Safety of pipeline. PREPA is obligated to design, construct, operate and maintain the pipeline in accordance with the Federal pipeline safety regulations issued by the U.S. Department of Transportation (DOT) and codified in 49 Code of Federal Regulations Parts 190-199 (49 CFR Part 190-199). The U.S. DOT's Pipeline and Hazardous Material Safety Administration (PHMSA) Office of Pipeline Safety (OPS) administers the regulatory program that establishes these rules. PHMSA inspects and enforces compliance under Title 49 of the U.S. Code (USC), Subtitle VIII, Chapter 601et seq. titled 'Pipelines – Safety'.

(i) The Puerto Rico Public Service Commission (PSC) is assuming all inspection, monitoring and enforcement of the pipeline safety regulations for this pipeline as provided by subchapter 49 USC 60105(a), titled 'State Pipeline Safety Program Certifications'. The PSC certifies to PHMSA that the Commonwealth of Puerto Rico has, among other things, adopted at a minimum the Federal standards, that those standards are being enforced (including inspections by employees that meet the Federal standard), that the PSC requires the pipeline operator to implement the record maintenance, reporting, and inspection requirements that are substantially the same as required by the Federal standard, that the PSC requires the pipeline operator to submit plans for inspection and maintenance for approval; and that the PSC can enforce compliance by Commonwealth laws substantially the same as as required by the Federal law, since PSC has adopted the Federal regulation. In addition, for the Via Verde project, and at the request of the Governor of Puerto Rico, PHMSA has and is committed to providing experienced professionals to work alongside PSC staff in performing reviews and inspections to assure that

inspection of this pipeline is equivalent to that performed for other pipelines in the Federal program.

(ii) The pipeline design includes higher safety criteria that will be implemented in the more populated areas, as discussed below.

(a) The entire length of pipeline is subdivided into "class locations" based on the number of structures within 660 feet on either side of the pipeline centerline of any continuous one mile length of pipeline, as defined at 49 CFR §192.5, titled 'class locations'. The regulation includes more detail, but in general the classifications are: Class location 1 has 10 or fewer buildings intended for human occupancy; Class location 2 has from 11 to 45 buildings; Class location 3 has 46 or more buildings or within 100 yards of areas or buildings of public assembly; and Class location 4 is where buildings with four or more stories above ground are prevalent. Approximately thirty-one percent (31%) of the pipeline (27.78 miles of the 89.1 miles studied) is Class location 3, approximately 19% is Class location 2, and approximately 50% is Class location 1 (Appendix 5.1 of the EIS).

(b) The following four paragraphs describe some of the adjustments of the design based on the class locations. This information is summarized from the permit application and the references to the Federal standards added by the Corps.

-1- Main Line Valves (MLV) are spaced closer together in higher populated areas to isolate sections of the pipeline for inspections, repairs, maintenance or emergencies, as required by 49 CFR §192.179. This table shows the section lengths, some are shorter because of the requirements relative to highway PR-22 (Appendix 5.2 of the EIS). The alignment starting from MLV10 until the end at San Juan is entirely Class 3. MLV10 is at the intersection of PR-22 and PR-2 west of Vega Alta (in the center of the aerial photo at paragraph 4.d.(2)(b)).

Mainline Valve Locations (MLV)				Shown on Wetland Impact Maps (Note 3)		
	MilePost	Section length (ft)		Between MP and MP	Map #	
EcoEléctrica	0.00	-				
MLV1	14.02	14.02				
MLV2	23.76	9.74				
MLV3	35.55	11.79				
MLV4&5	41.25	5.70				
MLV6	48.40	7.15		MP50 - MP 51	51	
MVL7	55.30	6.90	(Note 1)	MP57 - MP58	57	
MLV8	59.16	3.86				
MLV9	68.56	9.40		MP69 MP70	66	

SUBJECT: Department of the Army Environmental Assessment and Statement of Findings for Permit Application SAJ-2010-02881.

MVL10	69.86	1.30	(Note 1)	MP70 MP71	67	
MLV11	75.09	5.23		MP76 -MP77	70	
MLV12	76.93	1.84	(Note 2)	At MP78	71	
MLV13&14	84.35	7.42		MP85 – MP86	77	
San Juan	89.10	4.75				
Note 1. MLV added to comply with ASME B31.8 for PR-22						
Note 2. Added to accommodate a possible future urban development in area of Mile Post 73 to 81.						
Note 3. MLVs in wetlands require fill for the pad and in some cases access road and are shown on the Wetland Impact Maps. The Milepost (MP) and Map # is listed. The locations of the Mileposts in PREPA's drawings submitted to the Corps are different from PREPA's drawings in their EIS.						

-2- The pipe walls will be thicker in Class 2 and 3 locations and areas with higher population, as an additional project safety feature. The wall thickness is calculated using a more conservative Design Factor compared to that required by 49 CFR 192.11.

Class location	Design Factor	Required for certain locations	Actual Design Factor used	% of Via Verde pipeline
1	0.72	0.60		
1			0.72	35.5%
1			0.60	6.9%
1			0.50	5.6%
1			0.40	1.0%
2	0.60	0.50		
2			0.60	18.1%
2			0.50	1.0%
2			0.40	6.4%
3	0.50			
3	0.50		0.50	25.5%

-3- In some cases, the pipeline will be buried deeper than required by 49 CFR 192.327.

Inches of soil covering top of pipe			
Class		Minimum	Actual
1	Normal soil	30	36
1	Consolidated rock	18	36

SUBJECT: Department of the Army Environmental Assessment and Statement of Findings for Permit Application SAJ-2010-02881.

2 & 3	Normal soil	36	36
2 & 3	Consolidated rock	24	36
2 & 3	Along PR 10 and PR 22	36	60
All	Crossing Highways	60	87 (2.2 meters)
All	Crossing Freeways	60	118 (3.0 meters)
All	Longitudinal to Highways		60 (1.5 meters)
All	Longitudinal to Freeways		78 (2.0 meters)
All	If distance from edge of road to pipe less than 144 inches, then installation of a concrete slab over the pipe designed to support weight of 120 tons per square foot.		

-4- Once the pipe is placed in the trench, the pipe will be hydrostatically pressure tested in accordance with §192.505. In addition, in a Class location 1 or Class location 2 , if there is a building intended for human occupancy within 300 feet of the pipeline, the test must be conducted to a test pressure of at least 125 percent of maximum operating pressure, in accordance with 49 CFR §192.505.

(iii) There is not a Federal standard for a minimum distance between a pipeline to occupied structures. There is a standard for the minimum distance between the pipe and any other underground structure, and that is standard is 12 inches (49 CFR §192.325). PREPA will provide 24 inches to any underground structure "unless impracticable"[86]. For occupied structures, PREPA has established a distance of 150 feet[87]. PREPA plans to acquire 32 homes located within 50 feet of the centerline and will acquire all or some of the 60 homes located between 50 and 150 feet if the owners desire[88]. PREPA established the 150 foot distance utilizing a study titled "A Model for High Consequence Areas Sizing Associated with Natural Gas Pipelines".[89] Quoting from the report: "An equation has been developed that relates the diameter and operating pressure of a pipeline to the size of the area likely to experience high consequences in the event of a credible worst-case failure event. The hazardous event considered is a guillotine-type line rupture resulting in double-ended gas release feeding a trench fire that is assumed to ignite soon after failure." For Via Verde's 24- inch diameter pipe and 650 psi (pounds per square inch) operating pressure, the radius using the report's formula is 419 feet. The report then examines twelve actual pipeline incidents by calculating the radius based on the diameter and pressure of the pipe involved and comparing the result to the actual radius and distances of the burnt ground, of injuries, and of fatalities. The report found the actual area of burnt ground was always less than the calculated radius. PREPA states they utilized the incidents for those pipelines similar to Via Verde to adopt their distance of 150 feet.

(iv) For operation of the pipeline, PREPA is required to prepare, implement and follow a written Integrity Management Plan for High Consequence Areas (HCA), as stipulated in Subpart O of 49 CFR Chapter 192.

SUBJECT: Department of the Army Environmental Assessment and Statement of Findings for Permit Application SAJ-2010-02881.

(a)- An area is designated an HCA if there are a certain number of dwellings and other occupied land uses within the "potential impact radius" (PIR), or certain other criteria. This is defined at §§192.903 and 192.905. The PIR for Via Verde is 422 feet.

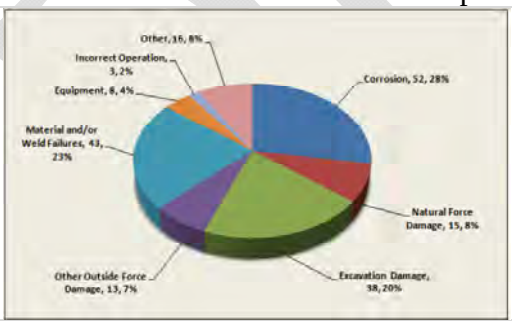
(b) The Integrity Management Plan addresses many elements, as described in detail by 49 CFR 192.912, including: identification of all HCAs, a baseline assessment, identification of threats, description of measures for direct assessment (e.g., corrosion) and integrity assessment (e.g., pipeline wall) and additional measures, including third party damage.

(c) PREPA is required to maintain the Integrity Management Plan and required records and make them available for review during an inspection by, in the case of Via Verde, the PSC.

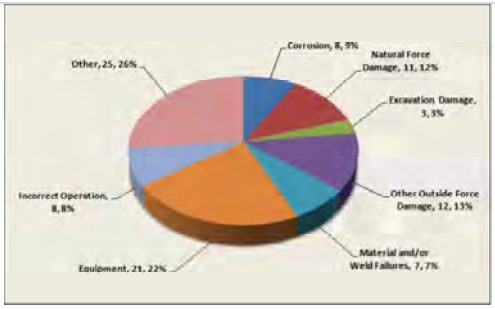
(v) The above describes the design, location and operation processes described above serve to minimize, but do not eliminate the risk of failure. The following discussion further analyzes the causes which have been found to result in pipeline failures

(a) PHMSA's report titled 'Building Safe Communities: Pipeline Risk and its Application to Local Development Decisions'[90] includes the following two graphics categorizing the significant incidents occurring along the pipeline and at ancillary facilities (compressor stations, regulator/metering stations). The report states "…the predominant failure causes for line pipe [sic] are corrosion, material/weld failures, and excavation damage." For the facilities, it states "…a high percentage of incidents are caused by equipment failures, other outside force damage, and natural force damage, but the highest percentage of incidents are classified as being due to "other" causes." The "other" included several releases due to equipment malfunctions at compressor stations, which are not present on the Via Verde project.

Causes of Gas Transmission Pipeline Significant Onshore Incidents 2005-2009



Right-of-Way Line Pipe Only



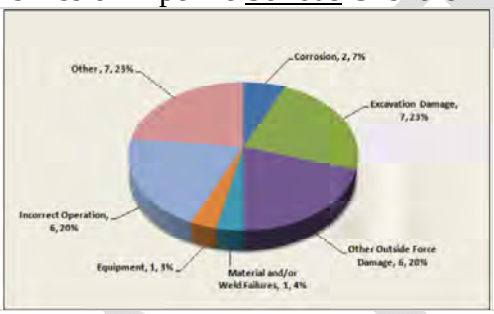
Facilities Only (e.g., Compressor Stations, Regulator/Metering Stations)

The report also summarizes serious incidents, a subset of the above that include a fatality or an injury requiring hospitalization. The report states ". . . excavation damage, incorrect operation,

SUBJECT: Department of the Army Environmental Assessment and Statement of Findings for Permit Application SAJ-2010-02881.

other outside force damage, and "other" causes are the causes of the highest percentage of serious incidents (although the number of incidents in any category is small)." As described above, some of the "other" would not be applicable to Via Verde since this graphic combines pipeline and facilities data. Therefore, minimization of serious injury/fatal incidents requires efforts so the public and others take precautions not to injure the pipe (for example, through public awareness) and efforts to ensure correct operation (for example, through qualifications of the employees and contractors confirmed with inspections by the PSC).

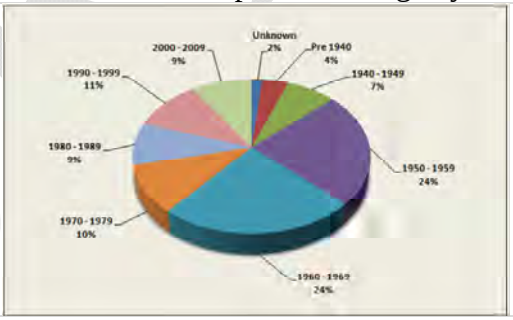
Causes of Gas Transmission Pipeline Serious Onshore Incidents 2005-2009



(Pipeline and Facilities)

The report further states "Corrosion, material/weld failures, and equipment failures are the cause of a lower percentage of serious incidents (injury/fatality) than they are for the larger population of significant incidents." It must be noted that 61% of the pipelines date from earlier than 1970, see below graphic. Via Verde is being constructed under the latest Federal standards.

Onshore Natural Gas Transmission Pipeline Mileage by Decade of Installation



(b) The following paragraphs briefly discuss each of the above categories of incidents.

-1- Corrosion Failure. Some comment letters raised concern that the project crosses soil types or areas that would accelerate corrosion, for example Casa Pueblo de Adjuntas describes a former mining area. PREPA states the entire length will be coated with Fusion Bonded Epoxy (FBE) and will use external cathodic protection systems to address this concern.

SUBJECT: Department of the Army Environmental Assessment and Statement of Findings for Permit Application SAJ-2010-02881.

Another comment expressed concern with accumulation of contaminants within the pipe in low spots of the alignment. However, after construction, the pipe walls will be periodically inspected by a Pipeline Inspection Guage (PIG), a device that is inserted and travels the length of the pipeline to detect anomalies in the pipe wall, thereby providing an early warning prior to external or internal failure.

-2- Natural Force Damage. Comment letters raised the following concerns regarding pipeline damage from natural forces. One expressed concern is that the pipe could be damaged during flooding. The Applicant states that in areas of high water table the pipe will be coated in concrete to prevent flotation. Additionally, the pipe is buried under the natural ground level that would presumably already been shaped by historic flood events. For example, in alluvial areas the pipe will be buried in a trench through many existing/historic farmlands. When crossing small streams, the pipe will be below the bottom of the stream. Most major streams are crossed at much deeper depths by employing HDD technology. There are some valve stations located in the alluvial areas, but the Applicant states that the critical valve station facilities will be installed on elevated platforms above the 100 year base flood elevation. A second expressed concern is the influence of wildfires on the pipeline. This potential for a serious incident caused by wildfires should be minimal since the pipe is buried. A third concern is with portions of the pipeline located in areas identified as at risk from tsunamis. However, this is a hazard shared with all LNG terminals since they are on the seacoast. The remaining comments expressed concern with various geological settings that the pipe passes through, including areas susceptible to landslides, the expansive clays of the San Sebastian Formation, the sands in the Rio Grande de Arecibo that could liquefy during earthquakes and the risk for the entire length of the pipeline from seismic activity. PREPA also states they adopted the suggestion to install an Earthquake Early Warning System, which would consist of instruments to detect strong earth motions. The Corps presumes that the professional engineers and other professionals of PREPA and their contractors will properly design and construct this project recognizing these natural forces. Several comments questioned that the north coast power plants will rely on a single import terminal and single pipeline that may be subject to a disruption of supply by tsunami and seismic events, and some go further to question establishing EcoEléctrica as essentially a monopoly. The Corps will not opine on the advisability of this concern, but does note that PREPA stated that the north coast plants will still retain ability to switch to the current oil fuel provided by other ports and suppliers.

-3- Excavation Damage (excavation damage by operator, operator's contractor, or excavation damage by others). There are several opportunities for an individual contemplating excavation to learn of the presence of the pipeline. One is that the landowner should be aware of PREPA's easement across their property. Another is the requirement to obtain an Excavation Permit from the Public Service Commission. Also, there will be physical signs marking the presence of the pipeline. Last, PREPA's operation and maintenance employees and contractors should be familiar with the route and will be providing routine aerial inspections.

-4- Other Outside Force Damage (nearby industrial, man-made, other fire or explosion, vehicles, mechanical damage, intentional damage by vandalism or terrorism). PREPA will develop and implement a written public awareness program, in accordance with 49 CFR192. 616, that will advise and educate industry and the public of the location of the Via Verde Pipeline. In addition, within freeways and highways the pipeline will be buried at a deeper depth and, for places closer than 12 feet from the road, have a concrete slab as a cover.

-5- Material Failure of Pipe or Weld. Implementation of the Federal standards will require that inspections be conducted during the manufacture of the pipe and that monitoring be performed during pipeline construction activities. Welding procedures will follow API 1104, including qualification test of the welders and radiography inspection of 100% of the field welds. The entire pipeline will be hydrostatically pressure tested using enough pressure to cause a stress of 90 percent the Specified Minimum Yield Strength (SMYS) of the pipe. Prior to putting the pipeline into gas service a "Baseline" inspection using the PIG will be run to obtain a reference point for future regularly scheduled inspections to identify anomalies in the pipe wall thickness and welds.

-6- Equipment Failure, incorrect operations of same and other such as vandalism. The Corps presumes the operations and maintenance personnel will be appropriately trained to purchase, install and maintain the equipment. Pipeline operations will be monitored and controlled from a central location at the Center of Operations in San Juan. The system will be designed, programmed, furnished and installed as a complete Supervisory Control and Data Acquisition (SCADA) Master Station Computer System (MCS). A secondary, or backup, system will be designed, programmed, furnished and installed at the Ponce Operations Center. The fiber optic cable communications equipment provide the SCADA System communication interface for acquiring data, status and alarm information and accepting open and close commands to each MLV. The data will include upstream and downstream pressure and temperature, and valve position. In the event of a sudden pressure drop MLVs will be capable of being automatically closed or manually initiated by a control room operator to isolate any pipeline section that is suspected to have a leak. A video surveillance camera will be installed at each meter station and MLV facility. Intrusion detection in the form of dual technology sensors arrayed to provide 360° coverage will be provided at each monitored facility.

(vi) Threshold of risk. Casa Pueblo de Adjuntas reports the number of failures on U.S. pipelines from 1990 to 2009 averages 2 per week and estimates 121,371 persons reside within 660 feet of the portions of the pipeline they identify as having higher risk. Dr. Roque uses records to conclude a 2% chance per year of an incident on the proposed pipeline. He further estimates that as many as 533 people in Toa Baja will die within the first 30 seconds of an explosion/fire incident. Mr. Vukusich, et al., in their comment letter, calculates a 1 in 170,000 annual risk for persons within PREPA's 150 foot distance to residences. They further note that

this distance is smaller than the PIR established under 49 CFR 192.903 and is smaller than the distances determined to provide appropriate level of risk for a pipeline in Great Britain. They were also concerned with slow gas leaks where the pipeline is in proximity to motors, radios, etc. on major roads. Many have expressed in general terms their concern about direct impacts to communities in case of an explosion. Dr. Roque states that 90% of the incidents in the U.S. occur in sparsely populated areas, but 72% of the proposed Via Verde pipeline alignment has human populations within 650 feet. For Levittown, a densely populated area, several commented on the difficulty of evacuation as well as entry of emergency vehicles, Mr. Vukusich, et al., estimate up to 10,000 evacuees in an emergency. For sparsely populated areas, several commented on the limited availability of medical services, the absence of fire hydrants and the limited firefighting capability. PREPA notes that they will be preparing an emergency plan, as required by 49 CFR 192.615, which is designed to comprehensively include all State and Municipal response resources. The Corps has not sought to confirm the information presented above nor sought to independently devise a distance analogous to PREPA's 150 feet. All of the above agree that there is some risk though there is disagreement on what level is acceptable. It is not within the purview of the Corps Regulatory Program to establish a threshold of risk since the governing Federal law does not establish such a distance. The Corps considers establishing such a distance a responsibility of local land use and zoning authorities when they establish distances between residences and other hazardous land uses.

(vii) Conclusion. Adverse effect. PREPA's implementation of Federal regulations for the design and operation of the pipeline would mitigate the risk of injury/fatality, but does not eliminate them. Therefore, the addition of a pipeline in the community decreases public safety.

(2) Shoreline erosion and accretion. Several comment letters expressed concern with the effect to the shoreline at and in the vicinity of Levittown, some noting the FEMA classification. Compared to early designs, the revised plan for this coastal area now has the pipeline installed using (HDD. To further mitigate the expressed concerns, the Applicant proposes to place much of the pipeline as much as 60 feet deep, except where it will be shallow except for a short shallow segment at the center of the beach. Therefore, the only shoreline disruption will be temporary work pads for the drilling and the assembly of the pipe above ground during construction. Conclusion: No effect.

(3) Needs and welfare of the people. Many commented on the emotional stress of construction in peaceful communities, with one group pointing to the presence of helicopters and crews. Many commented on fear and anxiety caused by the potential hazard being located close to their existing homes. Some state their opinion of PREPA's lack of experience as demonstrated by opposition, errors, etc. during construction of Southern Gas Pipeline and having witnessed other projects constructed in an expeditious manner where costs exceeded estimated budgets adversely affecting the financial health of Puerto Rico. One comment stated there is widespread mistrust of PREPA's ability to build and operate a safe and secure natural gas

pipeline. The Corps presumes PREPA is aware of and is prepared to fulfill their obligations under Title 49 of the U.S. Code (USC), Subtitle VIII, Chapter 601et seq. titled 'Pipelines – Safety'. However, the Corps has received over 6,000 letters and petitions opposing this project citing the concern for the hazards, indicating a wide-spread and real feeling that the pipeline would result in some degradation in the welfare of the community. Conclusion: Adverse effect.

(4) Considerations of property ownership. Many comment letters expressed concerns home property values will decrease. There are also concerns of the ability to continue use of their land for their agricultural livelihood Comment letters also expressed in general terms the detrimental effect of expropriating property. PREPA explains in their EIS that they are establishing a 150 foot easement over land to protect the pipe from activities that could harm the pipe. Agricultural use can continue if crops are not deep-rooted. Houses will be purchased within that easement and landowners will be compensated as provided by local laws. Conclusion: Adverse.

(5) Water supply and conservation. Several expressed concern for leakage of drilling mud from HDD through the karst region that would reach the underground water table. However, the original proposal was modified to eliminate HDD within the karst areas. Conclusion: Neutral due to mitigative action.

(6) Fish and wildlife values. Several issues were raised by comment letters.

(i) First is the concern for habitat fragmentation and effects on dispersion and migration: one effect is some species could view the corridor as a barrier and others could benefit; another effect is the change in conditions of the habitat just beyond the edge of the cleared corridor. Within wetlands the construction corridor will be temporarily impacted for the short duration required to install the pipe and will then be restored to previous site conditions with no further mowing or other clearance, therefore no permanent effect is expected. Within forested uplands, a 50 foot corridor will be maintained free of deep-rooted vegetation and therefore these potential adverse effects will be permanent. However, the forested areas cleared are a minor fraction of the whole extent of forested area.

(ii) The second issue raised is the effect on connectivity of the stream network. This would be a concern where streams are crossed using an open cut, however the Wetland and Waterbody Construction and Mitigation Procedures plan provides that the crossings will be performed quickly, the stream bottom will be restored to its original contour, and the fringe restored, therefore the potential for stream disconnect is unlikely to occur.

(iii) A third issue raised is that two species that were recently discovered in the karst region, the *Tabebuia karsoana* and *Pisonia taina*, may be impacted due to proposed pipeline impacts within the karst region. However, the alignment has shifted in the karst areas to be

located within the valleys between the mogotes and to areas of lower quality to minimize potential impacts to various listed species. Therefore, this action will also be protective of those imperiled species not currently listed under the Endangered Species Act.

(iv) A fourth issue raised by one comment letter is that land crabs could be affected by loss of wetlands. However, construction in the wetlands will be of short duration and immediately restored.

(v) A fifth issue raised is the effect on migratory birds. Birds are expected to move to nearby areas due to construction noise.

(vi) Conclusion: Negative, though minimal.

(7) General environmental concerns. Four issues are considered here.

(i) First is a concern over the impact to the Rio Grande de Arecibo watershed. The total acre of impact is to a small fraction of the total watershed and those impacts to the alluvial wetlands will be temporary.

(ii) The second is the loss of forests in the karst and mountain areas, one comment recalling scars from construction of PR-10 that did not heal. PREPA states that they will plant three trees for every mature tree cut down and implement the Upland Erosion Control, Revegetation and Maintenance Plan to reestablish herbaceous cover. If successful, the loss of forest cover will be offset, though with a temporal loss to the ecology until the replacement trees mature. The permanently maintained corridor will not be forested, but will have a herbaceous cover, still providing ecological function.

(iii) The third is the potential impact to the structural integrity of caves. Regarding an aerial photo that showed the pipeline crossing the Cueva Jaguar, PREPA states the alignment was modified based on results of a geotechnical analysis. The revised alignment is located to avoid the occurrence of any part of the cave structure within the ROW of the project. Regarding the Cueva Matos visited by the Corps, PREPA does not have a geotechnical analysis, but notes that the alignment follows PR-10 and the trench would only be 6 to 7 feet deep, and concludes that since there was no damage from the PR-10 construction, it is unlikely that any damage would occur from the pipeline. If the permit is issued, the Applicant will be required to implement surface geophysical investigation, such as ground penetrating radar ahead of construction, to confirm the depth of rock to caves.

(iv) The conversion to natural gas will reduce the air pollutants compared to those produced by burning fuel oils. PREPA estimates a reduction of up to 64% in “criteria pollutants” (various types) and up to 30% in carbon dioxide. However, these estimates are

calculated based on the north coast power plants on 100% natural gas.[91] As discussed elsewhere in this document, the available supply is much less than 100%, however there will still be a reduction in pollutants.

(v) Conclusion: While there is a benefit to air quality, there is an adverse effect from loss of forests (though minimized by planting of trees), temporary adverse effect to the alluvial wetlands (though temporary as wetlands are restored) and unknown effect on caves (though probably no effect), therefore overall is adverse but minimal.

(8) Economics. The primary impetus for this project is to reduce the cost of electricity in Puerto Rico. The cost per kilowatt hour (kW/hour) is a little over double that of the average for the continental United States.[92] As Dr. Gerson Beauchamp noted in his comments, the application did not include an analysis of the reduction in cost. The Applicant later stated their "…estimate is that the price reduction will be around 20% of the fuel adjustment factor". This reduction was calculated by comparing the price of a kW/hour produced from Bunker C and the price of a kW/hr produced from natural gas at their current prices. PREPA guarantees a price reduction but cannot give a final figure until the project is fully functional."[93] Several comment letters state that it is unlikely the cost reduction will reach 20%. The Hon. Alejandro García Padilla, believes 20% is overstated because the $477 million construction cost will probably be higher, the permit mitigation costs were not considered, and that EcoEléctrica can only supply 15% of the island's energy needs instead of the claimed 70%. Regarding the mitigation costs, the Applicant states the $477 million includes the cost of the permits[94]. The Corps does not know whether PREPA is basing its 20% estimate on the current available of supply of natural gas or if it is based on the full capacity of the of the north coast power plants.. An analysis by two economists, José Alameda and Sergio Marxuach estimates 11%. One commentator states that Natural Gas is unlikely to remain low cost and abundant. The Applicant response to this comment states they are using published projections by the Department of the Energy. W.M.R. Group Inc. estimates $12.58 Billion less fuel cost with Via Verde's Natural Gas compared to the cost of oil for 2011 to 2018.

To summarize the above, PREPA and the commentators disagree as to how much consumers' bills will be reduced, however they all describe a reduction. Therefore the Corps sees no need to conduct a separate evaluation to determine the degree of reduction. A reduction, of any amount, will benefit the economy. Conclusion: Beneficial.

(9) Conservation. Comments were provided for three specific locations subject to conservation efforts. The first location is the Foreman home and surrounding lands. The pipeline was re-aligned to go around the conservation easement. The second is the La Esperanza Natural Reserve. The pipeline design was revised to employ HDD to avoid any impact to the surface. The third location is the Hacienda Central Pellejas. The Applicant states that the proposed pipeline alignment runs west of the Pellejas River and thereby does not encroach on the

areas to the east of the area which is the subject of partnership agreements with the U.S. Fish and Wildlife Service.[95] Conclusion: Negligible.

(10) Wetlands. The Applicant's 82 Wetland Impact Sheets delineate through use of cross-hatching the extent of fill in wetlands. The total of all the sheets is 1.68 acres of permanent wetland impact and 289.35 of temporary impact (286.26 to wetlands and 3.09 to canals). The totals are circled in red at the bottom of the Field Recap Sheet attached. The permanent impacts are for the gravel fill for the MLV stations located in wetlands. The temporary fill represents the soil removed from and deposited on the side of the trench, and then later removed either to backfill the trench or to transport off-site any excess material. The cross-hatching for the temporary fill covers the entire 60 feet right of way, but in practice it will probably be less. The construction crews will be driving across the wetlands, cutting the vegetation and placing temporary wood work pads, as needed to minimize vehicular impacts. These activities are not regulated by the Corps, but the Applicant has committed to keeping within a 60 foot corridor.

In addition to acres, the Corps defined impacts using "units" based on a functional assessment conducted in the field and office by the Corps, FWS, EPA and the Applicant. This team visited 26 locations along the route and provided three numeric assessments: the existing condition; the condition they anticipate the site will be after construction and cleanup; and the condition they anticipate would result if the Applicant implemented certain mitigative actions. These actions include, among others, seeding and control of exotic species that could outcompete the re-growth of native plants. The assessment consists of assigning a value from 0 to 1 for three categories: Landscape, Community Structure, and Water Environment and then averaging the values. The concept is that the presence of ecological function ascribed to a 1 acre of a poor quality wetland (assessed as 0.3) is equivalent to the ecological function ascribed to 0.3 acres of a pristine wetland (assessed as 1.0). In this example, there are 0.3 "units" of ecological function.

The 26 assessments are then extrapolated to similar wetland areas. In general, wetlands were considered similar if they were nearby (on the same or adjacent Maps) and shared the same Cowardin[96] classification. For example, on Map#57 there are farmed alluvial wetlands along the Rio Manati that are labeled PEM1Af, indicating Palustrine, Emergent, Persistent, Temporarily Flooded, Farmed. The assessment of the site located nearby (on Map#59) is used for this example, as well as other similar wetlands on sheets 56 through 60, inclusive (marked by the red circle on the enclosed Field Recap Sheet). The assessment is 0.73 and the permanent impacts on these sheets total 0.09 acres, therefore a permanent impact of 0.07 "units". The temporary impact is calculated as the difference between the current condition and the mitigated condition, the difference being 0.13 multiplied by 33.42 acres arrives at 4.46 "units" lost for those areas defined in Map Sheets 56 to 60, inclusive. The Field Recap sheet shows these calculations and the total functional "units" of permanent impact of 1.05 and for temporary 'optimistically' of 24.84.

SUBJECT: Department of the Army Environmental Assessment and Statement of Findings for Permit Application SAJ-2010-02881.

The assessment of temporary impacts is considered 'optimistic' based on the field team's opinion that even the Applicant best efforts will still fall short of full restoration of the existing wetland ecological function some places along the alignment. However, the Applicant states they can indeed restore these to pre-condition and, therefore, they do not propose to perform compensation for 24.84 units of temporary impacts unless they fail in their attempt to restore the wetlands. Successful restoration will be measured as follows: 6 months after construction the Applicant will sample the construction right of way at every 200 feet. If the wetland inside the area of construction matches the nearby wetland outside the construction zone, then "passes" (e.g., wetland completely restored). If "fails", then they will try again. If "fail" again, then the Corps will calculate the "units" shortfall, based on the actual condition, and require additional compensatory mitigation.

The Applicant proposes to remove agricultural activities from "Area 2" (see attached "Illustration") to allow for restoration of preferred vegetation. This action has been determined to benefit the Cano Tiburones Reserve. The Applicant proposes two other locations that they could implement a similar mitigative action if they "fail" in some of their temporary impact restorations. Conclusion: Neutral as result of mitigative actions.

(11) Water quality. Although there are many other parameters measuring water quality, the one of interest for this review is the escape of sediment or drilling mud into the open bodies of water, as discussed here.

(i) There are 22 crossings under streams and wetlands using HDD technology. There is a potential that the drilling fluid will find or because of its pressure cause a fracture in the overlying soil and spill ("frac-out") into the waterbody. The Corps has analyzed the Applicant's Frac-Out Plan and believes this potential is very slight based particularly on the following. First, downhole monitoring of the fluid pressures will used. This will more quickly detect changes in the pressure that may indicate a frac-out. Second, an independent HDD professional will be employed to monitor the work. Third, the Corps has reviewed the soil borings and find no areas of concern, but have flagged a few locations warranting extra care, such as a shallow layer of gravel that will be intersected. The Applicant will implement special monitoring during period of drilling through this area. Fourth, the crossings are generally deep under the waterbody; at depths greater than the 25 feet recommended by the industry.. Fifth, the HDD work areas will use temporary fill and berms to contain spillage. Along the Levittown beach segment, those berms will be further reinforced by sheet piles. Sixth, the HDD work areas are set back from the wetland fringe except for a few locations and those locations will receive extra monitoring during the few days the work progresses. Sixth, the Applicant has provided supplemental information showing extensive re-use of the HDD mud/water, therefore minimizing the amount for disposal.

(ii) The Corps believes the potential for sediment impacts to aquatic resources from

construction activities to be slight based particularly on the following elements of the Applicant's draft "Wetland and Waterbody Construction and Mitigation Procedures" (Procedures). First, the Procedures are based on the FERC template, but are being tailored to consolidate and remove discrepancies between the various other documents in the Application. Therefore, a single concise document is more likely to be consulted and used in the field than multiple documents. Second, the Procedures incorporate some of the recommendations for BMPs from the FWS for this project. Third, the Procedures add provisions for protection of karst areas and caves. Fourth, most of the work next to streams is perpendicular to the stream channel, therefore only the short extent of the shoreline (60 to 100 feet of right of way) will be affected. The drawings show extra work space at the crossings, but the Procedures provide these to be behind the existing fringe.

(ii) Conclusion: Neutral as result of mitigative actions.

(12) Energy needs. The project will enable the three north coast power plants to use more efficient natural gas fuel as compared to current petroleum fuels. This provides multiple options for PREPA to switch between fuels and power plants due to plant efficiencies, price and availability. Conclusion: Beneficial.

b. Endangered Species Act.

(1) Action Area. As stated in paragraph 3.c. above, the entire construction right of way and work areas for the entire pipeline route are included for purposes of the ESA. During review of the application the Corps queried the Applicant to include all access roads and work areas in the revised project drawings (Wetland Impact Maps), including, if any, existing rural roads that would need to be improved. The Corps advised the Applicant that if the contractors needed access roads or work areas that are not shown on the drawings that this would first require appropriate surveys and re-initiation of consultation. There are some minor changes to the drawings at this time for which the Corps will be consulting with the FWS and re-initiating consultation as necessary once the drawings are complete and prior to any decision on the permit.

(2) The Corps requested FWS, by letter dated 11 July 2011, to initiate formal consultation on three animal species and their concurrence with the Corps' determination that the project was not likely to adversely affect 4 animal species and 27 plant species. The Corps provided a determination that the project was not likely to affect the Coqui llanero, though that species has not yet been listed. The FWS concurred with the Corps' determinations by letter dated 15 July 2011, and provided, by letter dated 23 August 2011, their Biological Opinion for the three species: the Puerto Rican Boa (*Epicrates inornatus*), Puerto Rican sharp-shinned hawk (*Accipiter striatus venator*), and Puerto Rican Broad-winged hawk (*Buteo platypterus brunnescens*). This consultation period was brief because of the extensive pre-consultation

SUBJECT: Department of the Army Environmental Assessment and Statement of Findings for Permit Application SAJ-2010-02881.

efforts described in the following two sub-paragraphs.

(i) The Permit Application dated 16 September 2010, included a Biological Evaluation (BE). The FWS, by letter to the Corps dated 18 October 2010, stated the survey methodologies used by the applicant did not maximize the probability of detecting listed species and that the BE did not include site-specific habitat characterization, therefore the FWS could not concur with the BE's determinations of effects. The FWS' Biological Opinion reports that from 26 October 2010 to 9 March 2011, that the FWS and Applicant met 8 times in the office and/or field and that FWS provided comments 4 times on the Applicant's submittal of work plans or surveys. This culminated with the Applicant's Biological Assesment (BA) submitted 15 April 2011.

(ii) The Corps met with FWS on 10 May 2010, to discuss and obtain technical assistance regarding the BA. Subsequently, from that date until 1 July 2011, the FWS met with the Corps, the Applicant, or both 12 times for technical assistance meetings in the office and/or field. The FWS also provided written comments 5 times on the surveys, project changes, and other additional information provided by the Applicant. The Corps all relevant information gathered to revise/prepare the Biological Assessment that was attached to the Corps letter to FWS dated 11 July 2011.

(3) The following table describes the determinations for all the listed species under the consultation with the FWS.

Determination: No Affect = No Affect; MANLAA = May Affect Not Likely to Adversely Affect; May Affect = May Affect NLJ = Not Likely to Jeopardize, based on the Biological Opinion. Status: E = Endangered; T = Threatened; CH = Critical Habitat

SCIENTIFIC NAME	COMMON NAME	NAME SPANISH	GROUP	STATUS	DISTRIBUTION	DETERMINATION
Accipiter striatus venator	Puerto Rican Sharp-Shinned Hawk	Falcon de Sierra	Bird	E	Monte Guilarte State Forest	NLJ
Agelaius xanthomus	Yellow-Shouldered Black Bird	Mariquita	Bird	E, CH	Coastal Forest	No Effect
Amazona vittata vittata	Puerto Rican Parrot	Cotorra Puertorriqueña	Bird	E	Rio Abajo State Forest	MANLAA
Auerodendron pauciflorum	No Common Name	No Common Name	Plant	E	Rio Abajo State Forest	MANLAA
Banara vanderbilitii	No Common Name	Palo de Ramon	Plant	E	Rio Lajas Hills	MANLAA
Buteo platypterus brunnescens	Puerto Rican Broad-Winged Hawk	Guaraguao de Bosque	Bird	E	Monte Guilarte State Forest	NLJ
Buxus vahalii	Val's Boxwood	Diablito de Tres Cuernos	Plant	E	Tallaboa Limestone Hills	MANLAA
Calyptronoma rivalis	No Common Name	Palma de Manaca	Plant	T	Rio Abajo State Forest	MANLAA
Caprimulgus noctitherus	Puerto Rican Nightjar	Guabairo	Bird	E	Coastal Forest	MANLAA

SUBJECT: Department of the Army Environmental Assessment and Statement of Findings for Permit Application SAJ-2010-02881.

SCIENTIFIC NAME	COMMON NAME	NAME SPANISH	GROUP	STATUS	DISTRIBUTION	DETERMINATION
Catesbaea melanocarpa	No Common Name	No Common Name	Plant	E	Dry Limestone Hills, Guayanilla to Ponce	MANLAA
Chamaecrista glandulosa var mirabilis	No Common Name	No Common Name	Plant	E	Tortuguero Lagoon Natural Reserve	MANLAA
Chelonia mydas	Green Sea Turtle	Peje Blanco	Reptile	T, CH	Coastal Zones	No Effect
Cordia bellonis	No Common Name	No Common Name	Plant	E	Rio Abajo State Forest	MANLAA
Cordia rupicola	Chigger Palo	Palo de Nigua	Plant	E		MANLAA
Cornutia obovata	No Common Name	Palo de Nigua	Plant	E	Rio Abajo State Forest	MANLAA
Cyathea dryopteroides	Elfin Tree Fern	Helecho de Bosque Enano	Plant	E	Monte Guilarte State Forest	MANLAA
Daphnopsis hellerana	No Common Name	No Common Name	Plant	E	Nevares Limestone Hills, Near Sabana Seca, Primate Center	MANLAA
Dermochelys coriacea	Leatherback Sea Turtle	Tinglar	Reptile	E, CH	Coastal Zones	No Effect
Eleutherodactylus jaunaruveroi	Plains Coqui	Coqui Llanero	Amphibian	Under Review		MANLAA
Epicrates inornatus	Puerto Rican Boa	Boa Puertorriqueña	Reptile	E	Forested Volcanic and Limestone (Karst) Hills	NLJ
Eretmochelys imbricata	Hawksbill Sea Turtle	No Common Name	Reptile	E, CH	Coastal Zones	No Effect
Eugenia woodburyana	No Common Name	No Common Name	Plant	E	Encarnación West of Las Cucharas	MANLAA
Goetzea elegans	Beautiful Goetzea	Matabuey	Plant	E	Coastal Zones	MANLAA
Juglans jamaicensis	West Indian Walnut	Nogal	Plant	E	Monte Guilarte State Forest (La Silla de Calderon)	MANLAA
Mitracarpus maxwelliae	No Common Name	No Common Name	Plant	E	Guanica Commonwealth Forest	No Effect
Mitracarpus polycladus	No Common Name	No Common Name	Plant	E	Guanica Commonwealth Forest	No Effect
Myrcia paganii	No Common Name	No Common Name	Plant	E	Biafara Arrozal	MANLAA
Patagioenas (Columba) inornata wetmorei	Puerto Rican Plain Pigeon	Paloma Sabanera	Bird	E	Lower Montane Forest and Riparian Habitats	No Effect
Ottoschulzia rhodoxylon	No Common Name	Palo de Rosa	Plant	E	Media Luna Ward, Candelaria Ward, Sabana Ward	MANLAA
Pelecanus occidentalis	Brown Pelican	Pelicano Pardo	Bird	E	Coastal Zones, Lago Dos Bocas, No	No Effect

SUBJECT: Department of the Army Environmental Assessment and Statement of Findings for Permit Application SAJ-2010-02881.

SCIENTIFIC NAME	COMMON NAME	NAME SPANISH	GROUP	STATUS	DISTRIBUTION	DETERMINATION
					Nesting	
Peltophryne lemur	Puerto Rican Crested Toad	Sapo Concho	Amphibian	T	Northern Karst Regions	MANLAA
Pleodendron macranthum	No Common Name	Chupacallos	Plant	E	Rio Abajo State Forest	MANLAA
Polystichum calderonense	No Common Name	No Tiene Nombre Comun	Plant	E	Cerrote Peñuelas	MANLAA
Schoepfia arenaria	No Common Name	No Tiene Nombre Comun	Plant	T	Rio Abajo State Forest (Cuesta de los Perros)	MANLAA
Solanum drymophilum	No Common Name	Erubia	Plant	E	Rio Abajo State Forest	MANLAA
Stahlia monosperma	No Common Name	Cobana Negra	Plant	E	Northern Wetlands and White Sands	MANLAA
Sterna dougallii	Roseate Tern	Palometa	Bird	T, CH	Coastal Areas and Offshore Cays, Nesting	No Effect
Tectaria estremerana	Halberd Fern	Helecho alabarda	Plant	E	Rio Abajo State Forest	MANLAA
Thelypteris inabonensis	No Common Name	No Common Name	Plant	E	None Identified near project	MANLAA
Thelypteris yaucoensis	No Common Name	No Common Name	Plant	E	None Identified near project	MANLAA
Thelypteris verecunda	No Common Name	Helecho doncella del Barrio Charcas	Plant	E	None identified near project	MANLAA
Trichechus manatus manatus	Antillean Manatee	Manati Antillano	Mammal	E	Coastal Zones	No Effect
Trichilia triacantha	No Common Name	Bariaco	Plant	E	Encarnacion, (Urb. El Peñon), Tallaboa Poniente	MANLAA
Zanthoxylum thomasianum	St. Thomas Prickly Ash		Plant	E	Northern Karst Regions	MANLAA

(4) Plant species.

(i) Applicant's surveys. The Applicant performed pedestrian surveys of portions of the route considered most probable to find listed plant species. After the Applicant provided the GPS information during the technical assistance meetings, the Corps and FWS determined that the surveys did not cover the width of the construction right of way in a manner sufficient to discover individuals of the species, if present. Therefore, additional surveys for this purpose will be performed as described in subparagraph (iv).

(ii) Changes to the project.

(a) The alignment between Manati and Vega Baja was modified so it now runs in the

valleys between mogotes. FWS and the Applicant walked a portion of the route to observe the general nature of the plant cover. The plant cover at the bottom of the valleys generally have greater human disturbance or of a character that FWS staff, in their comments to the Corps during the technical assistance meetings after the visits, indicated would be less likely to find listed species compared to the slopes or tops of the mogotes. However, the walk-through was not designed to serve as a comprehensive survey and the construction right of way would extend to the side slopes, therefore the surveys described in subparagraph (iv) are still needed. In one location, the alignment was moved to match an existing farm road. A subsequent pedestrian survey along the road confirmed the farm road shoulders are a low probability area for listed plant species. At two other locations the alignment was moved to saddles (low spots between two mogotes) after a pedestrian survey confirmed it to be covered by exotic species.

(b) Several alternative alignments in the Peñuelas hills were walked by a FWS and Applicant team to characterize the condition of the plant cover for potential for listed plants and also for Puerto Rican Nightjar habitat. An alternate alignment further north was considered, however, due to the presence of houses and topography the alignment proposed by the Applicant (following a small trail along a ridgeline) was found to be undisturbed and therefore of high potential. At one location the alignment was moved to an existing road, and while there is still potential habitat on either side of the road this alternate location had lesser impact than running the pipeline through a roadless area. Another portion of the alignment was relocated to a new location, confirmed by the team walk-through that had been disturbed from past agricultural activities and was determined less likely to find the listed species of concern.

(c) In a section of the alignment near Adjuntas, where the pipeline was moved to avoid the Foreman property, field inspections were conducted to confirm the quality of the areas. In some areas plant cover was found to have been disturbed by human activity and of a type considered by FWS staff to be less likely to find listed species, other areas had plant cover considered likely to find listed species and were included in the surveys described by subparagraph (iv).

(d) Along PR-10, adjacent to the Rio Abajo State Forest, areas that were planted as mitigation for impacts associated with PR-10 construction were visited by an Applicant and FWS team. The observed plant cover was largely herbaceous and the forested species expected to be present as a result of the mitigation plan was not present. The FWS staff in their comments to the Corps during the technical assistance meetings after the visits indicated these areas would be less likely to find listed species.

(iii) Avoidance, Minimization, and Compensation. The construction right-of-way will be reduced to 60 feet wide, compared to the 100 feet in the Permit Application, in the following locations: within the Peñuelas hills, near PR-10 east of Adjuntas, and within the mogotes area between Manati and Vega Baja. The right of way width will be also be restricted on steep slopes

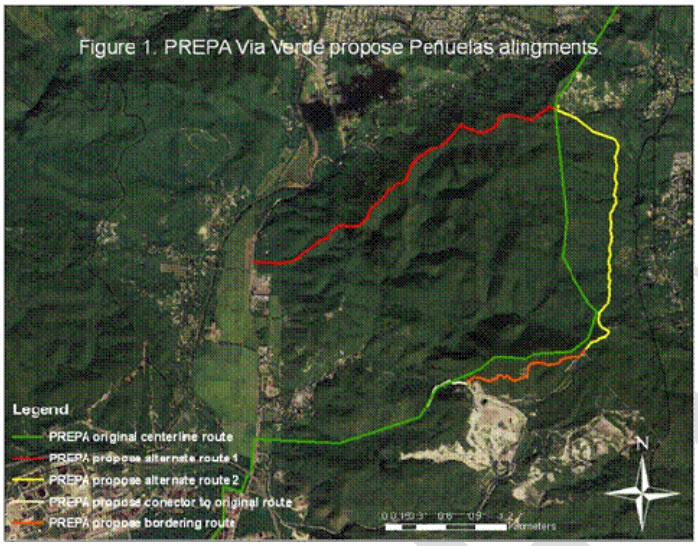
and ridges. If a permit is issued, it will be conditioned such that: (1) the Applicant will not be allowed to perform any land clearing until the surveys of the construction right-of-way are provided to the Corps and the Corps in consultation with FWS accepts the survey results; (2) this would apply to relatively undisturbed areas (Relatively undisturbed areas are those portions of the construction right of way, not including mowed highway right of ways and herbaceous wetlands, where the plant cover does not show evidence of human disturbance, e.g., presence of exotics); and (3) the survey results for any segment shall be provided to the Corps at least 30 days in advance of the start of land clearing (the surveys will be of sufficient intensity to search for species within the entire construction right of way). This is designed to provide time to identify re-alignment of the pipeline if listed species are found. At the time of this document, the Applicant has submitted to the Corps and FWS a proposed methodology and names of qualified individuals to perform this survey for some segments of the route. The Corps and FWS are currently reviewing this submittal. In addition, surveys will also be required concurrent to any land clearing. If a federally protected plant species is found, then work will stop in the affected area. All activity within 150 feet will cease until either the FWS confirms that the identified plant is not actually a federally listed species or the Corps approves resumption of work based on modifications to the project to avoid impacts to listed species. The Applicant will submit a proposal to realign the pipeline to avoid impact or submit for consideration justification why the project cannot be realigned. The Corps expects much flexibility in the project design to implement changes if individuals of the species are found, because during the technical assistance meetings, several realignments were implemented for such purpose. If the Corps accepts the justification for not realigning, then the Applicant will submit a proposal for transplanting affected individuals or submit a Biological Assessment for the Corps to initiate consultation with the FWS. Some species have been identified by the Corps and FWS as not t eligible for the transplanting option. For some species, there are no known methods for transplanting or propagation and for others the success of transplanting and propagation has been poor. Therefore, there is a chance that the project will be delayed until it is realigned or appropriate transplanting/propagation methods are developed and accepted.

(5) Puerto Rican Nightjar.

(i) Applicant's surveys. The Applicant performed 3 dawn and 3 dusk surveys at 7 stations along the portion of the alignment crossing for known Nightjar habitat. A total of 66 individuals were heard calling. This established that the species occupies the proposed construction right-of-way.

(ii) Changes to the project. Alternatives to the proposed alignment were explored during the technical assistance meetings, shown by this figure.

SUBJECT: Department of the Army Environmental Assessment and Statement of Findings for Permit Application SAJ-2010-02881.



(a) An alignment further north was considered to move the pipeline toward the outside edge of the habitat. However, the alignment identified by the Applicant (the red line) was found to be located within the habitat due to presence of houses and the need to increase the right of way to install the pipe near the bottom of the slope instead of the ridge. The plant cover on both sides of the ridge was found to be generally undisturbed and therefore this alignment would create a narrow fragment of habitat (between the pipeline and houses). This alternative was considered less desired than the proposed alignment.

(b) The alignment was relocated to follow an existing road (east-west portion, orange line). This new alignment results in a lesser area of impact, compared to the original alignment that ran through a roadless area.

(c) The north-south alignment was moved to the east (yellow line). The FWS and Applicant walked this area and found the plant cover reflects a greater disturbance from recent agricultural activities than the original alignment. The FWS staff in their comments to the Corps during the technical assistance meetings indicated they were of lower quality habitat for this species. The revised route was not re-surveyed because the Corps and FWS presumed species are present since they were present along the original route.

(iii) Avoidance, Minimization, and Compensation. The construction right of way within the two segments of the alignment in the Peñuelas hills will be limited to 60 feet wide compared to the 100 feet in the Permit Application. If a permit is issued, it will be conditioned so that the Applicant will not be allowed to perform any land clearing for pipeline construction during the breeding season (January to early July). The Applicant indicates there may arise emergency situations and thereby proposes that those specific locations needing to be cleared would be surveyed for nests. The Corps will consider further what types of emergency situations are

appropriate and if necessary, in coordination with FWS, develop the details and approvals for such a situation. The Applicant has proposed to acquire approximately 290 acres of suitable Nightjar habitat. Such land would have appropriate legal and physical measures to preserve it from human impacts. This amount of habitat acquisition is based on the Applicant's calculation that the pipeline right-of-way eliminates 1.9 acres of better quality and 38 acres of lesser quality plant cover. The loss in habitat would be compensated by decreased disturbance in the acquired lands. However, information by FWS (as stated in their Biological Opinion) and from Dr. Hector Quintero-Vilella (in his comment letter) indicates that the Applicant's acreage figures are incorrect. Dr. Hector Quintero Vilella provided a copy of a survey conducted for another project that documented observations of individuals in the vicinity of the proposed alignment. He also states that the Nightjar seems to be expanding its distribution and reports observing an individual north of the area surveyed by the Applicant. This Nightjar sighting is located along a portion of the alignment north of PR-132, while the portion that was re-aligned is south of PR-132. The Corps and FWS will be coordinating to establish the quantities of impacts, the range, and the proposed mitigation plan prior to any permit decision.

(6) Puerto Rican Crested Toad.

(i) Applicant's surveys. The Applicant used Geographic Information System (GIS) software to predict locations where water could accumulate within the historic range of the species. Those locations were visited during the day to search and identify cavities, cracks and pools, hereafter called "ponds", where the species remain during the day. These locations were surveyed during the night to detect the presence of the species. No species were observed, but several ponds were identified. The surveys were performed in November and December and not during the rainy season when they are more active. Therefore, the surveys cannot be considered conclusive with regard to the presence or absence of this species. The landscape was reported to be suitable for the species when they move out of the ponds. Therefore, the Corps presumes the species is present.

(ii) Changes to the project. In one location within the Peñuelas hills the alignment was shifted to avoid a suitable pond. In other locations along the alignment, ponds found during surveys were outside the right of way.

(iii) Avoidance, Minimization, and Compensation. The construction right-of-way in potential habitat areas is proposed to be limited to 70 feet wide, compared to the 100 feet in the Permit Application. This avoids the potential for loss of individuals of this species that are away from their pond and missed by the construction surveys. If a Corp's permit is issued, it will be conditioned so that the Applicant conduct daily monitoring. The Applicant proposes to do these in the morning in advance of the construction activities to detect the species. The Corps recognizes the species is more active at night, particularly after rain events, and therefore will consider implementing surveys during the more active time when construction approaches these

areas. The Applicant has proposed that if a species is detected that a capture and relocation protocol will be implemented. A comment letter indicates relocation would likely be unsuccessful since the toad is territorial and will seek to return to its territory from which it was removed. At the time of this document, the Corps and FWS is coordinating review of the monitoring and relocation protocol prior to any permit decision.

(7) Coquí Llanero. The Corps consulted with FWS on this species even though, at the time of the Permit Application, the FWS had only initiated their status review for this species (Federal Register dated 8 July 2009). The consultation concluded that the project may affect but is not likely to adversely affect this species. The FWS subsequently proposed listing the species as endangered and proposed critical habitat (Federal Register dated 12 October 2011).[97] This normally creates a requirement for the Corps to conference with the FWS. The Corps and FWS will be meeting to review any new information arising from FWS's proposal prior to any permit decision.

(i) Applicant's surveys. The Applicant conducted day and night surveys along the alignment in the vicinity of Toa Baja. At least six individuals were heard. The proposed construction right of way is largely located within palustrine emergent wetlands that are considered suitable habitat for this species. Therefore, the Corps presumes the species is present. The Applicant noted that the Federal Register dated 12 October 2011, describes that FWS did not detect any species when they revisited the location where the six individuals were heard and that the area was highly degraded and not considered habitat occupied by this species.[98] The Corps observes the plant cover in the land adjacent to where the species were heard is different from the bulk of the alignment from PR-867 to PR-165.[99] The Applicant states that this is not considered optimal habitat.[100]

(ii) Changes to the project. The proposed project alignment passes outside of and at its closest point is approximately 1 mile west of the proposed critical habitat defined in the FWS's 12 October 2011proposal to list this species as endangered and to designate critical habitat. The Applicant documented observation of this species 1.2 miles away from the boundary of the proposed critical habitat area. The project is impacting palustrine herbaceous wetlands. This is one of the primary constituent elements defining its proposed critical habitat. Potential impacts to this species are expected to be minimal because: (1) the impact is trenching and side-casting; (2) all the sidecast material will be removed and trench backfilled in a week or few weeks; and (3) the site will be restored, by natural growth or planting as needed, to match the surrounding wetlands. The trenching and backfilling is expected to be such a short time because (1) the typical construction process is for the earthmoving equipment to complete all operations before moving down to the next portion of the alignment and (2) this portion of the route is very flat. The plant cover is expected to quickly regrow to match surrounding because (1) it is herbaceous and (2) much of the land is prior agriculture that has regrown without human assistance. In any case, the draft mitigation plan provides for monitoring at the first six months and additional

actions if not restored to match the surrounding after 12 months.

(iii) Avoidance, Minimization, and Compensation. The construction right of way will be limited to 60 feet wide in all wetlands, compared to the 100 feet in the Permit Application. This reduces the acres of impacts compared to the 100 feet. If a permit is issued, it will be conditioned so that the Applicant will conduct surveys prior to any construction activities. Dr. Joglar in his comment letter noted this species is not active in the morning and is difficult to detect even when active. The Corps recognizes the species is more active at night and will consider implementing surveys during this more active time when construction approaches these areas. The Applicant has proposed a capture and relocation protocol that will be implemented if a species is detected. Dr. Joglar in his comment letter noted amphibian relocation could fail due to poor relocation habitat and homing/migration instincts of this species. Dr. Neftalí Ríos-López expressed concern that the pipeline trench would affect the hydrology of the wetland. The Applicant intends to install trench breakers which would prevent drainage. The Corps and FWS is coordinating review of the monitoring and relocation protocols.

(8) Puerto Rico Boa.

(i) Applicant's surveys. The Applicant did not conduct a survey for this species, but estimated habitat impacts based on the quantity of certain forested land cover located within the proposed 100 foot wide project right of way. Permanent impacts are calculated based on the area within the 50 foot portion of the right of way that will be maintained free of deep rooted vegetation. Temporary impacts are calculated based on the remaining 50 foot width of the construction right of way that will be revegetated. A total of 5 individuals were observed by the Applicant and/or FWS staff while visiting various portions of the proposed alignment. Since this species is distributed across the entire island, the Corps presumes this species may be encountered throughout the alignment, except for the large herbaceous wetland areas that lack any upland forest cover..

(ii) Changes to the project. None. This species is able to utilize many habitat types. The construction right of way and work areas intersect approximately 330 acres of Puerto Rican boa habitat as predicted by the Puerto Rico GAP. This compares to the approximately 1,000,000 acres of suitable habitat predicted for the entire island. It is expected that individuals may still cross the right of way post-construction and may utilize the permanent right of way for basking, even though it will be maintained free of forest cover.

(iii) Avoidance, Minimization, and Compensation. The karst areas proposed to be crossed by this project are expected to have a higher potential of occurrence of this species. The realignment that was implemented for the federally listed plant species will also benefit the Puerto Rican boa. If a permit is issued, it will be conditioned so that the Applicant will conduct surveys to determine the presence of individuals. The permit condition would require daily

surveys conducted each morning prior to initiation of daily construction operations. In addition, surveys will also be required starting 30 days in advance of construction during nocturnal hours and ideally in the months of highest activity. The Applicant has proposed a capture and relocation protocol that will be implemented if a species is detected. The protocol is one that has been used on other projects, but there remains concern over whether species will quickly return to the site of the construction. The Corps and FWS are coordinating review of the details of the survey and relocation protocols prior to any permit decision.

(9) Puerto Rican Broad-Winged Hawk.

(i) Applicant's surveys. The Applicant conducted a survey consisting of 6 hours of observations on two different days at each of 12 sampling points, for a total of 144 hours, along the proposed alignment during which one individual was observed. The FWS documented the sighting of an individual at another location along the alignment during a site inspection for this project. The Applicant's survey was not sufficient to determine nesting locations.

(ii) Changes to the project. None. This species utilizes forested land covers, including hardwood plantations, coffee plantations and mature secondary forests. Therefore, the project will result in the permanent loss of forested cover within the 50 feet of right of way that will be maintained free of deep rooted vegetation and the temporary loss as result of the construction right of way width of 100 feet. The construction right of way and work areas intersect approximately 104 acres, located within 19 miles of the proposed alignment, of Puerto Rican broad-winged hawk habitat, as predicted from the Puerto Rico GAP. This compares to the approximately 465,672 acres of potential Puerto Rican broad-winged hawk habitat predicted for the entire island. Because two individuals were sighted within the proposed project alignment, it is concluded that at least two occupied home ranges could be affected. A home range averages 262 acres.

(iii) Avoidance, Minimization, and Compensation. If a permit is issued, it will be conditioned to restrict construction activity to the non-breeding season (July to December) in the portions of the project alignment that crosses potential habitat of the species range. The Corps is considering to define this by a map. If a permit is issued, it will be conditioned to require the Applicant to conduct surveys during the 2012 and 2013 breeding seasons, which starts in January-February, to locate potential nesting sites. If nesting trees are identified, the pipeline alignment and associated clearing activities will be adjusted to avoid impacts to those trees. The Applicant has proposed a compensatory mitigation plan that directs the acquisition of up to 100 acres of suitable Puerto Rican broad-winged hawk habitat that is presently held in private ownership. The Corps and FWS are coordinating review of the details of the survey protocols and compensatory mitigation proposal prior to the decision on the permit.

(10) Puerto Rican Sharp-Shinned Hawk.

SUBJECT: Department of the Army Environmental Assessment and Statement of Findings for Permit Application SAJ-2010-02881.

(i) Applicant's surveys. The Applicant conducted a survey consisting of 6 hours of observations on two different days at each of 12 sampling points, for a total of 144 hours, along the proposed alignment during which four individuals were observed. The FWS documented an individual at another location along the alignment during a site inspection for this project. The survey was not sufficient to determine nesting locations. The project will result in the permanent loss of forested cover within the 50 feet of right of way that will be maintained free of deep rooted vegetation and the temporary loss as result of the construction right of way width of 100 feet.

(ii) Changes to the project. None. This species is utilizes various forested land covers. Therefore, the project will result in the permanent loss of forested cover within the 50 feet of right of way that will be maintained free of deep rooted vegetation and the temporary loss as result of the construction right of way width of 100 feet. The construction right of way and work areas intersect approximately 189 acres, located within 33 miles of the proposed alignment, of Puerto Rican sharp-shinned hawk habitat, as predicted by the Puerto Rico GAP. This compares to the approximately 209,024 acres of potential Puerto Rican sharp-shinned hawk habitat predicted for the entire island. Because four individuals were sighted within the proposed project alignment, it is concluded that at least two occupied home ranges could be affected. A home range averages 369 acres.

(iii) Avoidance, Minimization, and Compensation. If a permit is issued, it will be conditioned to restrict construction activity to the non-breeding season (July to December) in the portions of the project alignment that crosses potential habitat of this species. The Corps is considering to define this by a map. If a permit is issued, it will be conditioned to require the Applicant to conduct surveys during the 2012 and 2013 breeding seasons, which starts in January-February, to locate potential nesting sites. If nesting trees are identified, the pipeline alignment and associated clearing activities will be adjusted to avoid impacts to those trees. The Applicant has a compensatory mitigation plan that directs the acquisition of up to 50 acres of suitable Puerto Rican sharp-shinned hawk habitat that is presently held in private ownership. The Corps and FWS are coordinating review of the details of the survey protocols and compensatory mitigation proposal prior to any permit decision.

(11) Puerto Rican Parrot.

(i) Applicant's surveys. The Applicant conducted a survey concurrent with that done for the hawks. There were 3 survey locations near the range of the Puerto Rican Parrot, so observation time consisted of 6 hours of observations on two different days at these 3 sampling points. No individuals were found. However, the survey locations were not located based on the habitat characteristics and known locations of parrots and therefore not sufficient to determine use of the project area by this species.

(ii) Changes to the project. The project crosses the known range of this species where it is located along the right of way of PR-10 at Rio Abajo State Forest. The FWS and Applicant visited the locations along PR-10 at the Rio Abajo State Forest and observed the forested cover located at the base of the mogotes is suitable for use by this species. The Applicant's project drawings indicated the construction right of way extends over the mogotes. This is unlikely, as the construction would occur on the face or top of the mogotes. The GIS shapefiles describing the work areas have been adjusted to avoid the base of the mogotes.

(iii) Avoidance, Minimization, and Compensation. If a permit is issued, it will be conditioned so that the construction right of way boundary is no closer than 25 feet from the base of the mogotes along PR-10 at the Rio Abajo State Forest. No further actions needed considering the Applicant will be avoiding the small area (located at the base of a mogotes) of potential habitat.

(12) Antillean Manatee. As discussed in paragraph 3 above, FERC in April 2009 authorized EcoEléctrica to add two vaporizers and associated equipment increasing EcoElectrica's peak sendout of regasified LNG by 93 million standard cubic feet per day (MMscf/day) to supply re-gasified LNG to PREPA's Aquirre power plant. PREPA will now distribute this supply among the Costa Sur power plant and, if the Permit for Via Verde is issued, among the three power plants on the north coast. This increases the number of LNG vessels by 12 per year for a total of 24 per year (compared to 25 in the Biological Opinion for the FERC authorization in 2006). For the modification, FERC consulted with FWS who replied on 6 March 2009 concurring with FERC's determination the modification would not likely to adversely affect the Antillean manatee. PREPA may in the future purchase additional gas for transmission through the pipeline but that would require a modification of the import terminal which would require authorization from FERC, who would assess and consult with FWS on the effect on the Antillean Manatee.

(13) Right of Way indirect effects.

(i) In areas of forested cover, the project has been determined to result in the permanent loss of forested cover within the 50 foot portion of the right of way that will be maintained free of deep rooted vegetation. The construction right of way is typically 100 feet but in places is reduced to 70 feet or 60 feet as described above. After construction, all but the 50 foot permanent area will be re-planted by the Applicant. There will be a temporary loss of function between the timing of construction and the planting and re-growth (to maturity) of the trees. The loss of suitable forested habitat is expected to cause individuals of the Puerto Rican boa, Puerto Rican broad-winged hawk and the Puerto Rican sharp-shinned hawk to adjust their home ranges. These home range adjustments will potentially result in overlapping home ranges causing an increase in competition for prey and breeding. For the Puerto Rican broad-winged

hawk, opening of the forested canopy increases potential for juvenile predation by the red-tailed hawk. Acquisition of lands described in paragraphs above for both species of hawks would enable land management to off-set some of the expected adverse effects. A more effective compensatory action might be possible if a long term study of the region was performed to identify nesting and home-ranges. Some of this information will be obtained during the planned nesting surveys along the proposed alignment.

(ii) The Applicant proposes to restore the portion of the forested right of way located outside of the 50 foot permanent impact corridor by planting 3 trees for every 1 tree removed. In places where the entire 100 foot right of way is completely forested, there will not be sufficient space to replant trees at the 3:1 ratio. For the Penuelas area, the Applicant has proposed specific planting guidelines. The FWS has also proposed reforestation guidelines in their Biological Opinion. The details of the reforestation have not yet been written.

(ii) For listed plants, the opening of the canopy provides potential changes in microhabitat conditions, increased sedimentation of drainage areas, loss of seed bank and intrusion by exotic and nuisance plants. Therefore, if an individual of a listed plant species is found within the project right of way, the Applicant has proposed to implement a propagation program for those species.

(iii) In herbaceous wetland habitats, the entire right of way is proposed to be returned to its original condition. Since the majority of the wetlands impacted are herbaceous it is likely the same cover would return quickly. The draft wetland mitigation plan provides success criteria, a monitoring plan, and various management actions such as control of exotics. The Corps is coordinating review with the FWS, EPA and the Applicant to complete development of the plan. Therefore, there is not expected to be long-term indirect impacts to the species occupying this wetland habitat type.

(iv) The Applicant will travel the project corridor to conduct surveillance, inspection and maintenance actions. The removal of deep-rooted vegetation will also cause a disturbance. If herbicides are applied there will be additional impacts. There is a potential the public will use portions of this corridor for all-terrain vehicles, mountain bikes or horse-riding, creating a disturbance that would hinder the activities of these species. Boas could be killed by vehicles moving through the corridor. This access could induce illegal trash dumping, fires, cutting of vegetation, hunting, and introduce predators such as rats, mongooses, feral dogs and cats. To address potential indirect impacts resulting from unauthorized public access, the Applicant is proposing to install barriers where ever the project corridor crosses roads. If the permit is issued, the Applicant will be required to increase surveillance and law enforcement in the corridor and to prepare and submit a management plan protective of the Puerto Rican boa, Puerto Rican broad-winged hawk and Puerto Rican sharp-shinned hawk and other species.

SUBJECT: Department of the Army Environmental Assessment and Statement of Findings for Permit Application SAJ-2010-02881.

(v) At the time of this document, the Corps and FWS are coordinating review of the management and reforestation plans for the corridor.

(2) The project will not affect the following species when offshore: Loggerhead sea turtle (*Carretta carretta*); Green Sea Turtle (*Chelonia mydas*); Leatherback sea turtle (*Dermochelys coriacea*); Hawksbill Turtle (*Eretmochelys imbricata*); Staghorn Coral (*Acropora cervicornis*); and Elkhorn Coral (*Acropora palmata*). This determination is based on the analysis above that there is very little likelihood that sediment or drilling mud will spill into the open water marine habitat of these species. Even if there is a leak, proposed monitoring of drilling operations is expected to stop the spill soon enough to limit the quantity of material that will either settle or be diluted before reaching the open waters.

c. Essential Fish Habitat.

(1) Adverse impacts to Essential Fish Habitat (EFH) will not result from the proposed project.

(i). The National Marine Fisheries Service (NMFS) requested the following additional information: clarification of what is meant by temporary impacts; square footage of impacts to to seagrass, other submerged aquatic vegetation, mangroves, and other benthic resources; explanation of where HDD will be utilized to avoid EFH habitats; and provision of a survey of organisms in the estuarine areas within the proposed project area. Through use of HDD and adjustment of work areas the project will not result in impacts to EFH habitats.

(ii) The NMFS provided the following conservation recommendations: No clearing shall be authorized in areas that support seagrass or mangroves; Best Management Practices (BMPs) to minimize seagrass and mangrove impacts and water quality degradation shall be incorporated into the project design; and, once the project design is finalized, the Applicant will be required to develop a compensatory mitigation plan that offsets all direct and indirect impacts to EFH. This plan shall be based on a functional assessment and provided to NMFS for review and approval before the project is authorized. At the time of this document, the Corps is coordinating with NMFS to meet in order to present information on the above conservation recommendations.

d. Historic Properties. A determination has not yet been made whether the project will have any effect on any sites listed, or eligible for listing, in the National Register of Historic Places, or otherwise of national, state, or local significance. The State Historic Preservation Office (SHPO) has been providing technical assistance to the Corps through several meetings and exchange of information. PREPA's document research, Phase 1A Report, was submitted concurrent with the permit application.[101] The subsequent Phase 1B report, dated 1 June 2011, identified three more sites in proximity of the alignment for a total of 15 sites.[102] The Corps and SHPO identified several aspects of the report that were incomplete, including: the location of many sites is not

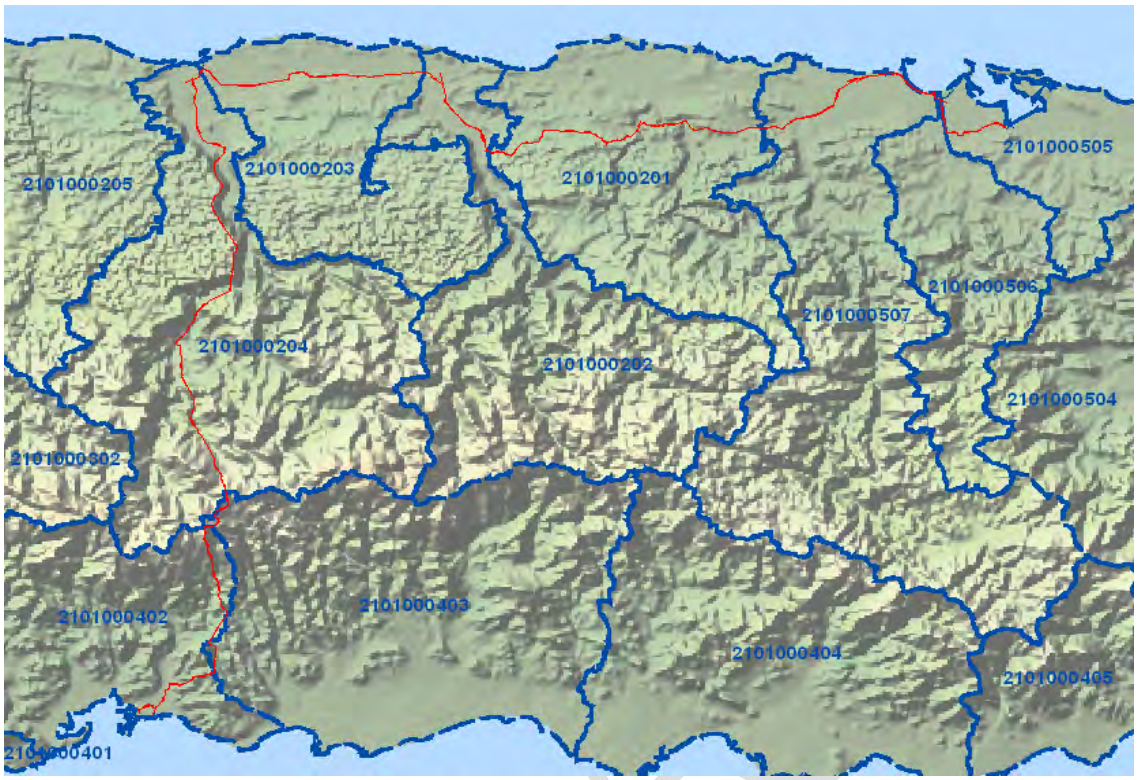
clearly defined and the soil and topography information is vague. The deficiencies in the report limits theCorps' ability to replicate the field work[103]. PREPA submitted a revised Phase 1B Report that included maps locating the sites and associated field notes. The Corps advised PREPA on 30 June 2011 that these revisions do not provide an investigation sufficient for the Corps to make a determination of effect. The Phase 1B Report documents only 207 subsurface tests for the 92 mile corridor. Specific concerns are: large intervals between subsurface tests, gaps in locations near known sites, and depth of the tests. Three specific examples of the insufficiencies provided are: (1) the proposed pipeline crosses within the mapped boundary of a known site, but no field investigation was conducted; (2) for a second known site within the site boundary, only three subsurface tests were excavated and these were spaced too far apart and were too shallow; and (3) at a third location the field notes reported finding a brick in the neighborhood of a known historic structure, yet no discussion or evaluation of this finding was discussed in the report.[104] Since June to the present, the Corps, PREPA and SHPO have developed a "Survey Strategy" of surface and subsurface field work in those portions of the proposed route with potential for finding previously undiscovered sites. Concurrently, an "Analysis of Known Historic Sites, including Additional Field Survey Recommendations", has been developed for 19 sites. The proposed pipeline alignment has been modified to avoid some of the sites. A Programmatic Agreement (PA) has been drafted by these parties in coordination with the Advisory Council for Historic Preservation (ACHP) to implement these surveys. The PA provides for a bi-weekly submittal of field survey information for review by the Corps, SHPO and other Consulting Parties. It has been agreed between the parties that construction would not commence in that surveyed area until after the Corps either: (1) determines no properties are present; or, (2) determines the properties are not eligible for listing in the National Register; or, (3) the pipeline is re-aligned. If re-alignment of the pipeline to avoid the property cannot be achieved, a Data Recovery Plan will be required to be developed and implemented. The Survey Strategy also provides for monitoring concurrent with construction for several portions of the alignment[105] Corps formally invited three others to be Consulting Parties and to provide comments on the entire PA package.

e. Cumulative & Secondary Impacts.

(1) Baseline.

(i) This figure shows the watersheds intersected by the pipeline route, as denoted by the red line.

SUBJECT: Department of the Army Environmental Assessment and Statement of Findings for Permit Application SAJ-2010-02881.



(ii) Most of the proposed project impacts are to the two types of wetlands defined in the below table. These two wetland categories are derived from the PRGAP land cover map.[106] Using Geographic Information System (GIS) software, the quantity of these two wetland types located within the project boundaries, corridor and work areas, was determined to be 400 acres. The 400 acres was determined to represent 0.17% of the total of these wetland types mapped by PRGAP in the 9 watersheds. Within the individual watersheds the wetland covers range from 0.04% to 2.10%. The 400 acres discussed herein is greater than the detailed estimate provided by the Applicant in the project wetland impact maps because the wetland impact maps used more field data to establish the wetland boundaries, whereas the PRGAP mapping boundaries relied on interpretation of aerial imagery. However, the accuracy is sufficient to establish that the proposed project's wetland impacts are a fraction of the total coverage of these wetland community types with the 9 watersheds.

	2101000201	2101000202	2101000203	2101000204	2101000402	2101000403	2101000505	2101000506	2101000507	Total
Moist Grasslands and Pastures(% of acres within project footprint compared to total acres in watershed)										
	0.1485%	0.0821%	0.3046%	0.2363%	0.1125%	0.0379%	0.0847%	0.0015%	0.0618%	
Seasonally Flooded Herbaceous Non-Saline Wetlands										
	0.0395%	0.7939%	2.1021%	0.4884%	0.0000%	0.0000%	0.6558%	0.2267%	0.8851%	
Total of acres within project footprint. (NOTE: is greater than project's detailed estimate)										400 acres
% of acres within project footprint compared to total acres in watershed										0.1703%

SUBJECT: Department of the Army Environmental Assessment and Statement of Findings for Permit Application SAJ-2010-02881.

(iii) Corps permits issued within the considered 9 watersheds for the period 2005 to 2010 (calendar years) have authorized 2.2 acres of permanent fill of within the two type of wetlands considered above. The projection is that authorizations will continue at the current rate because of the current economic climate.

(iv) Natural resource issues of particular concern, from Corps and non-Corps activities, are the conversion of most of the wetlands to agricultural. The majority of this conversion occurred by the 1930's with only fragments of the historic coverage of forested and herbaceous systems presently remaining. There has been some natural recovery in areas as agricultural lands have been abandoned. However, these lands are often subject to development.

(2) Context.

(i) The proposed project is very large compared to other activities in the watershed. Developments of similar nature to this proposal have occurred twice. First , a few years ago for the Gasoducto de Sur natural gas pipeline between the EcoEléctrica's terminal and the Aguirre power plant on the south coast. Second, circa 1996, for the North Coast SuperAqueduct Project. Future conditions are expected to be the continuation of small developments on the edges of existing urban areas.

(ii) Besides Corps authorized projects, other activities include the following as provided by the Puerto Rico Planning Board of those along the pipeline's alignment. All of them are on uplands.

NO.	CASE NO.	DESCRITPTION	PROJECT LOCATION/MUNICIPALITY	PROJECT STATUS
1	2010-06-0018-JPU-S	FUTURE RESIDENTIAL PROJECT	MP 40 / ARECIBO	Not built yet, but considered in the Class Location Study for Vía Verde. No estimated date of construction.
2	2010-CUB-16489	FUTURE RESIDENTIAL PROJECT	MP 64.5 / VEGA BAJA	Not built yet, but considered in the Class Location Study for Vía Verde. No estimated date of construction.
3	1998-09-0671-JPU	FUTURE RESIDNETIAL PROJECT WITH 524 LOTS	MP 65.5 / VEGA BAJA	Project under construction and considered in the Class Location Study for Vía Verde.
4	2010-11-0232-JPU	INDUSTRIAL COMPLEX WITH SEVEN LOTS (MINIMUM 8,000 SQ. METERS EACH)	MP 74.2 / DORADO	Not built yet, but considered in the Class Location Study for Vía Verde. No estimated date of construction.

SUBJECT: Department of the Army Environmental Assessment and Statement of Findings for Permit Application SAJ-2010-02881.

5	1994-11-0349-JPU	COMMERCIAL PROJECT WITH AN AREA OF 196,519 SQ. FEET (K-MART STORE)	MP 74.8 / DORADO	Not built yet, but considered in the Class Location Study for Vía Verde. No estimated date of construction.
6	2009-11-0129-JPU	MIXED PROJECT CONSISTING OF 870 RESIDENTIAL UNITS, 372,745 SQ. FEET OF COMMERCIAL DEVELOPMENT, 392 TOURISTIC UNITS, WITH 97,000 SQ. FEET OF INSTITUTIONAL USE AND FIVE CUERDAS FOR RECREATIONAL USE.	MP 76 / DORADO	Pending approval from the Planning Board, which must consider the approval granted to the Vía Verde Project. It was considered in the Class Location Study for Vía Verde.
7	1993-14-0448-JPU	DEVELOPMENT OF 118 RESIDENTIAL LOTS	MP 84 / TOA BAJA	Pending completion of additional information requested and approval from the Planning Board, which must consider the approval granted to the Vía Verde Project.
8	1991-14-0925-JGU	RELOCATION OF THE SHOOTING RANGE.	MP 84.5 / CATAÑO	Constructed and considered in the Class Location Study for Vía Verde.
9	1997-14-0742-JPU	WHAREHOUSE WITH 70,397 SQ. FEET.	MP 85.3 / CATAÑO	Constructed and considered in the Class Location Study for Vía Verde.
10	1991-14-1268-JGU-T	DEVELOPMENT OF A HAULING TRAILERS OPERATION CENTER.	MP 85.5 / CATAÑO	Constructed and considered in the Class Location Study for Vía Verde.
11	1992-14-0046-JPU	SEGREGATION OF FOUR INDUSTRIAL LOTS WITH AN AREA OF 25,000 SQ. METERS EACH.	MP 85.8 / CATAÑO	Constructed and considered in the Class Location Study for Vía Verde.
12	1990-15-0194-JPU	WHAREHOUSE FOR THE B. FERENDEZ & HERMANOS IMPORTERS ON 110,00 SQ. FEET.	MP 86.5 / BAYAMÓN	Constructed and considered in the Class Location Study for Vía Verde.

(iii) Resulting natural resource changes and stresses include loss of wetlands. These resources are also being affected by small projects at the fringes of growing urban areas. A key issue(s) of concern in this watershed is the loss of habitat resulting from wetland loss.

(3) Mitigation and Monitoring. The project affects the following key issue: loss of wetlands. The magnitude of the proposed effect has been determined to be small within the watershed. Avoidance and minimization methods that have been employed include (1) using HDD to install the pipe underneath to avoid impacts to forested wetlands and surface waters and (2) narrowing the construction right-of-way to 60 feet in wetlands; and (3) aligning the pipeline corridor within current or ex-agricultural wetland areas to reduce impacts to undisturbed wetland systems. Compensatory mitigation, primarily restoration of on-site wetlands to achieve no spatial loss and the acquisition and restoration of some wetlands currently subject to agricultural activities to compensate for permanent impacts, and monitoring described herein will result in no net reduction in the level of habitat functions currently provided by these wetlands.

f. Corps Wetland Policy. Based on the public interest review herein, the beneficial effects of the project outweigh the detrimental impacts of the project.

g. Water Quality Certification under Section 401 of the Clean Water Act has not been issued by the Commonwealth of Puerto Rico.

h. Coastal Zone Management (CZM) consistency/permit has been issued by the Commonwealth of Puerto Rico.

i. Other authorizations.

(1) U.S. Government Real Estate Interests. The Department of the Army Permit does not convey a property right. The applicant is responsible for securing those rights.

(i) For the U.S. Air Force's Punta Salinas Radar Site, the pipe will be installed by directional drilling 60 feet below the road[107]. PREPA sent a letter to the tenant, the Air National Guard, advising of the project. To date we are not aware of any concerns they might have.

(ii) For the public recreational beach 'Balneario de Punta Salinas', the Quitclaim Deed to the Commonwealth of Puerto Rico from the Department of the Interior included restrictions for future construction. The Corps advised PREPA of this for them to research if the project crosses the said property.

(iii) The pipeline crosses the former Sabana Seca Naval Security Group Activity that was closed by the U.S. Navy and ownership status of property is currently unknown. PREPA sent a

letter to the commercial firm that PREPA advises is managing the property. To date we are not aware of any concerns they might have.

(iv) The pipeline will be installed on the same right-of-way as other fuel pipes passing near the Army Maintenance Support Activity, the General Services Administration (GSA) center that houses several federal agencies and offices, the U.S. Federal Bureau of Prison's Metropolitan Detention Center (MDC), a Department of Interior building, and Ft Buchanan proper in Guaynabo. PREPA sent a letter to these agencies advising of the project. To date we are not aware of any concerns they might have.

(v) The pipeline crosses or is proximate to four flood control projects, Rio Grande de Arecibo, Rio Grande de Manati in Barceloneta, Rio Cibuco in Vega Baja and Rio La Plata in Dorado/Toa Alta. The Corps approved construction of the pipeline relative to these projects in accordance with 33 USC 408, though PREPA is responsible for relocation, if needed by these projects. PREPA is considering whether to place the pipe at a deeper depth at the point where it crosses a proposed future disposal area and embankment of the Rio La Plata project.

(2) The pipeline crosses and in some cases will be within the right-of-way of PR-10 and PR-22. The Federal Highway Administration is reviewing whether to issue authorization for same.

j. Significant Issues of Overriding National Importance. None.

8. Compensation and other mitigation actions.

a. Compensatory Mitigation

(1) Is compensatory mitigation required? Yes.

(2) Is the impact in the service area of an approved mitigation bank? No.

(3) Is the impact in the service area of an approved in-lieu fee program? No.

(4) Check the selected compensatory mitigation option(s):

☐ mitigation bank credits

☐ in-lieu fee program credits

☒ permittee-responsible mitigation under a watershed approach

SUBJECT: Department of the Army Environmental Assessment and Statement of Findings for Permit Application SAJ-2010-02881.

☒ permittee-responsible mitigation, on-site and in-kind

☐ permittee-responsible mitigation, off-site and out-of-kind

(5) If a selected compensatory mitigation option deviates from the order of the options presented in §332.3(b)(2)-(6), explain why the selected compensatory mitigation option is environmentally preferable. Address the criteria provided in §332.3(a)(1) (i.e., the likelihood for ecological success and sustainability, the location of the compensation site relative to the impact site and their significance within the watershed, and the costs of the compensatory mitigation project).

(i) Description of the compensatory mitigation: The individually small permanent impacts of the valve station pads and access roads will be compensated for collectively at a location adjacent to the Caño Tiburones Natural Reserve for benefit of the watershed. The temporary impacts of the sidecast of excavated material and HDD work pads will be compensated on-site and in-kind by restoration of the right of way after construction.

(ii) Selection of the mitigation type and location, §332.3(b)(2)-(6), considered the following.

Consideration	Caño Tiburones Site	On-site restoration
Uncertainty.	Removing agricultural activities will eliminate the impediment to natural succession of desirable plant species. The plan provides for moderate planting of forested species.	For locations with moderate or high presence of desirable plant species, concern that exotics will outcompete natural recruitment and growth of same. Other concern is introduction of trash and disturbance due to public access in cleared corridor.
Temporal loss.	Unknown at the time of this writing when agricultural activities will cease.	Most locations will be expected to be restored within a year because it is herbaceous coverage.
Risk.	Very low since removal of impact.	Difficult due to availability of exotic seed source to the narrow 60 foot corridor. Many locations are remote so it will be difficult to control trash and disturbance.
Size and ecological value of parcel.	42 acre site with 34 acres of enhancement contiguous to a larger wetland system.	Only a 60 foot corridor but not restoring it will create potential barrier to wildlife movement and entry for exotics into surrounding

		lands.
Consolidation of resources.	Not applicable.	Not applicable.
Scientific/technical analysis, planning and implementation.	PREPA has prepared a detailed survey of existing and expected conditions for the site.	Initial regrading work performed by the pipeline contractor but expect PREPA will have ecologists, etc. to monitor and implement restoration actions.
Timing of site identification, project specific planning and financial assurances in advance of impact or otherwise.	Draft plan currently under review.	Detailed plans for each site not prepared but standard for restoration to match adjacent wetland conditions.
Identified high priority resource need on watershed scale.	Will preclude change of this parcel's land use to something else, offsetting the historic loss of natural wetlands.	Maintain quantity of wetlands.
Achieve success soonest.	Not applicable.	Not applicable.
Practicable and compatible with project.	Impacts are freshwater herbaceous, same.	Will require active monitoring and preparedness to take actions such as seeding, removal of trash, etc.
Likelihood to offset impact.	The large number of acres and enhancement of the impacted condition of the site is expected to offset the permanent impacts. The detailed plan that is still under review exceeds the amount needed to offset these permanent impacts by this project and will provide additional advance compensation for any shortcomings of the temporary impact restoration.	Believe some areas will be so challenging that it will not be able to reach full restoration. The Applicant will be required to provide additional compensation as needed for these situations.
Environmentally preferable.	Expands the extent of protected wetlands.	Removes temporary fragmentation of the wetland system.

SUBJECT: Department of the Army Environmental Assessment and Statement of Findings for Permit Application SAJ-2010-02881.

(c) Selection relied upon the following aspects of the Mitigation Plan, §332.4(c)(2)-(14). *The Mitigation Plan is in draft form and under review and development at the time of this document.*

	Caño Tiburones Site	On-site restoration
Objectives.	Expands extent of natural herbaceous wetlands.	Restore to pre-construction condition.
Site Selection.	Contiguous to, but outside the protected wetlands of a major natural reserve.	The construction right of way.
Site Protection Instrument.	The exact form is under development but intent is to enable management for natural functions.	PREPA will have easement to prevent activities incompatible for the pipeline, therefore loss of wetlands to development is unlikely. However pre-construction activities such as agriculture will continue.
Baseline Information.	Existing agricultural activities noted. Draft report provided mapping site into 8 zones with characterization of exotic/native species mix.	Alignment sampled as described in paragraph 7.a.(10). For purposes of the restoration, the condition of the unimpacted wetlands outside of the area impacted will be used as the reference condition.
Determination of credits.	Under development. Will be using same functional assessment as for impacts.	Success will be determined using a observation of certain criteria (e.g., prevalence of exotics).
Mitigation work plan.	Removal of agricultural activities but draft plan proposes additional work to promote recruitment of desirable species.	Regraded after construction and seeding and other actions as needed. Draft plan under review.
Maintenance plan.	Based on monitoring.	Expect to be self-sustaining after success is reached.
Performance standards.	Draft plan proposes certain mapped zones and mix of species.	"Pass/fail": if observed criteria of the restored area matches the reference wetlands baseline.
Monitoring requirements.	Semi-annual in Year 1 and 2 and annually for years 3, 4, and 5, unless adjusted for additional actions to meet success.	Proposed monitoring and reporting to be performed every six months for three years. The restored site must pass two consecutive times to be considered successful.

SUBJECT: Department of the Army Environmental Assessment and Statement of Findings for Permit Application SAJ-2010-02881.

Long-term management plan.	Under development.	Is same as corridor managed for protection of the pipeline.
Adaptive management plan.	Seeding or exotic removal or other actions as needed.	Seeding or exotic removal or other actions as needed, such as erecting barriers to impede trash dumping.
Financial assurances.	Depends on timing of implementation of protection and management actions that are under development.	Corps is considering requiring a Performance Bond.

(6) Other Mitigative Actions: Those described elsewhere in this document, such as for the Endangered Species Act, National Historic Preservation Act, control of sedimentation, and HDD work plans. PREPA and the Corps are developing a plan to provide a third party independent "Environmental Monitor" to report directly to the Corps on implementation of the various commitments.

b. Special Condition.

(1) Functional assessment. *To be completed upon completion of the mitigation plan.*

(2) Compensatory mitigation required by special conditions of the permit. *To be developed if decision made to issue the permit.*

(3) Other mitigative actions required by special conditions of the permit. *To be developed if decision made to issue the permit.*

9. General evaluation criteria under the public interest review. We considered the following within this document:

a. The relative extent of the public and private need for the proposed structure or work. The Sociedad Espeleológica de Puerto Rico, opined that the economic, social and cultural impact is very high for 50 years of useful life of the pipeline. Many agree there is a public need for reduction in dependence on fuel oils and reduction in cost of power that is met by this project, but not at the expense to the private citizen of increased risk of pipeline accidents and their loss of enjoyment of the natural resources. Many have noted or asked for a study of other alternatives in lieu of the proposed pipeline to meet this need. PREPA notes the project is one part of their bigger plan to meet this need. The public will benefit from the new economic development that is expected if the cost of electricity goes down as a result of the project.

b. There are no unresolved conflicts as to resource use. There are alternatives with lesser

impacts but are not practicable or do not fulfill the project purpose. Mitigative measures have been identified for the impacts.

c. The extent and permanence of the beneficial and/or detrimental effects, which the proposed work is likely to have on the public and private uses to which the area is suited. The beneficial effects associated with having the ability to select alternative fuels at the north coast power plants would exist for the life of the pipeline; these benefits ascribe to the general public. The detrimental effects to the aquatic environment that provides benefits to the general public will be temporary due to the availability of options to restore affected wetlands and provide compensatory mitigation for identifiable losses. The detrimental effects to individuals living near the pipeline, in that there is an increased risk of injury or fatality, would exist for the life of the pipeline.

10. Determinations

a. Public Hearing Request. Numerous requests have been made. The decision to conduct public hearings will be made after review of comments on this draft document.

b. Section 176(c) of the Clean Air Act General Conformity Rule Review: The proposed permit action has been analyzed for conformity applicability pursuant to regulations implementing Section 176(c) of the Clean Air Act. It has been determined that the activities proposed under this permit will not exceed de minimis levels of direct or indirect emissions of a criteria pollutant or its precursors and are exempted by 40 CFR Part 93.153. Any later indirect emissions are generally not within the Corps' continuing program responsibility and generally cannot be practicably controlled by the Corps. For these reasons a conformity determination is not required for this permit action.

c. Relevant Presidential Executive Orders (EO).

(1) EO 13175, Consultation with Indian Tribes, Alaska Natives, and Native Hawaiians. This action has no substantial direct effect on one or more Indian tribes..

(2) EO 11988, Floodplain Management. The pipeline crosses floodplains but is entrenched below the current ground level, thereby not reducing the capacity or flow during flood events.

(3) EO 12898, Environmental Justice. This determination will be made by the time of the decision on the permit. PREPA presented a study as Chapter 7 of its EIS that compared various socioeconomic factors of the communities through which the pipeline crosses to the general population of Puerto Rico. PREPA explained that “EPA’s Region 2 environmental justice policy establishes that for a homogeneous population, as the one of Puerto Rico (98.8% of the population is considered Hispanic, as concluded in the 2000 census), which is classified as a

minority, the environmental justice analysis must substitute the ethnic approach analysis by a socioeconomic study. (United States EPA, Region 2 Draft Interim Policy on Identifying EJ Areas, June, 1999)." The Legal Aid Clinic of the University of Puerto Rico in their comment letter disputes PREPA's conclusion that there is no disproportionate burden on a particular economic group, noting municipalities and neighborhoods affected have an approximate 40.6% poverty level.

(4) EO 13112, Invasive Species: The evaluation above included invasive species concerns in the analysis of impacts at the project corridor and associated compensatory mitigation.

(5) EO 13212 and 13302, Energy Supply and Availability. The review was expedited and/or other actions were taken to the extent permitted by law and regulation to accelerate completion of this energy-related (including pipeline safety) project while maintaining safety, public health, and environmental protections.

d. Finding of No Significant Impact (FONSI). *The following describes the basis for the finding at the time this document was written. The final finding will be made after review of comments on this draft document.*

(1) The following are from 40 CFR 1508.27, definition for significantly.

(i) Context. While this permit application has garnered interest outside of PR, the area and population affected is limited to Puerto Rico. The placement of the pipeline affects 29 communities. The environmental and economics affect the citizens of the Commonwealth as a whole.

(ii) Intensity.

(a) Impacts.

-1- Other than the fill permanently placed on 1.68 acres, all other fill discharged from the construction is temporary and the wetlands will be restored. All aquatic ecological losses will be mitigated. (Low-Degree-Mitigated)

-2- The project may affect but is not likely to affect 4 animal species and 27 plant species. One of the animal species, the Puerto Rican night jar, is affected by the loss of forested habitat, but is expected to be compensated by the acquisition and preservation of lands to remove human disturbance. One of the animal species is not yet federally listed (the Coqui llanero) but the project impacts to its wetland habitat are expected to be temporary. For the remaining two species, the project would not directly impact habitat for the Puerto Rican parrot or the Puerto Rican crested toad. If any of the 27 plant species are found during construction surveys then

avoidance, propogation and transplanting programs will be implemented as possible. Three animal species will be adversely affected by the loss of forest habitat. Two are hawk species that are expected to be compensated by the acquisition and preservation of lands to remove human disturbance. (High-Degree-Mitigated)

-3- A beneficial effect of the project is to provide a more economical energy source to the people Puerto Rico. The island's electrical generation is mostly dependent on fuel oils. (Moderate-Degree-Positive)

-4- Conversion from fuel oils to natural gas reduces emissions as required by EPA's clean air standards. (Moderate-Degree-Positive)

(b) The degree to which the proposed action affects public health or safety. The design, construction and operation of the pipeline will be conducted in accordance with Federal law and regulations, which includes oversight by the Public Service Commission with the assistance of PHMSA. The safety of the public is affected by the proximity of the pipeline. The Federal regulations do not define a distance for safety, however the Applicant has established a minimum distance. (High-Degree-Negative)

(c) Unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas.

-1- The wetlands proposed to be impacted are not unique. They are predominantly agricultural lands which are common. (Low-Degree-Negative)

-2- There are some unique cultural resources in the proximity of the proposed project, but all potential impacts to those resources have been avoided by realignment of the pipeline or using HDD to pass under the resource.. If previously unknown cultural resources are encountered, it is expected that similar changes in the project would be possible, but cannot be ruled out. (Low-Degree-Mitigated)

-3- The project will fragment important wildlife habitats. The Applicant, working with resource agencies has minimized these impacts by realigning the pipeline to locations where the plan cover shows the effects of human disturbance, e.g., exotics, and therefore less likely to to find the species present. The Applicant is also providing compensatory mitigation. (Low-Degree-Negative)

-4- The project will cross through Karst topography, however the applicant has aligned the route so as to minimize impacts and avoid causing any damage to this important upland resource. (Low-Degree- Negative)

SUBJECT: Department of the Army Environmental Assessment and Statement of Findings for Permit Application SAJ-2010-02881.

(d) The degree to which the effects on the quality of the human environment are likely to be highly controversial. Comments received provide a diversity of viewpoints on private property, cultural resources, environmental and safety issues. Of these, the one that arises in most comments is safety. There is no scientific argument that there is risk of injury for persons living near a pipeline, and there are established methods to calculate the distances for which people will be at risk. However, the controversy is over the difference of opinions in the trade-off between the level of risk and the level of costs and benefits of the project. (High-Degree - Negative).

(e) The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks. (None).

(f) The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration. None.

(g) Whether the action is related to other actions with individually insignificant but cumulatively significant impacts. Significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment. Significance cannot be avoided by terming an action temporary or by breaking it down into small component parts. The proposed project will by supplied by EcoEléctrica's Terminal, however FERC's has authorized the expansion of the Terminal to provide the supply. .(None).

(h) The degree to which the action may adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources. A Programmatic Agreement has been developed to implement procedures for surveys in areas with potential to find previously undiscovered sites. It is expected that the pipeline can be realigned or use HDD to avoid those sites, and if not, the PA provides for Data Recovery Plans to mitigate. (None-Mitigated)

(i) The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of1973. See the description at subparagraph 10.d(1)(ii)(-2-) above. The Permit would include, if issued, measures designed to avoid, minimize, and/or mitigate the impact on these species. (Moderate-Degree-Mitigated)

(j) Whether the action threatens a violation of Federal, State, or local law or requirements imposed for the protection of the environment. All local permits have been authorized for this proposal. (None).

SUBJECT: Department of the Army Environmental Assessment and Statement of Findings for Permit Application SAJ-2010-02881.

(2) Having reviewed the information provided by the applicant and all interested parties and an assessment of the environmental impacts, I find that this permit action will not have a significant impact on the quality of the human environment. Therefore, an Environmental Impact Statement will not be required.

e. Compliance with 404(b)(1) guidelines. Whether the work complies with the guidelines will be determined at time of decision whether to issue a permit.

f. Public Interest Determination: Whether issuance of the Department of the Army Permit is or is not contrary to the public interest will be made at the time of decision whether to issue the permit.

PREPARED BY:

Bob Barron
Project Manager _____ *Date*

REVIEWED BY:

Osvaldo Collazo
Chief, North Permits Branch _____ *Date*

APPROVED BY:

ALFRED A. PANTANO, JR.
Colonel, Corps of Engineers
Commanding _____ *Date*

[1] 20111119-Corps-Public-Notice, page 1
[2] 20111119-Corps-Public-Notice, page 1
[3] 20111119-Corps-Public-Notice, page 1
[4] 20111119-Corps-Public-Notice, page 1

[5] 20111119-Corps-Public-Notice, page 2
[6] 20111119-Corps-Public-Notice, page 2
[7] 20111119-Corps-Public-Notice, page 3
[8] 20111103, JPA, BCPeabody-updated-Joint Permit Application, p85, index map extracted from first wetland impact map.
[9] 20111103, BCPeabody updated-Joint Permit Application, §1.5, pp 5-15, counting entries on Table 1. This total count, 240, differs from "the pipeline will traverse 235 rivers and wetlands" stated in 20111119-CorpsPublicNotrice, page 1.
[10] 20111103, BCPeabody-updated-Joint Permit Application, §1.4, p1.
[11] From examination of 20110516-PDFs-where-alignment-changed-CD-from-PREPA-Ivelese-SanchezSoultaire, drawing 48.0-Z-321.18-Rev3 for Aquirre, 48.0-Z-321.59-Rev4 for Barceloneta, and 48.0-Z-321.94-Rev3 for Bayamón.. The older drawings at 20110324-PREPA-letter-to-Corps-final-alignment are 48.0-Z-321.18-Rev2 for Aquirre where the valve numbers are different, 48.0-Z-321.58-Rev3 which showed a different location for Barceloneta, and 48.0-Z-321.94-Rev2 for Bayamón.
[12] EIS, pages 5-8 and 5-12.
[13] 20111103, BCPeabody-updated-Joint Permit Application, §1.1, p1, stating "The pipeline will be an industrial application, serving only PREPA, and as such will require fewer laterals, metering stations, compressor stations, and access points than a public NG pipeline."
[14] Examination of PDF alignment drawings: 20110324-PREPA-letter-to-Corps-final-alignment; and 20110516-PDFs-where-alignment-changed-CD-from-Ivelese-SanchezSoultaire.
[15] 20110511-MFR-PDT-Notes, ¶3.b.
[16] 20110602-BCPeabody-ltr-to-Corps-Supplemental-Information.
[17] 20110602-BCPeabody-ltr-to-Corps-Supplemental-Information.
[18] Examination by Bob Barron of drawings provided 20110602-Larry Evans upload of valve station drawings via ftp. Barceloneta station is MLV#7 (Main Line Valve). Palo Seco lateral is at MLV#13-14.
[19] 20110606-Telcon-Larry-Evans
[20] 20111110-Wetland-Impact-Maps-submittals-up-to-this-date-compiled-GIF, Sheets #57 and #80
[21] Comparison by Bob Barron of location on drawing to aerial imagery in Google Earth, the GIS landcover "map by The Puerto Rico Gap Analysis Project, U.S. Department of Agriculture General Technical Report IITF-GTR-39 (shows "Montane wet evergreen abandoned and active coffee plantation"), the GIS location of waterways (flowlines at National Hydrography Dataset, USGS), and the applicant's 20110513-Email-from-PREPA-enclosing-JD-Shapefiles showing not wetland.
[22] Comparison by Bob Barron of location on drawing to aerial imagery in Google Earth, the GIS National Wetland Inventory by U.S. Fish and Wildlife Service (shows Palustrine Emergent) and the applicant's 20110513-Email-from-PREPA-enclosing-JD-Shapefiles showing not wetland.
[23] 20090416-FERC-Order. Namely, 127FERC ¶61,044, Federal Energy Regulatory

SUBJECT: Department of the Army Environmental Assessment and Statement of Findings for Permit Application SAJ-2010-02881.

Commission, Docket No. CP95-23-001, "Order Amending Authorization under Section 3 of the Natural Gas Act (Issued April 16, 2009)".
[24] 20091023-PREPA-to-FERC-change to Southcoastplant.
[25] Clarified during discussion and site visit 20110627-Mtg-EcoElectrica.
[26] Item 1 of 20110701-Workplan-Mtg and 48.0-Z-322.21 at 20110516-PDFs-where-alignment-changed-CD-from-PREPA
[27] 20110714-DPagan-email-to-Corps-FERC-Conditional-Approval.
[28] 20110516-FWS-Edgars-email-enclosing-Corps-EcoElectrica-Permit
[29] 20110307-PREPA-to-Corps-Addtl-info-re-nat-gas-availability
[30] 20110901-FERC-Corps-email-EcoElectrica-Terminal-and-Via-Verde
[31] 20110620-PREPA-Table-Comments-and-Response, comment 13
[32] 20110822-PREPA-to-Corps-additional-analysis-regarding-FSRUs, sum of the third column of any of the three enclosures.
[33] 20110428-Law-Clinics-letter-to-Corps, bottom page 42.
[34] 20110128-PREPA-ltr-to-Corps-response, middle of page 3.
[35] 20110128-PREPA-ltr-to-Corps-response, bottom of page 6.
[36] 20110128-PREPA-ltr-to-Corps-response, bottom of page 8.
[37] 20110620-PREPA-Table-comments-and-responses, very end of response 1 to comment 13. Also from Corps discussion with manager of EcoElectrica during meeting of 27 Jun 2011, though this topic not recorded in the notes of that meeting.
[38] Vermont Law School comment letter of 8 Aug 2011, referencing two articles in the CARRIBEAN BUSINESS MAGAZINE by John Marino, of 30 June 2011 (Cordero: Via Verde Gas Set for Next Three Years) and 21 July 2011 (Feds OK Initial Work on EcoElectrica Project).
[39] 20110901-FERC-Corps-email-EcoElectrica-terminal-and ViaVerde
[40] 20111103, BCPeabody-updated-Joint Permit Application, §1.3.2 Overall Project Purpose p4
[41] 20111103, BCPeabody-updated-Joint Permit Application, §1.7.1. No Action Alternative. P16-18
[42] Footnote 72 of 20110428-Law-Clinics-ltr-to-Corps, copy of webpage at handout E of 20110715-Mtg-Vt-Law-School-et-al.
[43] 20110602-BCPeabody-letter-to-Corps-Supplemental-information, bottom of page 2.
[44] 33% calculated from 20111103, BCPeabody-updated-Joint Permit Application, §1.4, p5, statement "Construction and installation of the pipeline will require an initial construction right-of way (ROW) 150 feet wide and a permanently maintained ROW of 50 feet post construction. The total project area encompasses 1,113.8 acres (92 miles X 100 foot ROW); 369.3 acres of which are jurisdictional Waters of the United States." The calculation of 92 miles X 100 ft = 1115.15 acres, and 92 miles X 150 ft = 1,672,7 acres which was basis of figure used in 2011119-CorpsPublicNotice.
[45] 41% = 151.76 / 369.3, denominator from 20101103, BCPeabody-updated-Joint Permit Application, §1.4 in preceding footnote and numerator from §2.4.2, p50, "There are approximately 143.92 acres of temporary wetland impacts. There are approximately 7.84 acres

of temporary impacts associated with streams, rivers, creeks, and other surface waters. The total temporary impacts associated with the Via Verde pipeline is 151.76 acres."

[46] Comparison by Bob Barron of 20100916-Joint-Permit-Application Appendix B maps and Mile Markers in Appendix A Land Use Maps to descriptions of wildlife ranges in the Biological Assessment enclosure of 20110415 BCPeabody-ltr-to-Corps-enclosing-EFH-and-BA.

[47] Count of "MANLAA determinations in Table 15 of the Biological Assessment, pp 133-134

[48] 20100916-Joint Permit Application, Appendix E.

[49] 20110128-PREPA-ltr-to-Corps-response, page 3.

[50] 20110307-PREPA-ltr-to-Corps-re-nat-gas-availability.

[51] 20111103, BCPeabody-updated-Joint Permit Application, §2.4.2, p50. Presumably for the alignment in 2010916-Joint-Permit-Application.

[52] The 50 foot width from Section 2.4.1 of the 20101103-BCPeabody-updated-JointPermitApplication. The 60 foot width from item #8 of 20110729-DPagan-email-to-BBarron-supplemental-info-related-shape-files.

[53] Images from 20101129-Final-Environmental-Impact-Statement, Attachment 4.1 Criteria Maps, p 543f and overlayed using Google Earth imagery. 20110224-Applicant-ltr-to-Corps-Additonal-Information-Requested.pdf only included the East-West maps.

[54] Footnote 72 of 20110428-Law-Clinics-ltr-to-Corps, copy of webpage at handout E of 20110715-Mtg-Vt-Law-School-et-al.

[55] Excelerate Energy, http://www.excelerateenergy.com/ebrvs.html

[56] 20110602-BCPeabody-letter-to-Corps-Supplemental-Information, page 3, and 20110815-PREPA-Answers-to-Corps-Questions-of-8Aug, Question 5, question itself at 20110808-BBarron-to-DPagan-Questions-regarding-LNG-Barge-and-Buoy.

[57] 20110224-Applicant-ltr-to-Corps-Additonal-Information-Requested, Attachment 2, page 14 and 15.

[58] 20110822-PREPA-to-Corps-Additional-Analysis-Regarding-FSRUs, three enclosures.

[59] 20110224-Applicant-ltr-to-Corps-Additonal-Information-Requested, attachment 2, page 13

[60] 20110202-Hon. Antonio Fas Alzamora, President, Puerto Rico Senate, letter to Corps 2 Feb 2011. Enclosure First Progress Report on Senate Resolution 889.

[61] 20110620-PREPA-Table-Comments-And-Responses, Comment#13

[62] 20110805-YousevGarcia-email-to-BobBarron-Wetland-Impacts-3-EIS-Alts

[63] 20110805-YousevGarcia-email-to-BobBarron-Wetland-Impacts-3-EIS-Alts. For Route A, Bob did not include the acres from Maps 42 to 45, inclusive (North-South alignment immediately south of Arecibo).

[64] 2011085-YousevGarcia-email-to-BobBarron-Wetland-Impacts-3-EIS-Alts. For Route A, Bob did not include the acres from Maps 42 to 45, inclusive (North-South alignment immediately south of Arecibo).

[65] Response to question 2 at 20110805-DPagan-email-to-BBarron-Questions-Terrestial-Alts.

[66] 20110701-Meeting-106 Issues

[67] 20110224-Applicant-ltr-to-Corps-Additonal-Information-Requested, Attachment 2, page 23,

SUBJECT: Department of the Army Environmental Assessment and Statement of Findings for Permit Application SAJ-2010-02881.

"Residental Areas".
[68] 20110511-MFR-PDT-Notes, paragraphs 4g and 4j.
[69] 20111103, BCPeabody-updated-Joint Permit Application, §1.7.4.5, and repeated at 20110224-Applicant-ltr-to-Corps-Additonal-Information-Requested, Attachment 2, page 20.
[70] Response to question 1 at 20110805-DPagan-email-to-BBarron-Questions-Terrestial-Alts.
[71] Response to question 1 at 20110805-DPagan-email-to-BBarron-Questions-Terrestial-Alts.
[72] Response to question 1 at 20110805-DPagan-email-to-BBarron-Questions-Terrestial-Alts.
[73] 20110224-Applicant-ltr-to-Corps-Additonal-Information-Requested, attachment 2, page 2
[74] 20110822-PREPA-to-Corps-additional-analysis-regarding-FSRUs
[75] 20110815-PREPA-answers-to-Corps-questions-of-8Aug, question 2a.
[76] 20110224-Applicant-ltr-to-Corps-Additonal-Information-Requested, attachment EIS, Section 4.3
[77] 20110822-PREPA-to-Corps-additional-analysis-regarding-FSRUs
[78] 20110224-Applicant-ltr-to-Corps-Additonal-Information-Requested, attachment EIS, Section 4.2
[79] 20110620-PREPA-Table-Comments-And-Responses, Comment#33
[80] 20110815-PREPA-answers-to-Corps-questions-of-8Aug, question 2b.
[81] 20110224-Applicant-ltr-to-Corps-Additonal-Information-Requested, DIA-F, Section 4.2
[82] 20110202-Hon. Antonio Fas Alzamora, President, Puerto Rico Senate, letter to Corps 2 Feb 2011. Enclosure First Progress Report on Senate Resolution 889.
[83] 20110620-PREPA-Table-Comments-And-Responses, Comment#13
[84] Kendall, M.S., M.E. Monaco, K.R. Buja, J.D. Christensen, C.R. Kruer, and M. Finkbeiner, R.A. Warner. 2001. Methods Used to Map the Benthic Habitats of Puerto Rico and the U.S. Virgin Islands U.S. National Oceanic and Atmospheric Administration (NOAA). National Ocean Service (NOS), National Centers for Coastal Ocean Science (NOS) Biogeography Program, Silver Spring, MD. 46 pp.
[85] 20110719-PREPA-to-Corps-Revised-Fracout-Plan, §2.4
[86] EIS at Chapter 5.1
[87] EIS at 5.11.2.j
[88] PREPA/Corps Mtg 1 July 2011.
[89] Mark J. Stephens, October 2000, Gas Research Institute.
[90] Office of Pipeline Safety, October 2010.
[91] EIS at 6.18.2
[92] 20111103-BCPeabody-updated-JointPermitApplication, §1.3.2 dividing 21.63¢/KWH by 9.75¢/KWH = 2.21.
[93] 20110620-PREPA-Table-Comments-And-Responses, Comment#32
[94] 20110620-PREPA-Table-Comments-And-Responses, Comment#22
[95] 20110620-PREPA-Table-Comments-And-Responses, Comment#41
[96] Cowardin, L.M, V.Carter, F.C. Golet, E.T. LaRoe. 1979. Classification of wetlands and deepwater habitats of the United States. U.S. Department of the Interior, Fish and Wildlife

Service, Washington, D.C.. 131pp.
[97] Federal Register, Vol. 76, No. 197, Wednesday, October 12, 2011, page 63420ff, Department of the Interior, U.S. Fish and Wildlife Service, 50 CFR Part 17.
[98] 20111115-BCPeabody-ltr-to-Corps-USFWS-Petition-for-Listing-Coqui-llanero, top of page 4.
[99] Observation of land cover mapping from the Puerto Rico GAP and aerial photos.
[100] 20111115-BCPeabody-ltr-to-Corps-USFWS-Petition-for-Listing-Coqui-llanero, top of page 3.
[101] The Phase 1A Report is Appendix 5 of PREPA's EIS (DIA in Spanish), the entire EIS submitted with the Joint Permit Application dated September 16, 2009. The EIS was finalized on November 29, 2010. The Corps also had an English translation of this Appendix circa April, 2011.
[102] Number of sites stated in Executive Summary of the Phase 1B report provided by PREPA to the Corps on June 1, 2011. The SHPO, based on their letter dated May 31, 2011, to the Corps, received a copy in Spanish on a CD at the Interagency Meeting on May 11, 2011.
[103] 20110609-Meeting-SHPO.
[104] 20110630-Meeting-SHPO
[105] These sentences are a synopsis of 20111122-Programmatic Agreement, the DRAFT as of November 22, 2011 and the attachments (Survey Strategy and Analysis of Known Sites.
[106] Gould, W., C. Alarcón, B. Fevold, M.E. Jiménez, S. Martinuzzi, G. Potts, M. Solórzano, and E. Ventosa.2007. Puerto Rico Gap Analysis Project – Final Report. USGS, Moscow, ID and the USDA Forest Service International Institute of Tropical Forestry, Río Piedras, PR. 159 pp. and 8 appendices.
[107] 20110809-PREPA-ftp-HDD-drawings, 48.0.Z-325.19

Field Recap

				Permanent			Temporary			Landscape			Water			Structure					
Sort	Site#	Impact Map # (see Note 1)	Group	units	acre	(ΣC - zero) / 30	units	acre	(ΣC - ΣM) / 30	C urrent	P ost backfill	M with mitigation	C urrent	P ost backfill	M with mitigation	C urrent	P ost backfill	M with mitigation	Municipality	Cowardin
28	VV18B	52,51	1-DiverseWet	0.21	0.26	0.80	3.02	30.23	0.10	8	5	7	9	4	7	7	4	7	Arecibo	PEM1C,PEM1A
6	VV20	54	1-DiverseWet			0.67	1.05	10.51	0.10	7	4	6	8	4	7	5	2	4	Barecelon	PEM1C
29	VV19B	53	1-DiverseWet			0.93	1.84	13.80	0.13	9	7	8	10	4	7	9	7	9	eta	PEM1C
27	VV17/Cll17	50,49	1-DiverseWet			0.87	6.11	30.53	0.20	9	3	7	9	3	5	8	4	8	Arecibo	PEM1C
30	VV25/Cll11	66	2-Field-Vgrass	0.37	0.55	0.67	0.00	1.36	0.00	8	5	8	8	5	8	4	3	4	Vega Baja	PEM1A
31	VV26	67,4	2-Field-Vgrass	0.13	0.25	0.53	0.00	16.87	0.00	6	4	6	6	4	6	4	4	4	Vega Baja	PEM1A
25	VV14	42-45	3-Field-Cattle			0.60	0.00	21.24	0.00	7	6	7	7	6	7	4	3	4	Arecibo	PEM1A,PEM1C
26	VV16	48,46	2-Field-Cane			0.77	1.52	22.86	0.07	9	6	9	8	3	6	6	3	6	Arecibo	PEM1A,PFO3
21	VV3	2	2-Field-Vgrass			0.63			0.07	6	3	5	6	4	6	7	4	6	Peñuelas	
17	VV37	80,81,82	2-Field-Vgrass			0.50	1.42	10.63	0.13	4	2	3	5	3	5	6	2	3	Cataño	PEM1C
5	VV13	41	4-Alluvial-wetland			0.57	0.00	12.75	0.00	7	4	7	7	3	7	3	2	3	Arecibo	PEM1A,PEM1C
7	VV21	55,54	4-Alluvial-wetland			0.60	0.00	10.98	0.00	8	5	8	7	4	7	3	2	3	Manati	PEM1A
13	VV30	72	4-Alluvial-wetland			0.47	0.00	9.33	0.00	6	4	6	5	3	5	3	2	3	Toa Baja	PEM1C
12	VV28/Cll10	71,70	5-Alluvial-river	0.24	0.48	0.50	0.67	19.99	0.03	5	3	4	7	3	7	3	2	3	Dorado	PEM1C,PEM1A
11	VV26B	67	5-Alluvial-river			0.67		0.11	0.10	8	3	7	8	3	7	4	2	3	Vega Alta	River,adj PEM1A
19	VV10	27,25	5-Alluvial-river			0.63	0.11	0.85	0.13	5	3	4	9	3	7	5	3	4	Utuado	River crossing
24	VV12	40	4-Alluvial-wetland			0.70	0.28	2.10	0.13	7	5	5	8	3	6	6	3	6	Arecibo	
8	Coll 12	59,56-60	4-Alluvial-wetland	0.07	0.09	0.73	4.46	33.42	0.13	8	3	6	9	4	8	5	3	4	Manati	PEM1A
14	VV31/Cll6	74,73	4-Alluvial-wetland			0.80	2.50	18.75	0.13	8	3	6	9	3	9	7	4	5	Toa Baja	PEM1C (E2F03 .001)
18	VV11	30,28-31	5-Alluvial-river			0.83	0.22	1.30	0.17	9	3	7	9	3	7	7	3	6	Utuado	River crossing
20	VV9	24,9-23	6-SteepBank			0.97	0.40	0.75	0.53	10	2	4	10	2	5	9	2	4	Adjuntas	River crossing
10	VV24	66	7-River-terrace			0.87	0.00	0.00	0.27	10	3	7	9	4	7	7	3	4	Vega Baja	PEM/FO
16	VV36	77,79,80	8-Riverine			0.57		12.61	0.07	5	3	4	7	4	7	5	3	4	Cataño	PEM1F
15	Coll 3	77,78	8-Riverine	0.03	0.04	0.77	1.23	4.60	0.27	7	2	4	9	4	8	7	2	3	Cataño	PFO3A, C
22	VV4/Cll24	2	9 Marsh	0.01	0.01	0.70			0.07	6	3	5	6	4	6	9	5	8	Peñuelas	E2ESS open
23	VV4B/Cll27	2	9-Marsh			0.67	0.02	0.69	0.03	7	4	6	6	4	6	7	4	7	Peñuelas	E2ESS bermed
	Sum of canal acres on various Map#'s ->					0.63	0.00	3.09	0.00	<--presuming vegetation at waterline returns quickly										
				1.05	1.68		24.84	289.35												

version 10 Nov 2011

Note 1: First impact map # is location of field site. Score extrapolated to polygons on rest of map #'s listed based on Cowardin classification.

Note 2: Corps is confirming the impact maps and coordinating with other Federal agencies therefore revisions will be made to this table prior to the permit decision.

Illustration of off-site mitigation areas.